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Assessing the Durbin Amendment's Debit Card Interchange Fee Cap: An Application of the "Tourist Test" to US Retailer Data

Abstract: Payment cards have been a perennial source of debate among economists. That debate received additional fodder in 2010 with passage in the US of the Durbin Amendment, which targets debit card interchange fees. I assess the Durbin Amendment, testing the interchange fee cap it imposes against the "tourist test" proposed in the theoretical literature. I first calculate merchant incremental payment processing costs across payment instruments. While I find that debit card bank fees are higher than bank fees for other instruments, a comparison of other incremental costs softens that conclusion. With the cost estimates in hand, I then compare the interchange fee suggested by the "tourist test" with that set by the Durbin Amendment. The empirical assessment of the tourist test highlights the importance of the instrument whose costs are "avoided" – whether cash or check is used dramatically alters the test and indicates that an optimal one-size-fits-all interchange fee cap will be difficult to achieve.

Keywords: costs and benefits; debit cards; interchange fee; merchant indifference test; payments; tourist test.

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1 Introduction

The Wall Street Reform and Consumer Protection Act (also known as the Dodd-Frank Act)[1] was signed into US law in 2010 and has kicked up considerable dust ever since – and not just in financial markets, but throughout a wide array of industries. Among the more controversial aspects of the Act's well over-2000 pages is the seven-page Durbin Amendment,[2] which directs the Board of Governors of the Federal Reserve Bank to issue rules that cap the interchange fee that medium to large commercial banks are allowed to charge for processing debit card transac-

1 US Congress. House. *Dodd-Frank Wall Street Reform and Consumer Protection Act*. H.R. 4173. 111th Cong., 2nd sess. (5 January 2010). Sec. 1075 (a)(2)("Sec. 920(a)(1)."

2 H.R. 4173. Sec. 1075 (a)(2)("Sec. 920(a)(4)(B)(i)").

tions.[3] In particular, according to the detailed requirements set forth in the Durbin Amendment (the DA), interchange fees charged by the covered debit card issuers are to be limited to the "incremental" costs of authorization, clearing and settlement ("processing") of individual debit card transactions. The Amendment is not based on any interchange fee theory. Nor does it make any mention of the other side of this two-sided market, remaining silent on consumer charges for debit card use.

Following the DA prescription, the Board issued its ruling on the interchange fee cap in the summer of 2011, with an October 1, 2011 effective date.[4] Whereas prior to the DA the per transaction debit interchange fee had averaged around 44 cents (on an average transaction of $35), under the FRB's rule affected debit card issuing banks can charge no more than 21 cents plus half a basis point (0.0005) of the transaction size, plus an additional one cent to cover the cost of fraud prevention under certain conditions. In other words, the DA, as interpreted by the FRB, cut the interchange fee roughly in half for the average debit transaction, and by far more for larger transactions. This outcome achieves the stated goal of the Amendment, the underlying premise of which is that the merchant side of the debit card platform has been paying "too much" to banks in debit card transaction processing fees and that these excessive costs in turn have translated into higher retail prices for consumers.[5]

This paper empirically assesses the Durbin Amendment. First, I investigate merchants' pre-DA debit card processing fees relative to merchant transaction costs for cash and checks.[6] Second, using the merchant payment cost estimates, I assess whether the DA debit card cap meets the "tourist test" proposed in the theoretical economics literature as a regulatory benchmark for optimal interchange fees, in that fees meeting the tourist test maximize short run consumer surplus. Finally, to provide further perspective on the debate over whether interchange fees are "too high," I present estimates of some measurable incremental benefits that merchants potentially receive from debit cards relative to paper instruments.

3 The Amendment exempts credit unions and all banks with <$10 billion in assets.

4 Board of Governors of the Federal Reserve System (2011) "Debit Card Interchange Fees and Routing," Federal Register, 76(136):43404.

5 See, e.g., the following article quoting the National Retail Federation, PYMNTS.com, "NRF Says Federal Reserve Action on Debit Cards Could Lead to Discounts for Consumers," Dec 16, 2010, 4:03 pm, available at http://www.pymnts.com/nrf-says-federal-reserve-action-on-debit-cards-could-lead-to-discounts-for-consumers-20101216006715/?nl.

6 While it is likely that at least some consumers see credit cards as a substitute for debit cards, I do not include credit cards in my analysis for the following reasons: the Durbin Amendment applies only to debit cards, the debate surrounding the Durbin Amendment compares debit cards to checks and cash, and credit cards involve non-transactional aspects, such as the extension of credit, that make the analysis more complicated without contributing additional information to the question of appropriate debit card fee caps. For more on the point of credit provision affecting the tourist test, see footnote 38, infra.

In estimating merchants' costs of accepting cash, checks, and debit cards, I account for merchant heterogeneity. Retailers can differ significantly in the types of goods and services they provide, the transaction sizes associated with selling those goods and services can differ as well, and so can other related cost structures. Thus, a study of merchant debit card fees and overall payment costs should account for the retail venue at issue. I analyze a number of retail venues that accept debit cards and which cover a broad swath of the economy.

The remainder of the paper proceeds as follows. Section 2 provides a brief review of the relevant literatures. Section 3 then presents the case study cost estimates for a variety of retail venues. The tourist test is applied to the cost data in each retailer case study and to retailer cost averages at the end of the section. Section 4 presents a brief discussion of potential, quantifiable merchant benefits. Section 5 closes the paper with some general conclusions.

I find that how "avoided merchant costs" are measured – that is, what payment instrument is assumed to replace debit cards and what transaction size is used to assess the optimal rate – is of pivotal importance is assessing the regulatory interchange fee cap. Cash-centric merchants are likely to see the DA cap as still being too high, while check-accepting merchants will likely have the opposite reaction, finding the DA cap is set much too low. Similarly, the tests indicate that the DA cap is above the optimal level for retailers with relatively low average debit card transactions but below the optimal level for retailers with relatively high average debit card transactions.

2 Literature Review

Two strands of the economic literature are relevant for the analysis in this paper. The first is empirical analysis on the transactional costs and benefits of payment instruments. The second is the theoretical literature on optimal pricing of card payments.[7]

2.1 Payment Instrument Cost Estimates

The empirical cost analysis I present builds on an earlier study published in the *Review of Network Economics* that I coauthored with Daniel Garcia-Swartz and

7 To the best of my knowledge there are no empirical papers on optimal payment card fees or on the tourist test in practice.

Robert Hahn (Garcia-Swartz et al. 2006). In that paper, my coauthors and I conducted an extensive literature review of empirical papers. I provide a summary and update here.

Humphrey and Berger (1990) present one of the earliest attempts to comprehensively estimate payment instrument costs. Looking at the private and social costs for nine separate payment instruments they conclude that float benefits drove check use, indeed to the point of "overuse" from a social welfare perspective. Wells (1996) overturns this finding, reporting that float decreased considerably over the 6 years between the studies.

