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PAYMENTS INNOVATION AND INTERCHANGE FEES REGULATION: HOW INVERTING THE MERCHANT-PAYS BUSINESS MODEL WOULD AFFECT THE EXTENT AND DIRECTION OF INNOVATION

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PAYMENTS INNOVATION AND INTERCHANGE FEES REGULATION: HOW INVERTING THE MERCHANT-PAYS BUSINESS MODEL WOULD AFFECT THE EXTENT AND DIRECTION OF INNOVATION

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ABSTRACT

This paper examines the possible impact on innovation involving payment cards as a result of price caps that lead to a the significant drastic reduction in interchange fees. Such reductions invert the traditional business model for the payments card industry from a merchant-pays model to a consumer-pays model.

The paper argues that this inversion is likely to reduce the overall level of innovation in the industry, divert innovation away from the role of payments in transactions and towards improvements for which consumers can be charged non-transaction related fees, and discourage the entry of new payment systems.

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I. INTRODUCTION

In most parts of the world, when a person pays a merchant with a card the bank that issued that card receives a payment from the acquirer that processes transactions for that merchant. These "interchange fees" have come under increasing scrutiny by governments around the world. Antitrust authorities, central bank regulators, and legislatures in various jurisdictions have imposed price caps on these fees. Usually the fees decline—sometimes by more than 80 percent—following the regulations.1

Most of the work on interchange fees has focused on static models that examine how the payment system sets the profit-maximizing interchange fee, whether the interchange fee deviates from the interchange fee that would maximize social welfare, and how to regulate prices.2 Little work has considered the relationship between interchange fees and the level and type of innovation. Yet getting innovation right is likely to be far more important than getting prices right. Innovation generates new products that provide considerable improvements in social welfare while changing prices for existing products typically leads to marginal improvements in social welfare.[3]

This topic is especially important given the recent experience of ISIS. ISIS is a joint venture of the three largest mobile operators in the United States (AT&T, T-Mobile and Verizon). It said on its formation last year that it was going to develop a mobile payments system in United States working with the Discover Network and with Barclaycard US as its first issuer.[4]

Recent reports indicate that ISIS has abandoned this plan because the sharp reductions in debit-card interchange fees proposed by the United States. Federal Reserve Board made its original business model untenable.[5] It was going to distinguish itself by having a low merchant fee model but the proposed price caps would eliminate that source of differentiation. There are similar concerns in Europe over the impact of interchange fee caps on the incentives for starting new payment schemes. Although some banks are interested in starting a new EU card scheme to challenge MasterCard and Visa Europe, it is unclear whether these schemes would be viable if the European Commission required them to adopt the same low interchange fees as MasterCard and Visa have agreed to.[6]

Any economist who opines on innovation must be humble. Innovation is an extraordinarily complex process. After years of research economists have not found that it is possible to make many definitive statements either as a matter of theory or empirical evidence. Moreover, there has been no significant work concerning innovation involving multi-sided platforms. Nor have economists conducted much research on innovation in the payments industry.[7]

The aims of this paper are correspondingly humble. The focus is on examining how the interchange fee model—and is referred to as the "merchant pays model" more generally for reasons explained below—has influenced innovation in the payments industry and conjecturing how flipping it to a consumers pay model, as a result of low price caps on interchange fees, would alter innovation. A driving observation for the analysis is that interchange fee regulation that caps these fees a low level does not simply regulate prices but inverts the business model from one in which merchants bear most of the cost of the system (a merchant-pays model) to one in which consumers do (a consumers-pay model). It is like telling ad-supported media companies such as newspaper and television networks that they have to reduce their advertising rates by 80 percent and make up the difference by charging for content.

The paper argues that the merchant-pays model has resulted in drastic innovation that has resulted in considerable benefits to merchants and consumers and has been behind significant incremental innovation as well. While it is not possible to prove that these benefits could not have come without interchange fees, or with much lower ones, one should be at least mindful of these benefits in considering a radical change to the business model that was relied on by the entrepreneurs who created these benefits.

The paper also considers how adopting a consumer-pays model would alter the direction and pace of innovation. It would go much too far to suggest that sharply reducing interchange fees would eliminate innovation. Entrepreneurs will adapt to the new regime and adjust the types of payments innovation they develop accordingly. In fact, there will likely be a flurry of innovation resulting from such radical change in business models. Nevertheless,

the amount of innovation and investment in payments could decline if there was switch to a consumer pays model

for the simple reason that the amount of profits that payments systems can obtain from the consumer side is less than what it can obtain from the merchant side. It is simply less interesting to invest in innovation in an industry that is smaller and less profitable all else equal.

It is also likely that adopting the consumer-pays model would hinder new payment systems, such as ISIS in the United States and some of the new proposed schemes in the European Union, from starting or reaching critical mass, and shift the direction of innovation away from increasing payment card transactions and towards other types of improvements for which it is possible to charge and earn profits.

These considerations go beyond the usual concern that government regulation—and price caps in particular—deter innovation.[8]

The next section explains the merchant-pays model and describes how most payment systems have adopted this model from the beginning of the general-purpose payment card industry. Section III documents the social welfare that has resulted from the merchant-pays systems. Section IV describes how inverting the business model from merchant to consumer pays would affect the amount and direction of innovation. Section V concludes.

II. THE MERCHANT-PAYS MODEL

The merchant-pays model has been the basis for general-purpose payment card networks since these systems were first introduced in the 1950s. Before the invention of these networks consumers could pay with "store cards" that merchants issued. Consumers used those cards to identify themselves to the merchant who would put charges on a house account.

Consumers could then pay those charges off at the end of the month or finance them. Some groups of merchants developed standard identification cards that could be used at any of the merchants in that group. The merchants bore the costs of running their payment and financing programs and managing the risk associated with those activities. Many merchants did not offer payment cards, which were, at that time, largely confined to department stores.

Diners Club introduced the first general-purpose payment card in 1950 in the United States. Unlike the store cards it was possible for cardholders to use these cards to pay at any merchant that had joined the Diners Club network. Initially, Diners Club signed up restaurants but then expanded to hotels, airlines, car rentals, and other parts of what was called "travel and entertainment." The new network also quickly expanded internationally. American Express and Carte Blanche entered eight years later and also became internationally used cards primarily for travel and entertainment.[9]

These three-party[10] systems all adopted the merchant-pays model to cover the costs of operating this network and earn a profit. They charged merchants a fee—this was initially 7 percent of the transaction but declined to about 5 percent by the end of the 1950s. Cardholders did not bear much of the direct cost of these systems. They paid a modest annual fee but that roughly covered value of the float they received as a result of delaying their payments until the end of the month. Moreover, they did not have to pay any transactions fees—fees associated with using the card. As is well known, these card systems were examples of two-sided platforms that helped facilitate exchange between two groups that needed each other—in this case merchants and customers.[11]

> *Like many two-sided platforms they charged a low price to one side (the "subsidy" side) and a higher price to the other side (the "money" side).*[12]

A number of banks tried to enter the payment card business in the 1950s in the US. Bank of America introduced a credit card in 1958 in California that was particularly successful in part because it could promote this card to merchants and consumers statewide in a state with a large population. The credit card provided a personal line of credit that enabled consumers to finance their purchases. The finance charges to consumers who used it provided an additional stream of income to the issuer beyond merchant fees.

