Regulatory Intervention in Card Payment Systems: An analysis of regulatory goals and impact*

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This version 21 September 2018

Abstract: This paper assesses the extent to which regulatory intervention targeting interchange fees has been consistent with the economic theory of two-sided markets and examines the available evidence on the impact of these regulations. The last two decades have seen a drive to regulate the interchange fees of open payment card systems that was primarily motivated by merchants' complaints. Although pursuing the same objective of decreasing interchange fees, the theoretical and legal basis for interventions were diverse and often based on questionable premises. Economic research on two sided markets has shown that prices in such markets serve to distribute the costs and benefits of the system among the different types of users in a way that maximizes their voluntary participation. Prices to the different types of users are not mainly determined by costs but by the value that these users indirectly bring to the system, contributing to its attractiveness for other users. Regulatory interventions were mostly founded on a partial analysis of payment card systems and their impact was riddled with unintended consequences. Besides a transfer of rent from consumers and issuing banks to mostly large merchants, there is no empirical evidence that any other policy objectives in the form of overall efficiency or consumer welfare was achieved. Two decades of regulatory intervention in payment card systems provide sufficient evidence to call for much caution for further intervention in an increasingly dynamic and fast changing market.

Keywords: Payment cards, interchange fee, platform competition, two-sided markets, interchange fees, credit cards

1. Introduction

This paper considers the economic literature on the card payments industry to assess the extent to which regulatory intervention targeting interchange fees has been consistent with the economic theory of two-sided markets as well as to assess the impact of these regulations. This analysis includes the following key points:

- The last two decades have seen a regulatory drive to regulate the interchange fees of open payment card systems that was primarily motivated by merchants' complaints. Although pursuing the same objective of decreasing interchange fees, the theoretical and legal basis for interventions were diverse and based on questionable premises.

* This research was funded by Visa USA, Inc. All results and any errors are the responsibility of the authors and do not represent the opinion of The Brattle Group or its clients.

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- Economic research on two sided markets has shown that prices in such markets serve to distribute the costs and benefits of the system among the different types of users in a way that maximizes their voluntary participation. Prices to the different types of users are not mainly determined by costs but by the value that these users indirectly bring to the system, contributing to its attractiveness for other users.
- Regulatory interventions were founded on questionable premises and partial analysis of payment card systems and their impact was riddled with unintended consequences. Besides a transfer of rent from consumers and issuing banks to mostly large merchants, there is no empirical evidence that any other policy objectives in the form of overall efficiency or consumer welfare was achieved.
- Two decades of regulatory intervention in payment card systems provide sufficient evidence to question the efficacy of such policy and call for much caution for further intervention in an increasingly dynamic and fast changing market.

Card payments have been steadily increasing at the expense of cash and checks for the past two decades. Payment cards provide convenience to the cardholder in the form of higher liquidity and faster payment at point of sale. Merchants benefit from reduced transaction costs, guaranteed payments, and higher security in stores. Cardholders and merchants pay fees for the use of card payment systems, but in the so-called "open systems" that relationship is intermediated by banks. Under this model, cardholders and merchants, respectively, deal with issuing and acquiring banks that process the transfer of funds to carry out payments. Acquiring banks pay a fee to issuing banks called the interchange fee, which is then passed on to merchants. The interchange fee is the mechanism by which the cardholders and merchants share the benefits from the ability to use a card to pay for the transaction. Importantly, the interchange fee is set such that cardholders and merchants receive sufficient benefits to respectively use and accept cards for payment.

The important role of the interchange fee is described in the economic literature on two-sided markets. These are markets providing intermediation services to bring together two parties of a transaction. This research highlights the interdependencies of the behavior on each side of the market and explains the role of the interchange fee as a coordination mechanism to align incentives of both sides in order to increase the total value of the system. In the literature, the indirect benefit to merchants provided by the usage of payment cards is the ability to offer a service that attracts customers, but one can also consider that the spread of cards, and the liquidity that they generate, has a positive impact on aggregate sales and output.

Two-sided market literature models merchants' resistance to pay for the interchange fees. Realistically in these models, merchants may accept paying fees that are higher than their optimal fee, but will not accept payment systems that do not provide benefits for them. Research suggests that the relation between the interchange fee that is optimal for the payment scheme and the one that is optimal for the economy is ambiguous, positing the possibility, but not the certainty, that card usage might be inefficiently high. But the underlying premise of that research is that the structure of fees of card payment systems cannot be evaluated by looking at only one of the two sides of the market, in this case merchants. More importantly, this literature has shown the high degree of indeterminacy with respect to the relation between interchange fees, consumer welfare, and social welfare. Merchant market power, for example, affects merchants' resistance to the interchange fee by allowing them to extract consumer surplus independently of the payment method being offered. Furthermore, eliminating card payment systems rules, such as the one prohibiting surcharges, may actually decrease social welfare. Increased competition in the retail payment markets is also not necessarily associated with lower interchange fees.

The expansion of payment card usage that started in the late nineties was associated with increases in the cost of interchange fees. More customers paid with cards for more purchases so that the total cost of the card schemes for the merchants increased. Complaints by merchants that the fees for card payment services seemed to be excessive and steadily growing generated regulatory scrutiny of interchange fees. Antitrust concerns were raised in those instances where an association of banks collectively decided on the level of the interchange fee. Even in cases where the card payment system centrally established its fees, regulators presumed that widely accepted card systems had market power, leading to a series of regulatory interventions across many jurisdictions to cap interchange fees. Rules that were considered to contribute to the maintenance of market power were sometimes banned. Such interventions were motivated by the belief that competition in retail payment systems was impaired and that card payment systems were simultaneously charging high fees to the merchants and gaining undue diffusion by subsidizing cardholders. Underlying this regulatory narrative were the assumptions that the spread and success of payment cards were fundamentally driven by the choices of cardholders with merchants having to passively accept consumer payment decisions. Also, it was assumed that legitimate fees paid by merchants were those that covered the costs of processing payments (or paid for the transaction benefits of card payments in a later analysis). Finally, merchants were thought to derive no wider benefits from extensive card payments usage. In their analysis of the card payment markets, regulators analyzed the costs and benefits faced by merchants on a per transaction basis, ignoring any implications of the aggregate level of participation on the cardholder side on merchants. Interventions were based on a misguided analysis of the determinants of payment systems fees and accordingly led to unforeseen consequences, failing to provide an unambiguous improvement of the market for payment services.

Ex-post empirical studies on the impact of regulatory interventions have found little evidence of a beneficial impact on the economy, and the only sure result of the capping of interchange fees has been a transfer of revenues from issuing banks and cardholders to mostly large merchants. The pass-through of lower merchant fees to consumers does not seem to have happened. Issuing banks responded to lower interchange fees by raising other bank fees in ways that may have affected low-income bank customers the most, creating unintended redistribution effects. In those instances where card schemes' rules preventing merchants from surcharging customers for card payments were banned, merchants either did not surcharge or tended to surcharge excessively. Regulatory intervention did not unambiguously decrease payment card usage, which continued its increase. In some places, the regulation favored the unregulated card payment systems, and sometimes the fees for cardholders increased even in instances of no reduction in interchange fees. In some markets, a cap on interchange fees was actually contemporaneous to larger merchant adoption of cards and increased card usage, indicating that in some markets merchants had possibly been particularly reluctant to join payment cards systems despite consumer demand. Overall, the regulatory intervention impact on consumer welfare seems to have been negative, with a positive but unevenly distributed impact on merchants, and an undetermined impact on social welfare and efficiency.

The market for retail payment systems is currently being deeply impacted by the appearance of new payment services relying on digital technologies. Software-based players are providing convenient online payment services that may eventually disintermediate cards and be able to initiate payments directly. Digital platforms are stepping in as new intermediaries, organizing payment services, and providing a whole set of new complementary services. Innovation is drastically decreasing transaction costs, in terms of time and inconvenience, at the point of sale and in the acquiring and settlement markets. All these developments may render obsolete a regulatory framework designed for a world of cash and fixed line connectivity. As the complexity of the economic analysis of payment systems sinks in, it appears advisable for regulators neither to attempt to second-guess the appropriate distributions of costs and benefits in this new environment nor to interfere in the pricing of any of the payment systems.

In sum, as regulatory interventions come up for review, the elements presented above should give regulators some pause and make them reconsider whether the regulatory costs of intervention in retail payment markets are justified.

Part I of this paper describes the organization of card payment systems and the structure of its fees. Part II explains the two-sided market literature and what it teaches us regarding the determination of fees and the welfare implications of different fee structures in card payment markets. Part III summarizes the regulatory concerns that arose with respect to open systems and makes explicit the underlying economic assumptions implied by those concerns, followed by a summary of the resulting interventions and an analysis of regulatory efficacy. Part IV concludes.

2. Card Payment Systems

2.1. Overview of Card Payments Systems

Payment cards are payment instruments that can take a number of different forms. Debit and pre-paid cards both allow cardholders to access their funds, differing mainly in the way those funds are stored: debit cards give instant access to funds on a bank account and, in the case of pre-paid debit cards, to funds stored on the card. In contrast, credit cards, delayed debit, and charge cards allow cardholders to borrow funds for purchase. They differ from each other insofar as credit cards extent long term credit whereas delayed debit and charge cards require payment at the end of the preset payment period. Despite the differences in payment card types, they tend to follow common transactional principles. When a consumer makes a purchase from a merchant and uses a payment card, it triggers a transfer of funds from the consumer to the merchant via a series of intermediaries. The intermediation essentially consists of payment processing and clearing and involves a transfer from the cardholder's issuing bank to the merchant's bank (known as the acquiring bank). Card payments guarantee the payment to the merchant and the card-issuing bank is typically responsible for collecting funds from the cardholder, in some cases at a later stage.

Payment cards evolved to their current state of ubiquity (see Figure 1 and Figure 2 below) because they provide substantial economic benefits to cardholders and merchants. For example, payment cards offer a solution to consumers' short-run liquidity constraints that are caused by the challenges associated with carrying large sums of cash. Payment cards also eliminated the security risks to merchants associated with holding large sums of cash. Additionally, the level of fraud associated with payment cards is lower than that associated with other payments systems such as checks, and payments are guaranteed by the payment system. Such attributes decrease merchants' costs. Moreover, card payment has greatly facilitated distance and online sales and has facilitated in-store innovations, such as self-service. When properly accounted for, payment cards present a substantial cost savings and contribute to enhance revenues. Ultimately, the economic value captured through the cardholder and merchant benefits gave rise to a large and robust payment card industry.[1]

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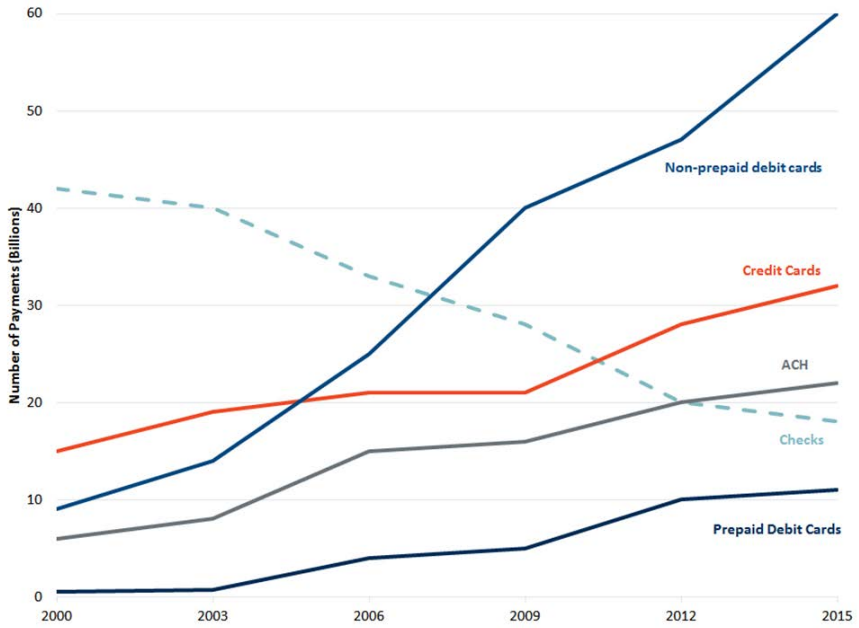
1 David S. Evans and Richard Schmalensee, *Paying with Plastic: The Digital Revolution in Buying and Borrowing* (Cambridge: MIT Press, 2005).

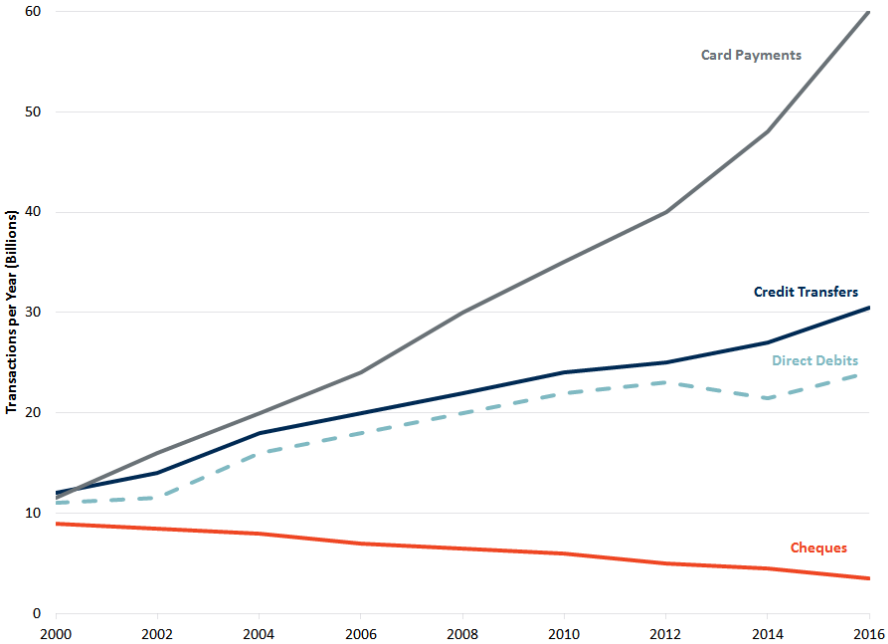
Figure 1: Trends in Non-cash Payments in the U.S. 2000–2015



Source: "The Federal Reserve Payments Study 2016," Federal Reserve System, 2016, p. 4 at Figure 2, accessed September 18, 2018, https://www.federalreserve.gov/paymentsystems/files/2016-payments-study-20161222.pdf.

Notes: Prepaid debit cards include general purpose, private label, and electronic benefit transfers. ACH refers to electronic credit and debit transfers using the automated clearinghouse system.

Figure 2: Use of the Main Payment Services in the European Union 2000–2016



Source: "Payments Statistics for 2016," European Central Bank press release, September 15, 2017, p. 2 at Chart 1, accessed August 2, 2018, https://www.ecb.europa.eu/press/pdf/pis/pis2016.pdf?be9989f6bd72483ebe27d8dfae1f0362.

Notes: For periods prior to 2010 data have been partially estimated, as methodological changes were implemented in previous years leaving various corresponding data unavailable. The ECB's historical estimation ensures comparability over the entire time period. Statistics on e-money payments and other payment services are also collected; these services represented 3.3 percent of all EU transactions in 2016.

In the early phase of the payment card industry, travel and tourism was a main source of payment card transactions. Payment cards were mostly used by travelers or to purchase particularly expensive consumer items. Over time, there was an increased acceptance and diffusion of cards with an acceleration of their penetration in the early part of the 21st century. Card payments grew steadily and the penetration of debit cards ultimately displaced checks in countries where checks were still used. Usage of cash has been steadily decreasing, even for small purchases. Nowadays card payments are the most common retail payment method in both the European Union (EU) and the U.S.

About 16 major card networks are currently in operation solely in the United States.[2] The largest and most well-known of these include Visa, MasterCard, Discover, and American Express. Card payment systems vary in their business models, and within each card network; card issuers market many different payment card products. As of 2013, Americans had an average of 4.1 credit cards, and of those 2.4 were rewards cards compared to 1.7 non-rewards cards.[3] The diverse product offering is reflective of a highly segmented payment card market with differentiation occurring according to card types, customer types, and geographical scope. There is a large number of card payment systems with different characteristics and target markets.

Figure 3: Major Global Card Networks

Source: Andrew Meola, "The Global Payment Landscape: Market Trends Explained," *Business Insider*, December 21, 2016, accessed September 17, 2018, https://www.businessinsider.com/global-payments-landscape-market-trends-2016-10.

2.1.1. Payment Card Platform Business Models: Open vs. Closed

While many differences exist between card network platforms, there are two prominent business models adopted in the market. They are referred to as the "open network" system (*e.g.*, Visa and MasterCard) and the "closed network" system (*e.g.*, Discover and American Express). The two business models are often referred to as "four-party" systems and "three-party" systems, respectively. Both systems facilitate the transfer of funds from a cardholder to a merchant and rely on the issuance of cards and the acquisition of merchants. Both must work to ensure sufficient acceptance and usage by both sides of the

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2 Andrew Meola, "The Global Payment Landscape: Market Trends Explained," *Business Insider*, December 21, 2016, accessed September 17, 2018, https://www.businessinsider.com/global-payments-landscape-market-trends-2016-10.

3 Jamie Gonzalez-Garcia, "Credit card ownership statistics," CreditCards.com, April 26, 2018, accessed July 5, 2018, https://www.creditcards.com/credit-card-news/ownership-statistics.php.

transaction. Where the two business models primarily differ is in the relationship between the card payment scheme on one side and the cardholder and merchants on the other. This relation is direct in a closed system but intermediated in an open one.

In an open system, such as Visa or MasterCard, the payment platform does not issue cards to cardholders, nor does it require merchants to accept cards. In this system, the platform relies on third-party intermediaries, normally banks, to issue cards and acquire merchants and focuses, instead, on the organization of the clearing activities. In this scheme, the card company acts as a service provider to the financial institutions that market payment cards, and a rules-based data processor that communicates payment authorizations between issuing and acquiring banks. Both the issuing side and the acquiring side of the payment system are fairly segmented markets with many companies participating.

Figure 4: Open Card Payment Ecosystem

Source: Andrew Meola, "These are the leading credit card processing companies," *Business Insider*, December 19, 2016, accessed September 18, 2018, https://www.businessinsider.com/list-credit-card-processing-companies-2016-11.

In its role as a coordinator of the payment system, the payment platform commonly sets the interchange fee, which is the per-transaction fee that merchants' banks pay to the cardholders' banks. Thus, the purpose of the interchange fee is to transfer value from one side of the market to the other, discussed in greater detail below. Other fees, such as those included in the merchant service charge (MSC) or the merchant discount rate (MDR) paid by the merchant to its bank or the fees that the cardholder may have to pay to their card issuing banks, are set individually by the banks.

Mechanically the process operates as follows, with the payment network facilitating communications of the transaction between issuers and acquirers to authorize a transaction: (1) A cardholder makes a purchase; (2) The merchant facilitating that purchase electronically submits a request for authorization approval for the transaction amount to its acquiring bank; (3) The acquiring bank electronically sends the authorization request to the appropriate payment network, which then passes the request to the issuing bank; (4) The issuing bank responds to the payment network, which forwards the response to the acquiring bank; and (5) During the clearing and settlement phases, the payment network transfers the information from acquirers to card issuers for posting to cardholders' accounts and transfers the net payment from issuers to acquirers (minus the interchange fee and a network transaction fee paid to the card payment system) to be credited to the merchant accounts (minus processing fees). This process is illustrated in Figure 5 below.