Today, over 20 years after the Humphrey and Berger (1990) study, check use is a fraction of its former dominance. A study by First Data Corporation found that in-store check use was only 18% in 1999 and had fallen further to 8% by 2008.[8] From consumers' perspective, checks are time consuming to write and process at the checkout counter and are cumbersome to carry. Moreover, retailers rarely ever accept out-of-state checks (given fraud risks), so they are a poor choice for consumers when travelling. Reflecting these constraints, the First Data study reports that in-store debit card use (signature and PIN combined) rose from 21% in 1999 to 37% in 2008.

The other side of the use coin, merchant acceptance, is likely another factor in the demise of checks and their replacement with debit cards. According to a Federal Reserve Bank report, check fraud cost retailers $10 billion in 2006.[9] That figure is over five times the fraud cost that debit cards imposed on retailers that same year, as the total cost to brick-and-mortar retailers from both debit and credit cards was only $2 billion in 2006.[10] When a check bounces, the retailer's bank will typically attempt to run it through a second or third time – charging the retailer a returned deposit item fee each time the check bounces. If the check fails to clear after the second or third try, it is up to the retailer to recover the loss. This typically entails hiring a collection agency. But even with collection attempts, some checks are never paid. Of the funds that are recovered, the collection agency often keeps a substantial percentage as its fee. Thus, despite the government subsidy that comes in the form of bank-to-bank at-par exchange,[11] both consumer check use and merchant check acceptance have been declining steadily within the US.

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8 First Data Market Brief, "Consumer Payment Preferences for In-Store Purchases" (2008). Available at http://www.firstdata.com/enews/CPPBrief_InStore.pdf.

9 Sullivan, supra note 35.

10 Note that I focus solely on brick-and-mortar transactions, as online transactions are beyond the scope of my analysis. Online transactions involve additional distinct payment options, such as PayPal, and entail additional distinct costs and benefits, such as increased fraud concerns.

11 For a discussion, see Howard Chang, Marina Danilevsky, David Evans and Daniel Garcia-Swartz (2008) "The Economics of Market Coordination for the Pre-Fed Check-Clearing System: A Peek into the Bloomington (IL) Node," Explorations in Economic History, 45:4.

As for studies with key findings on cash, Humphrey et al. (1996) analyzes data from 14 developed countries and concludes that "institutional variables" – in particular the violent crime rate – explain a non-trivial portion of the observed differences in cash usage across countries. Humphrey et al. (2003) suggest that a country could save 1% of its GDP annually by shifting from a fully paper-based to a fully electronic-based system. Garcia-Swartz et al. (2006) adds estimates of private and social benefits to the analysis and confirms that the shift to a cashless society (i.e., a shift away from cash and checks and toward electronic payments, including credit and debit cards) is likely to be socially beneficial.

2.2 Payment Card Optimal Pricing

The second strand of literature relevant for my analysis is that on how payment card interchange fees should be set. In comparison to the empirical literature on payment instrument costs, the theoretical literature on interchange fees and payment cards began earlier, starting in the early 1980s, but has remained theoretical.[12] Most of these studies fit within the multi-sided market literature, as payment instruments are a prime example of a multi-sided platform. I survey a few of the more relevant papers here but make no attempt to be comprehensive.

The seminal paper is Baxter (1983). The key implication emerging from Baxter's analysis is that contrary to traditional markets, for multi-sided payment platforms optimal pricing for one side is not driven by the costs of that side alone because ensuring participation on both sides is pivotal to the success of the platform. This finding is fundamentally at odds with the Durbin Amendment approach, which attempts to set the interchange fee equal to a subset of "issuer costs" only, ignoring the consumer side altogether.

Rather than set one side's price equal to its "costs," Baxter argues that to maximize surplus in the card network it is the sum across sides that matters: the sum of cardholder and merchant benefits for the marginal transaction should equal the sum of the respective marginal costs. Rearranging the terms, cardholders should be charged a fee equal to the sum of the issuing bank's and the acquiring bank's marginal costs, less the merchants' transactional benefits. When different banks compete for cardholders (issuing) and merchants (acquiring), however, we cannot expect this optimal fee to be achieved. This is where

12 To the best of my knowledge, there is no empirical literature on optimal payment card pricing. For a recent survey of this literature, see Marc Rysman and Julian Wright, "The Economics of Payment Cards," working paper, 29 November 2012, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2183420.

an appropriately set interchange fee enters: the payment made by acquirers to issuers achieves balance between the two sides.

Rochet and Tirole (2002) were the first to study the welfare implications of interchange fees. They find that if merchants are not allowed to surcharge customers paying with a card, then the optimal interchange fee from a payment card association's perspective is either the same as the socially optimal fee or is higher than it, which leads to an overprovision of card payment services. When surcharges are allowed, however, the interchange fee is neutral, as merchants simply undo it with the surcharge.[13] In this latter case, cards are underprovided, but the effects on social welfare are ambiguous.

Wright (2003) extends the Rochet-Tirole framework to, among other things,[14] offer guidance on setting an optimal interchange fee from both a private (system) and social perspective. He finds that a socially optimal interchange fee is equal to the Baxter fee, discussed above. That is, the socially optimal interchange fee equates the sum of merchant and consumer marginal costs to the sum of their marginal benefits. Again, it is clear that the Durbin approach took no guidance from the literature, as it ignores benefits altogether and considers only a subset of costs, not the aggregate sum across sides.

Rochet and Tirole (2011) furthers the analysis by theoretically assessing the argument that retailers are forced to accept card transactions that increase their net costs – the "must take" claim that merchants make in regard to debit and credit cards. As part of their analysis, the authors recast the Baxter optimality condition as a test for assessing merchant fees, which they dub the "tourist test."[15] Specifically, the test compares the merchant discount (of which the interchange fee is the biggest portion) to the marginal costs avoided by the merchant when accepting a card payment, which can be thought of as the "convenience benefits" that a merchant earns from accepting cards. Rochet and Tirole explain the logic underpinning this test as follows: "would a merchant want to refuse a card payment when a non-repeat customer with enough cash in her pocket is about to pay at the cash register?"

The tourist test has captured attention as a benchmark for regulatory intervention. As Zenger (2011) observes, "the tourist test mimics as a second-best mechanism the market outcome in the absence of transaction costs that inhibit

13 In practice, neutrality does not appear to hold. See, e.g., the discussion in Rysman and Wright (2012), supra note 13.

14 In particular, he extends Rochet and Tirole's analysis on surcharging. As this is not pertinent to my analysis, I do not cover these results.

