The Impact of the Durbin Amendment on Banks, Merchants, and Consumers

NOTE: Preliminary draft. Not for circulation.

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November 2018

Abstract

After the Great Recession, new regulatory interventions were introduced to protect consumers and reduce the costs of financial products. Some voiced concern that direct price regulation was unlikely to help consumers, because banks offset losses in one domain by increasing the prices that they charge consumers for other products. This paper studies this issue using the Durbin Amendment, which decreased the interchange fees that banks are allowed to charge merchants for processing debit transactions. Merchant interchange fees, previously averaging 2 percent of transaction value, were capped at $0.21, decreasing bank revenue by $6.5 billion annually. The objective of Durbin was to increase consumer welfare. For consumers to benefit, banks needed to not offset Durbin losses and merchants needed to pass through savings to consumers. Instead, we find causal evidence that banks fully offset losses by charging higher fees for their products: For example, following Durbin, the provision of free checking accounts decreases by 40 percentage points. On the merchant side, we find that retailers pass-through savings most when debit usage is common and when competitive pressures are highest. However, we find little evidence of across-the-board consumer savings. Our analysis suggests that consumers are not helped by this interchange regulation.

I. Introduction

The Great Recession prompted widespread outrage at the financial sector. A host of regulatory interventions—and even an entirely new agency, the Consumer Financial Protection Bureau—emerged to help tilt the balance of power away from the largest financial institutions responsible for the crisis and toward the consumers who were most harmed by it. New regulations sought to curb banks' fee income, which had become the fastest growing source of revenue in the decade leading up to the crisis. How effective has the consumer financial regulatory project been? How do firms respond to price regulation? Do consumers benefit?

We study these questions empirically in the context of the banking industry and Section 1075 of the Dodd-Frank Act (colloquially known as the "Durbin Amendment" for its main sponsor, Senator Dick Durbin of Illinois). The Durbin Amendment capped the interchange fees paid by merchants to cover the cost of processing debit transactions. Durbin's supporters expected lower merchant interchange expense to pass-through to consumers in the form of lower retail prices.

Skeptics long expressed doubt that such price regulations are welfare-enhancing (Stigler and Friedland 1962, Olsen 1972, Glaeser and Luttmer 2003). In consumer finance, even pre-crisis proponents of regulation (Barr et al. 2009) worry that sophisticated financial firms will respond to regulation by passing through any fee losses to their less-sophisticated customer base, prompting an inevitable game of "regulatory whack-a-mole" (Kahn 1979).[1] Additionally, given that regulation is shaped by industries with significant political and financial influence, it may exacerbate the market failures it seeks to correct (Stigler 1971).

Recent work on the post-crisis regulation of bank prices is more optimistic on its potential than this earlier literature. A series of empirical studies (Bar-Gill and Bubb 2012, Agarwal et al. 2014, Nelson 2018, among others) find limited evidence of banks'

[1] Whack-a-mole is an arcade game. Players use a mallet to hit moles back into their holes. When one mole disappears, another emerges. Alfred Khan described this phenomenon with a different analogy: "The regulatory rule is: each time the dike springs a leak, plug it with one of your fingers; just as dynamic industry will perpetually find ways of opening new holes in the dike, so an ingenious regulator will never run out of fingers" (Kahn 1979).

offsetting losses associated with the CARD Act, which restricted their ability to charge late fees and raise interest rates on borrowers. The CARD Act appears to decrease costs for consumers by around $12 billion annually (Agarwal et al. 2014).

This paper aims to advance the debate by studying another post-crisis price regulation: the Durbin Amendment. The Federal Reserve's rules implementing Durbin capped debit interchange fees for banks with assets of $10 billion or more. This reduced interchange revenue for covered banks by nearly 25 percent. The rationale behind Durbin was that these savings would be passed through to consumers, and that, like the CARD Act, the result would be across-the-board consumer savings (Durbin 2010). We empirically analyze the incidence of the Durbin Amendment on banks, merchants, and consumers to understand the extent to which it achieved its ends.

Prior to Durbin, merchant interchange fees ranged from 1–3 percent of transaction value. Post-Durbin, when customers use a debit card from a covered issuer, these fees are capped at $0.21. Interchange fees for uncovered issuers (banks below the $10 billion threshold) are unchanged. The implications for a $100 debit transaction are described below.

Merchant Interchange Fees for $100 Purchase		
Customer debit card issued by:	Pre-Durbin	Post-Durbin
Bank A (above $10 billion)	2% x 100 = $2	$0.21
Merchant savings/bank losses		($1.79)
Bank B (below $10 billion)	2% x 100 = $2	$2
Merchant savings/bank losses		$0

Our experiment is to compare banks and merchants impacted by Durbin (banks above the $10 billion threshold and merchants with customers who use debit cards from these banks) to those not impacted to understand its effect on bank and merchant pricing, and ultimately the extent to which consumers benefit from its passage.

We conduct this analysis using several sources of data. Using a panel dataset of branch-specific pricing information, we provide causal evidence that banks whose interchange revenue decreases post-Durbin respond by increasing consumer fees. The branch-specific data also allows us to examine how local competitive dynamics impact a

bank's response to Durbin. Next, to study how consumer prices are impacted by Durbin, we combine two datasets: daily prices for gas stations in the United States, and proprietary zipcode-level interchange data made accessible, subject to robust privacy and data protection controls, by a large card network.[2] Collectively, our data provide new insights into merchant interchange costs. Overall, we have branch-level pricing data for nearly 70 percent of bank holding companies, daily prices for over 50 percent of all gas stations, and zipcode-level interchange data for nearly 80 percent of all zipcodes in the United States. We use this rich data to comprehensively evaluate the incidence of the Durbin Amendment.

We consider the impact of Durbin on banks using a difference-in-differences research design. Our analysis relies on comparing pricing practices of banks above the $10 billion Durbin threshold (whose interchange revenue falls post-Durbin) to those below the threshold (whose interchange revenue is not impacted). Our identifying assumption is that in the absence of Durbin, interchange revenue and account fees of banks covered by Durbin would have moved with those exempted. We provide both graphical evidence and formal tests to demonstrate that the parallel trends assumption is satisfied.

We find that the Durbin interchange cap successfully drove down banks' interchange revenue. Covered institutions' annual interchange revenue fell by over 25 percent. This is a long-term decrease and there is no comparable decline for banks exempt from the new regulation. If passed through to consumers and not offset by banks, the result would be annual consumer savings about half as large as the CARD Act's welfare enhancement.

However, we find significant evidence of banks offsetting Durbin losses by raising other account fees. The share of free basic checking accounts (accounts with a $0 monthly minimum for all customers, regardless of account balance) decreases from 60 percent to 20 percent as a result of Durbin. Equivalently, average checking account fees increase from $4.34/month to $7.44/month. Monthly minimums to avoid these fees increase by around 25 percent, and monthly fees on interest checking accounts also

[2] Appendix Figure A3 illustrates the coverage of our interchange and gas data.

increase by nearly 13 percent. A rough back-of-the envelope calculation suggests that banks make up approximately all Durbin losses. These higher fees are disproportionately borne by low-income consumers whose account balances do not meet the monthly minimum required for these fees to be waived.

One concern with this identification strategy is that we may incorrectly confound the effect of the Durbin Amendment with bank reactions to other regulatory changes that include an exemption for banks with less than $10 billion in total assets. For example, following Dodd-Frank banks above the $10 billion threshold receive onsite consumer examinations by the CFPB and must establish enterprise-wide risk committees (Independent Banker 2017). Fortunately for our methodology, the vast majority of these changes are implemented years after Dodd-Frank; whereas our focus is on the quarters immediately following its passage. Additionally, most of the bank response to Durbin that we document is on the exact checking account that prior to Durbin generated 12 percent of banks' total non-interest income. The local nature of this response gives us confidence that what we document is related to Durbin, rather than other changes. Because our identification relies on a size-cutoff, another concern is that post-crisis large firms may respond to a heightened regulatory burden in different ways than small firms, whose risk practices are less impacted. To test this possibility, we perform a series of robustness checks. For example, we exclude "megabanks" (with more than $100 billion in assets) from our analysis and find virtually identical results.

We then test for Durbin's impact on merchant prices by focusing on the gasoline industry. We choose gas because it is an industry where interchange expense declines substantially post-Durbin: Interchange fees across all industries fall by $6.5 billion, and gas retailers account for around 15 percent of these total savings. Furthermore, gas prices are set locally, and products are standardized, allowing for identification of relatively small price movements. We compute an "impact" variable for each zipcode which reflects by what percentage debit interchange fees decrease post-Durbin. We find some evidence that gas retailers with significant interchange savings lower prices following Durbin's enactment. Pass-through is greatest in regions where debit usage is most common (so Durbin especially relevant) and where competition is highest.

However, outside of the top savers, we find no evidence that other gas retailers pass-through interchange savings in the six months following Durbin's enactment. While we hypothesize that this is a byproduct of a "rule of thumb" pricing approach—whereby retailers adjust prices only in the face of significant shocks—an alternative is that savings for the average station are too small to capture empirically. Furthermore, merchants may not adjust immediately and tracking long-term price response is complicated by other changes that may confound our results.

Despite these caveats, we can conclusively show that consumers experience immediate Durbin losses through higher bank fees, and we find limited evidence in the gas industry for across-the-board consumer gains through significantly lower merchant prices. This merchant behavior is consistent with contemporaneous anecdotal evidence (Electronic Payments Coalition 2011, Wang et al. 2014) and industry reports documenting higher retail margins post-Durbin (Home Depot Earnings Call 2011). Given that banks completely offset interchange losses, barring complete pass-through of merchant savings, Durbin decreased consumer welfare. Importantly, even if merchants do pass along Durbin savings, the most sympathetic read of the evidence is that Durbin overall had zero impact on consumer welfare and had unintended distributional consequences, as higher bank fees are borne only by the poorest consumers, while everyone benefits from lower prices.

From a policy perspective, our results should caution those who are enthusiastic about the potential of price regulation to enhance consumer welfare. The Durbin case study illustrates that in most settings consumer advocates are right to anticipate regulatory whack-a-mole. Although not our focus here, the Durbin case study is also rife with examples of industry influence that implicate Stiglerian concerns about the efficacy of the regulatory project given the likelihood of capture (Stigler 1971, 1983). Regulators' initial push for a credit interchange cap was dropped as more lobbying dollars were spent on Durbin than on any other aspect of Dodd-Frank. Additionally, the Federal Reserve initially proposed a lower debit fee cap ($0.12) but raised it in response to

industry outrage.[3] It is imperative to consider market particulars and the likely response of regulated entities when contemplating price regulation.[4] Our results highlight how well-intentioned interventions can have unintended consequences for consumer welfare.

This paper contributes to a long line of literature that considers the need for consumer financial regulation and analyzes its efficacy (Campbell 2006, Sunstein 2006, Bar-Gill and Warren 2008, Barr et al. 2009, Campbell et al. 2011, Willis 2013, Bubb and Pildes 2013, Campbell 2016). We also contribute to a primarily theoretical literature on the nature of two-sided markets like the interchange market, where card networks' success relies on banks providing these cards to consumers, consumers using these cards, and merchants accepting them (Rochet and Tirole 2002, Evans and Schmalensee 2005, Armstrong 2006, Rochet and Tirole 2006, Farrel1 2008, Rysman 2009, Valverde et al. 2016). Our study is close in spirit to work by Levitin (2007, 2008), Bedre-Defolie and Calvano (2013), and Edelman and Wright (2015) who highlight that payment networks' price coherence (consumers pay the same price for a good, regardless of its interchange expense to merchants) harms low-income consumers and results in excessive use of payment cards.

We also contribute to a small but growing literature on the impact of the Durbin Amendment, including Wang et al. (2014), who use survey evidence to find, like us, a relatively muted merchant response to Durbin and Evans et al. (2013) who use event study methods to suggest banks lost and merchants gained from Durbin. Our consideration of banks' response to Durbin is related to two papers by economists at the Federal Reserve Board (Kay et al. 2018, Manuszak and Wozniak 2017). Although generally their results—of substantial bank offset—are consistent with ours, there are notable differences. First, Kay et al. (2018) rely solely on bank regulatory data and suggest that banks offset their Durbin losses through an increase in "service fees"—a regulatory line-item that includes account fees but also overdraft revenue, among other

[3] Libgober (2018) provides suggestive evidence about the importance of the lobbying around Durbin—through meetings with the Federal Reserve Board and public comments—on the outcome of the final rule.
[4] Said another way, the CARD Act is the exception, not the norm. It involves a very particular setting—where banks take advantage of consumers' behavioral limitations and charge them high penalty fees that they ignore. Although price regulation may not be fully offset in this instance, this success is not generalizable.

items. However, these results do not control for simultaneous deposit growth for banks above the Durbin-threshold. Once we control for this, we find no post-Durbin growth in service fees, which is why we turn to more granular account-level data to isolate Durbin's effect on specific account prices. Manuszak and Wozniak (2017) also use pricing data to estimate Durbin's impact; however, they aggregate their sample to the bank-holding company, rather than branch, level. Since many banks set prices regionally, we believe branch-level granularity to be valuable. Further, our work builds on this prior literature as it is the first to combine data on bank pricing behavior with actual interchange data reported by a large card network. This allows us to estimate both a bank and merchant response to Durbin to think through its impact on overall consumer welfare. We also provide suggestive evidence on some of Durbin's distributional consequences: Higher bank fees are borne primarily by low-income consumers and banks appear to push consumers to greater use of credit cards, left unregulated by Durbin.

The rest of the paper proceeds as follows. Section II provides background on credit and debit card interchange, describing the concerns that led to the Durbin Amendment and its key provisions. Section III describes the multitude of data sources. Section IV describes our methodology and presents results on banks' and merchants' price response. Section V considers overall consumer welfare as well as some distributional effects. Section VI concludes.

II. Background on the Durbin Amendment

a. An Introduction to Interchange

The use of bank cards as a means of purchase dates back to the late 1960s. The card system involves four distinct parties: (1) cardholders who use the cards to purchase goods; (2) merchants who accept the cards in exchange for goods; (3) issuing banks who issue cards to cardholders; and (4) acquiring banks who manage the card accounts of merchant clients. In practice, the acquiring banks and the issuing banks can be the same. Card networks are "two-sided" because the success of their platforms relies on their ability to recruit both cardholders to use their cards and merchants to accept them.

Interchange fees are fees paid by the bank of the merchant ("acquiring bank") to the bank of the customer ("issuing bank"). To simplify a complex series of transactions, the interchange fee can be understood as a cost paid from a merchant to a bank for processing a consumer's debit or credit transaction. Unlike virtually all other bank fee revenue (e.g., credit card late fees, overdraft fees, out-of-network ATM fees), interchange fee schedules are set by the card networks that intermediate transactions, not the banks directly (Ausubel 1991). Card networks receive a portion of the interchange fees banks collect. Prior to Durbin, the fee schedule was equivalent for all bank participants in a card network, although there were differences both among the networks (American Express with the highest interchange rates) and within networks (premium rewards cards had higher interchange rates). Historically, interchange fees ranged from between 1 and 3 percent of the value of a customer's transaction.

In the decade leading up to the Recession, interchange expense became a significant cost of operating for merchants, in some cases even their second highest cost after labor (Gackle 2009). This growth had two causes. First, the use of payment cards increased substantially: in 1990, less than 15 percent of consumer payments were made by credit or debit card; today, this share is greater than 50 percent (Greene and Schuh 2017). Second, card networks began introducing premium cards with higher merchant interchange fees and incentivizing the use of these cards through attractive consumer rewards programs. By 2008, a merchant was paying $1 in interchange fees on a $40 purchase for a premium card (2.5 percent interchange rate); compared with around $0.60 for a basic card (1.5 percent interchange rate) (GAO 2009). Critics of interchange fees suggest that processing costs cannot possibly reach 3 percent of transaction value, that the cost of processing a $100 transaction should not be 100x the cost of processing a $1 transaction, and that there is no explanation—absent price-fixing—to explain high US interchange rates relative to other countries (Lyon 2006). Card networks contend that interchange costs cover significant expenses associated with developing and maintaining bank and merchant networks, guaranteeing quick payment to merchants, and allowing issuers to bear risks associated with covering customers' electronic payments (MasterCard 2018). Some academics are sympathetic to this view, pointing out that card networks have no incentive to set supracompetitive fees because their

business model relies on merchants choosing to accept their cards (Evans and Schmalensee 2005).

Given the substantial market power of card networks (Visa and MasterCard together account for around 70 percent of the payment card market) and bank issuers (40 percent of US deposits are concentrated in five banks—Bank of America, JP Morgan Chase, Wells Fargo, Citibank, and US Bancorp), the Department of Justice and various coalitions of merchants have repeatedly brought antitrust suits alleging collusive pricing practices keep interchange rates substantially raised relative to the costs of processing these transactions (Sarin 2018). Merchants argue that networks extract rents because retailers have no power to bargain for low rates: Practically, they must accept credit and debit cards to maintain customers, and so they are forced to accept high—and rising—interchange expenses.

b. Push for regulation and the Durbin Amendment

Concerns about pricing practices in the interchange market prompted attention from the regulatory community well before the crisis.[5]

Early interchange proposals considered fee caps for *credit* interchange.[6] This was because historically credit interchange rates were significantly higher than debit rates. Additionally, credit is viewed as a more pernicious payment instrument because, unlike debit, it does not decouple transacting from consumer borrowing (Bar-Gill 2004). This is precisely why predecessor legislation in Australia capped credit interchange rates: to discourage excessive credit use and encourage a shift toward debit.[7]

[5] For example, in 2005, the Federal Reserve held a conference titled "Interchange Fees in Credit and Debit Markets: What Role for Public Authorities". And a few years later, a 2009 Government Accountability Office report contemplated potential regulatory intervention in this market, for example by capping interchange fees. The GAO presciently voiced concern that the result of such an intervention may well be increased consumer costs, because banks would offset interchange losses and merchants would not pass-through these savings (GAO 2009).

[6] Incidentally, interchange fee caps were included in early iterations of the CARD Act. See, for example, Credit Card Interchange Fees Act of 2008," "The Credit Card Fair Fee Act of 2008," "Credit Card Accountability and Responsibility Disclosure of 2008."

[7] There is mixed evidence of the efficacy of the Australian intervention. For example, Chang et al. (2005) find that credit card fees rise by 50 percent after the interchange fee cap, but Farrell et al. (2005) argue that this work suffers from limited and noisy data.