Figure 5: Illustrative Transaction in Open Card Payment System

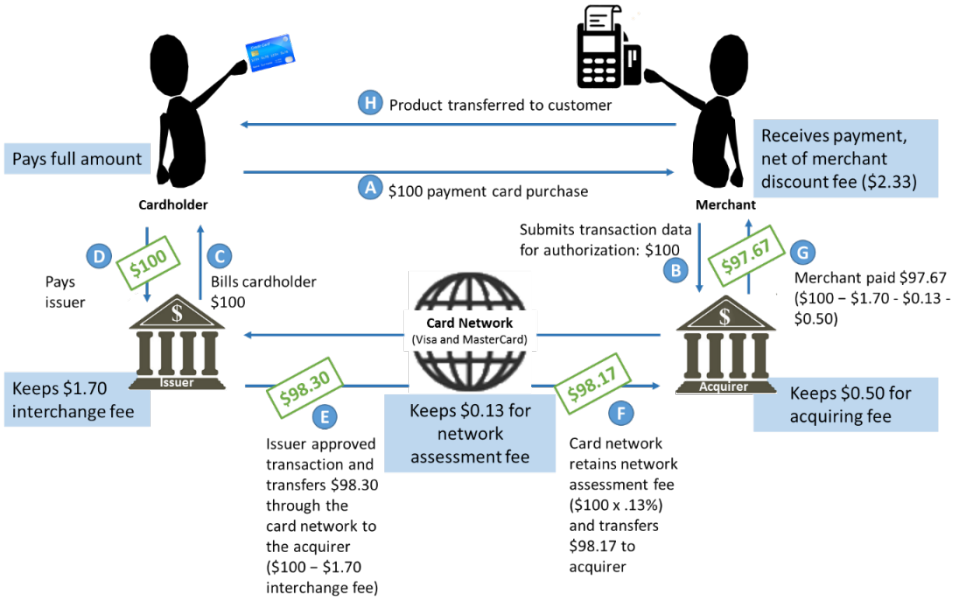

Image based on: U.S. Government Accountability Office, *Credit Cards, Rising Interchange Fees Have Increased Costs for Merchants, but Options for Reducing Fees Pose Challenges*, GAO-10-45 (Washington, DC, 2009), 8, accessed September 14, 2018, https://www.gao.gov/assets/300/298664.pdf.

The MSC paid by the merchants includes the acquiring services and the interchange fee set by the payment scheme. The part of the MSC set by the acquirer is meant to compensate for the services provided. The interchange fees, paid by the acquiring banks (and ultimately the merchant) to the issuing bank, are determined by the payment system in order to distribute the benefits of the payment service among payers and payees. Once paid to the issuing bank, they translate into services provided to the cardholder. These services are meant to compensate for the benefits that merchants extract from the card usage service.

Practically all open network schemes have set some default interchange fees that apply automatically when no bilateral agreement exists between banks. No widely adopted international scheme relies solely on bilateral negotiations for the interchange fee. This may be due to the excessive level of information complexity that a system of bilaterally negotiated fees would imply for merchants. To assess the cost of a card payment, the merchant would have to know not only the brand and type of the card used, but also the identity of the issuer. Additionally, given that most card systems impose an "honor all cards" rule on merchants, the absence of a common interchange fee may lead some issuing banks to impose high interchange fees for the cards that they issue and that the merchant is forced to accept.[4] Although there are open network schemes that have operated without interchange fees, these are very rare and with limited regional scope.[5]

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4 This "holdup" problem is described in Robin. A. Prager, Mark D. Manuszak, Elizabeth K. Kiser, Ron Borzekowski, "Interchange Fees and Payment Card Networks: Economics, Industry Developments, and Policy Issues," Finance and Economics Discussion Series, Divisions of Research & Statistics and Monetary Affairs, Federal Reserve Board, May 13, 2009, p. 12, accessed September 14, 2018, https://www.federalreserve.gov/Pubs/Feds/2009/200923/200923pap.pdf.

5 National card schemes in Denmark, Finland, Luxembourg, and the Netherlands have operated without interchange fees. Ann Börestam and Heiko Schmiedel, "Interchange Fees in Card Payments," European Central Bank Occasional Paper Series No. 131 (September 2011): 11. These cards' schemes do charge fees to their users, but they operate without interchange fees.

In a closed system, such as American Express or Discover, the card company issues the card directly to cardholders and engages in efforts to acquire merchants.[6] Because the card company in this type of scheme has direct control over the fees charged to merchants and cardholders, it does not need to charge an explicit interchange fee to balance the incentives of the two sides of the platform. It can directly determine the net benefits of the system to cardholders and merchants. However, the calculus of explicitly choosing the cardholder and merchant fees in order to optimize value in a closed system is conceptually analogous to the calculus employed by open systems in their decision to set interchange fees to adjust merchant and cardholder incentives to accept and use cards, respectively.

2.1.2. Product Diversity and Market Segmentation

The payment card industry is not fully commoditized, as cards continue to compete along the lines of product differentiation. Indeed, there are many different types of payment cards that provide quite different services for the cardholders in terms of the ownership of the funds accessed and the terms of financing when the funds accessed are not the payer's. One can distinguish four general types: credit cards, charge cards, debit cards (including delayed debit), and prepaid cards. Credit cards allow the cardholder to instantly borrow funds through a revolving line of credit established with its issuing bank. When the customer pays with a credit card or delayed debit card, the amount of the payment is not automatically withdrawn from his or her personal account, but a credit is granted via the issuing bank. Charge cards function like a credit card, with the difference that the credit balance must be paid off at the end of each billing period. Debit cards are linked to a specific bank account and debit the amount of the purchase at the time of sale. Debit cards provide a liquidity service by allowing cardholders easy and near ubiquitous access to their funds without the need to carry cash.[7] Prepaid cards are similar to debit cards insofar as they rely on funds owned by the cardholder, but the funds are "loaded" onto the card.[8]

Cards may vary according to the technology they use and the level of security they provide. "Chip" cards have been progressively introduced to enhance signature cards.[9] Some card schemes may offer security features such as transaction monitoring to identify fraudulent transactions.[10] Payment card systems face potentially large costs from fraudulent use of cardholder information, and they have actively incentivized merchants to upgrade their terminals to the more secure technologies.[11]

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6 Christian Ahlborn, Howard H. Chang, and David S. Evans, "The problem of interchange fee analysis: case without a cause?" *European Competition Law Review* 22(8) (August 2001): 304-312 describes the difference between open and closed or proprietary systems. See also: *Ohio et al. v. American Express Company et al.,* No. 16-1454 (S.C.O.T.U.S. June 25, 2018) ("Ohio v. American Express").

7 Note that debit cards may be processed through an electronic funds transfer (EFT) or through the same system as credit cards.

8 "Payment Card Types," BinDB, accessed September 19, 2018, accessed September 18, 2018, https://www.bindb.com/payment-card-types.html.

9 Jason Steele, "Credit card fraud and ID theft statistics," CreditCards.com, October 24, 2017, accessed September 24, 2018, https://www.creditcards.com/credit-card-news/credit-card-security-id-theft-fraud-statistics-1276.php.

10 Kimberly Palmer, "How Credit Card Companies Spot Fraud Before You Do," U.S. News & World Report, July 10, 2013, accessed September 24, 2018, https://creditcards.usnews.com/articles/how-credit-card-companies-spot-fraud-before-you-do.

11 Jesse Leigh Maniff, "Competition and Coordination: The Card Network Balancing Act," Federal Reserve Bank of Kansas City payments system research briefing, March 2017, p. 1, accessed September 24, 2018, https://www.kansascityfed.org/~/media/files/publicat/psr/briefings/psr-briefingmar2017.pdf.

A payment card scheme may be geographically segmented. Some card platforms may be geographically limited by construction, as they accept only banks from a particular country. Examples of payment systems that are national leaders are Bancontact in Belgium or ServiRed in Spain.[12] Regulations, or even cultural restraints, prevent some types of cards from being used in certain jurisdictions. For example, in Israel, banks issue deferred debit cards but not credit cards.[13]

Different cards will exhibit different fees, depending not only on the cost of services provided, but also on the usage and acceptance behavior of both cardholders and merchants. This latter element notably determines the interchange fee set by card payment systems to optimize the system's value.

2.2. The Role of the Interchange Fee

Differences in fees across different types of cards to some extent relate to the differences in benefits and costs that these cards entail.[14] Such differences in costs can arise due to the extent of the credit financing and default risk of the user as well as the protections that the card offers against fraud. A distinguishing factor of the interchange fee is that it serves to redistribute the benefits provided by the usage of any given type of card among cardholders and merchants to promote card adoption on both sides. For example, debit cards are the cards that are more akin to cash and will tend to be cheaper than credit cards for merchants as, although they do provide liquidity to customers, they do not provide credit services, and their usage does not impact sales to the same extent as credit cards.[15] Secured cards, which are backed by a secured payment used as collateral, carry less risk of default and may also cost less to both merchants and payers. The relative savings will be distributed depending on what side assigns the highest value to lowering fraud, and it therefore needs no incentives for adoption. National card schemes are generally cheaper to merchants than international card schemes, as they do not generally offer credit, provide limited international acceptance to cardholders, and do not benefit from the same level of efficiencies.[16] Corporate cards, on the other hand, offer complementary services to the cardholder, such

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12 In Belgium, Bancontact is the national leader in electronic payment services: "Electronic payments: who, what and how?" Bancontact, accessed September 19, 2018, https://www.bancontact.com/en/what-does-bancontact-stand-for. In Spain, ServiRed is the leading card scheme: "ServiRed Today," ServiRed, accessed September 19, 2018, https://www.servired.es/servired/servired-today/?lang=en.

13 "The Payment and Settlement Systems in Israel, The Red Book for the Years 2016–17," Bank of Israel, pp. 36-40, accessed September 24, 2018, http://www.boi.org.il/en/PaymentSystem/Documents/redb2016-17e.pdf.

14 For a discussion of differing card costs, see *e.g.,* Robin A. Prager, Mark D. Manuszak, Elizabeth K. Kiser, and Ron Borzekowski, "Interchange Fees and Payment Card Networks: Economics, Industry Developments, and Policy Issues," Finance and Economics Discussion Series, Divisions of Research & Statistics and Monetary Affairs Federal Reserve Board, May 13, 2009, accessed September 14, 2018, https://www.federalreserve.gov/Pubs/Feds/2009/200923/200923pap.pdf.

15 Robin A. Prager, Mark D. Manuszak, Elizabeth K. Kiser, and Ron Borzekowski, "Interchange Fees and Payment Card Networks: Economics, Industry Developments, and Policy Issues," Finance and Economics Discussion Series, Divisions of Research & Statistics and Monetary Affairs, Federal Reserve Board, May 13, 2009, p. 12, accessed September 14, 2018, https://www.federalreserve.gov/Pubs/Feds/2009/200923/200923pap.pdf.

16 "Payment Card Interchange Fees and Merchant Service Charges: An International Comparison," PYMNTS, January 5, 2010, accessed September 24, 2018, https://www.pymnts.com/business-wire/2010/payment-card-interchange-fees-and-merchant-service-charges-an-international-comparison/.

as travel insurance, and will tend to carry more fees, including higher interchange fees.[17] But these cards are normally used for corporate expenses and large ticket purchases where they provide an attractive financing opportunity for customers.

Because the benefits and incentives for adoption vary in each case, interchange fees will vary sharply for different types of cards (*e.g.*, debit, credit, etc.), different card products they offer (*e.g.*, "platinum" versus "gold" cards), the different types of cardholders (*e.g.*, personal versus corporate cardholders), and the types of merchants involved (*e.g.*, gas stations versus supermarkets). They tend to vary by other factors, such as type of purchase or physical presence of the card.[18] Figure 6 represents a page from Visa's published U.S. interchange fees, illustrating the diversity of interchange fees in any given jurisdiction. In addition to the standardized interchange fees, it is common for large merchants to negotiate a tailored structure of interchange fees directly with card payment systems. Although smaller merchants are charged a single merchant service fee that includes, but does not itemize, the interchange fee, very large merchants negotiate these separately with card systems and banks.[19]

A default interchange fee is generally set by the open payment card platform. Default interchange fees can be overridden, most often by agreements between issuing and acquiring banks. Originally, some card payment systems were governed by an association of banks who set the market fees, which raised the antitrust issue of the collective setting of the interchange fee. The efficiency of collective fee setting by bank consortia in the card payment context has been recognized.[20] In the National Bancard Corporation (Nabanco) case, the U.S. District Court established that interchange fees determined by the payment system are not anticompetitive.[21] In Europe, Visa benefited from an antitrust exemption for this collective decision until complaints resulted in the immunity being allowed to expire in 2007.[22]

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17 Robert Harrow, "Corporate Credit Cards: How They Work, and Differences vs. Business Cards," ValuePenguin, August 17, 2018, accessed September 24, 2018, https://www.valuepenguin.com/corporate-credit-cards-explanation-comparison; "Current US Interchange Rates," Host Merchant Services, accessed September 24, 2018, https://www.hostmerchantservices.com/current-us-interchange-rates/.

18 See *e.g.*, Approved Judgment of Mr. Justice Phillips in The Matter Between Sainsbury's Supermarkets Ltd. and Visa Europe Services LLC, Visa Europe Ltd., and Visa UK Ltd, In The High Court Of Justice Business And Property Courts Of England And Wales Queen's Bench Division Commercial Court, November 30, 2017, ¶ 31.

19 David S. Evans, Robert E. Litan, and Richard Schmalensee, "Economic Analysis of the Effects of the Federal Reserve Board's Proposed Debit Card Interchange Fee Regulations on Consumers and Small Businesses," February 22, 2011, p. 45.

20 Marc Rysman and Julian Wright, "The Economics of Payment Cards," *Review of Network Economics* 13(3) (2014): 303–353. For an advocacy of a more decentralized organization see: Alan S. Frankel and Allan L. Shampine, "The Economic Effects of Interchange Fees," *Antitrust Law Journal* 73(2006) 627-673.

21 See *e.g.*, *National Bancard Corporation (NaBanco) v. Visa USA, Inc.*, No. 79-6355-CIV-WMH, (U.S.D.C. September 20, 1984) ("NaBanco v. Visa").

22 "Information Paper on Competition Enforcement in the Payments Sector," European Competition Network Subgroup, Banking and Payments, March 2012, p. 7 at bullet 2, accessed September 19, 2018, http://ec.europa.eu/competition/sectors/financial_services/information_paper_payments_en.pdf.

Figure 6: Visa U.S.A. Consumer Credit Interchange Reimbursement Fees

<table>
<tr><th>Fee Program</th><th>Visa Signature Preferred / Visa Infinite†</th><th>Visa Signature / Visa Infinite‡</th><th>Traditional Rewards</th><th>All Other Products</th></tr>
<tr><td>CPS/Supermarket Credit—Performance Threshold* I</td><td rowspan="10">2.10% + $0.10</td><td rowspan="3">CPS/Rewards 1 1.65% + $0.10</td><td colspan="2">1.15% + $0.05</td></tr>
<tr><td>CPS/Supermarket Credit—Performance Threshold* II</td><td colspan="2">1.20% + $0.05</td></tr>
<tr><td>CPS/Supermarket Credit—Performance Threshold* III</td><td colspan="2">1.22% + $0.05</td></tr>
<tr><td>CPS/Supermarket Credit—All Other</td><td colspan="2">CPS/Rewards 1 1.65% + $0.10</td><td>1.22% + $0.05</td></tr>
<tr><td>CPS/Retail Credit—Performance Threshold* I</td><td rowspan="4">CPS/Rewards 1 1.65% + $0.10</td><td colspan="2">1.43% + $0.10</td></tr>
<tr><td>CPS/Retail Credit—Performance Threshold* II</td><td colspan="2">1.47% + $0.10</td></tr>
<tr><td>CPS/Retail Credit—Performance Threshold* III</td><td colspan="2">1.51% + $0.10</td></tr>
<tr><td>CPS/Retail Credit—All Other</td><td colspan="2">CPS/Rewards 1 1.65% + $0.10</td><td>1.51% + $0.10</td></tr>
<tr><td>CPS/Small Ticket</td><td colspan="3">1.65% + $0.04</td></tr>
<tr><td>CPS/Retail 2</td><td>2.40% + $0.10</td><td colspan="3">1.43% + $0.05</td></tr>
<tr><td>CPS/Recurring Payments MCCs: 4814 (Telco); 4899 (Cable)</td><td>2.40% + $0.10</td><td colspan="3">1.43% + $0.05</td></tr>
<tr><td>CPS/Charity</td><td colspan="4">1.35% + $0.05</td></tr>
<tr><td>CPS/Government</td><td colspan="4">1.55% + $0.10</td></tr>
<tr><td>CPS/Automated Fuel Dispenser (AFD)</td><td colspan="4">1.15% + $0.25 ($1.10 Cap)</td></tr>
<tr><td>CPS/Service Station</td><td colspan="4">1.15% + $0.25 ($1.10 Cap)</td></tr>
<tr><td>CPS/Utility</td><td colspan="4">$0.75</td></tr>
</table>

Source: "Visa USA Interchange Reimbursement Fees," Visa, April 14, 2018, p. 7, accessed June 21, 2018, https://usa.visa.com/dam/VCOM/global/support-legal/documents/visa-usa-interchange-reimbursement-fees-april-2018.pdf.

Notes: Rates Effective April 14, 2018.

* See source for notes on thresholds.

† Visa Infinite (Spend Qualified accounts).

‡ Visa Infinite (Spend Not Qualified accounts).

It is commonly assumed that the payment system organizations set fees in order to maximize their profits. Where the fees are defined in proportion to value or volume of the transactions that are processed through the payment system, profit maximization can be linked to the objective of increasing card usage. The interchange fee can be assumed to be set to maximize card usage by balancing incentives for the necessary participation of both cardholders and merchants. An interchange fee that is too "high" disincentivizes merchants from accepting card payments, while lowering the interchange fee reduces the incentives for cardholders to use their card. As noted by the U.S. Supreme Court, "To optimize sales, the network must find the balance of pricing that encourages the greatest number of matches between cardholders and merchants."[23] A vast body of literature has investigated the mechanisms of optimal interchange fee setting, which we proceed to describe below.

[23] Ohio v. American Express, p. 13.

3. Economics of Card Payment Systems

3.1. The Analysis of Two-Sided Card Payment Markets

The payment cards industry is considered to be a two-sided market. Card payments are offered simultaneously to the payer and the payee by the card payment scheme or its intermediaries. This means that a payment system's viability depends on a sufficient amount of participants on both sides of the transaction signing up and using the scheme. There is now a vast literature that analyzes the pricing structure of such markets and the way that payment schemes choose prices for each side to build the necessary level of participation by both sides of the market and maximize profits.

3.1.1. Two-Sided Markets and the Justification of Interchange Fees

Two-sided markets, such as that of payment cards, are characterized by the fact that the level of participation of one side of the service affects the value of the service to the other side.[24] Pricing in these markets takes into account these indirect effects and deviates from the classical relation between prices and marginal cost of one-sided markets.[25] Indirect effects, or externalities, occur when a cardholder uses a card in a transaction and generates a benefit for a merchant that goes beyond the profit on that particular transaction. Indirect benefits of one side's participation accrue to members on the other side whether or not these are the actual counterparties of the transaction. Economic literature has shown that in two-sided markets: (i) market outcome is determined not only by the total price of the service (all sides combined), but also by the relative allocation of the price among the different sides; (ii) the efficient structure of prices will be determined by the relative demand elasticities for the system of all sides, the extent of the externalities, and the net marginal costs faced by the different sides; and (iii) the interchange fee is a mechanism to achieve the efficient structure of prices.[26] A major conclusion from this literature is that to assess the market outcome in card payment services, the prices of each side must be considered together, as both will affect cardholders and merchants' benefits as well as card usage. Another conclusion is that the competitive prices on each side of the two-sided market do not depend only on marginal costs and can even be negative with high demand elasticity and strong indirect effects. We explain these concepts below.