15 See also the Merchant Indifference Test (MIT) proposed in Joseph Farrell, "Efficiency and competition between payment instruments," Review of Network Economics, 5:26–44.

merchants from differentiating retail prices by means of payment."[16] In particular, it meets Baxter's criteria for interchange fee optimality: if merchants internalize consumer benefits from cards, since this allows them to charge a higher price or attract more business at the same price (as they could do in providing any other meaningful service; see Rochet and Tirole 2002; Wright 2004), then the tourist test accounts for consumer costs and benefits along with merchant costs and benefits (the latter being the convenience benefits or avoided costs of the next most likely payment instrument). Hence, Rochet and Tirole establish, at least under the assumptions of their model, that a merchant fee equal to merchant avoided cost is optimal from a short-term consumer surplus perspective. While it is clear that the framework set forth in the Durbin Amendment is not based on the tourist test, the key question is whether the cap imposed by the FRB bears any relation to merchant avoided cost: does the DA interchange fee cap meet the tourist test? The remainder of the paper addresses this question.

3 Assessing the Optimality of The Durbin Amendment Interchange Fee Cap

In order to calculate the tourist test we first need to measure the relevant merchant costs. To that end, I present several retail venue cost case studies for the following payment instruments: cash, checks, signature and PIN debit. I do not include credit cards in my analysis because the DA cap applies only to debit cards. Moreover, the debate surrounding the Amendment focused on comparisons of debit cards to cash and checks.

I consider "incremental" costs that vary with transactions and do not include fixed costs, that is, costs that are incurred for the first transaction but which do not vary thereafter. Some "incremental costs," however, vary over different transaction "increments." As long as a cost varies with some increase in transaction, I count it as incremental, adjusting as needed to capture an appropriate cost for the increment studied. I explain this in more detail below.

After estimating a particular retail venue's incremental costs, I then use those costs to calculate the tourist test. At the end of the section, I present tourist test calculations based on merchant average costs.

16 Hans Zenger, "Perfect surcharging and the tourist test interchange fee," working paper, available at: http://ssrn.com/abstract=1845391.

Table 1 Estimated Incremental Costs ($) by Payment Type, Large QSRs.

	Costs By Transaction Type		
	Cash	**Signature Debit**	**PIN Debit**
POS Time	0.021	0.010	0.010
Back Office	0.013	0.000	0.000
Bank Costs	0.007	0.182	0.169
Float Costs	0.000	0.000	0.000
Theft/Robbery/Fraud	0.004	0.003	0.003
Counterfeit	0.000	0.000	0.000
Fraud Prevention Costs	0.011	0.000	0.000
Other Direct Costs	0.005	0.000	0.000
Total	0.061	0.196	0.182

Note: Figures are independently rounded.

3.1 QSR Payment Processing

Consider first fast food restaurants – so-called Quick Service Restaurants, or QSRs. Table 1 above presents the incremental costs associated with processing cash, signature debit and PIN debit payments at a QSR, broken down into the constituent per transaction cost elements.[17] Incremental costs are calculated at the average transaction size for each payment instrument ($5.62 for cash and $6.74 for debit).[18]

The calculations assume a large transaction base which one would associate with a major QSR like McDonald's. A large number of transactions reduce the estimate of per-transaction cash handling costs for variable costs that do not change at the individual transaction level, such as armored car transport, but which exhibit "stepwise" increases. As long as a QSR takes some cash payments, it must expend resources to safely transport that cash to the bank. One armored car will suffice only up to a point, however, until the threshold is reached where two armored car pickups per day are required. As a result of stepped variable costs of this sort, the number of transactions can affect per transaction calculations.[19] I take the venue's total transactions to determine where on the step function it most likely lies.

17 Note that equipment costs, such as the cost of cash registers or card processors, are excluded for all 3 payment instruments. In addition, some incremental costs, like per-transaction network transmission fees for debit cards, are excluded due to a lack of data.

18 The average transaction (regardless of payment type) at McDonalds is $6. As explained below, we can back out the cash transaction size using other data points. Assuming that card tickets are 20% higher than cash tickets implies the average cash transaction is $5.62.

19 I have also analyzed smaller, regional QSRs and find the results are qualitatively the same.

POS (point of sale) time is computed by calculating the merchant's cost of taking payment for a single transaction. This is given by the time taken to process the transaction (in seconds) – that is, the time from when the amount owed is first displayed on the cash register to the time payment is consummated – multiplied by the wage rate of the cashier (in dollars/second). According to industry reports, cash transactions take about 8–10 s to complete, whereas card transactions below $25 take 4–5 s to complete. To estimate POS costs, I use May 2009 hourly wages for cashiers in food services reported by the BLS.[20]

Back office costs cover the expense that merchants face in processing deposits. In this example, debit cards incur no back office costs because the merchant's bank account is credited with payment upon clearance, whereas cash deposits need to be prepared by an accountant or clerk working for the merchant. In the original (Garcia-Swartz et al., 2006) study, I relied on a Food Marketing Institute (FMI, 1998) survey of supermarkets for deposit preparation times. Here, I assume that the time taken to process a cash deposit remains what it was in the FMI survey. The FMI study also reports that 2.7 bank deposits are made each day for supermarkets. In order to adjust this figure for QSRs, which tend to deal with lower cash volumes, I assume a single deposit per day for QSRs.[21] For wage data, I use May 2009 hourly wages for bookkeepers, accountants, and auditing clerks in food services reported by the BLS.[22] I divide daily costs by the estimated number of daily cash transactions to estimate the average transactional cost.

Bank costs for cash are the fees charged by banks to process cash deposits. I use lower end fees charged by Wells Fargo Bank to business customers and multiply this by the cash transaction size of $5.62.[23] Bank costs attributable to debit arise from the transaction fees paid on a transaction of $5.62. The last pre-Durbin Visa signature debit interchange rate for QSRs was 1.55% plus a flat fee

20 US Department of Labor, Bureau of Labor Statistics. See national 5-digit NAICS industry-specific estimates available at http://www.bls.gov/oes/oes_dl.htm.

21 Weekly average supermarket sales in 2003 are available through the FMI available at http://www.fmi.org/facts_figs/?fuseaction=superfact. I compute this ratio separately for small and large QSRs.

22 US Department of Labor, Bureau of Labor Statistics. See national 5-digit NAICS industry-specific estimates available at http://www.bls.gov/oes/oes_dl.htm.