Interstate banking regulation prevented Bank of America and most banks from operating nationally while state regulation sometimes prevented them from operating even beyond a single location. These government-imposed restrictions therefore limited their ability to scale.

Banks formed two national associations in 1966 that evolved into MasterCard and Visa in response to these restrictions. Many of the members were initially banks that had their own local card programs. Like American Express, they signed up merchants and cardholders and charged both sides. As part of becoming associations, the banks agreed to allow consumers to pay with the card of any bank that belonged to the association at any merchant that had been signed up by any bank that belonged to the association. Eventually, the card associations adopted "interchange fees" to pay the bank that issued the card a fee when the card was used at a participating merchant.

The interchange fee determines in large part how much of the overall revenue (and profits) for the system come from the consumer versus the merchant side. It does this by influencing the prices merchant acquirers—the companies that sign up merchants and process merchant transactions—charge to merchants and card issuers charge to consumers for using the card.

The card association—or four-party system[13]—model was adopted around the world. In some countries MasterCard and Visa organized bank associations.[14] In many countries domestic schemes emerged which affiliated with MasterCard or Visa for the purpose of international card acceptance. Banks in these four-party systems issued credit cards, debit cards, or both. Countries quickly diverged, however, on the relative issuance of credit versus debit cards. Credit cards became the leading card type in the United States initially while debit cards became the leading card type in most of continental Europe. Debit cards started taking off in the United States in the mid 1990s and today account for 45 percent of payment card volume.[15] Credit cards have grown slowly in most other parts of the world with the exception of the Commonwealth and some of the Nordic countries.

PayPal provided another significant innovation by serving as an intermediary between consumers and merchants who wanted to transact online. Buyers provided PayPal with a means of payment (a payment card or their bank account number), which PayPal billed; sellers did the same and PayPal credited their cards or their bank accounts. Following its early acquisition by eBay, it mainly provided this service to buyers and sellers on eBay. Later it promoted its service more broadly to merchants off of eBay so that consumers could pay anyplace that took PayPal. PayPal is free to payers and it makes its money from charges to recipients of funds.

While it is not possible to obtain precise figures, it would appear most payment card systems are based on a merchant pays model in which the preponderance of the cost of the provision of payment transaction services is borne by merchants.[16] On the merchant side, almost all countries have interchange fees in which the bank that issued the card to a consumer receives a fee—often a percent of the transaction amount—from the merchant's acquirer when the consumer pays with her card.[17] Merchant acquirers pass on some or all of these fees to merchants either as a separate interchange fee assessment or as part of the overall merchant service fee. The three-party systems collect these charges directly from merchants usually. Therefore, merchants almost always pay some percent of the transaction amount. Merchants incur other costs as well to accept cards including obtaining terminals, training staff, and paying merchant processing fees on top of interchange fees. On the cardholder side, people pay little directly for using payment cards. Debit cards account for the preponderance of card transactions around the world. The bank usually provides these cards to customers as part of their checking account. Banks normally do not impose transaction fees for using these cards.[18] In some countries, credit cards account for a significant share of card transactions. Credit card customers do not pay transaction charges (and in fact sometimes receive rewards for using their cards). They do pay annual fees but the cost of these is offset in part by the free float that they receive as a result of not having to pay charges until the end of the month. About half of the people who use these cards, at least in the United States, pay off their charges in full every month and do not finance. For them the annual fee is the only cost of using credit cards. The other half finances their charges; the finance fees cover at least in part the cost of providing risky lending to customers.[19]

Payment card systems act as intermediaries between consumers and merchants. As it turns out, the merchant-pays business model appears to be common not just for payment card systems, but also for most businesses that serve as intermediaries between consumers and merchants.

The three leading examples of well-developed industries that provide intermediation services between consumers and merchants are shopping malls, e-commerce sites, and advertising-supported media.

1) Shopping mall owners usually charge merchants store rental fees and sometimes a percent of transaction volume; they usually provide consumers with free access to the malls.

2) e-Commerce sites such as amazon.com and ebay.com charge merchants fees for access to their sites and a "referral fee" or "final value fee" that are typically a percentage of the transaction price of the goods sold.

3) Advertising-supported media usually attracts viewers or listeners by providing them with valuable media content for free or for a fee that usually would not be sufficient to cover the cost of developing and delivering the content. They then sell access to these viewers to advertisers. Variants of the advertising-media model include search engines, social networking, and yellow pages.

Two recent innovative businesses that were started in the United States represent new variants of the merchant pays model.

OpenTable has a web-based platform that provides reviews and information on participating restaurants and enables consumers to make reservations at those restaurants. Consumers do not pay anything for the service. However, restaurants pay $1 per patron they get in addition to a monthly fee for reservation management software and a one-time set up fee.[20] TopTable, which OpenTable acquired in September 2010, provided similar services to restaurants in a number of European countries.[21]

Groupon helps businesses obtain traffic to their stores by providing coupons to people at heavily discounted prices for the products or services offered by the business. Groupon does not charge consumers anything for access to its discounting platform. It collects all of its revenues from merchants who pay 50 percent of the face value of the coupon as a commission to Groupon.[22] Groupon has expanded into 43 countries.[23] A number of other companies have started similar businesses in the United States or other countries.

It would appear, then, that over long periods of time and in diverse countries, payment cards have been using the merchant-pays model, and the same is true for other businesses that provide intermediation services between merchants and consumers.[24]

The merchant-pays model was also adopted by new businesses that had no market power at all. It is possible that a different pricing structure—one more balanced or tilted towards consumers—could enable the consumer-merchant intermediary businesses, including payment cards, to start, grow and sustain themselves profitably. But it would seem more likely that there is some fundamental market dynamic about the demand and costs for these businesses that has led them to structure themselves this way.

III. THE ROLE OF THE MERCHANT-PAYS MODEL IN INNOVATION

Over the last 60 years consumers and merchants have been able to participate in a number of innovative payment systems that were based on business models in which the merchant paid for most of the cost of the system. This section describes this innovation and the social welfare that they provided.

New businesses fail in part because it is very difficult to persuade customers to change their existing behavior. When a new venture succeeds there is a strong presumption that it is providing significant value to its customers. This statement is a strong version of the revealed preference theorem in economics:

the best way to determine what consumers value, and by how much, is to observe what they choose relative to the alternatives.

Over the last 60 years individuals and merchants (the customers of the two-sided payment systems) have flocked to new payments methods that they have determined provide them value.[25] The focus here is in explaining the sources of that value.

Generally there is an opportunity for the creation of a multi-sided platform when the provision of intermediation services to the different customers of the platform generates enough value to cover the cost of the platform itself as well as any subsidies that need to be paid by one side or the other.