Merchants derive greater value from the payment network as more cardholders join, and more cardholders are likely to join when the payment card is accepted by more merchants. The participation behavior of each side affects the benefits and decisions of the other side. But both types of participants make the adoption and usage decision by considering only their own costs and benefits and without considering these externalities—even though these externalities cause changes of behavior that will ultimately affect them. The interchange fee has been shown to be an efficient mechanism to distribute the costs and benefits of the card payment system among participants in a way that makes them internalize some of the benefits derived from the other side's behavior. Internalizing benefits consists of compensating the other side for these benefits to incentivize it to continue to participate. In card payment systems, the interchange fee makes merchants internalize the benefits that cardholders generate

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24 Marc Rysman, "The Economics of Two-Sided Markets," *Journal of Economic Perspectives* 23(3) (Summer 2009): 125–143.

25 *Ibid.*

26 David S. Evans and Richard Schmalensee, "The Economics of Interchange Fees and Their Regulation: An Overview," MIT Sloan School of Management Working Paper 4548-05, May 2005, accessed July 12, 2018, https://dspace.mit.edu/bitstream/handle/1721.1/18181/4548-05.pdf?sequence=1; Jean-Charles Rochet and Jean Tirole, "Two-sided markets: a progress report," *RAND Journal of Economics* 37(3) (Autumn 2006): 645-667.

in terms of convenience and higher aggregate sales. This results in lower prices for cardholders and a higher level of card usage among consumers, to the ultimate benefit of merchants. The interchange fee enables some card transactions that would not otherwise take place, potentially increasing welfare for all parties involved.[27]

Given a total price for the system, the structure of prices and the level of the optimal interchange fee will be determined by the relative elasticities of demand of both merchants and card holders, which are themselves a function of the relative benefits derived from the system.[28] The side with the most elastic demand will be charged less, as they are the ones that react to incentives the most and their higher response in terms of card adoption and usage will produce a higher level of indirect benefits to the other side. Thus, in order to maximize the total value of the system, given similar indirect effects on each side, it is efficient to lower the price to the side with the highest usage response. It is worth noting that increasing card adoption and usage requires incentivizing the marginal consumer, meaning the consumer that is the closest to using a payment card for a transaction but does not yet do so. Because the benefits that new potential consumers derive from card usage are lower than those obtained by existing cardholders, the fees for cardholders will have to decrease as the market expands. Merchants will be willing to pay for that decrease via the interchange fee for as long as they still derive net benefits from additional expansion of card usage.[29]

Related to the idea of benefits internalization is the justification of the interchange fee as a way to internalize indirect network effects to resolve the "chicken and egg" problem in two-sided markets, whereby the participation of one side must be elicited to achieve interest on the other side.[30] Regulators have pointed out that, in a mature market, such as that of many payment cards, indirect network effects are exhausted and are no longer an issue. This argument ignores the fact that consumers and merchants decide not only to accept or adopt payment cards, but whether to use it (or which card to use), and thus need to be incentivized on an on-going basis. As retail markets continue to grow over time, card payment systems, particularly in competitive settings, need to continue to generate new opportunities and attract new consumers and merchants.

It is worth mentioning alternative interpretations of the interchange fee. Notably, some literature sees the subsidization of payment cards as the exercise of possible market power by issuing banks, which fail to pass on to their cardholders the proceeds of a higher interchange fee. For example, some have argued that issuers can use market power to raise interchange fees to inefficiently promote the subsidy of cardholders at the expense of cash-paying customers in order to increase the systems' revenues.[31] But as will be discussed below, retailers' responses as well as competition from other forms of payment can limit the efficacy of any strategy aimed at excessive card usage at the expense of cash payers and merchants. Yet in other research, the ability to price discriminate with cardholders and not with

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27 Jean-Charles Rochet and Jean Tirole, "Cooperation among competitors: some economics of payment card associations," *RAND Journal of Economics* 33(4) (Winter 2002): 549–570.

28 Richard Schmalensee, "Payment Systems and Interchange Fees," *The Journal of Industrial Economics* 50(2) (June 2002): 113-114.

29 Jean-Charles Rochet and Jean Tirole, "Cooperation among competitors: some economics of payment card associations," *RAND Journal of Economics* 33(4) (Winter 2002): 549–570.

30 Howard H. Chang and David S. Evans, "The Competitive Effects of the Collective Setting of Interchange Fees by Payment Card Systems," The Antitrust Bulletin 45(3) (2000): 641-677.

31 Alan S. Frankel, "Monopoly and Competition in the Supply and Exchange of Money," *Antitrust Law Journal* 66 (1998): 313-361; Dennis W. Carlton and Alan S. Frankel, "The Antitrust Economics of Credit Card Networks: Reply to Evans and Schmalensee Comment," *Antitrust Law Journal* 63(3) (Spring 1995): 903–915.

merchants is the basis for maximizing cardholder surplus at the expense of merchants since this surplus can be more fully extracted with recourse to price discrimination.[32] Lack of evidence in support of an inability to price discriminate in the acquiring side questions the relevance of such an argument. Overall, these theories attempt to explain the interchange fee as an exercise of issuer market power and rely on a less than perfect pass-on of the interchange fee to cardholders, which would in principle generate fewer card transactions. These theories do not square well with the rapid expansion of payment systems' usage.

3.1.2. Optimal Level of Interchange Fee and Optimal Rules

Baxter (1983) first presented the seminal model that showed the efficient purpose of the interchange fee.[33] The starting premise was that a card payment system maximizes total welfare when the sum of the costs of the system is equal to the sum of its benefits for the marginal transaction. In Baxter's framework, the costs of the system are composed of the fees paid by the acquirer and the issuer. The benefits are the transaction benefits experienced by the card-holding customers and the merchants accepting the card payment. What characterizes open network systems is that, absent interchange fees, issuing banks can charge only cardholders and acquiring banks can charge only merchants. If, for example, merchants' costs of acquiring are higher than the transaction benefits, the payment system could not be set up, even if the sum of the overall benefits was higher than the sum of the overall costs. A transfer between acquirers and issuers in the form of an interchange fee allows for a welfare enhancing system to be set up by ensuring that both issuers and acquirers cover their costs and that those overall costs and benefits are balanced. The socially optimal interchange fee according to this framework is called the "Baxter fee." If paid by the acquiring bank to the issuer bank, it consists of the transactional benefits of the merchant minus the acquiring costs. The higher the merchant's transactional benefits, the higher the potential interchange fee and the lower the net card-holding customer fee.

Baxter's framework has long been accepted by regulators and resulted in a widespread acceptance of the existence of interchange fees. But the framework, as implemented by regulators, takes into account only issuing and acquiring costs and does not capture all the dynamics at play in a payment card system. Rochet and Tirole (2002) showed that when card acceptance can generate additional sales for merchants, the optimal interchange fees account for this, and they will be determined in a different way than calculated in a standard application of Baxter (1983).[34] When there are benefits for cardholders that accrue to the merchants in terms of higher revenues, merchants will be willing to support a higher interchange fee than the one predicted by Baxter's model in order to offer customers a "discount" for these benefits. Increased sales in Rochet and Tirole (2002) come from the diversion of sales away from competitors but one can also consider an increase in sales due to the ability to bring forward purchases in time or the ability to carry out unplanned purchases, as well as increased customer satisfaction with the purchasing experience.[35]

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32 Özlem Bedre-Defolie and Emilio Calvano, "Pricing Payment Cards," *American Economic Journal: Microeconomics* 5(3) (August 2013): 206–231.

33 William F. Baxter, "Bank Interchange of Transactional Paper: Legal and Economic Perspectives," *The Journal of Law and Economics* 26 (3) (October 1983): 541–588.

34 Jean-Charles Rochet and Jean Tirole, "Cooperation among competitors: some economics of payment card associations," *RAND Journal of Economics* 33(4) (Winter 2002): 549–570.

35 See, for example, the analysis of the interchange fee when merchants increase sales when credit is granted to customers in: Sujit Chakravorti and Ted To, "A Theory of Credit Cards," *International Journal of Industrial Organization* 25(3) (June 2007): 583–595.

The interchange fee set by a payment network will depend on its objective. It is common to assume that a card payment system maximizes the usage of its payment card in order to maximize its private profit. How much these two objectives actually differ will depend on the extent of market power in the issuing or acquiring markets, since market power can allow increases in fees that increase profits even at the expense of sales. The privately optimal interchange fee will in all cases be determined by taking costs and benefits into account on both the acquiring and the issuing sides. Assuming a "no surcharge" rule, imperfect competition in the issuing market, and a competitive setting for merchants, Rochet and Tirole (2002) show that the optimal interchange fee for a private system trying to maximize card usage will be set by equating the average benefit to cardholders to the net cost of the merchant taking into account all its transactional benefits.[36] If customers are sensitive to whether a merchant accepts payment cards when choosing to buy, the merchant will experience an additional cost from not accepting the card—or a larger net benefit from accepting it.[37] This will increase his acceptance of a higher merchant service fee, which may become larger than the net transaction savings. On the other hand, if the MSC is too high due to a higher interchange fee, then merchants will cease accepting card payments. This happens when cardholders have been subsidized to use cards to the point where the transaction cost of the payment system becomes higher than the average benefits of cardholders.

Note that this decision to opt out of the card system depends not only on cost, but also on the average benefit that cardholders get from cards. Most two-sided market models of open network systems attempt to describe the extent to which merchants will be willing to pay for the convenience that card payments provide to cardholders. They will clearly do so only when this convenience results in higher sales either due to competitive advantage or because card payment systems increase the overall value of sales.[38] Some factors may limit these indirectly derived benefits and increase merchants' resistance to the interchange fee. For example, if merchants have market power, they will value the transactional benefits of the cardholders to a lesser extent when deciding to accept card payments, since they can already extract consumer surplus.[39] They will face a higher resistance to an interchange fee, which will get closer to the Baxter level that is determined only by the merchant's net transaction savings. The fact that the interchange fee is lower when the market power of merchants is high is solely a reflection of the fact that merchants do not have large gains from offering card payment services, since customers are less likely to defect to competing retailers. The net benefits from payment card usage are then lower, reducing merchants' acceptance of it.

A proposed method to calculate a consumer welfare-maximizing interchange fee (as opposed to the profit- or usage-maximizing fees mentioned above) is described as being the results of the "merchant indifference" test.[40] This method aims at setting fees so as to make the merchant indifferent to the method of payment chosen by the customer at the point of sale.[41] In other words, the merchant service charge is such that accepting the card does not increase the merchant's net operating costs, and the

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36 Jean-Charles Rochet and Jean Tirole, "Cooperation among competitors: some economics of payment card associations," *RAND Journal of Economics* 33(4) (Winter 2002): 549–570.

37 *Ibid.*

38 Most economic literature takes the total value of the transaction as given and focuses on the competitive advantage of providing card payments. One can imagine that the removal of intertemporal constraints and the increase in access to credit increase the overall size of retail purchases at the expense of savings.

39 Julian Wright, "Optimal card payment systems," *European Economic Review* 47(4) (2003): 607-608.

40 See Joseph Farrell, "Efficiency and Competition between Payment Instruments," *Review of Network Economics* 5(1) (2006): 33; Jean-Charles Rochet and Jean Tirole, "Must-Take Cards: Merchant Discounts and Avoided Costs," *Journal of the European Economic Association* 9(3) (June 2011): 469, 483.

41 *Ibid.*

merchant does not pay more for than the convenience benefit for card transactions. In this way, there is "price coherence" as merchants offer the same price irrespective of the payment method chosen, and customers' choices do not distort payment system competition with their choice of payment. This method prevents merchants from being "forced" to accept card payments they do not want and the related increased cost of payment. The interchange fee derived from this test has been proposed as a possible regulatory cap, with cash used as the alternative payment method to cards. It is important to note that this test is meant to make the merchant indifferent between payments at the point of sale once the customer has walked into the store. Any benefit derived from a higher ability to attract customers to the store is assumed away. Because of this, the resulting interchange fee is the one that maximizes customer welfare in the short term, not taking into account longer term feedback effects.

There are also other complications with this methodology. As payment systems diversify, one would have to learn more about customers' payment preferences to evaluate the choices relevant for the test. The objectives pursued by such intervention may not be achieved when merchants are heterogeneous and derive different convenience benefits from card payments. With the likely scenario of imperfectly competitive issuers, the interchange fee derived from the merchant indifference test maximizes consumer welfare but is lower than required to maximize social welfare so that card usage is inefficiently low.[42]

The interchange fees discussed above present not only some conceptual issues, such as their relation to the socially desirable fee, but also significant computational challenges. Although conceptually simple, the existence of merchant heterogeneity, multiple payment instruments, consumer heterogeneity, and an unobvious allocation of costs complicates the calculation well beyond the expected issues relating to the quality of the data. The disparity in the interchange fees selected by regulators for those markets in which they intervened (see Appendix I) is testimony to the heterogeneity of situations and the complexity of the determination exercises.

3.1.3. Motivations for the "No Surcharge" Rule

The interchange fee serves the useful purpose of reallocating costs across merchants and card-holding customers, taking into account benefits and willingness to pay on both sides. The "no surcharge" rule adopted by most card payment systems prevents merchants from surcharging card-paying customers. This rule is necessary for the interchange fee to play a role in balancing demand by cardholders and merchants and to maximize network benefits. In theory, if merchants are allowed to surcharge card-paying customers in a way that fully passes on the interchange fee, there will be *de facto* no transfer of card usage benefits from merchants to consumers, as a surcharge will give back to the merchant what they paid to the issuing bank via interchange fees.[43] Merchants in this scenario will benefit from consumer adoption of payment cards without compensating these consumers for any gain. In this way, the ability to surcharge neutralizes the interchange fee and in principle makes it pointless.

The "no surcharge" rule will be useful only when it makes a difference in the ability (or incentives) of the merchants to pass to the customers the full cost of the card transaction. If merchants have sufficient market power, they in any case will indiscriminately charge users for the transactional benefits of the card payment option, as they do not need to give away this convenience to attract customers. In this

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42 Jean-Charles Rochet and Jean Tirole, "Must-Take Cards: Merchant Discounts and Avoided Costs," *Journal of the European Economic Association* 9(3) (June 2011): 476-477.

43 Joshua S. Gans and Stephen P. King, "The Neutrality of Interchange Fees in Payment Systems," *Topics in Economic Analysis & Policy* 3(1) (2003).

case, having the possibility to surcharge does not make a real difference.[44] In fact, adding a "no surcharge" may actually limit the overcharge by a powerful merchant, as cardholders experiencing transaction benefits can no longer be specifically targeted with higher prices. In the presence of powerful merchants, the "no surcharge" rule may therefore increase the usage of cards by limiting the ability of the merchant to extract all of the consumers' card payment benefits.

The "no surcharge" rule can be efficient when issuing banks want to charge a fixed annual fee. There are many reasons why issuing banks may want to introduce a fixed yearly fee in addition to a transaction fee. The fixed fee may serve to cover sign-up fixed costs, but it can also be used to ensure that cardholders use the card. Only cardholders that derive some benefit from the payment card will accept a fixed-fee payment, and this will eliminate low usage customers that derive little benefit from the scheme. The ability to surcharge and, in particular, the ability of powerful merchants to overcharge may strongly hurt the card system adoption as customers see all their transactional benefits extracted by the merchant while they still have to pay a fixed fee.[45] This is a problem that no individual issuing bank can resolve on its own, as lowering the fixed fee might entail an adverse selection of customers. A "no surcharge" rule in the case of powerful merchants and a competitive issuing market is likely to be efficient in preserving the attractiveness of card payment systems in the presence of such two part tariffs for cardholders.

When there is strong competition between merchants, surcharging does not neutralize the impact of the interchange fee if consumers are not fully informed ex-ante about merchants' card payment policies (and the cost of shopping for a retailer is high, possibly because of time invested).[46] Under such circumstances, the interchange fee will remain relevant for consumer and merchant behavior even with surcharging, as consumers imperfectly observe the transaction costs they will face at the point of sale. Allowing surcharging has ambiguous effects on social welfare. If the "no surcharge" interchange fee maximizes card usage in a way that is socially optimal, then total welfare decreases with surcharging as merchants recover their costs at point of sale and card usage is decreased. In other cases, social welfare may be increased or decreased depending on the level of the interchange fee, and allowing surcharge will only be optimal when the interchange fee is above a certain threshold.[47] When the interchange fee is consistent with the merchant indifference test, as regulators in the EU want it to be, surcharges will be inefficiently high and will lead to the underuse of cards.[48] Finally, another reason why the ability to surcharge can produce a suboptimal market outcome is that, in setting their individual prices, merchants take card acceptance as a given and ignore the aggregate effect of their surcharging behavior on general card acceptance. The "no surcharge" rule contributes to eliminating such opportunistic behavior by merchants.[49] Current theories do not fully explain observed surcharging behavior; where surcharging is allowed, it has been hard to explain the heterogeneity and level of adoption of the practice among merchants.[50]

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44 Julian Wright, "Optimal card payment systems," *European Economic Review* 47(4) (2003): 606.

45 *Id.*, at 599.

46 Hélène Bourguignon, Renato Gomes, and Jean Tirole, "Shrouded Transaction Costs: Must-take Cards, Discounts and Surcharges," Toulouse School of Economics (April 2018), accessed September 26, 2018, https://www.tse-fr.eu/sites/default/files/TSE/documents/doc/by/tirole/bourguignon_gomes_tirole_april_2018.pdf.

47 *Ibid.*

48 *Ibid.*

49 Julian Wright, "Optimal card payment systems," European Economic Review 47(4) (2003): 606.

50 Marc Rysman and Julian Wright, "The Economics of Payment Cards," *Review of Network Economics* 13(3) (2014): 303-353.

3.2. Effect of Competition on Interchange Fees

Interchange fees may not be lowered by increased competition.[51] It is important to remember that the interchange fee does not revert to the payment system in the form of a revenues but rather consists of a transfer between the issuer and the acquirer. The magnitude of the interchange fee is not indicative of market power or of the market share. In the face of a competitive threat, the payment card system will adjust the structure of the fees in order to increase the benefits to the type of participants more likely to defect. This change in the price structure need not be welfare improving.[52]

In the presence of market power, it is not clear that it is advantageous for either issuing banks or acquiring banks to grossly manipulate fees in their favor. If a monopolist acquirer exerts downward pressure on the interchange, the impact on issuers would lead to higher cost for payment cards, discouraging cardholders to the detriment of the whole system as the number of card transactions would decrease. Similarly, a monopolist issuing bank that demanded higher interchange fees would risk losing merchants' acceptance of the system, which would decrease the number of cardholders and card transactions. Such indirect effects may constrain the exercise of market power if it were to exist on any side of the payment system. Competition in the card issuing markets would contribute to eliminating the incentives to solicit a higher than optimal interchange fee, as the additional marginal revenue would be competed away in favor of cardholders so that there would be no additional profit to compensate for a possible lower acceptance by merchants. The level of competition that most affects the ability of issuing banks to appropriately set interchange fees is occurring at the merchant level rather than among issuing or acquiring banks.[53]

The impact of competition on interchange fees will depend on whether cardholders hold more than one card, a concept known as "multihoming."[54] If cardholders have only one card, competition will center on the enrollment of cardholders and the interchange fee will rise to allow issuers to make attractive offers.[55] Once the consumer has adopted a card, this will be the only one used and will impact merchants' incentives. If customers hold multiple cards, competition will center on the merchant's acceptance of the card with lower interchange fees. When merchants or consumers can join more than one platform, the impact of platform competition on the interchange fee will depend on which side benefits the most with a new option.

Other research has not been able to establish a link between the degree of competition, interchange fees, and cardholder or merchant welfare.[56] This theoretical indetermination of the impact of payment system competition on the level of interchange fees is consistent with an empirical lack of correlation between the degree of competition among payment systems in a market, measured in terms of concentration, and

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51 Graeme Guthrie and Julian Wright, "Competing Payment Schemes", *The Journal of Industrial Economics* 55(1) (March 2007): 59.

52 *Id.*, at 45-46.

53 Joshua S. Gans and Stephen P. King, "The Neutrality of Interchange Fees in Payment Systems," *Topics in Economic Analysis & Policy* 3(1) (2003).

54 Graeme Guthrie and Julian Wright, "Competing Payment Schemes," *The Journal of Industrial Economics* 55(1) (March 2007): 47.

55 *Id.*, at 38-39.