23 See Wells Fargo Bank business account holder service fees in IL, WI, and MI https://www.wellsfargo.com/downloads/pdf/biz/accounts/fee_information/michigan_wisconsin_illinois.pdf. Cash deposit fees are $0.0012 per dollar deposited; this is the lower of the two fee schedules shown (p. 31 and p. 38). Note that this assumption is conservative given the business customer fees charged by other national banks tend to be higher. For example, Bank of America charges between $0.0020 and $0.0030 per dollar in many states for monthly cash deposits exceeding $10,000 to $20,000 from business customers.

of $0.04 per transaction.[24] For PIN debit, the relevant Visa Interlink interchange rate was 0.50% plus a flat fee of $0.10 per transaction, capped at $0.60.[25] Evidence of intense competition amongst merchant acquiring banks leads one to expect that acquirer margins have remained stable over time or at least have not risen.[26] Assuming that the ratio of interchange rates to merchant transaction fees has remained the same, I compute the pre-Durbin bank transaction fees for QSR's to be 2.70% for signature debit and 2.50% for PIN debit.[27] While PIN debit processing fees have been lower than signature debit fees, over time PIN debit fees have risen considerably relative to signature debit.[28] As Table 1 illustrates, the bank transaction fees for the two forms of debit are now quite close to one another.

Float costs are given by the interest income that merchants could have earned if payments cleared instantaneously. Cash "clears" when the bank account deposit is made and thus merchants typically incur no more than 1 day's float cost for cash. PIN debit transactions typically clear within the day and therefore incur no float costs.[29] According to a VisaNet report, signature debit transactions

24 Visa eliminated the QSR specific interchange rate. Now QSRs pay the "small ticket debit" rate of 1.55% + $0.04 for tickets less than or equal to $15 and they pay the "restaurant debit" rate of 1.19% + $0.10 for tickets >$15. See, http://usa.visa.com/download/merchants/october-2010-visa-usa-interchange-rate-sheet.pdf.

25 See http://usa.visa.com/download/merchants/october-2010-interlink-interchange-rate-sheet.pdf.

26 A Visa study estimated that the merchant discount was 2.08% in 2004 and had grown by less than 0.5% annually over the previous 10 year period. See Visa, "Driving Value and Innovation: Interchange in Action," Federal Reserve Bank of Chicago, May 2005. To the extent that merchant discount fees have actually declined since then, the analysis here will overstate debit costs. For a discussion of acquirer competition, see Ann Kjos, "The Merchant-Acquiring Side of the Payment Card Industry: Structure, Operations, and Challenges," Federal Reserve Bank of Philadelphia Payment Card Center Discussion Paper, October 2007, p. 17–18. Available at http://www.philadelphiafed.org/payment-cards-center/%5Cpublications/discussion-papers/2007/D2007OctoberMerchantAcquiring.pdf.

27 The smaller the transaction size, the less of a base over which to spread the fixed fee portion of the charge. At larger transaction sizes, the fixed fee portion of the interchange fee will matter less, lowering (in percentage terms) retailer transaction fees for debit charges.

28 Fumiko. Hayashi, Richard Sullivan, and Stuart Weiner, "A Guide to the ATM and Debit Card Industry, 2006 Update," Federal Reserve Bank of Kansas City, especially pp. 12–13. "The gap between signature and PIN debit interchange fees has narrowed since 2001. (...) partial convergence has been the result of a slight decline in interchange fees for signature debit and a large increase for PIN debit." (p. 12).

29 See American Credit Card Processing Corp. "Study: PIN Debit Cheaper, Less Fraud-Prone Than Signature," Nov 2005. Available at http://www.accpconline.com/site/754600/page/696144.

take 1.46 days on average to clear.[30] To calculate float costs, I assume that merchants would be able to earn the November 2010 Series I US savings bond interest rate of 0.74%.[31] These costs are small, appearing beyond the fourth digit, and hence appear as zero in the table and have a minimal impact on the sums at the bottom of the table.

Theft, robbery, and fraud costs vary considerably by payment type. Theft and robbery are not applicable to signature and PIN debit, but fraud is. A 2003 FMI survey on loss prevention estimates that fraudulent debit transactions cost merchants 0.04% in retail sales.[32] For cash transactions, fraud comes in the guise of counterfeited bills. The Federal Reserve Bank of Chicago estimates that around $0.80 out of every $10,000 is counterfeit.[33] Therefore, QSR costs arising from counterfeit currency are given by multiplying 0.8/10,000 by the transaction size. In addition, losses that arise from employee theft and store robbery can be significant. I use data from the 2003 FMI survey on supermarkets to estimate losses for QSRs for all cash theft and robbery.

A Federal Reserve Bank study observed that "[t]he high costs of preventing payments fraud ... are similar to the estimates of actual losses due to fraud."[34] Expenses incurred in association with locksmiths and CCTVs are included within this cost category. Fraud prevention costs are estimated from data in the FMI 2003 study. For QSRs these costs are typically associated with the costs of preventing cash theft and are therefore considered only under the cash processing cost in Table 1.[35]

Finally, I estimate direct costs that can arise from other sources. For example, cash requires armored cars for transport. I update the average annual armored car costs for a single supermarket visit, estimated in 1997, using the Bureau of Economic Analysis' PCE chain-type price index for "other goods and services."

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30 Public sources indicate that signature debit processing times range from a few hours to a couple of days, consistent with the VisaNet report. See, e.g., Watermark Credit Union, "How long does it take for transactions to clear my checking account?," http://www.fuzeqna.com/watermarkcu/consumer/kbdetail.asp?kbid=3514.

31 See http://www.treasurydirect.gov/news/pressroom/currenteebondratespr.htm.

32 FMI survey data, "Loss Prevention," 2003, p.8.

33 Ruth Judson and Richard Porter, "Estimating the Volume of US Counterfeit Currency in Circulation Worldwide: Data and Extrapolation," Federal Reserve Bank of Chicago, Financial Markets Group, Policy Discussion Paper Series, March 1, 2010, p. 32.

34 Richard J. Sullivan, "Can Smart Cards Reduce Payments Fraud and Identity Theft?," 2008, available at http://www.kansascityfed.org/Publicat/Econrev/PDF/3q08Sullivan.pdf.

35 Fraud prevention efforts for debit cards are shouldered by card issuers and are therefore included in the bank fees they charge merchants.

Table 2 The QSR Tourist Test.

Transaction Size $6	Avoided Cash Costs
Optimal IF	$0.05
DA IF Cap	$0.22
Test Result	Too High

3.1.1 The QSR Tourist Test

The next step is to apply the above costs to the tourist test. Because the Durbin Amendment cut the interchange fee to half of its former level at the average debit card transaction size, it clearly met its stated goal of lowering merchant fees – at least for those merchants dealing with debit cards from banks covered by the Amendment. But merchant cost savings do not necessarily imply improved consumer or social welfare; indeed, if fees are set too low, they could fall below the optimal level and merely transfer wealth from issuing banks to merchants. Thus, the question remains as to whether the cap has been optimally set, especially considering that the DA guidelines were not anchored in any interchange fee theory, as discussed above.