For example, for advertising-supported media, merchants obtain enough value from advertising that the media entity can charge enough money to cover the costs of operating the platform as well as to cover the cost of the content that is used to lure consumers to come to the platform where they will, in turn, be exposed to advertisements.[26]

When Diners Club started in 1950, consumers and merchants both faced imperfections in transactions. Merchants incurred expenses from maintaining their own charge programs. They had to issue cards, manage their books, collect money, and so forth. The cards they issued were mainly relevant for repeat customers since occasional customers would probably not spend the time applying for a card and giving an occasional customer even temporary credit was likely risky. The merchant cards were also not relevant for travelers. At the same time, many merchants obviously found that, despite the availability of cash and checks for payment, it was profitable to establish a charge card program. It was presumably a valuable service to their customers and increased sales even though it must have been more costly than accepting cash or checks. Cash and checks were inconvenient in some cases for consumers. Especially in the days before ATM machines, it was inconvenient to carry cash for payment especially for occasional large purchases. Check books were more convenient but because they were not a secure method of payment for merchants not all merchants accepted them and did not accept them from all people.

Diners Club and subsequent entrants created three-party payment systems to solve these transaction problems by adopting a merchant pays model as described above. Diners Club charged a 7 percent commission on transactions to the merchant; it charged cardholders an annual fee that roughly compensated it for the cost of the float and did not charge cardholders any transaction fees. Although consumers clearly obtained value from the charge cards, Diners Club chose a strategy that did not seek to extract a significant payment for that value. Diners Club grew quickly in the United States and around the world.

Having demonstrated that there was merchant and consumer demand for a general-purpose card system that enabled multiple merchants and consumers to transact with each other, Diners Club soon faced competition from other firms, including American Express.

By the early 1960s, eighteen thousand merchants including most travel and entertainment businesses accepted cards from the three-party systems and a million consumers had and used these cards.[27]

In the United States, MasterCard and Visa were particularly important for solving another problem for merchants and consumers: the provision of credit. Before the advent of credit cards, merchants—especially large ones and ones that sold consumer durables—offered financing to their customers.[28] Often, these merchants allowed consumers to buy on an installment plan that enabled them to spread the cost of their purchases, and therefore finance them, over time. Consumers sometimes availed themselves of these plans or took out personal loans from their banks.

This, of course, was an extremely cumbersome system. The scale of lending operations was limited by the size of the merchant's customer base. Consumers faced high implicit interest charges from installment loans and had to apply separately at each store they patronized. They could obtain better rates from their banks, but securing a personal loan each time a new purchase was desired was a time consuming and inconvenient process Credit cards provided a more efficient method of financing for both merchants and cardholders. Not surprisingly, over time these programs displaced merchant lending programs including store cards and enabled consumers to avoid applying to their banks for personal loans when they wanted to make large purchases.

The four-party system itself was a major innovation. Banks had obvious skills in facilitating payments and lending money. However, no single bank had the scale in most countries to start its own card system.

By standardizing on a single brand and having interoperable cards, they made it possible to generate network effects quickly as a result of pooling merchants and cardholders and making it possible for them to transact with each other, regardless of which bank had issued their card.

The four-party system created by MasterCard and Visa provided a business model that banks around the world could imitate.

Most of these payment systems appear to have adopted an interchange model that required merchant acquirers to pay a percent of the transaction amount to the card issuer. That resulted in these four-party systems having a merchant-pays model that was similar to what the three-party systems had. These four-party systems then helped spread the use of debit and credit cards around the world.

The introduction of debit cards outside of the United States starting in the 1970s, and in the United States starting in the late 1990s, was another major innovation. In many countries, these cards helped merchants, consumers, and banks reduce the use of checks that, of course, are cumbersome on many dimensions. Data for the United States and the European Union indicates that debit cards have become the preferred non-cash method of payment for consumers. In the United States debit cards accounted for 35 percent of all non-cash transactions in 2009 and were the most commonly used non-cash payment method.[29] In Europe, cards with a debit function made up over 28 percent of all non-cash payment transactions and were second only to credit transfers in terms of the most commonly used form of payment.[30]

The merchant-pays model and the interchange-fee based four-party system model were therefore behind the development of an industry that, sixty years after its start, provides one of the leading payment methods in the world. Millions of merchants around the world have chosen to accept cards for payment and hundreds of million consumers use these cards to make purchases. The theory of revealed preference implies that merchants and consumers are obtaining value from using these cards. Otherwise, merchants would not accept these cards and consumers would not use them. There also does not seem to be any serious question about the overall value of payment cards. It is generally acknowledged that they have reduced the use of paper-based methods of payment and therefore moved society to the use of more efficient payment mechanisms.[31]

It is possible as a matter of theory that society could have gotten the benefits of these innovations if the entrepreneurs behind the payment card industry had chosen the consumer-pays model that would result with drastically lower interchange fees. That seems quite implausible though. It is hard to imagine that most entrepreneurs in the payments industry, over extended periods of time, in varying market circumstances, and in most countries, stumbled upon the wrong model to starting payments systems.

If the inverted consumer-pays model could have lead to the innovations described above, then we would have expected that more than a handful of entrepreneurs in a few countries would have adopted it.

This is not to say that the particular pricing adopted by the merchant-pays model is the socially efficient pricing that an all-knowing social planner would adopt. The two-sided markets literature has identified a variety of reasons why interchange fees, for example, could be set too high or too low relative to the socially efficient benchmark. It would be quite extreme, and inconsistent with the evidence, however, to assert that almost every payment system in almost every country over six decades is upside down in having a merchant-pays rather than a consumer-pays model.

IV. THE IMPACT OF A CONSUMER PAYS MODEL ON INNOVATION AND INVESTMENT

Competition authorities and regulators have imposed reductions in interchange fees of around 50 percent thus far. The Reserve Bank of Australia, for example, reduced the credit card interchange fee from .95 percent to .55 percent (a 42 percent reduction) during the 2000s.[32] The European Commission, in settlements with MasterCard and Visa Europe, reduced the interchange fee by about 60 percent.[33] The Federal Reserve Board originally proposed a 73 to 84 percent reduction in debit card interchange fees but ultimately reduced it by about 45 percent.[34] Some commentators in the United States and Europe have argued that interchange fees should be zero, which would largely eliminate the costs of payment cards for the merchant side of the business.[35]

Such regulation is much more radical than the price regulation that governments usually impose on public utilities or former state-owned enterprises.

