

INTRODUCTION

Over the past 20 years, the ways we pay for goods and services have undergone a revolution. There has been a dramatic shift away from the use of cash and checks and toward the use of payment cards. More recently, this shift has also migrated toward the use of online payments, mobile payments and, to a smaller degree, cryptocurrency. These shifts, demonstrated in Figure 1, have been driven by innovations in payments technologies that have made them quicker, more convenient, more secure, and less costly for both consumers and merchants. And it has continued over the past two years, despite the global COVID-19 pandemic; indeed, the pandemic accelerated the shift to contactless and online payments.^{1F[1]}

At the same time, governments have intervened in the operation of payment systems in various ways. As we have documented previously, these regulations have typically slowed the shift toward more innovative, quicker, more convenient payment systems, while also reducing other benefits and harming, in particular, poorer consumers and smaller merchants.^{2F[2]}

Figure 1: Shares of Non-Cash Payments in the US by Transaction Volume, 2000 - 2020

Source: *Authors' calculations based on data from the Federal Reserve Payment Studies*

This literature review revisits and builds upon our previous assessments, incorporating data, analyses, and insights from more recent research. The review is organized as follows. Section I provides a brief overview of the theory of two-sided markets as it pertains to payment-card networks, the role of the interchange fee as a balancing mechanism, and the theory of the optimal interchange fee. Section II describes some of the major ways that jurisdictions have capped interchange fees and posits some hypotheses regarding the likely effects of such caps. Sections III to VIII consider evidence for and against those hypotheses. Section IX concludes.

I. PAYMENT NETWORKS, TWO-SIDED MARKETS, AND INTERCHANGE FEES

Early card payments involved only two parties: the merchant and the consumer. The “card” (a metal plate) enabled merchants to maintain a record of credit provided to regular customers, who would then settle-up at the end of the month.^{3F[3]} In the 1950s, first Diners Club and then American Express established “three-party” systems, which enabled consumers to use the same card at multiple different merchants.^{4F[4]} In a three-party system, the card issuer pays merchants directly and bills and collects from cardholders directly.^{5F[5]}

During the 1960s, several organizations developed “four-party” systems. As their designation suggests, these systems, typified by those operated by Mastercard and Visa,

have four main parties: issuer, consumer, merchant, and acquirer. The issuer contracts with the consumer, providing the card, issuing bills, etc. The acquirer contracts with the merchant, making payment. The rules of the system are set by the network operator, which also facilitates settlement between issuer and acquirer, and monitors for fraud and other abuse.^{6F[6]}

A. Two-Sided Markets

One of the main challenges faced by any payment system is to persuade both merchants and consumers of its value, regardless of whether it is a three-party or four-party payment card system or some other payment mechanism such as cash, check, or cryptocurrency. If too few merchants accept a particular form of payment, consumers will have little reason to hold it and issuers will have little incentive to issue it. Likewise, if too few consumers hold a card, merchants will have little reason to accept it. Conceptually, economists describe such situations as “two-sided markets”: consumers are on one side, merchants on the other, and the payment system acts as the platform facilitating interactions between them.^{7F[7]} While payment cards are a prominent example of a two-sided market, there are many others, including: newspapers, shopping malls, social-networking sites, and search engines. Indeed, the rise of the Internet has made two-sided markets practically ubiquitous.

All platform operators that facilitate two-sided markets face essentially the same challenge: how to incentivize participation on each side to maximize the *joint net benefits* of the platform to all participants—and to allocate costs accordingly.^{8F[8]} Thus, the platform operator can be expected to set the respective prices charged to participants on each side of the market to achieve this maximand.^{9F[9]} If the operator sets the price too high for some consumers, they will be unwilling to use the platform; similarly, if the operator sets the price too high for some merchants, *they* will not be willing to use the platform.

This balancing is not static, but evolves over time in light of changes in costs, benefits, and preferences. Thus, whereas checks were once ubiquitous, now they are rarely used in retail payments, in large part because of their inconvenience and the risk to the merchant that a check will not clear. Similarly, while grocery stores and fast-food chains traditionally eschewed payment cards, their declining costs and increased speed and convenience facilitated faster throughput of the retail experience. Change may come from exogenous forces as well—for example, the COVID-19 pandemic led to a dramatic surge in the use of electronic payments and payment cards, as consumers and merchants sought to avoid physical cash and face-to-face interactions.

Nonetheless, platforms must cover the system operating costs, which arise from the *joint* interaction of the two sets of participants, mediated by the platform. In the case of payment networks, marginal costs are incurred only if *both* the consumer and the merchant choose to interact through the platform.^{10F[10]} Because the costs of operating the network arise from the joint interaction of participants on both sides, there is no “natural” way to allocate them.^{11F[11]} Ultimately, the costs of operating the platform must be covered either by merchants or by consumers, or by some combination of the two.^{12F[12]}

In many cases, this involves one side paying more of the costs than the other side. Consider newspapers, for example, where advertisers are on one side of the market and consumers on the other. Newspapers publish stories to attract readers. While some of the costs of operating a newspaper may come from reader's payments, often much and sometimes all of the costs are covered by advertisers. Participants on one side of the market, the advertisers, thus effectively subsidize the production of content that is of interest to participants on the other side of the market, the readers. Likewise, search engines return searches that are of interest to consumers while also displaying advertisements (that may be related to the search or to some other activity the searcher has been undertaking), with the revenue from the advertisements funding the (non-advertising related) search returns.

In addition to these cross-subsidies *across* the two sides of the market (from merchants to consumers), there are also often cross-subsidies *among* the participants on one side of the market, such as between business and consumer users of a platform service. The Portable Document Format standard (PDF) is a good example: Adobe supplies the PDF-reader software for free, while charging businesses that want to produce PDFs.

In general, the costs of operating the platform tend to fall on the party who is least sensitive to such costs—in the language of economics, the party with the lower price elasticity. In the case of newspapers and search engines, that is advertisers. In the case of payment cards, it is merchants.^{13F[13]}

Thus, it is predictable that the costs of payment-card transactions would gravitate to merchants to cover much of the cost of each transaction. Through this transaction fee, merchants often pay not only all the costs of operating the network but also effectively subsidize participation by consumers, e.g., through rewards programs. Consumers may also pay an annual fee, although this is rare today, except for cards that offer rewards such as airline miles for which the annual fee defrays the costs of operating the rewards program.

B. Interchange Fees

In three-party networks, the merchants' transaction fee is charged directly by the network operator. In four-party systems, merchants pay acquirers a "merchant discount" (known as the "merchant service charge" in some jurisdictions), which includes the acquirer's processing costs and the "interchange fee." The interchange fee is a charge made by the network operator, the bulk of which is paid to the issuer (in the form of a deduction from the amount sent by the issuer to the acquirer when settling the transaction).

The various three- and four-party payment networks have been engaged in a decades-long process of dynamic competition in which each has sought—and continues to seek—to discover how to maximize value to their networks of merchants and consumers. This has involved considerable investment in innovative products, including more effective ways to encourage participation, as well as the identification and prevention of fraud and theft. As one of us previously noted:

[Compared to in-house providers of credit,] card issuers have developed the capacity to assess and price risk more accurately, giving them an increased ability both to take on more risk and to allocate the cost of risk within the system. For example, because they draw from a wider array of retailers, card-holders and locations, general credit card issuers can develop more-sophisticated (and less-costly) systems for anticipating and preventing fraudulent practices, reducing the risk of default by particular consumers, or protecting consumers against identity theft. In light of the massive volume of transactions processed and the number of consumers in the system, it has become feasible for card issuers to take increasingly-sophisticated measures to minimize (or appropriately charge for) the risk of non-payment by cardholders. Likewise, this huge database of information has enabled issuers to learn how to attack fraud through effective devices like password authorization, additional digits for card number verification, and special protections for on-line sales. Card issuers deploy extraordinarily-complicated neural networks and intelligent computer systems to detect changing patterns of fraud in real-time. Very few of these protections would be cost-feasible for department store chains (much less supermarkets, small appliance, hardware, or convenience stores), and large-scale card issuers are able to extend affordable credit to a much wider population and to do so much more efficiently. Indeed, these protections represent a traditional economy of scale, the benefits of which redound to both consumers and merchants.^{14F[14]}

It has also involved experimentation with different levels of transaction fees. The early three-party schemes charged a transaction fee of as much as 7%.^{15F[15]} Competition and innovation (including, especially, innovation in measures to reduce delinquency, fraud, and theft) drove those rates down. For U.S. credit cards, the merchant discount rate currently ranges from about 1.5% to 3%.^{16F[16]} Rates vary by industry (for example, lower-margin industries, such as fast food and grocery stores, often have lower rates) and card-not-present transactions typically have higher interchange-fee rates because of higher incidences of fraud associated with them. (The specific rate depends on numerous factors, including the type of merchant and the type of arrangement the merchant has with the acquirer.)^{17F[17]}

The majority of the merchant discount is the interchange fee remitted to the issuing bank, which in the United States ranges from about 1.5% to 3.5% (except for debit cards, subject to the caps discussed below) and averages approximately 2.2%.^{18F[18]} Interchange-fee revenue covers many of the costs of operating the system, such as attracting new customers, card issuance, customer service, and fraud prevention and resolution, as well as such benefits as rewards, fraud protection, and car-rental insurance. Moreover, these services are offered for free today (no annual fee) or even at a negative price, such as when rewards are provided. Finance charges on revolving balances also generate substantial revenue, much of which covers the costs of underwriting, servicing, and charge-offs on credit balances. Revenue provided by interchange fees has risen substantially over time as a percentage of revenues from operations, increasing from 10% in 1990 to more than 20% in 2010, primarily mirroring a decline in the percentage of revenues generated by finance charges and the fact that transaction use (where the card balance is paid in full every month) grew more rapidly than revolving use.^{19F[19]}

C. What Does Economic Theory Say About Optimal Interchange Fees?

Beginning with William Baxter's seminal 1983 paper, a rich theoretical literature has sought to understand various aspects of how payment networks operate. This literature has uncovered numerous valuable insights, including:

- The interchange fee exists as a default in open-network schemes, at least in part, because of the high costs of negotiating and enforcing many bilateral agreements between banks.^{20F[20]}
- The interchange fee is set by payment-network operators, thereby internalizing the external costs that would arise if individual issuing banks set their own fees, as individual banks would have an incentive to set their fees excessively high to try to maximize their own revenue without regard to the impact on the value of the system as a whole.^{21F[21]}
- As noted, the optimal allocation of costs between merchants and consumers depends on the price elasticity of the participants on each side of the market.^{22F[22]} And since merchants tend to be less price sensitive, they generally bear more of the cost (via the merchant discount rate, which includes the interchange fee and merchant-acquirer fees), though consumers often also bear some of the cost (for example, in the form of annual fees, which tend to be applied to cards targeted at less price-sensitive consumers).

