Retail Payment Economics: Theory and Practice

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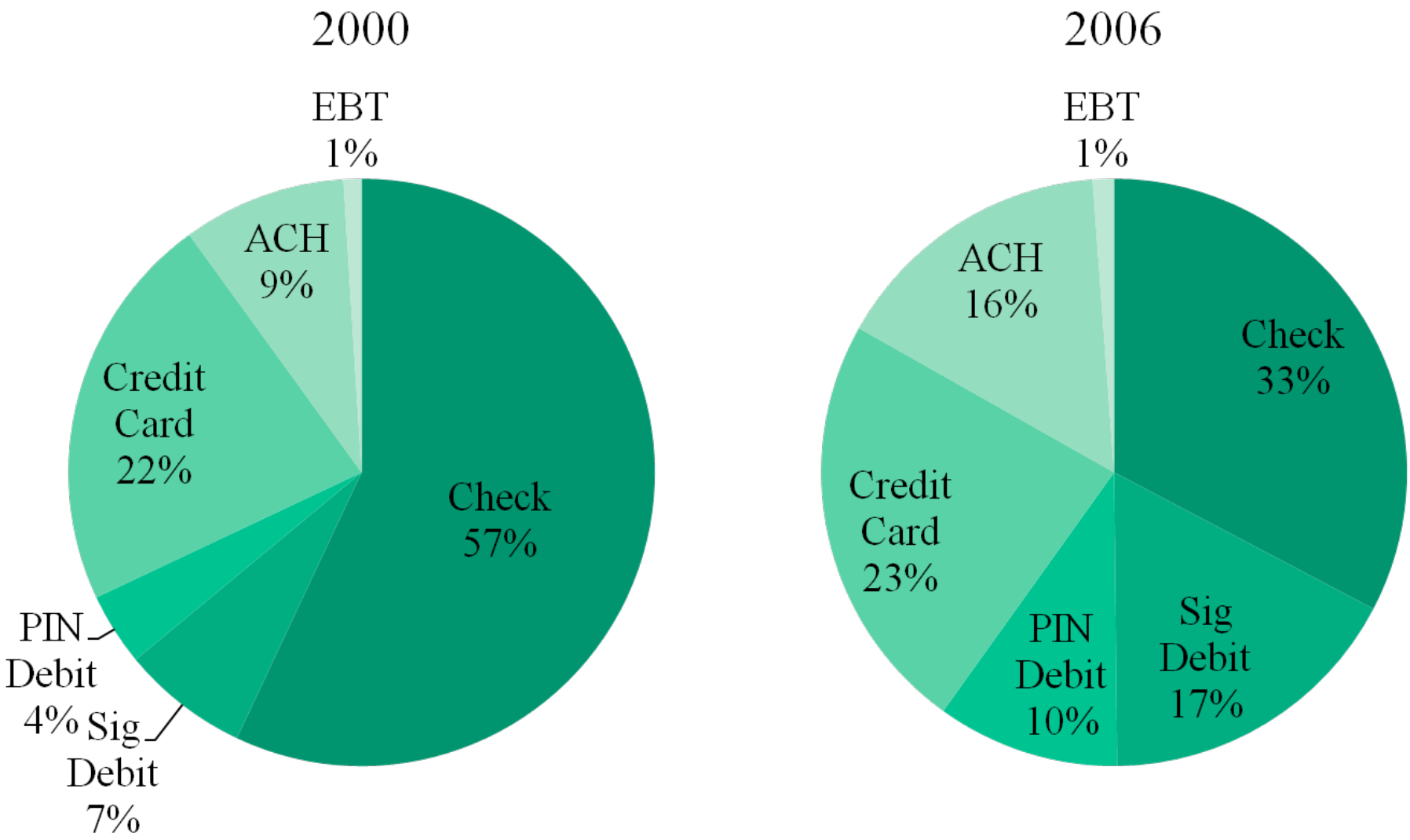
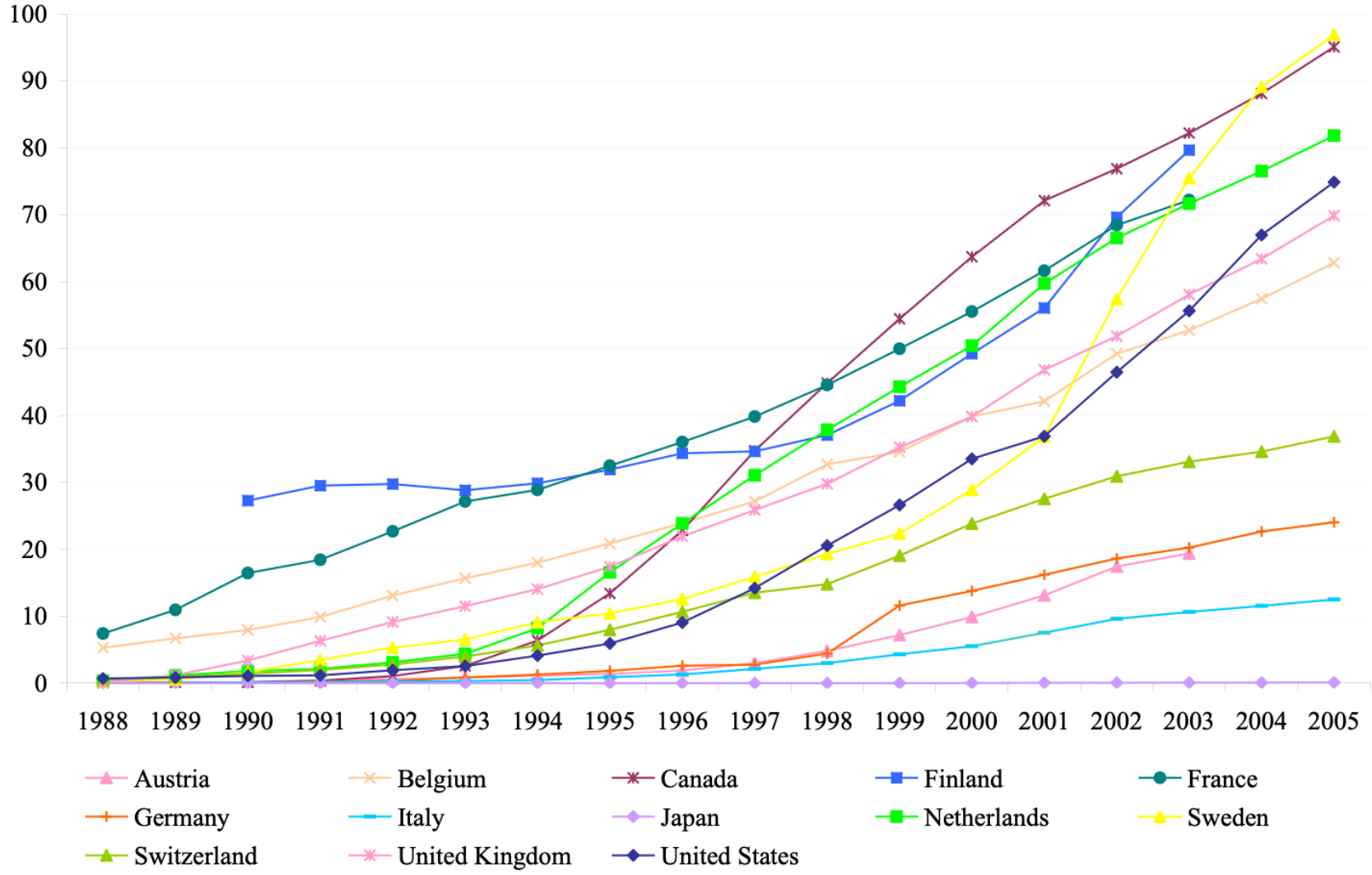
General Observations