56 See *e.g.,* Jean-Charles Rochet and Jean Tirole, "Platform Competition in Two-sided Markets," *Journal of the European Economic Association*, 1(4) (June 2003): 990-1029.

the levels of the prevalent interchange fees.[57] Nevertheless, some evidence points to a possible positive effect of intersystem competition on the level of interchange fee, pointing to the possibility that issuers or cardholders may be benefiting the most from multiple payment card schemes.[58] But the main inference from that empirical work is that the interchange fee depends on the complex interaction of the decisions of merchants and consumers, along with the market conditions underlying payment card services, such as regulation and degree of competition.[59]

3.3. Welfare Implications of Constraining Interchange Fee Systems

One of the most accepted models of interchange fees, described in Rochet and Tirole (2002), shows how the internalization of cardholder benefits by merchants can result in the privately optimal interchange fee being higher than the socially optimal one, with the result of an over-supply of payment cards.[60] A socially optimal interchange fee is set to equate the total transaction marginal cost of a card payment transaction to its total marginal benefit. It considers only net transaction benefits and does not include any macroeconomic impact of the card payment system. The socially optimal interchange fee, unlike the privately optimal fee, is not affected by the distribution of costs and benefits among issuers and acquirers or among merchants and customers. This distribution will affect the private optimal interchange fees and its relation to the socially optimal level.

Ultimately, there is a broad consensus among scholars that the privately optimal fee will not necessarily equal the socially optimal fee and that the difference between the private and social optima is in general ambiguous, both in direction and magnitude.[61] Hence, without contextually specific insight and a generally accepted empirical framework, constraining interchange fees can cause a decrease in social welfare as easily as it could cause an increase. Moreover, even if the directional relationship between the social and private optima was known, policy intervention would still be risky with respect to its impact on social welfare. Without knowing the magnitude of the difference, policymakers will be unable to properly compare the benefits of intervention to the potential costs (both intentional and unintentional) of intervention.

Convincing work has been done towards understanding the consumer welfare effects of constraints on the interchange fees. In particular, market concentrations (as a proxy for market power) on acquiring and issuing sides of payment card platforms can be used to gain insight into how a change in fees will be passed through.[62] A cap on interchange fees will in theory cause an increase in bank fees faced by cardholders and a decrease in merchant prices faced by all consumers. These will have countervailing effects on consumer welfare, making the net effect generally ambiguous. However, in many countries,

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57 Marc Rysman and Julian Wright, "The Economics of Payment Cards," *Review of Network Economics* 13(3) (2014): 303–353.

58 *Ibid.*

59 Stuart E. Weiner and Julian Wright, "Interchange Fees in Various Countries: Developments and Determinants," *Review of Network Economics* 4(4) (December 2005): 291.

60 Jean-Charles Rochet and Jean Tirole, "Cooperation among competitors: some economics of payment card associations," *RAND Journal of Economics* 33(4) (Winter 2002): 549-570.

61 David Evans and Richard Schmalensee, "The Economics of Interchange Fees and Their Regulation: An Overview," MIT Sloan School of Management Working Paper 4548-05, May 2005, p. 5, accessed July 12, 2018, https://dspace.mit.edu/bitstream/handle/1721.1/18181/4548-05.pdf?sequence=1.

62 David S. Evans and Abel M. Mateus, "How Changes in Payment Card Interchange Fees Affect Consumers Fees and Merchant Prices: An Economic Analysis with Applications to the European Union," SSRN Electronic Journal (June 27, 2011), accessed July 5, 2018, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1878735.

asymmetries exist between the issuer and acquirer sides that are likely to result in consumers experiencing a net decrease in consumer welfare. This is because consumer banking tends to be less concentrated than merchant banking, which may indicate the former is more competitive than the latter. Hence, a greater portion of the change in interchange fees may be passed through on the issuer side compared to the acquirer side. This incorporation of ideas from the cost pass-through literature is informative and could potentially be applied to both the consumer and merchant sides of the platform to estimate social welfare. However, the use of relative pass-through rates alone will at best result in an incomplete measure of welfare effects. This is because it accounts only for the changes in direct costs and not the changes in behavior—such as reduced card usage—that will affect welfare.

Although the direction and magnitude of the difference between the social and private optimal interchange fees are in general ambiguous, there has been recent work conducted to understand the specific conditions in which the directional difference is unambiguous. For example, certain combinations of specifically-shaped demand curves, pass-through rates, merchant internalization of customers' benefits, and the ability to price discriminate (among other assumptions) can be shown to lead to an excessive interchange fee.[63]

Most regulators today accept the theoretical relevance of two-sided markets and consider it good practice to acknowledge indirect feedback effects. The recent U.S. Supreme Court decision concerning American Express' "no-steering" rule goes even further and considers that the impact of commercial conduct in some two-sided markets needs to be assessed looking at the total output effect rather than at the impact on a particular side.[64] This decision considers that two-sided markets in which the two sides meet for a transaction and where indirect network externalities are strong should be analyzed as one market. This approach aims to capture the fact that both the direct and indirect benefits of a commercial decision, via its effect on the counterparty of the transaction, must account for the assessment of the impact of a conduct. It is too early to know the regulatory impact of this decision and it is not certain other jurisdictions will take a similar approach.

The extent to which the full implications of two-sided market theory are accepted will become apparent when the regulatory interventions of the past decade come up for review. Most of these interventions originated from complaints by merchants. As card usage started to expand in the late 1990s, and banks engaged more aggressively in the card issuing market, increasing incentives for cardholders, merchants started to complain that the fees they paid for the banks that processed card payments were excessive. This prompted regulatory scrutiny of interchange fees that resulting in interventions in several jurisdictions. A summary of the interventions is presented in Appendix I, which illustrates the extent of the regulatory reach. These interventions sometimes relied on questionable economic assumptions such as the impact of a presumed lack of competition among payment services. The interventions often imposed constraints on interchange fees based on cost parameters. Economic research on two-sided markets provides many reasons why these assumptions do not hold. Little has been done within the regulatory processes in trying to identify and measure the nature and dimension of externalities and indirect benefits—even though the premise that merchants internalize some indirect benefits from their customers' access to cards is critical in the analysis of two-sided markets and interchange fees.[65]

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63 Julian Wright, "Why payment card fees are biased against retailers," *RAND Journal of Economics* 43(4) (Winter 2012): 761–780.

64 Ohio v. American Express.

65 For one of the few attempts see *e.g.*, Daniel D. Garcia-Swartz, Robert W. Hahn, and Anne Layne-Farrar, "The Move Toward a Cashless Society: A Closer Look at Payment Instrument Economics." *Review of Network Economics* 5(2) (2006): 175–198.

4. Regulatory Interventions in Card Payment Systems

Initially, investigations of interchange fees focused on the merchant side, as merchants compared the fees they paid with the cost of the service they received. But as the economic analysis of card payment markets became more sophisticated, most regulators adopted a similar reasoning: the payment schemes were providing incentives to individual cardholders in order to promote card adoption and usage and they shifted these costs to the merchants who shouldered an undue share of the card payment transactions costs. Some regulatory bodies concluded that such promotion of payment cards to users was considered to be excessive and inefficient. In this section, we review these arguments in detail as well as the economic assumptions underpinning the narrative that motivates regulatory actions. We then examine whether the regulatory intervention managed to produce its desired effects.

4.1. Motivations for Regulatory Intervention

4.1.1. Excessive Merchant Service Fees

Intervention by regulators in the determination of interchange fees has been primarily motivated by the belief that merchants were paying excessive fees for participating in the payment card scheme. By setting a default interchange fee, the associations of banks governing the payment schemes were de facto setting a floor to any bilaterally negotiated interchange fees and, by extension, to the MSC, which consists of the interchange fees and the fees charged by the acquirer for transaction-related services.

In its reasoning of the 2002 Visa II decision,[66] the European Commission considered that the proper interchange fee should be calculated to pay for the services that the issuing bank was providing to the merchant via the acquiring bank.[67] These services were the processing of transactions, the payment guarantee, and the free funding period. The cost of these services would determine the appropriate cap for the interchange fee.[68] The same reasoning was applied in the European Commission's decision against MasterCard in 2007 and in the U.S. government's adoption of the "Durbin Amendment" that capped debit interchange fees in 2011.[69] In that context, the U.S. Federal Reserve, the entity responsible for implementing this rule, clarified that the costs to be used for the determination of the debit interchange fee were the costs of the issuer for authorizing, clearing, processing, and settling the transaction as well as the transaction monitoring costs for the purpose of fraud prevention. All costs that were not transaction-specific were to be excluded from the determination of the interchange fee.[70]

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66 *See* Appendix I.

67 Commission of the European Communities, Commission Decision of 24 July 2002 relating to a proceeding under Article 81 of the EC Treaty and Article 53 of the EEA Agreement, COMP/29.373 (2002), Section 3.2.3.2.

68 *Ibid.*

69 Commission of the European Communities, Non-Confidential Version of the Commission Decision of 19 December 2007, COMP/34.579 MasterCard, COMP/36.518 EuroCommerce, and COMP/38.580 Commercial Cards (2007) ("Commission Decision of December 19, 2007 in case COMP/34.579"). See also: "Federal Reserve issues a final rule establishing standards for debit card interchange fees and prohibiting network exclusivity arrangements and routing restrictions," Board of Governors of the Federal Reserve press release, June 29, 2011, accessed June 13, 2018, https://www.federalreserve.gov/newsevents/pressreleases/bcreg20110629a.htm.

70 "2011 Interchange Fee Revenue, Covered Issuer Costs, and Covered Issuer and Merchant Fraud Losses Related to Debit Card Transactions," Board of Governors of the Federal Reserve System, March 5, 2013, p. 29 at footnote 30, accessed September 14, 2018, https://www.federalreserve.gov/paymentsystems/files/debitfees_costs_2011.pdf.

When it regulated interchange fees, the Reserve Bank of Australia adopted a cost-based benchmark to assess the appropriate level of the interchange fee. The benchmark was based on the average costs of the issuers of the designated payment schemes, meaning the schemes subject to the regulation.[71] In all cases, that the interchange fee was found to be higher than the estimated costs of the transaction for the issuing bank was considered evidence that it was inefficiently high.

The benchmark considered for the appropriate interchange fee was somewhat different in the 2010 European Commission decision accepting commitments by Visa for cross-border debit cards and default national interchange fees.[72] In this decision, the Commission accepted the validity of the "merchant indifference test" to determine an appropriate merchant service charge.[73] The benchmark for the EU regulated interchange fees is now in principle based on relative costs, more specifically on the net transaction benefits for the merchants from being paid with a card rather than cash—or the next best alternative. As previously noted, the interchange fee so determined, assuming it is properly calculated, maximizes consumer welfare only in the short term. It ignores the effect from issuers' reduced ability to incent cardholders to use cards, which in turn reduces merchants' value of accepting cards. Another problem with this methodology of determining the appropriate interchange fee is that the next best alternative may vary by transaction. For example, online sales cannot be paid with cash.[74]

Over time, the debate shifted to the amount of card usage incentives that would result in a payment system's costs shifting from users to merchants. The prevailing argument was that interchange fees created an environment of excessive promotion of payment cards to the detriment of the overall efficiency of payment services in the economy.

4.1.2. Excessive Issuance of Inefficient Payment Cards

As explained earlier, the interchange fee used by open network payment schemes allows for the value of the system to be distributed with a fair amount of flexibility across merchants and cardholders for the purpose of optimally incentivizing users. This mechanism works to the advantage of both cardholders and merchants but results in merchants paying an interchange fee that may increase with the incentives given to cardholders. Some regulators mentioned the card system's objective to increase their diffusion as the explanation of the higher than expected interchange fee that they observed.[75] The regulatory

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71 "Review of Card Payments Regulation," Reserve Bank of Australia Issues Paper, March 2015, Section 2, p. 5, accessed July 26, 2018, https://www.rba.gov.au/payments-and-infrastructure/review-of-card-payments-regulation/pdf/review-of-card-payments-regulation-issues-paper.pdf.

72 European Commission, *Non-Confidential Version of Commission Decision of 8.12.2010 relating to proceedings under Article 101 of the Treaty on the Functioning of the European Union and Article 53 of the EEA Agreement*, COMP/39.398—Visa MIF, (2010).

73 *Id.*, at 9.

74 Wilko Bolt, Nicole Jonker, and Mirjam Plooij, "Tourist test or tourist trap? Unintended consequences of debit card interchange fee regulation," Dutch National Bank Working Paper No. 405, December 2013, p. 24, accessed June 11, 2018, https://www.dnb.nl/en/binaries/working%20Paper%20405_tcm47-301519.pdf. Specifically, the Tourist test yields "false positives" if cardholders' incentives are distorted or merchants are heterogeneous. The validity of test depends on issuers' having constant margins.

75 Both the European Commission and the Reserve Bank of Australia have linked the interchange fee to a goal of expanding the usage of a particular card scheme—although they consider this mechanism to be ultimately inefficient due to the costs shifted to merchants. See: Commission Decision of December 19, 2007 in case COMP/34.579, ¶¶ 679-690. See also: "Payment System Reforms," Reserve Bank of Australia press release, April 27, 2006, accessed June 13, 2018, https://www.rba.gov.au/media-releases/2006/mr-06-02.html, which

concern was that payment cards were subsidized beyond what would be justified under efficiency criteria with merchants being compelled to accept payment cards for risk of losing the transaction. Contributing to this inefficiency would be the fact that cardholders are not made aware of the costs of the payment method they use, which prompts them to use their cards based only the benefits they derive and without concern about the cost to the merchant. As a consequence, cardholders would use the card in instances where the relative benefit of using a payment card is less than the additional cost of the card payment to the merchant. The regulatory analysis did not allow for the calculation of aggregated benefits, let alone for the netting of the costs and benefits of the system across different users.

The demise of some national debit card schemes in the EU and the loss of market share of the national EFTPOS system in Australia to the benefit of the international schemes have been taken as examples of the over-penetration of more expensive international payment schemes.[76] This argument was used despite the fact that it has been recognized that the displaced schemes were less apt at adapting to technological innovation and customer demands. In fact, the described line of reasoning is based solely on the observed costs of the payment system and does not attempt to take into account wider relative benefits, such as increased overall sales due to the availability of card payments or the increased level of security in payments. It is interesting to note that the EFTPOS system in Australia adopted an interchange fee in 2011 under the blessing of the Reserve Bank of Australia, which thought the previous system of bilateral arrangements in which the issuing banks paid the acquiring banks was not suited for innovation and end user demand.[77] In fact, despite misgivings about the amount of the interchange fee, there was acceptance that the interchange fee structure could generate efficiencies by properly allocating value between cardholders and merchants. Yet, the different elements of these efficiencies were not fully explored.

The low price and financial incentives offered to cardholders by issuing banks have generally not been interpreted by intervening regulators as signs of vibrant competition among card schemes. In its 2007 MasterCard decision, the European Commission interpreted parallel increases of interchange fees as a sign of coordination rather than as a sign of more intense competition in card issuance.[78] The opinion remained that there was an excessive recourse to payment cards indirectly financed by merchants to the benefit of international payment card systems.

4.1.3. Price Obfuscation Mechanisms

The narrative underlying regulatory intervention rests on an inefficient lack of responsiveness by merchants to the allegedly excessive fees that they are paying. The "must carry" nature of the different payment cards has been invoked as the reason why the payment schemes had the power to impose the fees on merchants without causing them to drop out. Payment systems' rules commonly seek to prevent

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expresses concerns that a higher interchange fee will lead to the promotion of Visa debit over Electronic Funds Transfer at Point of Sale (EFTPOS).

76 See, for example, the Joint Study by the Reserve Bank of Australia and the Australian Competition and Consumer Commission: "Debit and Credit Card Schemes in Australia, A Study of Interchange Fees and Access," Reserve Bank of Australia and Australian Competition and Consumer Commission, October 2000, accessed September 14, 2018, https://www.rba.gov.au/payments-and-infrastructure/resources/publications/payments-au/interchg-fees-study.pdf.

77 "Review of the Regulatory Framework for the EFTPOS System: Consultation on Options for Reform," Reserve Bank Australia, June 2012, pp. 5-6, accessed June 13, 2018, https://www.rba.gov.au/publications/consultations/201206-rev-reg-frmwrk-eftpos-sys/pdf/201206-rev-reg-frmwrk-eftpos-sys-doc.pdf.

78 Commission Decision of December 19, 2007 in case COMP/34.579.

merchants from surcharging customers for using payment cards and from discriminating among cards used. Such "no surcharge," "no steering," and "honor all cards" rules have been considered as mechanisms that impaired proper price signals to work efficiently. The "no surcharge" rule prevented merchants from charging cardholders for more expensive cards and the "honor all card rules" prevented merchants from not accepting the expensive cards of any payment schemes. Their application was perceived as a means of price obfuscation, preventing the cardholders' exposure to the true cost of the payment instrument they chose. Due to these rules, customers at a store chose their payment method only according to their benefit without consideration of the merchant's cost. These system rules facilitated price discrimination in card systems to the benefit of issuing banks and to the detriment of merchants that had to accept costly high service cards. All in all, intervening regulators have considered that the combination of the interchange fees and the payment scheme rules produced price signal distortions resulting in inefficiency in the payment system in the form of over-usage of relatively expensive payment services. The Reserve Bank of Australia, for example, eliminated the "no surcharge" rule of international schemes as early as 2003.[79]

4.1.4. Economic Assumptions Behind Interventions

The arguments described above rely on a series of economic assumptions that were not always made explicit by regulators, let alone empirically tested. These are worth explaining, as the corroboration of these assumptions (or lack thereof) will have an impact on the accurateness of the regulatory narrative and on the effectiveness of the derived regulatory intervention. The implicit assumptions under many of the interventions were the following:

Assumption 1: Merchants must accept payment cards even when they would prefer not to

Regulatory intervention has relied on a supposed inability of merchants to reject a system that does not provide net benefits to them. Under this assumption, the degree of merchants' acceptance of payment cards plays little role in the penetration of these cards among cardholders, and it is the cardholders that determine the acceptance level of a card system in the economy. The approach that merchants are somehow forced into this inefficient payment system leads to the conclusion that competition alone will not resolve the issue of high interchange fees for merchants. This relies on the assumption that consumers will choose merchants based on the ability to use the payment cards that bring them benefits and will value these cards irrespective of their acceptance level by merchants. Because of this, merchants are unable to decline card schemes that they do not find profitable. In sum, the lack of competition is the result of a system of rules that promote a cardholder-driven market where consumers make inefficient choices. Economic literature has justified this "must-take" characteristic of cards on the need to compete on convenience to retain or attract sales from competitors but has failed to explain why such competition survives in a sub-optimal environment.[80] Assessments of the efficiency of payment card systems largely ignore the full implications of the interactions and feedback effects between cardholders and merchants, as they have been subsequently described in the two-sided market literature.[81] In

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79 "Review of Card Payment Regulation," Reserve Bank of Australia Issues Paper, March 2015, p. 12, accessed July 26, 2018, https://www.rba.gov.au/payments-and-infrastructure/review-of-card-payments-regulation/pdf/review-of-card-payments-regulation-issues-paper.pdf.

80 See for example Jean-Charles Rochet and Jean Tirole, "Must-Take Cards: Merchant Discounts and Avoided Costs," Journal of the European Economic Association 9(3) (June 2011): 476-477.

81 Bourguignon, Gomes, and Tirole (2018) include for the first time the sales generating impact of card payments in their analysis of card usage by linking the decision to shop to the payment transaction cost. Hélène Bourguignon,

particular, the assessment of the role of card payments in increasing aggregate sales has been largely neglected.

Assumption 2: The correct benchmark for the interchange fee is determined by cost measures.