According to the tourist test, a merchant debit card processing bank fee (the "merchant discount") set equal to merchant "avoided cost" is optimal from a short-term consumer surplus perspective.[36] I present the per-transaction incremental costs calculated above as consistent with the concept of merchant "avoided cost."[37] Table 2 above presents the tourist test results. The first row presents the optimal interchange fee (IF) per the tourist test using QSR cost data. The second row reports the DA cap for the average QSR transaction size. The final row indicates whether the DA cap passes the tourist test, which I interpret as any fee within five cents of the implied IF (given the imprecise nature of the cost calculations). If the DA cap is "too high," merchants may be paying more than "avoided costs" on average, which suggests the cap may need to be

36 Available information indicates that the interchange fee is 76% of the merchant discount, so taking incremental costs as the "optimal" merchant discount, the IF reported takes 76% of that cost.

37 Note that "avoided cost" measures are likely to be quite different for credit cards as compared to the debit card measures calculated here. Most importantly, credit cards offer credit. In calculating the tourist test implied interchange fee for credit cards, then, one would need to assess retailers' "avoided cost" of providing in-store credit to cash-constrained customers as an alternative to their use of credit cards. Rochet and Wright (2010) develop a theoretical model which accounts for this additional credit card "avoided cost; Jean-Charles Rochet and Julian Wright (2010) "Credit card interchange fees," Journal of Banking and Finance, 34:1788–1797.

lowered. If the DA cap is "too low," then merchants are likely paying too little to issuing banks, suggesting the cap should be increased.

Based on the QSR cost estimates for cash transactions, the DA interchange fee cap was set too high – the optimal level per the tourist test is far lower. However, note that in this instance the DA cap is not binding, as QSRs had already negotiated venue-specific fees well below the cap. In other words, the DA cap will have no impact for QSRs.

3.2 Discount Store Payment Processing

The second case study I consider is a typical purchase made at a discount store, such as Wal-Mart, Target, or Costco. For the purposes of cost analysis, there are a few key differences between QSRs and discounters. The first is transaction size. Rather than $5, the average transaction size at discount stores is around $50.[38] The second key difference is the interchange fee, which differs from the QSR rate. According to Visa data, pre-DA discount store retailers paid a blended interchange rate that combined the rate for grocery stores and retail stores. Finally, discount stores have traditionally accepted personal checks as payment, while QSRs generally do not.

Table 3 presents the costs of payment instrument acceptance for a typical "big box" discounter. Again, payment costs for each payment instrument are calculated at the average transaction size for that instrument.

While the cost estimates themselves differ from the QSR Table 1, the methods for estimating the cost elements are the same. As noted, big box discount stores often have one of two interchange rates applied depending on the particular items purchased. The pre-Durbin grocery store rate for signature debit was 0.62% plus a flat fee of $0.13 (capped at $0.35) and was $0.20 for PIN debit.[39] The general merchandise rate for signature debit was 0.62% plus $0.13 with no cap and 0.50% plus $0.10 (capped at $0.60) for PIN debit. I do not have the data necessary to parse discount store sales into grocery and general retail so I assume a 50–50 split to calculate the blended debit rate. I employ the same method as used for QSRs to estimate the applicable retailer bank transaction fee, which is 0.82% for signature and 0.69% for PIN.

38 I do not have a breakout of transaction sizes by payment instruments. Because general payment instrument data indicates that card transactions tend to be larger than cash transactions, I set debit card transactions at $50 and cash transactions at $49.38, 10% lower.

39 See, Visa U.S.A. and Interlink Consumer Debit Interchange Reimbursement Fees, October 16, 2010 available at http://usa.visa.com/download/merchants/october-2010-visa-usa-interchange-rate-sheet.pdf and http://usa.visa.com/download/merchants/october-2010-interlink-interchange-rate-sheet.pdf, respectively.

Table 3 Estimated Incremental Costs ($) by Payment Type, Big Box Discount Store.

	Costs By Transaction Type			
	Cash	**Check**	**Signature Debit**	**PIN Debit**
POS Time	0.041	0.136	0.046	0.043
Back Office	0.027	0.000	0.000	0.000
Bank Costs	0.059	0.080	0.538	0.376
Float Costs	0.001	0.001	0.002	0.000
Theft/Robbery/Fraud	0.037	0.489	0.022	0.022
Counterfeit Losses	0.004	0.000	0.000	0.000
Fraud Prevention Costs	0.094	0.000	0.000	0.000
Other Direct Costs	0.001	0.000	0.000	0.000
Total	0.264	0.706	0.608	0.441

Note: Figures are independently rounded.

The check fraud cost estimate is based on a LexisNexis Report that finds retailers face an average annual check fraud loss of 0.9% of their total annual revenue.[40] Because this figure is expressed as a percentage of total annual revenue, it will understate the loss that retailers experience as a percentage of check payment revenue, which would be a better measure of the cost to retailers of accepting an incremental check payment. The check fraud cost estimate of 49 cents reported in Table 3 above is therefore conservative.

Discount stores also differ significantly from QSRs in that they have to worry about both cash theft from the till and the theft of goods from inventory. Discount store theft prevention expenses are therefore substantial, but only a portion of that expense is relevant for cash payment acceptance. While there are public reports of what retailers expend to prevent theft from employees and thieves, I was unable to find a breakdown of those expenditures for inventory shrinkage/theft versus cash theft. As a conservative estimate, I assume that only 25% of a discount store's theft prevention expenditures are directed toward preventing cash loss (e.g., CCTV aimed at the till to catch employee theft).

3.2.1 The Discount Store Tourist Test

Because discount stores accept both cash and check payments, we need to consider the avoided costs for each instrument when calculating the tourist

40 Lexis Nexis, "2009 LexisNexis True Cost of Fraud Study" prepared by Javelin Strategy and Research.

Table 4 The Discount Store Tourist Test.

Transaction Size $50	Cash	Check	Wtd Avg
Optimal IF	$0.20	$0.54	$0.31
DA IF Cap	$0.25	$0.25	$0.25
Test Result	Pass	Too Low	Too Low/Pass

test for this type of merchant. Table 4 presents the results based on avoiding a cash transaction, a check transaction, or a weighted average of the two. For the latter, I use the venue's split between cash and checks as the weights, so that a single expected merchant avoided cost can be calculated.

By sheer luck, the DA interchange fee cap meets the tourist test when cash is the avoided instrument. However, this case study highlights the role that the alternative payment instrument plays: for avoided check transactions the DA cap is around half the optimal size. Though the weighted average optimal interchange fee is eleven cents higher than the optimal cash fee, it only misses a "pass" by one cent.

3.3 Supermarket Payment Processing

Table 5 presents the costs of accepting and processing various payment instruments for a typical supermarket purchase. In the supermarket analysis, I have taken the cash transaction size from the 2008 Phoenix Marketing study as the

Table 5 Supermarket Incremental Payment Costs.