- Reduction in the exchange of information via paper-based media
- Increase in the number of faceless transactions with unknown counterparties
- Migration from paper-based payment methods to electronic ones

U.S. Non-Cash Payments



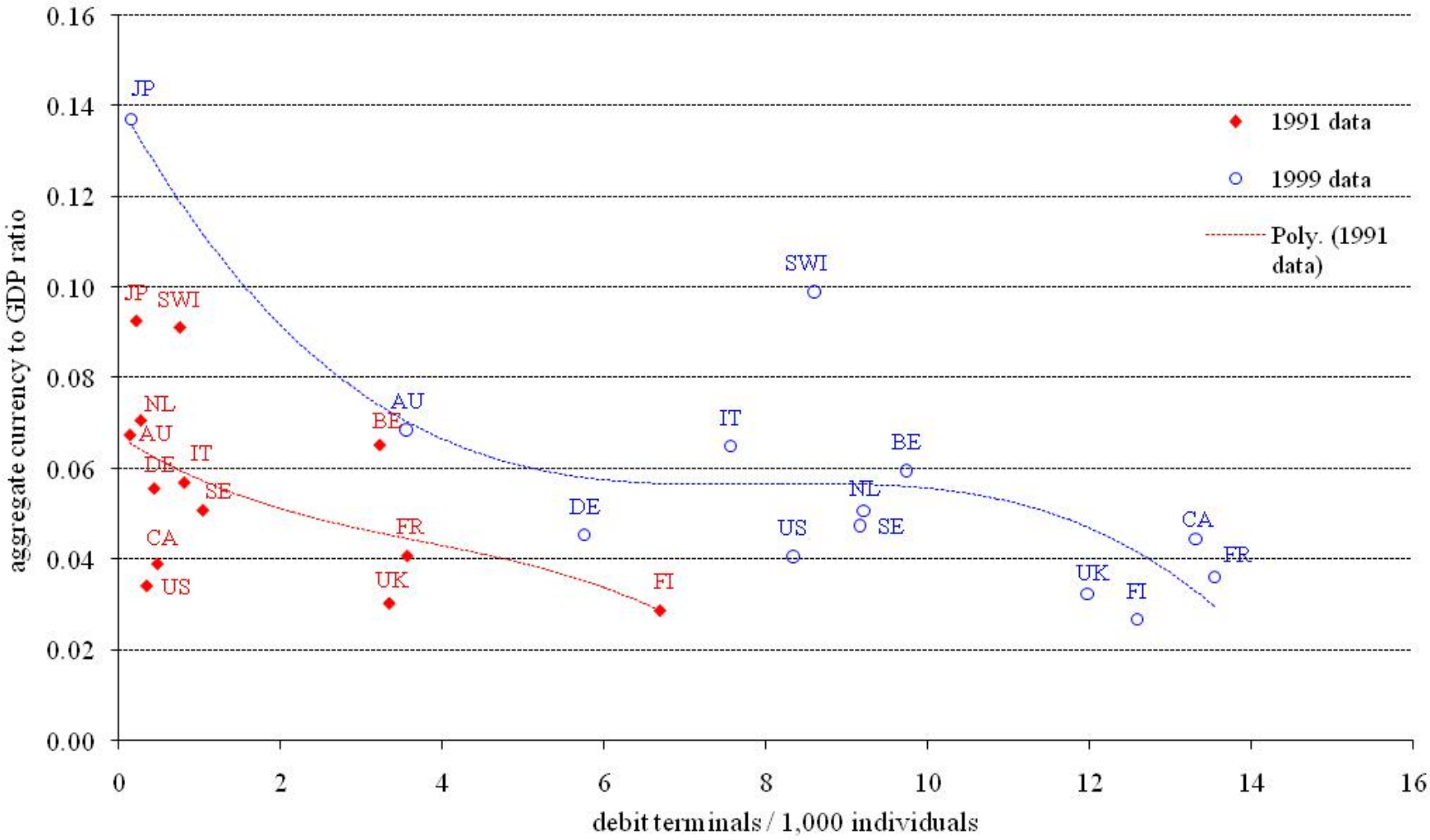
Growth of Debit Card Transactions (per capita/yr)



Cash Usage

- Is transactional demand for cash decreasing?
- When will the cashless society arrive?
  - Cash aggregates are fairly stable in many advanced economies
  - Cash has other functions such as: store of wealth
  - Cash is anonymous and hard to trace
- Policy directive in some jurisdictions: encourage non-cash instruments to promote greater efficiency
- Joint work with Gene Amromin of the Chicago Fed

Debit Infrastructure v. Currency Holdings/GDP



Denomination Categories

ATM-dispensed → medium; above → large; below → small

National Currency	Highest Denomination NCU	Highest Denomination US $	Most common ATM note NCU	Most common ATM note US $	*December 31, 2000* Exchange rate (NCU/$)
Austria Schillings	5,000	$342	100 - 1,000	$7 - $68	14.61
Belgium Francs	10,000	$234	1000	$23	42.82
Canada Dollars	1,000	$667	20	$13	1.50
Finland Markka	1,000	$158	100	$16	6.31
France Francs	500	$72	100	$14	6.96
Germany Deutsche Marks	1,000	$482	10 - 100	$5 - $48	2.08
Italy Lire	500,000	$243	10K - 50K	$5 - $24	2055.49
Japan Yen	10,000	$87	10000	$87	114.35
Netherlands Guilders	1,000	$427	100	$43	2.34
Sweden Kronor	1,000	$106	100 - 500	$11 - $53	9.40
Switzerland Francs	1,000	$621	20 - 200	$12 - $124	1.61
United Kingdom Pounds	50	$75	10 - 20	$15 - $30	0.67
United States Dollars	100	$100	20	$20	1.00

