# Determinants of Borrowing Limits on Credit Cards

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*The usual caveat applies to all my comments

# Motivation

- Understand the nature of credit card contracts

- Find testable implications based on the contracts analyzed

- Suggest improvements

# Literature

- Why are credit card rates so high?- Ausubel (1991), Mester (1994), Brito and Hartley (1995), Calem and Mester (1995), Cargill and Wendel (1996), Park (1997), Kerr (2002)

- Credit limits and rates - Gross and Souleles (2002), Dunn and Kim (2002), Castronova and Hagstrom (2004), Musto and Souleles (2005)

# Literature (continued)

- Credit line contracts typically have more dimensions – Strahan (1999), Agarwal et al. (2006)

- Credit card debt puzzles - Laibson et al. (2000), Dey (2006), Zinman (2006)

# The Model

- Two-dimensional contract – credit limit and interest rate
- Credit scoring system – risk classes
- Borrowing, among other things, is a function of the rate of interest, wealth and the risk class.
- Banks can generate borrowing distributions (lacking or not utilizing primarily customer wealth information)

# The Model (continued)

- Hence, default risk (uncertain repayment probabilities)
- Monopolistically competitive credit card market
- Maximize profits for various risk classes
- Competition drives profits to normal (zero) levels

# The Model (continued)

- Credit card contracts – offer different credit limits to different risk classes and charge interest rates based on full exposure

- An explanation for why rates among credit card-holders are so high

- Refuse credit to individuals with low risk rank (credit rationing)

# The Model (continued)

- Possibility of ex post misallocations –

(I) Risk score 60; ex ante repayment probability 0.6; refuse (I) a credit card
(II) Risk score 70; limit $500; rate 15%; ex ante repayment probability 0.7; first class to get a credit card; borrows $500; ex post repayment probability 0.7

# The Model (continued)

- If (I) got the limit $500; rate 15% offer and borrowed $50, making his/her ex post repayment probability 0.71

- (I) would have had a higher ex post repayment probability than (II) and without a credit card

- Not only possible credit rationing, but also ex post misallocation

# The Model (continued)

- Possibility of ex post misallocations –

(I) Risk score 150; limit $5,000; rate 10%; ex ante repayment probability 0.9

Borrows $5,000; ex post repayment probability 0.9

(II) Risk score 149; limit $4,900; rate 10%; ex ante repayment probability 0.89

Borrows $500; ex post repayment probability 0.91

# Example (continued)

- Competing banks come up with counter offers (balance transfer offers)

(II) Risk score 149; limit $4,900; rate 10%; ex ante
repayment probability 0.89
Borrows $500; ex post repayment probability 0.91
Give (II) the following profitable counter-offer:
Limit $4,900; rate 9%; (II) takes the alternative
offer and transfers $500 at rate 9% to the
competing bank

# The Model (continued)

- Can banks do better?
- Banks do adjust the original contracts based on observed borrowing patterns
- They lack a clean estimate of the borrowings of consumers
- They are missing critical inputs – wealth
- I suggest that *SCF* can fill in the missing inputs, such as, wealth
- *SCF* is public access

# An Empirical Strategy for Banks without the Wealth Information

- 1. Estimate the selection criterion of credit card holders using the *SCF* data
- 2. Estimate the borrowings (controlling for the selection) as functions of wealth etc.
- 3. Banks can then assign the estimated borrowings to customers in their own database (with and without credit cards) matching the *SCF* characteristics

# Empirical Strategy (continued)

- 4. They can then device a new selection criterion based on the estimated borrowing information (estimated repayment probs.)
- 5. Then estimate the inverse demand functions (rates as function of borrowings)
- 6. Then estimate the supply functions (credit limits as function of rates)
- 7. Adjust the existing contracts and use the new system for all future contracts

# An Empirical Strategy for Banks with the Wealth Information

- 1. Form an integrated database
- 2. Estimate the selection criterion of credit card holders using this database
- 3. Estimate the borrowings (controlling for the selection) as functions of wealth etc.
- 4. Assign the estimated borrowings to customers in their database (with and without credit cards)

# Empirical Strategy (continued)

- 4. Repeat steps 4-7
- Update these systems as *SCF* updates or due to any relevant structural changes
- These empirical strategies should help banks better select and retain their credit card customers and hence improve their profitability

# Some results based on the *SCF*

- More credit-worthy a household is, the more likely it is to receive credit cards from banks
- The selection equation matters for the borrowing, rate and limit estimates
- Wealthier consumers are estimated to borrow less

# Results (continued)

- Higher estimated borrowings fetch higher rates

- Positively-sloped credit supply function

- Higher quality borrowers (presumably with higher credit scores) fetch higher credit card borrowing limits

# Extensions and Future Work

- Lines of credit as optimal contracts for consumers, some work already done for business lines of credit

- A more explicit modeling of the use of credit as means of payment

- Banks earn fees as a result of consumers' use of credit cards for pure transactions purposes – effect on credit limits