REFORM OF CREDIT CARD SCHEMES IN AUSTRALIA
II

Commissioned Report
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NETWORK EFFECTS, INTERCHANGE FEES, AND NO-SURCHARGE RULES IN THE AUSTRALIAN CREDIT AND CHARGE CARD INDUSTRY

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CONTENTS

I. INTRODUCTION

1. This report analyses the economic effects of several practices of Australian credit and charge card systems. Specifically, it looks at the use of so-called *no-surcharge rules* and the setting of *interchange fees*.[1] Under no-surcharge rules imposed by MasterCard and Visa, a merchant accepting a given credit card agrees not to charge its customers any more for using that card than any other non-cash means of payment.[2, 3] The interchange fee is an amount collected from the relevant financial institution serving a merchant at which a payment card is used and transferred to the institution that issued the card.

2. These practices have been subject to an enquiry by the Reserve Bank of Australia and the Australian Competition and Consumer Commission. In October 2000, the Bank and

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[1] No-surcharge rules are sometimes referred to as "non-discrimination rules." The latter is an economic misnomer. To the extent that different payment mechanisms have different costs, no-surcharge rules force retailers to engage in price discrimination because they require the same prices for products with different costs.

[2] According to the MasterCard rules,

> **Charges to Cardholders.** The merchant shall not directly or indirectly require any MasterCard cardholder to pay a surcharge, to pay any part of any merchant discount, whether through any increase in price or otherwise, or to pay any contemporaneous finance charge in connection with the transaction in which a MasterCard card is used. A surcharge is any fee, charged directly or indirectly, deemed by this Corporation to be associated with the use of a MasterCard card that is not charged if another payment method is used. "Merchant discount," as used in this subsection, means any charge for the acquisition of sales slips negotiated by the merchant and the member or affiliate with which the merchant has a merchant agreement. The prohibitions of this subsection (14) do not prohibit discounts for payments in cash, or for charges (such as bona fide commissions, fees for special handling or expedited service, postage and handling, and the like) that are charged to the cardholder regardless of the form of payment. (*MasterCard Bylaws and Rules,* May 1999, §9.04(b)(14).)

According to the Visa rules,

> A Merchant must not:
>
> add any surcharges to Transactions, unless local law expressly requires that a Merchant be permitted to impose a surcharge. Any surcharge amount, if allowed, must be included in the Transaction amount and not collected separately. (*Visa ByLaws*, November 15, 1999, §5.2.c.)

[3] It is my understanding that Bankcard association regulations do not contain a no-surcharge rule, but that the agreements between merchants and their acquiring banks may well contain surcharge prohibitions.

Commission published a study (the *Joint Study*) stating their initial findings.[4] Industry participants were given the opportunity to comment on the study and offer support for, or objections to, its findings. The present report, commissioned by the Reserve Bank of Australia, analyses economic issues raised by the *Joint Study* and the responses to it.

3. The report is organized as follows. Sections II through IV set the stage for the later analysis. Section II provides an overview of the credit and charge card industry. Section III identifies benefits potentially enjoyed by consumers and merchants from the use of credit and charge cards. As discussed in Section IV, these benefits give rise to network effects. Moreover, because a card-based transaction affects both consumers and merchants, actions by one side of the transaction can affect the economic welfare of the other side. This fact raises the possibility of externalities, which also are defined in Section IV.

4. Sections V through VII analyse the effects of no-surcharge rules and interchange fees. Section V examines the market outcome when merchants can freely engage in surcharging. Section VI then examines the market outcome when merchants must set retail prices that are invariant with respect to the payment mechanism used. Section VII compares the market outcomes with and without surcharging to identify the net effects of no-surcharge rules on economic welfare.

5. After a brief concluding section, a technical appendix surveys several economic models that have been developed to shed light on interchange rate setting and no-surcharge rules. A second appendix discusses the definition of a relevant market and notes that there is no contradiction between the finding that credit and charge cards constitute a relevant market and the finding that distortions in credit and charge card prices can lead to excessive card use.

II. INDUSTRY OVERVIEW

6. Figure *A* provides an illustrative schematic of the credit and charge card industry. As shown in the diagram, consumers obtain credit and charge cards from card issuers. A card-holding consumer—either a household member or business employee—can use a credit or charge card to make purchases at merchants who accept that brand of card. To do so, the merchant must have a relationship with an acquiring institution. Card issuers and acquiring institutions interact with each other through the credit or charge card system to which they both belong. At the outset, it is important to recognize that each of the Bankcard, MasterCard, and Visa systems is an association of independent corporate entities, the member banks. In contrast, American Express and Diners Club each is a single corporate entity. Bankcard, MasterCard, and Visa often are referred to as *open systems*, while American Express and Diners Club are referred to as *closed systems.*

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[4] Reserve Bank of Australia and Australian Competition and Consumer Commission, "Debit and Credit Card Schemes in Australia, A Study of Interchange Fees and Access," October 2000.

7. An acquirer and issuer's interaction through their common card system allows them to verify that the consumer is entitled to use the card to make the desired purchase (authorization) and to ensure that payments flow to the appropriate parties (settlement). It is worth considering acquirers, issuers, and systems in more detail.

A. CARD ISSUANCE

8. A card issuer offers cards with particular features, sets the financial terms (*e.g.,* the annual fee, interest rate on unpaid balances, grace period, and late fees), renders the bills to the consumer, extends credit, collects payments from the consumer, and provides ongoing customer service.

9. The Bankcard, MasterCard, and Visa associations do not themselves act as card issuers. Instead, the banks that are members of the associations do. Examples include ANZ and National Australia Bank. American Express and Diners Club also act as card issuers and thus compete with the issuing banks that are members of the two associations. In addition, American Express has one partner issuer in Australia, AMP.

10. Like the rest of the Australian banking sector, credit card issuance is concentrated. This is true whether one measures concentration using data on accounts, transactions, or advances outstanding. Data for 2000 show that the top four issuing banks accounted for 82.6 percent of credit card accounts, 86.8 percent of credit card transactions, 88.1 percent of the dollar value of credit card transactions, and 74.4 percent of credit card advances outstanding. [5]

B. MERCHANT ACQUISITION AND PROCESSING

11. The activities of so-called acquirers can be subdivided into *merchant acquisition* and *merchant processing*.[6] In this typology, merchant acquisition refers to signing up merchants, installing point-of-sale terminals, and providing any necessary training of merchant employees. Merchant processing activities include routing transaction authorization requests from the merchant to the proper card issuing institution and relaying that issuer's reply back to the merchant, handling the flow of electronic and paper receipts, settling accounts, and providing ongoing services such as repairs, monitoring, and the provision of supplies.

12. Several members of the Bankcard, MasterCard, and Visa associations engage in merchant acquisition and processing. There are significant economies of scale in merchant processing, and a merchant acquirer may outsource merchant processing activities to a so-

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[5] Data provided by Reserve Bank of Australia.

[6] Industry participants sometimes use the term *merchant acquisition* to include merchant processing as well.

called third-party processor, of which there are relatively few. American Express serves as the sole merchant acquirer and processor for its network in Australia.[7]

13. Acquirers charge merchant service fees in both fixed annual amounts (*e.g.,* terminal rental fees) and on per-transaction bases. Per-transaction charges generally are on an *ad valorem* basis (*i.e.,* are levied as a percentage of the retail transaction value) but may also contain a flat amount per transaction.

14. Credit card acquiring is highly concentrated in Australia. The top four acquiring banks accounted for 90.9 percent of credit card transactions and 91.8 percent of the dollar value of credit card transactions in 2000.[8] To some extent, this is to be expected because of the large economies of scale in this industry. The *Joint Study*, however, raises the possibility that this concentration is increased by restrictive membership rules of the three associations.[9]

C. SYSTEMS SERVICES

15. Credit and charge card systems provide services to issuing and acquiring entities that make it possible for them to offer their services and products to consumers and merchants. Core system services include authorization and settlement protocols and standards that allow systems of a large number of different issuers and acquirers to work together to provide services to consumers and merchants. The set of merchants honoring a given credit and charge card system's cards constitute that system's acceptance network and is also a core system service. The size and coverage of its acceptance network is one of the most important characteristics of a credit and charge card system. The leading credit and charge card systems also engage in extensive brand-building and other activities in support of their members.

16. Credit and charge card systems levy a variety of assessments and fees on issuers and acquirers who use their systems services. Some fees cover non-transaction-related costs, such as brand promotion and innovation. Other fees cover the costs incurred to process transactions over authorization and settlement networks.

17. As noted in the introduction, in addition to charging members for network services, the Bankcard, MasterCard, and Visa associations stipulate the payment of interchange fees. Members of the associations collectively set the default rates in Australia.[10] Although stipulated at the network level, an interchange fee does not go to the network itself. The fee is a transfer between members: It is paid by a merchant's acquiring institution and received by the cardholder's issuing institution. American Express does not have a formal interchange fee.

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7 American Express, "Competition in Payment Systems," Submission to Reserve Bank of Australia, June 2001 (hereafter *American Express Submission*), at 5.

8 Data supplied by Reserve Bank of Australia.

9 *Joint Study,* §5.4.

10 It is my understanding that member banks have the right to negotiate different interchange rates among themselves, but that they do not do so.

However, American Express and its issuing partner, AMP, have an agreement that links AMP's compensation to the merchant fees collected by American Express.[11] This compensation is the economic analog of an interchange fee.

18. The Australian credit and charge systems market is highly concentrated. Survey data indicate that the Bankcard, MasterCard, and Visa schemes together accounted for 93.3 percent of the general purpose consumer credit and charge cards on issue in Australia in 2000. American Express and Diners Club combined had only a 6.7 percent share of cards on issue.[12] Because American Express and Diners Club have higher average transaction values than Bankcard, MasterCard, and Visa, share measurements using the dollar value of transactions yield somewhat different results. According to Visa, about 12 percent of the dollar value of transactions is accounted for by the closed general purpose credit and charge card schemes.[13] Thus, Bankcard, MasterCard, and Visa have an 88 percent market share, which is still highly concentrated.

19. Another notable feature of the Australian marketplace is the high degree of overlap in the ownership and governance of the three major credit card associations. Bankcard, MasterCard, and Visa are managed by full-time professional staffs and governed by their members. The four largest banks in Australia serve on the boards or executive committees of all three major open credit card schemes. ANZ, Commonwealth, National Australia Bank, and Westpac serve on the boards or executive committees of Bankcard, MasterCard, and Visa.[14] The board or executive committee of each scheme has the authority to approve interchange fees and other policies within the scheme. This extensive overlap of system governance, coupled with highly concentrated issuing and acquiring, raises very significant questions about the degree of competition in the Australian credit and charge card industry.

20. The association structure is relevant to the analysis of the effects that various practices have on competition and consumer welfare. To date, Bankcard, MasterCard, and Visa have not been operated as profit centers.[15] The governing members, however, generally are for-profit entities. Because issuers and acquirers control the associations, association policies can be used to effect economic agreements among horizontal rivals. And because, to date, the associations have not been operated as standalone profit centers, the exercise of association market power is not aimed at elevating the service prices charged to members in order to

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11 *American Express Submission* at 5.

12 Roy Morgan Research data provided by the Reserve Bank of Australia.

13 Visa International Service Association, "Delivering a Level Playing Field for Credit Card Payment Schemes," prepared by Network Economics Consulting Group Pty Limited, August 2001 (hereafter *Delivering a Level Playing Field*), footnote 54 at page 51.

14 Data provided to the Reserve Bank of Australia by Bankcard, MasterCard, and Visa.

15 The structure of MasterCard may be changing. See "MasterCard and Europay Plan to Combine into a Global Payments Organization with a Private Share Ownership Structure," MasterCard press release, 6 June 2001. Available at www.mastercardintl.com/about/press/pressreleases.cgi?id=427 on 4 August 2001.

generate association profits. Instead, market power is exercised to allow members to earn greater profits.

III. CONSUMER AND MERCHANT BENEFITS OF CARDHOLDING AND USE

21. Much of the public interest analysis of interchange rates and no-surcharge rules flows from the effects these policies have on the realization of economic benefits by consumers and merchants. Hence, it is useful to begin with a careful review of the potential sources of those benefits.

A. CONSUMER BENEFITS

22. Credit and charge cards serve both as a *payment mechanism* and—for many consumers—a *source of credit*. The term payment mechanism refers to any medium that can be used to effect a transaction. Examples include cash, cheques, debit cards, and credit and charge cards. Several payment mechanisms are various types of cards. A *general purpose credit card* is a plastic card that can be used at a wide variety of merchants to make purchases on a revolving credit line.[16] A *proprietary credit card* is a credit card that is accepted as payment only at a specific merchant or small set of merchants that issue the card (*e.g.,* a David Jones credit card). Credit cards offer two sources of credit. One, they offer unsecured, revolving lines of credit. Second, they offer a float comprising the time between when a purchase is made and when the consumer has to pay his or her credit card bill, which typically occurs monthly. A *charge card* offers only the second type of credit. Like a credit card, a charge card allows deferred payment, but instead of being allowed to run a balance, the user must pay his or her account in full after a set period, usually about one month.[17] The American Express Green card is the most well known charge card.

23. Another type of plastic payment card does not extend credit facilities. A holder of a *debit card* has the amounts purchased using the card deducted from his or her designated deposit account by the card issuer on a pay-as-you-buy basis, with a lag ranging from a few seconds to a few days.[18] A debit card typically can be used to make purchases at retailers (also known as EFTPOS) or to withdraw cash from automatic teller machines.

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16 Merchants can include supermarkets, department stores, other retailers, hotels, restaurants, airlines, and government agencies, among others.

17 Charge cards are sometimes referred to as travel and entertainment, or T&E, cards because of their historical origins as cards used by travellers.

18 *On-line debit* refers to debit cards that require the buyer to type his or her Personal Identification Number (PIN) on a PIN pad as part of the authorization process. *Off-line debit* refers to debit cards that rely on a signature as part of the security process for authorization, the way credit and charge cards typically do. Visa supports off-line debit cards in Australia. Despite the name, off-line debit cards usually make use of electronic

24. A single consumer may make use of cash, cheques, a debit card, and one or more general purpose credit cards. He or she may also carry the proprietary credit card of a department store or petrol retailer. The reason a single consumer makes use of this variety of payment mechanisms is that different mechanisms are best suited for particular situations. The choice of which payment mechanism to use for a particular purchase depends upon a matching of consumer, transaction, and payment mechanism characteristics.

25. The mix of transactions and the importance placed on various payment mechanism characteristics depend on characteristics of consumers, including a consumer's income and the extent to which the consumer travels for either business or recreation.

26. Characteristics of transactions include: the amount; the location (*e.g.,* local, out-of-state, or while traveling in a foreign nation); whether the transaction is planned, impulse, or the result of an emergency; whether the consumer and merchant are physically in one another's presence during the transaction (*e.g.,* a purchase in a department store versus a purchase over the telephone or Internet); and whether the purchaser deals with the seller repeatedly.

27. Characteristics of a payment mechanism include: security (such as how much the payment mechanism exposes a consumer to the risk of theft); flexibility (the extent to which a consumer has to plan in advance to be able to make a payment); ubiquity of acceptance; and ancillary benefits (*e.g.,* loyalty programs, travel insurance, and warranty extensions); and whether there are charges or fees associated with use of the mechanism. Some payment mechanisms (*e.g.,* credit and charge cards) have associated credit facilities, but others (*e.g.,* cash and debit cards) do not.

28. A consumer's choice of payment mechanism ultimately is made based on a assessment of the relative costs and benefits of different payment mechanisms in a given circumstance. The degree of substitution among various payment mechanisms will vary across situations. For example, cash may be a good substitute for a general purpose credit or charge card when spending $30 to buy CDs at a record store. However, cash is a poor substitute for a general purpose credit or charge card when making purchases on the Internet. And although a general purpose credit card and a David Jones proprietary credit card would be close substitutes for purchasing clothes at David Jones, they would not be substitutes for purchasing clothes at a Grace Bros. department store.

29. The overall degree of substitution among different payment mechanisms is sufficiently limited that the Australian Competition and Consumer Commission has concluded that, when assessing competition in a recent bank merger, credit cards constitute a relevant product market.[19]

30. It is important to recognize that this finding does not imply that credit and charge card pricing terms are irrelevant when consumers choose among payment mechanisms. First, various

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authorization.

[19] Australian Competition and Consumer Commission, "ACCC Not to Oppose Commonwealth Bank/Colonial Merger," Press Release, June 8, 2001, at 4.

general purpose credit and charge cards generally are much closer substitutes for one another than are cash, cheques, and debit cards. Hence, distorted prices may lead consumers to make the wrong choices among credit and charge cards. Second, for sufficiently large price differentials, some consumers will be willing to switch among different types of payment mechanisms.[20]

31. The discussion of pricing raises a second important point. Consumers may face two forms of price signal that influence their payment mechanism choices. First, there are the direct prices associated with use of a given payment mechanism, such as transactions fees or rebates. Second, in some circumstances, retail prices charged by merchants may vary with the type of payment mechanism used (*e.g.,* cash discounts).

B. MERCHANT BENEFITS

32. Generically, there are two reasons why a merchant might benefit from having its customers use credit or charge cards:[21, 22]

- *Transactions Costs Savings.* Some parties assert that purchases made using credit cards may entail lower merchant transactions costs than those made using other payment mechanisms.[23] Cash, for example, has costs associated with security, and cheques are subject to fraud costs.[24] In a July, 2001 survey of its members, the Australian Retailers' Association (ARA) collected information on the costs to retailers of accepting different payment methods. When the merchant service fee is included, credit and charge cards are the most costly payment methods to accept in terms of both absolute amounts per transaction and relative to transaction value. The average per-transaction cost of accepting a bank-issued credit card was $1.04 (1.9 percent of the transaction value). The corresponding figures for a charge card were $2.01 and 2.9 percent. In contrast, the acceptance costs were $0.12 (0.7 percent) for cash, $0.49

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20 This point is addressed further in the second appendix.

21 Generally, a merchant derives benefits only when a card is used. In theory, a merchant could benefit from card *holding* if it gave consumers the confidence or ability to patronize a given merchant even though the cardholder used a different payment mechanism at that merchant. This benefit does not appear to have been raised in either the *Joint Study* or the responses to it.

22 The merchant might also get increased information about its customers by being able to track their purchases. This benefit does not appear to have been raised with respect to general purpose cards in either the *Joint Study* or the responses to it.

23 See MasterCard International Incorporated, *Submission to the Reserve Bank of Australia,* June 8, 2001 (hereafter *MasterCard Submission*), at 4; St. George Bank, Comments on "A Study of Interchange Fees and Access in Debit and Credit Card Schemes in Australia" at 1.

24 See *American Express Submission* at 9 and 10 for a list of other benefits a merchant potentially enjoys on a per-transaction basis.

(1.4 percent) for cheques, and $0.17 (0.3 percent) for debit cards.[25] Netting out the merchant service fee would greatly reduce the merchant's apparent cost of accepting credit and charge cards. The ARA points out, however, that much of the cost of a transaction consists of staff time in processing the transaction. Because credit and charge cards generally require signature verification, such transactions consume more time than an otherwise comparable debit transaction.[26] Even without merchant service fees, the average cost of a credit or charge card transaction is $0.29 per transaction.[27]

- *Increased Sales.* Consumers may make purchases using their credit cards that they would not otherwise make from the merchant.[28] If these purchases take place at prices that exceed the merchant's marginal costs of the transaction (including costs associated with the use of a credit or charge card), then these additional sales constitute a benefit to the merchant.

33. There are three important points that must be recognized to understand the implications of merchant benefits for economic efficiency.