Traditional regulation typically results in marginal adjustments in prices within the confines of a well-established business model. Interchange fee regulation results in an inversion of the business model. The two-sided market literature has recognized that interchange-fee regulation results in determining the "pricing structure"—the relative prices for the two sides—rather than the overall pricing level. But it has not focused on the inversion issue and the radical departure it would result in from existing ways of doing business.[36]

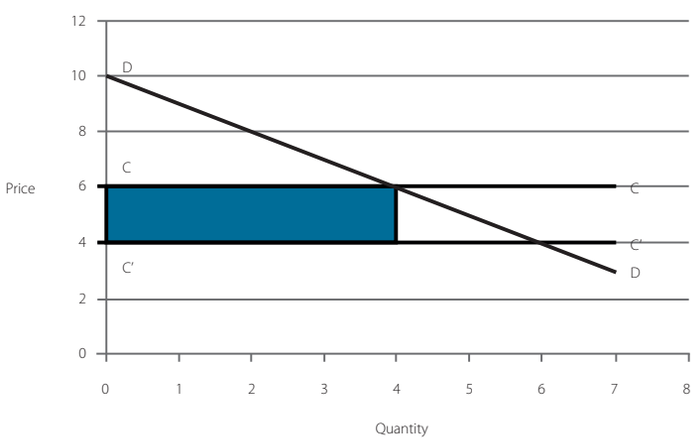
One would expect that such an inversion would have consequential results including on innovation as this section describes in more detail.

A) IMPACT ON PROFITS AND RETURN ON INVESTMENT

The theory of two-sided platforms finds that the relative prices for the two sides of the platform depend, in part, on the elasticities of demand.[37] The platform charges a higher price to the side with a more inelastic demand and a lower price to the side with a more elastic demand, all else equal. It seems plausible in the case of payment cards that consumers have a relatively elastic demand since they can use free payment methods such as cash for many transactions or other relatively low-cost substitutes such as checks. It likewise seems plausible that merchants have a relatively inelastic demand conditional on a modest fraction of customers carrying cards. The merchant stands to lose a sale—and the margin on that sale—if a consumer cannot pay or decides they do not want to pay unless they can do with their preferred method. Indeed, some of the economics literature that finds that there may be a market failure in the setting of interchange fees argues that merchants do not have any choice but to accept the card.[38]

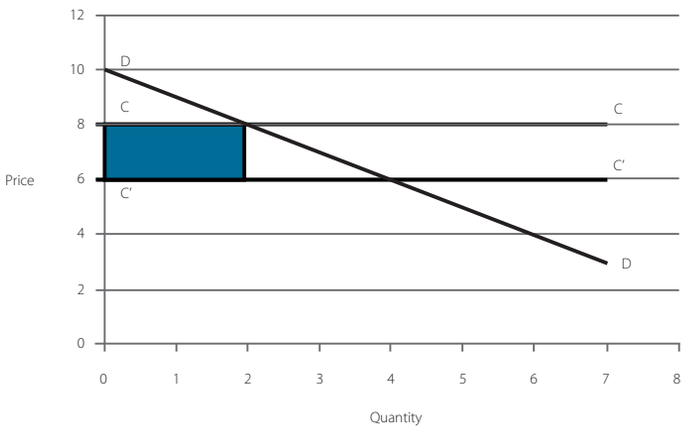
If consumers have a more elastic demand than merchants then it would not be possible for payment systems overall to earn as much revenue or profit if the price to merchants were, indirectly through interchange fee regulation, regulated to zero or a very low level. We can reasonably assume that the payments system would have been maximizing private profits before government intervention to lower interchange fees. After price caps are imposed on the merchant side of the business we would expect that there would be an attempt to increase fees to the consumer side of the business. However, since consumers have relatively elastic demand we would not expect that the payments systems overall would be able to fully replace revenue and profit after increasing prices and reducing service offering. Total profits would tend to decline since the revenue base would fall and because average profits are likely to be lower as well. The reduction in revenue and profits would tend to reduce the overall level of investment in innovation in payment card systems, and ultimately, the amount of innovation that would take place. Most economic models of investment in research and development find that the optimal investment depends on sales. For example, all else equal a business that is considering investing in process improvements will obtain greater returns if it can average the fixed costs of its research and development efforts across a larger business. An entrepreneur, and its venture backers, would, to take another example, realize a greater return if the sales and profit potential is greater. Those sales and profits would be smaller after imposing the constraint that it is not possible to earn significant revenues and profits from the side of the market with more inelastic demand. This process can be illustrated with a simple example based on a textbook model of innovation.[39] Consider a situation that is initially competitive, with a large number of issuers setting price equal to marginal cost and earning zero economic profit. Suppose one of these firms is considering investing in an innovation that would lower its costs. If it makes the investment, it will gain a temporary cost advantage over the other firms. While its advantage lasts, the innovative firm charges a price slightly below the old price (because the competitive threat of the other firms prevents it from charging any higher price), captures the entire market, and earns profits indicated by the shaded rectangle in the graph below.[40] The firm will make the investment if the net present value of these profits (taken over the expected duration of its cost advantage) is greater than the cost of the investment.

Figure 1: Incentive to Innovate - Before Cost Increase



Now suppose government regulations reduce issuers' interchange revenue, raising both the pre-innovation marginal cost and the post-innovation marginal cost (but with the same difference between the cost levels). This shifts the rectangle upward, as shown in the second graph below. Since demand slopes down, this reduces the incentive to innovate. The magnitude of the reduction is determined by the elasticity of demand. The more elastic the demand curve, the greater the reduction in the size of the rectangle.[41]

Figure 2: Incentive to Innovate - After Cost Increase



Although we can be confident that investment in innovation would decline as a result of switching from the merchant-pays to the consumer-pays model it is difficult to forecast the degree of the decline. That depends on how elastic the demand by consumers is and how clever banks, networks, and other members of the payment card systems are in raising fees for consumers and mitigating the losses from the merchant side. However, two sources of evidence should make us concerned that depressing effects of regulation on innovation could be significant.

First, empirical studies have found regulated industries tend to be relatively less innovative.

An early survey of the effects of regulation found mixed evidence of the effect of regulation on innovation.[42] Some heavily regulated industries had high productivity growth (electric power, telecommunications, airlines, and trucking), whereas others had low productivity growth (railroads, and pharmaceuticals).

One study estimated that 15 percent of the productivity slowdown of the 1970s in the United States could be explained by increased regulation.[43] More recent research has found more substantial evidence of the negative effects of regulation on productivity growth.[44] In particular, price regulation in the pharmaceutical industry has been found to deter the launch of new drugs.[45] It is difficult to be separate out cause and effect for these studies—perhaps industries that are regulated are ones that would have less innovation anyone. Nevertheless, the studies are consistent with the view that there is a negative effect of regulation on innovation.

The experience of the check-based payments system that has been subject to price regulation, for all intents and purposes, in the United States since 1914[46] provides a second source of evidence and also raises some concerns. As a result of a combination of common law and Federal Reserve Board regulation, there are significant constraints on the ability of financial institutions to charge individuals who cash checks—there is on par payment so banks have to pay the face value of the check.[47]

While there are apparently no systematic studies of innovation in the checking business, two tendencies are apparent in the United States. First, there has been a great deal of process innovation to reduce the cost of handling paper checks. This was born of necessity given the exponential growth in the use of checks over time. Second, there seems to have been little innovation that has benefited merchants or consumers. For most of the last century, there was little progress in how consumers wrote checks and managed their checkbooks; only recently have they benefited from online banking which has made it easier to use funds in a checking account. For most of the last century, there was little progress in how merchants authenticated and handled checks. Merchants today are able to use electronic capture, and some third-party check verification systems have arisen. For many consumers paying with a check at a store in the United States in 2011 would not appear to be much different than paying with a check at a store in 1911.

