The Costs and Benefits of Interchange Fee Regulation: An Empirical Investigation

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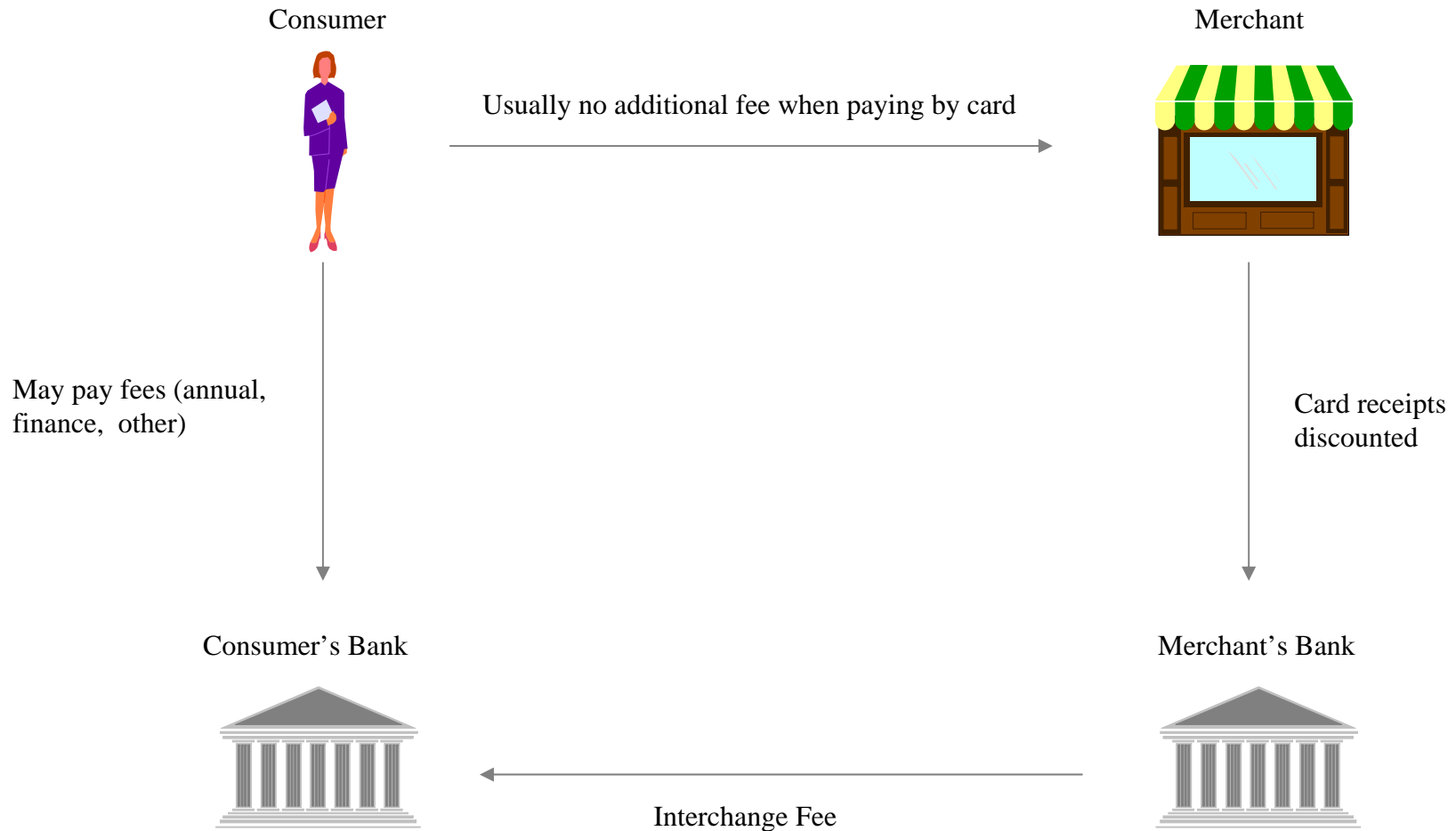
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Payment Card Network Transfers

Consumer

Merchant

Usually no additional fee when paying by card

May pay fees (annual, finance, other)

Card receipts discounted

Consumer's Bank

Merchant's Bank

Interchange Fee

Antitrust Scrutiny of Interchange Fees

- U.S. merchant interchange fee lawsuit

- Interchange fee regulation in Australia

- European Union interchange fee decision

- Spanish antitrust authorities have regulated interchange fees

Key Questions

- What is the socially optimal interchange fee?