34. First, merchants and their customers have commercial relationships. A merchant sets a price for the good or service sold to its customers. Through this pricing mechanism, a merchant's transactions benefits may be passed on to consumers. If, as has been claimed by some, credit and charge cards are cheaper (netting out both costs and benefits) for the merchant than are other payment mechanisms, then merchants have incentives to encourage credit and charge card use relative to the use of other payment mechanisms. These incentives exist even for merchants with market power.[29] Moreover, competition among merchants may create additional market forces that drive merchants to pass the transactional benefits through to their customers.

35. Second, it is important to recognize that any benefits from increased sales are derived from consumer preferences. Unlike transactions benefits, a merchant does not earn increased sales benefits directly from a consumer's use of a credit or charge card. Instead, the merchant

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25 Australian Retailers Association, "Credit Card Schemes in Australia," Submission to the Reserve Bank of Australia (hereafter *Australian Retailers Submission*), at 19-20.

26 *Australian Retailers Submission* at 20.

27 Data provided to the Reserve Bank of Australia by the Australian Retailers Association.

28 Visa states that "These benefits arise when people with credit cards make more purchases, larger purchases and in some cases, new types of purchases." Visa International Service Association, "Credit Card Schemes in Australia: A Response to the Reserve Bank of Australia and Australian Competition and Consumer Commission Joint Study," prepared by Network Economics Consulting Group Pty Limited, January 2001 (hereafter *Visa Response*), at 21.

29 For example, a monopoly merchant has incentives to encourage its customers to use the least-cost payment mechanism because that results in the greatest merchant profits, all else equal.

derives benefits only if the consumer prefers to use a credit or charge card *and* makes greater purchases because the card is a payment option. Because of the derived nature of this type of merchant benefits, it does not automatically follow that increased card use gives rise to merchant benefits. To see why, consider the following example. Suppose that there are two types of customer. One type greatly values using a credit card. The other type is indifferent between paying cash and using a credit card in the absence of a card loyalty program, but strictly prefers to use a credit card if it pays a one percent rebate.[30] Moreover, suppose that the merchant is charged the full cost of the rebate program (say, 0.25 percent for administrative costs and one percent to cover the cost of the funds rebated to card users) through the merchant service fee that it pays.[31] Given that it bears these costs of 1.25 percent, and consumers of the second type do not value card use per se, the merchant would be better off if these consumers did not hold cards. The merchant would make the same sales, but would do so at a lower cost. And, if these consumers did hold credit cards, the merchant would be better off if it could induce them to use cash rather than credit cards by passing part of its savings from the use of cash to them.

36. Third, it is important to distinguish between the benefits enjoyed by a single merchant and the overall effects on merchants collectively.[32] Consider the benefits of card acceptance that a merchant garners from increased sales at positive margins. An individual merchant may recognize that failure to accept a major general purpose credit card would lead potential customers to patronize rival merchants that accept those customers' preferred cards. Hence, from the individual merchant's perspective, card acceptance generates significant additional sales benefits. The benefits to the overall economy, however, depend on the effects on merchants as a whole (in addition to effects on consumers). It is easy to see that the collective effects may be very different from the individual effects. The reason, of course, is that the merchant's acceptance decision may have negative effects on rival merchants; the merchant accepts credit cards in part to take business away from its rivals. Thus, the collective benefits of a merchant's accepting credit and charge cards may be much lower than the merchant's individual benefits.[33]

37. Although individual merchants may increase their shares by accepting credit and charge cards, the public policy question is whether the use of these cards leads to a permanent increase in sales from the perspective of the economy as a whole. There is a significant literature on the macroeconomic effects of different types of payment and credit mechanisms. This literature

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30 One could also consider an example involving consumer switching between two payment mechanisms that are closer substitutes, such as two different credit cards.

31 For purposes of this illustrative example, assume that any other transactions costs of card or cash use are zero.

32 Visa makes this point with respect to the no-surcharge rule. See footnote 155 below.

33 This point is also made by Julian Wright, "The Determinants of Optimal Interchange Fees in Payment Systems," Department of Economics Working Paper No. 220, University of Auckland, July 19, 2001 (hereafter *Optimal Interchange Fees*), at 7.

sheds light on the claim that credit and charge card use leads to a permanent and significant increase in aggregate consumption, and suggests that this claim is ill founded.

- Consider first, a pure consumption-loan model with non-storable commodities.[34] By assumption, in any given period society has a fixed amount of total resources available for consumption: Anything created during a period that is not consumed in that period perishes. The use of borrowing and lending may improve consumer welfare by allowing an individual to smooth consumption over his or her lifetime. However, there is no change in aggregate consumption per period as the result of this credit activity—everything is consumed in the period it is produced and that total is fixed. Although the model clearly makes unrealistic simplifications, it shows the danger of confusing the effects on a single individual with the effects on the economy as a whole.
- If one relaxes the assumption that all goods are perishable, a consumer may hold inventories as a means of smoothing his or her consumption over time (*e.g.,* saving for retirement). In this setting, the extension of credit across individuals can raise consumer welfare by reducing the need to hold unproductive inventories. Instead of storing a commodity for future consumption, one individual can consume the good today in exchange for a commitment to supply some amount to the lender in the future. Thus, some output may be consumed earlier rather than held as inventories.
- Use of credit cards may reduce transactions costs associated with purchasing goods and services in the marketplace. Under certain plausible assumptions about household tastes, the reduction in transactions costs can lead to increased consumption of market-traded goods relative to home-produced goods (*e.g.,* home-cooked meals).[35]
- One could include the possibility of investment in productive capital. However, in theory the introduction of credit cards could reduce investment and thus, over time, reduce the level of per-period consumption.
- By reducing the transactions costs associated with making purchases while travelling, credit and charge cards may increase sales to foreign nationals visiting Australia.[36]
- In theory, general purpose credit and charge cards could lead to a redistribution of sales from low-margin to high-margin products.[37] But these products might also be the ones

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34 For a seminal analysis of consumption-loan models, see Paul A. Samuelson, "An Exact Consumption-Loan Model of Interest with or without the Social Contrivance of Money," *The Journal of Political Economy,* **LXVI**, No. 6, December 1958:467-482.

35 See, for example, Robert M. Townsend, "Financial Structure and Economic Activity," *American Economic Review,* **73**, No. 5, December 1983: 895-911.

36 *American Express Submission* at 10.

37 More precisely, the welfare effects would depend on the pattern of producer surplus, including input suppliers.

most likely to have proprietary cards in the absence of general purpose cards. Thus, claims of any such benefits must be regarded as highly speculative.

38. This discussion indicates that credit allows the smoothing of consumption in the face of uneven income streams, may reduce the need to hold unproductive inventories, and might reduce transactions costs. But one must be careful not to overstate the benefits. Moreover, one must recognize that these are beneficial effects of *credit in general,* not specifically benefits of *card* use. Thus, one must also examine the extent to which credit and charge card transactions generate these benefits. The Australian economy has other forms of credit available that can be used to engage in lifetime income smoothing (*e.g.,* home mortgages). The existence of other forms of credit does not remove the benefits of credit cards for many consumers as a means of short-term or small-scale smoothing, but it reduces the importance of credit cards for overall macroeconomic performance. A closely related question concerns the extent to which particular uses of credit cards give rise to these benefits. For example, so-called transactors may not use credit cards to smooth consumption flows, and thus their use of the cards may not generate many of these benefits.

39. The fact that credit and charge card use may not increase aggregate consumption, or may do so by significantly less than some parties imply, does not mean that credit cards have no beneficial effects. But, as will be shown below, the considerations identified here have significant consequences for efficient pricing and whether markets succeed or fail to attain efficient outcomes.

IV. THE POSSIBILITY OF EXTERNALITIES

40. A notable feature of consumer and merchant benefits is that a single card-based transaction can generate benefits for both sides of the transaction simultaneously. Moreover, each side needs to take actions in order for a transaction to take place. This fact raises the possibility each side will make privately optimal, but socially inefficient, decisions because it will fail to take into account effects on the other side of the transaction. This section explores these implications further and poses questions answered in the following sections.

A. NETWORK EFFECTS

41. A general purpose credit and charge card is valuable to consumers because it can be used to pay for purchases at a variety of merchants. All else equal, an actual or potential cardholder places greater value on a card issued on a network with more extensive merchant acceptance. Thus, the greater the number of merchants who accept a given system's cards, the greater the number of consumers who wish to carry and use the card. This positive relationship between network size (as measured by the number and variety of merchants) and consumer valuation is an example of a more general phenomenon that economists refer to as *network*

effects.[38] Network effects arise when, the greater the number of users on a system, the more valuable the system is to an individual user.

42. Economists distinguish *direct* network effects from *indirect* network effects. Direct network effects arise when an increase in the size of a network increases the value of the network to its users. Telephone networks entail direct network effects—different users value increased network size because they can communicate with one another, which gives rise to benefits of variety. Indirect effects arise when actions by one party increase the supply of complementary services, which increases the economic welfare of other users of those services. Personal computer operating systems and applications programs provide a very well known example: The greater the number of people using a given operating system, the larger the potential market for applications running on that operating system, the larger the number of applications that are likely to be written for that operating system, and thus the greater the benefits to users of that operating system.

43. The credit and charge card industry can exhibit both types of network effects. There is a direct network effect associated with merchant acceptance of cards. An increase in the number of merchants accepting a card raises expected consumer benefits because a cardholder is more likely to be able to use the card on occasions when he or she finds it valuable to do so.

44. The credit card industry may also exhibit indirect network effects. If one cardholder takes actions that make it more desirable for merchants to accept cards, those actions may lead to an increase in merchant acceptance, which can help other cardholders. For example, there can be a positive-feedback relationship between the number of consumers carrying and using cards on the one hand and the number of merchants accepting the cards on the other. When acceptance of a credit card stimulates profitable sales, an increase in the number of consumers carrying a given system's brand of cards raises the value to a merchant of accepting that brand of card because the greater the number of such customers, the more acceptance of the card is likely to stimulate sales for the merchant. Thus, the greater the number of consumers who carry and use a given system's credit and charge cards, the greater the number of merchants that find that the benefits of card acceptance outweigh the costs.[39] This increase in the number of merchants would then benefit other holders of cards on that network.

45. The presence of multiple competing payment networks complicates the analysis of network effects.[40] To the extent a user of a card on one network confers positive effects on

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[38] For a survey of the economics of network effects, see Michael L. Katz and Carl Shapiro "Systems Competition and Network Effects," *Journal of Economic Perspectives,* **8**, No. 2 (Spring 1994):93-115.

[39] There can be fixed costs of card acceptance. These include the expense of having terminals installed at the point of sale, the costs of training personnel, and any fixed costs charged by third-party processors or acquirers.

[40] The degree to which various payment mechanisms compete with one another has been subject to disagreement. In its analysis of a recent bank merger, the Australian Competition and Consumer Commission concluded that credit cards are in a relevant

other users of that network, he or she may also confer negative effects on users of other payment networks. These negative effects arise for the same reason that positive ones do—usage of other payment mechanisms falls, and to the extent that there are economies of scale in acceptance, the acceptance networks may shrink, reducing consumer benefits from use of that payment mechanism.

46. One question raised by the *Joint Study* is whether network effects diminish as a network matures.[41] Maturity can refer to several different concepts. In network markets, actual and potential users typically care about future network sizes. For example, if a consumer is going to pay an annual fee for a card, he or she would like to know how many merchants are likely to accept the card over the coming year. Consequently, consumer expectations can be an important driver of the market outcome. Consumers may form expectations by looking at current installed bases and projecting forward, which can lead to the so-called "chicken and egg problem." The chicken-and-egg problem arises when no consumer wants to join a network because too few merchants accept the card, but additional merchants don't want to join the network because too few consumers carry the card. Credit and charge card networks can share a self-fulfilling expectations property with other networks: If everyone expects a network to succeed it will succeed, and if everyone expects a network to fail it will fail. Once a network has become established, the expectations process may get past the chicken-and-egg problem. The network's viability may then be less sensitive to small changes in the size of the network, and the network may need to do less to promote membership (*e.g.,* subsidize membership) than would a fledgling network.

47. There is another sense in which a credit and charge card network may mature. It is possible that, at a sufficiently high level of membership on either the merchant side or the cardholder side, marginal changes in membership generate smaller or no benefits to other parties. For instance, to the extent that the incremental merchants on a network are substitutes for merchants already on the network, the value to a cardholder from having additional merchants accept cards very likely diminishes as the number of merchants increases.[42] An

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product market distinct from cash, cheques, and debit cards (Australian Competition and Consumer Commission, "ACCC Not to Oppose Commonwealth Bank/Colonial Merger," Press Release, June 8, 2001, at 4.) The credit card associations and their members often assert the existence of vigorous competition among all payment mechanisms and therefore would include debit and cheques in the relevant market. (For example, *MasterCard Submission* at 4.) Notwithstanding this disagreement, all parties agree that there are multiple general purpose credit card networks supporting payment mechanisms that are substitutes for one another.

41 *Joint Study* at ii.

42 In theory, the last merchants to join a network might turn out to be the ones most valued by consumers, but intuitively this is very unlikely to happen in practice. For example, there might be some sort of community-of-interest effects, where a set of consumers and merchants have particular interest in transacting with one another, and thus only want to belong to the network if other members of this community belong, but cannot coordinate to join the network in a timely fashion. I am unaware of evidence that these effects are

established network again might thus need to do less to promote membership than would a fledgling network.

48. These considerations bring up the broader issue of internalizing network benefits, to which the analysis now turns.

B. NETWORK EFFECTS OR NETWORK EXTERNALITIES?

49. In thinking through the business and public policy implications of network effects, it is important to understand whether the network *effects* are network *externalities*. Among economists, there have been decades of controversy over the definition of externalities. The various definitions proposed by economists include the following:[43]

- Any situation in which actions by one economic agent affect the welfare of another economic agent not directly involved in the transaction.
- Missing markets.
- Situations in which taxes or subsidies could lead to Pareto improvements.

50. A common feature of all of these definitions is the notion that there are certain effects that one economic agent's actions have on another economic agent that are not fully captured in market prices. The failure of prices to reflect these effects means that self-interested economic decision makers may not take into account the effects of their actions on other economic agents. Thus, there may be a divergence between social and private incentives. Air pollution provides a classic example of potential externalities. Consider the decision of a firm whether to operate a factory that would earn X dollars annually. Suppose that the pollution created by the factory's operating is harmful to people living around the plant, and the monetary equivalent of this harm is two million dollars. It is economically efficient to shut down the plant if X is less than two million. But, in the absence of legal restrictions on polluting, the firm will operate the plant if its private benefits exceed its private costs. Thus, the firm will operate the plant unless local residents are able to organize to offer payments of X dollars or more to the firm to shut it down. If the plant's neighbors are unable to organize, the firm may operate the plant even if its benefits are only one million dollars and the harm to others is two million dollars. In this case, the firm's decision to operate gives rise to the negative externality of air pollution.

51. Although the air pollution in this example is an external effect, it need not be an externality. Suppose that the firm has to purchase a permit to pollute the air and this permit costs two million dollars. In this case, there is a market for air pollution rights, and the firm chooses to operate the plant if and only if the benefits of operation exceed two million dollars,

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currently significant in Australian credit and charge card networks.

[43] Andreu Mas-Colell, Michael D. Whinston, and Jerry R. Green, *Microeconomic Theory*, Oxford University Press, 1995, at Chapter 11.

which is the socially efficient decision rule. Hence, the market for air pollution rights internalizes the effects.

52. This example thus illustrates a central point about externalities: Whether the effects of an activity constitute externalities depends, *inter alia*, on the set of market institutions in which the activity takes place. In part for this reason, there has been controversy over whether network effects constitute externalities, or whether market mechanisms develop to ensure that prices reflect the effects that one agent's actions have on others.[44]

C. THE POTENTIAL ROLE OF INTERCHANGE FEES

53. The interchange fee has been identified as one potential mechanism to promote internalization of external effects by transferring funds from one side of card-based transactions to the other. At first glance, the interchange fee is a payment that goes from the merchant acquiring institution to the card issuing one. However, economists distinguish between the *statutory incidence* and the *economic incidence* of a fee. The statutory incidence refers to the party that initially pays the fee under the formal rules and institutions of the market. The economic incidence refers to who actually pays the fee once the market adjusts to a new equilibrium reflecting the fee. It is a well-established principle of economics that the statutory and economic incidences of a fee may be very different from one another.[45]

54. The statutory incidence of the interchange fee for a given transaction is that the associated merchant acquirer pays. However, the presence of such fees affects the merchant service fees and thus may affect what merchants charge their customers. Moreover, receiving the fee affects an issuer's incentives for card issuance, including both pricing and promotion strategies. Hence, the economic incidence of interchange fees may fall on the associated merchant and its customers, both credit and charge card users and non-card users.

55. The effects of interchange fees on merchant service fees and the prices of card services charged to cardholders are recognized by both MasterCard and Visa in their rationales for interchange fees. MasterCard states that interchange

> is fundamentally a balancing device for increasing the value and safeguarding the efficiency of the open systems by shifting costs between issuers and acquirers, and thereby the charges between cardholders and merchants.[46]

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44 For a negative view on the importance of network externalities generally, see S. J. Liebowitz and Stephen E. Margolis, "Network Externality: An Uncommon Tragedy," *Journal of Economic Perspectives,* **8**, No. 2, Spring 1994:133-150.

45 See, for example, Michael L. Katz and Harvey S. Rosen, *Microeconomics,* 3rd Edition, Irwin McGraw-Hill, 1998, at Chapter 11.2, and Robert S. Pindyck and Daniel L. Rubenfeld, *Microeconomics,* 5th Edition, Prentice Hall, 2001, at Chapter 9.6.

46 *MasterCard Submission* at 9.

Visa states that the purpose of interchange fees "is to ensure an economically efficient balance between promotion to cardholders on the one hand and promotion to merchants on the other."[47]

56. The interchange fee may affect card holding, card use, and merchant acceptance, and thus it might serve to balance the costs and benefits of the merchant and cardholder sides of a card transaction. There are three fundamental questions:

- Does the level of an interchange fee affect the equilibrium outcome in ways that matter for economic efficiency and consumer welfare?
- In those cases in which the interchange fee does matter, what is the optimal interchange rate?
- In those cases in which the interchange fee does matter, do market forces lead to setting an optimal interchange rate?

The answers to all three questions depend on the market structure and business institutions that constitute the economic environment in which the interchange fee is levied.

57. No-surcharge rules are one of the most important elements of the institutional structure in which interchange fees operate. Moreover, surcharges may themselves serve as a mechanism for internalizing network effects so that they are not network externalities. Hence, the analysis below proceeds by examining the effects of interchange rates on market equilibrium first in a market where surcharges are feasible and second in a market where surcharges are banned. The two situations are then compared.

V. EQUILIBRIUM WITH FRICTIONLESS MERCHANT SURCHARGING

58. The present section assumes that merchants can costlessly surcharge in the absence of formal prohibitions. In practice, frictions may prevent a merchant from engaging in surcharging even in the absence of formal restrictions. For example, there may be transactions costs associated with charging multiple prices, or merchants may fear some form of consumer backlash. Thus, the analysis of the present section may overstate the extent to which removal of formal no-surcharge rules affects the market outcome.

A. A NEUTRALITY RESULT

59. As several authors have pointed out, when merchants are free to charge retail prices that are contingent on the method of payment used by the purchaser, these retail price differentials may undo any effects of interchange fees.[48]

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47 *Visa Response* at 21.