B) IMPACT ON STARTING A NEW SYSTEM

A price cap on interchange fees would tend to have two implications for entrepreneurs seeking to start a new four-party system.

First, for the reasons just discussed, the regulation would reduce the expected overall profitability of the new system. The system would not be able to earn as much profits under the constraint that it cannot charge the side of the market that has inelastic demand. Therefore entrepreneurs would be less motivated to start a system under these circumstances. Suppose, for example, that American Express was told in 1957 that, as a result of government regulation imposed following complaints from merchants, it was not possible to have a merchant discount of more than 50 basis points at a time when Diners Club was charging more than 500 basis points. We would expect that even if American Express recognized that Diners Club and other systems would face the same price cap, American Express would forecast a smaller revenue and profit for its business. That is because it, as well as the other systems, would have to charge the more elastic consumer side of the business. As it was, American Express almost did not survive—it tried to sell itself to Diners Club and also considered shutting down by the early 1960s—even under the merchant-pays model.[48]

Second, the price cap would interfere with the ability of the system to use the relative prices to merchants and cardholders to generate enough interest on the part of consumers and merchants to create critical mass. Putting aside the issue of how much money the system would make at maturity, most card systems appear to have started by providing incentives to consumers to get and want to use cards and then using the consumers amassed to motivate merchants to accept those cards for payment. Low prices to merchants as a result of low or zero interchange fees would increase merchant interest. But merchants would still need to incur costs to accept cards and would not do so unless the system had enough consumers. The system would therefore not have significant numbers of merchants to entice cardholders to join. Of course, the entrepreneur behind the system could seek other sources of funding for providing consumers with incentives to join. However, that could be very expensive and risky.[49]

The experience of ISIS illustrates the impact of inverting the business model from merchant to consumer pays.[50]

ISIS announced in November 2010 its intention to create a new mobile payments network that would allow consumers to pay at physical points of sale using their mobile phones. As noted earlier, ISIS was a joint venture between three mobile carriers: AT&T, Verizon and T-Mobile. ISIS also planned to use the Discover network to process transactions across its network, and Barclaycard US to issue its cards at launch. Consumer phones would have NFC-chips that would interact with merchant terminals to process these transactions, across the ISIS network.

The ISIS value proposition to consumers was the ability to transact at physical retail locations with a mobile phone and to use those phones to receive offers from merchants as inducements to shop in their stores, using cards that ran over the ISIS network. The proposition to merchants was lower acceptance fees since ISIS was planning to process transactions at a lower cost to that merchant than Visa or MasterCard was charging, presumably by using Discover's PULSE network[51] and by presumably persuading consumers to use a debit-like product. The combination of lower "swipe fees" and merchant offers was thought to be attractive enough for merchants to sign on, in spite of Discover's low market share.[52]

The ISIS business model was going to be funded in several ways: it was going to receive a commission on sales driven to merchants as a result of offers that were served to customers and from fees charged to merchants for processing payments across its network, even though those fees were said to be lower than those charged by MasterCard or Visa.

In May of 2011, ISIS abruptly announced a change in strategy, abandoning its ambition to be, in effect, the fifth payment network. It announced that it would reposition itself as a NFC-wallet, open to all issuers and networks. ISIS' spokesperson, Jaymee Johnson, stated that, "ISIS was forced to re-evaluate its strategy after financial reform legislation made it more difficult for companies like itself to make money off payment networks."[53] Johnson went on say that merchants were interested in the ISIS mobile network initially because it could deliver a mobile payments experience at a lower fee, but since Durbin was likely to so significantly reduce the fees associated with accepting cards, there was no future to the business model and the business the way it was initially conceived.

ISIS was planning to enter, therefore, by differentiating itself from existing system by charging lower merchant fees.

The government-imposed price caps largely eliminated that source of differentiation by forcing the four-party debit card systems to have low interchange fees and therefore likely low merchant fees. One could argue that ISIS provided value only because it was bypassing systems with inefficiently high interchange fees. However, by restricting competition on an important dimension government imposed price caps likely reduce the prospects for entry and differentiated-product competition.

The possible introduction of new card schemes in Europe also illustrates how low interchange fee caps could affect the decision to invest in new possibly innovative card schemes. Monnet, Payfair, and EAPS[54] have been considering starting pan-European card systems partly in response to European regulations that mandate the development of a single European payments area (SEPA). The SEPA initiatives are designed to encourage the development of an integrated European payments system. In payment cards, Europe has multiple schemes in most countries and these schemes do not interoperate well across borders. A possible result of SEPA, however, is the erosion of the domestic schemes and their replacement with cross-border schemes. That provides a business opportunity for new entry especially given that the only cross-border schemes are MasterCard and Visa.

At least two considerations come to bear on launching a new scheme. The first is the long run question of whether the new system could earn enough profits overall (which would then need to be paid to issuers, acquirers, the network and other participants) to warrant the investment and risk. To the extent that reduced interchange fees, for the reasons discussed above, reduce revenue and profits, they would likely also reduce the return on investment for a new system. The second is the shorter run question of whether it is possible for a new system to achieve the critical mass necessary for ignition.[55] This presents a practical business problem. Interchange fee setting by a pan-European system would likely be viewed by the Commission in the same way as it viewed price setting by MasterCard and Visa. If so, that would mean it would be faced possibly with a similar price cap in order to have an acceptable regime. However, in order to persuade banks that currently issue cards with domestic schemes to shift some or all of their volume to a new scheme the new scheme would, in many countries, be competing with domestic schemes that offer a higher interchange fee. It would therefore be difficult to attract cardholders and as a result hard to obtain merchant acceptance.

Part of the problem with a new scheme is that it would be required to compete with incumbent systems that have been able to use interchange fee revenues to recruit bank issuers and consumers over many decades. Even if all schemes were subject to the same price cap—zero for example—the new scheme would be at a competitive disadvantage. It would lack a major tool for getting consumers on board but at the same time would not have a better price to offer merchants.[56]

C) IMPACT ON THE DIRECTION OF INNOVATION

Although the reduced profitability of four-party payment systems would likely reduce overall innovation, there is no reason to believe that innovation would stop. In fact, the disruption in the existing business model would provide the opportunity and incentives to do things differently. However, interchange fee regulation would likely alter the direction of innovation.

Consider the following plausible scenario. Bank issuers do not impose transaction or other fees on cardholders because consumers have elastic demand; instead banks try to recover their losses through other fees related to the consumer's current account or through reduction in service. That seems like the most likely outcome in the United States.