Denomination-Specific Currency/GDP

	logarithm of		
Dependent variable:	Large/GDP	Medium/GDP	Small/GDP
log(Debit terminals/pop)	-0.005	0.025	-0.043***
	(0.030)	(0.029)	(0.012)
log(ATMs/pop)	-0.030	-0.242**	0.000
	(0.103)	(0.108)	(0.036)
log(Bank branches/pop)	0.424**	0.212	0.275**
	(0.168)	(0.204)	(0.094)
log(Ratio of self-employed)	-0.344	0.286	0.318***
	(0.308)	(0.221)	(0.101)
log(Short-term interest rate)	-0.061	-0.044	-0.022
	(0.037)	(0.028)	(0.015)
Y2K dummy	0.018	0.022	-0.002
	(0.053)	(0.029)	(-0.015)
constant	-2.566	-4.950	-5.812
N	169	169	169
Goodness-of-fit measure	within R^2	within R^2	within R^2
	0.07	0.21	0.66

- Debit infrastructure only affects small denominations
- No effect of interest rates on large notes

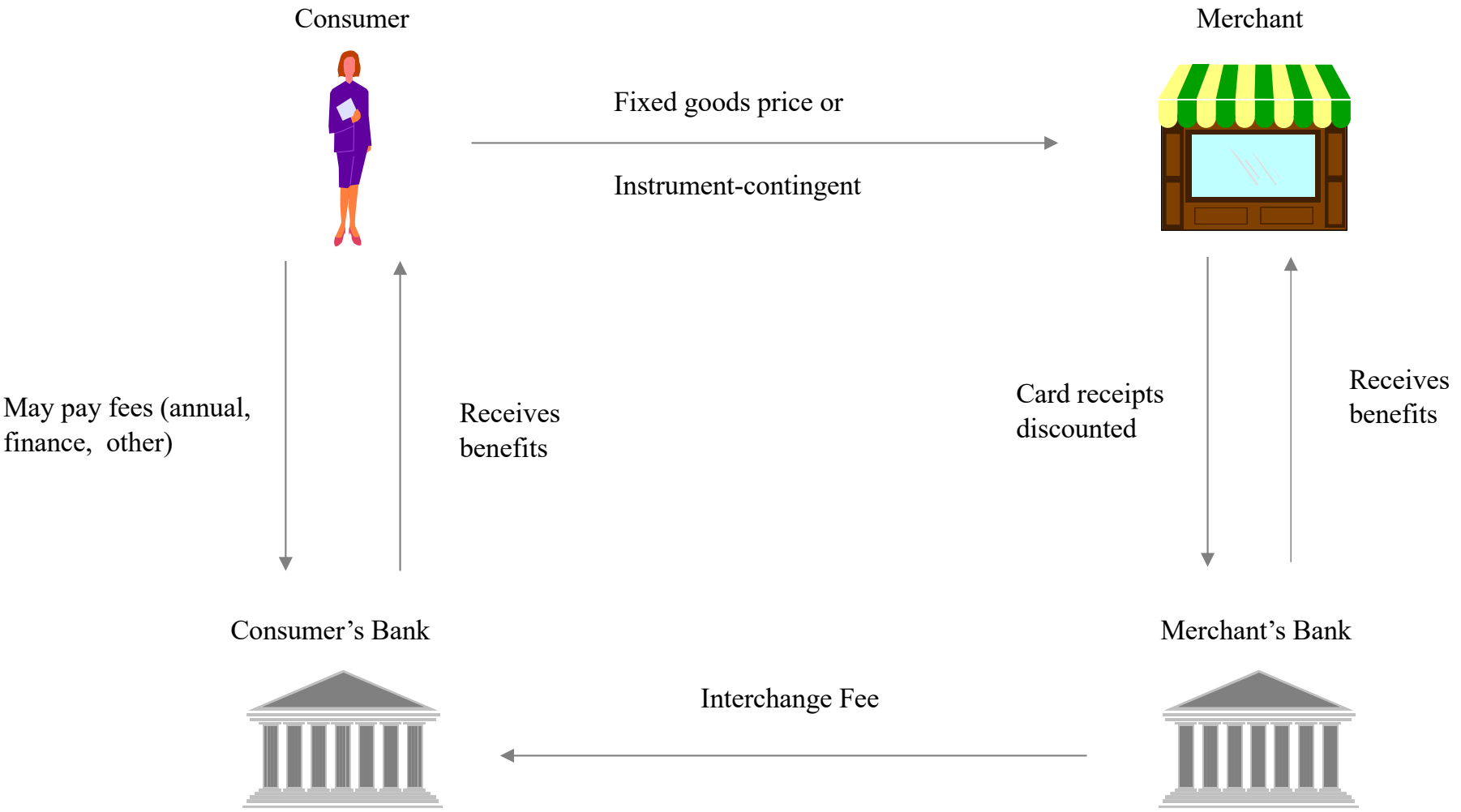
Payment Card Industry

- Payment cards have become indispensible
- Visa's IPO largest in U.S. history (~$18 billion)
- Antitrust scrutiny in several jurisdictions
  - U.S. merchant interchange fee lawsuit
  - Bill in U.S. Congress (Credit Card Fair Fee Act)
  - European MasterCard interchange fee decision
  - Australia, the Netherlands, Mexico, Spain, and others