	Costs By Transaction Type			
	Cash	Check	Signature Debit	PIN Debit
POS Time	0.045	0.152	0.052	0.048
Back Office	0.101	0.042	0.000	0.000
Bank Costs	0.088	0.080	0.656	0.831
Float Costs	0.001	0.002	0.002	0.000
Theft/Robbery/Fraud	0.054	0.723	0.032	0.032
Counterfeit Losses	0.006	0.000	0.000	0.000
Fraud Prevention Costs	0.139	0.000	0.000	0.000
Other Direct Costs	0.055	0.000	0.000	0.000
Total	0.489	0.998	0.743	0.911

Note: Figures are independently rounded.

Table 6 The Supermarket Tourist Test.

Transaction size $73	Cash	Check	Wtd Avg
Optimal IF	$0.37	$0.76	$0.49
DA IF Cap	$0.26	$0.26	$0.26
Test Result	Too Low	Too Low	Too Low

starting point ($73 for supermarkets) and have assumed debit card transactions are 10% higher than cash transactions.[41]

In order to determine bank costs for debit cards I use the pre-Durbin interchange fee cap (the then maximum chargeable rate) in light of the $73 transaction size assumed for the analysis. For both signature and PIN debit, the interchange fee was capped at $0.35 prior to the DA.[42] Making the same assumption about acquirer margins as in the prior case studies, I estimate the current merchant discount for signature debit is $0.66 and is $0.83 for PIN debit.

3.3.1 The Supermarket Tourist Test

As Table 6 illustrates, regardless of the paper instrument employed for the "avoided costs" of the tourist test, the DA interchange fee cap fails the tourist test for supermarket retailers. This result suggests that whenever debit cards are used for larger transactions, the DA cap is likely to be set too low.

3.4 Retail Gasoline/Convenience Store Payment Processing

The fourth retailer case study I present, in Table 7, focuses on gas stations with attached convenience stores. As an industry report states, "To survive, gasoline service stations will continue to expand the range of goods and services they offer and emphasize convenience to the consumer, through automatic pay machines, more self-service islands, and streamlined traffic flow organization."[43] In light of

41 This is the only venue for which I have transaction size by payment type. The average supermarket transaction size for debit is reported to be considerably higher than assumed, $112 vs. $80., however to maintain consistency across the case studies I rely on the assumed difference here.
42 See, Visa U.S.A. and Interlink Consumer Debit Interchange Reimbursement Fees, supra note 46.
43 See, "Gasoline Service Station, SIC 5541," Highbeam Business, http://business.highbeam.com/industry-reports/retail/gasoline-service-stations.

Table 7 Retail Fuel Incremental Payment Costs.

	Costs Per Fuel Transaction ($)		
	Cash	**Signature Debit**	**PIN Debit**
POS Time	0.021	0.000	0.000
Back Office	0.045	0.000	0.000
Bank Costs	0.022	0.458	0.458
Float Costs	0.000	0.001	0.000
Theft/Robbery/Fraud	0.014	0.009	0.009
Counterfeit	0.001	0.000	0.000
Fraud Prevention Costs	0.036	0.000	0.000
Other Direct Costs	0.019	0.000	0.000
Total	0.159	0.468	0.467

Note: Figures are independently rounded.

differing cost structures, the case study below considers fuel and non-fuel purchases separately.

In 2009, the average fuel transaction at a convenience store was $22.20 (roughly 9.5 gallons at $2.34 per gallon).[44] I assume that debit card transactions are 22% than cash transactions (this equates to $5 of additional fuel). I compute that a cash transaction would be $18.70. Note that gas stations generally do not accept checks, so that instrument is not included.

3.4.1 The Retail Gas Tourist Test

The same method as used for QSRs is applied here, with the results presented in Table 8. Despite the relatively higher average transaction size, the cost structure in this retail venue indicates a much lower optimal interchange fee than set through the DA.

Table 8 The Retail Gas Tourist Test.

Transaction size $22.20	**Cash**
Optimal IF	$0.12
DA IF Cap	$0.23
Test Result	Too High

44 See "2010 CSNEWS Industry Report," Convenience Store News, June 2010, available at http://www.csnews.com/article-operations-461.html, last visited on June 24, 2011.

3.4.2 Convenience Store Costs

The average non-fuel (convenience store) transaction was $7.39 in 2009, so nearly one-third the amount that consumers spend on gas (See Table 9). Consistent with the supermarket case study, I assume that debit card transactions are 10% higher than cash convenience transactions, which implies that the cash transaction size for non-fuel purchases is $6.87.

3.4.3 The Non-Fuel Convenience Store Tourist Test

The cost structure in this retail venue leads to an even lower implied optimal interchange fee (half that implied for retail gas transactions). As a result, the tourist test implies that DA cap is again too high (See Table 10).

3.5 Travel Retail Store Payment Processing

The fifth and final retailer case study, presented in Table 11, focuses on retail stores located in travel centers, such as airports and train stations. Dufry, the leading

Table 9 Convenience Store Non-Fuel Incremental Payment Costs.

	Costs Per Non-Fuel Transaction ($)		
	Cash	**Signature Debit**	**PIN Debit**
POS Time	0.021	0.011	0.011
Back Office	0.017	0.000	0.000
Bank Costs	0.008	0.295	0.295
Float Costs	0.000	0.000	0.000
Theft/Robbery/Fraud	0.005	0.003	0.003
Counterfeit	0.001	0.000	0.000
Fraud Prevention Costs	0.013	0.000	0.000
Other Direct Costs	0.007	0.000	0.000
Total	0.072	0.309	0.309

Note: Figures are independently rounded.

Table 10 The Non-Fuel Convenience Store Tourist Test.

Transaction size $7.39	**Cash**
Optimal IF	$0.06
DA IF Cap	$0.22
Test Result	Too High

Table 11 Travel Retail Incremental Payment Costs.

	Costs Per Transaction ($)		
	Cash	**Signature Debit**	**PIN Debit**
POS Time	0.021	0.011	0.011
Back Office	0.020	0.000	0.000
Bank Costs	0.009	0.305	0.305
Float Costs	0.000	0.000	0.000
Theft/Robbery/Fraud	0.005	0.003	0.003
Counterfeit	0.001	0.000	0.000
Fraud Prevention Costs	0.014	0.000	0.000
Other Direct Costs	0.013	0.000	0.000
Total	0.085	0.319	0.319

Table 12 The Travel Retail Tourist Test.