- Does competition among payment providers, networks, or instruments improve consumer and merchant welfare?

- Is there a network externality that justifies government intervention?

Balancing the Two Sides

- Cards benefit society when:

$$b_B + b_S \geq c_I + c_A$$

  where c_I and c_A are issuer and acquirer costs respectively

- A transfer may be necessary to bring both sides on board
  - Consumer fee decreases when interchange fees increase
  - Merchant fee increases when interchange fees increase

Competition and Merchant Acceptance

- Platform competition does not necessarily improve the price structure although the total price may decrease resulting from platform competition

- When merchant acceptance is far from complete, lowering interchange fees may result in higher merchant and consumer adoption resulting in greater usage

Interchange Fee Regulation

Year	Regulatory action	Regulatory body	Main implications for interchange fees
1999	REDUCTION OF INTERCHANGE FEES	THE SPANISH MINISTRY OF THE ECONOMY	Interchange fees were gradually reduced from 3.5% in 1999 to 2.75% in July 2002.
2002	INVESTIGATION ON THE SETTING OF INTERCHANGE FEES (MORAL SUASION)	SPAIN'S ANTITRUST AUTHORITY	Based on the European Commission on cross-border interchange fees analysis, Spain's Antitrust Authority requested the payment card networks to provide information on how interchange fees were determined.
2003	PROPOSALS FROM THE NETWORKS ON THE SETTING OF INTERCHANGE FEES ARE REFUSED (MORAL SUASION)	SPAIN'S ANTITRUST AUTHORITY	The TDC refused several proposals of the networks on their setting of interchange fees.
2005	A REDUCTION OF INTERCHANGE FEES AND A FINAL DATE FOR THE ADOPTION OF A COST-BASED MODEL	THE SPANISH MINISTRY OF INDUSTRY, TOURISM AND TRADE	From January 2006 until December 2008, the maximum interchange fee would be progressively reduced. From 2009 onwards, each of the card networks would provide a cost-based analysis for debit and credit cards.

Payment Card Adoption and Usage in Spain

	1997	2007
Total Number of Debit Cards (millions)	22	31
Total Number of Credit Cards (millions)	14	43
Total Debit Card Transactions (millions)	156	863
Total Credit Card Transactions (millions)	138	1037
Average Number of POS Transactions (per card)	7.1	27.8
Average Interchange Fee (earliest avail 2002)	1.71	.90

Our Dataset

- Data are from 45 Spanish banks participating in a payment card network from 1997:1 to 2007:4 (1,980 panel observations)

- Quarterly acquirer and issuer-level data on the number of payment cards, rival ATM density, number of transactions by payment instrument and consumer and merchant fees for debit and credit card transactions

- Merchant acceptance of debit and credit cards and crime rates in the area that the bank operates

Empirical Model

- Use simultaneous equation estimation techniques (GMM) distinguished by extensive and intensive margin and type of card

- Focus on growth rates

- Control variables include *bank size*, *crime rate* and *time trend*

- 4 regulatory dummies for the identified regime shifts

- Bank fixed effects and clustered standard errors

Empirical Model (exclusion restrictions)

Merchant extensive margin
- **Exclusion restrictions**: *merchant discount fees* (prediction: as fees decrease, merchant acceptance increases) and *number of cards* (prediction: as adoption of cards increases, there are more potential merchant sales).