These factors, in combination with others, mean that the “optimal” interchange fee is indeterminate *a priori* and varies from place to place and from time to time. The European Commission has noted similarly:

The Commission does not dispute in general that payment systems are characterised by indirect network externalities and that in theory a revenue transfer between issuing and acquiring banks may help optimise the utility of the network to its users. However, whether a collectively fixed interchange fee should flow from acquirers to issuers or vice versa, and at which level it should be set cannot be determined in a general manner by economic theory alone, as theories always rely on assumptions that may not sufficiently reflect market reality.^{23F[23]}

The U.S. Supreme Court put it more succinctly:

To optimize sales, the network must find the balance of pricing that encourages the greatest number of matches between cardholders and merchants.^{24F[24]}

Given the theoretical indeterminacy of the optimal interchange fee, economists have cautioned against intervention unless there is evidence of a significant market failure.^{25F[25]}

II. INTERCHANGE-FEE PRICE CONTROLS AND THEIR EFFECTS

In the three decades since Denmark introduced the first caps on interchange fees in 1990, dozens of jurisdictions have followed suit.^{26F[26]} This section summarizes, in A through D, some of the most significant interchange-fee caps that have been introduced in various jurisdictions, namely Spain, Australia, the United States, and the European Union. It then offers some hypotheses regarding the likely effects of such caps.

A. Spain

Spain's government twice imposed caps on interchange fees through "agreements" between merchant associations and payment-card schemes.^{27F[27]} The first of these was initiated by the competition authority in April 1999, with a cap of 3.5% coming into effect in July of that year and falling in increments of 0.25% per year until it reached 2.75% in July 2002. This first agreement expired in July 2003.

The second cap was introduced in December 2005 by the Ministry of Finance, Industry, Tourism and Trade, again through an "agreement" between merchant associations and card schemes. The caps came into effect in January 2006 and lasted for five years. These caps were much tighter than those in the previous agreement, as can be seen in the schedule in Table I.

Table 1: Maximum Interchange Fees in Spain Under the 'Agreement' Signed in 2005

Euros (€)	2006		2007		2008		2009-2010	
	Credit (%)	Debit (€)	Credit (%)	Debit (€)	Credit (%)	Debit (€)	Credit (%)	Debit (€)
0-100 mil.	1.40	0.53	1.30	0.47	1.10	0.40	0.79	0.35
100-500 mil.	1.05	0.36	0.84	0.29	0.63	0.25	0.53	0.21
> 500 mil.	0.66	0.27	0.66	0.25	0.54	0.21	0.45	0.18

Source: *Iranzo, et al., 2012, at 14*

B. Australia

In 2002, Australia's bank regulator, the Reserve Bank of Australia (RBA), introduced a series of regulations affecting the processing of credit-card transactions, including limits on interchange fees charged by four-party card networks. The RBA also prohibited card networks from enforcing restrictions on surcharges.

Under the rules, which came into force in 2003, interchange fees were not subject to an absolute cap but rather were subject to an effective cap set using a "cost-based framework."

Under the framework, a “cost-based measure” was calculated as the total of the eligible costs for each scheme in the preceding year, divided by the value of transactions processed by the scheme during the period. Meanwhile, eligible costs were limited to:

- (i) issuers’ costs incurred principally in processing credit card transactions, including the costs of receiving, verifying, reconciling and settling such transactions;
- (ii) issuers’ costs incurred principally in respect of fraud and fraud prevention in connection with credit card transactions;
- (iii) issuers’ costs incurred principally in providing authorization of credit card transactions; and
- (iv) issuers’ costs incurred in funding the interest-free period on credit card transactions, calculated using the average of the cash rate published by the Reserve Bank of Australia over the three financial years prior to the date by which the cost-based benchmark must be calculated.^{28F[28]}

Notably, these eligible costs did not include any cross-subsidies, such as for rewards programs.

In a media release issued Aug. 27, 2002, the RBA noted that “average interchange fees in Australia are expected to fall from around 0.95 per cent of the value of each credit card transaction at present to around 0.55-0.6 per cent in the second half of 2003 - a reduction of around 40 per cent.”^{29F[29]}

The cost-based framework meant that different card schemes were subject to somewhat different effective caps. In February 2005, the RBA launched an inquiry to assess the potential to introduce uniform caps. Following the inquiry, the RBA introduced a common standard in November 2005, under which all cards would be subject to the same caps.^{30F[30]} Under the standard, the caps were calculated based on the weighted average costs across the covered card networks, using the same eligible-cost framework as above.^{31F[31]}

Three-party cards were not originally subject to the regulation. In 2005, the RBA considered but rejected the possibility of regulating three-party cards that had partnered with banks.^{32F[32]}

In February 2006, the RBA changed the rules regarding interchange fees for the domestic debit system—EFTPOS, for “electronic funds transfer at point of sale”—introducing both a floor and a ceiling on EFTPOS transactions.^{33F[33]} At the same time, it prohibited Visa and Mastercard from enforcing their “honor all cards” rules with respect to debit transactions; i.e., if a merchant accepted Visa (Mastercard) credit, then Visa (Mastercard) could no longer require the merchant to accept Visa (Mastercard) debit.

On Sept. 29, 2006, the RBA set a common benchmark (average interchange fee) for Visa

and Mastercard of A\$0.5 per transaction, to apply for the three years following Nov. 1, 2006.^{34F[34]} In December 2008, the RBA decided to waive the three-year review, so the A\$0.5 per-transaction benchmark continued to apply.^{35F[35]}

In 2016, the RBA changed “Standard No. 1,” under which interchange and other credit-card fees were determined.^{36F[36]} Among other things, it set a hard cap of 0.8% per transaction and a maximum average rate of 0.5% over the course of a “reference period.” It also specified that issuers were prohibited from receiving “net compensation” in relation to credit-card transactions.

C. The United States

In 2010, the United States passed legislation to impose caps on interchange fees on debit-card transactions made using cards issued by banks with more than \$10 billion in assets. The caps, imposed under Section 1075 of the Dodd-Frank Wall Street Reform and Consumer Protection Act—a section titled “Reasonable Fees and Rules for Payment Card Transactions,” but better known as the “Durbin amendment” after its sponsor, Sen. Richard Durbin (D-Ill.)—required the Federal Reserve Board to set maximum interchange fees for covered banks that are “reasonable and proportional to the cost incurred by the issuer with respect to the transaction.”^{37F[37]} On July 20, 2011, the Fed Board issued its ruling, known as Regulation II, which capped fees for covered transactions at \$0.21 plus 0.05% of the transaction value.^{38F[38]} In a separate rulemaking, the Fed Board determined that an additional \$0.01 per transaction may also be charged to defray the cost of investments related to identifying and preventing fraud and suspicious transactions.^{39F[39]}

Regulation II came into effect in October 2011 and the consequences were both immediate and dramatic: average interchange fees for covered debit transactions fell from \$0.51 to \$0.24, while those for exempt transactions remained constant, at \$0.44.^{40F[40]} As can be seen in Figure 2, average interchange fees have remained at roughly the same level since October 2011, averaging \$0.23 for covered transactions and \$0.43 for exempt transactions.

Figure 2: Average Debit Card Interchange Fees, US, \$

Source: *Federal Reserve Board*

D. The European Union

Regulations implemented by individual member states notwithstanding, the EU’s actions on interchange fees had, up to 2015, primarily concerned cross-border transactions. For example, the European Commission issued a 2007 decision forcing Mastercard to repeal its fallback interchange fees for cross-border transactions within the European Economic Area.^{41F[41]}

In April 2015, the European Union introduced the Interchange Fee Regulation (IFR), which capped interchange fees for consumer debit cards at 0.2% and for consumer credit cards at

0.3% of the transaction value.^{42F[42]} As a regulation, the caps applied throughout the EU with direct effect; i.e., there was no need for member states to implement enabling legislation and no room for interpretation (although member states were responsible for establishing enforcement authorities). The caps came into force Dec. 9, 2015.^{43F[43]}

The IFR contained numerous other provisions, including:

- mandatory unbundling of card schemes and processors;^{44F[44]}
- a requirement that issuers offer consumers “co-badging” options, where these exist;^{45F[45]}
- a prohibition on the “honor all cards rule” for cards that are not covered by the fee caps;^{46F[46]} and
- prohibitions on restrictions on steering by merchants.^{47F[47]}

Since Dec. 9, 2015, the default interchange fees on covered cards issued by Visa and Mastercard have been 0.2% for debit and 0.3% for credit. Some national card schemes have continued to offer lower interchange fees.^{48F[48]} By contrast, interchange fees for (unregulated) *corporate* cards currently range from 0.3% to 1.9%.^{49F[49]}

E. Some Hypotheses Regarding the Effects of Interchange-Fee Caps

Based on the analysis in Section I, we may posit several hypotheses regarding the likely effects of imposing price controls on interchange fees. These hypotheses are spelled out here and assessed in subsequent sections.

First, since interchange-fee revenue is remitted to issuers, a cap on interchange fees would be expected to reduce revenue to issuers. This is our first hypothesis:

H1: Interchange-fee caps reduce (interchange-derived) revenue to issuers.

Second, interchange-fee price controls will reduce the revenues available to fund card operations but issuers will still need to cover a range of costs. As a result, to the extent possible, issuers will respond to the revenue losses caused by price controls by reducing costs directly associated with cards, such as rewards, and also seek alternative sources of revenue, such as by raising fees on other elements of the card contract (such as annual fees) or by increasing the finance charge on revolving balances:

H2: Issuers subject to the interchange-fee cap will reduce benefits associated with cards subject to the cap and recover lost revenue by raising other fees.

But issuers will not reduce the benefits associated with unaffected cards. Indeed, to the extent that an issuer also offers unaffected cards, it may seek to steer consumers toward

those unaffected cards. This gives us our third hypothesis:

H3: Issuers that offer both cards that are subject to a price cap and those that are not will seek to steer consumers toward the uncapped cards.

The increase in costs and reduction in benefits associated with cards subject to interchange-fee caps will lead consumers to shift to other payment methods, including to cards that are not subject to the caps, as well as to cash:

H4: Interchange-fee caps will cause consumers to switch to payment methods not subject to the caps.

Evidence from a range of industries suggests that, when input costs change, businesses rarely pass through all of the change to their consumers in the form of higher or lower prices.^{50F[50]} Moreover, the proportion of changes to input prices that are passed through tends to be asymmetric, with reductions in input prices being passed through at a lower rate than increases in such prices.^{51F[51]} Applying this to changes associated with caps on interchange fees gives us our fifth hypothesis:

H5: Merchants will, on average, pass through reductions in costs associated with reduced interchange fees at a rate considerably less than 100%, but issuers will pass through associated cost increases at a higher rate.

By reducing per-transaction card-related revenue to issuers, the interchange-fee cap reduces issuers' incentive to invest in innovations that might otherwise lead to increased transactions:

H6: Interchange-fee caps will result in reduced investments in innovative technology.

Through a combination of issuers charging higher fees and offering lower rewards, and limited passthrough by merchants, interchange-fee caps have a particularly adverse effect on lower-income consumers:

H7: Through this combinations of factors, interchange-fee caps will adversely affect financial inclusion.

III. HAVE INTERCHANGE-FEE CAPS REDUCED ISSUER

REVENUE?