Transaction size $7.60	**Cash**
Optimal IF	$0.07
DA IF Cap	$0.23
Test Result	Too High

travel retailer, has more than 1140 shops in 41 countries encompassing general travel retail shops, brand-name boutiques (e.g., Armani, Lacoste, and Versace), news and convenience stores ("Hudson News" in the US), and specialized shops. These stores rarely if ever accept checks, so only cash and debit cards are analyzed.

Transaction size is more difficult to determine for this case study because several different retail types are combined on the basis of their common location in a unique "locked-in" environment where consumers have little choice among competing stores. Enplanement data is useful here. An enplanement is a "single revenue-generating passenger departing from or arriving at an airport."[45] Taking information on the average expenditure per enplanement at several major US airports, I calculate the median of the airport averages and obtain a transaction size of $7.60.[46]

I assume that the distribution of payment instruments at travel retail stores is the same as that found at convenience stores.[47] Thus, I obtain average transaction sizes for cash of $7.43 and debit of $8.17.

45 See definition available at http://subsidyscope.org/glossary/, last visited on June 23, 2011.

46 See Jacobs Consultancy, "Food/beverage and retail concession performance assessment – Dallas/Fort Worth international airport," last visited on June 23, 2011.

47 See First Data, "Consumer Payment Preferences for In-Store Purchases," 2008, available at http://www.firstdata.com/downloads/thought-leadership/fd_consumerpreferencesinstorepurchases_research.pdf.

3.5.1 The Travel Retail Tourist Test

The tourist test results mimic those for QSRs, gasoline, and convenience merchants. The test implies the DA cap is set too high as shown in Table 12.

3.6 Applying Average Merchant Data to the Tourist Test

The case study tourist test results presented above suggest some general findings. First, the smaller transaction size merchant venues (QSRs, retail gas, convenient stores, and travel retail) are more likely to view the DA cap as not going far enough. For these retailers, the tourist test calculations indicate an optimal interchange fee much smaller than the DA cap, on the order of 5–7 cents. In contrast, the larger transaction retail venues (discount stores and supermarkets) are likely to see the DA cap as about right if cash is the avoided payment instrument, but are likely to view the DA cap as a windfall if checks are used more heavily, as for the latter the tests indicate that the cap is set well below the optimal level of 54–76 cents. When the cap is too low, it constitutes a transfer to the merchant – the merchant pays strictly less for debit card transactions than it avoids paying for processing a paper transaction (at the average transaction size). Merchants facing caps of this sort will likely want to encourage their customers to pay with debit cards, as such transactions would generally be more profitable.

Table 13, presenting retailer averages by transaction size, confirms the transaction size conclusion suggested by the venue-specific tourist tests presented above.

Table 13 The Tourist Test for Average Retailers.

	Cash	Check	Wtd Avg
Simple Small Avg ($7.00)			
Optimal IF	$0.06	NA	NA
DA IF Cap	$0.22		
Test Result	Too High		
Simple Large Avg ($50.00)			
Optimal IF	$0.23	$0.65	$0.40
DA IF Cap	$0.25	$0.25	$0.25
Test Result	Pass	Too Low	Too Low
Overall Avg ($27.70)			
Optimal IF	$0.14	$0.65	$0.18
DA IF Cap	$0.23	$0.23	$0.23
Test Result	Too High	Too Low	Pass

The last panel of the table above presents an overall merchant average (weighted by relative revenues, based on 2011 sales), since consumers can at best internalize the "average" costs and convenience benefits of the merchants with whom they deal. These last results for the average debit card accepting merchant are driven by the payment instrument avoided, just as the case study test results were. If the avoided payment is cash, the DA cap is set higher than the optimal level; if it is checks, the DA cap is below the optimal level. Surprisingly, given that the DA cap was not grounded in any economic theory and hence it will only be by chance that it is optimal, the weighted average indicates that the DA cap passes the tourist test.[48]

4 Merchant Benefits

As a final benchmark for the Durbin cap, I consider the potential that merchants receive benefits aside from the avoided costs of alternative payment mechanisms. Focusing solely on quantifiable benefits,[49] two potential merchant benefits emerge from the case study research: ticket lift and increased throughput.

Ticket lift is the increased per transaction revenues that some merchants have reported when their customers pay with cards instead of cash. QSR data is particularly helpful here. Early card accepter Sonic found that its order tickets paid by card were 80% higher than cash tickets.[50] Later QSR card adopters reported more modest, but still sizable, gains on the order of 20–30% higher than cash transactions.[51] This effect is not surprising. If a customer is limited to the cash in his wallet, then he may be constrained to purchase less than he otherwise would have at the moment he places his order.[52] Indeed, studies continue to find that US

48 This result calls to mind the old joke about the statistician who, with one hand in a bucket of freezing water and the other hand in a pot of boiling water, replies that on average the temperature is just right.

49 Many important benefits associated with payment instruments cannot be quantified. For instance, debit cards provide retailers with information about their customers that cash cannot: the cards can be linked to zip codes and demographic factors, which can help retailers improve their inventory and marketing practices. Cash, on the other hand, provides consumers with an anonymous method of payment and can offer merchants a means to evade taxes.

50 Fredric H. Lowe. (2001) "Cards Make the Fast-Food Menu," Cards and Payments, 14(1):18.

51 As reported in a Visa (2002) study based on tests at various QSRs (Burger King plus several others).

52 While it might be possible that card tickets are higher because customers use cards to pay when they order more goods or services, available evidence suggests that the causality runs in the other direction: customers order more when they use a card. See, e.g., Tamara E. Holmes, "Credit cards can make you fat," Bankrate.com, http://www.bankrate.com/brm/news/

consumers are carrying less and less cash over time, as debit card use increases.[53] With a debit card, however, a consumer has direct access to her bank account so an extra dollar to add a bag of French fries to her lunch or a magazine to her convenience store purchase is possible. With small size purchases (like those made at QSRs or convenient stores), the ability to purchase more is not a matter of credit availability, as it would be, say, for a credit card purchase at an electronics store. Rather, debit cards free consumers from the time and expense of having to obtain and carry cash, but do not involve credit or finance fees.

The second potential merchant benefit suggested by the case study research is increased throughput. Looking again at QSRs, the notion here is that for every second a fast food restaurant is able to shave off of its POS time, the more customers that QSR will be able to serve during its peak lunch and dinner rush hours. Not only will the restaurant be able to get to the next order faster, lines will be shorter both at the counter and in the drive-through, lines that could deter potential customers from even stopping at the restaurant.[54] One empirical study reports that every 10 s cut from QSR drive-through service during peak times increases sales by $1000.[55] Similar throughput benefits are possible for other retailers for whom fast customer turnaround is a key element of service.

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cc/20070704_credit_cards_fat_a1.asp. ("According to a new survey commissioned by Visa, 82% of respondents said fast food purchases made with debit or credit cards are more convenient than dealing with cash. And 68% say using payment cards is faster than paying with cash. Importantly, 77% say they can buy exactly what they want because they are not limited by the cash they have available.")