48 Jean-Charles Rochet and Jean Tirole ("Cooperation among Competitors: The Economics of Payment Card Associations," 16 May 2000 (hereafter *Rochet and Tirole*)) establish an interchange fee neutrality result in the context of a specific model of issuer, acquirer,

60. The issue can be represented algebraically as follows. Let p denote the price charged by merchants for card-based purchases. Let m denote the merchant service fee. Let r denote the rebate paid by issuers to cardholders. For users of cards with loyalty programs offering rebates or rewards, $r > 0$. For users of other credit and charge cards, the typical value of r is zero.[49] Finally, let a denote the interchange fee paid by acquirers to issuers.

61. Rational consumers base their purchase and payment mechanism decisions on $p - r$, the net cost to a consumer from making a card-based purchase. Suppose a change in the interchange fee of da leads to changes in p and r equal to dp and dr, respectively. Then the change in a consumer's net costs of a card-based transaction is $dp - dr$. Hence, if the rates of change are equal (*i.e.,* $dp/da = dr/da$), then changes in the interchange fee have no effect on the net prices paid by consumers to make card-based purchases.

62. How likely are the rates of change in p and r to be equal when the interchange fee rises? Consider what happens when each party—issuer, acquirer, and merchant—expects every other party simply to pass through the increase. The merchant sees its merchant service fee rise by da. But the merchant also sees consumers' willingness to purchase goods and services using cards rise by da because issuers pass on the benefits they receive from the higher interchange fee by increasing the rebate by da. Moreover, the merchant expects all other merchants to raise their prices for card-based transactions accordingly. Hence, the merchant faces a pricing problem that is identical to the earlier one, except that everything happens at a price da higher; equilibrium quantities would be unaffected.[50] Similar arguments can be made for acquirers and issuers. If there is a unique equilibrium in each of the merchant, acquiring, and issuing markets for a given interchange fee, then there is a unique set of equilibrium consumption and output levels and it is invariant with respect to the level of the interchange fee.

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and merchant behavior. Joshua S. Gans and Stephen P. King ("The Neutrality of Interchange Fees in Payment Systems," draft version 28 May 2001) provide very general conditions for neutrality to hold.

49 A negative value of r would correspond to per-transaction fee charged by the issuer to the card user.

50 Formally, let $p(x,X) + r$ denote the per-unit price consumers are willing to pay to purchase x units of a merchant's output, where X is a vector denoting the output levels of all rival merchants. Suppose the merchant's costs are $c(x) + mx$. Then the merchant's profits are $\{p(x,X) + r\}x - \{c(x) + mx\} = p(x,X)x - c(x) + \{r - m\}x$. If r and m change by the same amount, there is no effect on the optimal choice of x given what other merchants are doing. But if every merchant reasons this way, X will be unaffected. Hence, the original set of equilibrium quantities will remain equilibrium quantities after the change in the interchange fee. Similar notation can be introduced for acquirers and issuers to show that their quantity choices would be unaffected as well. For a formal derivation, see Joshua S. Gans and Stephen P. King, "The Neutrality of Interchange Fees in Payment Systems," draft version 28 May 2001.

B. WELFARE ANALYSIS

63. When the conditions of the neutrality result hold, the interchange fee cannot be used as a tool to balance the costs and benefits potentially enjoyed by the two sides of a card-based transaction. This raises the question of whether the resulting equilibrium will be inefficient and whether there will be uninternalized external effects. As it turns out, merchant pricing may still provide an important means of internalizing external effects.

64. Frontier Economics and Visa argue that, absent a mechanism for internalization, externalities will arise from card usage because merchants earn positive margins on sales made using credit and charge cards.[51] The argument goes as follows. Some people are willing to purchase a particular product from a given merchant only if that merchant accepts a particular brand of credit or charge card. Thus, because the merchant typically sells goods and services at prices that exceed its marginal costs, a consumer's decision to use his or her credit card generates a benefit for the merchant. This benefit will be an externality if there is no mechanism to ensure that merchants compensate card users.

65. There are several problems with using this argument to conclude that interchange fees are needed to ensure efficiency. Some of these problems have already been identified in the earlier discussion of merchant benefits. First, an individual merchant's benefits of card acceptance arise only from sales transactions that would not have been made if the merchant did not accept cards. Second, the merchants' *collective* benefits may be zero because one merchant's increased sales can come at the expense of other merchants' sales. Both of these points raise doubts about the magnitude of these effects, even if they are externalities. Third, there may be other mechanisms for internalization, specifically, merchant pricing. All of these problems point to the need for careful analysis.

66. Several authors have conducted formal economic analyses that examine the welfare properties of equilibrium when surcharging is practiced. Professors Rochet and Tirole carefully model market equilibrium under the assumption that there is a single card network and a single alternative payment mechanism, "cash."[52] They also assume that merchants are so-called Hotelling competitors: two firms that offer differentiated products and each choose prices taking the other merchant's prices as given. Absent a no-surcharge rule, a merchant in their model sets one price for card-based transactions and another for cash transactions.

67. In this model, an individual merchant can increase its sales by accepting credit cards. Moreover, Rochet and Tirole assume that merchants enjoy positive transactions benefits from card use. Thus, both types of potential merchant benefits identified in Part III.B above are present in their model. One of Rochet and Tirole's key findings is that neither of these benefits is a source of externality. The reasons why are worth exploring.

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51 Frontier Economics, "Joint Bank Review of Credit Card Membership and Interchange Fees," *Report on Credit Interchange Fees to Review Banks,* January 2001, at 73, and *Visa Response* at 21.

52 *Rochet and Tirole*.

68. First, the increased sales are not a source of externality because—although an individual merchant gains sales by accepting cards—the collective effect on merchant sales is zero. In the Rochet and Tirole model, the total quantity of purchases is fixed over the relevant range of prices. Hence, with respect to unit sales, the merchants play a zero-sum game.

69. Second, merchant transactions benefits are not a source of externality because there is an internalization mechanism. Competition between the two merchants leads them to pass their transactions benefits through to consumers in the merchants' retail prices.[53] If credit card transactions are 1 percent cheaper because of reduced cash handling costs, the merchants set prices lower for credit transactions than for cash transactions by a corresponding amount. In general, the retail pricing differential associated with card use may be positive or negative, reflecting the merchant's net incremental benefits and costs of card use. In this way, consumers face prices that guide their card holding and usage decisions based on the costs and benefits realized by both sides of a card-based transaction.

70. The intuition behind this result can be seen by taking the interchange fee to be negative (*i.e.,* issuers pay acquirers) and equal to the acquirer's marginal costs.[54] With this interchange fee, issuers bear all of the issuing and acquiring costs and pass these on to their cardholders. So why wouldn't there be a problem when merchants get benefits but all of the costs fall on the cardholder side of the transaction? The answer is the use of retail price differentials by merchants. Consumers would face all of the costs of card holding and usage, but given the prices set by merchants, consumers would also enjoy all of the benefits.

71. The Hotelling model is one representation of merchant behavior. There are others. For instance, the perfectly competitive model of merchant behavior also gives rise to equilibrium retail price differentials equal to the differences in merchants' net costs of different payment mechanisms. Hence, with perfectly competitive merchants, consumers would face retail prices that reflected net merchant benefits and costs. Other models of merchant behavior can give rise to different equilibrium retail price differentials. Part IX.F of the Technical Appendix contains an illustrative model of a monopoly merchant. Depending on demand conditions, the differentials may be larger or smaller than the differences in net transactions costs and benefits.[55]

72. Dr. Wright modifies the Rochet and Tirole model and reaches different conclusions. His most striking result is that, when merchants have monopoly power, frictionless surcharging destroys the market for credit and charge cards and eliminates their use entirely.[56] Dr. Wright finds that, when surcharging is feasible, the merchant sets prices that extract all of the consumer

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53 *Rochet and Tirole* at 18.

54 Recall that, because of neutrality, the choice of interchange fee does not affect the resulting equilibrium quantities or net retail prices.

55 In addition, as discussed later in the present section, Professors Gans and King examine a model in which a monopoly merchant sets the differential inefficiently high.

56 Julian Wright, "An Economic Analysis of a Card Payment Network," December 2000 (hereafter *An Economic Analysis*) at 13.

surplus derived from purchase of the good by the marginal cardholder (*i.e.,* the cardholder with the lowest benefits from card use). Knowing this would happen, the marginal cardholder would not have paid to obtain a card in the first place. Hence, there can be no marginal cardholder, and allowing surcharges leads to the complete collapse of the credit card industry. As discussed in the Technical Appendix, this result is an artifact of an extreme assumption made in the model.[57] Under more realistic assumptions, cards are used, or even overused, in equilibrium when merchants have monopoly power and surcharging is feasible.

73. Even with Hotelling merchants, Dr. Wright finds that the equilibrium outcome with surcharging can lead to inefficiently low levels of cardholding. The reason is that he, unlike Rochet and Tirole, assumes that consumers make greater purchases when credit cards are accepted. Hence, there are economywide increased-sales benefits which are not internalized even when retail price differentials reflect transactions benefits.[58] As discussed in Part III.B above, however, the assumption of significant economywide increased-sales benefits is problematical.

74. Collectively, these models illustrate an important general point. Depending on the model of merchant pass through, some or all of the transactions benefits will be passed through to consumers through retail price differentials. Surcharges can thus be a mechanism for ensuring a balance of cost and benefits between the two sides of a card-based transaction. In other words, *surcharging can allow the market to internalize what might otherwise be an externality.*

75. American Express claims to the contrary that

> permitting surcharging amounts to an arbitrary decision by regulators that merchants should have to pay none of the costs of the credit card system and that cardholders should pay all of those costs.[59]

As the analyses above demonstrate, this claim is false. For some market structures, surcharges fully internalize the effects on the two sides of a transaction. In other cases, although the surcharges do not perfectly reflect merchants' net costs and benefits of different payment mechanisms, surcharges still partially internalize these effects.

76. A similar assertion is sometimes made that 'because merchants benefit from card use they should have to bear the costs.' When the transactions benefits minus the merchant service fee are positive, merchants will have incentives to promote card use through discounts, rather than surcharges. Similarly, if the transactions benefits were equal to the merchant service fee, merchants would be neutral in terms of promoting one payment mechanism or another. It is in

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57 See Part IX.C below.

58 More precisely, there are economywide gains in the surplus associated with equilibrium sales. (See *An Economic Analysis*, §4.3.)

59 *American Express Submission* at 10.

merchants' interests to use surcharges to reduce credit and charge card use relative to other payment mechanisms only when the merchant service fee exceeds the transactions benefits.

77. Even if surcharges exactly reflect differences in the net transaction benefits and costs of different payment mechanisms, there may be other distortions in the market outcome. For instance, if issuers and acquirers in the Rochet and Tirole model were perfectly competitive, the market outcome with frictionless surcharges would be fully efficient. However, Rochet and Tirole find that, when issuers are less than perfectly competitive, equilibrium in their model entails the under use of credit cards as the result of issuer market power.[60] The fact that issuer market power is the source of the problem indicates the social value of removing obstacles to issuer competition.

78. Distortions in issuers' pricing to their cardholders raise a second issue. Credit card issuers generate two revenue streams from their operations. One stream comprises annual fees and interchange fees, which are collected even if a card is never used as a source of credit beyond the grace period. The other stream comprises finance charges paid by cardholders who maintain balances past the grace periods on their cards. Although this point is not addressed by the formal models cited by respondents, the profitability of credit card lending may create incentives for issuers with market power to set annual fees or transactions charges below cost (*e.g.,* no-annual-fee cards) in order to encourage consumers to hold cards, use them to make purchases, and increase their borrowing levels. The presence of these incentives may offset or even outweigh the incentives for issuers with market power to set annual fees or the transactions charges levied on consumers above costs. To the extent that issuers set annual fees and transactions charges below costs, the overuse of cards would be encouraged in the setting examined by Rochet and Tirole.

79. Professors Gans and King consider a model in which there is a monopoly merchant and similarly find that there is insufficient card use.[61] Unlike Rochet and Tirole, Gans and King find that the market outcome results in credit card sales that are strictly less than socially optimal even when issuers are perfectly competitive. Like Rochet and Tirole however, Gans and King find that the restriction of credit card use is *not* due to network externalities. Instead, the distortion in card use is the result of the exercise of merchant market power, specifically retail price discrimination against card use.[62] As discussed in the Technical Appendix, the possibility of this type of price discrimination follows from the special structure of demand that they have

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60 *Rochet and Tirole* at 20.

61 Joshua S. Gans and Stephen P. King, "Regulating Interchange Fees in Payment Systems," draft version 14 June 2001 (hereafter *Regulating Interchange Fees*) Proposition 1 at 7. This proposition relies on the unstated assumption that the sum of the transaction fees charged by issuers to cardholders and by acquirers to merchants are greater than or equal to social marginal costs.

In contrast to Dr. Wright's finding in *An Economic Analysis*, the use of credit cards is not eliminated entirely when the merchant is a monopolist in the Gans and King model.

62 *Regulating Interchange Fees* at 8.

assumed—where a consumer uses credit cards for those transactions for which he or she has a relatively high willingness to pay—and it need not arise in other models of demand, even when there is a monopoly merchant.[63]

80. The models discussed so far demonstrate that the nature of competition among merchants and among issuers can affect the efficiency of the market outcome. A final point to note is that increased competition among acquirers might simultaneously promote increased merchant acceptance and efficient card holding and use. The logic underlying this conclusion is that increased competition among acquirers could be expected to reduce the markup of merchant service fees over the interchange fee and acquisition costs, all else equal. The lower merchant service fees would make card acceptance more attractive to merchants and could lead to lower surcharges (or bigger discounts) for the use of credit and charge cards.

81. In summary, economic theory provides reasons to believe that surcharges can serve as an important means of internalizing external effects but that the market outcome may not be fully optimal in the presence of frictionless surcharging. The lesson of these models is that both the structure of consumer demands and the nature of retailer market structure can affect the degree to which retail price differentials reflect underlying differentials in a merchant's costs and benefits of various payment mechanisms. Under some conditions, these differentials will exactly reflect the underlying cost and benefit differentials, thus perfectly internalizing the external effects. In other cases, the differentials may be smaller or larger than ideal. There is no general finding that merchants with market power will set retail price differentials that are biased against credit and charge cards. Moreover, in some cases the problem is not network effects, it is issuer market power.

VI. EQUILIBRIUM IN THE PRESENCE OF NO-SURCHARGE RULES

82. When merchants are forbidden to surcharge, the neutrality result discussed in the previous section may no longer hold, which raises questions of the welfare effects of interchange fees and the determination of optimal interchange fee levels.

A. EQUILIBRIUM FOR A GIVEN INTERCHANGE RATE

83. The presence of a no-surcharge rule breaks the logic of the interchange neutrality argument presented in the previous section. But even with a no-surcharge rule, neutrality still holds when merchants are perfectly competitive. To see this fact, suppose that card-based transactions are more costly to merchants than are other transactions. Then under a no-surcharge rule, individual merchants will specialize. Some merchants will accept credit and charge cards and will charge relatively high prices. Other merchants will accept only cash and will charge relatively low prices. Any merchant that tried to set a common price for both card

[63] See Part IX.E below and cross-references therein.

and non-card transactions would lose all non-card sales unless it set the same price as the non-card stores. But then it would fail to cover its card acceptance costs.[64]

84. When there are economies of scale at the retail level and merchants offer differentiated products, it may not be economically viable for retailers to specialize in terms of which payment mechanisms are accepted. For example, suppose a small town has four restaurants, each offering a different cuisine. Given the economies of scale involved in operating a restaurant, the town's market might not be large enough to support eight, twelve, or more restaurants offering the same four cuisines, but some accepting only cash, others accepting only credit and charge cards, and still others accepting only debit cards.

85. The remainder of this section maintains the assumption that economies of scale and merchant differentiation make it economically infeasible to have separate stores for each different type of payment mechanism. In this case, a single merchant will accept multiple payment mechanisms and charge the same price for all types of transaction under a no-surcharge rule.[65] A profit-maximizing merchant sets this common price based on the average marginal cost of a transaction, where the average is taken over types of transaction. Merchant pricing behavior can no longer "undo" the effects of interchange rates because there is no way to distinguish between card users and non-card users.

86. In theory, a no-surcharge rule thus makes it possible to use the interchange fee as a means of internalizing network effects. But, at the same time, the rule takes away surcharges as a means of internalizing network effects. Because of the no-surcharge rule, consumers no longer face retail price signals that convey the net benefits or costs incurred by merchants due to the use of different payment mechanisms. As Professors Gans and King have nicely summarized,

> Under the no-surcharge rule, the customer chooses the level of credit card transactions according to their [sic] own marginal costs and benefits. They [sic] ignore the marginal costs and benefits of credit card purchases to the merchant.[66]

Hence, no-surcharge rules substitute one mechanism for the other. Which one performs better? The market outcome under a no-surcharge rule depends critically on the cardholder benefits net of any fees they pay to issuers or rebates they receive from them. These fees and rebates, in turn, depend on the level of the interchange fee.

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64 For a more detailed analysis of this case, see *An Economic Analysis*, §4.2.

65 In practice, merchants may offer discounts for the use of cash. However, no-surcharge rules limit merchants' abilities to maintain retail price differentials among other payment mechanisms.

66 *Regulating Interchange Fees* at 11.

B. ECONOMIC ANALYSIS OF EFFICIENT INTERCHANGE FEES

87. In principle, the interchange fee could be set to reach an efficient balance of the costs and benefits realized on the two sides of a card-based transaction. There are two central questions. First, what is the socially optimal interchange fee? Second, will economic self interest lead to privately chosen interchange fees that are at least approximately socially optimal?

88. An early and classic analysis of interchange fee setting was provided by Professor Baxter.[67] Recall that the efficiency effects of an interchange fee derive from its effects on merchant service fees and cardholder fees, which in turn affect merchant acceptance and consumer card use. Professor Baxter found that the socially optimal interchange fee is one that results in a card use fee to consumers equal to the total social costs of a card-based transaction (*i.e.,* the sum of the acquirer and issuer's transactions costs measured relative to the transactions costs of the next best payment mechanism) minus the merchant's marginal transactions benefits.[68] This price ensures that, when a consumer compares his or her private benefit of card use with the price of card use, he or she will be comparing the sum of merchant and consumer benefits with the social costs of card use, and thus will make the socially efficient choice.[69]

89. Professor Baxter compares the setting of interchange rates on an issuer-acquirer pair basis with the collective setting of rates at the system level. He argues that "collective institutional determination of the interchange fee is both appropriate and desirable," and that "individual establishment of the interchange fees will almost certainly produce chaotic results, such as higher fees and instability within the card systems."[70]

90. Although, if accepted, this finding indicates that the collective setting of interchange fees is preferable to a decentralized system, this finding does *not* establish that the interchange rate will collectively be set at the economically efficient level. Moreover, Professor Baxter's analysis of whether private parties will set the interchange fee at the efficient level is based on a flawed assumption. Specifically, Professor Baxter adopted the assumption that merchant willingness to pay for card acceptance can be taken as a measure of the transactions benefits that merchants enjoy from card acceptance.[71]

91. This assumption matters because it affects the degree to which market forces—in particular merchants' willingness to "resist" card acceptance—will drive a card system to set an

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67 William F. Baxter, "Bank Interchange of Transactional Paper: Legal and Economic Perspectives," *The Journal of Law & Economics,* Volume 26, Number 3, October 1983 (hereafter *Baxter*).

68 Professor Baxter did not explicitly solve for the optimal interchange fee, but it is implicit in his analysis (*Baxter* at 552 and 553).

69 Recall that this is just what surcharges did in the analysis of Hotelling competition discussed in the previous section.