Our first hypothesis is that, since interchange-fee revenue is remitted to issuers, a cap on interchange fees would be expected to reduce revenue to issuers. Studies looking at the effect of caps in Spain, the United States, and the EU generally confirm this effect.

An econometric analysis of Spain's series of interchange-fee regulations by Valverde, *et al.*, suggested that the mandatory reduction in interchange fees in Spain increased merchant acceptance and contributed to an increase in the volume of transactions.^{52F[52]} However, the analysis by Valverde, *et al.*, only covered the period 1997-2007, so missed most of the more aggressive period of interchange-fee caps (2008-2010). Iranzo, *et al.*, found that, over the five-year period 2006-2010, total bank revenues from interchange fees fell by €3.3 billion.^{53F[53]}

Estimates suggest that the Durbin amendment initially reduced annual interchange-fee revenue for covered banks by between \$4.1 and \$8 billion.^{54F[54]} Since then, the volume and value of debit-card transactions has continued to grow and, but for the Durbin amendment, would have grown more rapidly (see below). The result is that, relative to the revenue that covered banks otherwise would have realized, the annual lost interchange-fee revenue may have been as much as \$8.9 billion in 2012, growing to \$14 billion in 2019.^{55F[55]} Extrapolating to 2021, this implies that over the 10 years since it was first implemented, the Durbin amendment may have caused issuing banks to lose \$120 billion or more.

In a 2020 study, Edgar Dunn & Co. found that interchange-fee revenue for debit and credit combined fell by 43% following the introduction of the IFR in the EU.^{56F[56]}

IV. HAVE ISSUERS SUBJECT TO INTERCHANGE-FEE CAPS REDUCED REWARDS AND INCREASED OTHER FEES?

Our second hypothesis is that issuers faced with declining revenue from interchange fees will reduce rewards and increase other fees. While responses vary from jurisdiction to jurisdiction, in general, the evidence supports this hypothesis.

Survey evidence reported by Iranzo, *et al.*, suggests that issuers in Spain reduced the rewards available from cards following the reduction in interchange fees.^{57F[57]} From 2008 to 2010, issuing banks increased interest rates from an average of 3% above the European Central Bank (ECB) base rate in 2005 to 4.6% above base.^{58F[58]} As a result, income from interest payments was nearly 80% higher from 2006 to 2010 than in 2005, representing a total incremental increase in income from interest over the period of about €2.6 billion (although this could be an overstatement, since we are only comparing to revenue in 2005). At the same time, average annual fees on credit cards rose by 50% from

€22.94 to €34.39, generating incremental revenue over the period of €1.7 billion. And average annual fees for debit cards rose by 56%, from €11.12 to €17.30 per card, increasing revenue by another €0.6 billion. In other words, incremental interest payments and annual fees made up at least a large fraction of what was lost from the interchange-fee caps.

The Reserve Bank of Australia sought to make credit cards less attractive in order to encourage consumers to use the allegedly more “socially efficient” EFTPOS debit system. The data show that it was successful in this endeavor. Between 2003 and 2011, the average spend required to obtain a A\$100 shopping voucher through use of a four-party credit card issued by the four largest banks in Australia went from A\$12,400 to A\$18,400.^{59F[59]} In addition, issuers introduced caps on the total number of rewards that could be earned in a given period.^{60F[60]} This turns the conventional rewards card model on its head: instead of creating incentives to use the rewards card more to achieve specific additional benefits, Australian credit-card issuers now incentivize rewards-card holders to switch cards when they reach the cap.

Australian issuers also increased the fees they charged on four-party credit cards. Between 2002 (the year before the regulation came into effect) and 2004, the annual fee on a “standard” rewards credit card went from A\$61 to A\$85 (an increase of about 40%). Over the same period, the fee on a “gold” rewards card rose from A\$98 to A\$128 (a 30% increase). By 2017, although the structure of rewards-card programs had changed somewhat, the average fee on rewards cards (of various kinds) had risen to A\$199—significantly higher, even taking inflation into account, than the fee on a gold card in 2002.^{61F[61]}

In sum, consumers in Australia now pay vastly more for their rewards credit cards and receive considerably fewer rewards for each dollar they spend. As a result, consumers have switched from using credit cards to using debit cards. The volume of debit transactions has increased at a much faster rate than the volume of credit-card transactions. Meanwhile, the value of debit-card transactions has gradually been catching up to the value of credit-card transactions.

U.S. banks covered by the Durbin amendment eliminated or reduced card-rewards programs on debit cards.^{62F[62]} Data from the Federal Reserve Board suggest that rewards on debit cards issued by covered banks averaged approximately \$0.05 per transaction in 2009 but fell to about \$0.02 per transaction afterward.^{63F[63]}

At the same time, covered banks increased the minimum balance required to qualify for free checking accounts and narrowed the types of account that qualified. In 2008, the average minimum deposit required to maintain a free checking account was \$109. By 2012, that figure had soared to \$723 and has remained around that level since.^{64F[64]} Manuszak and Wozniak estimated that, following the Durbin amendment, the average minimum balance necessary to qualify for a basic (non-interest-bearing) free checking account increased by more than \$400, while for interest-bearing checking accounts it had increased by nearly \$1,700.^{65F[65]}

Meanwhile, the monthly cost to maintain a checking account had already doubled during the second half of 2010, as banks prepared for the revenue effects of the Durbin amendment.^{66F[66]}

According to data from Bankrate, between 2011 and 2013, the proportion of free checking accounts offered by covered banks fell by half, from 76% to 38%, and remained at about the same level until last year, when they rose to 48% (still considerably lower than the level in 2010).^{67F[67]} Meanwhile, using a proprietary data set, Mukharlyamov and Sarin found that the share of free basic checking accounts held by customers at covered banks fell by about half, from 61% to 28%, following the introduction of the Durbin amendment.^{68F[68]}

Studies show that increased account fees have replaced between 40% and 90% of the reduction in revenue from debit-interchange fees.^{69F[69]}

Turning to the EU, Table II shows that issuing banks made up for the losses on interchange-fee revenue following the introduction of the IFR through a combination of increased interest, late-payment fees, and overdraft fees, which rose by nearly 38%, and from increased international-transaction fees, which rose by 22%.^{70F[70]} However, against expectations(i.e., contrary to our hypothesis) average annual fees for both credit and debit *fell* by an average of 5.6% between 2014 and 2018. Nonetheless, because of the increases in other fees, overall bank revenue rose by 3.7% following the introduction of the IFR.

Table II: Fees charged by issuing banks in the EU, 2014 and 2018

Fees	2014			2018			Change
	Credit	Debit	Combined	Credit	Debit	Combined	
Annual Fees	9501	14620	24121	8741	14036	22777	-5.57%
Interest, late & overdraft	13469	8728	22197	15250	15352	30602	37.87%
International transaction	292	985	1277	382	1180	1562	22.32%
Interchange	4343	7527	11870	2258	4474	6732	-43.29%
Total	27605	31860	59465	26631	35042	61673	3.71%

Source: Authors based on Edgar Dunn & Co.^{71F[71]}

V. HAVE ISSUERS ENCOURAGED CONSUMERS TO USE CARDS THAT ARE NOT COVERED BY INTERCHANGE-FEE PRICE CAPS?

The presence of price controls on interchange fees means that consumers will pay higher prices but obtain lower benefits than when fees are set by market forces. Payment devices for which the interchange fee is set by market forces rather than government fiat, by

contrast, will offer more net value for consumers. As a result, it would be predicted that consumers will migrate away from those cards that are subject to interchange-fee price controls to those that are unregulated.

This observation leads to two predictions. First (our third hypothesis), where possible, issuers will encourage consumers to switch to cards (and other forms of payment) that are not subject to the caps. Second (our fourth hypothesis), consumers will switch to payment methods not subject to the caps. Again, the evidence from several jurisdictions supports these hypotheses.

Shortly after Australia's interchange-fee caps for four-party cards came into force in 2003, two banks introduced three-party credit cards with annual fees and rewards similar to those that previously existed on their four-party cards.^{72F[72]} In addition, several issuers introduced packages of two similar premium rewards cards, one that operates on a four-party network and one that operates on a three-party network.^{73F[73]} The reason these "companion cards" existed is that far fewer merchants accept three-party cards than four-party cards; with both cards, consumers could use the higher-earning three-party card where it is accepted and the lower-earning four-party card elsewhere.

Unsurprisingly, the market share of three-party cards, while still relatively small, increased considerably following the 2003 regulations. By volume of transactions, three-party cards increased from about 10% in 2002 to about 16% in 2013 (a 60% increase). By value of transactions, they increased their market share from about 15% in 2002 to more than 20% in 2013 (a 33% increase).

In October 2015, the RBA designated American Express Companion Cards as a "payment system."^{74F[74]} In its May 2016 Review of Card Payments Regulation, the RBA announced that these cards would—effective July 1, 2017—be subject to the same interchange-fee caps as other cards so designated.^{75F[75]} Following introduction of the caps, companion cards were discontinued and the market share by volume of three-party cards fell back to 7%. But, as seen in Figure 3, it has since risen slightly to about 8%.^{76F[76]} By value, three-party cards' market share of transactions also fell steeply after mid-2017, but it has risen again since then. In addition, the number of three-party cards held by consumers increased by 36,000 in the year to October 2021, while the number of four-party cards fell by 750,000.^{77F[77]}

These trends suggest that consumers who qualify for three-party cards increased adoption, presumably in no small part because the cards are not subject to interchange-fee caps and therefore are able to offer attractive rewards. Likewise, consumers with both three-party and four-party cards tend to use the former where possible, in order to obtain the larger rewards.

Figure 3: Market Share of Four-Party Cards (Mastercard and Visa, left axis) and Three-Party Cards (American Express and Diners Club, right axis) by Volume of Transactions in Australia, 2002-2021

Source: Reserve Bank of Australia^{78F[78]}

Figure 4: Market Share of Four-Party Cards (Mastercard and Visa, left axis) and Three-Party Cards (American Express and Diners Club, right axis) by Value of Transactions in Australia, 2002-2021

Source: Reserve Bank of Australia^{79F}[79]

Because the Durbin amendment did not apply to credit cards, U.S. issuers had no reason to reduce rewards on those cards. In response, many consumers switched from using debit to using credit for transactional purposes, paying their balance each month in full rather than revolving.^{80F}[80] As a discussion paper by the Federal Reserve Bank of Philadelphia Consumer Finance Institute put it, this switch from debit to credit was driven by a combination of “regulatory changes in the debit space that limited interchange, making debit rewards less financially viable for depository institutions and a change in preferences by both card issuers and consumers for more and richer rewards as incentives for using a particular form of payment.”^{81F}[81]

Consumers without credit cards—predominantly those with poor credit records—were not positioned to switch from debit to credit. They thus replaced their debit usage with increased use of cash and checks.^{82F}[82] To the extent that debit-only consumers tend to be lower income, the cuts in debit-card rewards and the rising cost of checking accounts, both brought on by the Durbin amendment, have had regressive effects, while higher-income consumers switched to credit cards whose rewards rates remain unaffected.