Despite this context and an initial push to curb *credit* interchange fees, the Durbin Amendment eventually made debit interchange its target. This was after substantial lobbying by credit card networks and financial firms, who spent more lobbying effort on Durbin than any other aspect of Dodd-Frank.[8] Senator Dick Durbin, who sponsored the Amendment celebrated the focus on debit, rather than credit, arguing that this would mitigate any offsetting behavior by banks.[9]

Durbin was a late addition to the Senate version of Dodd-Frank, passed without hearings or debate in May 2010. Many critics took issue with the speed of its passage (American Bankers Association 2016). It called on the Federal Reserve to promulgate a rule to ensure that issuer interchange fees for debit transactions be "reasonable and proportional" to the actual cost incurred by the issuer. In June 2010, the Board issued Regulation II to implement the Durbin Amendment. The Board's initial rule called for a $0.12 fee cap, which, based on comments received by industry and academic experts, was raised to $0.21 per transaction, plus five basis points times the transaction value. The final rule was announced on June 29, 2011 to be enacted in October of that year.

Durbin's dollar (rather than percentage) cap changes the structure of interchange rates from a percentage fee to a flat fee, with only five basis points of the transaction value as the variable component. Post-Durbin, for banks above the $10 billion threshold, interchange fees on an average transaction ($38.00) fall from $0.43 to $0.23 (exactly the maximum Durbin allows: $0.21 + .05% x $38.00). Interchange fees for banks below the $10 billion threshold are unchanged—still $0.43. The result is a decrease of $6.5 billion annually (25 percent of their total interchange revenue) for banks above the Durbin threshold and no commensurate decrease for banks below the threshold.

III. Data

We use data from a variety of sources to analyze Durbin's incidence.

a. Bank financials

[8] The ability of lobbyists to shape Durbin implicates some of Stigler's early concerns about regulatory capture (Stigler 1971, 1983). Given that regulation is substantially shaped by industry participants, it is perhaps unsurprising that consumer benefit is limited.

[9] "Some have argued that the Durbin amendment would reduce credit availability by regulating credit card interchange rates. However, the amendment's reasonable fee requirement only applies to debit cards." (Durbin 2010)

Our initial bank sample includes all bank holding companies with more than $500 million in assets[10] for whom quarterly data between Q1 2008 – Q4 2012 is available on the regulatory Call Reports (FRY-9c).[11] We begin our sample in 2008 because prior to this date, interchange income was not reported as a line item on bank financial statements. We are primarily concerned with line items associated with bank assets; credit and debit interchange income; and service charges on deposit accounts, which includes monthly account maintenance fees, check writing fees, and overdraft fees, among many others.

We exclude from our sample 547 bank holding companies who do not report service charges or interchange income throughout our sample period[12] and 27 of the remaining bank holding companies who experience a significant merger during our sample period (assets change by 20 percent or more within a quarter). We are left with 520 bank holding companies, 47 above the $10 billion Durbin threshold and 473 below it. In some specifications, we also exclude 13 "megabanks," whose assets average more than $100 billion due to concerns that we may conflate reactions to heightened regulation for these "too-big-to-fail" banks with Durbin's impact.

Relevant summary statistics for both our Durbin treatment and control group are highlighted in Table 1. The table presents averages across a range of balance sheet and income statement variables as of year-end 2010 (pre-Durbin), 2011 (immediately following Durbin's Q4 2011 enactment), and 2012 (a year post-Durbin). Appendix Table A1 provides these same summary statistics excluding megabanks from the Durbin subsample. Unsurprisingly, the average Durbin bank in our sample has 137x the assets of the average non-Durbin bank. We include bank-fixed effects to control for any time-invariant confounds.

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[10] We exclude small banks (under $500 million in total assets) because of concerns that these are not comparable to the banks impacted by Durbin above the $10 billion threshold.

[11] Unlike Kay et al. (2018), we use bank holding companies, not retail banks, as our unit of observation. This is typical in most of the finance literature that uses the Call Report data and is especially sensible in this setting because Durbin's applicability is based on a bank holding company's total assets. Our results are comparable if we use retail bank-level, rather than holding company level, data.

[12] Banks only report interchange income if it is 3 percent or more of total non-interest income. By excluding banks who do not report throughout our sample, we understate Durbin's impact. 10 percent of banks who reported non-interest income in Q3 2011 (prior to Durbin) no longer report this income in Q4 2011 after Durbin is enacted.

To capture the impact of local market dynamics on banks' Durbin response, we rely on bank Summary of Deposit data. Specifically, for each county we compute a Herfindahl-Hirschman competition index (HHI) based on local market shares of banks with branches in that county. Intuitively, this index captures the probability that two randomly drawn dollars of bank deposits within a county are held by the same bank.

The normalized HHI ranges between 0 (perfect competition) and 1 (monopoly). We show how HHI differs substantially across counties in Appendix Figure A1 which plots county-level HHI's for 2011. The HHI attached to a particular branch observation is the HHI of the county in which that branch is located. Branches located in highly competitive states (e.g., California) have a lower HHI than those in less competitive states (e.g., Montana).

b. Account pricing

RateWatch, a data collection firm, surveys bank branches weekly for information on their fees, deposit rates, and mortgage rates. We rely on these data and focus on fees charged for the basic checking account, though some specifications also include fee information about other accounts: interest checking accounts, savings accounts, and money market accounts. While a fee-setting branch remains in its sample, RateWatch provides data at a weekly frequency on its monthly maintenance fee and the minimum deposit required in that account to avoid the fee. For non-transactional accounts (savings and money market accounts), RateWatch also provides information on withdrawal fees associated with removing funds from these accounts. For the purpose of our analysis, we average weekly observations to get quarterly snapshots of fees associated with each account.

Importantly, RateWatch surveys only fee-setting branches. It provides data on linkages between fee-setting branches and non-fee-setting branches. However, it only contains reliable data on the most recent linkage. As such, a non-fee setting Bank of America branch that was previously a Wachovia branch will appear in the data to be linked to Bank of America for its whole existence, despite the ownership change. To avoid conflating the impact of the Durbin Amendment with unrelated changes in bank-branch relationships, we thus restrict our analysis to all *fee-setting branches* of the bank

holding companies in our sample. Our sample thus contains data on 3,707 unique bank branches, corresponding to 628 holding companies. Appendix Table A2 (Panel B) provides a sense of RateWatch's coverage. Of the 954 bank holding companies with more than $500M in assets in Q3 2011, 628 of them have a fee-setting branch that is in our sample. This means that nearly 75 percent of total bank assets (and over 90 percent of total bank branches) are in our sample.

Table 2 provides summary statistics for branches in the Durbin treatment and control group. The table considers fees associated with bank checking, interest checking, savings, and deposit accounts at three points in time: Q4 2010 (pre-Durbin), Q4 2011 (immediately following Durbin), and Q4 2012 (one year post-Durbin). We define a branch as offering a "free" checking or savings account if it has a $0 monthly maintenance fee associated with this account, regardless of account size. Interestingly, even pre-Durbin, larger banks charged higher fees. We are careful not to conflate baseline differences in fee-setting with Durbin's effect.

c. Interchange data

We also obtained access to proprietary data on merchant interchange rates from a large card network. For 120 retail merchant categories (ranging from grocery stores to barber shops to gas stations), the card network provided us with access to aggregated and anonymized data at the zipcode level on the total volume of regulated (card issued by bank above $10 billion Durbin threshold) and unregulated (card issued by bank below $10 billion threshold) debit, as well as the number of transactions and the interchange fees collected.

Below is a snapshot of one observation with the zipcode, year and merchant category removed to preserve confidentiality.

Regulated Debit (Bank Issuer Over $10 billion)				Unregulated Debit (Bank Issuer Under $10 billion)			
Volume	Transactions	IC Fees	Rate	Volume	Transactions	IC Fees	Rate
$50,841,211.40	955,612	$235,231.15	0.46%	$59,346,844.59	1,118,540	$1,124,299.04	1.89%

For gas retailers (the focus of our merchant analysis) we also received access to aggregated and anonymized data on *credit* usage within a zipcode.

Our data allow for us to trace out how interchange expense varies. Absent regulation, interchange schedules differ significantly across industries and even merchants within an industry. For example, transactions made with MasterCard debit cards issued by small banks (below the $10 billion Durbin threshold) have a base interchange rate of 1.05% + $0.15 in 2018, but grocery merchants with sufficiently large debit card volume receive a discount: "Tier-1" grocers (with annual debit volume of $400 million or more) pay only 0.70% + $0.15. Credit card pricing has a similar tiered structure—in 2018, Visa credit cards used at grocers with $92.7 million or more in annual volume pay 1.15% + $0.05, but those with less than $14.8 million annually pay seven basis points more: 1.22% + $0.05.

This publicly available tiered pricing schedule does not fully capture differences in merchant interchange rates: Merchants with significant market power may negotiate even more attractive terms (Digital Transactions 2011). Durbin changes the structure of the market by eliminating much of this dispersion: In 2018, for transactions made with MasterCard debit cards issued by banks above the Durbin threshold, grocers pay $0.21 plus five basis points times the value of the transaction, regardless of their debit volume. Dispersion in the credit interchange market, left unregulated by Durbin, remains.

Our data indicate that merchants most helped by Durbin are those without tiered or otherwise low debit interchange rates negotiated ex-ante with card networks. Some merchants actually see their interchange fees rise post-Durbin. This is because small-ticket discounts disappear post-Durbin as the $0.21 debit interchange fee cap becomes a floor across debit transactions (Digital Transactions 2011, American Banker 2012).[13] Merchant savings are concentrated in the gasoline retailers, book stores, miscellaneous retail stores (typically smaller department store chains), and auto/truck dealerships-repairs-leases. The standardized product line, local pricing, and significant

[13] Economically, the disappearance of this discount post-Durbin is surprising. It is hard to understand why profit-maximizing card networks and banks were not charging small-dollar merchants maximal fees ex-ante. One explanation could be that these firms target a certain level of interchange revenue—when they are no longer able to generate it from large merchants, they feel compelled to change pricing structure across merchant categories. Additional theoretical and empirical work on the structure of this market is warranted.

share of Durbin savings (16 percent of the total across all industries) in gasoline make it an attractive arena for considering Durbin's price impact.

Appendix Figure A2 illustrates the significant variation in interchange rates faced by merchants in our sample. Our data are aggregated to the zipcode level, so as to preserve the confidentiality of individual merchant interchange rates. However, even this geographic aggregation allows us to capture the significant dispersion in unregulated interchange rates across our sample.

Durbin reins in this dispersion. Appendix Figure A2 also includes *regulated* debit interchange rates in these same industries. While these too vary, this is exactly based on average ticket size in different zipcodes, which we expect: the $0.21 flat fee is a 21 percent fee if transaction value is $1.00 and .21 percent fee if transaction value is $100.00. Within and between industry dispersion in interchange rates disappears once issuers are subject to Durbin's debit interchange cap.

Due to limitations on the availability of historical data, our data runs from 2014–2016. This means we are unable to directly observe how interchange rates and total fees paid change for a particular merchant (or more precisely in our setting, for a particular class of merchants within a zipcode) as a result of Durbin's passage. However, anecdotal evidence and industry insights shared by a major card network suggest that interchange rates changed only for those debit card issuers above the $10 billion threshold. This means unregulated debit interchange rates and credit card interchange rates were unchanged post-Durbin. Thus, to capture the Durbin impact of a particular industry within a zipcode, we compare what debit interchange fees would have been in the absence of Durbin to interchange fees given the $0.21 fee cap. We calculate a zipcode's Durbin-induced change in debit interchange fees as:

$$\begin{aligned} \Delta InterchangeFees_{z,i} &= Fees_{z,i}^{PostDurbin} - Fees_{z,i}^{PreDurbin} \\ &= Value_{z,i}^{reg} \times (IC_{z,i}^{reg} - IC_{z,i}^{unreg}) \end{aligned}$$

where z is a zipcode, i is an industry, $IC_{z,i}^{unreg}$ is the per dollar interchange rate for unregulated debit, $IC_{z,i}^{reg}$ is the per dollar interchange rate for regulated debit, $Value_{z,i}^{reg}$ is the dollar value of transactions with regulated debit.

We then scale the absolute dollar Durbin-induced reduction in debit interchange fees by the total level of debit interchange fees collected in a zipcode for that industry and define:

$$Impact_{z,i} = \frac{-\Delta InterchangeFees_{z,i}}{Debit\ Interchange_{z,i}}$$

Our impact measure is the negative of the percentage change in debit interchange expense attributable to Durbin. High values of *Impact* indicate substantial *decreases* in interchange expense resulting from Durbin.

Unsurprisingly, this measure is highly correlated with a more naïve estimate of Durbin exposure, for example by considering the share of bank branches (or the share of bank deposits) in a zipcode associated with banks above and below the Durbin threshold. We prefer our interchange-based measure of Durbin savings because it allows us to see exactly how a merchant's cost dynamics evolve post-Durbin. For example, if 50 percent of a zipcode's bank branches are above-Durbin banks, but none of those customers use their debit cards, then the more naïve estimate will overstate Durbin's importance to that zipcode.

d. Gas price data

Our data on gas prices comes from Oil Price Information Service (OPIS). OPIS contains station-level information on daily pump prices for (1) regular; (2) mid-grade; and (3) premium fuel. It also contains information on retail margins for each category, which it computes based on the difference between the net fuel price (retail price less state, federal, and local taxes and freight) and the wholesale price (the same-day rack price quoted by the nearest wholesale distributor to a particular station).

The gas data is attractive for its granularity: for the ten largest states in the United States (CA, TX, FL, NY, PA, IL, OH, GA, NC, and MI) we have daily data for the six months prior to and six months following the implementation of Durbin (April 2011 – March 2012). In addition to station-level pricing, the data contains station-specific information including: name, address, latitude/longitude, and brand. Pricing data comes from a mix of sources: exclusive relationships with credit card companies

who provide this information directly to OPIS; gas station "fleet card" users; direct feeds from fuel retailers; and a data partnership with GasBuddy, a company that collects user-inputted station pricing information (OPIS 2017).

Between these varied sources, OPIS data cover 65,000 gas stations in our ten-state subsample. However, some stations are available only for a portion of 2011–2012 or have prices that are reported sporadically. As such, we focus on zipcodes in which OPIS reporting meets the Barrage et al. (2014) "minimum density criteria" and require fuel stations in the sample to have at least three observations per week for the sample period. To the best of our knowledge, we are the first to attempt to empirically estimate merchant price responses to interchange regulation.

We focus on the gas industry for several reasons. First, of the 120 industries in our dataset, gas retailers save the most as a result of Durbin—15 percent of total savings across all industries. Second, unlike many retailers, for example the grocery and drug store industry (Gentzkow and DellaVigna 2017), gas stations price *locally*. This means that we will be able to test whether interchange savings for gas retailers within a particular zipcode translate to lower gas prices for customers in that zipcode. Additionally, gas offers very standardized products, simplifying price comparisons.[14]

e. Other data sources

To calibrate the magnitude of banks' Durbin recovery and study its impact on other consumer outcomes (e.g., credit usage and unbanked status) we turn to data from a few other sources. Specifically, we rely on two surveys conducted by bank regulators: (1) the Survey of Consumer Finances, which contains demographic and financial information about consumers, including checking account balances; (2) the FDIC's Survey of Unbanked and Underbanked Households, which contains a host of information on these consumers, including the main reason they are unbanked. Data from the Nilson Report, which provides annual snapshots of total credit and debit purchase volume for

[14] Incidentally, opponents of Durbin also focused on the gas industry to highlight the failures of intervention. The Electronic Payment Coalition launched a web campaign—http://wheresmydebitdiscount.com—which (very roughly) approximated what consumer savings per gallon from Durbin should have been and argued that these had not materialized.

the largest issuers in the United States, helps shed light on how credit and debit usage evolve post-Durbin.

IV. Methodology and results

a. Bank interchange income and service charges on deposit accounts

Table 1 hints at the regression results to follow. Relative to untreated banks, treated banks experience a significant decrease in interchange revenue. Between Q4 2010 (pre-Durbin) and Q4 2011 (post-Durbin), interchange revenue fell by over 29 percent for Durbin banks. During this same period, interchange income *increased* by 12.2 percent for banks above the Durbin threshold. This difference is statistically significant at the 1 percent level. Importantly, during this same time period deposits grow faster at Durbin banks than their non-Durbin counterparts—between Q4 2010 and Q4 2011 deposits grew by 9.6 percent at Durbin banks relative to 3.9 percent at non-Durbin banks. This difference is significant at the 1 percent level and is consistent with post-crisis deposits growth being concentrated at the largest financial institutions (Ensign 2018). It is important then to consider the growth in interchange and service charge revenue *relative to each dollar of bank deposits.* Considering interchange and deposit revenue without accounting for contemporaneous deposit growth conflates the impact of Durbin with this growth.

Figure 1 demonstrates the impact of the Durbin Amendment on banks' interchange revenue, both overall and scaled by deposits. As intended, interchange revenue drops substantially (by around 25 percent) for banks above the $10 billion threshold immediately following Durbin's enactment in Q4 2011. Figure 2 does not indicate similarly drastic growth in service charges on deposit accounts.

In Figures 3 and 4, we perform a series of event study regressions, where in the quarters prior to and following Durbin's passage we estimate the change in fee revenue (relative to Q2 2010) for banks above and below the Durbin threshold. This approach allows us to trace out the effect of Durbin over time. The coefficients plotted represent the change in interchange income and service charges on deposit accounts in a particular quarter relative to Q2 2010.

Specifically, we estimate:

$$Y_{i,t} = \alpha_i + \phi_t + \sum_{s \neq 10Q2} \beta_s \times \text{Durbin}_\text{i} \times 1[s = t] + \epsilon_{i,t}$$

Where $Y_{i,t}$ represents our outcome variable (interchange income per dollar of deposits, service fees on deposit accounts per dollar of deposits), α_i is a bank holding company fixed effect to control for time invariant bank characteristics, and year-quarter fixed effects ϕ_t control for time trends. $Durbin_i$ is an indicator that takes a value of 1 if a bank holding company is above the $10 billion threshold. We cluster our standard errors at the bank holding company level. This is a generalized version of a basic difference-in-difference approach.

We see that for covered banks interchange income per dollar of deposits falls by nearly 18 percent following Durbin's passage. There is no observable simultaneous increase in service charges on deposit accounts—in fact, scaled by dollars of deposits, these fees *decrease*. Our results are essentially identical when we exclude megabanks with assets over $100 billion.