The existence of the interchange fee has been accepted as a valid business model in all jurisdictions but regulators have generally considered that the benchmark for the interchange fee needed to be directly determined by the cost of the services provided. This has been argued for both the determination of the interchange fee and of the MSC. The determination of the interchange fee according to the merchant indifference test represents an evolution towards utility-based pricing as it anchors the interchange fee on the relative benefits of card payment transactions to the merchant. Still, only transactional benefits are considered in that analysis. In practice, the benefits in the merchant indifference test have been measured only in terms of cost savings so that the methodology as applied is still focused on costs and continues to ignore the indirect benefits that merchants obtain from customers' access to cards. These indirect benefits can take the form of increased overall sales thanks to consumers' increased access to liquidity or credit provided by the payment card. Underlying the cost-based approach to interchange fees is the assumption that the merchant does not value credit card systems beyond the possible transaction costs savings that it provides at point of sale.

Assumption 3: Incentives to promote card usage are suboptimal for the economy.

Regulatory intervention presupposes that the impact of a higher penetration of cards does not generate any value for merchants beyond the transaction costs savings at the point of sale. This somewhat negates the impact of card payments in generating more efficient payments and more sales in the economy at large. The assumption that access to credit cards or high-quality debit cards does not have an impact on the number of transactions would merit empirical validation, in particular if we take into consideration the rise of online and distance transactions, the increase of cross border transactions, increased demand for fast and trusted payment systems, or trends in liquidity constraints. Such an increase in the efficiency level of the system would be the only justifiable argument for an intervention that would result in a rent transfer between cardholders and merchants. Yet, such welfare analysis has not been performed. Instead the following presumptions are held: (i) the penetration of payment cards to consumers does not have a positive impact on merchants' total sales; (ii) the expansion of card payment systems does not increase the overall efficiency of payments for the larger economy—for example, in terms of security, fraud prevention, transaction monitoring, or facilitating merchant-cardholder relationships including disputes.

Assumption 4: Payment system rules help maintain market power and inefficient price discrimination

Payment schemes rules such as the "honor all cards" rule and the "no surcharge" rule have been assessed by some regulators as mechanisms of price obfuscation preventing cardholders from understanding the payment card's costs, which in turn has prevented or softened competition among card systems. But this presupposes an alternative scenario in which the merchants would optimally price different cards at the point of sale. As we have seen, there is no reason to assume merchants would not try to overprice the least favorable cards to them at the time of payment and there is ample empirical evidence of excessive surcharges when surcharges occur.

Renato Gomes, Jean Tirole, "Shrouded Transaction Costs: Must-Take Cards, Discounts and Surcharges," Toulouse School of Economics (2018), accessed September 26, 2018, https://www.tse-fr.eu/sites/default/files/TSE/documents/doc/by/tirole/bourguignon_gomes_tirole_april_2018.pdf.

The set of assumptions made by regulators and the conclusions that they generated led to a regulatory drive that saw wide intervention in card payment systems over the last two decades. The history of these interventions and how they spread is worth recounting briefly.

4.2. Summary of Regulatory Interventions

In the last couple of decades, both Visa and MasterCard faced litigation regarding interchange fees that resulted in regulatory intervention in various countries. National payment card fee regulation can be traced to 1990 in Denmark; the 1990 Act on Certain Payment Instruments capped the merchant service charge of internationally branded payment cards issued by Danish banks at 0.75 percent of the transaction value.[82] Regulatory authorities in Australia first raised questions about interchange fees in a 1992 report on credit card interest rates by the Prices Surveillance Authority (PSA).[83] But a regulatory drive began in earnest in the early 2000's with the European Commission's striking an agreement with Visa in 2002 to reduce their weighted average interchange fee to 0.7 percent by the end of 2007, and the Australian Federal Reserve initiating an in-depth inquiry of payment system fees.[84] Various other countries followed with their own investigations and regulatory interventions.[85]

Between the years 2003 and 2017, as many as 37 countries' took some form of regulatory action related to interchange and merchant service fee and 22 set regulatory limits to interchange fees.[86] The amounts or ranges chosen as acceptable fees have varied considerably, spanning between 0.3 percent in the European Union and an average of 1.5 percent in Canada for the case of credit card payments.[87] Regulatory interventions addressed both the credit and debit card interchange fees of international open network card schemes such as Visa and MasterCard as well as on occasion domestic payment schemes such as EFTPOS in Australia or Groupement des Cartes Bancaires in France.[88] The interventions varied in scope across jurisdictions and scrutiny extended to card scheme rules in many instances. For example, the "no surcharge" rule, preventing merchants from passing-on the MSC fees related to payment card

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82 Fumiko Hayashi and Jesse Leigh Maniff, "Public Authority Involvement in Payment Card Markets: Various Countries, August 2017 Update," Federal Reserve Bank of Kansas City, August 2017, p. 4, accessed June 13, 2018, https://kansascityfed.org/~/media/files/publicat/psr/dataset/pub-auth_payments_var_countries_august2017.pdf.

83 "Debit and Credit Card Schemes in Australia: A Study of Interchange Fees and Acess," Reserve Bank of Australia and Australian Competition and Consumer Commission, October 2000.

84 Commission of the European Communities, Commission Decision of 24 July 2002 relating to a proceeding under Article 81 of the EC Treaty and Article 53 of the EEA Agreement, COMP/29.373 (2002), Section 3.2.3.1; "Debit and Credit Card Schemes in Australia, A Study of Interchange Fees and Access," Reserve Bank of Australia and Australian Competition and Consumer Commission, October 2000, accessed September 14, 2018, https://www.rba.gov.au/payments-and-infrastructure/resources/publications/payments-au/interchg-fees-study.pdf.

85 Fumiko Hayashi and Jesse Leigh Maniff, "Public Authority Involvement in Payment Card Markets: Various Countries, August 2017 Update," Federal Reserve Bank of Kansas City, August 2017, accessed June 13, 2018, https://kansascityfed.org/~/media/files/publicat/psr/dataset/pub-auth_payments_var_countries_august2017.pdf.

86 *Id.*, at 2-12.

87 *Id.*, at 3-4.

88 *Id.*, at 2-6.

transactions, was forbidden in Australia in 2003.[89] The "honor all cards rule" was investigated and banned in the European Union in 2015, which cited concern over consumers' having to pay higher prices to subsidize those cardholders with higher interchange fees.[90] Appendix I summarizes regulatory intervention in card payment schemes.

Intervention was often led by bank supervisors such as the Federal Reserve in the United States or the Reserve Bank of Australia. Yet, antitrust authorities took it upon themselves to investigate the banks' agreements on fees that they saw as anticompetitive.[91] Antitrust enforcement was the course chosen by the European Commission, who carried out a series of antitrust investigations against Visa and MasterCard.[92] Ultimately, the European Commission opted for regulating interchange fees, setting them at 0.2 percent of the transaction for debit cards payments and 0.3 percent for credit cards.[93] Related cases have been handled by courts, notably in the United States and in the United Kingdom. The U.S. also has national regulation of interchange fees for debit cards. Following complaints from merchants, the "Durbin Amendment" of the 2010 Dodd-Frank Wall Street Reform and Consumer Protection Act capped debit card interchange fees at 21 cents plus 5 percent of the transaction amount (plus 1 cent if certain fraud prevention measures were implemented).[94]

In addition to national regulation and legal actions, regulators have worked directly with major card providers to negotiate interchange fee rates. In 2005, Spanish regulators sponsored a five-year agreement between prominent merchants and payment networks to lower interchange fees. Swiss regulators have also negotiated directly with card providers before turning to national interchange fee intervention in 2010.[95]

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89 "Payment System Reforms," Reserve Bank of Australia press release, April 27, 2006, accessed June 13, 2018, https://www.rba.gov.au/media-releases/2006/mr-06-02.html.

90 "Regulation (EU) 2015/751 of the European Parliament and of the Council of 29 April 2015 on interchange fees for card-based payment transactions," *Official Journal of the European Union*, May 19, 2015, Article 10; European Commission, "Proposal for a Regulation of the European Parliament and of the Council on interchange fees for card-based payment transactions," COM(2013) 550 final, July 24, 2013, p. 3.

91 In 2010, Italian regulators fined MasterCard and affiliate banks, and Latvian competition regulators fined 22 commercial banks who coordinated on interchange fee agreements. Fumiko Hayashi and Jesse Leigh Maniff, "Public Authority Involvement in Payment Card Markets: Various Countries, August 2017 Update," Federal Reserve Bank of Kansas City, August 2017, pp. 7-8, accessed June 13, 2018, https://kansascityfed.org/~/media/files/publicat/psr/dataset/pub-auth_payments_var_countries_august2017.pdf.

92 "Information Paper on Competition Enforcement in the Payments Sector," European Competition Network, March 2012, pp. 11–13, accessed September 19, 2018, http://ec.europa.eu/competition/sectors/financial_services/information_paper_payments_en.pdf.

93 "Regulation (EU) 2015/751 of the European Parliament and of the Council of 29 April 2015 on interchange fees for card-based payment transactions," *Official Journal of the European Union*, May 19, 2015, Chapter II, Articles 3-4.

94 "2011 Interchange Fee Revenue, Covered Issuer Costs, and Covered Issuer and Merchant Fraud Losses Related to Debit Card Transactions," Board of Governors of the Federal Reserve System, March 5, 2013, pp. 1, 38, accessed September 14, 2018, https://www.federalreserve.gov/paymentsystems/files/debitfees_costs_2011.pdf.

95 Fumiko Hayashi and Jesse Leigh Maniff, "Public Authority Involvement in Payment Card Markets: Various Countries, August 2017 Update," Federal Reserve Bank of Kansas City, August 2017, pp. 10-11, accessed June 13, 2018, https://kansascityfed.org/~/media/files/publicat/psr/dataset/pub-auth_payments_var_countries_august2017.pdf.

Regulators around the world have reacted decisively to the complaints of merchants, (large merchants in particular) about the fees they pay for card-based transactions. The interventions were sometimes carried out on overly simplistic regulatory analysis, which failed to incorporate all the elements of the two-sided markets theories that were being developed at the time.[96] Sufficient time has passed to have a glimpse at the effect that these regulations have had. An assessment of the empirical evidence calls into question whether the intended objectives were achieved.

4.3. Impact of Regulatory Intervention: Have Regulatory Objectives Been Achieved?

4.3.1. The Complexity of Intervening in Card Payment Systems

Empirical evidence relating to card payment systems indicates the need for an abundance of caution when contemplating interchange fee regulation for several reasons. First, evidence suggests the migration from paper money to electronic retail payment systems positively impacts the real economy. For example, Hasan, Renzis, and Schmiedel (2013) conducted a study of 27 European countries and found that a 1.2 percent increase in the card penetration ratio of a jurisdiction is associated with an increase in Gross Domestic Product (GDP) by 0.07 percent.[97] In level terms, a 1 million euro increase in card payments corresponds to a 6 million euro increase in GDP.[98]

Second, empirical evidence supports the basic underlying theory of two-sided markets in the context of payment cards. Behavior on one side of the market (*e.g.*, merchants) affects behavior and utility on the other side of the market (*e.g.*, cardholders). For example, Rysman (2004) demonstrates a geographical correlation between consumer usage and merchant acceptance within the major card networks.[99] Such a correlation is indicative of a positive feedback loop whereby, when benefits are properly balanced across the system, increased card usage leads to increased card acceptance, which in turn leads to further increases in card usage, and so on. Note, however, that this feedback loop can work in reverse. If the balance of system benefits is tilted away from cardholders through intervention, they will decrease card usage, which may decrease card acceptance, which may in turn further decrease card usage. This is a relevant consideration because it implies, as theory predicts, that the effects of changing interchange fees will be far more complex than a simple redistribution of a fixed level of revenue between issuer and acquirer. That is to say, a change in interchange fees (for example following a regulatory cap) will change the distribution and level of revenue in the system. Adopting measures that increase the transparency of interchange fees to card holders at the point of sale defeats the purpose of the payment system pricing structure, which is to distribute the overall benefits of the payment system to maximize its voluntary adoption by both users and merchants. Consumers' decisions at point of sale do not take into account all the costs and benefits of the payment system but reflect a shortsighted cost minimization decision on a per transaction basis. Allowing merchants to pass-on payment card fees also results in merchants avoiding payments that would serve to compensate card users as a group for the aggregate benefits of their adoption of the card payment system. Intervening in only one part of the complex pricing scheme of payment card systems will disturb the behavior of all participants in ways that may not serve the regulator's objective.

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96 Ohio v. American Express.

97 Iftekhar Hasan, Tania De Renzis, and Heiko Schmiedel, "Retail Payments and the Real Economy," European Central Bank Working Paper Series, No. 1572 (August 2013): 2.

98 *Ibid.*

99 Marc Rysman, "An Empirical Analysis of Payment Card Usage," *The Journal of Industrial Economics* 55(1) (March 2007): 1-36.

Third, empirical evidence supports the idea that interchange fees are determined by many factors, such as the sensitivity of cardholders and merchants to changes in net transactional benefits, network externalities, and market maturity. Weiner and Wright (2005) provide evidence that rejects the idea that interchange fees are simplistically determined by relative market concentrations of issuers and acquirers.[100] Complexity in the determinants of interchange fees may make it difficult to predict the channels (*e.g.*, MSC or other fees, consumer prices, or pattern of card usage) through which the effects of fee caps will flow. Hence, it may be difficult to achieve policy objectives and to avoid unintended consequences.

In light of these complicating factors, it is not surprising that much of the regulation implemented to date with respect to payment cards is replete with unintended consequences and has led to generally ambiguous results with little in the way of demonstrable net economic benefit. For example, an important result of empirical analyses is that the effects of interchange fee caps vary with (but are not fully determined by) the relative market power held on each side of the platform. This is because the pass-through rates from issuer to cardholder, from acquirer to merchant, and from merchant to consumer depends on the relative market power of those groups. Unsurprisingly, empirical evidence shows broad variation in bank and merchant market power within and across economies.[101] This in turn suggests that the effects of interchange fee caps on merchant profit, consumer welfare, and social welfare will vary significantly across jurisdictions and industries.

Available empirical evidence is limited, allowing for some conclusions to be drawn but leaving many important questions unanswered. For example, caps appear to reduce merchant costs to a small degree, but it is unclear whether those costs savings are passed through to cardholders—although the limited evidence suggests they are not. Additionally, the evidence is inconclusive with respect to the relationship between interchange fees and card usage; some evidence suggests little or no effect of interchange fee caps on card usage, while other evidence suggests that interchange fee caps can, in certain circumstances, increase card usage by increasing merchant acceptance. Moreover, interchange fee caps appear to have clear negative effect on issuer revenue, but an inconclusive effect on acquirer revenue. Ultimately, the primary lesson to be gleaned from the empirical evidence is that the effects of interchange fee caps are difficult to generalize, as they vary broadly with market and demographic characteristics. The following sections describe the available evidence on the impact of payment card regulation on the different fees and market participants.

4.3.2. How Have the Regulations Impacted Consumers?

Interchange fee cap regulations, by definition, are aimed at regulating interactions between banks and payment card networks. Nevertheless, regulators' broader expectations are that a change in fees at this level will trickle down to affect merchants and consumers. This trickle-down effect is, of course, dependent on how costs and costs savings are passed through from various entities in the system. In particular, in order for a decrease in an interchange fee to affect merchants, acquiring banks would need to pass through some of that change to merchants. Likewise, in order for that decrease to affect consumers, merchants would need to pass some of their costs savings through to consumers in the form

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100 Stuart E. Weiner and Julian Wright, "Interchange Fees in Various Countries: Developments and Determinants," *Review of Network Economics* 4(4) (December 2005): 291-323.

101 David S. Evans and Abel Mateus, "How Changes in Payment Card Interchange Fees Affect Consumers Fees and Merchant Prices: An Economic Analysis with Applications to the European Union," SSRN Electronic Journal (June 27, 2011): 24 at Table 1, 36, accessed July 5, 2018, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1878735.

of price changes, or issuing banks would need to pass their additional costs through to cardholders in the form of higher cardholder fees.

While acquirers tend to pass through interchange fee reductions to merchants (as further discussed in the next section), this does not necessarily translate into savings for cardholders or other consumers (on net or in gross) since such savings are dependent on the merchant-to-consumer pass-through rate. Both theory and empirical evidence are inconclusive on the extent to which decreased merchant fees are passed through to consumers in the form of lower prices. The relatively small amount of cost savings derived from decreased merchant fees, combined with the cost of changing prices ("menu costs"), may make it impractical or even unprofitable for merchants to pass reduced merchant fees through to consumers in the short run.[102] Indeed, Hubbard (2013) notes that merchants appear to have not passed through any of their fee savings to consumers in response to the Durbin Amendment's decrease of U.S. debit card interchange fees.[103] Hubbard's findings are further contextualized and corroborated by Wang, Schwartz, and Mitchell (2014) who find that the vast majority of U.S. merchants did not realize or at least were not aware of a decrease in debit acceptance costs, and many realized increased debit costs.[104] Wang *et al.* also observe that while merchants that realized increased debit costs tended to increase consumer prices, the converse was rarely true, highlighting the "well-documented fact that retail prices tend to respond faster to input cost increases than to decreases."[105] In a similar context related to Australia's interchange fee regulations, Chang, Evans, and Garcia Swartz (2005) note that it is unlikely that Australian consumers would see any pass-through from merchants after the 2003 Australian interchange fee caps.[106]

Lack of pass-through of lower interchange fees from merchants to consumers defeats the purpose of eliminating the cross subsidization of cardholders by non-cardholders. The elimination of the "no surcharge" rule was equally ineffective in signaling to consumers the proper cost of each payment method. Interestingly, most merchants who were able to levy a surcharge thanks to regulatory intervention initially chose not to do so, although the practice eventually gained some popularity in Australia.[107] One concern from an economic and regulatory perspective is that merchants may levy a surcharge that exceeds the relevant interchange fee cost in an effort to extract additional rents from card-paying customers. This concern, to some extent, has been empirically validated in Australia, where a regulation had to be issued in 2016 prohibiting surcharges from exceeding the acceptance costs for the

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102 Chang, Evans, and Garcia Swartz estimate that the decrease in merchant fees resulting from the 2003 Australian interchange fee cap equates to 8 cents on an AU$40 purchase. Howard Chang, David S. Evans, and Daniel D. Garcia Swartz, "The Effect of Regulatory Intervention in Two-Sided Markets: An Assessment of Interchange-Fee Capping in Australia," *Review of Network Economics* 4(4) (December 2005): 341.

103 Brad G. Hubbard, "The Durbin Amendment, Two-Sided Markets, and Wealth Transfers: An Examination of Unintended Consequences Three Years Later," May 26, 2013, pp. 37-38.

104 Zhu Wang, Scarlett Schwartz, and Neil Mitchell, "The Impact of the Durbin Amendment on Merchants: A Survey Study," *Economic Quarterly* 100(3) (2014): 205-207, accessed September 25, 2018, https://www.richmondfed.org/-/media/richmondfedorg/publications/research/economic_quarterly/2014/q3/pdf/wang.pdf.

105 *Ibid.*

106 Howard Chang, David S. Evans, and Daniel D. Garcia Swartz, "The Effect of Regulatory Intervention in Two-Sided Markets: An Assessment of Interchange-Fee Capping in Australia," *Review of Network Economics* 4(4) (December 2005).

107 *Ibid.*

merchant.[108] Such concerns kept the European Commission from prohibiting the "no surcharge" rule in its regulation of interchange fees. The objective to have consumers make informed decisions on the most efficient payment at point of sale does not seem to have been achieved by any regulatory intervention.

Adoption and usage rates of payment instruments likely vary by consumer demographic characteristics, thus preventing any generalization of impact analysis. Analysis from Koulayev, *et al.* (2012) demonstrates that demand elasticities of payment card costs are dependent on socioeconomic and other demographic characteristics.[109] This implies that the benefits of payment cards to cardholders are heterogeneous. Indeed Koulayev, *et al.* find that the negative consumer welfare effects associated with increased debit card costs in the U.S. are twice as large for low income cardholders compared to high income cardholders.[110] Hence, it is important for regulators to examine the level of potential effects, as well as the distribution of effects. Even if an interchange fee regulation could reasonably guarantee an increase in total social welfare, it is possible that such results may come at the expense of the disadvantaged socioeconomic classes.