The EU’s dramatic caps on interchange fees appear to have led issuers to limit card issuance in general and to shift consumers away from credit and toward debit. In a study funded by the European Commission, Ernst & Young and Copenhagen Economics (EY/CE) found that the number of credit cards issued in the EU fell following the introduction of the IFR, while the number of debit cards grew only modestly.^{83F}[83] They observe:

We find that the total number of issued consumer cards in the EU as reported by the schemes changed moderately between 2015 and 2017. The total number of consumer debit cards in the EU grew by 3% and 4% respectively in 2016 and in 2017 ... The number of credit cards declined by 1%. The larger decline in the number of credit cards could be related to the large reduction in interchange fees for credit card transactions to meet the interchange fee cap.^{84F}[84]

The EY/CE study also found that the proportion of corporate cards, as a share of all cards, increased in several member states. The shift was particularly dramatic in Ireland, where the proportion of corporate cards went from about 6% in 2015 (before the IFR) to about 14% in 2017.^{85F}[85] Moreover, EY/CE found that the number of commercial-card transactions increased by a weighted average of 12.4 million per member state.^{86F}[86] Since corporate cards are not subject to the IFR, it would seem that issuers sought, in part, to recoup losses by switching eligible consumers to the use of corporate cards.

VI. DO MERCHANTS PASS ON REDUCTIONS IN COSTS ASSOCIATED WITH REDUCED INTERCHANGE FEES?

One of the primary justifications made by legislators and regulators for introducing caps on interchange fees is that these fees drive up the merchant discount rate, which in turn leads merchants to raise the prices of goods and services offered to consumers. For example, an oft-cited 2010 study estimated that low-income U.S. households pay on average an additional \$21 per year on goods and services due to credit-card interchange fees and card rewards.^{87F[87]} To arrive at this number, the study assumed that interchange fees are fully passed through to consumers in the form of higher prices.

However, the only reason the overwhelming majority of merchants would pass on all cost savings is that they believe their consumers would otherwise buy their goods and/or services elsewhere—in other words, it assumes the merchants have zero market power. While that might be true for retailers of gasoline and diesel, it is unlikely to be true for retailers of less homogenous goods and services.^{88F[88]} Most retailers have some degree of pricing power because of the idiosyncratic nature of the products they sell and the way in which they are sold (which can include factors such as location, expertise of the staff, the way products are displayed, among others).^{89F[89]} Indeed, the evidence for cost passthrough in general indicates that, while cost increases are often passed through at rates of around 90%, cost decreases are typically passed through at much lower rates.^{90F[90]}

In addition, a 100% pass-through rate would imply that merchants would reap none of the benefit from a reduction in interchange fees. As such, they would have no incentive to lobby for such a change. Since some merchants do lobby for reduced interchange fees, it seems highly likely that they enjoy some degree of pricing power in their given markets and are thus able to pass through less than 100% of the reduction in interchange fees.^{91F[91]}

Hence our fifth hypothesis, that merchants will pass through relatively little of the cost savings from reduced interchange fees, whereas card issuers will pass on much of the losses they incur. As noted above, most of card issuers' revenue losses are passed on to consumers in the form of higher prices and lower benefits. Merchants, by contrast, demonstrate much lower pass-through rates of cost savings. Moreover, cost savings tend to be passed through at a lower rate to consumers than cost increases.

Iranzo, *et al.*, found that, while acquirers in Spain reduced the merchant service charge (MSC)—the European equivalent of the merchant discount rate—they did so by less than the reduction in the interchange fee.^{92F[92]} Over five years, the difference totaled more than €440 million. However, this may partially reflect unavoidable per-transaction costs, so the net amount received by acquiring banks may have been less.

While acquirers passed through to merchants much (but not all) of the reduction in interchange fees, merchants appear to have passed through little, if any, of their savings to consumers. The survey by Iranzo, *et al.*, of merchant groups asked directly whether their

members had reduced prices of goods and services or improved the quality of offerings in response to the interchange-fee caps. Perhaps surprisingly, the response was uniformly negative: merchants had not passed on their savings in any way.^{93F[93]}

Since the additional costs of using payment cards were directly paid by consumers in the form of higher annual fees and interest payments, and since consumers seem not to have obtained any benefit in the form of lower prices or higher-quality goods and services, it seems clear that the main effect of the interchange-fee cap in Spain was to transfer wealth from consumers to big-box merchants.

The Reserve Bank of Australia's hope that its interchange-fee regulations would save consumers money does not appear to have materialized. In the 19 years since the regulations went into effect, there has been no substantive evidence that merchants have passed savings on to consumers. Even assuming that some savings have been passed on, it is very unlikely that the savings for the average consumer have been anywhere close to the costs imposed on them by the regulation in the form of increased fees on, and reduced benefit from, rewards cards.

The average merchant service charge on four-party cards fell from about 1.4% prior to the interchange-fee cap to around 0.7% in 2020—a reduction of 0.7 percentage points, or 50% in relative terms (see Figure 5).^{94F[94]} Since Mastercard and Visa credit-card transactions make up about a quarter of retail transactions, the overall effect on a typical merchant would have been a reduction in per-transaction costs of about 0.17%. Thus, even if these savings had been fully passed through, the average consumer would have seen prices fall by less than 0.2%. But because the consumer price index in Australia has risen, on average, by 2.3% annually since 2002,^{95F[95]} it would be difficult to discern such an effect.

Figure 5: Total Merchant Service Fees for Various Payment Networks in Australia, 2003–2020

Source: *Reserve Bank of Australia*

Evidence from Surcharging In Australia

Following the 2002 regulations, merchants have also been able to impose surcharges on payments made with credit cards in Australia. However, most merchants have not introduced surcharges.^{96F[96]} A 2010 survey commissioned by the RBA found that less than 10% of large merchants and less than 5% of small merchants imposed surcharges in 2005. By 2010, however, around a quarter of small merchants and nearly half of all large merchants were surcharging.^{97F[97]} A subsequent survey conducted by the RBA in 2013 found that just under 7% of Mastercard and Visa credit-card payments were subject to surcharges.^{98F[98]}

Merchants who introduced surcharging did so as a form of price discrimination in instances where consumers have an inelastic demand for using cards (such as online purchases, airline tickets, or hotel rooms) or where merchants are not constrained by repeat

purchasers (such as on travel and restaurants).^{99F[99]} So, while surcharging is not at all uniform, it was highly prevalent in areas where price discrimination and rent-seeking are profitable.

Moreover, until caps came into force (see below), merchants almost ubiquitously imposed surcharges at rates that were considerably higher than the cost of acceptance: the RBA survey found that average surcharges in 2013 were 1.5% of payment value. Because average merchant-service fees were 0.8%, this represents a nearly 90% markup over the MSC.^{100F[100]}

Clearly, merchants had been using surcharges as a means of price discrimination against consumers who used credit cards. As a result, many consumers making purchases with credit cards at merchants who imposed surcharges were hit with a triple whammy: higher annual fees, fewer rewards, and higher prices.

In 2016, the Australian Parliament passed legislation prohibiting merchants from applying “excessive” surcharges and capping any surcharge at an amount that reflects “the cost of using the payment methods for which they are charged.” ^{101F[101]} The rules, laid out in more detail in a standard issued by the RBA, came into force in September 2016 for large merchants and September 2017 for smaller merchants.^{102F[102]} The surcharge rules are enforced by the Australian Competition and Consumer Protection Commission, which has issued several fines to companies found to be in violation.^{103F[103]} In response, merchants have reduced their surcharges, as the RBA notes:

“Merchants have generally responded appropriately to the new framework coming into effect. Most notably, the airline industry moved from fixed-fee surcharges (see above) to a percentage-based surcharge with a fee cap. Prior to the reform, a \$100 domestic flight would have attracted a surcharge of up to \$8.50 for debit and credit cards alike. Following the reform, the same flight would attract a maximum surcharge of \$1.30 for credit cards and \$0.60 for debit cards (calculated as a percentage of the cost of the airfare).”^{104F[104]}

More precise estimates of the extent of passthrough have been possible for the United States. Using proprietary data from banks and one of the card networks, Mukharlyamov and Sarin estimated that merchants passed through “at most” 28% of their debit-card savings to consumers. Meanwhile, banks passed through 42% of their interchange-fee revenue losses to consumers (with most of those losses passed on to lower-income consumers who pay higher bank fees). They estimate that the net result of this was a \$4 billion transfer to merchants, of which \$3.2 billion came directly from banks and \$0.8 billion from consumers, who paid \$2.3 billion in higher checking fees but received only \$1.5 billion in lower retail prices.

Wang, Schwartz, and Mitchell, found that, while some merchants received reductions in the merchant discount rate they paid, others actually saw their debit-card acceptance costs increase.^{105F[105]} They found an asymmetric response: merchants who saw their prices increase usually passed those increased costs onto their customers, while very few of those

who saw their debit costs decrease passed those costs onto customers. This suggests that there was very little passthrough of savings by merchants (certainly far less than 100%) and that, if there was any substantial passthrough at all, it was greatly delayed.

The story is similar for the EU, where EY/CE estimated that, on average, acquirers passed through about 45% of the reduction in interchange fees (see Table III). Meanwhile, EY/CE also estimated that the average EU-wide pass-through rate by merchants of the lower MSC is 66%.^{106F[106]} Taking these two pass-through rates together, on average, EU consumers would have received about 30% of the reduction in interchange fees in the form of lower costs and/or improved quality.^{107F[107]}

To some extent, these averages, mask differences among member states. For example, EY/CE found that a typical Polish household would save only €1.53 per year, while a household in Italy would save as much as €12.42. However, as Edgar Dunn & Co. noted, banks more than made up for the lost interchange-fee revenue in the form of higher charges. Since those charges were mainly in the form of increases in interest and late-payment fees, it is likely that they would have mainly affected lower-income households that are more reliant on the use of overdrafts and credit cards for short-term credit.^{108F[108]}

Table III: Change in Acquirer's Margin following the IFR

Fees	Change (EUR million)	Effect on acquirers
Change MSC	-1,200	Revenue loss
- Change interchange fee	-2,680	Cost saving
- Change acquirer scheme fee	280	Cost increase
= Change acquiring margin	1,200	Margin increase

Source: *EY/CE study*

VII. HAVE INTERCHANGE-FEE CAPS RESULTED IN REDUCED INVESTMENTS IN INNOVATIVE TECHNOLOGY?

Our sixth hypothesis is that interchange-fee caps will reduce issuing banks' incentive to invest in innovative technology. The evidence seems to support this hypothesis.

Consider, for example, investments in innovation by EFTPOS, Australia's domestic debit-card network. In its 2015 Review of Card Payments Regulation, the Reserve Bank of Australia noted that "the greater functionality of the international scheme cards (eftpos is still working to develop online and contactless functionality) has also contributed to the shift in market shares."^{109F[109]} As of September 2021, EFTPOS still had not developed online functionality.^{110F[110]}

The consequence of this lack of innovation for EFTPOS has been little short of catastrophic. Far from becoming the dominant low-cost transaction network for Australia's consumers, as the RBA had hoped, the proportion of debit transactions undertaken via EFTPOS declined from 82% in 2009 to 40% in 2020, while the value of debit transactions declined by an even larger amount, as can be seen in figure 6.