As a result, for banks and for the system overall, not much revenue is based directly on transactions taking place. In addition, there is much less revenue coming from merchants directly. Getting an additional merchant or merchant location on board does not result in any direct increase in revenue since neither the merchant nor the cardholder would be paying transaction fees. The value only comes indirectly from increasing the value of the card brand to the consumer. In these circumstances we would expect that innovation will be directed towards products and services that can earn revenue as a result of consumers being more likely to take out a checking account, and purchasing complementary products, and possibly paying annual fees for the use of a debit or credit card. That is more or less what has happened in checking in the United States. There has been little consumer or merchant innovation surrounding checking account transactions, as noted above. The innovation has occurred in the overall checking account services provided to merchants and consumers such as online banking and online bill pay as a way to lock in consumers to those services, and ultimately the checking accounts that they underpin.

Eliminating monthly fees, being able to deposit checks at ATMS without putting them in envelopes, mobile banking and transactions alerts are just a few examples of how innovation is happening on top of checking accounts in the United States.

D) COULD LESS CARD INNOVATION BE A GOOD THING?

Of course, one might argue that this redirection of innovative effort is a good thing. At least one theory of payment cards is that they are a clever way to extract money from merchants: card systems bribe consumers to sign up and use the card and then charge merchants who do not want to lose sales from these consumers. Others have argued that payment card systems provide a subsidy to the wealthy that is paid for by a tax to the poor.[57]

Assessing the social value of payment cards versus other payment methods is beyond the scope of this paper. However, the view that we have too much use of payment cards and too much investment in payment card innovation has a couple of implications that would appear implausible on their face. The first implication is that we should have more cash and check transactions. Much of the information in the world has moved from physical to digital media in the last 15 years. We would expect that the same would be true for payments, which is information all of which can be expressed digitally. In part it has. Check use has declined in a number of countries and cash use in some. Much of the growth of electronic payments has come from the use of debit and credit cards. Debit cards are the most popular non-cash electronic payment method in the United States and the second-most popular method in Europe. Nevertheless, even in developed countries a large fraction—in many cases the majority—of consumer payments transactions are based on exchanging paper money, coins, or paper checks. It is hard to imagine that countries should have moved even more slowly from paper-based methods to electronic methods of payment than they actually have.

The second implication of objecting to the growth of debit and card cards is that given the government's reservations over the private-sector payments systems, perhaps, we should count more on the government for payments innovation.

When Diners Club was created in 1950, general-purpose payments instruments were tightly controlled by the U.S. government, which controlled the cash and coins and largely controlled the checking account system through the Federal Reserve Board. Although the Federal Reserve Board is widely credited with making an intrinsically inefficient paper-based check system more efficient, one would be hard pressed to look at the history of cash and checks—and more recently the ACH system—and argue that it has been a fountain of innovation. Looking around the world, whether it is M-Pesa in Kenya (a mobile phone based payments and banking system), PayPal's online wallet and recently introduced applications platform, DoCoMo's contactless mobile payments system in Japan, or Greendot's prepaid card products in the United States, one does not typically see governments behind payments innovation. The inexorable rise in the use of debit and credit throughout the world after the introduction of Diners Club in the United States and especially after the creation of the four-party system model, and the innovation surround those payment products, is best seen as a response to a lack of innovation by government-controlled payments systems. These private payments systems obtained traction with consumers and merchants because of the existence of transaction-cost problems that the government payment systems were not solving.

V. CONCLUSION

Consumers and merchants around the world have benefited over the last 60 years as a result payments innovation largely driven by for-profit payment card systems. There is no way to prove how much of this innovation—or alternative innovation—would have been possible under a consumer-pays model rather than the merchant-pays model that was actually used. However, given that the merchant-pays model is the one that entrepreneurs gravitated towards and that a consumer-pays model would have faced elastic demand from consumer it appears likely that society would have had considerably less innovation with the consumer pays model.

Interchange fee regulation has, or has proposed, forcing payment card systems to drop the merchant-pays model which would necessarily resulting in requiring them to flip their business models to consumers-pay. Such a radical change in business models, combined with the fact that it would impose price caps on the side of the

market with inelastic demand and require recovery of costs and profits from the side of the market with elastic demand, must have material effects including on innovation. Forecasting innovation is difficult in the best of worlds but more so in the case of two-sided markets where theory is undeveloped.

Nevertheless, the most likely scenario is that investment in payments card innovation will decline overall and will shift towards the creation of value-added services for accounts that include payment cards as a feature. As we have already seen with the decision by the U.S. joint venture of the three largest mobile carriers to drop its ambitious plans to start a new mobile-phone based payments system given the expected drop in debit-card interchange fees, it is likely that the inversion of the business model will result in the discouragement of the formation of new payment card systems, or other systems for which payments is an essential attribute.

1 The European Commission filed complaints that MasterCard and Visa violated the European Union's antitrust laws by setting interchange fees and entered into agreements with both card systems to lower those fees for the cross-country transactions as a result. *See* Matthew Dalton, *EU Says MasterCard Won't Face Antitrust Penalties*, Dow Jones Int'l News, Apr. 1, 2009, http://www.advfn.com/news_EU-Says-MasterCard-Wont-Face-Antitrust-Penalties-Over-Fees_37122940.html, and Foo Yun Chee, *EU Accepts Visa Europe Fee Cuts, Drops Probe*, Reuters, Dec. 8, 2010, http://www.reuters.com/article/2010/12/08/eu-visaeurope-idUSLDE6B70VH20101208. The U.S. Congress enacted legislation that in 2010 that requires the Federal Reserve Board to regulate debit interchange fees. See Dodd–Frank Wall Street Reform and Consumer Protection Act, Pub. L. 111-203, § 1075, 124 Stat. 1376, (2010). The Reserve Bank of Australia has imposed price caps on debit and credit card interchange fees. *See* Reserve Bank of Australia, Payment System Board Annual Report, 2004 (2004), available at http://www.rba.gov.au/publications/annual-reports/psb/2004/pdf/2004-psb-ann-report.pdf and Reserve Bank of Australia, Reform of Australia's Payments System: Issues for the 2007/08 Review ¶ 28 (May 2007), *available at* http://www.rba.gov.au/payments-system/reforms/review-card-reforms/review-0708-issues/index.html. Other countries have imposed price caps on interchange fees or have started inquiries concerning these fees.

2 For a summary, see Marianne Verdier, *Interchange Fees in Payment Card Systems: A Survey of the Literature*, 25(2) J. Econ. Surveys 273 (2011).

3 For the classic study on new products see Jerry A. Hausman, *Valuation of New Goods under Perfect and Imperfect Competition*, in The Economics of New Goods (1997).

4 *See* Troy McCombs, *AT&T, T-Mobile and Verizon Wireless Announce Joint Venture to Build National Mobile Commerce Network* (Verizon Wireless News Center) Nov. 16, 2010, *available at* http://news.vzw.com/news/2010/11/pr2010-11-16.html.