The observation that service charges on deposit accounts do not appear to offset Durbin losses runs counter to prior work by Kay et al. (2018), who suggest that growth in service charges offsets 90 percent of Durbin's effect. These authors ignore simultaneous deposits growth at large banks, which leads to higher deposit fee revenue independent of Durbin dynamics. While we agree with—and illustrate subsequently—the notion that banks raised account fees to offset Durbin losses, the category "service charges on deposit accounts" is too all-encompassing to allow for clear identification of the Durbin response. This is why we next turn to data from RateWatch, which provides information on historical pricing at the branch level for different kinds of bank accounts.

b. Bank account fees

i. Baseline results

In Figure 5, we illustrate the impact of Durbin on free checking, monthly maintenance fees, and monthly minimums to avoid these fees on consumer checking accounts. Importantly, we see no evidence in these figures of differential trends for large

banks (Durbin treatment) relative to small banks (Durbin control) in the pre-Durbin period.[15] These parallel pre-trends give us confidence that the identifying assumption is satisfied, and we can attribute the changes in checking account pricing to Durbin's passage.

We estimate the impact of Durbin—and test our parallel trends assumption—more formally in Figure 6, using a basic event study approach as above. Here, in the quarters prior to and following Durbin's passage we estimate the change in free checking, account fees, and monthly minimums to avoid checking account fees for branches of banks above, relative to below, the Durbin threshold in a series of quarters relative to Q2 2010 (Durbin's passage). Specifically, we estimate:

$$Y_{i,t} = \alpha_i + \phi_t + \sum_{s \neq 10Q2} \beta_s \times \text{Durbin}_\text{i} \times 1[s = t] + \epsilon_{i,t}$$

We cluster standard errors at the bank holding company level and include branch fixed effects. This approach allows us to formally test for different pretrends between our treatment and control groups and it allows us to observe when bank account fees begin to adjust to Durbin. We benchmark against Q2 2010 because we hypothesize—and empirically confirm—that at least some banks begin adjusting to Durbin after it passes, but before the new debit interchange fee cap is enacted. This is why in Q3 2011 there is a statistically significant decrease in free checking (or increase in monthly maintenance fee), even though Durbin is not enacted until Q4 2011. Many more banks adjust to Durbin in the immediate aftermath of its enactment: by Q4 2011, Durbin has led to a 40 percentage point decrease in free checking. We can precisely rule out an effect on free checking that is smaller than 15 percentage points. Equivalently, monthly maintenance fees, which averaged $4 for banks above the Durbin threshold increased by between 50–100 percent because of Durbin's passage. Although monthly minimums on the basic checking account trend upward as well, these differences are only significant at the 10 percent level.

[15] Although monthly minimums to avoid fees appear to be trending downward for Durbin banks prior to Durbin. We thus primarily focus on changes in free checking and monthly maintenance fees, where the parallel trends assumption is most clearly satisfied.

In Table 3, we also present the results of a basic difference-in-difference approach, where we estimate the following:

$$Y_{i,t} = \alpha_i + \phi_t + \beta_d \times Durbin_i \times Post_t + \epsilon_{i,t}$$

where variables are defined as above, with the addition of the $Post_t$ indicator, which in this specification takes a value of 1 for Q2 2010 (when Durbin is passed) and all quarters that follow. The coefficient of interest β_d can be interpreted as the change in pricing for banks above relative to below the $10 billion threshold attributable to Durbin's passage. Table 3 presents these results and extends the difference-in-differences methodology to other common bank accounts, to capture the extent to which banks change fees outside of the basic checking account most directly impacted by Durbin. We consider interest checking accounts, as well as non-transactional savings and money market accounts. For non-transactional accounts, we also consider whether withdrawal fees are impacted.

We see very little increase in account fees outside of the basic checking account following Durbin's passage. We do see an increase in monthly maintenance fees on interest checking accounts, but it is smaller in magnitude—fees increase by around 13 percent on this account, relative to nearly 100 percent on the basic checking account.

ii. Impact of competition

Economic theory predicts that firms with market power should charge higher prices.[16] Recently in the banking industry, Drechsler et al. 2017 point out that banks with more market power pay lower deposit rates. In Table 4, we illustrate that banks with market power also charge higher fees: A one standard deviation increase in county-level HHI increases checking account fees by approximately $0.19. We analyze the impact of market power in the context of Durbin, testing whether pricing power impacts the speed or size of bank response.[17]

[16] There is a long line of theoretical and empirical literature on the impact of market concentration on retail prices. For example, see Bresnahan (1983) for an early summary of empirical work in various industries.

[17] This inquiry is also closely related to Drechsler et al. (2017). These authors find that banks in high-concentration areas increase deposit spreads by more than banks in low-concentration areas in response to

We again use an event study approach to test the extent to which market power influences bank response. In Table 5, we estimate the following:

$$Y_{i,t} = \alpha_i + \phi_t + \sum_{s \neq 10Q2} \beta_s \times \text{Durbin}_\text{i} \times 1[s = t] + \epsilon_{i,t}$$

Separately for banks located in counties where HHI is above-median (significant market power) and those where HHI is below-median (closer to perfect competition). We fix our HHI measure in 2008 to avoid any possible endogeneity between Durbin's effect and local market power.

We observe that Durbin banks with pricing power begin to decrease free checking immediately after Durbin's passage (an 8 percentage point decrease by Q3 2010). In contrast, there is no statistically significant decrease in free checking for Durbin banks in more competitive regions until a year later, in Q3 2011. Monopolistic Durbin banks also adjust more to Durbin—by Q4 2012 free checking decreases by 47.7 percentage points for Durbin branches in above-median HHI counties, relative to 33.5 percentage points for their low-median counterparts.

In most quarters, these differences are statistically significant. Durbin banks in concentrated markets adjust first: by 2011 Q1 they decrease free checking by 14.3 percentage points more than Durbin banks in competitive markets (significant at the 5 percent level). They also adjust most: by 2012 Q4, Durbin banks with market power decrease free checking by 13.5 percentage points more than their more competitive counterparts (significant at the 10 percent level).

1. Why might market power matter?

In a perfectly competitive world, firms earn zero-profit in equilibrium. Regulation that decreases banks' ability to generate revenue on one dimension (like Durbin's interchange cap) must be fully offset. In reality, banks have market power, e.g., because of switching costs (Klemperer 1995) or the fact that bank accounts are not perfect substitutes across banks. This market power is highest where there is least inter-bank

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interest rate changes. In this paper, we are interested in whether banks' adjustment to Durbin also depends on local market dynamics.

competition (high HHI). Regulation that constrains monopolists' ability to generate rents should theoretically (at least weakly) increase consumer welfare. And yet we find evidence that banks in less competitive markets adjust *more* to Durbin than banks in markets that are closer to perfect competition, where we anticipate full pass-through of interchange losses.

There are several possible explanations for this empirical observation. The first is that we observe short-run adjustment to Durbin, in the quarters immediately following its passage. Banks in competitive markets may lose money because of Durbin in the short-run (by not offsetting losses fully), so that in the long-run they are forced to shut down because they are no longer profitable. This is consistent with anecdotal evidence that banks close branches post-Durbin (Cooper 2015). Another possibility is that banks in less-concentrated markets are not profit-maximizing ex-ante, but for example are targeting a certain level of income (Bajaj 2018). When Durbin decreases interchange revenue, banks with market power exploit it to meet profit targets. This is consistent with our observation that card networks *increase* interchange rates for small-ticket merchants in the aftermath of Durbin. Absent some deviation from standard models of profit-maximizing firms, it is hard to understand why financial institutions with market power appear to be leaving money on the table (with low interchange rates and low account fees) prior to Durbin's enactment.

c. Bank robustness checks

i. Large vs. small bank trends

One concern with our identification strategy is that it captures general differences in revenue and pricing for large versus small banks that are independent of the Durbin Amendment. The passage and enactment of the Durbin Amendment coincides with a post-crisis overhaul of the financial sector that results in significantly elevated regulatory burdens for all banks, but particularly the largest "too-big-to-fail" financial institutions. If the heightened regulatory burden triggers pricing changes, then we will mistakenly ascribe these to Durbin's passage.

To test for this possibility, we perform a series of robustness checks.

First, we perform the analysis described above for a subsample that excludes megabanks, defined as banks with more than $100 billion in assets. Although there are differences (e.g., definitionally, average assets of treated banks when megabanks are excluded from the sample are much lower; also pre-Durbin account fees for megabanks appear higher) our results are qualitatively and quantitatively similar when we exclude this subgroup.

For example, if costs associated with regulatory compliance for TBTF banks drive the price movements we observe, then we expect to see significantly less (or perhaps even no) increase in account fees for large non-megabanks relative to their smaller counterparts. Appendix Table A3 reports the results of a difference-in-differences estimate for this subsample. Although our point estimates are slightly smaller than for the whole sample, we still see a large increase in monthly account fees ($1.98 for large versus small banks following Durbin, significant at the 1 percent level) and decrease in free checking (27.2 percentage points following Durbin, significant at the 1 percent level).

As an alternative, we can also focus attention on the small group of banks directly above and below the Durbin threshold. In Appendix Table A4, we compare banks directly above the $10 billion threshold (with assets of $10 billion to $30 billion) to those directly below $5 billion to $30 billion, an approach closer to a regression discontinuity in spirit. This eliminates concerns that comparing very small banks (for example, total asset $1B) to megabanks may not be appropriate. Our sample shrinks significantly (54 percent of covered branches remain in the sample, but only 5.5 percent of exempt branches) and we lose the power to estimate Durbin impact precisely since we are left with fewer than 100 bank holding company clusters. However, the sign of these results is consistent with our previous estimates and the 27 percent decrease in free checking is significant at the 10 percent level.

ii. Bunching

Our identification strategy assumes that the Durbin Amendment is a natural experiment which exogenously exposes banks to treatment (decrease in interchange revenue) based on an arbitrary asset threshold of $10 billion. If banks strategically avoid this $10 billion threshold during our sample period, this casts doubt on our assumption of exogeneity.

To test for this possibility, we look for strategic manipulation around the $10 billion asset threshold. We implement a variation of the McCrary (2008) test[18] using the local polynomial density estimator of Cattaneo et al. (2017) to estimate the density of the distribution of bank assets around the discontinuity of interest ($10 billion) with quarterly data on bank assets. The goal is to ascertain whether banks are sorting themselves out of treatment to avoid the Durbin hit to their interchange revenue. If they are not systematically sorting, then we expect that the density near the cutoff to be continuous. Figure 7, Panel A provides the results of our manipulation test using a third-order polynomial. Our empirical results provide no evidence of manipulation in the period surrounding Durbin (2010-2012). The p-value is 0.37, meaning we cannot reject the null that the density is continuous across the cutoff. This is consistent with Kay et al. (2018) who find no evidence of banks bunching below the Durbin threshold.

However, when we expand beyond our sample period and instead test whether there is a discontinuity in the distribution of bank assets using data from 2008-2016, we find a large and statistically significant gap in bank assets immediately above the Durbin threshold (t-statistic of -4.22). This manipulation is driven by the last few years of this expanded sample—we find a discontinuity on this order of magnitude when we drop observations associated with the years surrounding Durbin (2010-2013).

The histogram of distribution of bank-quarters by asset threshold in Figure 7, Panel B provides another visual illustration of this discontinuity. Here we plot bank-

[18] McCrary (2008) proposes a density test to validate regression discontinuity (RD) designs, but as Cattaneo et al. (2017) note, the general principle applies to a wide array of questions regarding self-selection around a boundary point including our setting. We prefer the discontinuity test based on the density estimator in Cattaneo et. al. (2017) over the original approach taken in McCrary (2008) based on the local polynomial density estimator of Cheng et al. (1997) as it does not require the choice of many additional tuning parameters.

quarters by asset size for banks with assets from $5-16 billion separately in the pre-crisis (2003-2008) and post-crisis (2011-2016) period. More than twice as many banks are right above the $10 billion threshold ($10-$11 billion) in the pre-crisis period. This is consistent with work by Ballew et al. (2017) who find that banks near the $10 billion threshold are less likely to engage in acquisitions in the post-crisis relative to pre-crisis period. The disappearance of $10 billion banks is consistent with anecdotal evidence from banks who report that enhanced regulatory burden makes it unprofitable to be in the range of $10-12 billion (Smith 2016, Springer 2017).

Given that bank adjustment around the $10 billion threshold appears to occur primarily through merger activity,[19] it makes sense that this discontinuity is a longer-term effect of regulations around the $10 billion threshold, rather than an instantaneous response to Durbin. Other Dodd Frank requirements—notably annual company-run stress tests[20] and CFPB oversight—also kick in at the $10 billion threshold (Fuster 2018).[21] While an interesting long-run impact of post-crisis regulatory changes, the lack of discernible strategic manipulation during our sample period validates our empirical approach.

d. Merchant response: gas margins

Since Durbin-induced changes in interchange expense are related to consumer payment choice, the share of customers who bank at covered entities, and the pre-Durbin interchange rate merchants face; Durbin's impact is unevenly distributed across the zipcodes in our sample. This variation motivates our empirical analysis.

A back of the envelope calculation described in Table 6 suggests that gas stations save on average $0.0076 per gallon following Durbin's enactment.

[19] "Since 2010, 37 U.S. banking institutions have crossed that threshold. According to Killian, 14 of the others breached $10 billion in one acquisition, 11 did so through multiple small acquisitions, and eight decided they couldn't offset the extra cost of preparedness, so they decided to sell. Only four financial institutions did it through organic growth." (Springer 2017).

[20] The first set of company-run stress tests did not begin until March 2014. Annual examinations were discontinued for banks with assets between $10-$250 billion in assets as of June 2018.

[21] Ballew et al. (2017) hypothesize that these rather than Durbin drive their results because the fixed costs imposed make acquisitions to grow substantially—rather than incremental organic growth—the preferred approach of banks near the threshold

To trace out the degree to which this interchange cost shock is passed through to consumers, we estimate the following cross-sectional regression.

$$\left(\overline{Margin}_{\text{f,z,c,post}} - \overline{Margin}_{\text{f,z,c,pre}}\right) = \beta \times Impact_z + \alpha_c + \epsilon$$

which captures how fuel station margins over this period vary with the zipcode's Durbin impact.

A station's retail margin is its retail price in excess of all applicable state and local taxes, freight costs, and wholesale price. The pre- and post-Durbin margins are averaged from the daily data of each fuel station (f) over six months pre- and post- the Durbin Amendment's enactment on October 1, 2011. County (c) fixed effects are included, and the standard errors are clustered by zip code (z). If Durbin interchange savings are passed through to consumers, we anticipate that retail margins will decline significantly following its enactment.

We estimate this Durbin impact for a variety of subgroups whose exposure to Durbin differs. In Column 1 of Table 7, we compare "treated" zipcodes—with high (i.e., top decile) levels of *Impact*, whose debit interchange expense drops on average by 33.7 percent as a result of Durbin—to "control" (i.e., bottom decile) zipcodes, whose debit interchange expense barely drops (on average, by 3.6 percent) post-Durbin. We worry that these zipcodes are fundamentally different, and so any changes in retail margins could be a byproduct of these differences rather than a consequence of Durbin. As such, we choose "control" zipcodes using a propensity-score matching procedure based on a host of observable characteristics, including (log) average household income, (log) population density (total population/total area), (log) fuel station density (total number of fuel stations/total area), and (log) zipcode area. In this matched sample, we observe no difference in retail margins for zipcodes highly impacted by Durbin relative to those who are less affected.[22] In Column 2 we similarly find no significant change in retail margins when comparing a matched sample of zipcodes in the top and bottom quartile of Durbin impact, and no change in Column 3 when considering the whole sample (above versus below-median impacted zipcodes). We can precisely rule out a change in

[22] All specifications in Tables 7–9 rely on control groups propensity score-matched to the corresponding treatment group used in a given column.

retail margins greater than $0.002 when comparing above versus below-median impacted zipcodes.

Next, in Columns 4–9, we focus separately on zipcodes with above median (on average, 52.7 percent) and below median (on average, 26.8 percent) debit usage. The idea is that even if debit interchange decreases significantly post-Durbin (high value of "Impact"), if a gas retailer's customers primarily pay with non-debit instruments (e.g., credit cards), then Durbin is not all that significant. If, on the other hand, customers primarily pay with debit, then Durbin savings are material.

In Columns 4 and 5, we see that high-debit volume zipcodes whose interchange expense drops significantly post-Durbin *do* in fact pass these savings through to consumers following Durbin's enactment. When we compare high (top decile) relative to low (bottom decile) impact zipcodes *within this high debit subgroup*, we observe a $0.028 decrease in margins. We observe similar magnitudes (a $0.023 decrease) when comparing the top quartile of impacted high-debit zipcodes to the bottom quartile. For zipcodes with limited debit usage (Columns 7–9) for whom Durbin results in less pronounced savings, we see no decrease in retail margins post-Durbin. These results suggest heterogeneous pass-through of merchant Durbin savings: for the subgroup for whom Durbin results in a large decrease in expense, pass-through is immediate and significant. No similar pass-through is observed for retailers with less pronounced savings.

In Columns 10–11, we consider the importance of market dynamics for Durbin's price pass-through. Specifically, for the subgroup where pass-through is large and significant (the top decile of "impacted" zipcodes where debit usage is common), we separately consider highly competitive zipcodes (above median gas stations per capita) and less competitive zipcodes (below median). While we observe significant pass-through across all high-debit zipcodes, retailers adjust most in competitive markets. This is consistent with recent work by (Knittel et al. 2018) who observe that negative cost shocks are quickly passed through for competitive gasoline products, but only slowly work their way into prices in more concentrated markets.

The aggregate pass-through of interchange savings to consumers depends on the extent to which margins drop in all deciles. Since Durbin savings fall from 33.7 percent of total debit interchange expense in the top decile to 28.6 percent (25.6 percent) in the ninth (eighth) decile, we expect to see lower margin reductions, if any, outside of the right tail of the distribution. In Table 8, Panel A for the subgroup of zipcodes most exposed to Durbin (high debit usage), we compare the change in retail margins in the six months following Durbin's enactment to the six months prior. In Column 1, we replicate the results of Column 4 in Panel A. We then do this same exercise for the ninth decile (Column 2, average debit interchange savings of 28.6 percent post-Durbin) relative to those in the bottom decile; the eighth decile (Column 3, average debit interchange savings of 25.6 percent) and so forth. As expected, only those zipcodes with the largest Durbin savings (in the top 3 deciles) see a statistically significant decrease in retail gas margins. The decrease is most pronounced for the top decile of savers and then quickly falls off, with no statistically significant decrease for the seventh decile (average debit interchange savings of 22.9 percent) and below.