Figure 6: Value and Volume of Debit Transactions in Australia, 2009- 2020

Source: *Blockley, 2021*

As Lance Blockley noted in a submission to the Australian Competition and Consumer Commission (ACCC) regarding the proposed merger of EFTPOS, NPP Australia, and BPay, made on behalf of the merging parties:

[T]he debit card market was originally the sole domain of eftpos (from its launch in 1983), until Visa Debit was launched in the market in the 1990's. Scheme Debit (the term covering Visa Debit and Mastercard Debit) was initially focused on the smaller financial institutions, but eventually became adopted by the four major banks as, unlike eftpos, they were able to be used both online and overseas (making them attractive to consumers); in addition, they generated positive interchange revenue for issuers (at a time when eftpos caused a negative interchange outflow for issuers), making them attractive to the banks.

As Scheme Debit became more issued and used in the market, and consequently eftpos's share of the total debit card transaction volume fell, the number of eftpos transactions still grew in total due to the strong increases in total debit card volumes. The state of declining share but increasing absolute volume slowed severely for eftpos, however, when contactless debit card transactions became widely adopted, as shown in the charts below.^{111F[111]}

In 2018, the Australian government's Productivity Commission issued a report about competition in the banking sector that noted with concern the decline in EFTPOS' market share, asserting:

The decline in market share of eftpos is concerning because eftpos is considered highly price-competitive.... This suggests that competition is stymied by other forces, such as distortions in who pays the costs of card payments.^{112F[112]}

Yet, as noted above, EFTPOS' own consultant acknowledges that EFTPOS previously had a monopoly in the debit market and that its declining market share is largely a result of consumer preferences for Visa and Mastercard debit that, unlike EFTPOS, enable users both to pay online and to use contactless.

Clearly, EFTPOS' failure to develop online and contactless functionality was a major drawback and is almost certainly related to its relative lack of investment in innovation, which in turn is a function of its bargain-basement cost model. Logically, the decline in EFTPOS' market share was driven by competition, not stymied by it.

It should also be noted that Australia has one of the highest penetrations of contactless cards in the world (something that likely helped facilitate continued in-person shopping in the country during the COVID-19 pandemic). This has been thanks almost entirely to Visa and Mastercard, which, unlike EFTPOS, have been able to recover the costs of investment in innovations in other markets.

As with Australia, there is some tentative evidence that domestic networks in the EU may be underinvesting in innovation due to the very low interchange rates mandated by the IFR. As reported by EY/CE, the market share of domestic payment networks declined slightly between 2014 and 2016, with the market share of domestic debit-card schemes falling from 81% to 78% on average and the market share of domestic credit-card schemes falling from 72% to 68% on average (in those member states that have such schemes).^{113F[113]}

In the United States, the Durbin amendment has substantially diminished covered banks' ability to recover investments in payment innovations that would benefit both merchants and consumers. As a result, some potentially valuable new technologies likely have not been developed and implemented as quickly as they otherwise might have been.^{114F[114]}

Jonathan Reinisch argues that, by dampening investment in innovation, the Durbin amendment has delayed the otherwise "inevitable" shift to mobile payments.^{115F[115]} These reduced investments are driven by two factors: first, the redistribution of costs, as discussed above, which constrains card issuers' ability to recover investments in innovation, and second, the fee cap itself, which has the effect of reducing the potential savings that merchants might realize from switching to a payment system with lower fees.

Meanwhile, Zywicki predicted that "the arbitrary definition that the Durbin amendment provides for debit cards will promote regulatory arbitrage, as competitors seek to gerrymander products out of the amendment's net."^{116F[116]} And that is precisely what we have seen, with various financial-technology (or "fintech") companies issuing debit cards by partnering with banks whose assets fall below \$10 billion.^{117F[117]} The higher interchange-fee revenue from each customer means that, relative to covered banks, fintechs are able to:

- invest more in R&D, thereby improving their offerings and exacerbating their differential from covered banks;
- spend more acquiring new customers in other ways, including by offering reward programs; and
- serve customer niches not currently served by covered banks.

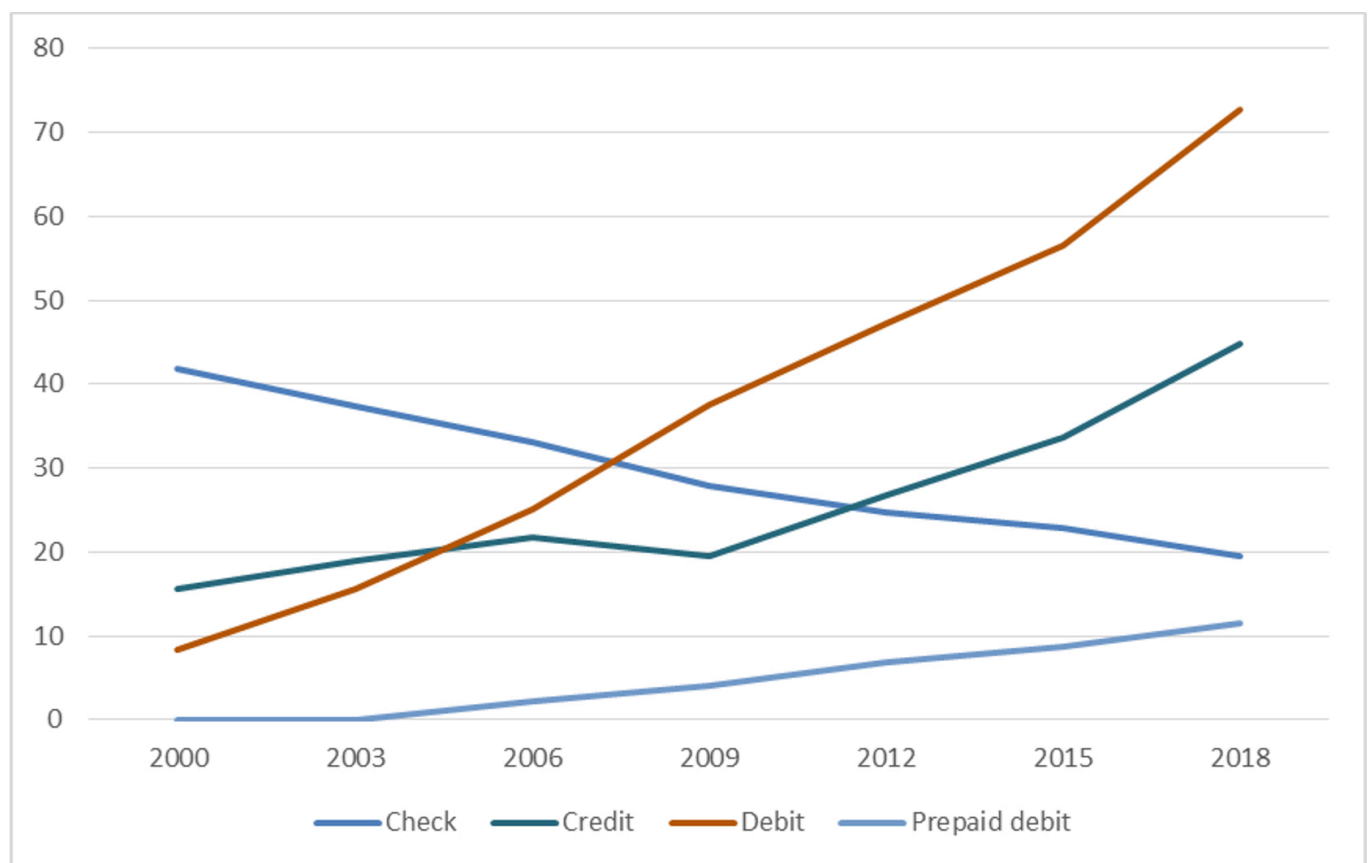
While this arbitrage has allowed various new payment technologies to be rolled out, the pace of roll-out is arguably slower than would be the case if larger banks could also partner with fintechs.

VIII. HAVE INTERCHANGE-FEE CAPS ADVERSELY AFFECTED FINANCIAL INCLUSION?

Our final hypothesis is that caps on interchange fees would adversely affect financial inclusion. Support for this hypothesis comes in part from the observation that more of the costs of regulation tend to be borne by lower-income consumers, which has been noted above for Australia and the EU.

More direct evidence, however, comes from the United States, where caps on debit-card interchange fees have adversely affected access to banking. To see this, it helps to go back a few years before the introduction of the Durbin amendment. As can be seen in Figure 7, during the 2000s, debit-card transaction volume exploded: in 2000, debit was responsible for about one-fifth as many transactions as checks, but by 2007, it had overtaken checks in popularity.

Figure 7: Volume of Payments by Type, U.S., 2000-2018 (billions)



Source: *Federal Reserve Payments Studies*

This rise in debit-card volume coincided with a significant reduction in the average cost of checking accounts, an increase in the number of “free” checking accounts, and a reduction in the minimum balance required to qualify for free checking. According to a U.S. Government Accountability Office report, between 2000 and 2006, the proportion of banks

offering free checking accounts doubled from 30% to 60%, while monthly maintenance fees fell from \$6.81 to \$5.41.^{118F[118]}

This is not surprising, as the two things are related in a virtuous circle: rising debit-card use increased revenue from interchange fees on debit, which in turn enabled banks to reduce checking-account charges, which increased the number of account holders, which increased debit-card use. At the same time, debit-card purchases mainly replaced purchases made using checks, which are expensive to process. By dramatically expanding access to free checking and eliminating monthly maintenance fees, the introduction and rapid adoption of debit cards dramatically expanded financial inclusion for many consumers who traditionally could not afford a checking account.

As noted in Section IV, the introduction of caps on debit-card interchange fees reversed this trend: debit-card interchange-fee revenue fell, so banks were less able to subsidize free checking accounts. Mukharlyamov and Sarin estimated that, in the absence of the Durbin amendment, the proportion of free checking accounts would have risen to 66%. Since the actual number was 29%, they infer that Durbin caused a reduction of 37 percentage points.^{119F[119]}

Unsurprisingly, the loss of access to free checking accounts and the increase in monthly fees both disproportionately affect lower-income consumers. Mukharlyamov and Sarin found that:

[O]ver 70 percent of consumers in the lowest income quintile (annual household income of \$22,500 or less) bear higher account fees, since they fall below the average post-Durbin account minimum required to avoid a monthly maintenance fee (\$1,400). In contrast, only 5 percent of consumers in the highest income quintile (household income of \$157,000 or more) keep balances falling below this threshold.^{120F[120]}

By reducing the availability of free checking and increasing the cost of bank accounts, the Durbin amendment likely resulted in many lower-income people becoming “underbanked” and some people to become unbanked (exiting the banking system altogether). Federal Deposit Insurance Corp. (FDIC) data show that, between 2009 and 2011, the number of unbanked households rose by one million and the number of underbanked households rose by three million. As a result, many of those unbanked and underbanked individuals will have relied on more costly alternatives, such as money orders, prepaid cards, and check-cashing services.^{121F[121]} Plausibly, some of that increase was due to the lower availability of free checking and the increased cost of bank accounts, as banks readied for the implementation of the Durbin amendment.