Cost and Benefits

- Generally, electronic payments are less costly than paper-based payments
- However, certain electronic payments may be more expensive for merchants to accept
- Two questions:
  - Do the benefits outweigh the costs?
  - If so, how should these costs be allocated?

Payment Card Network Fees



Key Questions

- What is the optimal structure of payment fees between consumers and merchants?
- Will competition among payment providers, networks, or instruments improve consumer and merchant welfare?
- What guidelines should policymakers follow when regulating fees for payment services?

Economic Models

Theoretical payment card models focus on different aspects of network

- Interchange fees
- Pricing of payment services and consumption goods
- Platform competition
- Extension of credit
- Competition among payment instruments

Interchange Fees

- Because they are set collectively, antitrust authorities have questioned their levels and, in some cases, “encouraged” or “mandated” lower fees
- Balance consumer and merchant demands
- Socially optimal interchange fee may not be the same as profit-maximizing fee

Differentiated Prices of Consumption Goods

- Lack of price incentives or “rewards” may induce usage of more costly payment instruments
- If merchants were allowed to set different prices, interchange fees would be neutral if there is 100 percent pass-through
- However, not common in reality

Platform Competition

- Platform competition does not necessarily improve the price structure
- However, the total price may decrease resulting from platform competition
- Competition may result in too high interchange fees if issuers compete too vigorously on the consumer side

Extension of Credit

- Most of the payment card literature ignores the extension of credit
- Surprising given that much of the antitrust scrutiny is about credit cards
- Credit allows consumers to make purchases and merchants to make sales that may not have otherwise occurred

Extension of Credit

- There is a tradeoff between extending credit to less creditworthy consumers and the merchant discount fee
- Differentiated prices reduce real resource costs and separates liquidity-constrained consumers from others
- Non-liquidity constrained consumers may be enticed to use their credit cards with financial incentives from credit-constrained ones (who pays for these rewards?)

Bolt and Chakravorti (2008)

- Merchant pricing restrictions on consumption goods may induce over usage of credit cards
- The profit-maximizing consumer fee is greater than the welfare-maximizing one but the merchant fee may be the same
- Differences in cost of debit and credit cards determine if banks offer them

A Regulatory Experiment

- Spanish public authorities directly or indirectly reduced interchange fees for debit and credit cards
- Debit card fees were converted from proportional to fixed fee regardless of transaction size
- Question: What happened to adoption and usage?
- Joint work with Santiago Carbo Valverde and Francisco Rodriguez Fernandez at the University of Granada

Some Figures for 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
Average Debit Card Fixed Interchange Fee (euro)		.40
Average Credit Card Interchange fee (proportional)		.93

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	Following the investigations of the European Commission on cross-border interchange fees, Spain's Antitrust Authority (the TDC) requested the Spanish payment card networks to provide information on their method of determining interchange fee.
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 level for an interchange fee would be progressively reduced. From 2009 onwards, each of the card networks would audit their operations and provide a cost-based analysis for debit and credit cards.

Theoretical Predictions

- Higher than optimal interchange fees may result if there is too much competition for consumers
- Test to see if lowering interchange fee results in lower consumer adoption, lower usage, or both
- If merchant acceptance is not complete, lowering interchange fees *may* result in higher merchant adoption

Preliminary Results from Spain

- Almost a one-to-one reduction in merchant fees with reduction of interchange fees
- Lower interchange fee results in greater merchant adoption
- However, lower interchange fee does not decrease consumer adoption
  - Debit cards are also used to withdraw cash and no explicit fee
  - Consumers may be inelastic or the increase in credit card annual fees is offset by greater merchant acceptance

Conclusion

- Migration away from cash and checks is occuring
- Payment card economics is complicated because of the interplay of a set of interdependent bilateral relationships
- Theoretical models predict that socially optimal interchange fee may not be the same as the profit-maximizing one
- Given regulatory actions in various jurisdictions, economists would be able to test theoretical models subject to data availability

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