Cardholder extensive margin
- **Exclusion restrictions**: *Lagged merchant acceptance* (prediction: increased merchant acceptance should increase the value of debit cards and spur greater adoption). For debit cards, density or rivals' ATM (indicator of increased cash acquisition costs to a given bank's customers). For credit cards, we include annual fees (no annual fees for debit cards).

Merchant intensive margin
- **Exclusion restrictions**: *an interaction term of merchant acceptance by acquirer and the total number of cards in that network* (prediction: as the interaction of variables increases, the transactional volume should increase).

Cardholder intensive margin
- **Exclusion restrictions:** *interaction of merchant acceptance in the network and the number of debit cards issued by a bank* (prediction as the interaction term increases, the number of transactions per card should increase)

Results for Debit Card Adoption

- Government-mandated reductions in debit card interchange fees resulted in greater merchant acceptance

- Greater merchant acceptance of debit cards increased consumer adoption of debit cards

- As the density of rival ATMs increased, the adoption of debit cards by consumers increased

Results for Debit Cards (usage)

- Debit card transactions at POS machines increased when the interaction term of an acquirer's acceptance and total debit cards in network increased

- Debit card transactions per issuer increased when the interaction term of cards issued by an issuer and total merchant acceptance increased

- All the regulatory dummies are positive and significant suggesting that reductions in debit card interchange fees increased debit card transactions

Results for Credit Cards (adoption)

- A reduction in the merchant credit card discount fee increased merchant acceptance

- An increase in the merchant acceptance of credit cards resulted in an increase in card adoption

- An increase in the crime rate, increased card adoption

- However, we fail to find a statistically significant effect of changes in the annual fee on card adoption

Results for Credit Cards (usage)

- The number of credit card transactions at an acquirer increases as the interaction of the proportion of an acquirer's merchants and total cards increases

- The number of transactions at an issuer increases with the interaction of cards issued by the issuer and network merchant acceptance

- Almost all of the regulatory dummies are positive and significant

Acquirer and issuer revenues (1997-2007)
(€million)
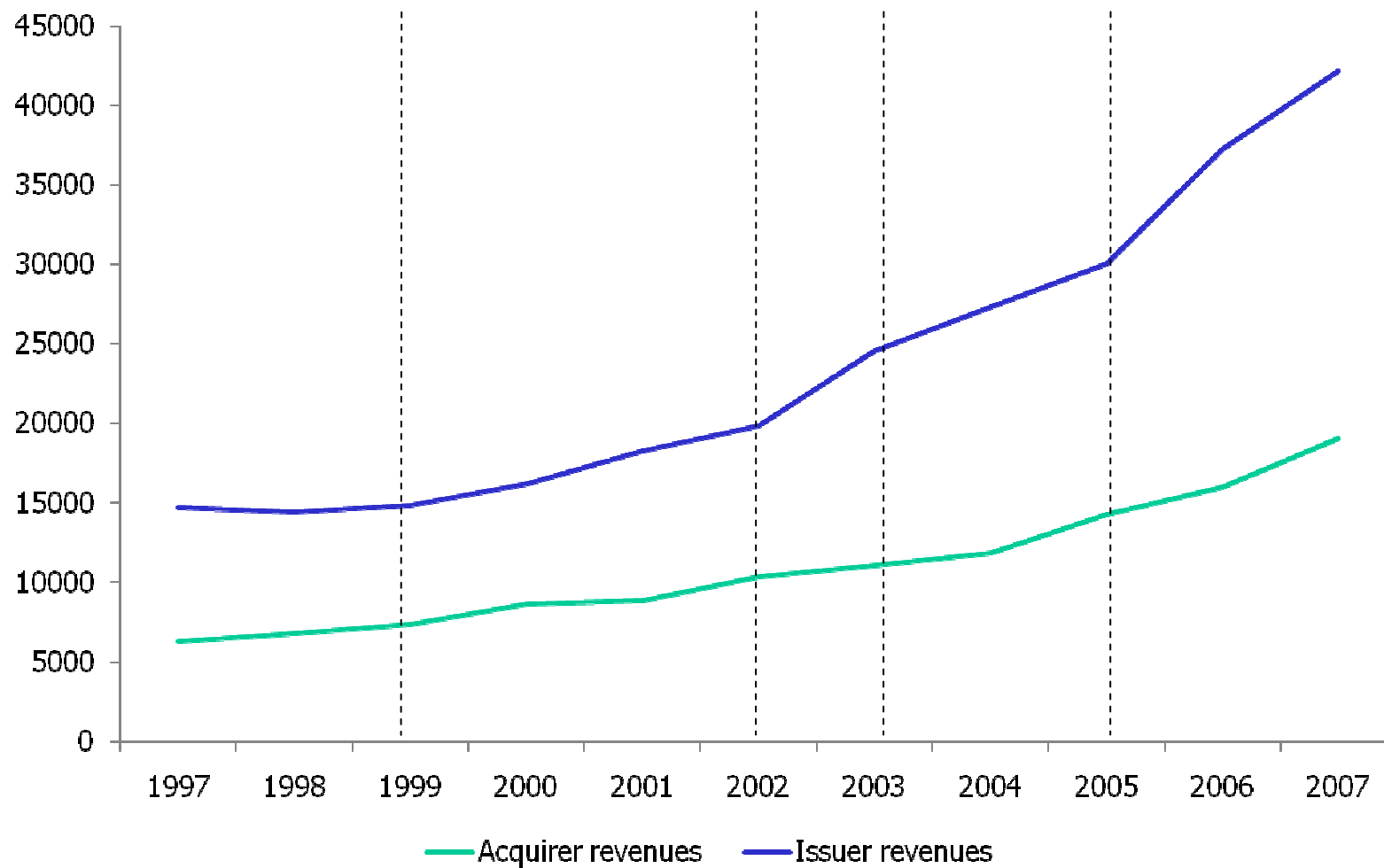
Conclusion