The proportion of unbanked households has gradually fallen since peaking in 2011; in 2019, it was lower than in 2009. But it is noteworthy that among those consumers who remain unbanked, whereas 12.7% of respondents gave “minimum balance requirements too high” as *a reason* for not having a bank account in 2009, by 2019, 29% of households gave that as *the main reason* for not having a bank account and 48.9% identified this obstacle as a

factor.^{122F[122]}In addition, 34% identified “bank account fees too high” as a reason, with 7.3% citing it as the “main” reason.^{123F[123]} This suggests that, as the economy has grown stronger, the cost increases brought about in response to the Durbin amendment have become a more significant cause of households being unbanked.

Mukharlyamov and Sarin looked specifically at the difference in the proportion of unbanked individuals between 2011 and 2013 and found an 81% increase in the percentage of unbanked consumers who said that high account fees was their main reason for not having a bank account.^{124F[124]} Further support for the hypothesis that the Durbin amendment has caused households to become unbanked comes from the finding that residents of states with the highest proportion of deposits at banks with assets in excess of \$10 billion were most likely to attribute their unbanked status to high fees.^{125F[125]}The growth in the recently unbanked was also highest in states with more affected banks, where the increase in account fees is most pronounced.

These findings contrast dramatically with the hypothetical claims made by Schuh, *et al.*, who claimed that lower-income consumers *could* save as much as \$21 per year in lower retail costs from interchange-fee price controls.^{126F[126]} To make that claim, they assumed full passthrough by merchants of the reduction in acceptance costs, while implicitly assuming no passthrough of revenue losses by banks (such as through reduced access to free checking, higher required minimum balances, and higher bank fees). Even if Schuh, *et al.*, were correct about the nominal savings by lower-income consumers, these are clearly massively outweighed by higher bank fees, which are estimated in the range of \$115 to \$172 per year.^{127F[127]}

IX. Conclusion

Overall, it is clear that imposing price caps on interchange fees has had many pernicious effects and that, in contrast to the claims of those who support them, they have done far more harm than good.

First and foremost, interchange-fee caps have harmed the very people they were supposed to help. Wherever they have been implemented, they have resulted in lower revenue for issuing banks, which have responded by increasing fees for consumers, either on bank accounts, on credit cards, or both. These fee increases have in general been highly regressive, hurting those with lower incomes the most.

Second, in some cases, such as with the Durbin amendment in the United States, the higher fees have resulted in many people becoming unbanked.

Third, in nearly all cases, issuers have reduced the rewards on payment cards. But those with higher incomes and/or better credit records have often been able to switch to alternative payment cards that are not subject to the caps. So, the reductions in rewards have mainly harmed the poor and those with poor credit records.

Fourth, the rate at which merchants have passed through reductions in costs associated with lower interchange fees (in the form of lower-priced goods) has been less than the rate at which banks have passed through losses in fee revenue—in the form of higher-priced accounts, cards and services, and reductions in rewards. As such, consumers have lost out on net.

Fifth, interchange-fee caps have had somewhat predictable effects on modes of payment and hence on investments in those modes of payment. Thus, the Durbin amendment, which exclusively affected debit, led to a shift in payments toward credit and impeded investment in debit-related payment technologies (until fintech companies realized they could partner with exempt financial institutions). By contrast, the caps in Australia and the EU were effectively tighter for credit than for debit (since the difference between the interchange-fee rates before the caps and after the caps was greater for credit than debit), which led to shifts away from credit and toward debit. However, the caps were so low that investment in domestic debit systems seems to have been impaired, especially in Australia.

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[1] See *Developments in Noncash Payments for 2019 and 2020: Findings From the Federal Reserve Payments Study*, Federal Reserve Board, (December 2021), available at <https://www.federalreserve.gov/publications/files/developments-in-noncash-payments-for-2019-and-2020-20211222.pdf>, and the various previous studies and associated data, https://www.federalreserve.gov/paymentsystems/frps_previous.htm.

[2] See Todd J. Zywicki, *The Economics of Payment Card Interchange Fees and the Limits of Regulation*, International Center for Law and Economics, ICLE Financial Regulatory Program White Paper Series, (Jun. 2, 2010), available at http://laweconcenter.org/images/articles/zywicki_interchange.pdf; Todd J. Zywicki, Geoffrey A. Manne, & Julian Morris, *Unreasonable and Disproportionate: How the Durbin Amendment Harms Poorer Americans and Small Businesses*, International Center for Law and Economics, (Apr.25, 2017); Todd J. Zywicki, Geoffrey A. Manne, & Julian Morris, *Price Controls on Payment Card Interchange Fees: The U.S. Experience*, George Mason Law & Economics Research Paper No. 14-18, (Jun. 6, 2014).

[3] Claire Tsosie, *The History of the Credit Card*, NerdWallet.com, (Mar 15, 2021), <https://www.nerdwallet.com/article/credit-cards/history-credit-card>; see also Jeremy Norman, *The Charga-Plate, Precursor of the Credit Card, Circa 1935 to 1950*, HistoryofInformation.com, <https://www.historyofinformation.com/detail.php?id=1710>.

[4] See Zywicki, *supra* note 2. Several banks also attempted to establish three-party cards

during the 1950s. Most of these were unsuccessful. The exception was Bank Americard, which subsequently became a four-party system and eventually rebranded as Visa.

[5] The issuer may arrange separate underwriting. More recently, the processing of three-party card transactions are sub-contracted to other payment processors. But the fundamental three-party legal arrangements remain the same.

[6] For a more detailed explanation of the operation of payment card systems, see Zywicki, *supra* note 2, at 27-30.

[7] See Zywicki, *supra* note 2; see also Jean-Charles Rochet & Jean Tirole, *Two-Sided Markets: A Progress Report*, 37 Rand J. Econ. 645 (2006); As the U.S. Supreme Court wrote in *Ohio v. American Express Co.* (585 U.S. Slip Op, 2018, at 2):

By providing these services to cardholders and merchants, credit-card companies bring these parties together, and therefore operate what economists call a “two-sided platform.” As the name implies, a two-sided platform offers different products or services to two different groups who both depend on the platform to intermediate between them.”... For credit cards, that interaction is a transaction.... The key feature of transaction platforms is that they cannot make a sale to one side of the platform without simultaneously making a sale to the other.

[8] Bruno Jullien, Alessandro Pavan, & Marc Rysman, *Two-Sided Markets, Pricing, and Network Effects*, in *Handbook of Industrial Organization* (Vol. 4), 485-592, (2021).

[9] Thomas Eisenmann, Geoffrey Parker, & Marshall W. Van Alstyne, *Strategies for Two-Sided Markets*, Harv. Bus. Rev. (October 2006).

[10] See William F. Baxter, *Bank Interchange of Transactional Paper: Legal and Economic Perspectives*, 26 J. L. & Econ. 541 (1983).

[11] See Ronald H. Coase, *The Problem of Social Cost*, 3 J. L. & Econ. 1 (1960).

[12] See Zywicki, *supra* note 2, at 31-32.

[13] See Zywicki, *supra* note 2, at 33.

[14] Zywicki, *supra* note 2, at 10.

[15] Tsosie, *supra* note 3.

[16] See Frank Kehl, *The Complete Guide to Merchant Account & Credit Card Processing Fees*, Merchant Maverick, (Nov. 12, 2021).

<https://www.merchantmaverick.com/the-complete-guide-to-credit-card-processing-rates-and-fees>. For a description of CNP transactions, see Ben Dwyer, *Card Present vs. Card Not Present Transactions*, CardFellow, (Apr. 6, 2020),

<https://www.cardfellow.com/blog/card-present-card-not-present-definition>.

[17] *Visa USA Interchange Reimbursement Fees*, Visa Public, (Oct. 15, 2021), available at <https://usa.visa.com/content/dam/VCOM/download/merchants/visa-usa-interchange-reimbursement-fees.pdf>; *Mastercard USA Interchange Rates*, Helcim, <https://www.helcim.com/mastercard-usa-interchange-rates>.

[18] *Id.*

[19] See Thomas A. Durkin, Gregory Elliehausen, Michael E. Staten, & Todd J. Zywicki, *Consumer Credit and the American Economy*, (2014), at 347, Fig. 71.

[20] Eliana Garcés & Brent Lutes, *Regulatory Intervention in Card Payment Systems: An Analysis of Regulatory Goals and Impact*, working paper, (Sep. 21, 2018), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3346472, at 8. As Garces and Lutes note: “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. Although there are open network schemes that have operated without interchange fees, these are very rare and with limited regional scope.”

[21] Baxter, *supra* note 10, at 572-582.

[22] Zywicki, *supra* note 2, at 33; Jean-Charles Rochet and Jean Tirole, *Platform Competition in Two-Sided Markets*, 1 J. Europ. Econ. Assoc. 990-1029, (Jun 1, 2003), at 997; Julian Wright, *Pricing in Debit and Credit Card Schemes*, 80 Econ. Lett 305-309, (2003).

[23] *Summary of Commission Decision of 19 December 2007 Relating to a Proceeding Under Article 81 of the EC Treaty and Article 53 of the EEA Agreement (Case COMP/34.579 — MasterCard, Case COMP/36.518 — EuroCommerce, Case COMP/38.580 — Commercial Cards)*, Official Journal of the European Union, (Nov. 6, 2009), available at <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2009:264:0008:0011:EN:PDF>, at 19.

[24] *Ohio v Amex*, *supra* note 7, at 13.

[25] Jean-Charles Rochet & Jean Tirole, *An Economic Analysis of the Determination of Interchange Fees in Payment Card Systems*, 2 Rev. Netw. Econ. 69-79, (January 2003).

[26] For a fairly comprehensive overview of such caps, see Fumiko Hayashi & Jesse Leigh

Maniff, *Public Authority Involvement in Payment Card Markets: Various Countries*, August 2020 Update, Federal Reserve Bank of Kansas City, (August 2020), available at https://www.kansascityfed.org/documents/6660/PublicAuthorityInvolvementPaymentCardMarkets_VariousCountries_August2020Update.pdf.

[27] Juan Iranzo, Pascual Fernández, Gustavo Matías, & Manuel Delgado, *The Effects of the Mandatory Decrease of Interchange Fees in Spain*, Munich Personal RePEc Archive, MPRA Paper No. 43097, (October 2012), available at https://mpra.ub.uni-muenchen.de/43097/1/MPRA_%20paper_43097.pdf.

[28] *Standard No. 1 The Setting of (Wholesale) Interchange Fees*, Reserve Bank of Australia, (2002). The same standard was issued to each four-party card issuer.

[29] *Media Release: Reform of Credit Card Schemes in Australia, 2002-15*, Reserve Bank of Australia, (Aug. 27, 2002), <https://www.rba.gov.au/media-releases/2002/mr-02-15.html>.