70 *Baxter* at 586.

71 *Baxter* at 545.

efficient interchange fee. As Rochet and Tirole point out, as a consequence of this assumption, Baxter's model generically "overstates merchant resistance by ignoring that card acceptance is a competitive instrument."[72] The reason is that a merchant may be willing to accept cards for the increased-sales benefits, in addition to the transactions benefits. And, as discussed above, an individual merchant's increased-sales benefits may not be social benefits. Because each merchant acting alone may be willing to pay more than the social value to accept credit and charge cards, merchants may accept cards even when the interchange fee and resulting merchant service fees are set inefficiently high.

92. In a more recent and technically sophisticated paper, Professor Richard Schmalensee formally models the private setting of interchange rates and compares the equilibrium interchange rates with the socially optimal ones. Professor Schmalensee finds that, if merchants collectively have a linear demand curve for card acceptance, consumers collectively have a linear demand curve for card use, and acquiring and issuing each is monopolized, then the interchange fee that maximizes total issuer and acquirer profits also maximizes both card use and a measure of economic welfare.[73] He also finds that, when demands are linear but issuing and acquiring are not each monopolized, both the profit-maximizing value of the interchange fee and the welfare-maximizing value depart from the card-use-maximizing value in the same direction.[74]

93. An important and fundamental criticism of Professor Schmalensee's analysis concerns the measure of economic welfare on which his results are based. He adopts the assumption that merchant willingness to pay can be taken as a measure of social benefits. Professor Schmalensee is careful to observe that this assumption deserves scrutiny because merchants' demand for card acceptance derives from consumers' demand to use cards.[75] As he points out, his welfare measure ignores distortions that might arise when merchants exercise market power and set prices above costs.[76] A more important criticism, however, is that merchants' demand for card acceptance may be a very misleading measure of economic welfare. Specifically, *there may be very little connection between an individual merchant's incentives to accept credit and charge cards and the overall effects of card acceptance on merchant and social welfare*.[77]

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72 *Rochet and Tirole* at 15.

73 Richard Schmalensee, "Payment Systems and Interchange Fees," National Bureau of Economic Research, Inc., Working Paper 8256, April 2001 (hereafter *Schmalensee*), at 17.

74 *Schmalensee* at 18.

75 *Schmalensee* at 7.

76 *Schmalensee* at 7 and footnote 22.

77 Dr. Wright also notes the failure of the Baxter and Schmalensee analyses to provide models in which merchant willingness to accept cards is derived from a model of the underlying benefits of card use. (*Optimal Interchange Fees* at 4.)

94. This point is essentially the same one made in Rochet and Tirole's critique of Baxter's analysis. Nevertheless, it is worth exploring further. The following stylized example illustrates the dangers of Professor Schmalensee's assumption. Consider a market served by two merchants. Some consumers prefer one merchant, other consumers prefer its rival, but each consumer is willing to patronize either merchant depending on the relative prices. Suppose that each consumer purchases exactly one unit of the good sold in this market, so that the only question about a consumer's purchase behavior is from which merchant he or she will make a purchase.[78] Because total consumer purchases are fixed, one immediately sees that, *from the perspective of merchants as whole,* acceptance of credit cards has no effect on total sales. Yet, merchants may still have individual incentives to accept credit cards because an individual merchant may garner increased sales through card acceptance. Summing up individual merchants' acceptance incentives, without accounting for the harm to other merchants, overstates the benefits of card use.[79]

95. The fact that merchants' willingness to pay for card acceptance can be a very misleading measure of economic welfare raises serious doubts about the validity of Professor Schmalensee's conclusions about the relationship between privately and socially optimal interchange fees. There may be models of merchant behavior under which Schmalensee's conclusions are correct, but the existence (and relevance) of any such models should be treated as an open question at this point. In short, Professor Schmalensee's model does not provide a rigorous basis for concluding that privately set interchange rates will be efficient.

96. Rochet and Tirole model merchants' acceptance incentives based on fundamental parameters. They assume that acquiring is competitive and consider a variety of market structures for issuing. When issuers are perfectly competitive as well, the optimal interchange fee is zero.[80] When issuers are less than perfectly competitive, Rochet and Tirole find that a positive interchange fee can promote efficiency.

97. In the Rochet and Tirole model, the role of the interchange fee is *not* to internalize network effects or other externalities. Instead, the interchange fee compensates for the pricing distortions introduced by the exercise of issuer market power. Rochet and Tirole find that subsidizing issuers with market power will induce them to reduce their prices, partially compensating for the standard monopoly output restriction. This finding suggests that policies aimed at increasing issuer competition would reduce both the loss of economic welfare due to issuer market power and the need for an interchange fee. Moreover, it raises the public interest question of whether it is desirable to elevate the prices paid by non-card users (through interchange fees and no-surcharge rules) in order to pay issuers not to exercise their market power with respect to card users.

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78 This model is studied in depth by *Rochet and Tirole*.

79 A more complete analysis of this effect is provided in Part IX.G below, where it is shown that Schmalensee's approach overstates the benefits of card use by 100 percent.

80 Rochet and Tirole do not formally analyse the case of perfectly competitive issuers. A more complete analysis of this case is provided in Part IX.B below.

98. Rochet and Tirole also compare privately and socially optimal interchange rates and find that an "issuer-controlled" association may choose an interchange fee that leads to "overprovision" of credit card services.[81] This finding is one illustration of a more general result: *In the presence of no-surcharge rules, setting relatively high interchange fees can promote inefficiently high levels of credit and charge card usage.*

99. Professors Schwartz and Vincent also find that the combination of a privately optimal interchange fee and a no-surcharge rule can lead to the overuse of credit and charge cards. They find that a monopoly card network with a monopoly issuer may use rebates to create incentives for excessive card use, leading Schwartz and Vincent to make the following observation:

> It might be thought that card issuer rebates to cardholders … is evidence of strong competition for cardholders. These results show, instead, that rebates may be a pricing tactic by a monopolist, designed to increase the impact of the [no-surcharge rule]![82]

100. Dr. Wright extends the Rochet and Tirole model to allow for heterogeneous merchant transactions benefits from card use. (Rochet and Tirole assume that all merchants enjoy the same benefits per transaction.) He shows that the determination of the socially optimal interchange fee is more complex than is suggested by the Baxter analysis. Wright examines how the interchange fee can balance merchant and consumer incentives to participate in a card system, and how the weights in that balancing depend on the benefits that one party's participation in the system generates for the party on the other side of a transaction. He establishes that socially and privately optimal interchange fees typically diverge.[83]

101. Dr. Wright also argues that merchants' socially excessive acceptance incentives (due to the beggar-thy-neighbor aspect of increased-sales benefits) give rise to an efficiency argument for higher interchange fees.[84] The logic is that merchants are willing to remain on a card network even if the merchant service fee exceeds their transactions benefits, while consumers will drop off if the price of card use exceeds their transactions benefits. As an argument for a positive interchange fee, this logic hinges on the assumption that the net transactions benefits that would be enjoyed by merchants if merchant service fees were equal to acquirer transaction costs are positive so that there is a positive external effect in need of internalization.[85]

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81 Indeed, the only time the privately optimal interchange fee level does not exceed the socially optimal level is when each is set at the highest level consistent with merchant acceptance of cards. (*Rochet and Tirole,* Proposition 3 at 17.)

82 Marius Schwartz and Daniel R. Vincent, "Same Price, Cash or Credit: Vertical Control by Payment Networks," draft version November 2000 (hereafter *Schwartz and Vincent*) at 15.

83 *Optimal Interchange Fees* Propositions 1 and 2 at 17 and 18, and at 30.

84 *Optimal Interchange Fees* at 8 and 29.

85 Stated in terms of the formal notation described in the Technical Appendix, the

102. Professors Gans and King consider the case of a monopoly merchant in their baseline model. Like other authors, they explore the role of interchange fees in balancing the costs and benefits enjoyed by two sides of a transaction. For their baseline model, Gans and King find that the socially optimal interchange fee is sensitive to the relative marginal benefits enjoyed by consumers and merchants from card-based transactions.[86] They also find that the socially optimal interchange fee depends on the degree of issuer competition (the fee helps offset the reduction in card use due to issuer market power) but not the degree of acquirer competition, because consumers (not merchants) choose the payment method.[87]

103. Summarizing the findings on socially optimal interchange rates, there are situations in which it is optimal to use interchange fees to rebalance the costs and benefits enjoyed by the two sides of a card-based transaction. The socially optimal fee level depends on the nature of merchant, issuer, and acquirer competition, as well as consumer characteristics. As a general matter, when no-surcharge rules are in effect, there is little reason to believe that it is optimal to set the interchange fee equal to either an issuer's marginal costs of a card transaction or zero.

104. The findings on the relationship between the interchange rate chosen by a rationally self-interested association and the socially optimal interchange fee can be summarized as follows. In general, they can be expected to differ from one another. One source of the divergence is that private parties will respond to merchants' willingness to accept cards, which may be a poor measure of the overall effects of card acceptance on merchant welfare. Because of this distortion in acceptance incentives, privately optimal interchange fees may promote socially excessive card use.

C. CURRENT PRACTICES

105. Economic theory notwithstanding, an important question is: How do the associations and their members actually set interchange fees? Even if there were fully developed models establishing conditions under which privately optimal interchange rates are socially optimal, the question of whether the associations conform to these models would remain. To date, there is little hard evidence on how the associations actually set their interchange fee levels in Australia. Moreover, the processes that have been attributed to them in various responses to the *Joint Study* do not conform to the recommendations of the various economic models that have been cited.

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assumption is that $b_m - c_A > 0$ for at least some merchants.

86 *Regulating Interchange Fees,* Proposition 2 at 12.

87 *Regulating Interchange Fees*, Proposition 5 and discussion following at 17. This result appears to assume that the merchant would never refuse to accept cards at the socially optimal interchange fee. Moreover, as the authors note (at 18), acquirer competition could matter if there were endogenous entry of merchants.

106. Neither the associations nor their members provide much detail regarding their current procedures for determining interchange fees in Australia.[88, 89] Instead, each association asserts that competition among payment mechanisms ensures that there cannot be a problem with interchange fees. For example, MasterCard argues that they have set the fee at an appropriate level because if it had been set

> too high or too low in relation to what benefits the system can deliver to all its participants -- then the participants will behave (according to incentives created by the inappropriate interchange fees) in such a way that the four party systems are rendered not viable.[90]

This argument, however, fails to account for either the possibility of credit card system market power or the divergence between an individual merchant's private acceptance incentives and social benefits.

107. Although both MasterCard and Visa point to competition as a guarantee that interchange will be set efficiently, the premise of competition is suspect. As noted earlier, there is overlapping ownership and governance of Bankcard, MasterCard, and Visa, and both issuing and acquiring are concentrated markets. In his widely cited paper arguing in favor of collectively setting interchange fees, Professor Baxter stated that

> antitrust and banking authorities should be alert to ensure that the number of payment systems is as large as the attainment of economies of scale permits. Though unbridled autonomy within a system cannot be attained, unbridled rivalry between a multiplicity of systems should be encouraged.[91]

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88 According to MasterCard's rules,

> The interchange fee, the incentive interchange fee, cash disbursement accommodation fee, and the ATM cash disbursement fee are designed to compensate a member for particular expenses that it incurs as the result of interchange transactions. For sales transactions, various elements of expense make up the interchange fee, including cost of processing, costs of money, and increased risk due to the use of MasterCard cards in interchange transactions. (*MasterCard Bylaws and Rules,* May 1999, §11.09(a))

89 Visa asserts that

> The setting of interchange fees is a complex matter that requires commercial judgment. In the current arrangements, this judgment is shaped by the realities of market-place competition: between VISA and its open credit card network competitors; between the open credit card networks and their closed counterparts; between credit cards and debit cards; and between cards and other means of payment. This judgment is then tested in the negotiating process over interchange between members, which elicits information about the likely outcomes with alternative possible fee levels. (*Visa Response* at 25.)

90 *MasterCard Submission* at 6.

91 *Baxter* at 587.

The current system of governance and ownership does not encourage full competition. At a minimum, this finding highlights the importance of policy makers' understanding the process by which the associations set their interchange fee levels.

108. According to the Australian Bankers' Association (ABA), the MasterCard methodology is based on the recovery of specific issuer costs attributable to the provision of services to merchant acquirers.[92] According to the ABA, the interchange cost comprises a per-transaction element to cover processing costs and a percentage element to cover risk and funding costs. In determining actual interchange fees, the interchange cost may be adjusted to take into account the fees charged by other schemes, the need to encourage adoption of new technologies, and the need to improve merchant acceptance in certain segments.[93]

109. According to the ABA, under the Visa methodology all costs attributable to the "payment functionality" of credit cards are allocated to issuers and acquirers based on cardholder and merchant demand for that functionality.[94] Interchange is then the difference between the issuers' allocated costs and actual costs. Interchange fees in this methodology may be adjusted based on the setter's commercial judgment.[95]

110. As described by the ABA, MasterCard and Visa's processes of basing interchange fees on allocations of cost components between merchants and consumers based on functionality do not conform to any of the economic analyses that have been cited in this matter. In all of the models, the optimal merchant service fees and consumer card services charges depend only on the *sum* of the marginal costs of providing service and the conditions of demand.[96] To the extent that the formulas for optimal interchange fees depend on the individual components—issuer marginal cost and acquirer marginal cost—it is because those components affect the pricing decisions separately made by issuers and acquirers.

111. Dr. Wright, who has served as a consultant for Visa, briefly describes Visa's interchange methodology in one of his papers analyzing issues raised by the *Joint Study*. He

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92 Australian Bankers' Association, "Credit Card Networks in Australia: An Appropriate Regulatory Framework," Submission to the Reserve Bank of Australia, July 2001 (hereafter *ABA Submission*), at 50.

93 *ABA Submission* at 50. It is my understanding that, notwithstanding this claim regarding the calculation of interchage costs, credit card interchange fees are collected entirely on an *ad valorem* basis in Australia.

94 *ABA Submission* at 50.

95 *ABA Submission* at 50.

96 Cost allocations based on specific functionality could be economically sensible if specific services were sold to merchants and card users on an unbundled basis and the consumption of these services by one side of a card-based transaction had no effect on the welfare of the other side. The interchange fee, however, affects the prices charged for bundles of services associated with a card-based transaction which, as respondents have emphasized, affect both sides of the transaction.

characterizes the Visa Australia fee-setting process as "the balancing of profitability between acquiring and issuing banks, where profits are scaled by revenue."[97]

112. When issuers and acquirers have constant unit costs (which need not be the same for issuers and acquirers), this rule is equivalent to an equal markup rule. Hence, the rule ascribed to Visa indicates that, if issuers are less competitive than acquirers and tend to have higher markups, then the interchange fee should be lower than otherwise if this will lower issuer markups relative to acquirer markups. This is the opposite of what is indicated by the analyses of Professors Gans and King, Professors Rochet and Tirole, and Dr. Wright.[98] Indeed, if acquirers were perfectly competitive, and thus earned zero average markups, the process described by Dr. Wright could lead to negative interchange fees designed to make issuers' net costs so high that even with the exercise of market power they would not earn positive economic profits. This is a rather perverse feature of the process, and it strongly suggests that it does not promote efficiency.

113. Although several parties have made representations about the process by which the associations' members set interchange fees in Australia, it is my understanding that no respondent has provided contemporaneous documents showing the actual processes used to set current interchange levels. Moreover, there are questions whether the associations and their members possess the knowledge needed to follow some of the processes that they are said to follow or aspire to follow. For example, the interchange formulas cited by Visa as justifying unconstrained private rate setting depend in part on the price elasticities of consumer and merchant demand for cardholding and acceptance.[99] Yet Visa has provided no evidence that it explicitly takes into account these price elasticities. Indeed, it is my understanding that no respondent has submitted elasticity estimates. Further, in the United States, but not in Australia, Visa has interchange fees that vary across merchant categories. This difference raises the question of whether costs and elasticities are more uniform in Australia than in the U.S., or suggests that Visa uses different methodologies in different countries. If the latter is the case, then three important policy questions are: (1) what explains the differences; (2) is there a reason that Visa follows an optimal policy in one country but not the other; and (3) is Australia the country in which Visa and its members are not pursuing the optimal policy? Finally, Visa's Australian members last updated the interchange rate in 1993, which raises the question of whether the relevant market conditions have remained unchanged since then or if Visa is pursuing a different approach than laid out in responses to the *Joint Study*.

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97 *An Economic Analysis* at 33. Acquirer revenues in this scaling are equal to merchant service fees minus interchange fees paid. In other words, in calculating profit-to-revenue ratios, interchange fees are treated as negative revenues rather than costs.

98 See *Regulating Interchange Fees,* Proposition 5 at 17, *Rochet and Tirole* at 17 (if issuers have a given margin of card fees minus net issuing costs, for example, then the socially optimal interchange fee in their model increases one for one with that margin, as long as merchants continue to accept cards), and *Optimal Interchange Fees* at 23.

99 *Visa Response* at 14, citing *Schmalensee*.

D. PROPOSALS FOR FUTURE RATE SETTING

114. There are benefits from allowing collective rate setting rather than having each issuer-acquirer pair negotiate separately. At the same time, it does not follow that private parties will collectively choose the interchange fee level that is optimal in terms of its effects on economic efficiency and consumer welfare. The possible divergence between social and private incentives has several implications:

- It is desirable to promote inter-network competition broadly.
- Transparency is valuable, so that competition policy and banking authorities can monitor the interchange fee-setting process for signs of trouble.
- There may be scope for public intervention to improve matters. This intervention could take the form of mandatory procedures to ensure transparency, implementation of policies designed to increase competition in the credit and charge card industry, the imposition of ceilings on interchange fee levels, or direct fee setting, for example.
- An assessment of the value of intervention must consider not only the problems with the current outcome, but also the possible adverse consequences of intervention.

115. Several proposals have been put forward for ceilings or caps on interchange fee levels:

- In its Avoidable Cost methodology, the ABA proposes that, rather than prescribing an explicit methodology for setting interchange fees, key principles should be set to which any interchange methodology must conform.[100] The key pricing principle is that the interchange methodology used recovers

  > in aggregate *no more than the stand alone economic costs* of sustainably delivering the 'buy now, pay later' payment functionality only – with *differentiation* of fees allowed where appropriate on the basis of significant cost differences among classes of transactions.[101]

- Professors Gans and King appear to suggest that setting an interchange fee that equalizes issuers and acquirers' net marginal costs of a transaction may be a reasonable approach in the face of incomplete information about underlying consumer and merchant benefits.[102]

- MasterCard asserts that the interchange fee should redress any imbalance between issuer costs and revenues; issuers should be compensated for costs in providing certain services to merchants, namely, the payment guarantee, funding of delayed payment (by the cardholder), and transaction processing.

  The interchange fee is then established by taking these costs as a starting

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100 *ABA Submission* at 51-55.

101 *ABA Submission* at 54.

102 *Regulating Interchange Fees* at 3 and 12.

point and taking into consideration other factors, including the need to provide incentives for widespread issuance and for merchants to accept cards or deploy technology and the level of competitors' fees.[103]

- In Europe, Visa International recently agreed to reduce the level of the interchange fees charged on intraregional credit transactions over a period of several years.[104] Visa also proposed that an "objective benchmark" consisting of the sum of three cost components be used as a ceiling on the association's interchange fee.[105] The costs to be included, in whole or in part, in the benchmark are those associated with transactions processing, financing of cardholder float, and guarantee of payment to the merchant.[106]

116. An immediate difficulty with the ABA proposal arises from the need to figure out what it actually says. It could be read as saying the interchange fee is subject to a cap equal to the average unit costs of a card-issuing operation not part of a larger organization (*i.e.,* an issuer that derived no economies of scope from related operations). This cap does not appear to have been derived from *any* of the economic analyses cited by respondents to the *Joint Study*.[107] The ABA does not provide an economically sound basis for concluding that its proposed approach would promote consumer welfare or efficiency.