It is worth noting that the lack of significance in the seventh decile and below is not driven by the lack of statistical power. In fact, for these deciles, our data allow us to estimate the zero effect quite precisely—both the point estimates and their standard errors are close to zero.

To estimate a conservative upper bound on the aggregate pass-through of interchange savings to consumers, in Table 8, Panel B we pool together deciles based on their Durbin impact. Panel B, Column (1) simply repeats the exercise in Panel A, Column 1. For the top decile of Durbin savers, we can rule out a Durbin price impact of more than \$0.052. Once we pool the top three deciles, the only ones where we see statistically significant margin decreases post-Durbin (Column 3), we can bound the Durbin-induced decrease in gas margins at \$0.032.

In Column (9), we compare price movement at all high-debit zipcodes where Durbin decreases interchange expense (deciles 2-10) to propensity-score matched zipcodes in the bottom decile, where Durbin savings are essentially zero. For this pooled group, we estimate a very precise zero impact of Durbin on retail margins. We are able

to reject a decrease in gas margins of more than $0.0012 for high-debit zipcodes as a group in the six months following Durbin's enactment.

In Table 9, we follow the approach of Table 8, but focus on zipcodes with below-median debit usage. Earlier results (Table 7) suggest that we will find very limited (if any) decrease in retail margins for these zipcodes. This is expected, as these are regions where debit usage is uncommon, and so Durbin's debit interchange cap is of less relevance. As expected, even in the top deciles, we see no evidence of a statistically significant decrease in prices.[23] These estimates are less precise than those for high-debit zipcodes. As a result, even though there is basically no evidence that gas margins decrease for low-debit zipcodes, when we use our standard errors in Table 8, Panel B to place bounds on how gas margins change post-Durbin, we can only reject that prices fall by more than $0.0068—5x the price movement we can reject for high-debit zipcodes, where we find empirical support for Durbin pass-through.

Further work on Durbin's impact on gas margins is necessary and these are rough and preliminary estimates. We find it more likely that the upper bound on pass-through we estimate for high-debit zipcodes reflects Durbin's impact than the estimate for low-debit zipcodes, where results are noisy. That said, if we average these two estimates into one combined across-the-board number, we get an upper bound for the Durbin-induced decrease in retail gas margins on the order of $0.004. Relative to the average savings per gallon that we estimate in Table 6 ($.0076/gallon) this represents only a 53 percent pass-through of gas retailers' Durbin savings.

i. Explaining incomplete pass-through

Several papers study the pass-through of retail cost shocks and find evidence on an asymmetry: retail prices rise faster than they fall (Peltzman 2000). Many of these papers focus on the gasoline industry, and although the magnitudes are mixed, they broadly document asymmetric pass-through of cost shocks: when merchant costs rise,

[23] One exception is the 6th decile, where margins appear to fall by around $0.01 in the months following Durbin. It is hard to understand why Durbin would induce price movement in this decile but not in ones where Durbin impact is more pronounced (Columns 1-4) where in fact point estimates are often positive (suggesting price *increases* in the months following Durbin). An irrelevant variable is significant at the 5% level in 1 out of 20 regressions, on average. So it is unsurprising that we observe significance for one of the specifications in Panel A, but it would be unwise to read too much into this result.

higher expenses are quickly passed through to consumers. When merchant costs fall, it takes longer for these savings to accrue to customers. This is known as the "rockets-and-feathers" effect (Borenstein et al. 1997, Owyang and Vermann 2014). A similar trend exists in banking: although banks quickly increase interest rates for borrowers when interest rates rise, they are slow to raise the rates they pay depositors (Deltas 2008). A plausible explanation for this asymmetry is that when costs fall, oligopolists exploit market power to earn positive profits in the short-run, before these are competed away. This is consistent with empirical evidence to suggest that pass-through asymmetries are most pronounced in concentrated markets (Knittel et al. 2018).

It is not obvious why gas stations for whom the Durbin shock is largest pass through this cost shock to consumers quickly. Possibly, gas retailers price by "rules-of-thumb" (Amato and Laubach 2003, Zbaracki 2004). Evidence suggests such practices are common and can help explain sluggish price movement in response to shocks (Alvarez et al. 2006). Gas retailers may be slow to update prices in response to decreases in interchange expense because this cost shock is not material enough to prompt updating pricing rules. This is consistent with the observation of Wang et al. (2014) that many merchants do not know that their interchange expense decreases following Durbin's enactment. However, in zipcodes where Durbin looms large—where interchange expense falls significantly—retailers do revise prices quickly.

V. Suggestive evidence on Durbin's distributional consequences

a. Low income consumers bear incidence of new fees

In response to Durbin, basic checking account fees nearly double. However, these fees are borne only by customers who do not maintain a minimum balance high enough to avoid these fees.[24] To try and understand the size and incidence of the bank response to Durbin, we turn to the Federal Reserve Board's 2010 Survey of Consumer Finances, which contains detailed demographic and financial information about individuals,

[24] In some cases, monthly fees can also be avoided by customers who receive direct deposits into their checking account, e.g. from an employer.

including for example annual income, checking and savings account balances, and mortgage information.[25]

For this back-of-the-envelope calculation, we consider the banking industry as a whole, as well as the largest depository institutions: Bank of America (49M checking accounts in Q2 2010), Citigroup (24M), JP Morgan (40M), and US Bancorp (8.5M) Wells Fargo (85M). In total, in Q2 2010, we estimate that there are nearly 288M basic checking accounts at banks above the Durbin threshold.[26] These institutions accounted for around 50 percent of total deposits (43 percent of total domestic deposits).

For the industry overall and then for each large bank, we calculated the average monthly maintenance fee and the minimum required to avoid this fee pre- and post-Durbin as the average across all banks' fee-setting branches. These are reported in Table 10. Prior to Durbin, only 20 percent of large bank customers bore a monthly maintenance fee (nearly 60 percent had free checking, and half of the remaining accounts had account balances above the minimum threshold). Following Durbin, the share paying monthly fees doubles.

We then estimate the overall and big-bank specific recovery from higher monthly checking account fees. We compare the increase in checking account revenue to the decrease in interchange revenue post-Durbin.[27] Our rough estimates suggest that overall, Durbin banks totally offset interchange losses with higher account fees. This recovery was heterogeneous—Bank of America and JP Morgan Chase lost as a result of Durbin; Citigroup, despite relatively minor losses in interchange revenue, appears to have used Durbin as an opportunity to eliminate its free checking product, substantially increasing its revenue. In the best-case scenario, if there is full pass-through of merchant savings,

[25] Unfortunately, this information is not bank-specific, so we are not able to observe, for example, the differences in average checking account size for large bank versus small bank customers.

[26] Bank regulatory reports contain information on the number of depository accounts with a balance of under $250,000, but do not break these out into checking, savings, and time deposit accounts. They do however report the share of total deposits that are in transaction versus non-transactional accounts. We assume that the share of the number of accounts that are transaction accounts is equivalent to the share of deposits that are transaction deposits We are unable to distinguish between basic checking accounts and other kinds of transaction accounts. This means that the total we call "basic checking accounts" includes interest checking accounts, but also excludes large checking accounts (with balances greater than $250,000).

[27] While total checking account fees for banks are unreported, we can estimate this as: Number of accounts x Share of Accounts that Pay Checking Fee x Average Fee.

the result of Durbin is zero impact on consumer welfare. With less than full pass-through, consumers lose from Durbin's enactment.

In Figure 8 we turn to data from the Federal Reserve's Survey of Consumer Finances to ascertain the distribution of average checking account size by household income category. Unsurprisingly, the data illustrates that wealthier households have higher average account balances. This means that new account fees associated with Durbin are borne primarily by low-income consumers, as their high-income counterparts typically maintain checking account balances that place them above minimum balance thresholds to waive these fees.

Specifically, over 70 percent of consumers in the lowest income quintile (annual household income of $22,500 or less) fall below the average post-Durbin average account minimum required to avoid a monthly maintenance fee ($1,400). Only 5 percent of consumers in the highest income quintile (household income of $157,000 or more) pay these fees.

b. Impact on credit usage

Durbin capped *debit* rather than *credit* interchange rates. This increased the incentive of banks to encourage credit use, with higher and still unregulated interchange rates. This is an unintended and undesirable consequence of Durbin—credit is generally regarded as a dangerous payment instrument, because it combines financial transacting and consumer borrowing (Bar-Gill 2004). A push toward greater credit use can trap consumers in expensive cycles of debt.[28]

Anecdotal evidence suggests banks ended debit rewards programs in response to Durbin (Kerr 2015) and increased credit rewards, leading to greater credit card use (Alix and Wack 2017). Credit usage (across all issuers) grew more in the three years following Durbin's enactment than in any other three-year period since 2000 (Federal Reserve Payments Study 2016).

[28] Predecessor interchange regulation in Australia targeted credit rather than debit interchange fees precisely because regulators hoped to push consumers toward use of safer debit cards. Incidentally, earlier iterations of interchange regulation contemplated capping credit interchange rates but were abandoned after aggressive lobbying by financial firms.

To try and understand Durbin's impact on consumer payment choice, we collect annual data from 2009-2014 from The Nilson Report, a monthly newsletter on debit and credit card statistics. Once a year, the Nilson Report provides credit and debit purchase volume for the largest card issuers in the U.S. We collect annual purchase volume for the 100 largest credit and 50 debit card issuers and categorize them as "Durbin" or "non-Durbin" issuers.[29] Unfortunately, this leaves us with a very small sample; however, even this limited dataset we observe suggestive evidence of a trend toward credit usage in the years following Durbin.

Figure 9 plots average growth rates of debit and credit purchase volume separately for three groups of banks: (1) all Durbin banks; (2) the five megabanks (Bank of America, Citigroup, JP Morgan, Morgan Stanley, Wells Fargo, who together account for more than 50 percent of total domestic deposits); (3) non-Durbin banks. For each year in our sample (2009-2014), we sum total credit and debit purchase volume for these issuers. We then compute the annual growth rate in credit and debit usage as well as the annual growth rate in card usage overall (debit + credit cards).[30] For Durbin banks, overall card use increases between 6-8 percent during our sample period. However, this is driven by credit growth: debit usage actually trends downward in the years following Durbin. For the largest banks, the increase in credit usage is most pronounced. Debit growth falls from a peak of 10 percent in 2010 to just over 4 percent in 2014. At the same time, credit growth more than doubles, increasing from 4 percent to 8 percent for this subsample. Appendix Figure A4, we break out debit and credit growth rates separately for each megabank. The increase in credit relative to debit usage is especially pronounced for JP Morgan and Wells Fargo. This trend is distinct from debit and credit usage for non-Durbin banks, which appear to move in the exact opposite direction. For this subgroup, debit growth rates increase from around 8 percent per year to 15 percent, and credit growth rates fall. In Appendix Table A5, we illustrate this result with a difference-in-difference-in-differences specification. We compare credit and debit purchase volume for banks above versus below the $10 billion threshold and find a large

[29] Issuers that are not bank holding companies having "missing" Durbin status.
[30] 2010 estimate is the change in credit and debit purchase volume relative to 2009, the first year in our sample.

and statistically significant increase in credit usage by customers of banks above the threshold following Durbin's enactment.

It is important to note that our data on non-Durbin banks is very limited since Nilson only covers the largest credit and debit issuers, the vast majority of whom are well above the $10 billion Durbin threshold. Additional bank-level data, for example information on rewards spending and advertising by banks, would be useful.

c. Potential impact on the unbanked

Nearly 8 percent of Americans were unbanked in 2013, with nearly 10 percent of this group becoming unbanked in the last year. Using data from the FDIC National Survey of Unbanked and Underbanked Households, in Table 11 we show that immediately following Durbin there is a significant growth (80 percent increase relative to survey pre-Durbin) in the share of the unbanked population that credits high account fees as the main reason for their not having a bank account. Respondents in states most impacted by Durbin (those with the highest share of deposits at banks above the $10 billion threshold) are most likely to attribute their unbanked status post-Durbin to high fees (over 15 percent on those surveyed in the highest Durbin tercile[31]). The growth in the recently unbanked (those who had accounts previously but closed them within the last year) is also highest in states with the most Durbin banks, where the increase in account fees is most pronounced. It is plausible that at least some bank customers respond to Durbin fee increases by severing their banking relationship and perhaps turning to potentially more expensive alternative financial services providers such as payday lenders and check-cashing facilities. Further work about the potential impact of Durbin on the unbanked is warranted.

VI. Conclusion

In the aftermath of the Great Recession, a host of price regulations targeted banks' fee revenue. The objective of these interventions was to increase overall consumer welfare by decreasing costs for financial services and retail goods. Much of the empirical

[31] Appendix Figure A5 shows the distribution of Durbin deposits across US states. Generally, there is a larger concentration of Durbin deposits on the West and East coasts and far less Durbin presence in more rural areas.

analysis on these reforms has focused on the success of the CARD Act, whose limits on late fees and interest rate hikes save consumers on the order of $12B annually. This success leads some to speculate that concerns about regulatory "whack-a-mole" are overblown.

This paper adds to the debate about the efficacy of the post-crisis consumer financial reform agenda by considering another price regulation, a cap on interchange fees on debit cards issued by large banks, with over $10 billion in assets. Covered banks responded to this 25 percent decline in interchange revenue by doubling monthly maintenance fees on checking accounts, decreasing the share of consumers with free checking accounts from 60 percent to 20 percent. While we find that gas retailers most helped by Durbin appear to decrease retail prices, we find little evidence of across-the-board consumer savings.

The distributional aspects of Durbin merit additional consideration. Paradoxically, Durbin encourages greater use of credit, a payment instrument that is more likely to increase consumer indebtedness and one with historically higher interchange rates for merchants than its debit counterpart. Additionally, following Durbin there is a growth in the share of consumers who are unbanked and attribute their status to high bank fees. Although our data does not allow us to trace individual consumers' account closures, Durbin may well have pushed consumers out of the traditional financial system and toward more costly alternatives. Our results caution that well-intentioned regulatory intervention can fail to benefit consumers and have unintended consequences.

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Table 1: Descriptive Statistics for Call Report Data

This table compares banks holding companies above (41 treated BHCs) and below (471 untreated BHCs) the Durbin threshold in 2010 Q4 (pre-Durbin), 2011 Q4 (immediately post-Durbin), and 2012 Q4 (one year post-Durbin). Log differences relative to Q4 2010 are reported in the four columns on the right.

	Treated			Untreated			11Q4 vs 10Q4		12Q4 vs 10Q4	
	2010 Q4	2011 Q4	2012 Q4	2010 Q4	2011 Q4	2012 Q4	Treated	Untreated	Treated	Untreated
Interchange income	130,334	107,452	117,109	636	650	739	-0.291	0.122***	-0.139	0.249***
	[308,681]	[253,014]	[270,881]	[1,442]	[1,353]	[1,541]	[0.456]	[0.454]	[0.380]	[0.530]
Deposit fees	129,370	135,252	134,341	1,663	1,472	1,475	-0.001	-0.032	-0.009	-0.046
	[278,550]	[296,187]	[297,345]	[4,901]	[3,841]	[3,977]	[0.106]	[0.241]	[0.175]	[0.248]
Assets	218,041,847	221,817,070	232,567,557	1,581,584	1,629,733	1,711,317	0.041	0.031	0.101	0.076
	[532,167,680]	[532,840,352]	[550,769,344]	[1,605,501]	[1,650,853]	[1,729,940]	[0.069]	[0.082]	[0.120]	[0.139]
Deposits	99,589,528	114,075,693	128,311,356	1,259,613	1,313,213	1,393,679	0.096	0.039***	0.193	0.093***
	[202,334,336]	[236,156,800]	[265,380,400]	[1,221,326]	[1,282,715]	[1,356,498]	[0.089]	[0.100]	[0.143]	[0.154]

Table 2: Descriptive Statistics for RateWatch Data

This table compares branch subsidiaries of bank holding companies above and below the Durbin threshold in 2010 Q4 (pre-Durbin), 2011 Q4 (immediately post-Durbin), and 2012 Q4 (one year post-Durbin).

	Treated			Untreated		
	2010 Q4	2011 Q4	2012 Q4	2010 Q4	2011 Q4	2012 Q4
Basic checking account						
Free account	0.537	0.259	0.209	0.627	0.650	0.618
Monthly fee	4.438	6.706	7.165	2.360	2.331	2.419
Monthly min to avoid fee	1,293.77	1,358.12	1,395.99	1,497.58	1,516.04	1,500.21
Interest checking account						
Free account	0.02	0.02	0.02	0.04	0.05	0.06
Monthly fee	15.72	16.19	16.23	8.91	8.85	9.16
Monthly min to avoid fee	385.88	288.55	494.48	445.20	451.28	466.97
Savings account						
Free account	0.05	0.05	0.06	0.16	0.15	0.12
Monthly fee	4.55	4.63	5.83	3.19	3.24	3.49
Monthly min to avoid fee	316.22	315.91	298.20	192.17	196.56	200.77
Withdrawal fee	3.84	6.23	5.95	2.27	2.60	3.00
Money market account						
Free account	0.08	0.06	0.03	0.09	0.09	0.08
Monthly fee	9.97	11.36	11.44	9.28	9.60	9.89
Monthly min	2,668.82	3,537.76	3,697.66	2,359.20	2,211.70	2,479.22
Withdrawal fee	9.13	9.83	9.45	6.54	6.73	7.20

Table 3: Difference-in-Differences: Impact of Durbin on Bank Fees

This table reports results for DD specifications that compare pricing by bank branches above and below the Durbin threshold prior to and following Durbin's Q2 2010 passage. Specifically, we estimate:

$$Y_{i,t} = \alpha_i + \phi_t + \beta_d \times Durbin_i \times Post_t + \epsilon_{i,t}.$$

Column name includes dependent variable in each model. All are dollar values, except for "free" which is binary, with value 1 if branches offer $0 fee accounts to all customers, regardless of account size. The regressions are run and reported separately for each product: basic checking, interest checking, savings, and money market accounts.