[30] *Media Release: Payments System Board – November 2005-13*, Reserve Bank of Australia, (Nov. 25, 2005), <https://www.rba.gov.au/media-releases/2005/mr-05-13.html>.

[31] *Common Benchmark for the Setting of Credit Card Interchange Fees*, Reserve Bank of Australia, (November 2005), <https://www.rba.gov.au/payments-and-infrastructure/credit-cards/cc-fees-benchmark>.

[32] *Media Release: Payments System Reform, 2005-02*, Reserve Bank of Australia, (Feb. 24, 2005), available at <https://www.rba.gov.au/payments-and-infrastructure/credit-cards/cc-fees-benchmark/pdf/cc-fees-benchmark.pdf>.

[33] *Media Release: Payments System Reforms Number 2006-02*, Reserve Bank of Australia, (Apr. 27, 2006), <https://www.rba.gov.au/media-releases/2006/mr-06-02.html>.

[34] *Credit Card Benchmark Calculation*, Reserve Bank of Australia, (2006), available at <https://www.rba.gov.au/media-releases/2006/pdf/mr-06-08-benchmark-calc-credit-card.pdf>.

[35] *Payment Systems (Regulation) Act 1998 Variation of Interchange Fee Standards*, Reserve Bank of Australia, (2008), available at <https://www.rba.gov.au/media-releases/2008/pdf/mr-08-28-vifs.pdf>.

[36] *Payment Systems (Regulation) Act 1998, Standard No. 1 of 2016, The Setting of Interchange Fees in the Designated Credit Card Schemes and Net Payments to Issuers*, Reserve Bank of Australia, (May 26, 2016), available at <https://www.rba.gov.au/payments-and-infrastructure/review-of-card-payments-regulation/pdf/standard-no-1-of-2016-credit-card-interchange-2016-05-26.pdf>.

[37] H.R.4173 – Dodd-Frank Wall Street Reform and Consumer Protection Act, s.1075(a)(3).

[38] *Debit Card Interchange Fees and Routing; Final Rule*, 76 Fed. Reg. 43,393-43,475, (Jul. 20, 2011).

[39] The fraud-prevention measures were initially spelled out in an interim final rule published on the same day: *Debit Card Interchange Fees and Routing; Interim Final Rule*, 76 Fed. Reg. 43,477-43,488, (Jul. 20, 2011). They were subsequently incorporated into an amended final rule: 77 Fed. Reg. 46,258-46,282, (Aug. 3, 2012).

[40] See Zywicki, *et al.*, *Unreasonable and Disproportionate*, *supra* note 2. See also *Regulation II (Debit Card Interchange Fees And Routing)*, Board of Governors of the Federal Reserve System, (Jul. 18, 2019), <https://www.federalreserve.gov/paymentsystems/regii-average-interchange-fee.htm>.

[41] The decision related to a case originally brought in response to a 1992 complaint by the British Retail Consortium related to the interchange fees and network rules of Europay (now Mastercard) and Visa-branded cards. See *Non-Confidential Version of Commission Decision of 19 December 2007, COMP/34.579 MasterCard, COMP/36.518 EuroCommerce and COMP/38.580 Commercial Cards*, The Commission of the European Communities, (Dec. 19, 2007), available at https://ec.europa.eu/competition/antitrust/cases/dec_docs/34579/34579_1889_2.pdf. For a summary, see *Summary of Commission Decisions*, *supra* note 23.

[42] *Regulation (EU) 2015/751 of the European Parliament and of the Council of Apr. 29, 2015, on Interchange Fees for Card-Based Payment Transactions*, Official Journal of the European Union, (Apr. 29, 2015), at 10-11, Articles 3 and 4. Note that these caps did not apply to corporate cards, as discussed below.

[43] *Id.*, at 14, Article 18.

[44] *Id.* Article 7.

[45] *Id.* Article 8. Co-badging is defined as: “The inclusion of two or more payment brands or payment applications of the same brand on the same card-based payment instrument.” (Per Regulation (EU) 2015/751, Art. 2).

[46] *Id.* Article 10.

[47] *Id.* Article 11.

[48] *Study on the Application of the Interchange Fee Regulation: Final Report*, prepared by Ernst & Young and Copenhagen Economics (“EY/CE study”) for the European Commission, (2020), available at <https://ec.europa.eu/competition/publications/reports/kd0120161enn.pdf>, at 89.

[49] *Intra-EEA – Intercountry Interchange Fees*, Mastercard, (Jan. 22, 2021); *Intra Europe EEA Multi-lateral Interchange Fees*, Visa, (Oct 16, 2021).

[50] EY/CE study, *supra* note 48, at 169-170; *Cost Pass-Through: Theory, Measurement, and Potential Policy Implications*, prepared by RBB Economics (“RBB Economics study”) for the U.K. Office of Fair Trading, (February 2014).

[51] Sam Peltzman, *Prices Rise Faster Than They Fall*, 108 J Polit. Econ. 466-502, (June 2000).

[52] Santiago Carbó Valverde, Sujit Chakravorti, & Francisco Rodríguez Fernández, *The Role of Interchange Fees in Two-Sided Markets: An Empirical Investigation on Payment Cards*, 98 Rev. Econ. Stat. 367-381, (Apr. 21, 2016), https://doi.org/10.1162/REST_a_00502.

[53] Iranzo, *et al.*, *supra* note 27.

[54] See Benjamin S. Kay, Mark D. Manuszak, & Cindy M. Vojtech, *Competition and Complementarities in Retail Banking: Evidence From Debit Card Interchange Regulation*, 34 J. Fin. Intermediation 91, 92 (2018); see also Vladimir Mukharlyamov & Natasha Sarin, *Price Regulation in Two-Sided Markets: Empirical Evidence From Debit Cards*, working paper, (December 2019) (estimating \$5.5 billion annual revenue loss to banks from interchange-fee reductions); Bradley G. Hubbard, *The Durbin Amendment, Two-Sided Markets, and Wealth Transfers: An Examination of Unintended Consequences Three Years Later*, working paper, (May 20, 2013), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2285105, at 20 (estimating annual revenue loss of \$6.6 billion to \$8 billion from the Durbin amendment).

[55] See *Out of Balance: How the Durbin Amendment Has Failed to Meet Its Promise*, Electronic Payments Coalition, (December 2018), available at <https://www.electronicpaymentscoalition.org/wp-content/uploads/2018/12/EPC.DurbinStudiesPaper.pdf>.

[56] *Interchange Fee Regulation Impact Study*, Edgar Dunn & Co., (April 2020), available at <https://edgardunn.com/wp-content/uploads/2020/04/Interchange-Fee-Regulation-Impact-Study-EDC-v1.1.pdf>.

[57] Iranzo, *et al.*, *supra* note 27, at 34-37.

[58] *Id.*, at 27. See also marginal lending facility rates from European Central Bank, <https://sdw.ecb.europa.eu/browse.do?node=9691107>.

[59] Iris Chan, Sophia Chong, & Stephen Mitchell, *The Personal Credit Card Market in Australia: Pricing Over the Past Decade*, Reserve Bank of Australia Bulletin, (March 2012), available at <https://www.rba.gov.au/publications/bulletin/2012/mar/pdf/bu-0312-7.pdf>.

[60] Robert Stillman, William Bishop, Kyla Malcolm, & Nicole Hildebrandt, *Regulatory Intervention in the Payment Card Industry by the Reserve Bank of Australia: Analysis of the Evidence*, CRA International, (2008), at 16.

[61] Emily Perry & Christian Maruthiah, *Banking Fees in Australia*, Reserve Bank of Australia Bulletin, (June 2018), available at <https://www.rba.gov.au/publications/bulletin/2018/jun/pdf/banking-fees-in-australia.pdf>, at 5.

[62] See Darryl E. Getter, *Regulation of Debit Interchange Fees*, Congressional Research Service, (May 16, 2017), at 8; see also *Out of Balance: How the Durbin Amendment Has Failed to Meet Its Promises*, Electronic Payments Coalition, (Dec. 2018), at 7. Eliminating rewards, such as cash-back on purchases, is functionally equivalent to a price increase.

[63] Kay, *et al.*, *supra* note 54, at 99, citing *2009 Interchange Revenue, Covered Issuer Cost, and Covered Issuer and Merchant Fraud Loss Related to Debit Card Transactions*, Federal Reserve Board, (2011), available at: www.federalreserve.gov/paymentsystems/files/debitfees_costs.pdf. *2011 Interchange Fee Revenue, Covered Issuer Costs, and Covered Issuer and Merchant Fraud Losses Related to Debit Card Transactions*, Federal Reserve Board, (2013), available at www.federalreserve.gov/paymentsystems/files/debitfees_costs_2011.pdf121913_2013_payment_study_release.pdf.

[64] Mukharlyamov & Sarin estimated a 21% increase in the monthly minimum needed to be eligible for free checking and to avoid having to pay monthly fees.

[65] Mark D. Manuszak & Krzysztof Wozniak, *The Impact of Price Controls in Two-Sided Markets: Evidence From US Debit Card Interchange Fee Regulation*, Board of Governors of the Federal Reserve System Finance and Economics Discussion Series, FEDS Working Paper No. 2017-074, (Jul. 10, 2017), at 5. Two recent surveys by consumer finance websites of the largest banks' account terms also illustrate the high cost to those who no longer qualify for free checking accounts. A survey by Moneyrates.com reported an average monthly maintenance fee of \$14.39 (\$172.68 per year) on the accounts it surveyed. See Richard Barrington, *How Much Are Bank Fees—The Latest MoneyRates Update*, Moneyrates.com, (Aug. 20, 2020), <https://www.money-rates.com/research-center/bank-fees>. A study by another website reported an average monthly fee on the accounts reviewed of \$9.60 (\$115.20 per year) and the minimum balance necessary to waive the fee was \$1,010. See Theresa Kim, *Checking Account Fee Comparison at Top U.S. Banks*, Mybanktracker.com, (Jul. 23, 2020), <https://www.mybanktracker.com/news/checking-account-fee-comparison-top-10-us-banks>. This survey includes one Internet bank that reports no monthly fee, with no minimum balance required. If that bank is excluded, the average monthly fee would be \$10.61.

[66] Mukharlyamov & Sarin, *supra* note 54, at 2-4. They concluded that average monthly checking account fees increased from \$3.07 to \$5.92. *Id.*, at 4.

[67] Matthew Goldberg, *Survey: Free Checking Accounts on the Rise as Total ATM Fees Fall*, Bankrate.com, (Oct. 20, 2021), <https://www.bankrate.com/banking/checking/checking-account-survey>.

[68] Mukharlyamov & Sarin, *supra* note 54, at 2-4.

[69] Mukharlyamov & Sarin, *supra* note 54, at 4, estimated that issuers lost approximately \$5.5 billion in reduced interchange-fee income annually, of which they recouped about \$2.3 billion in higher bank fees, or approximately 42% of lost revenue. Meanwhile, Kay, *et al.*, *supra* note 54, at 99, estimated that banks increased other fees by about \$4 billion in total, offsetting about 90% of the revenue reduction of approximately \$4.1 billion in debit-interchange fees. Note that these studies did not seek to extrapolate the losses, so the proportions are based on non-extrapolated losses.