117. The MasterCard and Visa approaches also do not appear to be based on economic analyses. In each case, the approach attempts to allocate costs based on functionality, with only vague reference to demand conditions. As the economic analysis of credit and charge card

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103 *MasterCard Submission* at 39.

104 The interchange fee charged on transactions varies with the type of card used. By 2007, the weighted average interchange fee on consumer credit and debit card products will be capped at 0.7 percent. (European Commission, Directorate-General Competition, "Notice pursuant to Article 19(3) of Council Regulation No. 17, Case COMP/29.373 – Visa International (2001/C 226/10)," *Official Journal of the European Communities*, August 11, 2001, at §4.1.)

105 In some circumstances, Visa would be allowed to charge an interchange fee higher than the benchmark. (*Ibid* at §4.2.)

106 *Ibid* at §4.2.

107 To the extent that this proposal can be equated with a cap of c_I in Dr. Wright's formal model, he found that such a cap would be optimal under the "extreme assumption" that "acquiring banks pass on all their costs to merchants while issuing banks do not rebate any of the interchange revenue back to cardholders." (*Optimal Interchange Fees* at 28.)

When acquirers pass through the interchange fee to merchants via merchant service fees on a one-for-one basis, setting the interchange fee equal to the issuer's transactions costs results in the merchant's bearing all of the transactions costs of card use (before shifting some of these costs back to all of its customers, card-users and non-card users alike). But the merchant is not the party making the choice of payment mechanism. The Baxter logic suggests that card users should face the net social transactions costs because they are the ones making card use decisions.

markets demonstrates, however, card-based transactions may have costs and benefits for both sides of the market simultaneously, many costs are common, and efficient pricing must be based in part on demand conditions.

118. Only the Gans and King "proposal" stems from an explicitly stated model. However, as the authors note, it is a rule of thumb based on a special case that may be a plausible starting point. Moreover, as discussed in the Technical Appendix, the model itself is a specialized one.[108]

119. The ABA's proposed approach would include loyalty program expenditures in the calculation of issuers' standalone costs. The treatment of rebate costs in determining cost-based interchange rates has been a contentious issue. The *Joint Study* asserts that the costs of loyalty programs should not be included in calculating a cost-based interchange rate.[109] The ABA argues that loyalty program costs should be included in any cost-based interchange calculation because loyalty programs are a resource cost and a means of promoting credit cards and attracting cardholders to a specific issuer.[110]

120. The relevant policy question is not whether issuer expenditures on loyalty programs constitute economic costs to issuers. The policy question is whether including rebate expenditures in a (partially) cost-based cap promotes efficiency and consumer welfare. Although rebate expenditures are an economic cost from the issuer's perspective, one has to be careful about their treatment in setting caps on interchange fee levels. If the costs of rebate and reward programs are included in the calculation of a cap or safe harbor for interchange fees, then public policy might place little limit on the ability of issuers to use inefficiently high interchange fees to support inefficiently high rebates and rewards for card use. The reason is that raising the interchange fee to fund increased rebates and rewards would raise the cap. Under market conditions where merchants accept credit and charge cards even at inefficiently high merchant service fees, issuers might thus be able to set a relatively high interchange rate to exploit the incentive problems created by no-surcharge rules that can lead to socially excessive card use.[111]

121. There is also the practical question of how rebate and reward costs would be included in the calculation of a cap, given that these costs differ widely across different cards. Lastly, it is notable that the formal economic models cited by respondents to the *Joint Study* do not include rebate costs in their analyses of optimality.[112]

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108 See Part IX.E below.

109 *Joint Study* at 44.

110 *ABA Submission* at 31.

111 See the discussion in §VI.B above.

112 For example, in the models of *Optimal Interchange Fees*, *Regulating Interchange Fees, Rochet and Tirole*, and *Schmalensee,* the formulas for optimal interchange fees depend on the marginal costs of issuing cards, the transactions costs of issuing and acquiring, and demand conditions. The marginal costs of issuing in these models, c_I,

E. WILL PUBLIC INTERVENTION DISTORT COMPETITION?

122. Visa raises a number of objections to public policy intervention with respect to interchange fees based on the claim that such intervention will distort competition between open and closed credit and charge card schemes.[113]

123. Visa characterizes designation of Bankcard, Mastercard, and Visa as "differential regulation based purely on differences in organizational form."[114] However, this claim ignores the fact that Bankcard, MasterCard, and Visa have overlapping ownership and governance and collectively dominate the credit card systems market in Australia, and thus designation can be viewed as intervention based on the extent of market power.[115]

124. Visa recognizes the general argument that policy intervention with respect to one competitor may—through market forces—induce other competitors effectively to abide by the same policies.[116] Visa asserts, however, that this general argument does not apply to the specific case of the Australian credit and charge card schemes.[117, 118] Ironically, Visa's argument that American Express would have unfair and inefficient advantages if Visa's interchange fee were regulated is based on identifying distortions that follow from card-user rebates, merchants' inability to surcharge, and the fact that merchants garner individual increased-sales benefits of card acceptance even if there are no collective merchant benefits.

125. Moreover, Visa appears to be of two minds on the efficacy of inter-systems competition and American Express market power. At one point, Visa asserts that

> One card with quite low penetration among merchants is American Express.

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comprise transactions costs unrelated to the equilibrium size of per-transactions fees (or rebates) levied by issuers on their cardholders. See, for example, *Optimal Interchange Fees* at 8.

113 *Delivering a Level Playing Field*.

114 *Delivering a Level Playing Field* at 7.

115 Visa also ignores the fact that the associations involve horizontal competitors acting together for certain purposes. Competition policy often draws distinctions between unilateral and coordinated actions. For example, a single firm's growing to a market share of 60 percent through innovation and the introduction of superior products might raise no competitive concerns, whereas the creation of a firm with a 60 percent market share through the merger of two firms each with 30 percent shares might raise competitive concerns.

116 *Delivering a Level Playing Field* at 16.

117 *Delivering a Level Playing Field,* §3.5.

118 Access Economics argues to the contrary that systems without market power would be forced to lower their merchant service fees in response to competition from other systems. (Access Economics Pty Limited, "Notes on Further Matters Related to Australian Credit Card Regulation," prepared for American Express International, Inc., August 2001, at 5.)

> There would seem to be two possible reasons for this low penetration rate.
>
> The first is that merchant service fees for American Express are too high, so merchants select lower cost methods, such as VISA. Alternatively, one might argue that merchants do not feel as much need to accept American Express because there are fewer cardholders for this card. Both of these reasons are likely to have some validity. [footnote omitted asserting that merchants are less willing to pay the American Express merchant service fee because it has fewer cardholders than other schemes.][119]

Yet, Visa also declares:

> The decision by merchants to accept a particular type of card depends not so much on the number of cardholders that the system has, but rather on the additional cost of accepting the card versus the margin they earn on additional customers attracted by accepting the card (as well as other benefits obtained through card acceptance). [footnote omitted][120]

and asserts that high merchant service fees are unlikely to drive away merchants when these fees can be used to finance cardholder loyalty benefits.[121]

126. Another claim made by Visa is that designation will impair the association and its members' ability to maximize the number of card transactions. For this claim to be of policy relevance, Visa would have to establish that a designated system would try to maximize the number of card transactions absent designation and that maximizing the number of transactions would be in the public interest.

127. With respect to the first point, Visa assumes that, absent public intervention, an association would set its interchange fee at the level that maximizes the card transactions volume. Visa points to the *Schmalensee* and *Rochet and Tirole* models to provide theoretical justification.[122] However, this result is sensitive to the specific models used and the association's objective function. For instance, in Professor Schmalensee's analysis of the linear demands case cited by Visa, he finds that an association chooses the transactions-maximizing interchange fee when the system's goal is to maximize the sum of issuer and acquirer profits, but he finds that an issuer-controlled system sets the interchange rate above the transactions-maximizing level.[123] Moreover, the following argument demonstrates that an association can have incentives to set the interchange fee higher than the transactions-maximizing level more generally. Suppose the association seeks to maximize some weighted sum of issuer and acquirer profits and that the correspondingly weighted sum of issuer and acquirer margins is an increasing function of the

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119 *Visa Response* at 32.

120 *Delivering a Level Playing Field* at 32.

121 *Delivering a Level Playing Field* at 32.

122 *Delivering a Level Playing Field* at 21.

123 Schmalensee at 19.

interchange rate.[124] Suppose, counterfactually, that a system set the interchange fee below the transactions-maximizing level. Then the system could choose a higher fee that both raised the number of transactions and their weighted margins. Hence, weighted profits would rise, contradicting the private optimality of the original choice. Similarly, starting at the transactions-maximizing fee level, there is no first-order loss of quantity from a small increase in the fee, but there is a first-order increase in weighted margins. Hence, profits would rise here too.

128. With respect to the second point, as has already been discussed, setting the intechange fee to maximize the use of credit and charge cards may not be socially optimal. Instead, it may promote the overuse of cards.

129. Lastly, Visa asserts that policy restrictions on interchange fees could lead large banks to set up their own credit card schemes.[125] As Visa points out, one should take into account any increases in organizational costs and the possible loss of network benefits.[126] Visa fails to point out, however, that increased inter-systems competition resulting from new schemes might generate static and dynamic efficiency gains.

VII. WELFARE ANALYSIS OF NO-SURCHARGE RULES

130. No-surcharge rules are attempts by the credit and charge card networks to regulate retail pricing. The welfare effects of this regulation are equal to the differences in the welfare levels under the equilibrium outcomes with and without no-surcharge rules in effect. At a broad level, the imposition of no-surcharge rules has several effects:

- No-surcharge rules may force retailers to engage in price discrimination because the rules induce the same prices for transactions with potentially different costs.
- No-surcharge rules alter the nature of competition and thwart the use of retail price signals to guide consumers' choices among payment mechanisms.
- No-surcharge rules remove the neutrality of interchange rates.

Several arguments have been put forth for and against no-surcharge rules.

A. ADVERSE WELFARE EFFECTS OF NO-SURCHARGE RULES

131. Consider first the adverse effects of imposing a no-surcharge rule.

1. Suppressed Consumption by Non-Card-Users

132. Under a no-surcharge rule, a merchant charges the same price for card-based transactions and others. In setting this common retail price, a rational, profit-maximizing

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124 This relationship between weighted margins and the interchange rate holds in the *Rochet and Tirole* model, for instance.

125 *Delivering a Level Playing Field* at 43, for example.

126 *Delivering a Level Playing Field* at 45.

merchant takes into account its marginal costs for the average transaction. When credit and charge card-based transactions are more costly to the merchant than are transactions supported by other payment mechanisms, the retail price based on the cost of an average transaction will be higher than would be a retail price that applied only to transactions using the less costly payment mechanisms, all else equal. Thus, in most economic models, removal of a no-surcharge rule leads to lower retail prices charged to non-card users under the assumption that merchants find credit and charge card transactions more costly than others.[127]

133. Higher retail prices tend to reduce the quantities of goods and services purchased by consumers. There can be distortions in the consumption levels across different markets or between market and non-market goods.[128] The first sort of distortion arises when the extent of credit and charge card use differs across markets, and thus the extent to which non-card prices are distorted upward varies across markets. The resulting changes in relative prices across markets (*i.e.,* prices rise proportionately more in markets with high levels of credit and charge card use) distort the consumption decisions and thus give rise to efficiency losses. The second type of distortion is, essentially, an extension of the first. Goods and services produced in non-market settings (*e.g.,* leisure or home-cooked meals) do not have their "retail prices" affected by credit and charge card use. Hence, when no-surcharge rules raise the retail prices of market goods and services, consumption decisions are distorted toward non-market goods, again creating efficiency losses.

2. Economically Excessive Use of Credit and Charge Cards

134. When merchants face different costs from different payment mechanisms, a no-surcharge rule blocks the use of retail price differentials as a means of creating incentives for consumers to choose lower-cost means of payments. Hence, when merchants' cost differences represent social cost differences, a cardholder may use his or her card inefficiently often because he or she does not bear the costs imposed on merchants through the decision to use a credit or charge card.[129, 130] These effects arise when there are payment mechanisms that are substitutes for one another, for at least some set of consumers and/or transactions.[131]

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127 See, for example, *Schwartz and Vincent*, Lemma 4 at 13. One exception is *Regulating Interchange Fees*, where—due to the special structure assumed for consumer demands—consumers do not use credit cards for their marginal transactions and thus the merchant sets the common price under the no-surcharge rule equal to the cash-only price that prevails under surcharging. (*Regulating Interchange Fees* at 9.)

128 For a formal analysis, see *Schwartz and Vincent.*

129 This conclusion also depends, of course, on the relationship between card holding and usage fees and the issuers' costs.

130 Formally, these effects arise in the models of *An Economic Analysis*, *Rochet and Tirole*, and *Schwartz and Vincent*, as well as in the alternative model developed in the Technical Appendix.

131 As explained in the second appendix below, the existence of this degree of substitution is

3. Reduced Merchant Acceptance of Credit and Charge Cards

135. If merchants were allowed to surcharge and did so, they could have greater incentives to accept cards. In particular, allowing surcharges removes a primary reason why a merchant might not otherwise accept credit cards. Professors Rochet and Tirole state that:

> When merchants are allowed to apply card surcharges, their accepting the card is no longer an issue, since they can charge a price for payment card transactions at least equal to the cash price plus their cost of payment card transactions. [132]

Of course, to the extent there are fixed costs of card acceptance, these could be disincentives to accept low-volume cards even when surcharging is allowed.[133] The disincentives would be much lower, however, than if surcharging were banned. Moreover, if merchant acquirers charged only on a per-transaction basis and/or acquirers (possibly aided by payments collected through the network) offered to help merchants cover their fixed acceptance costs, merchants would have little reason not to accept credit and charge cards.

B. FIVE ARGUMENTS PUT FORTH IN SUPPORT OF NO-SURCHARGE RULES

136. At least five principal arguments have been made in support of no-surcharge rules.

1. Assertion that there are No Cross-Subsidies

137. The first argument in support of no-surcharge rules is defensive: It is asserted that no-surcharge rules do not give rise to the cross-subsidization of credit and charge card users by non-card users. Specifically, Frontier Economics asserts that a principal objection raised to no-surcharge rules is that they lead to cross-subsidies but that, under an economic definition of cross-subsidy, there is in fact no cross subsidy.[134] Frontier Economics is correct that several parties have asserted that a no-surcharge rule can lead to cross subsidies[135] and that, by a

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consistent with credit and charge cards' constituting a relevant antitrust market.

132 *Rochet and Tirole* at 18. Original contains a footnote noting the need to treat fixed merchant costs in the absence of a network subsidy.

133 For example, the Australian Retailers Association reported that the average annual rental cost to merchants for card processing terminals is $300, and it ranged as high as $960. Australian Retailers Association, "Submission to the Reserve Bank of Australia and Australian Competition and Consumers Commission," January 2000, at 7.

134 Frontier Economics, "Joint Bank Review of Credit Card Membership and Interchange Fees," *Report on Credit Interchange Fees to Review Banks,* January 2001, §8.2.4.

135 For example, Rochet and Tirole state that a no-surcharge rule can reduce social welfare by creating "cross-subsidization between cardholders and non-cardholders." (*Rochet and Tirole* at 20.) The *Joint Study* (at 52 and 54-55) also raises the possibility of cross subsidization.

standard definition of cross subsidy, there may be no cross subsidy.[136] However, what matters for consumer welfare and efficiency is what actually happens, not what labels are attached to the effects. Whatever labels one uses, imposition of a no-surcharge rule can harm non-card users and economic efficiency by raising the prices paid by non-card users.

138. First, consider the effects on consumers. When card-based transactions are more costly to merchants than are non-card-based transactions, non-card users are hurt by card use because merchants have incentives to raise retail prices to reflect their higher costs due to some consumers' using relatively expensive payment means.[137] As Professor Rochet and Tirole find in their formal analysis, "The no-surcharge rule leads, as one would expect, to a redistribution toward cardholders."[138]

139. Visa and others have put forth a counter argument that non-card-users benefit from credit card use under a no-surcharge rule because merchants enjoy increased sales and, in the presence of increasing returns to scale, these increased sales may lead merchants to charge lower prices to all of their customers.[139] As discussed above in Part III.B, this is a seriously flawed argument which fails to recognize that, to the extent card use merely diverts sales among

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136 A standard economic definition of cross subsidy due to Professor Gerald Faulhaber ("Cross-Subsidization: Pricing in Public Enterprise," *American Economic Review,* **65,** Issue 5, December 1975, 966-977) builds on the notion of incremental costs. The incremental costs of serving a group of consumers are equal to the difference in total costs when the supplier serves that group and all other existing consumers and total costs when the supplier serves solely the other existing consumers. Under Faulhaber's definition, prices are said to be subsidy free when there is no group of consumers that pay less than the incremental costs of serving them. Presumably merchants will accept card customers only if on average they cover their incremental costs (including the costs of both the merchandise and the payment systems used), and thus other groups of customers will not cross-subsidize them as a group in this sense. However, individual customers might be cross-subsidized when the net costs of serving consumers varies among them and merchants are unable selectively to refuse the patronage of unprofitable customers.

137 Dr. Wright argues that '[t]here can be no presumption that card paying customers are being subsidized by cash paying customers." (*Optimal Interchange Fees* at 20.) He bases this argument on the claim that merchants may enjoy transactions benefits that exceed merchant service fees. ARA data (see footnote 25 and accompanying text above) and merchants' desires to be able to steer consumers to other payment mechanisms suggest that this is an unrealistic case for many merchants.

138 *Rochet and Tirole* at 18.

139 Specifically, the Visa argument is the following: Merchants accepting credit cards enjoy increased retail sales. Without credit card acceptance, a merchant would have lower sales and thus its average costs would be higher because its fixed costs would be spread over fewer transactions. Thus retail prices would be higher in the absence of credit card acceptance and use. (*Visa Response* at 31.) In addition to the problems with this argument discussed in the text, the argument fails to make economically relevant distinctions between marginal and average costs.

merchants, it has no effect on aggregate sales and the realization of economies of scale. To be valid, one would have to demonstrate either that economywide sales increase or that sales are reallocated to merchants that tend to enjoy high degrees of economies of scale relative to others. I am unaware of any such evidence's having been put forth. Moreover, if credit and charge cards would be used in the presence of surcharging (*i.e.,* in absence of no-surcharge rules), non-card users would enjoy the claimed benefits of scale without suffering the losses that arise from having to pay retail prices that reflect the higher merchant costs of card use.

140. Next, consider economic efficiency. The cited economic test for cross-subsidies (*e.g.,* incremental cost floors) is neither a necessary nor sufficient test for economic efficiency. By distorting relative prices, the no-surcharge rule can harm economic efficiency even if all prices are above incremental costs. These effects have two sources. One is from distortions in the use of alternative payment mechanisms. The other is from distortions in the retail purchases made by consumers not using the credit or charge card at issue.

2. Merchants will Exploit Card Users

141. In their comments, parties point to two pieces of evidence that they assert demonstrate that merchants will use surcharges to exploit credit card users if allowed to do so. However, this evidence does not stand up to scrutiny.