5 *See* Robin Sidel & Shayndi Raice, *Pay-by-Phone Dialed Back*, Wall St. J., May 4, 2009, *available at* http://online.wsj.com/article/SB10001424052748704740604576301482470575092.html; Maria Aspan, *Dodd-Frank Hurt Mobile Payment System Plans: AT&T*, Reuters, May 13, 2011, http://www.reuters.com/article/2011/05/13/us-summit-att-isis-idUSTRE74C61V20110513.

6 John B. Frank, *Monnet Could Challenge V/MC with Introduction of European Debit System*, Epayment News, July 10, 2009, *available at* http://epaymentnews.blogspot.com/2009/07/monnet-could-challenge-vmc-with.html#axzz1OXiNepsF.

7 For a descriptive review of what is happening in payments innovation and why, see David S. Evans & Richard Schmalensee, *Innovation in Payments*, *in* Moving Money: The Future of Consumer Payments (2009).

8 *See* Paul L. Joskow & Nancy L. Rose, *The Effects of Economic Regulation*, *in* 2 Handbook of Industrial Organization, 1449 (1982), and the extensive literature they discuss; *see also* W. Kip Viscusi, John M. Vernon & Joseph E. Harrington Jr., Economics of Regulation and Antitrust (2005).

9 Bank of America also entered in 1958 with a card program in California. Interstate banking restrictions in the United States prevented in from operating outside of California.

10 They are call three party because they involve the merchant, network, and consumer.

11 Jean-Charles Rochet & Jean Tirole, *Platform Competition in Two-Sided Markets*, 1(4) J. Eur. Econ. Ass'n 990 (2003); David S. Evans & Richard Schmalensee, Catalyst Code: The Strategies Behind the World's Most Dynamic Companies (2007).

12 This distinction between the "money side" and the "subsidy side" is used in the business strategy literature. Given joint costs and indirect network effects it is often not strictly correct to say that one side provides a "subsidy" to the other. Rather one side is more important for generating profit than the other. For evidence on the prevalence of low and zero prices though see David S. Evans, *Some Empirical Aspects of Multi-sided Platform Industries*, 2(3) Rev. Network Econ. 191 (2003).

13 They are called four-party systems because they have merchant, acquirer, issuer, and cardholder although strictly speaking they are five-party systems that include the network.

14 Some multinational card schemes also emerged, such as Eurocard which eventually was merged into MasterCard. *See MasterCard Completes Europay Merger*, Electronic Payments International (July 26, 2002).

15 The Nilson Report 948 (May 2010).

16 Two other payment systems are notable. Cash is provided by the government and is financed in effect from payers and payees from seigniorage and general tax funds. Checks are provided through a complex set of institutions and regulations at least in the United States. We discuss this more below.

17 A small number of card schemes have zero interchange fees or have systems in which the merchant acquirer is paid by the card issuer. The European Commission's first interim report listed four EU countries in which banks participated in a debit payment network without interchange fees. In all the report listed 16 major domestic debit networks. Also, the primary credit card networks in Europe operate in a non-zero interchange fee structure. *See* European Commission, Interim Report I Payment Cards (Apr. 12, 2006). Card networks in other markets such as China, Singapore, and the United States operate with a non-zero interchange fee.

18 Of course, banks could charge indirectly for debit cards as part of the overall banking relationship.

19 In the four-party systems the network also charges the acquirers and the issuers directly and the acquirers may pass on some of these costs to merchants. In the United States, debit networks collected 48 percent of network fees from acquirers and 52 percent from issuers; these fees are small relative to interchange fees, however, and therefore the interchange fees largely determine the overall cost to the merchant versus the consumer side of the business.

20 Randall Stross, *The Online Reservations That Restaurants Love to Hate*, N.Y. Times, Dec. 11, 2010, *available at* http://www.nytimes.com/2010/12/12/business/12digi.html.

21 Interestingly, OpenTable has attracted the same sort of complaints from restaurants that the payment card systems received early in their existence. *Compare* Randall Stross, *supra* note 20, with David S. Evans & Richard Schmalensee, *System Wars*, *in* Paying With Plastic: The Digital Revolution In Buying And Borrowing (2005).

22 Bari Weiss, *Groupon's $6 Billion Gambler*, Wall St. J., Dec. 20, 2010, *available at* http://online.wsj.com/article/SB10001424052748704828104576021481410635432.html.

23 Groupon, Registration of Securities (Form S-1) (June 2, 2011), *available at* http://sec.gov/Archives/edgar/data/1490281/000104746911005613/a2203913zs-1.htm.

24 I have not conducted any systematic surveys of business models for advertising, shopping malls, or e-commerce businesses around the world but my impression from the countries that I am familiar with is that it is generally the case that the merchant pays.

25 Some of the advocates of interchange fee regulation claim that merchants do not have a choice. But all merchants need to enter into contracts to accept cards and then must install equipment and train staff to take payment cards. In the United States MasterCard and Visa have lowered interchange fees to various segments that did not accept cards. As prices declined merchants changed from making the business decision of not accepting cards to accepting them. In some countries that have high merchant discounts many merchants choose not to accept cards.

26 Simon Anderson & Jean Gabszewicz, *The Media and Advertising: A Tale of Two-Sided Markets*, *in* Handbook On The Economics of Art and Culture 567 (Victor A. Ginsburgh & David Throsby eds., 2006).

27 David S. Evans & Richard Schmalensee, *More Than Money*, *in* Paying with Plastic: The Digital Revolution in Buying and Borrowing (2005).

28 Lendol Calder, Financing the American Dream: A Cultural History of Consumer Credit (2001).

29 The Federal Reserve System, The 2010 Federal Reserve Payments Study: Noncash Payment Trends in the United States: 2006 – 2009 (Apr. 5, 2011), *available at* http://www.frbservices.org/files/communications/pdf/press/2010_payments_study.pdf.

30 European Central Bank, Payment Statistics (Sept. 2010), *available at* http://sdw.ecb.europa.eu/reports.do?node=1000001440. The reported percentages excludes France for which there was no subtotals provided for the categories credit, debit, and delayed debit.

31 *See, e.g.*, William Poole, *President's Message: Checks Lose Market Share to Electronic Payments – and the Economy Gains*, The Regional Economist, Jan. 2002, *available at* www.stlouisfed.org/publications/re/articles/?id=451 ("Replacing checks with electronic payments is good for the economy; electronic payments are just plain more efficient."); Press Release, Federal Reserve Financial Services Policy Committee, Federal Reserve Study Shows More Than Three-Quarters of Noncash Payments Are Now Electronic (Dec. 8, 2010), *available at* http://www.federalreserve.gov/newsevents/press/other/20101208a.htm ("The results of the study clearly underscore this nation's efforts to move toward a more efficient electronic clearing system for all types of retail payments.").

32 Reserve Bank of Australia, Payment System Board Annual Report, 2004 (2004), *available at* http://www.rba.gov.au/publications/annual-reports/psb/2004/pdf/2004-psb-ann-report.pdf.