	Fee	Free	Minimum	Withdrawal
	(1)	(2)	(3)	(4)
Basic checking				
Post X Durbin	3.109***	-0.337***	337.8*	
	(0.726)	(0.096)	(194.5)	
Q2 2010 average	4.340	0.544	1,235.6	
Interest checking				
Post X Durbin	1.878**	-0.0235	-75.01	
	(0.804)	(0.015)	(178.5)	
Q2 2010 average	14.670	0.0157	438.0	
Savings				
Post X Durbin	1.003	-0.00137	-0.138	0.572
	(0.673)	(0.024)	(10.74)	(0.38)
Q2 2010 average	4.285	0.0626	308.8	4.531
Money market				
Post X Durbin	0.628	-0.0198	995.6	0.0955
	(0.577)	(0.025)	(982.4)	(0.680)
Q2 2010 average	10.230	0.0739	2,740.8	8.989
Branch FE	Y	Y	Y	Y
Year-Quarter FE	Y	Y	Y	Y

Table 4: Market Power and Bank Pricing

This table describes the relationship between market structure and bank prices. The dependent variable is banks' monthly maintenance fees on basic checking accounts. HHI is normalized to be between 0 and 1. Specifically, we estimate:

$$Y_{i,t} = \alpha_i + \phi_t + \beta_h \times HHI_{i,t} + \epsilon_{i,t}$$

across a variety of subgroups (indicated by column name).

	Full sample	Non-Durbin banks	Durbin banks		
			All	Megabanks	Non-megabanks
	(1)	(2)	(3)	(4)	(5)
County-HHI	1.689***	1.674***	1.726***	2.101***	1.988**
	(0.343)	(0.366)	(0.567)	(0.702)	(0.909)
Branch FE	Y	Y	Y	Y	Y
Time FE	Y	Y	Y	Y	Y
R-squared	0.678	0.671	0.681	0.699	0.642
Observations	90,502	47,828	42,656	27,726	14,926

Table 5: Change in Free Checking, Durbin vs. Non-Durbin Banks by Competitive Dynamics

This table reports results from an event study specification that compares pricing by bank branches above and below the Durbin threshold prior to and following Durbin's Q2 2010 passage (Column 1). We estimate this specification separately for concentrated markets (Column 2) and more competitive markets (Column 3), as well as the difference between these two subgroups (Column 4). Specifically, in Columns 1–3, we estimate

$$Y_{i,t} = \alpha_i + \phi_t + \sum_{s \neq 10Q2} \beta_s \times \text{Durbin}_\text{i} \times 1[s = t] + \epsilon_{i,t}$$

and report β_s that is the difference in free checking for banks above relative to below the Durbin threshold in a given quarter (relative to Q2 2010, when Durbin is passed). In Column 4, we estimate a DDD specification:

$$Y_{i,t} = \alpha_i + \phi_t + \sum_{s \neq 10Q2} \beta_s \times \text{Durbin}_\text{i} \times 1[s = t] + \sum_{s \neq 10Q2} \beta_h \times HHI_i^{High} \times 1[s = t] + \sum_{s \neq 10Q2} \beta_{s,h} \times HHI_i^{High} \times 1[s = t] + \epsilon_{i,t}$$

where HHI^{High} is a binary variable that takes a value of 1 for branches with above median HHI. We report $\beta_{s,h}$, the coefficient on the triple interaction.

	All banks (1)	Above median HHI (2)	Below median HHI (3)	Diff. b/w (2) & (3) (4)
Pre-Durbin				
2008 Q1	-0.0248	-0.0647	-0.0138	-0.0376
	(0.052)	(0.057)	(0.060)	(0.052)
2008 Q2	-0.0141	-0.0573	-0.00107	-0.0426
	(0.051)	(0.055)	(0.055)	(0.053)
2008 Q3	-0.0359	-0.069	-0.032	-0.0229
	(0.046)	(0.050)	(0.048)	(0.044)
2008 Q4	-0.0505	-0.101	-0.0283	-0.0586
	(0.054)	(0.069)	(0.051)	(0.064)
2009 Q1	-0.017	-0.0741	-0.00693	-0.0534
	(0.047)	(0.065)	(0.041)	(0.065)
2009 Q2	-0.0179	-0.0541	-0.0408	0.000402
	(0.051)	(0.055)	(0.051)	(0.043)
2009 Q3	-0.00583	-0.0327	-0.0136	-0.00536
	(0.027)	(0.029)	(0.028)	(0.038)
2009 Q4	0.00533	-0.0168	0.00184	-0.00492
	(0.019)	(0.024)	(0.019)	(0.037)
2010 Q1	-0.0564	-0.0803	-0.0517	-0.0148
	(0.042)	(0.051)	(0.044)	(0.037)

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Post-Passage				
2010 Q3	-0.0400*	-0.0763**	-0.0257	-0.0368
	(0.0225)	(0.0339)	(0.0245)	(0.0397)
2010 Q4	-0.074	-0.121*	-0.0386	-0.0697*
	(0.052)	(0.064)	(0.072)	(0.040)
2011 Q1	-0.155*	-0.253**	-0.0961	-0.143**
	(0.088)	(0.107)	(0.094)	(0.064)
2011 Q2	-0.188**	-0.278**	-0.157	-0.108
	(0.086)	(0.109)	(0.098)	(0.070)
2011 Q3	-0.308***	-0.399***	-0.241**	-0.144*
	(0.102)	(0.126)	(0.110)	(0.076)
Post-Enactment				
2011 Q4	-0.374***	-0.444***	-0.310**	-0.123
	(0.112)	(0.131)	(0.123)	(0.0792)
2012 Q1	-0.407***	-0.479***	-0.341***	0.127
	(0.120)	(0.131)	(0.127)	(0.0829)
2012 Q2	-0.409***	-0.477***	-0.335***	-0.131
	(0.120)	(0.133)	(0.128)	(0.084)
2012 Q3	-0.401***	-0.488***	-0.322**	-0.154*
	(0.122)	(0.136)	(0.129)	(0.082)
2012 Q4	-0.405***	-0.483***	-0.335**	-0.135*
	(0.123)	(0.136)	(0.131)	(0.080)
Branch FE	Y	Y	Y	Y
Time FE	Y	Y	Y	Y
R-squared	0.658	0.648	0.633	0.640
Observations	69,882	30,609	27,909	58,526

Table 6: Benchmarking Gas Retailers' Durbin Savings

(1) Gas stations sales in 2011	\$500B
(2) Average gas price per gallon in 2011	\$3.8
(3) Gallons sold in 2011 = (1)/(2)	132B
(4) Gas station annual interchange savings	\$1B
(5) Average savings per gallon = (4)/(3)	\$0.0076

Sources: (1) Census Bureau; (2) Oil Price Information Service (OPIS) data; (4) proprietary interchange data

Table 7: Durbin's Impact on Gas Margins by Debit Usage and Competition

This table reports results from a cross-sectional regression that compares the average change in retail margins for gas stations in high and low impact zipcodes in the six months pre- and post-Durbin. Specifically, we estimate $\left(\overline{Margin_{\text{f,z,c,post}}} - \overline{Margin_{\text{f,z,c,pre}}}\right) = \beta \times Impact_z + \alpha_c + \epsilon$, where *Impact* is a binary variable based on a station's Durbin-induced change in debit interchange expense. For each zipcode we compute the percentage change in debit interchange post-Durbin as $-\Delta InterchangeFees_z / Debit\ Interchange_z$ and use this measure to sort zipcodes.

Specifically, for Columns 1, 4, 7, and 10–11, *Impact* takes a value of 1 for zipcodes in the top-decile of Durbin impact (highest percentage change in debit interchange expense), and a value of 0 for the propensity-score matched zipcodes in the bottom-decile. For Columns 2, 5, and 8, *Impact* takes a value of 1 for zipcodes in the top quartile of Durbin impact, 0 for zipcodes in the bottom quartile. For Columns 3, 6, and 9, *Impact* takes a value of 1 for zipcodes with above median Durbin impact, 0 for zipcodes below median.

"High debit" areas are those with above median debit usage, where debit usage is defined as $\left(\frac{Debit\ Volume}{Debit\ Volume + Credit\ Volume}\right)$.

"High competition" are zipcodes within the "High debit" regions that have an above median number of gas stations per capita in a zipcode.

Subsample:	Overall			High Debit			Low Debit			High Debit	
										High Comp	Low Comp
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Impact: Top vs. Bottom Deciles	-0.002			-0.028**			0.005			-0.069***	-0.024**
	[0.006]			[0.012]			[0.009]			[0.003]	[0.012]
Impact: Top vs. Bottom Quartiles		-0.004			-0.023***			0.004			
		[0.004]			[0.005]			[0.005]			
Impact: Above vs. Below Median			0.000			-0.001			0.000		
			[0.001]			[0.002]			[0.002]		
Zipcode Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gas Type FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
County FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	22,410	51,525	88,891	10,376	22,920	36,007	11,984	28,529	52,783	5,207	5,169
Adjusted R-squared	0.225	0.223	0.206	0.272	0.264	0.226	0.148	0.181	0.197	0.293	0.264

Table 8: Durbin's Impact on Gas Margins by Decile, High Debit Zipcodes

This table reports results from a cross-sectional regression that compares the average change in retail margins for gas stations in high and low impact zipcodes in the six months pre- and post-Durbin. Specifically, we estimate $\left(\overline{Margin_{\text{f,z,c,post}}} - \overline{Margin_{\text{f,z,c,pre}}}\right) = \beta \times Impact_z + \alpha_c + \epsilon$, where *Impact* is a binary variable based on a station's Durbin-induced change in debit interchange expense. For each zipcode we compute the percentage change in debit interchange post-Durbin as $-\Delta InterchangeFees_z / Debit\ Interchange_z$ and use this measure to sort zipcodes into deciles. In Panel A, *Impact* is a binary variable that takes a value of 1 for the decile listed in the column name and a value of 0 for the bottom decile. In Panel B, we pool deciles together, and so *Impact* is a binary variable that takes a value of 1 for the group of deciles listed in the column name and a value of 0 for the bottom decile. In this table, we limit our focus to zipcodes with above-median debit usage.

Panel A: Durbin's Impact on Gas Margins for Above Median Debit Usage Retailers by Decile

Treatment Decile:	10th (Top)	9th	8th	7th	6th	5th	4th	3rd	2nd
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Impact: Treatment vs. Bottom Decile	-0.028**	-0.017***	-0.020***	-0.002	-0.005	-0.003	-0.001	0.005*	0.003
	[0.012]	[0.006]	[0.005]	[0.006]	[0.006]	[0.003]	[0.003]	[0.002]	[0.002]
Zipcode Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gas Type FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
County FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,376	11,705	12,775	13,025	13,448	14,472	14,646	16,305	17,393
Adjusted R-squared	0.272	0.287	0.272	0.291	0.296	0.29	0.276	0.291	0.297
Durbin-induced debit interchange decline:	33.7%	28.6%	25.6%	22.9%	20.0%	16.9%	14.0%	11.4%	8.1%

Panel B: Durbin's Impact on Gas Margins for Above Median Debit Usage Retailers by Pooled Groups of Deciles

Treatment Deciles:	10th (Top)	10–9	10–8	10–7	10–6	10–5	10–4	10–3	10–2
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Impact: Treatment vs. Bottom Decile	-0.0285**	-0.0213***	-0.0219***	-0.0113**	-0.0056	-0.0028	-0.0022	0.0016	0.0017
	[0.0121]	[0.0064]	[0.0051]	[0.0049]	[0.0043]	[0.0030]	[0.0025]	[0.0021]	[0.0015]
Zipcode Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gas Type FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
County FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,376	14,729	19,232	23,792	28,825	34,675	40,847	48,594	57,162
Adjusted R-squared	0.272	0.258	0.235	0.230	0.230	0.231	0.231	0.234	0.242

Table 9: Durbin's Impact on Gas Margins by Decile, Low Debit Zipcodes

This table reports results from a cross-sectional regression that compares the average change in retail margins for gas stations in high and low impact zipcodes in the six months pre- and post-Durbin. Specifically, we estimate $\left(\overline{Margin_{\text{f,z,c,post}}} - \overline{Margin_{\text{f,z,c,pre}}}\right) = \beta \times Impact_z + \alpha_c + \epsilon$, where *Impact* is a binary variable based on a station's Durbin-induced change in debit interchange expense. For each zipcode we compute the percentage change in debit interchange post-Durbin as $-\Delta InterchangeFees_z / Debit\ Interchange_z$ and use this measure to sort zipcodes into deciles. In Panel A, *Impact* is a binary variable that takes a value of 1 for the decile listed in the column name and a value of 0 for the bottom decile. In Panel B, we pool deciles together, and so *Impact* is a binary variable that takes a value of 1 for the group of deciles listed in the column name and a value of 0 for the bottom decile. In this table, we limit our focus to zipcodes with below-median debit usage.

Panel A: Durbin's Impact on Gas Margins for Below Median Debit Usage Retailers by Decile

Treatment Decile:	10th (Top)	9th	8th	7th	6th	5th	4th	3rd	2nd
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Impact: Treatment vs. Bottom Decile	0.005	-0.001	0.002	0.000	-0.009**	0.003	0.003	0.002	-0.003
	[0.009]	[0.008]	[0.005]	[0.006]	[0.004]	[0.004]	[0.007]	[0.005]	[0.005]
Zipcode Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gas Type FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
County FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,984	10,455	9,375	8,705	7,846	6,898	6,435	4,773	3,692
Adjusted R-squared	0.148	0.188	0.275	0.224	0.249	0.249	0.206	0.288	0.282

Panel B: Durbin's Impact on Gas Margins for Below Median Debit Usage Retailers by Pooled Groups of Deciles

Treatment Deciles:	10th (Top)	10–9	10–8	10–7	10–6	10–5	10–4	10–3	10–2
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Impact: Treatment vs. Bottom Decile	0.0046	0.0015	-0.0012	-0.0042	-0.0053	-0.0048	0.0002	0.0004	0.0010
	[0.0086]	[0.0088]	[0.0072]	[0.0062]	[0.0049]	[0.0047]	[0.0048]	[0.0044]	[0.0040]
Zipcode Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gas Type FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
County FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,984	21,373	29,685	37,382	44,210	50,126	55,513	59,200	61,801
Adjusted R-squared	0.148	0.158	0.183	0.185	0.197	0.201	0.2	0.206	0.208

Table 10: Estimating Banks' Durbin Recovery

Panel A: Average monthly checking account fees and incidence

	All Durbin Banks		Bank of America		Citigroup	
	'10 Q2	'13 Q2	'10 Q2	'13 Q2	'10 Q2	'13 Q2
Share of no fee accounts	58.79%	18.29%	19.23%	16.02%	80.77%	0.00%
Level of fee if present	8.64	7.73	10.98	11.53	8.20	10.00
Min to avoid fee	1,263.63	1,398.99	2,040.31	2,838.95	1,500.00	1,500.00
Number of accounts (m.)	288	351	49	57	24	37
Share of accounts below min	50.0%	52.1%	59.3%	68.6%	52.9%	52.9%

	JPMorgan Chase		US Bancorp		Wells Fargo	
	'10 Q2	'13 Q2	'10 Q2	'13 Q2	'10 Q2	'13 Q2
Share of no fee accounts	2.07%	1.35%	100.00%	9.15%	92.76%	3.67%
Level of fee if present	9.63	11.47	—	7.66	5.00	7.79
Min to avoid fee	1,316.10	1,493.15	—	1,465.28	682.35	1,489.45
Number of accounts (m.)	40	44	8.5	12.0	85	95
Share of accounts below min	50.2%	52.9%	—	52.8%	38.4%	52.9%

Panel B: Estimated recovery from higher fees

	Checking account fees		Total recovery ($B)	Interchange loss ($B)	Loss recovered (%)
	2010 Q2 ($B)	2013 Q2 ($B)			
Overall	6.15	13.85	7.70	6.24	123%
Bank of America	3.10	4.54	1.44	2.11	68%
Citigroup	0.24	2.35	2.11	0.31	685%
JP Morgan Chase	2.27	3.16	0.89	1.17	76%
US Bancorp	0.00	0.55	0.55	0.35	158%
Wells Fargo	0.14	4.52	4.38	1.44	304%

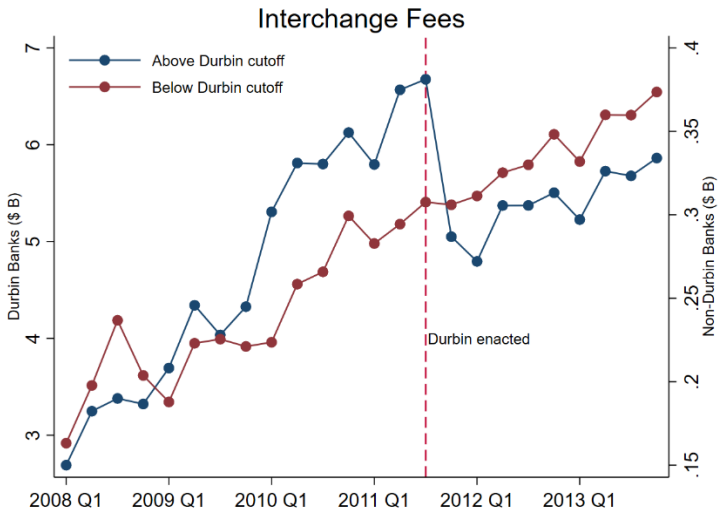
Table 11: Understanding Causes of Unbanked Status

In this table, we report data from the 2011 and 2013 FDIC Surveys of Unbanked and Underbanked Households. We report unbanked status, new unbanked status, and the main reasons consumers are unbanked overall; as well as separately for subgroups of states depending on the share of bank deposits at large (above $10B threshold) banks.