142. Visa points to "high" charges for theatre bookings by telephone in the United Kingdom and asserts that these charges represent surcharges for credit card use.[140] However, Visa offers no evidence that it is cheaper to purchase tickets by telephone using other payment mechanisms. Indeed, this is unlikely to be so, because credit cards are often the only way to purchase by telephone. Visa offers no means of distinguishing between a "surcharge on credit card use" and a "surcharge on booking by telephone". Evidence suggests that it is the latter. It is my understanding that theatres do not have differential charges for the use of alternative payment mechanisms at the box office (*e.g.,* credit at the box office versus cash at the box office).

143. Visa also points to the surcharge imposed by Cabcharge for the processing of credit card payments.[141] Cabcharge is a payment service owned by the taxi industry. It includes both a proprietary payment mechanism (via a Cabcharge account accessed either through a docket or a card) and "Freeway," which is an electronic payments system used to process transactions not only on Cabcharge proprietary accounts but also on non-proprietary credit, charge and debit cards. Riders paying their fares with Cabcharge's proprietary card are charged a fee equal to ten percent of the fare. Riders paying with a general purpose credit, charge, or debit card are charged a fee equal to 11 percent of the fare,[142] which Visa describes as "clearly not cost reflective," and "an example of rent-taking by the intermediary in a credit card

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140 *Visa Response* at 37.

141 *Visa Response* at 36.

142 11 percent is equal to a ten percent charge by Cabcharge plus GST of ten percent of the ten-percent charge.

transaction."[143] This is a non-representative situation, however. Cabcharge is owned by the taxi industry and is used in 90 percent of taxis. Cabcharge is an unusual situation in which an industry has created its own payment mechanism and apparently acts on a cartelized basis to enforce an agreement to charge high prices to consumers. It is my understanding that this is an extremely unusual situation in the Australian economy and thus the experience with Cabcharge is not a good predictor of what would happen in the rest of the Australian economy if no-surcharge rules were prohibited.

144. Although unrepresentative in many respects, the Cabcharge situation does illustrate a point made earlier in Part VII.A.3: Allowing merchants to surcharge increases their incentives to accept credit and charge cards. Visa does not allow surcharges and is not accepted in Australian cabs, while MasterCard allows the Cabcharge surcharge and is accepted.[144] Even with an 11 percent surcharge, a MasterCard user is better off as a result—he or she has the option of paying with his or her MasterCard if he or she chooses to do so.

145. Lastly, there is evidence from other countries that merchants will set much lower surcharges than indicated by the Cabcharge experience. Specifically, an empirical study of merchant surcharging behavior in the Netherlands found that merchants, when they are allowed and choose to surcharge, charge an amount that is on average equal to or below the merchant service fees they pay for card transactions.[145]

3. Few Merchants would Surcharge

146. In their comments, some parties argue that most Australian merchants would not levy surcharges and, in some cases, point to evidence in other countries that the lack of no surcharge rules has not led to widespread merchant adoption of the practice.[146] Further, some argue, only those merchants imposing excessive surcharges will take advantage of the option to levy surcharges.[147]

147. In studies conducted in the Netherlands and Sweden on the effect of lifting no-surcharge rules, it was found that only a small portion of merchants imposed surcharges.[148] No-surcharge

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143 *Visa Response* at 36. Visa does not provide transaction cost data. Cabs have mobile credit and charge processing terminals and process low-dollar value transactions, both of which could increase transactions costs. The text assumes, *arguendo*, that Visa's characterization is correct.

144 *Visa Response* at 36.

145 ITM Research, "The Abolition of the No-discrimination Rule," March 2000, at 8.

146 Access Economics Pty Limited, "The Appropriate Scope of Credit Card Scheme Regulation," prepared for American Express International, Inc., June 2001, at 20 and 21; *Visa Response* at 36-37.

147 See, for example, *An Economic Analysis* at 6.

148 ITM Research, "The Abolition of the No-discrimination Rule," March 2000; IMA Market Development, "Study Regarding the Effects of the Abolition of the Non-discrimination

rules were lifted in the Netherlands in 1997 and in Sweden in 1995. In the Netherlands, 10 percent of retailers applied surcharges in 2000. This low percentage apparently reflects, in part, a lack of merchant information. Of the merchants who were expressly aware that the no surcharge rule had been abolished, 18 percent surcharged.[149] The differential rates of surcharging suggests that any policy of prohibiting no-surcharge rules should be accompanied by an education and outreach program aimed at informing merchants of their options.

148. In Sweden, only 5 percent of all merchants surveyed surcharge. One should not read too much into this finding, however, given that Visa reports that in Sweden it is very common for acquiring banks to impose no-surcharge rules on merchants, even though the credit card networks are prohibited from having such rules.[150]

149. Even if it were true that many merchants would choose not to surcharge after lifting the no-surcharge rules in Australia, there might still be important non-price dimensions to "surcharging." For instance, a merchant might use signage or oral requests by their employees to steer customers to low-cost payment mechanisms. This steering could be between various credit and charge cards, or in some cases between credit and charge cards and other forms of payment such as debit cards, cheques, and cash. To the extent that merchants' costs are social costs, this steering could bring consumers' choices among payment mechanisms more in line with efficiency.

4. Network Effects will not be Internalized

150. A fourth argument made in support of no-surcharge rules is that, in their absence, external benefits will fail to be internalized.[151] To a large degree, this claim has already been addressed in the discussion of network effects and pricing. To summarize earlier findings, merchant surcharges may themselves provide a way of internalizing external effects. If credit and charge cards create strong transactional benefits for merchants, then merchants have

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Rule in Sweden," February 29, 2000.

149 Half of those merchants who surcharged were unaware that the rule had been abolished yet surcharged anyway. It is possible that these merchants were never aware that surcharging had been prohibited in the past because they came into existence after the rule had been abolished.

150 *Visa Response* at 36.

151 Professors Gans and King also make a somewhat different argument. They suggest that advertising by card issuers, acquirers, and systems may help attract consumers to a merchant and that, absent a no-surcharge rule, merchants will be able to induce customers to use a payment mechanism other than the one that conducted the initial marketing. (Joshua Gans and Stephen King, "Observations on the Joint RBA/ACCC Study 'Debit and Credit Card Schemes in Australia: A Study of Interchange Fees and Access'," 3 November 2000 at 5.) They do not provide evidence of this effect, however. Moreover, surcharges might be used to move consumers toward the advertising payment mechanism or merchants might be charged directly for the advertising.

incentives to set retail prices that promote card use. Moreover, allowing surcharges could promote merchant acceptance of credit and charge cards, and thus generate additional positive network effects. With respect to merchant benefits from increased sales, these benefits arise only from transactions that would not have been made otherwise, and the collective benefits from merchants may be zero because one merchant's increased sales may come at the expense of other merchants' sales. These last two points raise doubts about the magnitude of increased-sales effects, even if they are externalities. Further, changes in current pricing practices (particularly charging annual fees to cardholders) might be a more effective way to internalize network effects.[152]

151. Some parties may nevertheless assert that no-surcharge rules are needed to internalize externalities generated by card holding and usage because merchants earn positive margins on sales made using credit and charge cards.[153] The argument has the following logical structure. Merchants typically sell goods and services at prices that exceed the merchants' marginal costs. Some people are willing to purchase a particular product from a particular merchant using any of a variety of payment mechanisms. Other consumers will purchase the product from that merchant only if the merchant accepts a particular brand of credit or charge card. Thus, in an intuitive sense, the card helps the merchant make sales, and the merchant benefits every time someone uses a card to make a purchase. However, to the extent that card transactions are more expensive, a profit-maximizing merchant will charge consumers more for card transactions than for others if allowed to do so. Therefore, a card network needs a no-surcharge rule.

152. One must be wary of drawing conclusions that are too far reaching. It would be misguided to adopt a public policy of declaring serious market failure due to externalities whenever a consumer takes an action (*e.g.,* reading a catalog or driving to a shopping district) that leads to the purchase of a good sold at a positive margin. Consider, for example, the following argument:

> Many restaurants sell slices of bread, sometimes on a standalone basis as toast, and other times as components of chicken sandwiches. Some people are willing to buy toast, but others will buy bread only if it is part of a chicken sandwich. Thus, "chicken helps sell bread," and restaurant owners benefit every time someone buys a chicken sandwich.[154] However, because chicken sandwiches cost more to make than does toast (and most customers are willing to pay more for chicken sandwiches) a profit-maximizing restaurant owner will charge consumers more for chicken sandwiches than for toast if allowed to do so. Therefore, the chicken producers should introduce a no-surcharge rule that

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152 See the discussion in Part VII.C below.

153 Frontier Economics, "Joint Bank Review of Credit Card Membership and Interchange Fees," *Report on Credit Interchange Fees to Review Banks,* January 2001, at 73, and *Visa Response* at 21.

154 Other customers might even benefit because a restaurant has a greater volume of business over which to amortize its overhead.

> requires restaurants to charge the same price for chicken sandwiches as they do for toast.

The above argument clearly is silly. Yet it has the same logical structure as that made by those who assert that externalities exist because merchants earn positive margins on sales made using credit and charge cards. Moreover, in analyzing the welfare effects of restrictions on merchant pricing, one must take into account the existence of multiple credit and charge card networks, as well as other payment networks. No-surcharge rules can limit the ability of competing payment systems to create consumer incentives that internalize any increased-sales benefits that they create. Taken to an extreme, one could argue that credit card holders should pay a fee whose revenues would be used to cross-subsidize cash users and debit cardholders in order to internalize external benefits that those consumers would generate for merchants. In short, the argument that no-surcharge rules are needed to internalize increased-sales benefits does not provide a sound basis for public policy.

153. Lastly, it is Visa's position that, although an individual merchant would gain from being able to surcharge, merchants are collectively better off with the no-surcharge rule than without it. Visa raises the example of card promotion funded out of merchant service fees and asserts that:

> [w]hile any given merchant would clearly prefer lower service fees, and accordingly might surcharge if it were permitted to do so, all merchants collectively are better off as a result of the cardholder promotion that is partially funded from service fees.[155]

A public policy of deregulating retail markets so that merchants could choose to levy surcharges would affect merchants *collectively*. Thus, if merchants agreed with Visa's assessment of the situation, they would support the imposition of no-surcharge rules by Australian credit and charge card systems. Visa has offered no evidence that large numbers of merchants or their trade groups support a public policy of allowing no-surcharge rules to be imposed. By the same logic, opposition to no-surcharge rules either by individual merchants or merchant trade groups contradicts Visa's view. In this regard it is notable that the Australian Retailers Association supports *removing* no-surcharge rules.[156]

154. To sum up the discussion, claims of externality appear overstated. Moreover, in some circumstances, rather than simply undermining the use of interchange fees, merchant surcharges are a substitute for interchange fees that ensure the internalization of what would otherwise be externalities.

5. The Car Park Analogy

155. The last argument proceeds by analogy. Visa argues that credit card acceptance is a service provided by merchants to consumers just as free car parks at shopping malls are a

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155 *Visa Response* at 30.

156 *Australian Retailers Submission* at 23.

service provided to consumers by merchants in those markets.[157] In both cases, the costs of the service are passed on to all consumers regardless of whether any particular consumer utilizes the service.

156. As constructed, the analogy is inapt for several reasons. First, there is competition among landlords, who presumably choose their policies independently and without overlapping ownership and governance. Second, there are a variety of parking and shopping arrangements. In some cases parking is free for all, in other cases there is shop validation that gives rise to free parking or reduced-rate parking, and in other cases consumers pay to park. Third, Visa has provided no evidence that landlords forbid merchants from surcharging from parking. It appears far more likely that retailers choose not to surcharge as part of their competitive strategies. Deregulating the credit and charge card market would have a similar effect—merchants would be free to make decisions whether to surcharge based on market conditions, rather than system rules. Fourth, the transactions costs of surcharging may be different. In cases where there is free parking without validation, transactions costs are avoided because the lot owner does not have to track parking usage and merchants do not have to identify which customers made use of parking and which did not. With a credit or charge card transaction, the merchant knows know who pays by card, and thus this type of transaction cost would not be incremental to the decision to surcharge. Moreover, when a consumer patronizes multiple merchants at a single shopping mall, it might be costly to allocate the costs across merchants—consumers would have to report the full set of merchants they patronized on a given trip and then merchants would have to have an agreed process for allocating costs. Lastly, the incremental costs associated with a shopper's choosing to park on a given day may be extremely low (given that a lot of sufficient capacity has already been constructed, possibly due to zoning requirements). In contrast, merchants face significant costs per card transaction.

157. A more appropriate analogy would be to ask what would happen if the vast majority of all landlords for retail space in Australia got together and insisted that merchants pay them for providing free parking but not pass any of those costs on specifically to consumers who drove. One would not be surprised to see competition authorities block an attempt to reach this sort of agreement.

C. ARE CURRENT CARD PRICING PRACTICES CONSISTENT WITH INTERNALIZATION CLAIMS?

158. Card issuers and the associations argue that no-surcharge rules and the use of interchange fees are socially desirable because they are necessary to internalize network effects. Additional light can be shed on this issue by examining whether other credit and charge card system policies are consistent with internalizing external effects. Specifically, light can be shed by examining whether the associations and their members pursue pricing policies for card services that promote membership.

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[157] *Visa Response* at 26.

159. Credit and charge card users generally pay transactions fees that are below marginal cost. Indeed, a striking feature of the Australian credit card industry is that many cardholders face *negative* prices for using their credit cards. These negative prices are the result of rebates and rewards programs. For example, a cardholder may receive airline miles that can be redeemed for free flights. Loyalty programs have become increasingly important in the Australian credit card industry.[158] Even cardholders who are not members of loyalty programs generally pay below-cost transactions fees: The typical transaction fee levied on consumer charges is zero, although the associations and their members have stated that their marginal costs are positive.

160. There is a significant literature on pricing in the presence of network effects.[159] In addition to influencing optimal price *levels*, network effects influence the optimal price *structure*. In particular, there may be tradeoffs in the pricing of network *access* and network *use*. In the credit and charge card industry, access pricing corresponds to the annual fees associated with card holding, and usage pricing corresponds to the transactions charges or rebates and rewards that a consumer receives for utilizing a credit or charge card to make a purchase.

161. Dr. Wright argues that external effects create a tendency for too few consumers to hold cards.[160] In this situation, the economics literature identifies possible pricing strategies to internalize the positive external effects generated by network participation. The optimal policy depends on whether consumers at the margin of holding a card tend to use their cards for higher or lower volumes of purchases than do average cardholders. If the marginal consumer has lower transactions volume than average (as is intuitively sensible), then it is efficient to set annual fees below the fixed per-account costs borne by card issuers. To see why such a policy can be effective, suppose that annual fees are set at zero. Then it is valuable for a consumer to hold a card even if he or she expects to use it only once. If there is a need to raise issuer revenues, this can be done by setting transactions fees above marginal transactions costs. By raising revenues through above-cost transactions charges rather than above-cost annual fees, issuers would collect greater profits from the most intense card users (who presumably have the greatest incentives to hold cards) rather than collecting from all cardholders equally through annual fees.

162. Stated differently, economic analysis indicates that, when there are significant network effects, charging below-cost annual fees is a more effective means of encouraging cardholding than is paying rebates or charging below-cost transactions fees. This finding suggest that either the associations and their members have been unable to implement strategies to pursue their

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158 Mike Macrow, Craig Williams, and Alistair Scarff, "Credit Cards, An Ace Up the Sleeve," Merrill Lynch, 14 April 2000 at 23 and 24.

159 For a review of this literature, see Benjamin E. Hermalin and Michael L. Katz, "Retail Telecommunications Pricing in the Presence of External Effects," in *International Handbook on Emerging Telecommunications Networks,* G. Madden (ed.), (forthcoming).

160 *An Economic Analysis* at 4.

objective of encouraging membership, or below-cost pricing is driven by considerations other than internalizing network effects to promote cardholding (*e.g.,* the pricing might be used to promote excessive card use and thus increase issuer profits).

163. In order to promote lower annual fees, it may be necessary to take actions at the network level. This relationship could hold because the *structure* of the interchange fee can influence issuers' card services pricing structures. When interchange fee payments are based on transaction volumes, competition among issuers might drive them to set relatively high annual fees and high rebates in order to attract the highest-volume card users and thus collect the most revenue through interchange fees. If interchange fees had a per-capita component that partially replaced the usage-sensitive component, however, these incentives would be reduced.[161] Alternatively, a network might set caps on the annual fees charged by issuers.[162]

D. TWO INCONSISTENCIES

164. There are two ways in which the credit and charge card systems' policies appear to be internally inconsistent. First, these systems impose no-surcharge rules to ensure retail prices that are uniform across payment mechanisms. But the systems allow issuers to offer rebates and rewards to cardholders. As a result of these rebates and rewards, consumers face net retail prices that vary with the payment mechanism used. This inconsistency is also manifest in the treatment of proprietary or store cards. A prohibition of store card rebates would distort competition between store cards and general purpose cards and would raise questions of why only general purpose credit and charge cards should be allowed to offer rebates and rewards. On the other hand, if store cards can offer rebates—and thus merchants can charge different net retail prices depending on the payment mechanism used—why should merchants be allowed to set differential net retail prices for store credit cards, but not other payment mechanisms?

165. A second inconsistency arises from the fact that the associations charge different fees for fully electronic, card-present transactions and all other card transactions, apparently because they believe that prices (*i.e.,* merchant service fees, which depend in large part on interchange fees) should reflect cost differences. Yet, by imposing no-surcharge rules, the credit and charge card systems impose retail price regulation that forbids merchants from setting retail prices that reflect cost differences.

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161 This type of arrangement and potential incentives problems associated with it are briefly discussed in *Optimal Interchange Fees* at 34.

162 Although an association might express concern about objections by competition authorities, I am unaware of any association's ever having sought a ruling from competition authorities on whether a ceiling on annual fees would be acceptable. Moreover, I am unaware of evidence that the associations opposed the lifting of Australian government regulations that used to block annual fees.

E. TWO PROPOSED EXEMPTIONS FROM A PROHIBITION OF NO-SURCHARGE RULES

166. Two exemptions from any prohibition of no-surcharge rules have been proposed, one for open systems and the other for "voluntary" agreements.

1. Treatment of Open Versus Closed Systems

167. Parties responding to the *Joint Study* have stated opposing views on the extent to which open and closed networks should be treated similarly with respect to any public policy prohibition on no-surcharge rules.

168. Access Economics argues that closed systems should not be included under any prohibition of no-surcharge rules because closed systems do not have interchange fees.[163] This argument is incorrect on at least two counts. First, American Express has an Australian partner bank, AMP, that issues cards that run over the American Express network. Although American Express does not have a charge formally labeled as an interchange fee, American Express does have arrangements governing compensation between itself—in its roles as both acquirer and network—and its partner issuer. Second, even a closed system with no partner issuers collects charges from merchants in its role as an acquirer, which then affect its incentives to price card services to consumers in its role as an issuer. Although there can be some differences in terms of specifics, the potential economic distortions identified above for open card systems apply at a broad level to closed systems as well.[164]

169. Visa argues that closed general purpose credit card schemes such as American Express and Diners Club, and store cards that are issued by third parties, such as G.E. Capital, should fall under the same regulations as the open card schemes. Visa asserts that all of these cards are close competitors to the credit cards issued by the open schemes and that differences in regulatory treatment will provide the closed schemes unfair competitive advantages and thus harm efficiency.[165] Although Visa disagrees with the justifications that the *Joint Study* put forward for prohibiting no-surcharge rules, Visa argues that those justifications apply more strongly to the closed schemes than to the open schemes because the closed schemes levy a merchant service fee that exceeds that typically assessed in the open schemes.[166]

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163 Access Economics Pty Limited, "The Appropriate Scope of Credit Card Scheme Regulation," prepared for American Express International, Inc., June 2001, at 32.