[70] Edgar Dunn & Co, *supra* note 56, at 23.

[71] *Id.*

[72] Chan, *et al.*, *supra* note 59.

[73] *Companion Cards Increase Credit Card Rewards*, Mozo, (Dec. 8, 2009), <https://mozo.com.au/credit-cards/articles/companion-cards-increase-credit-card-rewards/19502078>.

[74] *Designatton Under the Payment Systems (Regulation) Act 1998, Designation No 1 of 2015*, Reserve Bank of Australia, (Oct. 18, 2015), available at <https://www.rba.gov.au/media-releases/2015/pdf/mr-15-19-designation-2015-01-american-express-companion-card.pdf>.

[75] *Standard No. 1 of 2016, The Setting of Interchange Fees in the Designated Credit Card Schemes and Net Payments to Issuers*, Reserve Bank of Australia, (May 26, 2016), amended version available at <https://www.rba.gov.au/payments-and-infrastructure/review-of-card-payments-regulation/pdf/standard-no-1-of-2016-credit-card-interchange-2018-05-31.pdf>.

[76] *C2: Market Shares of Credit and Charge Card Schemes*, Reserve Bank of Australia, (March 2019), <https://www.rba.gov.au/statistics/tables/xls-disc/c02hist.xls>.

[77] George Lekakis, *Amex and Diners Claw Back Market Share*, Banking Day, (Dec. 8, 2021), <https://www.bankingday.com/amex-diners-claw-back-share>.

[78] *Statistics, Credit and Charge Cards – Market Shares of Card Schemes – C1.3*, Reserve Bank of Australia, available at <https://www.rba.gov.au/statistics/tables/xls/c01-3-hist.xlsx?v=2022-03-01-12-57-31>.

[79] *Id.*

[80] See Zywicki, *et al.*, *Price Controls*, *supra* note 2, at 18-22; see also Vladimir Mukharlyamov and Natasha Sarin, *The Impact of the Durbin Amendment on Banks, Merchants, and Consumers*, Faculty Scholarship at Penn Law, (January 2019), at 34-35; Tom

Ankana, *Consumer Payment Preferences and the Impact of Technology and Regulation: Insights From the Via Payment Panel Study*, Federal Reserve Bank of Philadelphia Consumer Finance Institute, Discussion Paper DP 19-01, (February 2019).

[81] Ankana, *supra* note 80, at 11.

[82] See Sergei Koulayev, Marc Rysman, Scott Schuh, & Joanna Stavins, *Explaining Adoption and Use of Payment Instruments by US Consumers*, 47 Rand J. of Econ. 293 (2016). Kloulayev, *et al.*, also note the same trends associated with higher and lower education levels.

[83] EY/CE study, *supra* note 48 at 135.

[84] *Id.*

[85] *Id.* at 139-140.

[86] *Id.* at 140-141.

[87] Scott Schuh, Oz Shy, & Joanna Stavins, *Who Gains and Who Loses From Credit Card Payments? Theory and Calibrations*, Federal Reserve Bank of Boston, Research Department Public Policy Discussion Paper No. 10-3, (August 2010).

[88] Among the rare exceptions are globally traded commodities like oil; changes in the price of crude oil are fully reflected in the price of diesel within four weeks. See Erwan Gautier, Magali Marx, & Paul Vertier, *How do oil prices pass through to fuel prices?*, Eco Notepad, (Oct. 14, 2021), <https://blocnotesdeleco.banque-france.fr/en/blog-entry/how-do-oil-prices-pass-through-fuel-prices>.

[89] Thomas Bittmann, Jens-Peter Loy, & Sven Anders, *Product Differentiation and Cost Pass-Through: Industry-Wide Versus Firm-Specific Cost Shocks*, 64 Aust J Agric Resour Econ. 1184-1209, (Sep. 6, 2020), <https://doi.org/10.1111/1467-8489.12399>.

[90] EY/CE study *supra* note 48, at 169-170; RBB Economics study, *supra* note 50.

[91] Ian Lee, Geoffrey A. Manne, Julian Morris, & Todd J. Zywicki, *Credit Where It's Due: How Payment Cards Benefit Canadian Merchants and Consumers, and How Regulation Can Harm Them*, Macdonald-Laurier Institute, (2013), at 27.

[92] Iranzo, *et al.*, *supra* note 27.

[93] Iranzo, *et al.*, *supra* note 27 at 34-37.

[94] Kateryna Occhiutto, *The Cost of Card Payments for Merchants*, Reserve Bank of Australia Bulletin, (March 2020).

[95] *Inflation Calculator*, Reserve Bank of Australia, <https://www.rba.gov.au/calculator/annualDecimal.html>.

[96] This is consistent with theory. See Wright, *supra* note 22.

[97] *Australian Merchant Acquiring and Cards Markets: Special Question Placement Report*, prepared by East & Partners for the Reserve Bank of Australia, (December 2010).

[98] Crystal Ossolinski, Tai Lam, & David Emery, *Changing Way We Pay: Trends in Consumer Payments*, Reserve Bank of Australia, (June 2014), available at <http://www.rba.gov.au/publications/rdp/2014/pdf/rdp2014-05.pdf>.

[99] Todd J. Zywicki, Geoffrey A. Manne, & Kristian Stout, *Behavioral Economics Goes to Court: The Fundamental Flaws in the Behavioral Law & Economics Arguments Against No-Surcharge Law*, 82 Mo. L. Rev. 822, (2017).

[100] See also Stillman, *et al.*, *supra* note 60, at 25–26, citing survey evidence from 2004–07 indicating that surcharges ranged from 15 to 81 basis points higher than the merchant-service charge.

[101] Competition and Consumer Amendment (Payment Surcharges) Act 2016 (Austl.).

[102] *Payment Systems (Regulation) Act 1998 Standard No. 3 Of 2016, Scheme Rules Relating to Merchant Pricing for Credit Debit and Prepaid Card Transactions*. Reserve Bank of Australia, (May 26, 2016), available at <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>.

[103] *ACCC Enforcement of Credit Card Surcharging Laws*, Australian Federation of Travel Agents, available at <https://www.afta.com.au/news-hub/accc-enforcement-of-credit-card-surcharging-laws>.

[104] Cameron Dark, Chay Fisher, Kim McBey, & Ed Tellez, *Payment Surcharges: Economics, Regulation and Enforcement*, Reserve Bank of Australia Bulletin, (December 2018), available at <https://www.rba.gov.au/publications/bulletin/2018/dec/pdf/payment-surcharges-economics-regulation-and-enforcement.pdf>.

[105] Zhu Wang, Scarlett Schwartz, & Neil Mitchell, *The Impact of the Durbin Amendment on Merchants: A Survey Study*, 100(3) Econ. Q. 183, (2014) (3rd Quarter). Some merchants saw their acceptance costs increase because, prior to Dodd-Frank's price controls, some merchants, especially smaller merchants, had received discounts on acceptance costs. But the imposition of price ceilings also effectively created a price floor, leading some merchants to pay higher fees than previously.

[106] EY/CE study, *supra* note 48, at 170.

[107] 66% of 45% is 30%.

[108] *The Household Finance and Consumption Survey: Results From the 2017 wave*, European Central Bank, No. 36, (March 2020).

[109] *Review of Card Payments Regulation Issues Paper*, Reserve Bank of Australia, (March 2015),

<https://www.rba.gov.au/payments-and-infrastructure/review-of-card-payments-regulation/developments-card-payments-mkt.html>.

[110] Olivia Gee, *Debit Cards vs EFTPOS*, Mozo, (Sep. 9, 2021),

<https://mozo.com.au/debit-cards/guides/debit-cards-vs-eftpos>; EFTPOS' 2021 annual report asserts that the system will be ready for ecommerce by May 2022. See *EFTPOS Annual Financial Report*, EFTPOS, (2021), available at

<https://www.eftposaustralia.com.au/sites/default/files/2021-11/ANNUAL%20REPORT%202021%20FINAL%20HR.pdf>, at 8.

[111] Lance Sinclair Blockley, *Expert Industry Opinion in Relation to the Application to the Australian Competition and Consumer Commission for Authorisation of the Proposed Amalgamation of BPay Group Pty Limited and BPay Pty Ltd, EFTPOS Payments Australia Limited and NPP Australia Limited*, Australian Competition and Consumer Commission, (Mar. 18, 2021).

[112] *Competition in the Australian Financial System, Inquiry Report*, Productivity Commission, (2018), at 471.

[113] EY/CE study, *supra* note 48, at 61.

[114] Todd J. Zywicki, *Durbin's Innovation Killer: The Durbin Amendment Would Raise Costs for Consumers, Increase Fraud, and Kill Innovation*, *The American* (Jun. 11, 2011), <https://www.aei.org/articles/durbins-innovation-killer>.

[115] Jonathon Reinisch, *Swipe Freeze: How the Durbin Amendment Is Preventing Your Mobile Phone From Replacing Your Wallet*, 63 *DePaul L. Rev.* 123, (2013), at 137.

[116] Zywicki, *supra* note 114.

[117] Tanay Jaipuria, *Fintech and Regulatory Arbitrage: Understanding the The Durbin Amendment*, Tanay's Newsletter, (May 24, 2021),

<https://tanay.substack.com/p/fintech-and-regulatory-arbitrage>.

[118] *Bank Fees: Federal Banking Regulators Could Better Ensure That Consumers Have Required Disclosure Documents Prior to Opening Checking or Savings Accounts*, U.S. Government Accountability Office, (January 2008), available at

<https://www.gao.gov/assets/gao-08-281.pdf>, at 15.

[119] Mukharlyamov & Sarin, *supra* note 54, at 37.

[120] *Id.*, at 30.

[121] See Zywicki, *et al.*, *Price Controls*, *supra* note 2.

[122] 2009 FDIC National Survey of Unbanked and Underbanked Households, Federal Deposit Insurance Corporation, (2009), <https://www.fdic.gov/analysis/household-survey/2009/index.html>, at 25; *How America Banks: Household Use of Banking and Financial Services*, Federal Deposit Insurance Corporation, (2019), <https://www.fdic.gov/analysis/household-survey>, at 2.

[123] On the eve of Dodd-Frank's enactment, the 2009 FDIC report found only 6.3% of consumers said "service charges too high" was a reason why they did not have a bank account (FDIC 2009, *supra* note 122). There were some changes in how the survey questions were asked over time that makes it difficult to compare precise figures, although the trend lines appear clear.

[124] Mukharlyamov & Sarin, *supra* note 54, at 30.

[125] *Id.*

[126] Schuh, *et al.*, *supra* note 87.

[127] The authors' analysis applies to credit cards, not debit cards. But oddly, they assume that the annual fee on credit cards would remain the same after imposing interchange-fee price controls. Experience in Australia and elsewhere reveals this assumption to be completely unfounded. See Chan, *et al.*, *supra* note 59.