53 See, e.g., Electronic Banking Options, "US consumer use of cash to decline by nearly $200 billion by 2015, January 15, 2011, http://electronicbankingoptions.com/2011/01/15/u-s-consumer-use-of-cash-to-decline-by-nearly-200-billion-by-2015/ ("United States consumers' use of cash declined 3% last year and it will continue to drop at the same rate through 2015, according to a new report by Aite Group LLC, a Boston-based consulting firm.")

54 Note that the throughput benefit is *not* a double counting of the saved POS time already accounted for in the cost estimates. The cost savings involve a lower employee expense in transaction time: because cards are faster than cash for no-sign transactions, each transaction costs less to process. This cost saving applies to all transactions. The throughput benefit, on the other hand, captures the additional sales revenue that faster transaction processing can entail at certain points of the day. That is, during the lunch peak, for instance, increasing throughput can lead to additional transactions being made (Gad Allon, Awi Federgruen, and Margaret Pierson, "How much is a reduction of your customers' wait worth? An empirical study of the fast-food drive-thru industry based on structural estimation methods," 2011 Northwestern University working paper, http://www.kellogg.northwestern.edu/faculty/allon/htm/Research/Fast_Food_Waiting_Time_MSOM_052611.pdf). The incremental revenue from those additional transactions, only for the peak times when throughput matters and not for every transaction, can be measured.

55 Note that this benefit is limited to peak times and must therefore be appropriately scaled for the "average" transaction. Linda Punch and Jeffrey Green (2003) "Fast Food Meets Fast Payment," Credit Card Management, 15(11):18. Drive-through windows account for between 50 and

Table 14 Break-Even Ticket Lift.

Merchant Type	Signature debit	PIN debit
QSR		
Implied Ticket Lift ($)	$0.20	$0.18
Implied Ticket Lift (%)	3.40%	3.05%
Discount Stores		
Implied Ticket Lift ($)	$1.47	$0.75
Implied Ticket Lift (%)	2.78%	1.43%
Supermarkets		
Implied Ticket Lift ($)	$1.05	$1.74
Implied Ticket Lift (%)	1.36%	2.27%
Gas Stations		
Implied Ticket Lift ($)	$5.32	$5.31
Implied Ticket Lift (%)	29.31%	29.23%
Convenience Stores		
Implied Ticket Lift ($)	$0.69	$0.69
Implied Ticket Lift (%)	10.07%	10.06%
Travel Retail		
Implied Ticket Lift ($)	$0.42	$0.42
Implied Ticket Lift (%)	5.61%	5.61%

These possible benefits raise the question of how the various payment instruments compare once all cost and benefit components have been taken into account. As the tables above indicate, the cost differentials between cash and debit are relatively small once we look beyond bank charges. This section therefore considers how large merchant benefits would need to be in order to make merchants indifferent between cash and debit at the pre-Durbin interchange fee rates. This question is similar to the tourist test, but is considered from the perspective of benefit increases rather than merchant fee decreases.

Table 14 presents the ticket lift merchant benefit required to put debit card incremental net cost at parity with cash.

For most retail venues, the level and percentage of ticket lift required to equate cash and debit net costs is quite small. Gasoline stations and convenience stores are the only venues that require double digit ticket lift percentages in order for debit to reach the breakeven point with cash.

Throughput is a more complicated potential benefit. First, it applies only to those retailers for whom fast customer turnaround is a key element of service.

65% of an average QSRs sales. Allon et al. (2011), supra note 42, test a similar industry claim that a 7-second reduction in wait time leads to a 1% increase in that chain's market share. They find that on average this claim holds, though it can be up to 3% for large chains like McDonald's. The $1000 benefit assumption made by the industry is therefore conservative.

From among the case studies presented here, that would include QSRs, retail gasoline stations, convenient stores, and travel retailers.[56] For these retailers, the faster transaction turnaround times that cards provide as compared to paper instruments (due to the faster POS time, or at pump paying for retail gas) can lead to additional profits during the retailer's peak hours. If we were to add estimates of this benefit to the ticket lift above, the needed ticket lift to achieve cash-break-even would be even smaller.[57]

5 Concluding Remarks

The aim of this paper is to evaluate the debit card interchange fee caps imposed under the Durbin Amendment. To that end, I have calculated merchant transaction processing costs and benefits for cash, check, and debit card payments across six retail venues with frequent debit card use. I then applied the tourist test proposed in theoretical literature to the calculated cost data.

I confirm that on the basis of bank fees alone, debit cards are the most costly of the payment instruments for merchants to accept. That being said, bank costs alone present a misleading picture because this approach ignores other relevant incremental costs. It also ignores potential benefits, such as ticket lift or throughput. For most retail venues, only modest benefits are required to equate the merchant processing cost for debit cards to paper instruments.

The application of the incremental cost data to the tourist test provides mixed results across transaction size and the most likely avoided payment costs. Merchants whose customers pay with checks are more likely to find the Durbin Amendment cap falls in their favor (that is, it is set "too low" in relation to their avoided costs). For cash-centric merchants with small transaction sizes, the tourist test calculations suggest that the cap may be "too high." For cash-centric

56 For example, the time to purchase fuel at peak times is based on an assumed 250 transactions per peak hour at a gas station with 18 pumps. During that hour, there are therefore 13.9 transactions per pump, implying that each transaction takes 4.32 min. See http://www2.tbo.com/news/northwest/2009/feb/25/nw-residents-oppose-new-gas-station-ar-225156/. The additional time to pay with cash, 2.37 min, includes time to walk into the store, select an item, wait in line, pay, and return to the car. See NACS, "Convenience Stores Sell Time," May 7, 2009, available at http://www.nacsonline.com/NACS/NEWS/FACTSHEETS/SCOPEOFINDUSTRY/Pages/Convenience.aspx Supermarket and discount store queues tend to eliminate the relative benefits of paying with card versus paper, although, the rise of self-checkout lanes at both venues likely means that increased throughput from card payment is likely beneficial to these retailers for consumers buying relatively smaller amounts at self-checkout.

57 These calculations were presented in an earlier version of this paper, available from the author.

merchants with larger typical transactions the DA cap surprisingly looks about right (surprising given that it is by sheer luck that the DA might achieve this goal), though when checks are the most likely alternative to debit for larger transactions, the DA cap is decidedly "too low."

The one clear finding to emerge from the analysis is that transaction size matters a great deal, as does the most likely avoided payment instrument (cash or check). Especially considering that other forms of payment not included here, like PayPal, are likely to have different again cost factors, it is unclear how the sizeable differences between avoided costs across alternative payment types could be overcome in an implementable regulatory cap.

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