33 *See* Press Release, European Commission, Antitrust: Commission Makes Visa Europe's Commitments to Cut Interbank Fees for Debit Cards Legally Binding (Dec. 8, 2010), *available at* http://europa.eu/rapid/pressReleasesAction.do?reference=IP/10/1684 and Press Release, European Commission, Commissioner Kroes Takes Note of MasterCard's Decision to Cut Cross-Border Multilateral Interchange Fees (MIFs) and to Repeal Recent Scheme Fee Increases (Apr. 1, 2009), *available at* http://europa.eu/rapid/pressReleasesAction.do?reference=IP/09/515.

34 The debit card interchange fee was reduced from 44 cents for an average $38.58 transaction to 21 cents, plus 1 cent for fraud losses, a 5 basis points for fraud prevention efforts. This works out to 24 cents for an average $38.58 transaction. *See* Debit Card Interchange Fees and Routing, 12 C.F.R. pt. 235 (2011).

35 *See* Alan Frankel, *Towards a Competitive Card Payments Marketplace*, Reserve Bank of Australia, Payments System Review Conference, Proceedings of a Conference held in Sydney (Nov. 29, 2007). *See also* Alan Frankel & Allan Shampine, *Economic Effects of Interchange Fees,* 3 Antitrust L. J. 627 (2006).

36 An exception is Calvano who, in a submission to the Federal Reserve Board, noted that it was unlikely that a drastic reduction in interchange fees was optimal. *See* Emilio Calvano, *Note on the Economic Theory of Interchange* (submitted to the Federal Reserve Board regarding the implementation of the Durbin Amendment, Feb. 22, 2011), *available at* http://www.federalreserve.gov/SECRS/2011/March/20110308/R-1404/R-1404_030811_69122_621890579792_1.pdf.

37 E. Glen Weyl, *A Price Theory of Multi-sided Platforms*, 100(4) Am. Econ. Rev. 1642 (2010).

38 Özlem Bedre-Defolie & Emilio Calvano, *Pricing Payment Cards* (European Central Bank, Working Paper No. 1139, 2011), *available at* http://dl.dropbox.com/u/123685/Website/ppc.pdf.

39 Based on Jean Tirole, The Theory Of Industrial Organization (1988); a similar argument applies to many of the other models of innovation presented in this chapter. This particular model was chosen for simplicity.

40 This assumes that the cost reduction is not too large (called a non-drastic innovation). If the cost reduction is large enough that the post-innovation monopoly price is lower than the pre-innovation marginal cost (called a drastic innovation), then the innovating firm will charge the monopoly price. This does change the conclusion that the reduction of interchange will reduce the incentive to innovate, but does complicate the graphical presentation.

41 This discussion is based on the issuer incentive to innovation. However, the point applies more generally to the payments ecosystem. By constraining the price on the inelastic side of the ecosystem the overall prospects for revenue and profit must decline overall.

42 Paul L. Joskow & Nancy L. Rose, *The Effects of Economic Regulation*, *in* Handbook of Industrial Organization (Richard Schmalensee, ed., 1989).

43 Gregory B. Christainsen & Robert H. Haveman, *Public Regulations and the Slowdown in Productivity Growth*, 71 AM. ECON. REV. 320 (1981).

44 John W. Dawson & John J. Seater, *Federal Regulation and Aggregate Economic Growth* (Department of Economics, Appalachian State University, Working Paper No. 09-02, Dec. 2008), *available at* http://econ.appstate.edu/RePEc/pdf/wp0902.pdf; Simeon Djankov, Caralee McLiesh, & Rita Maria Ramalho, *Regulation and Growth*, 92(3) Econ. Letters 395 (2006); Giuseppe Nicoletti, Stefano Scarpetta & Philip R. Lane, *Regulation, Productivity, and Growth: OECD Evidence*, 18(36) Econ. Pol'y 9 (2003).

45 Margaret K. Kyle, *Pharmaceutical Price Controls and Entry Strategies*, 89(1) R. Econ. Stat. 88 (2007); Abdulkadir Civan & Michael T. Maloney, *The Effect of Price on Pharmaceutical R&D*, 9(1) B. E. J. Econ. Anal. & Pol'y 15 (2009).

46 Stephen Quinn & William Roberds, *The Evolution of the Check as a Means of Payment: An Historical Survey*, 93 Fed. Reserve Bank Atlanta Econ. Rev. 1 (2008).

47 Howard H. Chang, David S. Evans & Daniel D. Garcia Swartz, *An Assessment of the Reserve Bank of Australia's Interchange Fee Regulation* (2005) (unpublished manuscript, *available at* http://www.ny.frb.org/research/conference/2005/antitrust/chang_evans_garcia.pdf).

48 David S. Evans & Richard Schmalensee, *supra* note 11.

49 Some of the advocates of interchange fee regulation recognize that interchange fees may be needed early on to solve this "chicken and egg problem." *See* Steven C. Salop et al., *Economic Analysis of Debit Card Regulation Under Section 920* (submitted to the Board of Governors of the Federal Reserve System Concerning Its Rulemaking Pursuant to Section 920 of the Electronic Fund Transfer Act, Oct. 27, 2010).

50 For some background, see Gene Retske, *ISIS Changing Course? Conflicting Reports Cloud Water* (June 1, 2011), http://www.prepaid-press.com/wordpress/?page_id=4397.

51 PULSE was purchased by Discover in 2005. PULSE is one of the leading EFT/ATM networks, processing debit transactions.

52 Discover controls about 3.5 percent of all transactions, MasterCard and Visa together account for roughly 90 percent of transactions.

53 *See* Maisie Ramsay, *Isis Explains Strategy Shift*, Wireless Week (May 9, 2011), http://www.wirelessweek.com/news/2011/05/Isis-Explains-Strategy-Shift.

54 The Euro Alliance of Payment Schemes (EAPS) was formally announced in 2007 and is an international alliance of European bank and interbank networks designed to create a pan-European debit card system.

55 See David S. Evans, *How Catalysts Ignite: The Economics of Platform-Based Start-Ups*, *in* Platforms, Markets and Innovation (Annabelle Gawer ed., 2009); David S. Evans, *Launching New Payments Businesses: The Role of Critical Mass and Ignition Strategies*, *in* Ignition Series eBook (2010), http://pymnts.com/briefingroom/commentary-2/ignition-series.

56 Similar interchange fee caps on credit cards could have reduced the incentives of Discover to enter the U.S. market in the mid 1980s. One part of its strategy was to secure merchant acceptance by offering lower merchant fees than the rates being charged by MasterCard, Visa, and American Express brands. A price cap would have limited the strategies available to it for obtaining merchant acceptance in competition with the established brands.

57 Scott Schuh, Oz Shy, & Joanna Stavins, *Who Gains and Who Loses from Credit Card Payments? Theory and Calibrations* (Federal Reserve Bank of Boston, Public Policy Discussion Paper No. 10-03, Aug. 31, 2010), *available at* www.bos.frb.org/economic/ppdp/2010/ppdp1003.pdf.