164 For example, *Rochet and Tirole* (§6.2) and *Schwartz and Vincent* (compare Proposition 6 at 27 with the paper's earlier results) identify some differences in the behavior of associations and proprietary systems.

165 Visa, "Inclusion of Closed Card Schemes in the Designation Process, Submission to the Reserve Bank of Australia, 17th April 2000, at 3, and *Delivering a Level Playing Field* at 7-9.

166 Visa, "Inclusion of Closed Card Schemes in the Designation Process, Submission to the Reserve Bank of Australia, 17th April 2000, at 15 and 19.

170. The screen for whether a credit or charge card system should be subject to a ban on no-surcharge rules should be based on market power. If a system does not have market power, then that system acting on its own will not be able force merchants to accept inefficient no-surcharge rules because the merchants will be able to turn to other payment mechanisms to meet consumers' payment needs. This point is also relevant for the assessment of whether distortions would arise if no-surcharge rules were banned for some systems but not others. If no-surcharge rules were forbidden for all systems with market power, competition from these systems could be expected to force card systems without market power to abandon their no-surcharge rules in situations where the rules were inefficient.

171. A full analysis of market power in the Australian market for credit and charge card systems is beyond the scope of this report. There is, however, one issue that deserves mention here. By itself, the finding that credit and charge cards issued on the American Express or Diners Club networks comprise small shares of total cards or support small shares of total card-based transactions does not prove that these systems lack market power in the sense relevant for the analysis of no-surcharge rules. For example, if business travelers using American Express corporate cards were required to use those cards when traveling for business purposes in order to qualify for reimbursement by their employers, then this requirement might generate market power for American Express with respect to merchants, particularly merchants catering to business travellers, such as airlines, hotels, and restaurants. Visa also argues that American Express cardholder rewards programs could have similar effects for other consumers.[167]

2. "Voluntary" No-Surcharge Agreements

172. American Express attempts to draw a distinction between mandatory and optional no-surcharge rules. Specifically, American Express argues that "card issuers and/or merchant acquirers should be permitted to offer incentives or differential pricing to merchants who do not surcharge."[168] This proposal, as stated, is meaningless. Under the present system merchant acquirers offer differential pricing to merchants who do not surcharge—those who do not surcharge pay the standard merchant service fees and those who wish to surcharge are, in effect, charged punitive merchant service fees (*i.e.,* they are denied admission to the acceptance network). Without constraints on the nature of the incentives or price differentials, there might be no practical difference between a voluntary and mandatory rule.

VIII. CONCLUSION

173. The issues addressed by the *Joint Study* are complicated ones, but they are amenable to careful theoretical and empirical economic analyses. Perhaps the most central finding of these analyses is that, while network effects are a prominent feature of credit and charge card markets, there are multiple mechanisms through which these effects may be internalized.

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167 *Delivering a Level Playing Field* at 32.

168 *American Express Submission* at 11.

IX. TECHNICAL APPENDIX

174. This appendix reviews several economic models that have been developed to examine issues relevant to the *Joint Study*. It also analyses two simple alternative models that highlight the importance of various assumptions made in the existing literature.

A. COMMON NOTATION

175. The various papers discussed here generally follow similar notational conventions. Table 1 summarizes that notation as used in the present report. In some cases, the notation used in the original analyses has been translated to create uniform conventions for the discussion below.

Table 1: Notation

Transactions Benefits of Card Use

b_b = per-transaction benefits enjoyed by a buyer when using a credit or charge card to make a purchase in comparison with using the next-best payment mechanism

$G(b)$ = percentage of consumer population for whom $b_b \geq b$

b_m = per-transaction benefits enjoyed by a merchant from card use in comparison with the next-best payment mechanism[169]

Costs

c_I = cost incurred by card issuers on a per-transaction basis

c_F = annual fixed cost per account incurred by an issuer

c_A = cost incurred by merchant acquirers on a per-transaction basis

Fees and Charges

f = annual charge levied by issuers on cardholders

$f^*(c)$ = equilibrium annual charge levied by issuers when they have net marginal costs c

r = rebate paid by issuers to cardholders on a per-transaction basis

m = merchant service fee charged on a per-transaction basis

$m^*(c)$ = equilibrium transaction charge levied by acquirers when they have net marginal costs c

[169] The models reviewed and analysed in this appendix assume that the "next-best" mechanism is the same for all merchants and consumers.

a = interchange fee paid by acquirer to the issuer

Retail Prices and Consumer Willingness to Pay for the Goods

v = dollar value consumer is willing to pay for a unit of a retailer's output not accounting for any disutility associated with that merchant or from using other than the consumer's preferred payment mechanism

p_{cr} = price charged by the merchant for a credit or charge card-based transaction

p_{ca} = price charged by the merchant for a non-card-based ("cash") transaction

B. "COOPERATION AMONG COMPETITORS: THE ECONOMICS OF PAYMENT CARD ASSOCIATIONS" BY JEAN-CHARLES ROCHET AND JEAN TIROLE

176. Professors Rochet and Tirole develop a formal model in which they examine the effects of interchange rates and a no-surcharge rule.[170] The bulk of their analysis concerns an economy with a single credit card network and a single alternative payment mechanism, cash. They assume that acquiring is competitive and consider a variety of market structures for issuing. Merchants are assumed to be differentiated price setters along the lines of the standard Hotelling model with fixed locations. The timing of their model is as follows (1) the interchange fee is set; (2) issuers set customer fees and customers make cardholding choices, while merchants make card acceptance decisions and then set their retail prices; and (3) customers make retail purchases.[171] Their basic model assumes that any consumer who obtains a credit card makes a fixed number of transactions (normalized to one) so that there is no distinction between annual fees and transactions charges in their model.[172]

177. As expected, Rochet and Tirole find that, when there is frictionless surcharging, the interchange fee has no effects on equilibrium card use or the net prices faced by consumers.[173] The welfare properties of the frictionless surcharging case depend on the degree of issuer competition. First, suppose issuers are perfectly competitive. Perfectly competitive issuers set $f = c_I - a$. Given that acquirers are perfectly competitive, they set the merchant service fee equal to the marginal cost of acquisition: $m = c_A + a$. Under the symmetric Hotelling model, merchants pass through marginal cost differences on a one-for-one basis, so the surcharge is equal to the merchant's net benefits (costs) of card use. That is, merchants set the card surcharge equal to the merchant service fee minus the merchants' transactions benefits, or $p_{cr} - p_{ca} = c_A + a - b_m$, which can be positive or negative. Hence, the net cost of a card transaction

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170 *Rochet and Tirole.*

171 *Rochet and Tirole* at 11.

172 As will become clear from the discussion of *Analysis of a Payment Network* below, the lack of distinction between the effects of f and r also depends on the nature of merchant competition.

173 *Rochet and Tirole* at 19.

to the consumer is $f + p_{cr} - p_{ca} = c_I + c_A - b_m$, which provides the consumer incentives to make the efficient choice. When issuers are perfectly competitive, the surcharging equilibrium leads to efficient card use and the consumption of retail goods: Merchant surcharges fully internalize what could otherwise have been externalities.

178. When issuers are less than perfectly competitive, so that $f^*(c) > c$, the surcharge equilibrium entails too little card use because now $f + p_{cr} - p_{ca} > c_I + c_A - b_m$. This distortion is not due to the failure to internalize network effects or other externalities. Instead, the problem is the exercise of issuer market power.

179. The interchange fee can affect the equilibrium outcome in the Rochet-Tirole model when a no-surcharge rule is in effect. Rochet and Tirole find that an "issuer-controlled" association may choose an interchange fee that leads to "overprovision" of credit card services.[174] In other cases, both the privately and socially optimal interchange fees are equal to the highest level consistent with merchant acceptance of cards. Although Rochet and Tirole do not derive this result, it can be shown that, for sufficiently competitive issuers, the privately optimal interchange fee is greater than the socially optimal one.[175]

180. Having characterized the equilibrium with and without a no-surcharge rule, Rochet and Tirole examine the net effects of the rule and find that it may raise or lower welfare.[176] Rochet and Tirole also find that: (a) in comparison with charging solely per-transaction fees, charging cardholders annual fees as well as per-transactions fees can weaken "merchant resistance" to accepting cards when the interchange fee exceeds issuer cost,[177] and (b) "lifting the no-surcharge rule may increase social welfare when merchant resistance is weak…".[178]

181. Like those of any model, the results of the Rochet-Tirole model are sensitive to the assumptions made. For example, the model makes an assumption that eliminates another type of distortion that would be expected in practice. With a no-surcharge rule in effect, consumers in the Rochet-Tirole model who do not use credit cards end up paying higher prices than they would if surcharging were allowed or if credit cards were banned. Moreover, even when surcharging is feasible, the prices for non-card transactions are set above marginal costs. A no-surcharge rule increases this margin. In the Rochet and Tirole model, however, consumer demands are unresponsive to prices over the relevant range, and there are no adverse allocative efficiency effects from this price distortion. In more realistic settings, where consumers reduce

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174 *Rochet and Tirole* Proposition 3 at 17.

175 This conclusion follows from the fact that, as the issuer margin goes to zero, the socially optimal interchange fee goes to $b_m - c_A$, which results in a merchant service fee of $m = b_m$, which in turn is lower than a merchant's cutoff value for accepting cards because the latter includes the private increased-sales benefits.

176 *Rochet and Tirole* Proposition 4 at 20.

177 *Rochet and Tirole* Proposition 1' at 23.

178 *Rochet and Tirole* at 20.

consumption in response to higher prices, the increased margins will give rise to efficiency losses.[179]

182. Rochet and Tirole also assume that acquiring is perfectly competitive. If it is not, then the highest interchange fee consistent with merchant acceptance can be lower than indicated in their baseline model. Let $m^*(c_A+a)$ denote the merchant fee charged by acquirers given costs c_A and interchange fee a. Then the condition for merchant acceptance is $m^*(c_A+a) \leq E[b_b \mid b_b \geq f^*(c_I - a)] + b_m$. Stated differently, increased acquirer competition that shifts m^* downward will lead to greater net incentives for merchant acceptance, all else equal.

183. Lastly, Rochet and Tirole also make specific assumptions about the nature of merchant competition. Under the symmetric Hotelling duopoly model, merchants pass through marginal cost differences on a one-for-one basis, so the surcharge is equal to the merchant's net benefits (costs) of card use. Under other models of merchant behavior, surcharges might fail to be set at efficient levels even if both acquiring and issuing were perfectly competitive.

C. "AN ECONOMIC ANALYSIS OF A CARD PAYMENT NETWORK" BY JULIAN WRIGHT

184. Dr. Wright examines a modified version of the Rochet and Tirole model to analyse the economic effects of a no-surcharge rule and the setting of an interchange fee. He examines a variety of different retail market structures and reaches very different conclusions than do Rochet and Tirole. Unlike Rochet and Tirole, he allows for increased-sales benefits at the economywide level—with some probability a consumer can make a purchase only if he or she holds a card and the merchant accepts the card.[180]

185. By their nature, models are often built on unrealistic or stylized assumptions, and one must test whether the results are plausible. In the Wright model, one assumption is particularly unrealistic and troubling. Specifically, the model assumes that consumers purchase a fixed number of goods each period as long as the price is less than a single reservation price that is the same for all consumers.[181] This assumption gives rise to several potentially misleading conclusions. First, as noted above in the discussion of Rochet and Tirole's model, this assumption de facto eliminates the possibility of efficiency losses from distortions in the purchase behavior of non-cardholders induced by excessively high (or low) retail prices for goods and services. Second, this assumption is the reason that the model exhibits the property that surcharging eliminates the use of credit cards when merchants have monopoly power. The

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179 Of course, one would also have to take into account that a no-surcharge rule may reduce distortions in card-user consumption levels. *Schwartz and Vincent* offers an analysis of how these effects balance and establishes conditions under which the adverse effects outweigh the beneficial ones.

180 The implications of, and difficulties with, this assumption were discussed earlier in Part V.B above.

181 *Analysis of a Payment Network* , Assumption (A1) at 7.

common willingness to pay allows that merchant to extract all of a consumer's incremental surplus from making a card-based purchase.

186. To see the power of this assumption (and the unreasonableness of its implications), suppose that all consumers have the same willingness to pay for a good and must incur a fixed cost to get to the merchant, regardless of the method of payment used. Once the consumer has sunk the cost of getting to the merchant, the merchant should charge a price that extracts all of the surplus of the marginal consumer. But then that consumer would regret having gone to the store and, recognizing that this is what will happen, would never have gone in the first place. Thus, if there are any costs of going to a store, there can be no shopping!

187. Different and more realistic assumptions would give rise to different results. For example, if it is assumed that consumers continuously reduce their purchase quantities in response to higher merchant prices, then it can be unprofitable for merchants to extract all of a consumer's surplus through higher prices. A simple model of this type is examined in Part IX.F below. Another example is a model in which a given consumer has different values of b_b for different transactions.

188. A final point with respect to the analysis is that the model apparently takes the levels of fixed annual charges to be exogenous. In fact, these levels are endogenous and, in practice, they vary across cards. This assumption can be significant because rate structures, as well as levels, matter for consumers' incentives to hold and use cards. For example, the conclusions of the analysis would change if the fixed charges to cardholders were set at 0, as is done by some cards in Australia. In this case, it would be an equilibrium outcome for all consumers in the model to hold cards, regardless of merchant pricing strategies. Thus, results indicating that too few consumers hold cards would no longer apply.

189. Dr. Wright also presents the results of a simulation model. One problem with these simulations is that they build on models embodying the unrealistic assumptions discussed above. A second problem is that there is almost no documentation of the sources of the various parameter values used in the simulations, and thus it is difficult to judge their validity.[182]

190. For example, the welfare calculations appear to be based on the assumption that there are 15 million unique credit card holders. If so, this is an overestimate. The total number of adults in Australia in December 2000 was 15.3 million, and many of them apparently do not have a credit card.[183] In June 2001, the Reserve Bank of Australia estimated that there were 9.6 million credit card accounts.[184] Survey data collected by the Australian Payments Clearing

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182 *Analysis of a Payment Network* at 34 and 35.

183 Of a population of 19.277 million Australians in December 2000, 79.5 percent, or 15.3 million, were aged 15 or older. Data provided by Reserve Bank of Australia.

184 This figure includes only bank issued credit cards. (Reserve Bank of Australia, "C1: Credit Card Statistics – Banks," http://www.rba.gov.au/Statistics/Bulletin/C01hist.xls (site visited August 25, 2001).)

Association indicate that there are 12.1 million credit cards on issue.[185] Even if each cardholder has only one card, and even if the number of American Express and Diners Club cards are added (though it is not clear that this is Wright's intent) the number of credit cardholders appears to be significantly less than 15 million.[186] To the extent that some cardholders hold more than one card, the number of unique cardholders would be even smaller.

D. "SAME PRICE, CASH OR CREDIT: VERTICAL CONTROL BY PAYMENT NETWORKS" BY MARIUS SCHWARTZ AND DANIEL R. VINCENT.

191. Professors Schwartz and Vincent examine the effects of interchange rates and a no-surcharge rule.[187] Their model assumes away consumer cardholding decisions: One fixed set of consumers always uses credit cards when they make purchases and another fixed set of consumers always uses cash. Instead of modeling cardholding decisions, the authors allow for consumers to adjust their purchase levels in response to retail prices and the analysis focuses on the welfare effects of changes in net retail prices. The model is complementary to that of Rochet and Tirole in the sense that each model examines an effect assumed away by the other.

192. The authors examine two models, one that they interpret as a closed credit card system and one that they interpret as an open credit card system or association. The authors conclude that a no-surcharge rule may raise or lower total surplus.[188] For the case of an open system (their competitive issuers case), Schwartz and Vincent find that a no-surcharge rule lowers total surplus when consumers' demand functions for the merchant's product are linear and $b_m = 0$.[189] Imposition of a no-surcharge rule raises the net price paid by non-card users and lowers the net price paid by card users. Under the assumptions of their model, the welfare losses outweigh the gains.[190]

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185 Data provided by Reserve Bank of Australia. This is consistent with other estimates that, on average, there are 1.3 cardholders for every account. See Mike Macrow, Craig Williams, and Alistair Scarff, "Credit Cards, An Ace Up the Sleeve," Merrill Lynch, 14 April 2000, at 18.

186 Merrill Lynch estimated that American Express had 1 million and Diners Club had 600,000 cards on issue in Australia. Mike Macrow, Craig Williams, and Alistair Scarff, "Credit Cards, An Ace Up the Sleeve," Merrill Lynch, 14 April 2000, at 5.

187 *Schwartz and Vincent.*

188 *Schwartz and Vincent,* Proposition 5(i) at 24.

N.B. According to correspondence from the authors, Proposition 5(ii) is incorrect as stated in the paper. The result holds only for $\alpha > 1/3$.

189 *Schwartz and Vincent*, Proposition 6(iii) at 27.

190 *Schwartz and Vincent* at 36.

E. "REGULATING INTERCHANGE FEES IN PAYMENT SYSTEMS" BY JOSHUA S. GANS AND STEPHEN P. KING

193. Professors Gans and King examine the welfare effects of a no-surcharge rule and characterize the socially optimal interchange fee level.[191] They use a special formulation of demand, which leads to strong results. Specifically, Gans and King assume that a consumer makes all of his or her purchases from a single merchant and credit card use raises a consumer's willingness to pay for the retail good, but does so by an amount that decreases with the volume of card use. This structure allows the merchant to charge separately for card use and thus price discriminate against card use. Moreover, given the model's formulation of demand, all marginal purchases are made using cash. Hence, changes in the credit card price affect only the extent to which credit cards are used and have no effect on total purchase volume. Thus, the cash price with surcharging is identical to the common price under a no-surcharge rule.[192] In this model, non-card users are no worse off under the no-surcharge rule.

194. These results do not appear to be robust. As already discussed, imposition of a no-surcharge rule often raises the price paid by non-card users. Furthermore, price discrimination against card use need not occur under the alternative model presented in the next part of this section. This result also need not extend to the case of multiple merchants, even where each merchant is a monopoly supplier in a separate product market. To see this point, consider a three-sector economy. Two of the sectors are monopolized. That is, there is a single producer of the product sold in each of these markets. There is also a cash-only sector of the economy that offers an unlimited number of constant surplus transactions, where the surplus is normalized to zero. Although each firm monopolizes the supply of its product, the two retailers compete to attract card use. As Bertrand competitors, they will drive the retail "price for card use," $p_{cr} - p_{ca}$ down to $m - b_m$. Hence, with competitive acquirers and no interchange fee, there will be no price discrimination against card users and surcharging will fully internalize what might otherwise be external effects. Of course, each retailer's overall monopoly markup over marginal cost will remain, but this will not distort the marginal choice of payment mechanisms.

F. AN ALTERNATIVE MODEL OF CONSUMER DEMAND

195. This part presents an illustrative analysis of a model that extends Professors Schwartz and Vincent's model of consumer behavior to allow for endogenous cardholding decisions. This model demonstrates that, contrary to the findings of Professors Gans and King, a monopoly merchant may choose not to price discriminate against card use when surcharging is allowed. This model also sheds light on Dr. Wright's prediction that frictionless surcharging will destroy the market for credit and charge cards and demonstrates one of the reasons why this prediction is almost certainly incorrect.

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191 *Regulating Interchange Fees.*

192 *Regulating Interchange Fees* at 9.