	Overall		1st tercile Least Durbin		2nd tercile		3rd tercile Most Durbin	
	2011	2013	2011	2013	2011	2013	2011	2013
Unbanked	8.2	7.74	8.65	9.04	8.32	7.32	7.79	7.67
Became unbanked in last year	9.33	9.08	9.16	6.83	10.58	9.75	7.57	9.51
Main reason for being unbanked								
Don't have enough money to keep in account	44.98	35.62	44.9	36.87	45.28	35.46	44.61	35.09
Don't trust banks	10.26	14.93	12.31	14.13	10.63	15.37	8.55	14.84
Account fees too high/unpredictable	7.38	13.38	7.81	12.26	7.19	12.33	7.39	15.39
ID/credit history problems	9.03	6.85	6.91	5.24	8.34	7.21	11.23	7.32
Banks don't offer needed products	1.97	2.64	1.84	3.53	2.44	2.81	1.38	1.89
Inconvenient hours/locations	0.57	1.25	0.79	2.01	0.54	0.69	0.48	1.52
Other reason	25.82	25.33	25.43	25.96	25.58	26.13	26.36	23.94
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Figure 1: Impact of Durbin Amendment on Interchange Revenue

Panel A: Overall



Panel B: Interchange fees per dollar of deposits

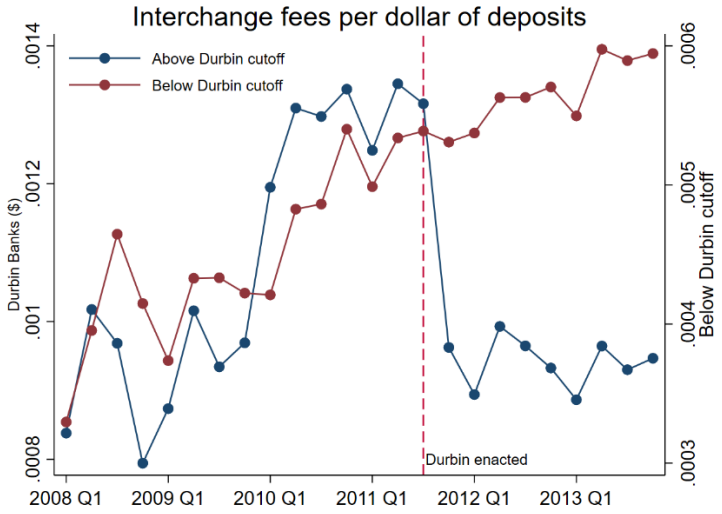
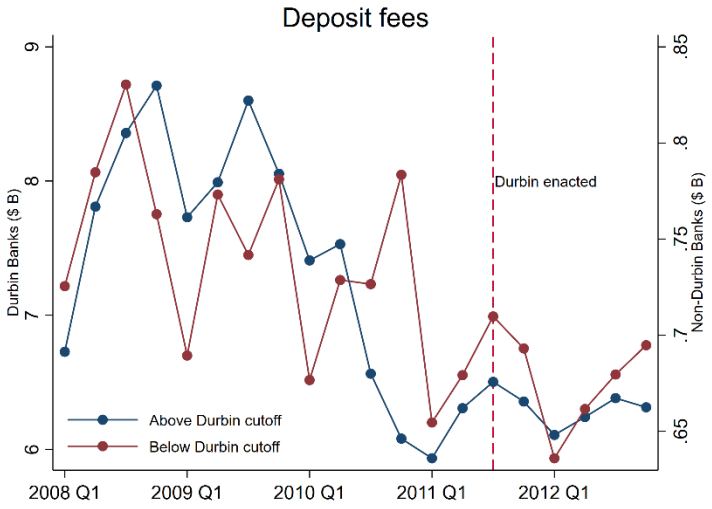


Figure 2: Impact of Durbin on Deposit Fees ("Service Charges on Deposit Accounts")

Panel A: Overall



Panel B: Deposit fees per dollar of deposits

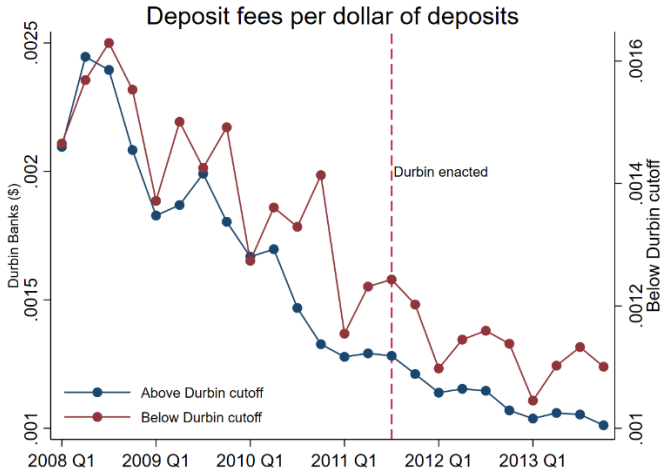
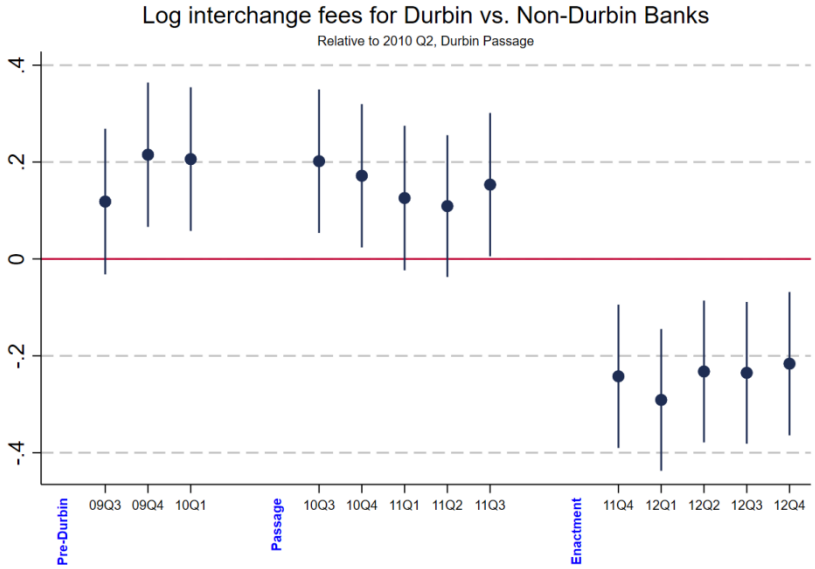


Figure 3: Impact of Durbin on Interchange Revenue, Event Study Approach

We estimate the following:

$$Y_{i,t} = \alpha_i + \phi_t + \sum_{s \neq 10Q2} \beta_s \times \text{Durbin}_\text{i} \times 1[s = t] + \epsilon_{i,t}$$

Coefficients on $Time \times Durbin$ indicators are reported, along with their 95% confidence intervals. Estimates are benchmarked against quarter of Durbin's passage (Q2 2010).



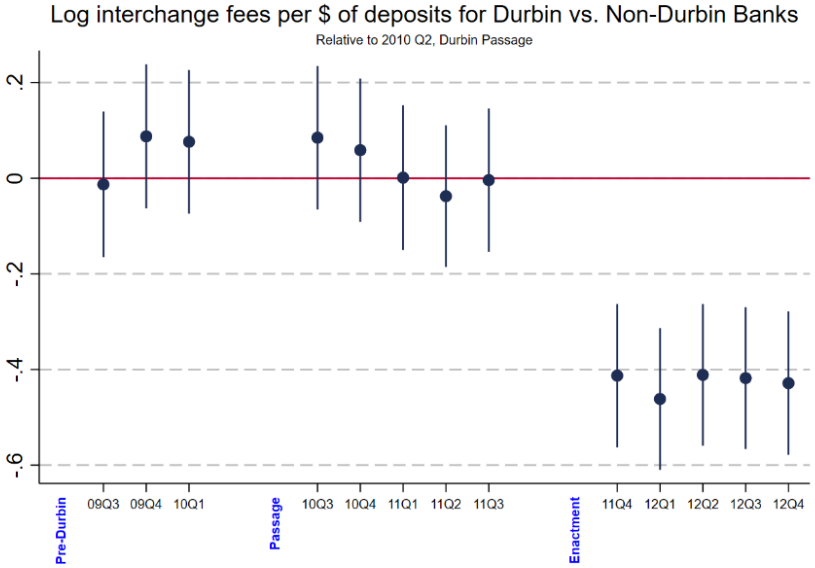
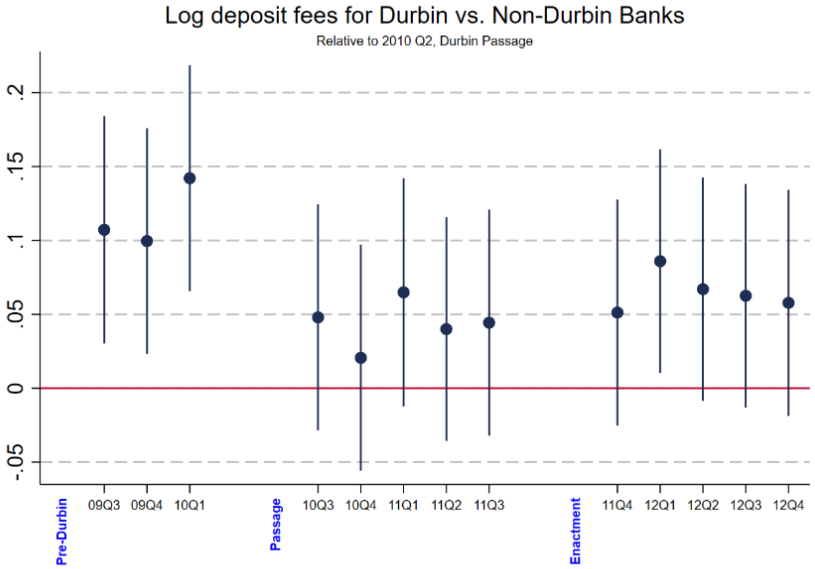


Figure 4: Impact of Durbin on Deposit Fees, Event Study Approach

We estimate the following:

$$Y_{i,t} = \alpha_i + \phi_t + \sum_{s \neq 10Q2} \beta_s \times \text{Durbin}_\text{i} \times 1[s = t] + \epsilon_{i,t}$$

Coefficients on $Time \times Durbin$ indicators are reported, along with their 95% confidence intervals. Estimates are benchmarked against quarter of Durbin's passage (Q2 2010).



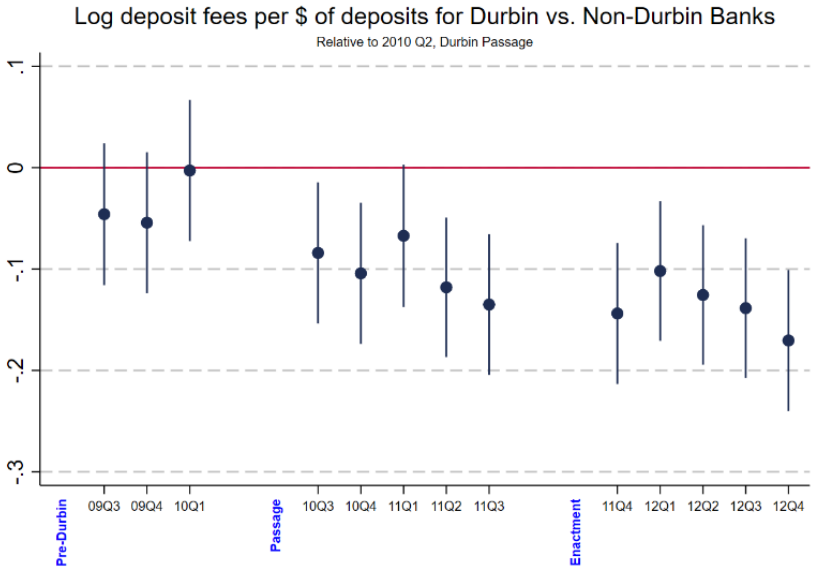
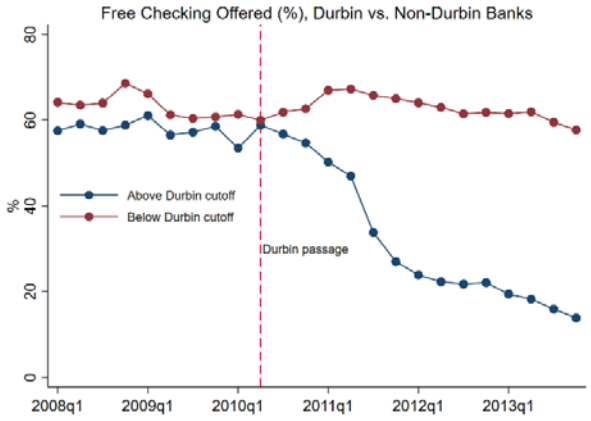
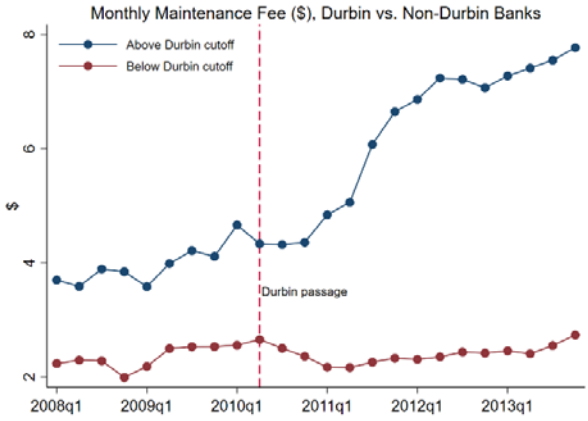


Figure 5: Impact of Durbin on Basic Checking Account Fees





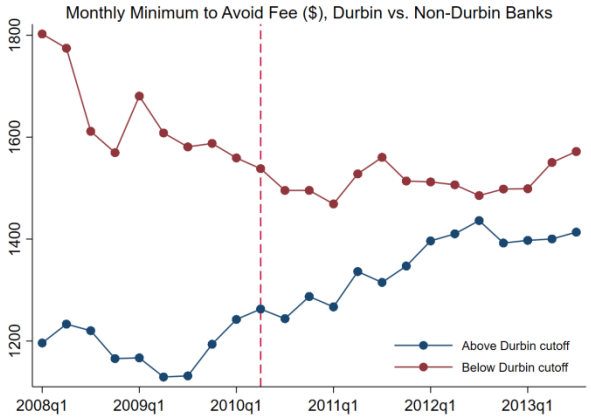


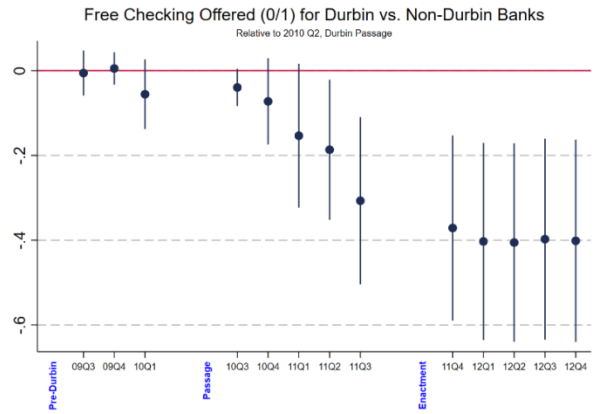
Figure 6: Impact of Durbin on Basic Checking Account Fees, Event Study Approach

We estimate the following:

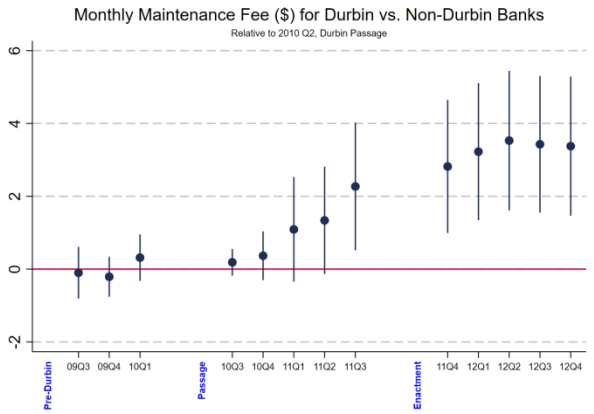
$$Y_{i,t} = \alpha_i + \phi_t + \sum_{s \neq 10Q2} \beta_s \times \text{Durbin}_\text{i} \times 1[s = t] + \epsilon_{i,t}$$

Coefficients on $Time \times Durbin$ indicators are reported, along with their 95% confidence interval. Estimates are benchmarked against quarter of Durbin's passage (Q2 2010).

Panel A: Impact on Free Checking



Panel B: Impact on Monthly Maintenance Fee



Panel C: Impact on Monthly Minimum to Avoid Maintenance Fee

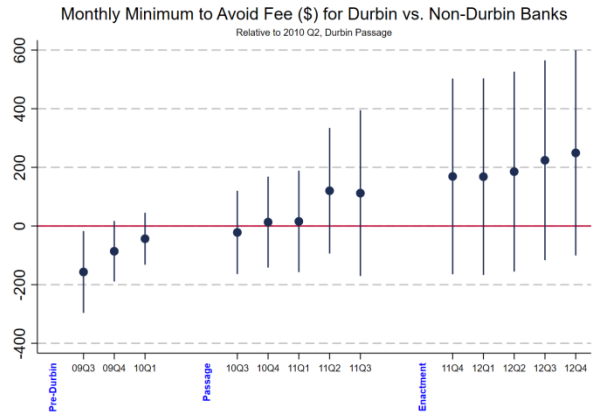
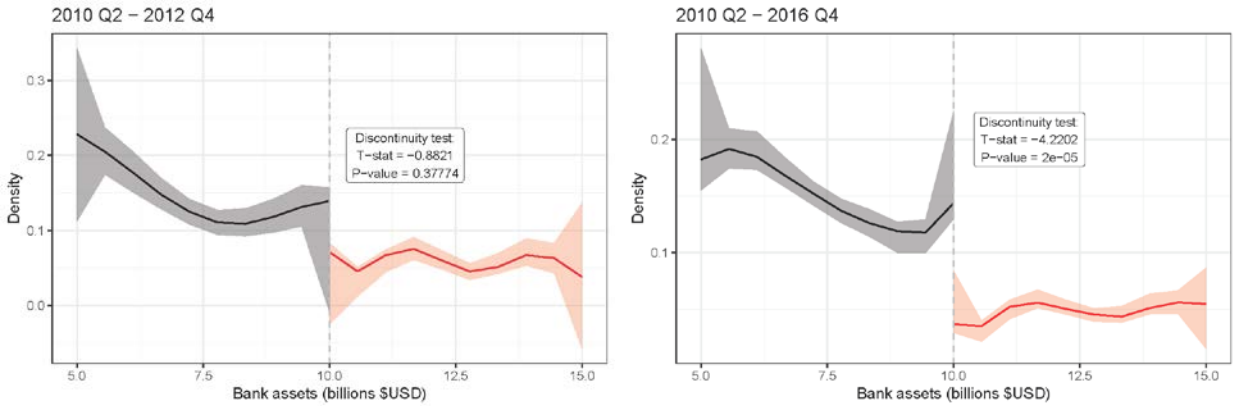


Figure 7: Strategic Manipulation of Durbin Threshold

Panel A: Estimation of density of distribution of bank assets around the $10 billion Durbin threshold using Cattaneo et al. (2017) local polynomial density estimator



Panel B: Histogram of distribution of bank-quarters, banks with $5-$16B in total assets

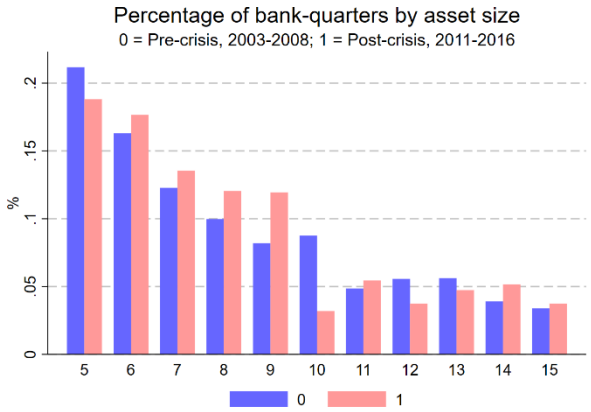


Figure 8: Incidence of Checking Account Fees by Income Category

Data from Survey of Consumer finances showing checking account balance across income categories.

