

Consumer Credit and Payment Cards

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- How does the provision of consumer credit affect the pricing of debit and credit cards?
- Two business models of consumer credit:
 - credit via overdraft on current account...
 - ...and credit via credit line associated with credit card
- Consider two cases
 - monopoly pricing by network
 - competition between debit and credit card networks (consumer multihomes)
- Policy context
 - Emergence of additional European card scheme
 - US Durbin amendment

Monopolist networks

- Funding and default costs do not affect debit merchant fees, but do affect credit card merchant fees
- Interplay between overdraft costs and *credit card* fees

Competing networks

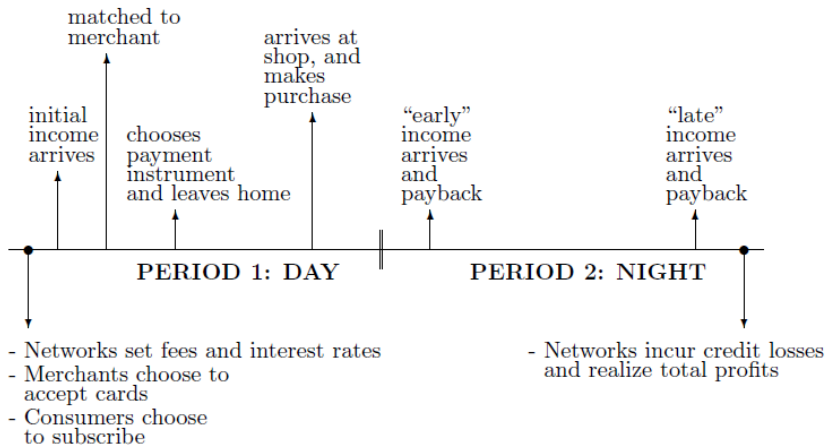
- Competition drives down prices...
- ...but also element of complementarity between debit and credit cards, through 'grace' period of credit line
- Debit merchant fees may rise to monopolistic levels (above the socially optimal level)
- Default risk now affects both card merchant fees

- Chakravorti and To (2001)
- Weiner and Wright (2005)
- Bolt and Chakravorti (2008)
- Bedre and Calvano (2009)
- Rochet and Tirole (2010)
- Shy and Wang (2010)
- Verdier (2010)
- Bolt and Schmiedel (2011)

- Card network sets consumer fees (F) and merchant fees (f)
 - 3-party network so do not solve for interchange fee
 - but simple positive relationship between interchange fee and merchant fee if acquiring bank is perfectly competitive
 - network faces processing cost c
- Heterogenous merchants
 - merchants vary in their profit margins π_i
 - cost of cash handling h
- Homogenous consumers
 - single purchase, from which consumers obtain utility v_0
 - card network sets consumer fee to extract full consumer surplus from card
 - cost of cash (probability $(1 - \rho)$ of being mugged)

- Period 1: Consumer may receive income, yet still requires credit to make purchase
 - in good state, only requires small amount of credit
 - in bad state, requires large amount of credit
- Overdraft
 - can be used with cash or debit card
 - only offers small amount of credit
 - interest accrues immediately on use
- Credit line of credit card
 - offers large amount of credit
 - initial interest-free 'grace' period
- Positive probability of default in both cases
 - Consumer may not receive period 2 income

Timeline



$$r_d = r_d(r, \gamma_E, \gamma_L)$$

$$r_c = r_c(r, \gamma_E, \gamma_L)$$

- Interest rates determined in competitive aftermarket (NPV=0) as function of lender's funding cost and probability of default
 - overdraft competes with store credit
 - credit line competes with overdraft
 - expected cost of default covered by high interest rate
- Despite this, interest rates and probability of default may still affect equilibrium consumer and merchant fees
- Intuition:
 - Higher interest rates decrease consumers' willingness to pay
 - This lowers the consumer fixed fee and so requires an increase in the merchant fee

Monopolistic Networks

Debit card-only world

- Default risk and funding cost have no effect on consumer or merchant fees
- Intuition: debit card provides extra security over cash, rather than enabling extra credit

Credit card-only world

- merchant fees *do* depend on default risk and funding cost
- Intuition: credit card enables payment in extra state of the world, with no period 1 income
- Credit card also competes with overdraft in states with positive period 1 income
 - implies higher expected costs of servicing overdraft may lead to lower credit card merchant fees
 - ... and so increase acceptance ratio of credit cards...