- Our results suggest that interchange fee regulation has had a positive effect on consumer and merchant adoption and usage

- Some evidence suggests that banks are even better off because the increase in volume of transactions offsets the decrease in per-transaction revenue

- However, once the network (adoption and usage) externality is eliminated, interchange fee regulation may not further improve social welfare

Appendix

Table 5: Debit Card Extensive Margins for Consumers and Merchants

	Merchant acceptance by acquirer ($MACCD_{it}$)	Number of debit cards by issuer ($DCARDS_{it}$)
Constant	0.24E-11 (0.001)	0.21E-12 (0.001)
Merchant acceptance in the network ($MACCDN_{t-1}$)	-	0.0363** (0.012)
Merchant debit card discount fee ($MFEED_{it}$)	-0.0429** (0.005)	-
Number of debit cards in the network ($DCARDSN_t$)	0.0015** (0.002)	-
Rival ATM density ($RATMD_{it}$)	-	.1637** (0.014)
Bank size (in the card network) ($BSIZE_{it}$)	0.0122 (0.021)	0.0443** (0.018)
Crime rate ($CRIME_{it}$)	-0.0268 (0.161)	-0.0123 (0.852)
Linear time trend	0.0193** (0.005)	0.1951** (0.018)
Regulation dummy 1999 (REG99)	-0.0234* (0.013)	0.0926** (0.011)
Regulation dummy 2002 (REG02)	0.0116** (0.008)	-0.1425* (0.016)
Regulation dummy 2003 (REG03)	0.0155** (0.007)	-0.1007 (0.023)
Regulation dummy 2005 (REG05)	0.0126** (0.005)	-0.1852** (0.035)
Adjusted R^2	0.82	0.71