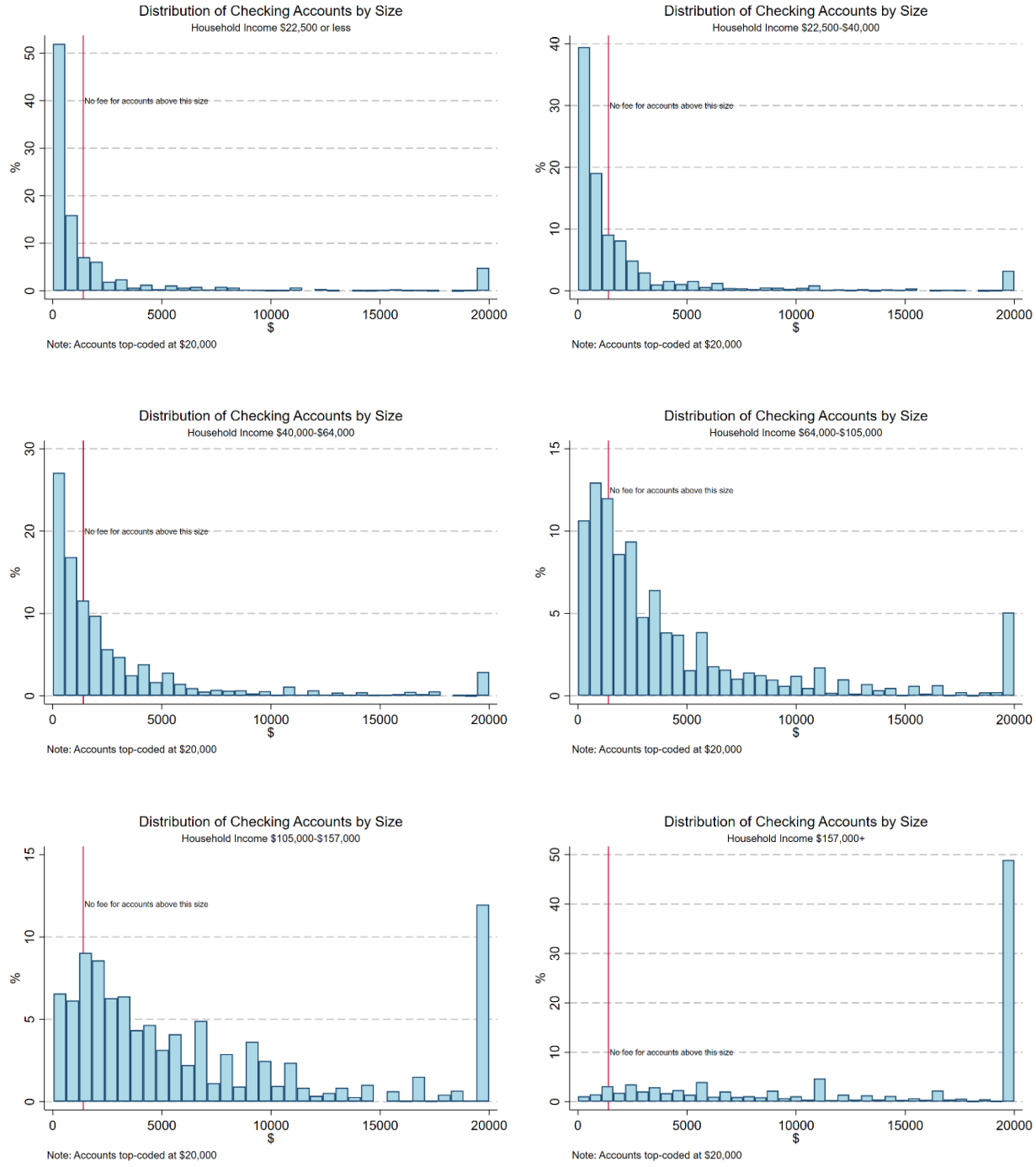
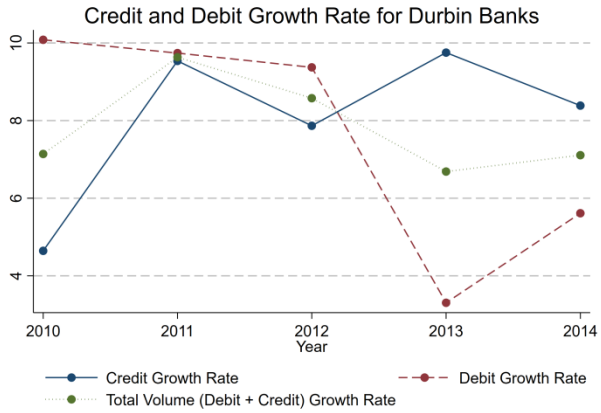
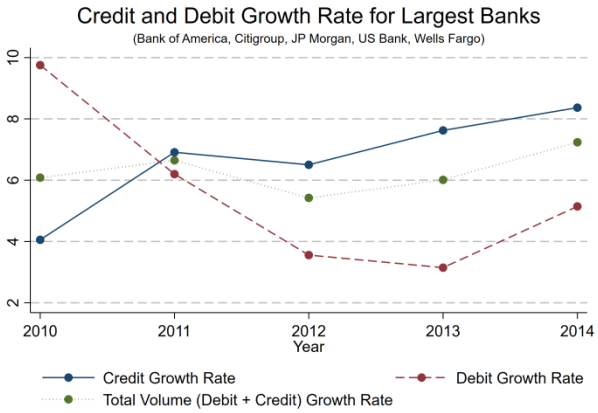
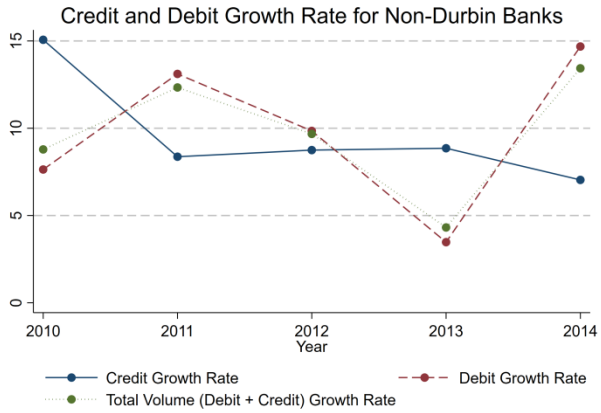


Figure 9: Credit and Debit Purchase Volume Growth Rates

Data from Nilson Report on annual credit and debit growth rates in years surrounding Durbin. Large banks includes the five largest banks—Bank of America, Citigroup, JPMorgan Chase, US Bank, and Wells Fargo.







Appendix Table A1: Descriptive Statistics for Call Report Data (excluding mega banks)

This table compares banks holding companies above (34 treated non-mega BHCs) and below (471 untreated BHCs) the Durbin threshold in 2010 Q4 (pre-Durbin), 2011 Q4 (immediately post-Durbin), and 2012 Q4 (one year post-Durbin). Log differences relative to Q4 2010 are reported in the four columns on the right.

	Treated			Untreated			11Q4 vs 10Q4		12Q4 vs 10Q4	
	2010 Q4	2011 Q4	2012 Q4	2010 Q4	2011 Q4	2012 Q4	Treated	Untreated	Treated	Untreated
Interchange income	22,981	18,726	18,159	636	650	739	-0.296	0.122***	-0.155	0.249***
	[52,460]	[47,337]	[38,221]	[1,442]	[1,353]	[1,541]	[0.494]	[0.454]	[0.396]	[0.530]
Deposit fees	27,111	27,118	27,097	1,663	1,472	1,475	-0.016	-0.032	-0.007	-0.046
	[21,171]	[22,102]	[22,132]	[4,901]	[3,841]	[3,977]	[0.114]	[0.241]	[0.158]	[0.248]
Assets	30,587,538	32,096,792	33,903,297	1,581,584	1,629,733	1,711,317	0.043	0.031	0.102	0.076
	[23,453,568]	[25,005,832]	[26,174,324]	[1,605,501]	[1,650,853]	[1,729,940]	[0.074]	[0.082]	[0.113]	[0.139]
Deposits	21,336,224	23,520,429	25,741,030	1,259,613	1,313,213	1,393,679	0.085	0.039***	0.172	0.093***
	[15,647,446]	[17,809,378]	[19,760,638]	[1,221,326]	[1,282,715]	[1,356,498]	[0.092]	[0.100]	[0.133]	[0.154]

Appendix Table A2: Sample Coverage

Panel A Call Reports Sample Coverage

Sample inclusion criteria			Tabulation by category			
Assets over $500m	Interchange Reported	Organic Growth Only	Assets (billions $)		Branches	
No			739	4.24%	16,454	20.59%
Yes	No		5,220	29.98%	9,088	11.37%
Yes	Yes	No	247	1.42%	2,103	2.63%
Yes	Yes	Yes	11,200	64.33%	52,253	65.40%
			17,410	100.00%	79,898	100.00%

Panel B: RateWatch Coverage.
RateWatch sample includes fee-setting branches of BHCs with more than $500M in assets.

Subpanel B1: Overall

	Total	Durbin-exempt	Durbin-covered
Number of BHCs	954	891	63
Branches	63,444	21,077	42,367
Assets (billions $)	14,900	1,310	13,600

Subpanel B2: Present in RateWatch Data

	Total	Durbin-exempt	Durbin-covered
Number of BHCs	628	582	46
Branches	58,512	17,026	41,486
Assets (billions $)	11,000	961,000	10,100,000

Subpanel B3: Present in RateWatch Data – as a fraction of overall

	Total	Durbin-exempt	Durbin-covered
Number of BHCs	65.83%	65.32%	73.02%
Branches	92.23%	80.78%	97.92%
Assets	73.83%	73.36%	74.26%

Appendix Table A3: Impact of Durbin on Bank Fees, Difference-in-Differences, Excluding Megabanks

This table reports results for DD specifications that compare pricing by bank branches above and below the Durbin threshold prior to and following Durbin's Q2 2010 passage. Specifically, we estimate:

$$Y_{i,t} = \alpha_i + \phi_t + \beta_d \times Durbin_i \times Post_t + \epsilon_{i,t}.$$

Here, we exclude branches of banks with more than $100B in assets ("megabanks"). Column name includes dependent variable in each model. All are dollar values, except for "free" which is binary, with value 1 if branches offer $0 fee accounts to all customers, regardless of account size. The regressions are run and reported separately for each product: basic checking, interest checking, savings, and money market accounts.

	Fee	Free	Minimum	Withdrawal
	(1)	(2)	(3)	(4)
Basic checking				
Post X Durbin	1.978***	-0.272***	-34.34	
	(0.740)	(0.086)	(137.8)	
Q2 2010 avg	3.583	0.571	866.5	
Interest checking				
Post X Durbin	0.964	-0.0196	333.3	
	(0.597)	(0.012)	(431.7)	
Q2 2010 avg	12.45	0.0124	196.3	
Savings				
Post X Durbin	0.757	-0.0295	-13.37	0.881
	(0.625)	(0.037)	(14.19)	(0.56)
Q2 2010 avg	4.397	0.0747	312.1	3.677
Money market				
Post X Durbin	0.295	-0.000194	498.8	0.533
	(0.481)	(0.015)	(386.0)	(0.365)
Q2 2010 avg	10.59	0.0509	3316.3	8.083
Branch FE	Y	Y	Y	Y
Year-Quarter FE	Y	Y	Y	Y

Appendix Table A4: Impact of Durbin on Bank Fees, Difference-in-Differences, Around $10B Durbin Threshold

This table reports results for DD specifications that compare pricing by bank branches above and below the $10B threshold prior to and following Durbin's Q2 2010 passage. Specifically, we estimate:

$$Y_{i,t} = \alpha_i + \phi_t + \beta_d \times Durbin_i \times Post_t + \epsilon_{i,t}.$$

Here, we exclude branches of banks with less than $5B and more than $30B in total assets. Column name includes dependent variable in each model. All are dollar values, except for "free" which is binary, with value 1 if branches offer $0 fee accounts to all customers, regardless of account size.

	Fee	Free	Minimum
	(1)	(2)	(3)
Basic checking			
Post X Durbin	1.426	-0.270*	124.8
	(1.043)	(0.149)	(185.1)
Q2 2010 avg	4.343	0.523	729.1
R-squared	0.688	0.622	0.944
Observations	9,960	9,960	4,740

Appendix Table A5: Impact of Durbin on Consumer Payment Choice

This table considers how Durbin impacts the growth of debit and credit usage. The dependent variable is log purchase volume. In Column 1 (2), we report results from DD specifications that compares credit (debit) purchase growth for banks above relative to below the Durbin threshold before and after Durbin. Specifically, we estimate:

$$\text{Ln}(Y_{i,t}) = \alpha_i + \phi_t + \beta \times Durbin_i \times Post_t + \epsilon_{i,t}$$

In Column 3, we report results from a DDD specification that compares credit vs. debit purchase growth for banks above relative to below the Durbin threshold. We estimate:

$$\text{Ln}(Y_{i,t}) = \alpha_i + \phi_t + \beta_d \times Durbin_i \times Post_t + \beta_c \times Credit_{i,t} \times Post_t + \beta_{c,d} \times Durbin_i \times Credit_{i,t} \times Post_t + \epsilon_{i,t}$$

	DD: Credit Volume	DD: Debit Volume	DDD: Credit and Debit Volumes
	(1)	(2)	(3)
Durbin X Post	0.125**	0.0401	-0.449*
	(0.062)	(0.070)	(0.268)
Credit X Post			-1.382***
			(0.296)
Durbin X Credit X Post			1.000***
			(0.292)
Bank FE	Y	Y	Y
Year FE	Y	Y	Y
Account FE			Y
Bank Clusters	70	41	24
R-Squared	0.975	0.973	0.842
Observations	566	366	432

Appendix Table A6: Durbin Impact, Log Income Regressions

In this table, we report results from a DD specification that compares log interchange income (overall and per dollar of deposits) and log service fees (overall and per dollar of deposits) for banks above relative to below the $10B threshold before and after Durbin. Column name includes dependent variable in each model. Specifically, we estimate:

$$\text{Ln}(Y_{i,t}) = \alpha_i + \phi_t + \beta \times Durbin_i \times Post_t + \epsilon_{i,t}$$

	Interchange	Interchange / Deposits	Service Fees	Service Fees / Deposits	Interchange + Service Fees	(Interchange + Service Fees) / Deposits
	(1)	(2)	(3)	(4)	(5)	(6)
Durbin X Treat	-0.279***	-0.390***	0.135**	0.0134	0.0227	-0.109***
	(0.0802)	(0.0899)	(0.0673)	(0.0133)	(0.0226)	(0.0196)
Kay et al. Estimate	*-0.326****		*.187****	*-.00486*		
Bank FE	Y	Y	Y	Y	Y	Y
Time FE	Y	Y	Y	Y	Y	Y
R-squared	0.953	0.872	0.975	0.889	0.932	0.783
Observations	34,069	34,069	95,530	95,517	34,179	34,179

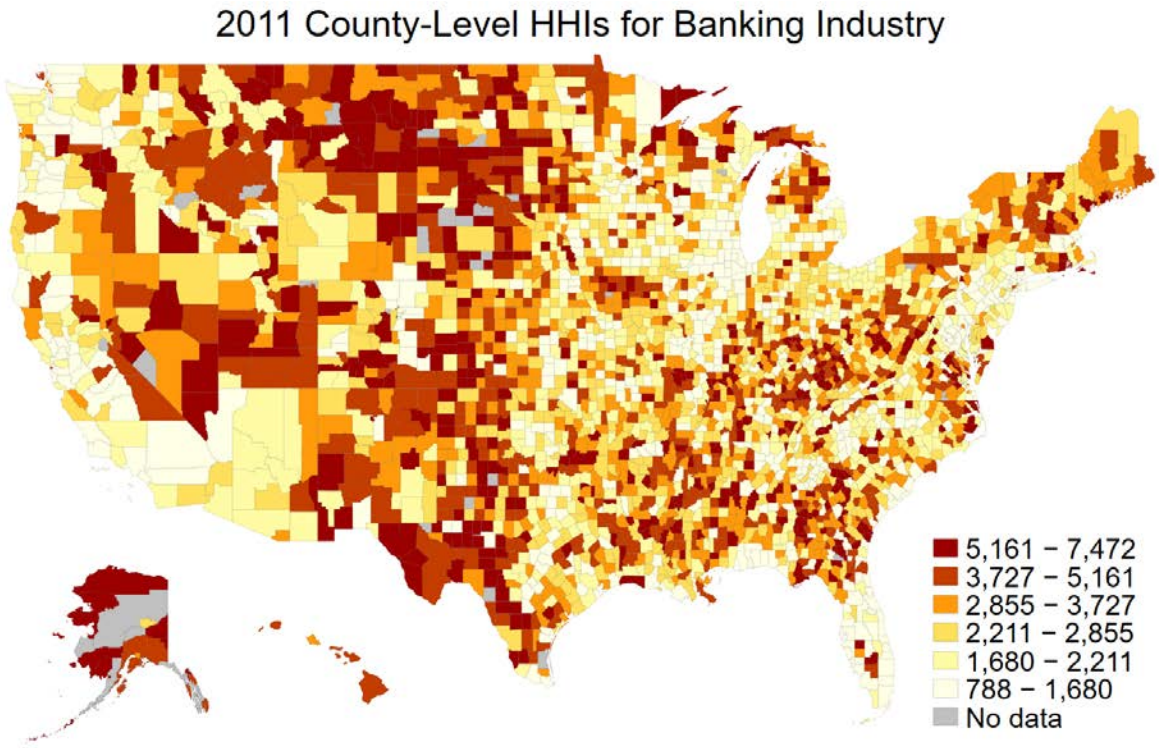
Appendix Table A7: Market Power, Durbin Share, and Bank Pricing

In this table, we report results from a DD specification that examines the impact of competition on free checking offered by *non-Durbin banks* before and after Durbin. Competition measures are county-level HHI (Column 1) and county share of deposits at banks above the $10B threshold (Column 2). These measures are standardized for ease of comparison and frozen prior to Durbin (2008) to avoid endogeneity concerns. Specifically, we estimate:

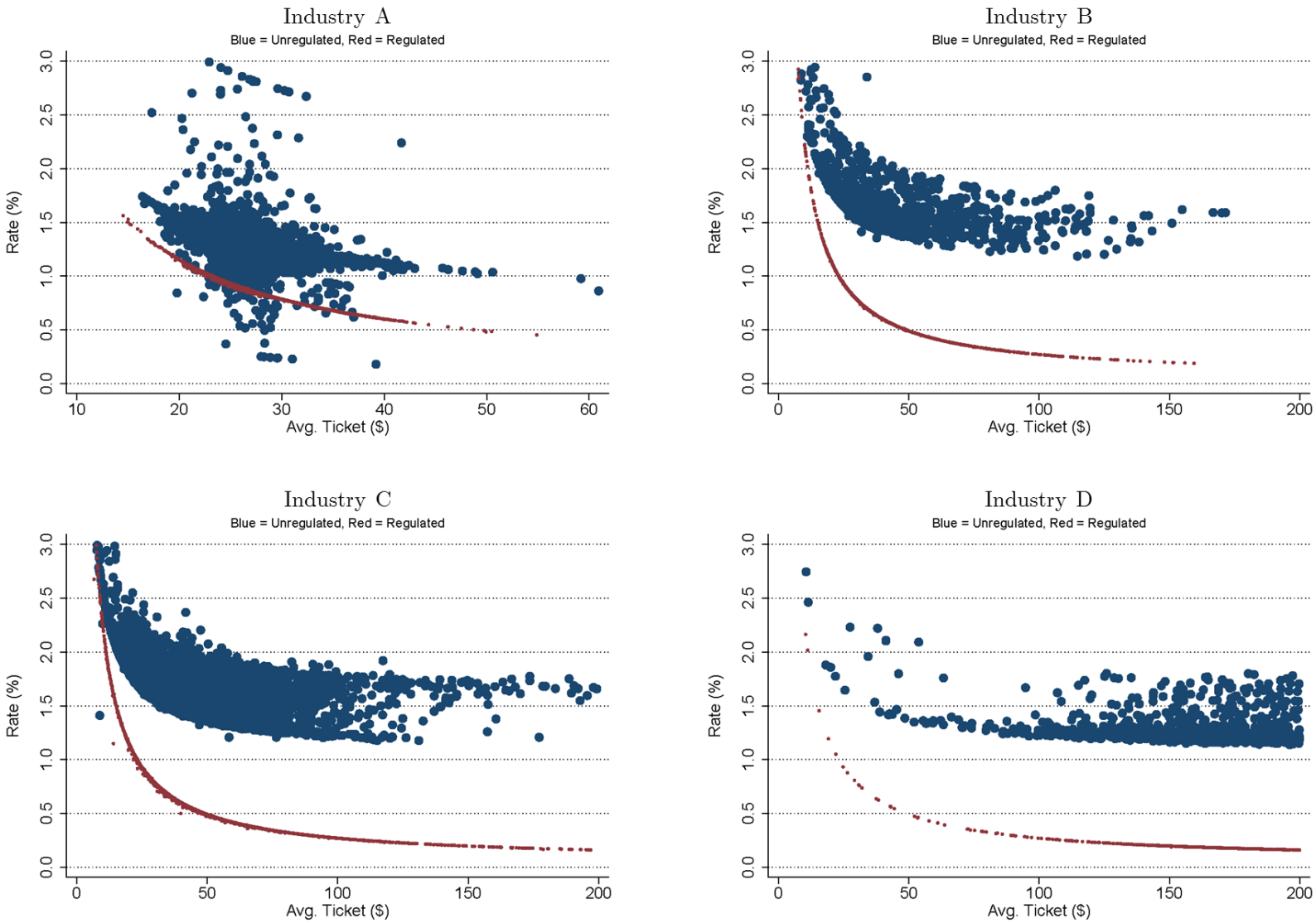
$$Y_{i,t} = \alpha_i + \phi_t + \beta_1 \times Comp_i + \beta_2 \times Comp_i \times Post_t + \epsilon_{i,t}$$

	(1)	(2)
HHI	-0.0221	
	(0.021)	
HHI X Post	0.0502**	
	(0.023)	
Share Durbin		-0.00445
		-0.0255
Share Durbin X Post		0.0028
		(0.014)
Bank FE	Y	Y
Time FE	Y	Y
R-squared	0.673	0.670
Observations	37,401	37,401

Appendix Figure A1: HHI Variation across Counties

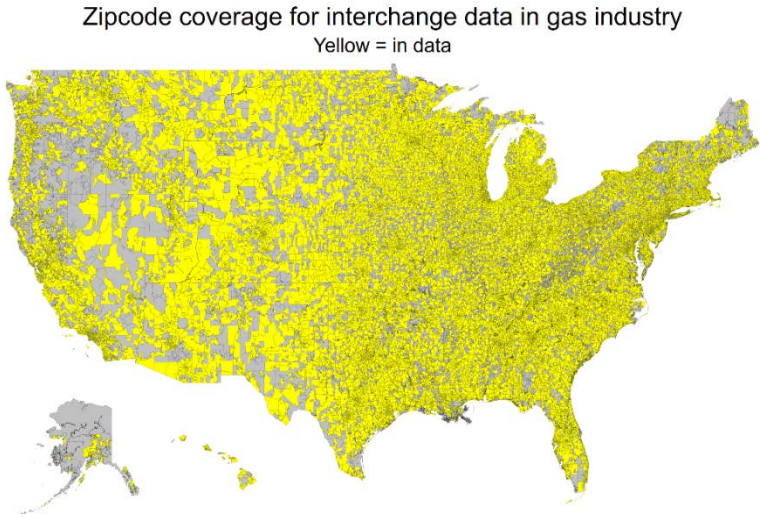


Appendix Figure A2: Interchange Rates on Regulated and Unregulated Debit Transactions for Merchant Categories that Benefited Significantly from the Durbin Amendment

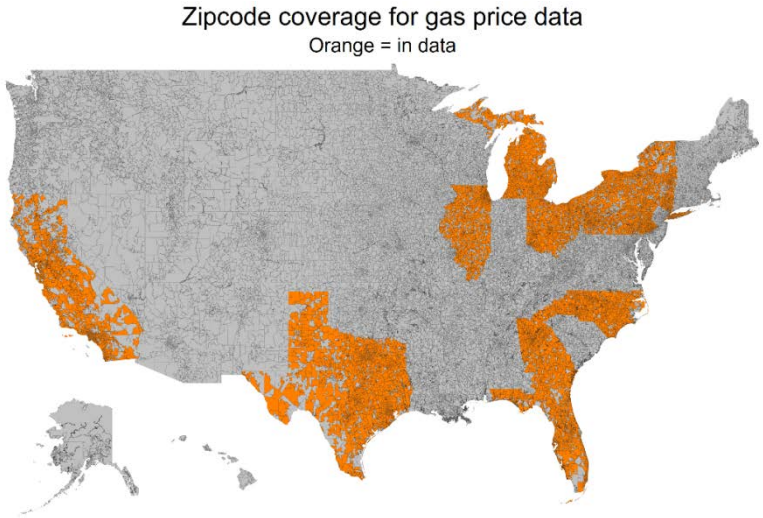


Appendix Figure A3: Gas Interchange and Margins Coverage

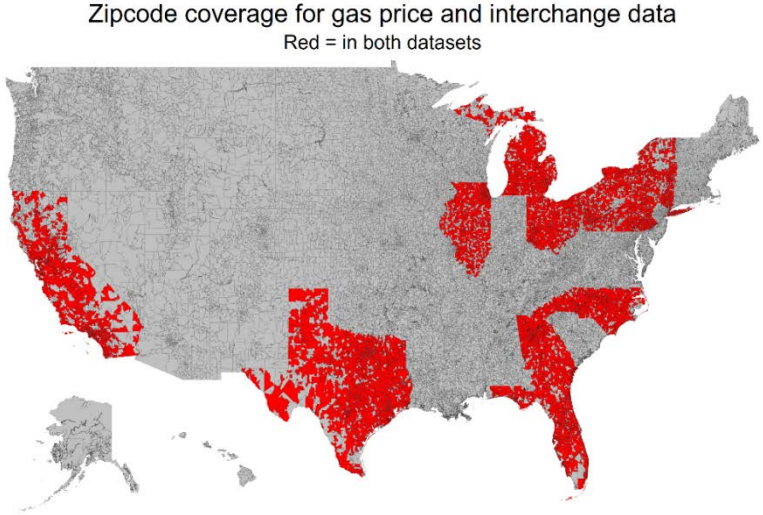
Panel A: Availability of Interchange Rates for Gasoline Industry



Panel B: Availability of Retail Gas Margins

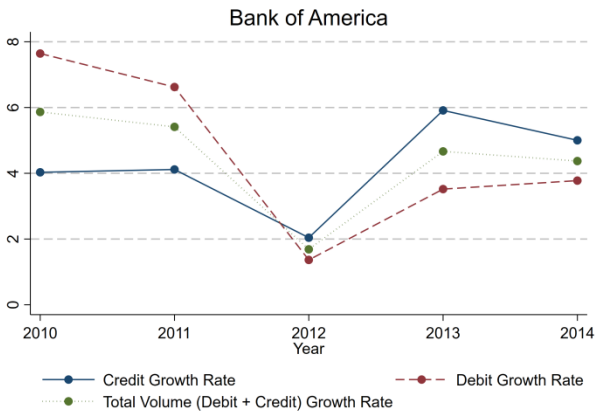


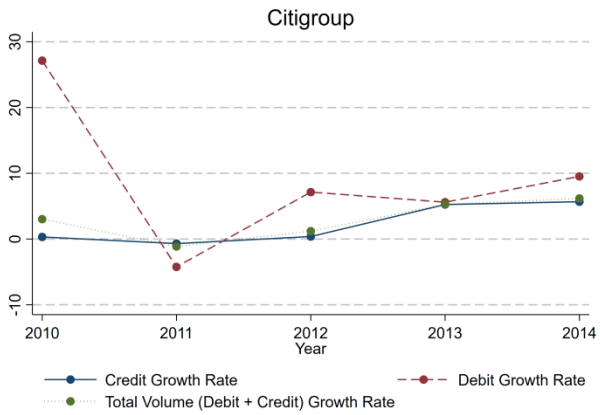
Panel C: Availability of Interchange and Retail Gas Margins

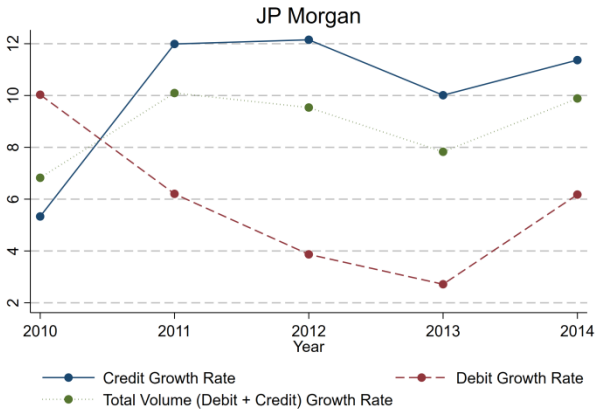


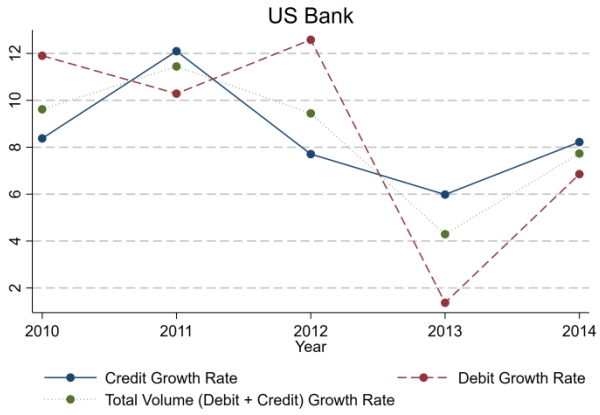
Appendix Figure A4: Credit and Debit Purchase Volume Growth Rates, Large Banks

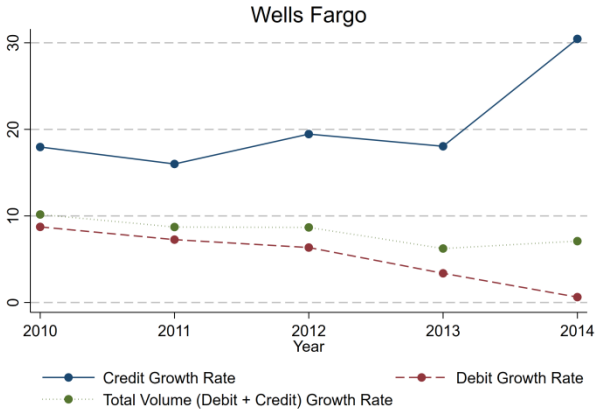
Data from Nilson Report on annual credit and debit growth rates in years surrounding Durbin.



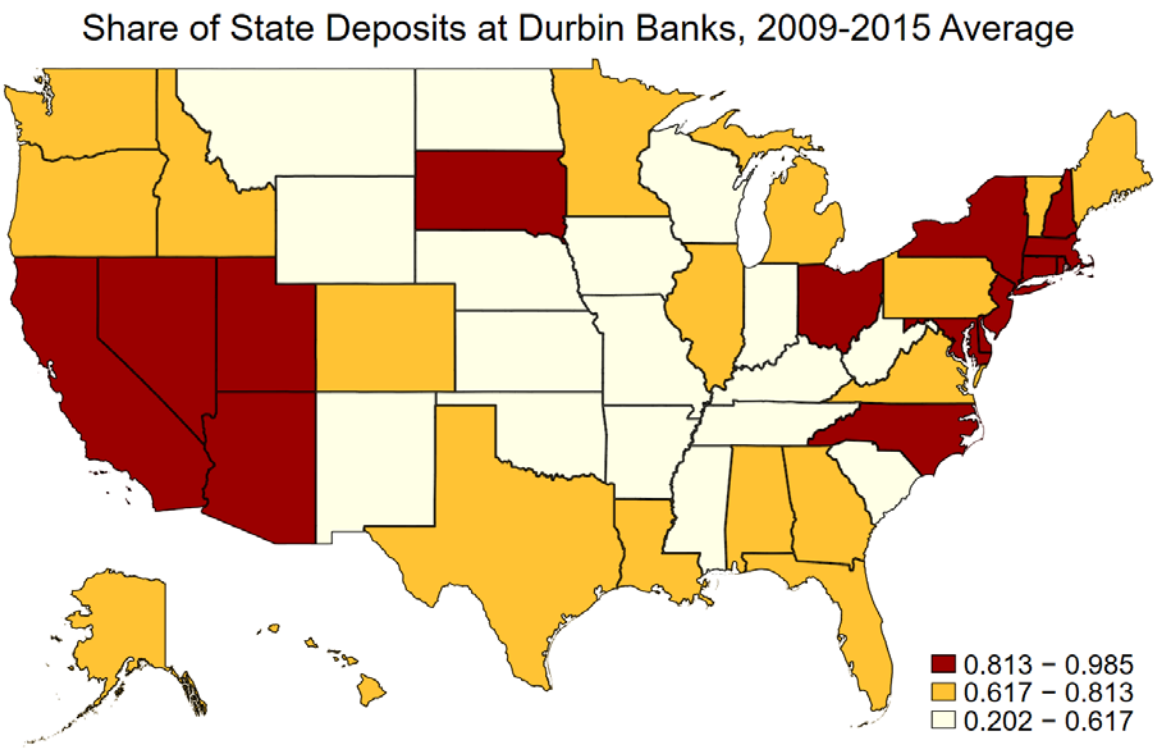




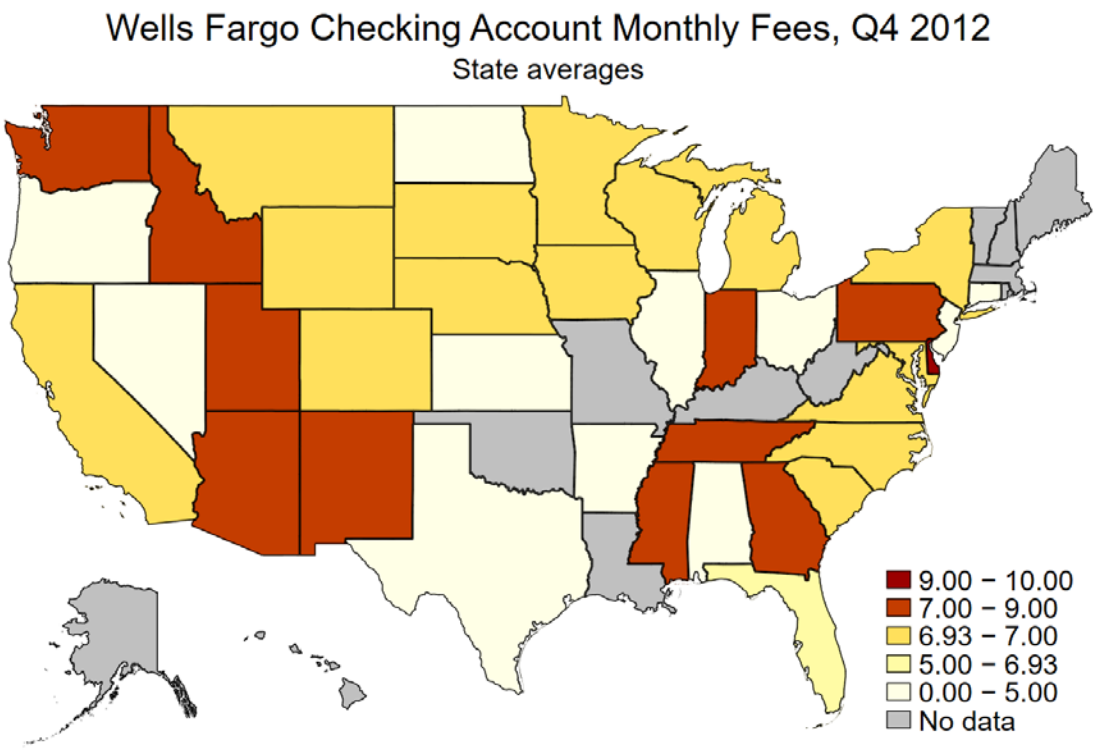




Appendix Figure A5: Share of State Deposits at Banks Above $10B Durbin Threshold



Appendix Figure A6: Regional Variation in Account Fees



Appendix Figure A7: Checking versus Savings Account Pricing for Durbin Banks