196. As in the baseline versions of the other models summarized in this appendix, consider an economy with a single credit card network and a single alternative payment mechanism, "cash." Suppose that each consumer has a downward sloping demand curve, $D(\cdot)$, for a product sold by a monopoly merchant. With probability λ_i consumer i will need to use a credit card to make a purchase from the merchant. If a consumer needs to use a card but the merchant does not accept cards or the consumer does not hold one, then the consumer makes no purchase from that merchant and instead makes a purchase in a cash-only competitive sector of the economy that yields constant consumer and producer surplus normalized to zero. At the time of making the decision whether to hold a card, each consumer knows his or her probability of needing a card. To keep the model simple, assume $b_b = 0$ for all consumers.[193]

197. Assume that acquiring and issuing are perfectly competitive, so that $m = c_A + a$, $f = c_F$, and $r = a - c_I$. In what follows, observe that as in the Wright model—and in contrast to the Rochet-Tirole model—the annual fee and rebate do not collapse to a single fee.

198. The game proceeds as follows. Consumers form expectations about retail prices and then choose whether to join the credit card network by paying an annual fee of f. At the time the cardholding decision is made, consumers know the value of r, the per-transaction rebate paid by the issuer. After cardholders have signed up, the merchant chooses its prices for cash- and credit card-based transactions knowing the extent of consumer cardholding. Consumers then make purchases. The equilibrium concept is that of subgame-perfect Nash equilibrium, which rules out incredible threats and promises by the merchant or consumers. In equilibrium, consumers' beliefs about retail prices at the time of making cardholding decisions are fulfilled by the actual prices the merchant charges.

199. Suppose that surcharging is allowed and consumers expect prices p_{cr} and p_{ca}, where $p_{cr} - r \geq p_{ca}$. Given these prices, a cardholding consumer would use cash when feasible and thus a cardholding consumer enjoys expected surplus

$$\lambda_i S(p_{cr}-r) + (1 - \lambda_i)S(p_{ca}) - f \ ,$$

where

$$S(p) \quad = \quad \int_p^\infty D(q)\, dq \ .$$

That is, $S(p)$ is a consumer's surplus when the merchant's net price is p and he or she purchases the good. A consumer who does not hold a card enjoys expected surplus

$$(1 - \lambda_i)S(p_{ca}) \ .$$

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193 The force of this assumption is that $b_b + b_m < c_I + c_A$. If this condition were not satisfied, it would be efficient for a consumer use a card for all transactions conditional on holding a card—card use could never be excessive. The assumption made in the text allows for the possibility of both excessive and insufficient card use.

Hence, a consumer will hold a card if and only if

$$\lambda_i S(p_{cr} - r) \geq f \ . \qquad (1)$$

200. Before continuing, observe that, given $r \leq a - c_I$, $m \geq c_A + a$, and $c_A + c_I - b_m > 0$, the merchant would never choose prices that induce full-time use of cards. The reason is that $(1 - \lambda_i)$ of the time, consumer *i,* enjoys no transactions benefits of card use, other than the rebate. But the merchant funds the rebate out of the merchant service fee. The merchant can increase its profits by a setting a cash price "just below" $p_{cr} - r$ to induce consumers to use cash when possible and thus allow the merchant and consumer to avoid the net card transactions costs $c_A + c_I - b_m$. It is readily shown that this will increase merchant profits in comparison with all consumers' using cards. Likewise, it is never in the merchant's interest to set p_{cr} so high that it chokes off card use conditional on at least some consumers' holding cards.

201. Let $p^\pi(c)$ denote the profit-maximizing price for a monopoly merchant with marginal cost c facing demand curve $D(\cdot)$. Normalize demand so that the cost of cash sales is zero and the net cost of card sales is $m - b_m$. Then the merchant sets prices satisfying $p_{cr} - r = p^\pi(m - b_m - r) = p^\pi(c_A + c_I - b_m)$ and $p_{ca} = p^\pi(0)$, where use has been made of the assumption that issuers and acquirers are perfectly competitive.[194] Notice that the equilibrium value of $p_{cr} - r$ is greater than the equilibrium value of p_{ca} because $p^\pi(\cdot)$ is an increasing function.

203. With linear demand curves of the form $D(p) = \alpha - p$, the resulting prices are $p_{cr} - r = (\alpha + c_A + c_I - b_m)/2$ and $p_{ca} = \alpha/2$. In this case, $p_{cr} - r - p_{ca} = (c_A + c_I - b_m)/2$. Assuming that $(c_A + c_I - b_m) > 0$, the merchant's prices entail price discrimination in favor of card users because the difference in social costs is $(c_A + c_I - b_m)$. This result stands in contrast to the one obtained by Professors Gans and King indicating that merchant pricing distorts card use downward.[195]

202. Now consider equilibrium cardholding. Substituting the equilibrium values of relevant prices and fees into inequality (1), a consumer will hold a card if and only if

$$\lambda_i S(p^\pi(c_A + c_I - b_m)) \geq c_F.$$

Given the merchant's prices, it is socially optimal for a consumer to hold a card if and only if

$$\lambda_i \{S(p^\pi(c_A + c_I - b_m)) + [p^\pi(c_A + c_I - b_m) - c_A - c_I + b_m]D(p^\pi(c_A + c_I - b_m))\} \geq c_F \ .$$

Given that $p^\pi(c_A + c_I - b_m) - c_A - c_I + b_m > 0$ (or else the merchant would shut down), there is too little cardholding, conditional on the merchant's prices. This result obtains because the cardholder ignores the positive effects of cardholding on other economic agents; absent

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194 The derivation of the equilibrium value of $p_{cr} - r$ follows from the fact that the merchant's pricing problem can be expressed as choosing p_{cr} to maximize

$$D(p_{cr} - r)\{(p_{cr} - r) - (m - b_m - r)\} \ .$$

195 *Regulating Interchange Fees,* Proposition 1 at 7.

cardholding, the economy forgoes sales with positive margins.[196] This distortion is not due to the failure to internalize network effects. Instead, it is a monopoly commitment problem. If the merchant could commit to a lower price for card use—and thus encourage greater cardholding—the merchant would find it profitable to do so.[197]

203. To gain further insight, suppose that everyone has the same value of λ. As long as

$$\lambda\, S(p^{\pi}(c_A + c_I - b_m)) \geq c_F \ , \qquad (2)$$

all consumers will hold cards. In contrast to Dr. Wright's finding, the market for credit cards is not destroyed even when the merchant knows the marginal consumer's valuation of credit card holding. The reason is that raising the retail price of purchases made using cards leads to a reduction in purchase levels so that it is not profitable for the merchant to raise prices to the point that the marginal cardholder enjoys no surplus.[198]

204. Now, suppose that a no-surcharge rule is put in to effect. If the interchange fee exceeds issuers' marginal costs, then issuers pay rebates to card users: For any $a > c_I$, $r > 0$. In this case, any consumer holding a card would always use his or her card to make purchases. Faced with a common retail price, p, all consumers will hold cards as long as

$$S(p - a + c_I) - c_F \geq (1 - \lambda)S(p) \ , \qquad (3)$$

where use has been made of the facts that the equilibrium value of r is $a - c_I$ and the equilibrium value of f is c_F. If the merchant expects all of its customers to use cards, it will set its price to maximize

$$D(p - a + c_I)\{p - c_A - a + b_m\} \ ,$$

where use has been made of the fact that the equilibrium value of m is $c_A + a$. Knowing this, the merchant would set its retail price to satisfy

$$p_{cr} - (a - c_I) = p^{\pi}(c_A + c_I - b_m) \ ,$$

and would earn profits of

$$D(p^{\pi}(c_A + c_I - b_m))\{\, p^{\pi}(c_A + c_I - b_m) - c_A - c_I + b_m \,\}$$

if it accepted cards. Given the merchant's price, inequality (2) is a sufficient condition for inequality (3) to hold. Assume that inequality (2) is satisfied. If the merchant refuses to accept cards, it sets $p_{ca} = p^{\pi}(0)$ and earns profits of

$$(1 - \lambda)D(p^{\pi}(0))\, p^{\pi}(0) \ .$$

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196 Recall from the discussion of Section III.B above that this model likely overstates the economywide benefits of card holding.

197 With a large number of competing merchants, there could be a free-rider problem with respect to promoting cardholding, but competition would lead to lower prices anyway.

198 The key (and realistic) assumption is that the merchant cannot engage in perfect price discrimination, so that consumers enjoy positive surplus from their purchases.

205. For λ large enough, card acceptance is an equilibrium outcome under a no-surcharge rule. As long as $\lambda < 1$, this outcome leads to excessive card use in this model. In order to get the rebate of r, consumers use their cards to make all of their purchases. Thus, $(1 - \lambda)$ of the purchases are made using cards even though there are no direct consumer benefits of card use but there are transactions costs of $c_A + c_I - b_m > 0$.

G. "PAYMENT SYSTEMS AND INTERCHANGE FEES" BY RICHARD SCHMALENSEE

206. This paper examines and compares privately and socially optimal interchange fees.[199] Professor Schmalensee concludes that, in apparently non-pathological cases, the privately optimal interchange fee performs well. As noted in Part VI.B of the text above, a fundamental weakness of Schmalensee's analysis is that it uses a suspect and potentially misleading measure of economic welfare to determine the socially optimal interchange fee.[200] The problem comes from equating an individual merchant's acceptance incentives with the aggregate effect on merchant welfare. Put another way, Professor Schmalensee fails to account for the negative effects that one merchant's acceptance of credit and charge cards may have on other merchants. Thus, his model may be valid if every merchant that accepts cards is a monopolist in a separate market, but is very likely incorrect otherwise.

207. The following formal example, based on the Rochet and Tirole model, demonstrates the flaw in Schmalensee's analysis. Recall that each consumer in the Rochet-Tirole model purchases one unit of a merchant's output. Under a no-surcharge rule, a consumer makes his or her card holding and use decision by comparing the direct benefits of card use, b_b, with the annual fee, f. As Rochet and Tirole show, the socially optimal interchange fee is the one that maximizes

$$\int_{\max\{0,\, f\}}^{\infty} [b_b + b_m - c_A - c_I] dG(b_b) \quad .^{201} \tag{4}$$

Note that the lower limit of integration is restricted to being non-negative, because a cardholder with a negative value of b_b would never use his or her card to make a purchase. Using the fact that $f = f^*(c_I - a)$, setting the derivative of (4) with respect to a equal to 0 yields the first-order condition for the socially optimal interchange fee:

$$f^*(c_I - a^w) = \max\{0, c_A + c_I - b_m\} \ . \tag{5}$$

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199 *Schmalensee*.

200 Professors Gans and King also assert that there is an algebraic error in Schmalensee's derivation of the privately optimal interchange fee in the "symmetric demands case." (*Regulating Interchange Fees* at footnote 5.)

201 *Rochet and Tirole* at 17. This formula assumes that merchants accept cards at the resulting merchant service fees.

208. Under the Schmalensee approach, one would substitute merchant willingness to pay for card acceptance in place of merchant transactions benefits in the measure of total welfare. As shown by Rochet and Tirole, each merchant is willing to pay up to $b_m + E[b_b \mid b_b \geq f]$ to accept cards. Thus, the Schmalensee-optimal card fee is the one that maximizes

$$\int_{\max\{0,\, f\}}^{\infty} [b_b + b_m + E[b_b \mid b_b \geq f] - c_A - c_I] dG(b_b)$$

$$= \int_{\max\{0,\, f\}}^{\infty} [2b_b + b_m - c_A - c_I] dG(b_b) \quad , \qquad (6)$$

where the equality follows from the fact that

$$E[b_b \mid b_b \geq f] \quad = \quad \int_{\max\{0,\, f\}}^{\infty} b_b \, dG(b_b) \;\div\; \int_{\max\{0,\, f\}}^{\infty} dG(b_b) \quad .$$

209. Comparing (4) and (6), one sees that the Schmalensee approach leads to the double counting of consumer benefits from card use: $2b_b$ appears in the Schmalensee measure when the correct term is b_b. Intuitively, because of the increased-sales effect, a merchant is willing to pay a merchant service fee up to the average level of consumer transactions benefits. Hence, by counting the increased sales effect, the consumer transactions benefits are double counted—once for consumers and once for merchants. But the increased-sales effect is not a social benefit (one merchant gains at the other's expense), so the consumer benefits should be counted only once.

210. As expected, the mismeasurement of welfare leads to calculation of the wrong value of the interchange fee. To see this fact, set the derivative of (6) equal to zero, which yields the first-order condition for the Schmalensee-optimal interchange fee:

$$f^*(c_I - a^S) = \max\{0, (c_A + c_I - b_m)/2\} \quad . \qquad (7)$$

Comparing the expressions for optimal interchange fees, (5) and (7), one observes that

$$f^*(c_I - a^S) = f^*(c_I - a^W)/2 \quad .$$

In the case of perfectly competitive issuers, $f^*(c_I - a) = c_I - a$, and thus $c_I - a^S = (c_I - a^W)/2$. It follows that

$$a^S = (c_I + a^W)/2 > a^W$$

because $a^W < c_I$ to avoid negative f. Hence, the Schmalensee approach errs toward interchange fees that encourage excessive card use.

X. APPENDIX ON RELEVANT MARKETS AND CONSUMPTION DISTORTIONS

211. In its competitive analysis of a recent bank merger, the Australian Competition and Consumer Commission found that credit cards are in a relevant market distinct from cheques and debit cards.[202] At first glance, it might appear that policy makers should not be concerned about distortions in the prices of credit and charge cards relative to other payment mechanisms if those payment mechanisms are in distinct relevant markets. Policy makers should, however, be concerned for two reasons. First, there may be distortions among credit and charge cards. Second, the price differentials used in the definition of relevant markets are much smaller than the price differentials that may arise as the result of merchant surcharging and card rebates and rewards. This second point merits further explanation.

212. Relevant markets are defined along two dimensions: the products included and the geographic scope. The focus here is on product definition. A fundamental principle by which economists define the product scope of a market is to include two goods or services in the same relevant market if consumers view them as sufficiently close substitutes and not to include them in the same relevant market if consumers do not view them as sufficiently close substitutes. As part of its analysis and definition of relevant markets, the Australian Competition and Consumer Commission looks at consumer substitution among products.[203]

213. There are, of course, many different degrees of substitution and competition among products. To some extent, milkshakes compete with automobiles for consumers' dollars, but one should not conclude that milkshakes and automobiles are in the same product market. A standard approach to identifying the set of products in a market is to ask what would be the smallest set of products such that a firm that had a hypothetical monopoly as the supplier of those products would maximize its profits by raising price above the competitive level by a significant amount for a sustained period of time. In practice, "significant" is often taken to mean a price change in the range of five to ten percent.

214. A significant increase in price above the competitive level will raise a hypothetical monopolist's profits unless unit sales volume falls sufficiently to offset the higher price received for units sold. Thus, economists determine that a set of products constitute a relevant market if a small but significant price increase would lead to too little substitution to goods outside of that market to make the price increase unprofitable for a hypothetical monopolist. Thus, a finding that credit cards constitute a relevant product market distinct from cheques and debit cards indicates that the Australian Competition and Consumer Commission found relatively low levels of consumer substitution among these payment mechanisms.

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202 Australian Competition and Consumer Commission, "ACCC Not to Oppose Commonwealth Bank/Colonial Merger," Press Release, June 8, 2001, at 4.

203 Australian Competition and Consumer Commission, *Merger Guidelines*, June, 1999, at 31-42.

215. However, low levels of substitution in response to a five or ten percent price increase are fully consistent with much higher levels of substitution in response to price changes of 50 or 100 percent or more, which are in the range of price changes associated with the effects of interchange fees and/or various loyalty programs.

216. To understand the magnitudes of the relevant price changes, it is important to distinguish between a percentage increase in the price of the *goods purchased* and an equivalent percentage increase in the price of *credit or charge card services*. The following example brings out the intuitive basis for needing to make this distinction. Suppose a researcher is trying to estimate consumer price sensitivity for a particular stockbroker's services. The researcher questions a number of people who are planning to purchase $1,000 worth of stock. The broker charges a $30 fee for this transaction, and the researcher wants to determine how investors would respond if the price of the broker's services were increased by five percent. The proper procedure for eliciting this information would be to ask consumers if they would still buy the stock using this broker if *this broker's fee* were increased by five percent to $31.50 for the transaction. It would make no sense to ask what would happen if the price of the *stock* were increased by five percent (*i.e.,* by $50). The consumer pays only $30 as the baseline cost of the brokerage services, and a price increase of $50 would correspond to a 167 percent increase in the price of brokerage services, not five percent. It would not be surprising if a $50 price increase induced every investor to switch to another brokerage firm. But it would be incorrect to conclude from this fact that a "5 percent" price increase leads to a 100 percent fall in the demand for the firm's brokerage services.

217. One must be careful not to make the same mistake in looking at credit and charge card usage. Consider a consumer who holds a credit card and maintains an amount outstanding on it. Now suppose that she must decide whether to use that credit card instead of another payment mechanism for a particular transaction. Because the consumer in this example maintains an outstanding balance, she has to pay interest immediately from the time the purchase is made until she pays down her balance at the close of the next billing cycle, which typically will be less than one month later.[204] The average annual interest rate charged by the four major banks is 16 percent.[205] Hence, the cardholder's cost of the less-than-one-month loan from using a credit card instead of cash is approximately 1.33 percent.

218. Now examine the effect of interchange fees, which affect the per-transactions prices that consumers pay. The average interchange fee in Australia is 0.95 percent of the dollar value of a

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[204] A consumer with a revolving balance typically does not enjoy a grace period on her purchases and begins incurring finance charges immediately. If one were to consider a consumer without a revolving balance, the consumer's cost of using the card to make purchases would be even lower.

[205] This is the average interest rate for accounts with an interest-free period. The average interest rate for all banks with a loyalty scheme is also 16 percent. The average interest rate for all banks without a loyalty scheme is 15.2 percent. Data provided by Reserve Bank of Australia.

transaction.[206] In the absence of interchange fees, consumers might be charged this amount—because issuers would face higher effective costs of card use—and so the total cost of a consumer's usage of a card would be 2.28 percent. The use of interchange fees rather than consumer card-use fees thus causes a 41 percent change in the price of the card services. Interchange fees thus may induce consumer substitution among payment mechanisms even when these mechanisms are not in the same relevant market.[207]

219. Some analyses also cite credit card loyalty programs as causing distortions in consumers' choices among payment mechanisms. As with the above example, this is consistent with the view that credit and charge cards and other payment mechanisms are in different relevant markets. The average value of a loyalty program is typically around one percent of the transaction value.[208] Instituting a typical rebate program raises the rebate from zero to one percent of the value of the transaction. Hence, given the 1.33 percent cardholder transaction cost calculated above, this corresponds to more than a 75-percent change in the price of the card services.[209] It would not be surprising to see significant shifts in consumers' uses of payment mechanisms away from debit cards, for example, and toward credit cards in response to such large price declines. This is not the same, however, as a test for whether credit cards and debit cards or other payment mechanisms belong in the same relevant product market. Thus one may be concerned about distortions among payment mechanisms even though the payment mechanisms are in separate relevant product markets.

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206 *Joint Study* at 43.

207 The use of interchange fees instead of consumer card-use transaction fees results, on average, in a price decline for a credit card transaction from 2.28 percent (1.33 percent + 0.95 percent) to 1.33 percent. This is a 42 percent decline in the price of the credit card transaction to the consumer.

208 Data provided by Reserve Bank of Australia.

209 Adding a rebate program results, on average, in a price decline for a credit card transaction from 1.33 percent to .33 percent. This is a 75 percent decline in the price of the credit card transaction to the consumer.

Figure A: An Industry Schematic