Analysis of the effect of interchange fee regulation on cardholder fees has shown that an unintended policy outcome has been higher cardholder fees that have been implemented in heterogeneous ways. For example, in response to the Durbin Amendment in the U.S., many affected banks reduced the availability of free checking accounts, while other banks increased the minimum balance requirements in accounts.[111] Indeed, the general reaction to the Durbin Amendment seems to have been an increase in various forms of fixed fees with little change to the benefits or transaction costs, leaving variable pricing unchanged.[112] Similar findings have emerged with respect to Australian interchange fee caps.[113] This means that low usage customers may turn to other payment methods as a result of interchange fee

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108 Competition and Consumer Amendment (Payment Surcharges) Act 2016, No. 9, February 25, 2016, accessed September 24, 2018, https://www.legislation.gov.au/Details/C2016A00009; Payment Systems (Regulation) Act 7998, Standard No. 3 of 2016, Scheme Rules Relating To Merchant Pricing For Credit, Debit and Prepaid Card Transactions, Australian Government Federal Register of Legislation, Reserve Bank of Australia, May 26, 2016, p. 6, accessed September 24, 2018, https://www.rba.gov.au/payments-and-infrastructure/review-of-card-payments-regulation/pdf/standard-no-3-of-2016-scheme-rules-relating-to-merchant-pricing-2016-05-26.pdf.

109 Sergei Koulayev, Marc Rysman, Scott Schuh, and Joanna Stavins, "Explaining Adoption and Use of Payment Instruments by U.S. Consumers," Federal Reserve Bank of Boston, Working Paper No. 12-14, September 20, 2012, p. 35, accessed July 13, 2018, https://www.econstor.eu/handle/10419/96425.

110 *Id.*, at 31.

111 Todd J. Zywicki, Geoffrey A. Manne, and Julian Morris, "Price Controls on Payment Card Interchange Fees: The U.S. Experience," George Mason Law & Economics Research Paper Series, No. 14-18, 2014, p. 1, accessed July 13, 2018, https://www.law.gmu.edu/assets/files/publications/working_papers/1418.pdf.

112 Mark D. Manuszak and Krzysztof Wozniak, "The Impact of Price Controls in Two-sided Markets: Evidence from U.S. Debit Card Interchange Fee Regulation," Board of Governors of the Federal Reserve System Finance and Economics Discussion Series 2017-074, 2017, accessed July 13, 2018, https://www.federalreserve.gov/econres/feds/files/2017074pap.pdf; Todd J. Zywicki, Geoffrey A. Manne, and Julian Morris, "Price Controls on Payment Card Interchange Fees: The U.S. Experience," George Mason Law & Economics Research Paper Series No. 14-18, 2014, accessed July 13, 2018, https://www.law.gmu.edu/assets/files/publications/working_papers/1418.pdf.

113 Howard Chang, David S. Evans, and Daniel D. Garcia Swartz, "The Effect of Regulatory Intervention in Two-Sided Markets: An Assessment of Interchange-Fee Capping in Australia," *Review of Network Economics* 4(4) (December 2005).

regulation but card usage among remaining cardholders remains unchanged. The latter's decision about what payment to use at the register remains unaltered, continuing to pay with cards in instances when it is not beneficial to the merchant, while those that derive low benefits from card usage do not use cards at all as a consequence of pricing intervention.

Empirical evidence unsurprisingly demonstrates that reduced interchange fees result in higher cardholder fees—among other higher fees. Moreover, as discussed previously, interchange fee caps appear to have little effect on merchant prices faced by cardholders. Hence, the impact of interchange fee caps on net effect per transaction consumer welfare is likely negative. However, to the extent that interchange fee caps might increase merchant acceptance, as may have been the case in Spain, the effect on total consumer welfare may be ambiguous.[114] This is because consumers face the countervailing effect of increased per transaction cost with the increased utility derived from being able to use payment cards more broadly. In contrast, when interchange fee caps do not increase card acceptance (as implied by transaction volume), which appears to have been the case in the U.S. and Australia, the effect of interchange fee caps on total consumer welfare is negative.

4.3.3. How Have the Regulations Impacted Merchants?

Economic intuition tells us that decreasing the interchange fees paid by acquiring banks to issuing banks will decrease the merchant discount rate charged by acquiring banks. The evidence of a positive pass-through has been shown by empirical investigations in the U.S. and Australia. In both cases, interchange fee reductions have been linked to merchant discount rate reductions.[115] Although the pass-through rate on the acquiring side, like that on the issuing side, is a case by case empirical question, evidence suggests that the acquiring pass-through rate tends to be higher than that of issuers. For example, evidence suggests 100 percent pass-through from acquirers to merchants after the Australian interchange fee cap.[116] Similarly, Evans, Chang, and Joyce (2013) discuss full pass-through in relation to the U.S. Durbin Amendment.[117]

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114 Santiago Carbó Valverde, Sujit Chakravorti, and Francisco Rodríguez Fernández, "The Role of Interchange Fees in Two-Sided Markets: An Empirical Investigation on Payment Cards," *The Review of Economics and Statistics* 98(2) (May 2016): 367-381.

115 Howard Chang, David S. Evans, and Daniel D. Garcia Swartz, "The Effect of Regulatory Intervention in Two-Sided Markets: An Assessment of Interchange-Fee Capping in Australia," *Review of Network Economics* 4(4) (December 2005): 340; David S. Evans, Howard H. Chang, and Steven Joyce, "The Impact of the U.S. Debit Card Interchange Fee Caps on Consumer Welfare: An Event Study Analysis," Coase-Sandor Institute for Law and Economics Working Paper No. 658, October 2013, p. 2, accessed June 12, 2018, https://chicagounbound.uchicago.edu/cgi/viewcontent.cgi?article=1651&context=law_and_economics.

116 This high average pass-through rate is likely skewed by large merchants with substantial bargaining power. Howard Chang, David S. Evans, and Daniel D. Garcia Swartz, "The Effect of Regulatory Intervention in Two-Sided Markets: An Assessment of Interchange-Fee Capping in Australia," *Review of Network Economics* 4:4 (2005): 335. See also: David S. Evans and Abel Mateus, "How Changes in Payment Card Interchange Fees Affect Consumers Fees and Merchant Prices: An Economic Analysis with Applications to the European Union," SSRN Electronic Journal (June 27, 2011): 21-22, accessed July 5, 2018, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1878735.

117 David S. Evans, Howard H. Chang, and Steven Joyce, "The Impact of the U.S. Debit Card Interchange Fee Caps on Consumer Welfare: An Event Study Analysis," Coase-Sandor Institute for Law and Economics Working Paper No. 658, October 2013, p. 21, accessed June 12, 2018, https://chicagounbound.uchicago.edu/cgi/viewcontent.cgi?article=1651&context=law_and_economics.

Evans and Mateus (2011) illustrate that pass-through rates are heterogeneous across merchant types, such as merchant size.[118] They explain that large merchants tend to pay merchant discounts based specifically on the interchange fee rate plus some negotiated markup. In contrast, small merchants tend to pay a merchant discount rate in the form of a flat fee, based on a fixed bundle of services provided by the acquirer.[119] Because the composition of fees to small merchants is opaque, small merchant discount rates are less responsive to changes in the interchange fee, resulting in a lower pass-through rate. It is important to underline this high degree of heterogeneity among merchants, as this has an effect on the impact of any interchange fee regulation. Large merchants negotiate their merchant service charges with the acquirers, and they negotiate the level of interchange fee applicable to their sales with the payment systems and so benefit from lower interchange fee levels, with a higher level of visibility and pass-through, compared to their smaller competitors.

In an example that demonstrates how interchange fee caps interfere with some of the pricing efficiency that payment platforms exercise, payment systems tend to grant merchants with many low-volume transactions lower interchange fees since customers in those stores are more likely to be easily switched to cash. Higher interchange fees are imposed on merchants with customers exhibiting more inelastic demands, such as traveling customers or those purchasing big ticket or luxury items. Regulations capping the average interchange fee have had different impacts on these different types of merchants and, although regulating interchange fees does seem to have achieved the policy purpose of decreasing the interchange fees paid by merchants on aggregate, some evidence points to the regulation having helped large merchants the most.[120] In fact, an unintended effect of interchange fee regulation is revenue balancing by issuing banks in response to reduced interchange revenues (also known as the "waterbed effect"). This was the case following the Durbin Amendment in the U.S. Prior to the regulation, small merchants and merchants that sold small-ticket items (*e.g.*, fast food restaurants) benefited from discounted interchange fees. The Durbin Amendment set a cap on the overall weighted-average interchange fee charged by a card network. However, although the cap forced lower interchange fees for most large merchants, it exceeded the discounted interchange fees charged to many small merchants. As a result, many networks eliminated small merchant discounts, raising the effective rates.[121]

Ultimately, the available empirical evidence suggests that interchange fee regulation will have a positive impact on aggregate merchants' profits for several reasons. As discussed above, acquirers tend to pass through all or most of the cost savings stemming from reduced interchange fees to merchants, which reduces the merchants' costs. Studies show that little of this cost savings is passed through from merchant to consumer; hence, the cost savings likely goes towards the merchants' bottom lines. In theory, a decrease in transactions may decrease merchant profits, and an increase in transactions may increase merchant profits. In the case of decreased transactions, merchants would be faced with

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118 David S. Evans and Abel Mateus, "How Changes in Payment Card Interchange Fees Affect Consumers Fees and Merchant Prices: An Economic Analysis with Applications to the European Union," SSRN Electronic Journal (June 27, 2011): 35, accessed July 5, 2018, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1878735.

119 *Id.*, at 34-35.

120 With respect to the Durbin Amendment, Hubbard notes that, "Overall, big-box retailers saw a large increase in their bottom lines as they internalized the capped interchange fees; small retailers—those with an average transaction value of less than $10.50—on the other hand, saw their bottom line decrease as their average interchange fee increased." Brad G. Hubbard, "The Durbin Amendment, Two-Sided Markets, and Wealth Transfers: An Examination of Unintended Consequences Three Years Later," May 26, 2013, p. 31.

121 Todd J. Zywicki, Geoffrey A. Manne, and Julian Morris, "Price Controls on Payment Card Interchange Fees: The U.S. Experience," George Mason Law & Economics Research Paper Series, No. 14-18, 2014, accessed July 13, 2018, https://www.law.gmu.edu/assets/files/publications/working_papers/1418.pdf.

countervailing effects of increased profit per transaction but fewer transactions. Nevertheless, empirical analyses to date have failed to link interchange fee caps with a reduction in transaction volume. Hence, based on available data, the effect of interchange fee caps on total merchant profits appears to be positive.

4.3.4. How Have the Regulations Impacted Banks?

It is rational to believe that decreased interchange fees will have a negative effect on issuer revenue per transaction. This has been empirically observed in response to both the Durbin Amendment in the U.S. and the interchange fee caps in Australia (starting in 2003).[122] The effect of interchange fee caps on card issuing banks appears to be a clear reduction in per transaction revenue. This stems from evidence indicating that less than 100 percent of costs are passed through from issuing banks to cardholders, resulting in a clear loss of per transaction revenue and per transaction profit. While the effect of interchange fee caps on per transaction profit and revenue is fairly clear, the effect on total profit and revenue is less so. The volume of transactions could, in theory, increase or decrease in response to interchange fee caps depending on the relative responsiveness of merchants and issuing banks to lower fees. If transaction volume decreased, the effect of interchange fee caps on total issuer revenue and profit would be unambiguously negative. However, if transaction volume increased, the net effect on issuers' revenue would be ambiguous. Available empirical evidence provides mixed results. In Spain, where transactions may have increased as a result of reduced interchange fees, the net effect on issuers is not clear.[123] However, in Australia where interchange fee regulation appears to have not affected transactions levels, the net effect on issuer revenues and profits made on the regulated cards was likely negative.[124] In the U.S., estimates of debit card issuers' lost revenue from interchange fees range from $6.5 billion to $14 billion.[125] However, issuing banks that were affected by the Durbin Amendment seem to have compensated for much of the revenue loss by increasing the fees on other banking services. It is estimated that the regulation increased deposit fees in affected banks by 15 percent, which offset 90 percent of lost interchange fee revenue.[126] Interestingly, these banks' customers did not switch to unaffected banks due to the higher fees evidencing some degree of market power in the banking sector.

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122 David S. Evans, Howard H. Chang, and Steven Joyce, "The Impact of the U.S. Debit Card Interchange Fee Caps on Consumer Welfare: An Event Study Analysis," Coase-Sandor Institute for Law and Economics Working Paper No. 658, October 2013, p. 2, accessed June 12, 2018, https://chicagounbound.uchicago.edu/cgi/viewcontent.cgi?article=1651&context=law_and_economics; Howard Chang, David S. Evans, and Daniel D. Garcia Swartz, "The Effect of Regulatory Intervention in Two-Sided Markets: An Assessment of Interchange-Fee Capping in Australia," *Review of Network Economics* 4(4) (December 2005): 336.

123 Santiago Carbó Valverde, Sujit Chakravorti, and Francisco Rodríguez Fernández, "The Role of Interchange Fees in Two-Sided Markets: An Empirical Investigation on Payment Cards," *The Review of Economics and Statistics* 98(2) (May 2016): 378-379.

124 Joshua Gans, "Evaluating the Impact of the Payment System Reforms," Submission to the Reserve Bank of Australia's Payment System Board's 2007-08 Review of Payment System Reforms, August 27, 2007, accessed July 16, 2018, https://www.researchgate.net/publication/242547109/download.

125 Todd J. Zywicki, Geoffrey A. Manne, and Julian Morris, "Unreasonable and Disproportionate: How the Durbin Amendment Harms Poorer Americans and Small Businesses," International Center for Law & Economics, April 25, 2017, p. 8, accessed July 11, 2018, http://laweconcenter.org/images/articles/icle-durbin_update_2017_final.pdf; Benjamin S. Kay, Mark D. Manuszak, Cindy M. Vojtech, "Competition and complementarities in retail banking: Evidence from debit card interchange regulation," *Journal of Financial Intermediation* 34 (April 2018): 91-108.

126 *Ibid.*

Additionally, empirical studies support models of payment card platforms that predict a change in cardholder fees as a result of interchange fee regulation. Cardholder fees have been observed to increase in the cases of both the Durbin Amendment and the 2003 interchange fee caps in Australia.[127] However, the amount by which cardholder fees increase (or quality and innovation decrease) is likely situationally specific and highly dependent on market and regulatory conditions. For example, researchers estimate a pass-through of 30–40 percent from issuers to cardholders after the 2003 interchange fee caps in Australia.[128] In contrast, evidence from the U.S. indicates that issuing banks passed through about 80 percent of their lost interchange fee revenue to cardholders after the Durbin Amendment.[129]

With respect to acquiring banks, the effect of interchange fee regulation on per transaction profit and revenue is more likely to be neutral. This is because empirical evidence suggests that acquirers tend to pass through all or most of the cost savings related to interchange fee caps to merchants.[130] This, however, is not a generalizable result as acquirer pass-through rates may vary by jurisdiction and industry depending on individual market conditions. Moreover, the effect of interchange fee regulations on total acquirer profits and revenues is ambiguous for the same reasons it is so for issuers. That is, transaction volume may increase or decrease in response to interchange fee caps; hence there may be more or fewer transactions on which acquirers will earn profits and revenue.

4.3.5. How Have the Regulations Impacted the Market for Retail Payments?

Economic models of payment systems predict a link between interchange fee levels and card utilization levels.[131] Hence, regulators have used interchange fee caps in an effort to change payment card usage. Indeed, such was the purpose of Australia's 2003 interchange fee cap regulation.[132] Regulators believed that payment card usage was inefficiently high and sought to reduce it by reducing interchange fees, which would then reduce transaction benefits for cardholders.[133] However, empirical evidence suggests that Australian regulation did not decrease the level of card usage.[134] Many other factors, including

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127 *Ibid.* See also Howard Chang, David S. Evans, and Daniel D. Garcia Swartz, "The Effect of Regulatory Intervention in Two-Sided Markets: An Assessment of Interchange-Fee Capping in Australia," *Review of Network Economics* 4(4) (December 2005).

128 *Ibid.*

129 David S. Evans, Howard H. Chang, and Steven Joyce, "The Impact of the U.S. Debit Card Interchange Fee Caps on Consumer Welfare: An Event Study Analysis," Coase-Sandor Institute for Law and Economics Working Paper No. 658, October 2013, p. 54, accessed June 12, 2018, https://chicagounbound.uchicago.edu/cgi/viewcontent.cgi?article=1651&context=law_and_economics.

130 Howard Chang, David S. Evans, and Daniel D. Garcia Swartz, "The Effect of Regulatory Intervention in Two-Sided Markets: An Assessment of Interchange-Fee Capping in Australia," *Review of Network Economics* 4(4) (2005); David S. Evans, Howard H. Chang, and Steven Joyce, "The Impact of the U.S. Debit Card Interchange Fee Caps on Consumer Welfare: An Event Study Analysis," Coase-Sandor Institute for Law and Economics Working Paper No. 658, October 2013, p. 21, accessed June 12, 2018, https://chicagounbound.uchicago.edu/cgi/viewcontent.cgi?article=1651&context=law_and_economics.

131 See Section II.A.

132 Howard Chang, David S. Evans, and Daniel D. Garcia Swartz, "The Effect of Regulatory Intervention in Two-Sided Markets: An Assessment of Interchange-Fee Capping in Australia," *Review of Network Economics* 4(4) (December 2005): 329.

133 *Ibid.*

134 Richard Hayes, "Is Price Regulation of Payment Card Associations Effective? Evidence from a Dramatic Policy Experiment," Melbourne Business School (January 28, 2010): 3; Joshua S. Gans, "Evaluating the Impact of the Payment System Reforms," Submission to the Reserve Bank of Australia's Payment System Board's 2007-08

positive network effects and larger net benefits for users, may have been at play for the continued growth of card payments.

Interestingly, regulators have used the same approach to increase card usage. Such was the case in Mexico. Mexican regulators, similar to Australian regulators, enacted policy to limit interchange fees. However, unlike Australian regulators, Mexican regulators expected this to increase card usage, not decrease it.[135] This presupposes that the merchants, and not the users, were the ones more reticent to card usage in Mexico and for reasons other than the interchange fees. Expensive equipment, the high prevalence of fraud or default, or the preference of the merchant for cash in order to evade fiscal scrutiny are all possible reasons for merchant reticence to accept cards. Empirical evidence suggests that card usage did increase after the intervention; however, interchange fee regulation was implemented in conjunction with other policy interventions making it difficult to identify the effects specifically attributable to decreased interchange fees.[136]

While there is no clear evidence on the efficacy of the Mexican interchange fee regulation, researchers have found empirical links between lower interchange fees and higher card usage in other contexts. For example Valverde, Chakravorti, and Fernández (2016) find that increased card adoption was preceded by reduced interchange fees in Spain.[137] From that result they conclude that reducing interchange fees may have a positive effect on both consumer and merchant adoption and usage when the merchant adoption level is low.[138] Similarly, Ardizzi (2013) finds a positive relationship between interchange fee levels and the level of transactions conducted in cash.[139] This could result from merchant reluctance to accept cards or their larger incentive to steer consumers to cash at the point of purchase. Nevertheless, Ardizzi interprets these results to mean that lower interchange fees would result in increased card usage in those markets where merchants have been particularly reticent to card adoption. While these results are interesting and suggestive, they are neither conclusive nor generalizable. As a preliminary matter, neither analysis sufficiently controls for general trends in payment instruments in a way that allows for a causal link between interchange fees and card usage. Moreover, if a negative causal link exists between interchange fees and card usage, it is likely a relationship that is circumstantially specific. For example, Valverde, Chakravorti, and Fernández (2016) point out that their results are likely due to under-acceptance of cards to begin with by Spanish merchants.[140] This is a significant qualification, as it suggests that in circumstances particular to Spain, merchants are likely under-compensated relative to cardholders. A transfer from cardholders to merchants will likely have a different effect in this case than it would in a case where cards are widely accepted. Similarly, it is likely that merchants in different jurisdictions have different cost and benefit structures related to card acceptance. For example, in jurisdictions in which

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Review of Payment System Reforms, August 27, 2007, p. 7, accessed July 16, 2018, https://www.researchgate.net/publication/242547109/download.