Table 6: Debit Card Intensive Margins for Consumers and Merchants

	Debit card transactions at the POS ($DEBPOSTR_{it}$)	Debit card transactions (issuer perspective) ($DEBISS_{it}$)
Constant	0.05E-13 (0.001)	-0.05E-13 (0.001)
Merchant acceptance by acquirer ($MACCD_{it-1}$)X Number of debit cards in the network ($DCARDSN_{t-1}$)	0.0326** (0.010)	-
Merchant acceptance in the network ($MACCDN_{t-1}$)X Number of debit cards by issuer ($DCARDS_{it-1}$)	-	0.1160** (0.016)
Rival ATM density ($RATMD_{it}$)	-	0.1271** (0.013)
Bank size (in the card network) ($BSIZE_{it}$)	0.0231* (0.004)	0.0091 (0.011)
Crime rate ($CRIME_{it}$)	0.2736 (0.628)	0.1029 (0.257)
Linear time trend	0.1858** (0.002)	0.1696** (0.004)
Regulation dummy 1999 (REG99)	0.0163** (0.004)	0.0824* (0.009)
Regulation dummy 2002 (REG02)	0.1025** (0.008)	0.0899** (0.012)
Regulation dummy 2003 (REG03)	0.1021** (0.004)	0.1269* (0.021)
Regulation dummy 2005 (REG05)	0.2026** (0.012)	0.2635** (0.015)
Adjusted R^2	0.92	0.64

Table 7: Credit Card Extensive Margins for Consumers and Merchants

	Merchant acceptance by acquirer ($MACCC_{it}$)	Number of credit cards by issuer ($CCARDS_{it}$)
Constant	-0.30E-06 (0.001)	0.53E-06 (0.001)
Merchant acceptance in the network ($MACCCN_{t-1}$)	-	0.2985** (0.007)
Merchant credit card discount fee ($MFEEC_{it}$)	-0.1585** (0.023)	-
Number of credit cards in the network ($CCARDSN_t$)	0.1630** (0.018)	-
Annual credit card fee ($AFEECRED_{it}$)	-	0.6023 (0.730)
Bank size (in the card network) ($BSIZE_{it}$)	0.0045* (0.001)	-0.0013 (0.019)
Crime rate ($CRIME_{it}$)	0.0696* (0.012)	0.0651** (0.018)
Linear time trend	0.1694** (0.001)	0.1388** (0.042)
Regulation dummy 1999 (REG99)	-0.0950 (0.011)	0.0372** (0.004)
Regulation dummy 2002 (REG02)	0.0633 (0.071)	-0.0231 (0.032)
Regulation dummy 2003 (REG03)	0.1124** (0.055)	0.2651** (0.018)
Regulation dummy 2005 (REG05)	0.2023** (0.018)	0.2955** (0.009)
Adjusted R^2	0.87	0.93

Table 8: Credit Card Intensive Margins for Consumers and Merchants

	Credit card transactions at the POS ($CREDPOSTR_{it}$)	Credit card transactions (issuer perspective) ($CREDISS_{it}$)
Constant	0.25E-06 (0.001)	-0.19E-06* (0.001)
Merchant acceptance by acquirer($MACCC_{it-1}$)X Number of credit cards in the network ($CCARDSTN_{t-1}$)	0.3216** (0.004)	-
Merchant acceptance in the network ($MACCCN_{t-1}$)X Number of credit cards by issuer ($CCARDS_{it-1}$)	-	0.1854** (0.002)
Bank size (in the card network) ($BSIZE_{it}$)	-0.1618 (0.025)	0.0123* (0.002)
Crime rate ($CRIME_{it}$)	0.0851* (0.039)	0.0742* (0.023)
Linear time trend	0.2214** (0.003)	0.1996** (0.001)
Regulation dummy 1999 (REG99)	0.0681 (0.072)	0.0725** (0.004)
Regulation dummy 2002 (REG02)	0.2335** (0.004)	0.1935** (0.002)
Regulation dummy 2003 (REG03)	0.1073** (0.003)	0.1180** (0.002)
Regulation dummy 2005 (REG05)	0.3104** (0.009)	0.2932** (0.006)
Adjusted R^2	0.68	0.94