Numerical Results (monopolistic networks)

	funding cost r		default D		early income γ_E		initial income δ	
	1%	3%	5%	10%	50%	55%	95%	99%
f_D^*	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050
α_D^*	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000
f_C^*	0.0314	0.0321	0.0314	0.0326	0.0314	0.0301	0.0314	0.0103
α_C^*	0.4726	0.4601	0.4726	0.4517	0.4726	0.4939	0.4726	0.4837
r_d	0.0464	0.0679	0.0464	0.0885	0.0464	0.0100	0.0464	0.0464
r_c	0.1444	0.2111	0.1444	0.2885	0.1444	0.0322	0.1444	0.1444

Note: Where f^D and f^C denote the merchant fees for debit and credit cards, while α^D and α^C denote the proportion of merchants accepting the respective card. Interest rates on overdrafts and credit lines are denoted by r_c and r_d respectively. We set: $c_d = c_c = 0.00$, $h = 0.00$, $v_0 = 0$, and $\rho = 0.99$. Baseline parameters: $r = 0.01$, $\gamma_E = 0.50$, $\gamma_L = 0.45$, and $\delta = 0.95$.

Competition between Debit and Credit Card Networks

- Competition drives down payment card fees
- Element of complementarity as well as competition
 - Debit card bank (DCB) can earn interest on positive balance in current account, during free 'grace' period of credit card
 - For high expected period 1 income, DCB's profit function actually *increases* with proportion of merchants accepting *credit card*
 - At margin, DCB sets high merchant fee to *discourage* debit acceptance in favour of credit cards
 - Debit merchant fees may approach monopolistic levels, as funding costs increase
- Default risk and funding cost now affect both cards
 - but stronger effect on credit card fees
 - debit merchant fees may increase with default risk, at the same time as increase in acceptance of debit cards

Comparison between Competition and Monopoly

Default ($r = 1\%$)	Monopoly				Competition			
	debit		credit		debit		credit	
	$D = 5\%$	$D = 10\%$	$D = 5\%$	$D = 10\%$	$D = 5\%$	$D = 10\%$	$D = 5\%$	$D = 10\%$
f^*	0.0050	0.0050	0.0314	0.0326	0.0029	0.0030	0.0280	0.0293
α^*	0.5000	0.5000	0.4726	0.4517	0.2114	0.2244	0.4954	0.4714
r_d	0.0464	0.0885	0.0464	0.0885	0.0464	0.0885	0.0464	0.0885
r_c	0.1444	0.2885	0.1444	0.2885	0.1444	0.2885	0.1444	0.2885
Funding cost ($D = 5\%$)	4 Monopoly				c Competition			
	debit		credit		debit		credit	
	$r = 1\%$	$r = 3\%$	$r = 1\%$	$r = 3\%$	$r = 1\%$	$r = 3\%$	$r = 1\%$	$r = 3\%$
f^*	0.0050	0.0050	0.0314	0.0312	0.0029	0.0043	0.0280	0.0294
α^*	0.5000	0.5000	0.4726	0.4601	0.2114	0.0875	0.4954	0.4924
r_d	0.0464	0.0679	0.0464	0.0679	0.0464	0.0679	0.0464	0.0679
r_c	0.1444	0.2111	0.1444	0.2111	0.1444	0.2111	0.1444	0.2111

Note: Where f denotes the merchant fee in each case, and α the proportion of merchants accepting the respective card. Interest rates on overdrafts and credit lines are denoted by r_c and r_d respectively. We set: $c_d = c_c = 0.00$, $h = 0.00$, $v_0 = 0$, $\rho = 0.99$, $\gamma_E = 0.50$, $\delta = 0.95$, and $x_1 = 0.5$. Baseline parameters: $r = 0.01$ and 0.03 , $\gamma_L = 0.45$ ($D = 5\%$) and 0.40 ($D = 10\%$).

- Credit facilities affect equilibrium payment card fees, even when credit is priced competitively
- Close interaction between costs of servicing overdraft and credit card merchant fees
- Complementarity exists between debit card model and credit card model, even when competition drives down fees

Implications and Further Work

- Implications

- Supports different MIFs for debt and credit card payments
- Debit card fees still depend on default risk, even if no extra risk of default from using debit card
- Additional European Card scheme would increase competition with downward pressure on fees

- What does this mean for welfare?

- Complementarity relationship between debit card and credit card models not relevant for welfare if interest rates are merely transfers between agents...
- Seems likely therefore that competitive debit merchant fees are higher than socially optimal