135 Sujit Chakravorti, "Externalities in Payment Card Networks: Theory and Evidence," *Review of Network Economics* 9(2) (June 2010).

136 *Ibid.*

137 Santiago Carbó Valverde, Sujit Chakravorti, and Francisco Rodríguez Fernández, "The Role of Interchange Fees in Two-Sided Markets: An Empirical Investigation on Payment Cards," *The Review of Economics and Statistics* 98(2) (May 2016): 376-377.

138 *Id.*, at 379.

139 Guerino Ardizzi, "Card Versus Cash: Empirical Evidence of the Impact of Payment Card Interchange Fees on End Users' Choice of Payment Methods," *Journal of Financial Market Infrastructures* 1(4) (2013): 102.

140 Santiago Carbó Valverde, Sujit Chakravorti, and Francisco Rodríguez Fernández, "The Role of Interchange Fees in Two-Sided Markets: An Empirical Investigation on Payment Cards," *Review of Economics and Statistics* 98(2) (May 2016).

merchants can easily avoid taxes on cash transactions, the opportunity cost of accepting cards is higher than it would be elsewhere. Ultimately, the available evidence implies that interchange fee caps may have an increasing, decreasing, or neutral effect on card usage depending on other factors related to risk of fraud, trends in types of transaction, structure of retail markets, and card acceptance levels. These complex market factors further suggest that a one-size-fits-all approach from price interventions is unlikely to address all these factors. Competitive payment platforms are more likely to tailor interchange across jurisdictions as well as across merchants within jurisdictions.

One of the perhaps unintended effects of interchange fee regulation is a switch from cards affected by regulation to cards unaffected by regulation. This was observed in both Australia and the U.S. after interchange fee cap regulation. In Australia, closed payment systems such as American Express were not subject to the regulations imposed on open systems such as Visa and MasterCard. As a result, some issuers began issuing American Express and Diners Club instead of Visa or MasterCard.[141] Issuing banks and consumers migrated to three party payment cards systems that, because they remained unregulated, could benefit from higher interchange fees and provide higher card user benefits. Hence any reduction in card usage on the regulated systems (as was the policy objective) would have been greatly mitigated by an increase in non-regulated card usage. In the U.S., the Durbin Amendment regulated interchange fees only on debit cards issued by banks that exceeded an asset threshold.[142] That left many banks unregulated and free to compete for cardholders.[143]

Relatedly, banks unaffected by the Durbin Amendment appear to have raised cardholder fees as a competitive response to cards issued by regulated banks.[144] This resulted in universally higher cardholder fees with no off-setting reduction in consumer prices.[145] These higher fees have forced many low income consumers to leave the banking system.[146]

Additionally, interchange fee caps appear to have a negative effect on card innovation. For example, following the Durbin Amendment in the U.S., Hubbard (2013) observes "less innovation in areas such as risk management, security, loyalty programs, product development, and user education due to the

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141 Howard Chang, David S. Evans, and Daniel D. Garcia Swartz, "The Effect of Regulatory Intervention in Two-Sided Markets: An Assessment of Interchange-Fee Capping in Australia," *Review of Network Economics* 4(4) (December 2005): 339–340.

142 Todd J. Zywicki, Geoffrey A. Manne, and Julian Morris, "Price Controls on Payment Card Interchange Fees: The U.S. Experience," George Mason Law & Economics Research Paper Series No. 14-18, 2014, p. 3, accessed July 13, 2018, https://www.law.gmu.edu/assets/files/publications/working_papers/1418.pdf.

143 Mark D. Manuszak and Krzysztof Wozniak, "The Impact of Price Controls in Two-sided Markets: Evidence from U.S. Debit Card Interchange Fee Regulation," Board of Governors of the Federal Reserve System Finance and Economics Discussion Series 2017-074, 2017, accessed July 13, 2018, https://www.federalreserve.gov/econres/feds/files/2017074pap.pdf.

144 *Id.*, at 25-26.

145 Todd J. Zywicki, Geoffrey A. Manne, and Julian Morris, "Unreasonable and Disproportionate: How the Durbin Amendment Harms Poorer Americans and Small Businesses," International Center for Law & Economics, April 25, 2017, p. 2, accessed July 11, 2018, http://laweconcenter.org/images/articles/icle-durbin_update_2017_final.pdf.

146 *Ibid.*

limited capital available for investment."[147] Hubbard also observes decreased adoption of new card technology and stifled innovation following the 2003 interchange fee regulation in Australia.[148]

In sum, the net effects of interchange fee regulations are entirely ambiguous, and no research appears to have clear empirical evidence measuring the effects of interchange fee caps on total social welfare. As discussed above, there is evidence suggesting negative effects on issuers and cardholders, neutral effects on acquirers, positive effects on the largest merchants, and adverse effects for smaller merchants. If we were to take these effects as given, the implication is that interchange fee caps constitute a utility transfer from cardholders and issuers to large merchants. Nevertheless, even under these strong assumptions, the net effect on social welfare is still ambiguous as such a transfer could represent either an increase or decrease in economic efficiency depending on the size of the cardholder and issuer losses on the one hand relative to the merchant gains on the other. In addition, macroeconomic effects of changes in the usage of card payments are ambiguous.

5. Conclusion: Lessons Learned from Implemented Interventions

5.1. Achievement of Policy Objectives

As previously discussed, regulation of interchange fees has been implemented with specific policy objectives in mind. However, with respect to the regulatory interventions for which sufficient empirical evidence exists, it is not clear that those objectives have been ultimately achieved. For example, the Durbin Amendment in the U.S., like other interventions to reduce interchange fee, was intended to reduce merchants' and consumers' costs.[149] Empirical evidence suggests that the amendment benefited a subset of merchants (mostly large) and generally harmed consumers with debit cards without much benefit to other consumers.[150] Further complicating issues is the fact that empirical evidence suggests heterogeneous responses to interchange fee caps with strong implications for the distribution of benefits and harm. This implies that regulators face a difficult task in predicting the total effects of regulatory intervention as well as how the effects are felt by different segments of users.

The removal of alleged illegal coordination of banks that was the basis for many antitrust interventions does not seem to have had an impact on competition. Spain or Italy (and initially the EU), who intervened on antitrust grounds, do not seem to have prompted competition in the area of payment systems or even among banks. While Spanish regulators did succeed in lowering interchange fees through an agreement with industry, they appear to have failed in promoting any competitive dynamics. Indeed, regulation may have harmed the ability of open network systems to compete with closed network systems.[151]

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147 Brad G. Hubbard, "The Durbin Amendment, Two-Sided Markets, and Wealth Transfers: An Examination of Unintended Consequences Three Years Later," May 26, 2013, p. 31.

148 *Id.*, at 44.

149 David S. Evans, Howard H. Chang, and Margaret Weichert, "Economic Analysis of Claims in Support of the 'Durbin Amendment' to Regulate Debit Card Interchange Fees," in *Interchange Fees, The Economics and Regulation of What Merchants Pay for Cards*, ed. David S. Evans (Competition Policy International, 2011), 187.

150 Brad G. Hubbard, "The Durbin Amendment, Two-Sided Markets, and Wealth Transfers: An Examination of Unintended Consequences Three Years Later," May 26, 2013, pp. 37-38.

151 Juan Iranzo, Pascual Fernández, Gustavo Matías, and Manuel Delgado, "The Effects of the Mandatory Decrease of Interchange Fees in Spain," October 2012, p. 110, accessed July 18, 2018, https://repositorio.uam.es/bitstream/handle/10486/10839/54105_informe_matiasclavero.pdf?sequence=1.

The alleged cross subsidization in favor of card-paying consumers does not seem to have been resolved in the expected manner. While there does not appear to be clear empirical evidence that cash-paying consumers are harmed by the broad use of payment cards, it is theoretically possible to model situations in which some subsidization occurs.[152] Such models abstract from the fact that most retail customers will tend to use both card and cash with there being no distinct groups of individuals aligning with specific payment methods. Even assuming such distinct groups existed, the available empirical evidence on merchant behavior suggests that regulatory intervention may not be an effective remedy against such theoretical cross subsidization. As previously discussed, merchants do not appear to pass through reduced payment card fees to consumers. Moreover, allowing merchants to charge differential prices for card- versus cash-paying consumers (via surcharging) appears to be ineffective if not detrimental.

It is unlikely that cardholders received the cost message that regulators intended. Issuers have responded to regulation in ways that were unforeseen. For example, some responded to interchange fee caps by increasing fixed cardholder fees rather than transactions fees so that the marginal usage cost did not increase for cardholders.[153] Although some cardholders may have dropped from the system altogether, card usage among those that derived high benefits from cards was incentivized very much in the same manner. Further, non-regulated card systems attracted cardholders and issuers that were adversely impacted by interchange fee caps.

Evidence suggests that the relation between interchange fee regulation and optimal card usage is tenuous. Empirical findings suggest interchange fee caps have had no demonstrable effect on the volume of card transactions, although they did have an effect on the market share of different payment systems. Moreover, empirical results on the impact of the caps to interchange fees on transaction volumes are mixed, and there is no clear theoretical result that can be generally applied due to merchant, consumer, and other market characteristics. But the continued expansion of card payments over time seems to suggest that the regulatory (and possibly academic) discourse may be missing some of the benefits of card payments for both consumers and merchants.

As is often the case with regulatory intervention, unintended results in terms of distribution effects have arisen from interchange fee cap regulation. It seems apparent that payment system-specific intervention may have been unsuccessful in meeting any policy objectives broader than providing a rent transfer to some merchants. Although regulators have pointed to some narrowly qualified success in the efficacy of regulation, many appear to be generally aware, either explicitly or implicitly, of the limits of that success and the current inability to appropriately measure their regulatory efficacy. For example, researchers with the Congressional Research Service have noted that although the Durbin Amendment was successful in reducing interchange fees, "merchants have seen a limited and unequal impact on the amount they pay in [merchant discount] fees."[154] Similarly, the Reserve Bank of Australia has produced multiple publications touting its success in reducing interchange fees.[155] However, the objective of the Reserve

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152 It is reasonable to believe that cash-paying consumers realize some countervailing benefits through indirect channels, such as the broad economic growth associated with payment card usage.

153 Howard Chang, David S. Evans, and Daniel D. Garcia Swartz, "The Effect of Regulatory Intervention in Two-Sided Markets: An Assessment of Interchange-Fee Capping in Australia," *Review of Network Economics* 4(4) (December 2005): 350.

154 Darryl E. Getter, "Regulation of Debit Interchange Fees," Congressional Research Service, May 16, 2017, summary page, accessed September 14, 2018, https://fas.org/sgp/crs/misc/R41913.pdf.

155 "Review of Card Payments Regulation Conclusions Paper," Reserve Bank of Australia, May 2016, accessed July 26, 2018, https://www.rba.gov.au/payments-and-infrastructure/review-of-card-payments-regulation/pdf/review-of-card-payments-regulation-conclusions-paper-2016-05.pdf; "Review of Card

Bank of Australia's intervention was to lower interchange fees because it believed that credit card usage was inefficiently high. Nonetheless, the Reserve Bank of Australia's publications have generally not shown a reduction in card usage, nor have they attempted to measure efficiency or welfare affects.

Ultimately, policy objectives have been difficult to achieve for several reasons. The heterogeneity of the actors and consequent differential impact was likely underestimated. There seems to have been a higher degree of market power among merchants than previously thought—after all, they were the main complainants and presented themselves as being exploited. Strategic and competitive responses were not properly foreseen, and evidence of some factors important for the analysis was missed. The efficiencies generated by card usage may have been underestimated so that merchants continued to accept many expensive cards and "low cost competition" did not thrive.

5.2. The Way Forward

The above findings call for a high level of caution when considering regulatory intervention with respect to payment card systems. While it is demonstrated that capping interchange fees reduces per transaction costs of some merchants, such a result may come with negative consequences that may be difficult to predict or capture. The ability to regulate interchange fees in a way that clearly produces social benefits or even a market efficient outcome is unproven and appears to be somewhat speculative based on limited theory and evidence. With the recent Supreme Court decision on American Express, regulators in the U.S. can no longer ignore the findings of the two-sided market literature that shows the importance of feedback effects between the two sides of these markets where the benefits of each type of user depend on the aggregate behavior of users on the other side. In other jurisdictions the one-sided analysis has shown its conceptual limitations. The unintended and negative consequences of such short-sighted regulation question the wisdom of further intervention.

While it is possible that researchers will eventually be able to better understand the complex relationship between card payment fees and outcomes in card payment markets, the current lack of knowledge presents a substantial obstacle for regulators. This is further compounded by potentially disruptive innovations in the payment systems sector and the evolving competitive structure of the market.

For example, the diffusion of mobile devices and portable connectivity has opened the door for digital payment solutions offered by new entrants that are coming, not from the banking sector, but from the software space. Moreover, smartphones and portable devices present a payments system innovation in and of themselves. Digital wallets on mobile devices allow the storage of payment information on the device in the same way as online payment services do. This will affect card fees by facilitating inter-system competition, and the added convenience of mobile pay systems will change the cost-benefit calculus of using payments. Additionally, banks are reacting to the appearance of competing payment services by developing their own efficient payment mechanisms in the hope of eliminating the role of intermediaries.[156] The higher number of alternative payments options for consumers and merchants is

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Payments Regulation Issues Paper," Reserve Bank of Australia Issues Paper, March 2015, accessed July 26, 2018, https://www.rba.gov.au/payments-and-infrastructure/review-of-card-payments-regulation/pdf/review-of-card-payments-regulation-issues-paper.pdf. See also: Iris Chan, Sophia Chong and Stephen Mitchell, "The Personal Credit Card Market in Australia: Pricing over the Past Decade," Reserve Bank of Australia, March 2012, accessed July 19, 2018, https://www.rba.gov.au/publications/bulletin/2012/mar/pdf/bu-0312-7.pdf.

156 In the European Union, the European Payment Council, composed mostly of banks, launched in 2017 an instant funds transfer service (SCT Inst) in 2017 that allows a payer to initiate an online transfer of up to €15,000 from bank account to bank account and get the money transferred in less than 10 seconds. "SEPA Instant Credit

bound to have an impact on both the level and the structure of fees. Indeed, the two-sided market literature teaches us that the relative burden of the cost value, and hence the prices of the payment system, will be distributed depending on the net benefits obtained by each side of the transaction and on the alternatives that they each face.

Other new technologies will affect payment cards and associated fees in complex ways. For example, the rise of near field communications (NFC) provides convenience and efficiency for consumers with services such as the "tap and go" (contactless) payment method. In order to keep up, cards have to join such solutions and pay the intermediary, or else develop such technology themselves. The ability to keep up with the authentication efficiencies provided by digital wallets and mobile payment solutions may turn out to be important to maintain the relevance of the current card payments for certain transactions in the long term affect payment card fee structures.

Ultimately, the appearance of a new type of competition that will force card payment systems to redefine their role in retail payment markets introduces further complexity in the analysis. It will be impossible for regulators to second guess the optimal strategy and level of fees of any of the payment systems that will both partner and compete with each other. It would therefore seem wise to provide markets with the necessary flexibility so that it is able to adjust to the needs of an increasing variety of players and users.

Transfer," European Payments Council, 2018, accessed August 3, 2018, https://www.europeanpaymentscouncil.eu/what-we-do/sepa-instant-credit-transfer.

Appendix I. The Extent of Regulatory Interventions in Payment Card Schemes

Country	Year	Legislation/Ruling
Argentina	1999	Law 25.065 for Credit Cards is enacted. The law establishes norms that regulate various aspects related to the credit, debit, and retail card systems. Among these norms is the setting of limits on the ability to implement price discrimination in merchant fees.
	2005	The maximum merchant discount rate is set at 3% for credit cards and 1.5% for debit cards.
	2017	The El Banco Central de la República Argentina (BCRA) introduces a timetable for gradually reducing interchange fee caps for debit and credit cards over the next four years to 0.6% for debit transactions and 1.3% for credit transactions.
Australia	2003	The Reserve Bank of Australia (RBA) mandates Bankcard, MasterCard, and Visa to set interchange fees on a cost-based benchmark for credit cards; interchange fees drop to average 0.5% of the transaction value.
	2006	RBA introduces interchange standards for the EFTPOS and Visa/Mastercard Debit systems. Interchange fees for MasterCard and Visa debit must average below 12 cents per transaction and EFTPOS interchange fees are between 4 and 5 cents.
	2009	RBA revises EFTPOS interchange fee standard for multilateral debit interchange fees following the establishment of EPAL. Bilateral interchange fees must remain between 4 and 5 cents paid to the acquirer. Multilateral interchange fees are subject to a weighted-average cap of $0.12 flowing to the issuer.
	2013	EFTPOS debit interchange fees must not exceed the benchmark set for the Visa Debit system: 12 cents paid to the issuer.
	2016	RBA reduces the weighted average interchange feee benchmark for domestic debit cards to 8 cents per transaction, with interchange rates not to exceed 15 cents or 0.2%. The weighted average interchange fee of 0.5% remains for domestic credit cards. Individual rates may not exceed 0.8%. The American Express companion card system is subject to the same regulation as Visa and Mastercard on interchange-like payments American Express receives.
Austria	2003	The Austrian Cartel Court fines Europay Austria, who runs Maestro debit card payment system, for forming an illegal cartel to hold interchange fees excessively high.
	2006	Following the European Commission's interim reports on the retail banking industry, Austrian banks agree to review arrangements for setting interchange fees and announce that a reduction can be expected.
Canada	2009	In March, the Senate Committee on Banking, Trade and Commerce announces an investigation of Canada's credit and debit card system.
	2014	The Federal Budget includes provisions to help lower credit card acceptance costs for merchants. In November, Visa and MasterCard voluntarily agree to reduce interchange fees for consumer credit cards at an average effective rate of 1.5% for the next five years.
	2016	Legislation is introduced to establish a cap on credit card interchange fees.
	2018	Visa and Mastercard agree to lower credit card interchange fees to 1.4% starting in 2020.

Chile	2005	The Chilean Antitrust Court admits a complaint filed by the National Economic Prosecutor alleging abuse of a dominant position by Transbank, the acquirer of all credit and debit cards issued in the country. A partial understanding between the parties, requiring Transbank to reduce merchant fee ceilings and present a self-regulating plan for setting prices, settles the issue.
	2017	The Chilean Competition Tribunal (TDLC) recommends the establishment of fixed interchange fees to prevent their setting through negotiation between acquirers and issuers or by international card brands.
China	2002	The People's Bank of China (PBOC) sets the maximum merchant fee rates and the division of the merchant fee, which consists of the interchange fee, switch fee, and merchant acquirer fees (so called the 8:1:1 rule).
	2012	The State Council approves a change to the decade-old standards on merchant fees which will reduce most merchant fees by 25% or more.
	2016	The PBOC announces a new policy to cap interchange fees at 0.35% for debit cards and 0.45% for credit cards.
Colombia	2004	Colombia's competition authority passes the new Inter-bank Exchange Tariff, allowing merchants to negotiate fee rates with merchant acquirers.
	2006	Credibanco (a Visa issuer) is required to exclude certain costs included in its fee computation that were judged not to correspond exclusively to payment card services offered to merchants.
Denmark	1990	The Act on Certain Payment Instruments sets a cap on merchant service charges (MSC) on internationally-branded credit/debit cards issued by Danish banks for domestic transactions at 0.75% of transaction value. The Act sets Dankort (national debit card) merchant services charges to be zero.
	1990	The Act on Certain Payment Instruments sets Dankort merchant service charges to be zero.
	2003	An amendment to the Act introduces a positive merchant service charges to Dankort transactions and reduces the fees on Maestro and Visa Electron debit transactionsfrom 0.75% to 0.4%, with a maximum of DKK 4.
	2005	An annual fee per retailer replaces Dankort merchant service charges. The fee is based on the number of annual transactions.

European Union	2002	The European Commission (EC) reaches an agreement with Visa to reduce its cross-border debit and credit interchange fees by December 2007. The benchmark for its interchange fees is to be set at the level of the cost of supplying Visa payment services and cannot exceed the cost of the services that issuing banks provide, wholly or partly, to the benefit of merchants.
	2007	In December, EC rules that MasterCard's debit and credit interchange fees are illegal. EC claims Mastercard's MIFs inflated card acceptance cost by retailers without increased efficiencies.
	2009	In April, EC and MasterCard reach an interim agreement, setting MasterCard interchange rates for cross-border transactions at, on average, 0.3% for credit cards and 0.2% for debit cards. The EC sends a Statement of Objections to Visa asserting its preliminary view that multilateral interchange fees set by Visa violate European Antitrust rules.
	2010	In April, Visa Europe proposes to cap the weighted average MIF for consumer immediate debit card transactions at 0.2%. The cap is applicable to cross-border transactions within EEA and, separately, to domestic transactions in each EEA country where MIFs are either set directly by Visa Europe or the Visa Europe cross-border rates applies by default.
	2012	In July, the EC submits a supplementary statement of objections to Visa Europe regarding its use of MIFs in the EEA. The EC alleges that these MIFs restrict competition and put upward pressure consumer prices.
	2013	In April, the EC opens a formal investigation into whether several of MasterCard's interchange fees and practices violate EU antitrust rules. The proceedings identify MasterCard's interchange fees on payments made by cardholders from non EEA countries and its cross-border acquiring rules as items of particular concern.
	2014	In February, the EC renders legally binding the commitments offered by Visa Europe to cut MIF (to 0.3% for credit and 0.2% for debit transactions) and reform its rules in the 28 EU countries and Iceland, Norway, and Liechtenstein. Visa Europe also commits to allow cross-border acquirers to offer either the domestic debit or credit MIF applicable at the merchant's location or an MIF rate of 0.2 % for debit and 0.3% for credit beginning January 2015.
	2015	The EU adopts the regulation to cap (multilateral, bilateral, or unilateral) interchange fees at 0.3% for credit, 0.2% for debit, starting from December 9, 2015. The regulation does not apply to three-party schemes without licensees and to commercial cards if charged directly to a company account. In July, the EC sends a Statement of Objections to MasterCard stating its preliminary view that MasterCard's rules on cross-border acquiring and inter-regional interchange fees violate EU antitrust rules.

France	2009	Proceedings opened following a complaint from the Fédération des entreprises du Commerce et de la Distribution trade association regarding credit and debit interchange fees.
	2011	In July, the French Competition Authority (FCA) closes its investigation concerning interchange fees by accepting the commitments offered by the Groupement des Cartes Bancaires (a syndicate of banks issuing payment cards). Among other things, the commitment includes a reduction in the interchange fees from 0.47% to 0.3% on average for all cards. The period of the commitments is four years. The FCA turns its attention to the interchange fees set by other payment card systems, including MasterCard and Visa.
	2013	In September, Visa and MasterCard agree with FCA to cap their debit and credit interchange fees at 0.28%.
Greece	2008	The Hellenic Competition Commission accepts commitments offered by banks to reduce the level of debit interchange fees.
Hungary	2008	GVH begins an antitrust probe against major credit card companies suspecting price collusion and anticompetitive practices.
	2009	GVH imposes fines upon Visa Europe, MasterCard and top commercial banks, ruling they have inhibited competition by forming an illegal bank card interchange-fee cartel. This ruling is overturned in 2017.
India	2012	To promote the use of debit cards, the Reserve Bank of India (RBI) caps the merchant discount rate (MDR) on debit card transactions at 0.75% for values at or below Rs 2000 and at 1% for values above Rs 2000.
	2017	The RBI announces its restructuring of MDR for debit transactions, capping the rate for small merchants at 0.4% for physical POS infrastructure and 0.3% for digital POS. For other merchants (excluding special merchant category and government), the rates are capped at 0.95% for physical POS infrastructure and 0.85% for digital POS.
Israel	2006	The Antitrust Tribunal in Israel reaches an agreement with banks to reduce credit interchange fees from 1.25% to 0.875% by 2012.
	2011	Credit card companies adopt the Tribunal's methodology for calculating interchange fees and agree to reduce fees from 0.875% to 0.7% by July 2014.
	2015	Bank of Israel sets interchange fees for immediate debit transactions at 0.3% for a period of one year, effective as of April 1, 2016.
Italy	2010	The Italian Competition Authority (ICA) fines MasterCard and eight banks for allegedly using licensing agreements to keep credit and debit interchange fees high and passing those charges on to merchants.
	2010	The ICA accepts commitments offered by PagoBANCOMAT (the dominant Italian network) in response to an investigation opened in October 2009. The commitments aim to reduce the level of multilateral interchange fees for national transactions using national PagoBANCOMAT branded debit cards and include: a 4% reduction of MIFs, a pledge to not increase MIFs in the future, and a re-definition of MIFs in accordance with ICA.
	2014	The ICA begins investigating whether Constorium Bancomat's decision to set debit interchange fees for bill payment transactions made with a PagoBancomat debit card at €0.10 per transaction violates antitrust law.

Latvia	2011	The Latvian Competition Council decides that 22 commercial banks have infringed the Competition Law by participating in multilateral interchange fee agreements for debit and credit transactions and imposes fines on those banks.
Malaysia	2014	In December, Bank Negara Malaysia (the Central Bank of Malaysia) issues the Payment Card Reform Framework, effective as of July 1, 2015, which caps interchange fees at the lesser of 0.15% or 50 sen plus 0.01% for domestic debit and the lessor of 0.21% or 70 sen plus 0.01% for international debit and prepaid. Interchange fees for credit are capped at either 1.10% or 1% from July 1, 2015 and at 0.48% from January 1, 2021.
Mexico	2006	The Bank of Mexico and the Mexican Bankers Association agree to reduce interchange fees for credit and debit transactions. Credit interchange fees decrease by .43% and debit interchange fees decrease by 1.34%.
Netherlands	2004	The Netherlands Competition Authority (NMa) fines Interpay, which operates the debit card system, and member banks for charging excessive merchant fees for PIN debit transactions. NMa withdraws the accusation and the fine imposed on Interpay but upholds the fine on the banks in 2005.
	2014	MasterCard promises the Netherlands Authority for Consumers and Markets (ACM) to reduce its interchange fee rate for domestic credit card payments from 0.9% to 0.7% (June 1, 2014), 0.5% (January 1, 2015), and 0.3% (January 1, 2016).
New Zealand	2007	The New Zealand Commerce Commission investiagates Visa, MasterCard, and member institutions of the schemes for price-fixing in credit card interchange fees.
	2009	The New Zealand Commerce Commission agrees with Visa and MasterCard to settle credit card interchange fee proceedings. The agreements require both networks to alter the scheme rules in New Zealand, allowing merchants to surcharge, nonbanks to become acquirers, and card issuers to individually set interchange fees (the networks set the maximum interchange fee rates).
Nigeria	2016	The Central Bank of Nigeria issues the credit and debit interchange fee regime, which sets the fee level at 0.4% for general merchants and 0.85% for travel and entertainment effective in May 2017. This regime, however, has been suspended, until further notice.
Poland	2007	The Polish Office of Competition and Consumer Protection (OCCP) orders banks to discontinue their multilateral interchange fee agreements for debit and credit schemes.
	2008	In November, the Court of Competition and Consumer Protection (CCCP) overturns the OCCP's decision on interchange fees, holding that the participation of 20 banks in an agreement fixing the fee levels does not constitute an infringement of the Competition Act in the European Union (*i.e.* , Art 81.1 EC) nor equivalent national provision.
	2014	In January, a law goes into effect that amends the Act on Payment Services to include a maximum interchange fee of 0.5% on all Polish debit and credit cards. Affected entities have six months to comply. In December, the President signs another amendment to the Act of Payment Services, which caps interchange fee at 0.2% for debit and 0.3% for credit from January 2015.

Serbia	2017	The National Bank of Serbia (NBS) publishes a draft law on interchange fees consisting of two phases: the cap on interchange fees for the first nine months after implementation would be 0.5% for debit and 0.6% for credit, after which fees would be capped at 0.2% for debit and 0.3% for credit.
Spain	2005	The Spanish Competition Tribunal denies authorizing the credit and debit interchange fee arrangements of the Spanish card schemes. In December, Spanish card networks and merchants reach an agreement coordinated by the Spanish Ministry of Industry, Tourism and Trade for interchange fees to be reduced immediately and progressively (effective November 2006).
	2014	In July, the Government approves caps on interchange fees. For a €20 or less transaction, the cap is set at 0.1% for debit and 0.2% for credit. For a higher value transaction (higher than €20), the cap is set at 0.2% or €0.07, whichever is less, for debit and 0.3% for credit. These caps apply to four-party schemes only are effective on September 1, 2014.
South Africa	2014	The South African Reserve Bank determines the levels of debit and credit card interchange fees based on whether the issuer and the acquirer of a given transaction are compliant of EMV (for card-present) and 3D secure (for card-not-present). These rates become effective on January 1, 2015. Fees range between 0.36% for debit cards and 1.89% for credit cards.
South Korea	2005	The Korean Fair Trade Commission rules that BC Card's (South Korea's four-party scheme credit card) joint pricing of merchant service charges is a cartel, imposes a fine of 10.092 billion Korean won, and issues corrective measures.
	2012	The National Assembly approves The Revision of the Credit Finance Law (effective January 2013). Among other things, this revision requires credit card companies to apply special merchant fee rates determined by FSC to merchants with annual revenue under a certain level.
	2015	From the end of January 2016, the FSC cuts credit card fees up to 0.7 percentage points for small and medium-sized merchants and cuts the credit card fee cap from 2.7% to 2.5%. Debit card fees for small and medium-sized businesses are reduced to 0.5% and 1% for small and medium merchants respectively.
Switzerland	2005	The Swiss Competition Commission and credit card issuers agree to reduce interchange fees from 1.65–1.70% to 1.30–1.35%.
	2010	The Commission sets the maximum interchange fee for 2010 at 1.058%.
	2011	The Commission reduces the maximum interchange fee to 0.990% for 2011.
	2011	The Secretariat of the Competition Commission closes preliminary investigations. It concludes that an interchange fee for Maestro card transactions could violate the Act on Cartels while an interchange fee for Debit MasterCard might be possible within certain limits, *e.g.* , its market share remains below 15% and the interchange fee is, on average, no more than 0.20 Swiss francs per transaction.

Turkey	2005	The Turkish Competition Authority (TCA) makes a decision on Interbank Card Centre (BKM)'s clearing commission rate by member banks. The formula must be adjusted for certain cost items.
United Kingdom	2005	In September, the Office of Fair Trading (OFT) finds that MasterCard's credit card interchange fee arrangements are illegal. In October, the OFT issues a statement of objections against Visa regarding its agreement on multilateral interchange fees.
	2016	The Competition Appeal Tribunal finds MasterCard's debit and credit interchange fees anticompetitive and orders MasterCard to pay the plaintiff (a retailer) damages.
	2017	In January, the Commercial Court finds that MasterCard's MIFs were necessary for MasterCard to keep business in the UK given competition from Visa. From April 2017, the Payment System Regulator imposes the interchange fee caps on UK domestic transactions of American Express for one year (its exemption status will be reevaluated annually).
United States	2011	The Federal Reserve Board sets the debit card interchange fee standards for regulated banks whose asset size exceeds $10 billion (at the bank holding company level). Debit cards issued by banks with less than $10 billion in assets and reloadable prepaid cards are exempted from the interchange fee standards. The maximum interchange fee that an issue may receive for an electronic debit transaction is the sum of 21 cents and .05% multiplied by the value of the transaction.
Venezuela	2008	Resolución No. 08-12-01 is passed (effective January 2009) which states that the Board of the Central Bank of Venezuela will set limits annually on merchant discount rates and trade commissions for payments made by debit and credit for each merchant category.

Sources: Fumiko Hayashi and Jesse Leigh Maniff, "Public Authority Involvement in Payment Card Markets: Various Countries, August 2017 Update," Federal Reserve Bank of Kansas City, August 2017, pp. 2-30, accessed June 13, 2018, https://kansascityfed.org/~/media/files/publicat/psr/dataset/pub-auth_payments_var_countries_august2017.pdf; Michele Bullock, "A Guide to the Card Payments System Reforms," Reserve Bank of Australia Bulletin, September Quarter 2010; Payment Systems (Regulation) Act 1998 - Interchange Fees in the EFTPOS System (November 2012); Doug Alexander, "Visa, Mastercard Agree to Cut Canada Interchange Fees," Bloomberg, August 9, 2018, accessed September 2014, https://www.bloomberg.com/news/articles/2018-08-09/visa-mastercard-amex-agree-to-trim-interchange-fees-in-canada; Ombline Ancelin, "Visa and Mastercard interchange fees slashed in France," Simmons & Simmons elexica, October 2, 2013, accessed September 25, 2018, http://www.elexica.com/en/legal-topics/antitrust-and-merger-control/30-visa-and-mastercard-interchange-fees-slashed-in-france; "A Revised Interchange Standard for the EFTPOS System" in A Revised Interchange Standard for the EFTPOS System, Reserve Bank of Australia, November 2009; Guillermo Ortiz, "Remarks on Interchange Fees: Central Bank Perspectives and Options," Federal Reserve Bank of Kansas, 2005; "Card results of the Interchange Determination Project - Phase 2," South African Reserve Bank, March 20, 2014; "Credit Card Merchant Fees To Be Lowered," South Korea Financial Services Commission press release, November 2, 2015; and "Federal Reserve issues a final rule establishing standards for debit card interchange fees and prohibiting network exclusivity arrangements and routing restrictions," Board of Governors of the Federal Reserve System press release, June 29, 2011.

Appendix II. Description of Academic Articles on Impact of Regulation

Name	Description
Ardizzi, G. (2013) "Card Versus Cash: Empirical Evidence of the Impact of Payment Card Interchange Fees on End Users' Choice of Payment Methods."	Starting with the assumption that Italian card usage is too low, the author demonstrates a positive correlation between interchange levels and cash usage and argues that lower MIFs would increase card use.
Chakravorti, S. (2010) "Externalities in Payment Card Networks: Theory and Evidence."	The authors assess interchange fees in multiple countries and demonstrate benefits to merchants and consumers if more merchants accept payment cards; there is an overall benefit if the gains from greater card acceptance outweigh the costs to payment providers.
Chan, I, Chong, S, and Mitchell, S. (2012) "The Personal Card Market in Australia: Pricing over The Past Decade."	The authors assess the costs to consumers and merchants of different card schemes as they developed in the 2000s.
Chang, H, Evans, D, and Garcia Swartz, D. (2005) "The Effect of Regulatory Intervention in Two-Sided Markets: An Assessment of Interchange-Fee Capping in Australia."	The authors demonstrate that following reduced interchange fees, acquiring banks passed through the reduced fees to merchants in the form of reduced merchant discount rates, these savings were likely not passed to consumers, and it is unclear how card usage will be impacted by the regulation.
Evans, D and Mateus A. (2011) "How Changes in Payment Card Interchange Fees Affect Consumers Fees and Merchant Prices: An Economic Analysis with Applications to the European Union."	The authors demonstrate that issuing banks in the EU tend to be unconcentrated, thus suggesting a higher pass through to the card holder.
Evans, D, Chang, H, and Joyce, S. (2013) "The Impact of U.S. Debit Card Interchange Fee Caps on Consumer Welfare: An Event Study Analysis."	The authors study the impact of the Durbin Amendment and demonstrate that banks that issued debit cards would have received an estimated $7.3 billion less in interchange fee revenue in 2012 but for the regulation.
Gans, J. (2007) "Evaluating the Impact of the Payment System Reforms, *Submission to the Reserve Bank of Australia's Payment System Board."*	Using Australian data following payment system reforms, the author finds that Australian interchange fee caps did not impact credit card usage.
Getter, D. (2017) "Regulation of Debit Interchange Fees."	The author assesses the impact of the Durbin Amendment and finds asymmetric effects: merchants face an unequal swipe fee and covered institutions have seen varied results from the legislation. The author additionally discusses The Financial CHOICE Act's proposal to eliminate the Durbin Amendment.
Hasan, I, De Renzis, T, and Schmiedel, H. (2013) "Retail Payments and The Real Economy."	The authors use retail payments data from all 27 EU Member States from 1995 to 2009 to demonstrate a positive relation between the migration from paper to electronic retail payments and the real economy.
Hayes, R. (2010) "Is Price Regulation of Payment Card Associations Effective? Evidence From a Dramatic Policy Experiment."	Following 2003 interchange regulation in Australia, the author demonstrates no change in card usage other than those related to interest rate changes.
Hubbard, B. (2012) "The Durbin Amendment, Two-Sided Markets, and Wealth Transfers: an Examination of Unintended Consequences Three Years Later."	The author assesses different aspects of the Durbin Amendment and finds significant negative financial impact for banks, a positive network fee externality for issuers, harmed consumers, and gains for large retailers.
Iranzo, J, Fernández, P, Matías, G, and Delgado, M. (2012) "The Effects of The Mandatory Decrease of Interchange Fees in Spain."	The authors find that following 2005 interchange fee regulation Spanish consumers were harmed by increased cadholder fees and reduced benefits, the dynamics of the four party system were altered, and financial developments and electronic payment progress slowed down.
Kay, B, Manuszak, M, and Vojtech, C. (2018) "Competition and Complementarities in Retail Banking: Evidence from Debit Card Interchange Regulation."	Using the Durbin Amendment as a natural experiment, the authors quantify the decline in interchange income for impacted banks and demonstrate that impacted banks offset 90 percent of these losses with increased fees.

Koulayev, S, Rysman, M, Schuh, S, and Stavins, J. (2012) "Explaining Adoption and Use of Payment Instruments by U.S. Consumers."	The authors study the socioeconomic impact of card uptake and demonstrate that a policy that reduces debit market share would reduce consumer welfare between −2.8 and −1.3 percent varying by income level.
Manuszak, M, and Wozniak, K. (2017) "The Impact of Price Controls in Two-sided Markets: Evidence from US Debit Card Interchange Fee Regulation."	The authors demonstrate that banks that were exempt from the Durbin Amendment and faced competition from covered banks would reduce the availability of free noninterest checking accounts.
Rysman, M. (2004) "An Empirical Analysis of Payment Card Usage."	The author demonstrates that many consumers multi-home regarding holding cards on different systems, but few consumers multi-home with card usage.
Valverde, S, Chakravorti, S, and Fernández, F. (2016) "The Role of Interchange Fees in Two-Sided Markets: An Empirical Investigation on Payment Cards."	Using Spanish data from 1997 to 2007, the authors demonstrate that bank revenues increased following interchange fee reductions; the authors additionally demonstrate that when merchant adoption is far from complete, reducing interchange fees may positively impact consumer and merchant card adoption.
Weiner, S and Wright J. (2005) "Interchange Fees in Various Countries: Developments and Determinants."	Using cross-country data, the authors reject that the level of interchange fees is solely a reflection of the market concentration of issuers.
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Zywicki, T, Manne, G, and Morris, J. (2014) "Price Controls on Payment Card Interchange Fees: The U.S. Experience."	The authors assess the impact of the Durbin Amendment and demonstrate that consumers have seen large and immediate increases in the cost of bank accounts, and that there has been an annual transfer of $1 to $3 billion from low income households to large retailers and their shareholders.
Zywicki, T, Manne, G, and Morris, J. (2017) "Unreasonable and Disproportionate: How the Durbin Amendment Harms Poorer Americans and Small Businesses."	The authors demonstrate that following the Durbin Amendment, increased costs harm low income consumers as well as smaller retailers.