Credit Card Competition and Naive Hyperbolic Consumers

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Introduction and Literature

- Credit Card Market is expected to be competitive
  - more than 4000 banks with no significant barrier to entry
  - relatively homogenous good
  - ten largest firms account for only about two-fifths of the market

Introduction and Literature

- Is the profitability at a competitive level?
  - Ausubel (1991)
  - Evans and Schmalensee (2000)
- Previous theories of credit card competitors
  - Brito and Hartley (1995)
  - Parlour and Rajan (2001)
  - DellaVigna and Malmendier (2003)
- Time Inconsistency (Hyperbolic Discounting)
  - Strotz (1956)
  - Phelps and Pollak (1968), Laibson (1997)

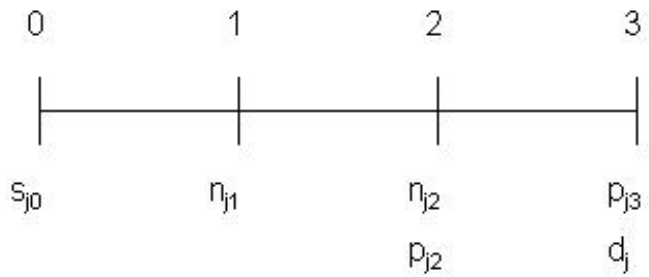
Environment

- Initial period for contracting
- Three period of consumption with one good at each
- Three agents
  - A consumer/borrower
  - Two companies/lenders

Strategic Interaction

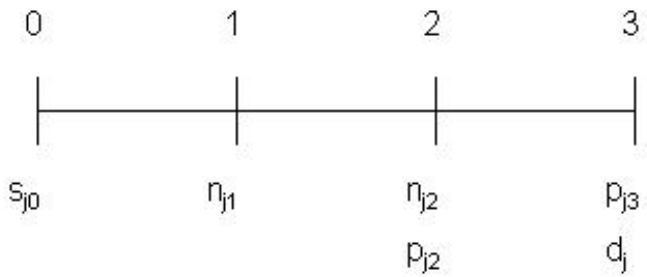
- Two companies make simultaneous contract offers at period zero/initial period
- The consumer decides which ones to choose later in the same period
- Subsequently the consumer also makes two sequential decisions which determines the consumption
- The only strategic game at period zero

Time Line of Events



- n_{j1}^0 : period one believed amount of borrowing on card j determined by period zero self, $\sum_{j=1}^{2} n_{j1}^0 = n_1^0$
- n_{j1}^1 : period one actual amount of borrowing on card j determined by period one self, $\sum_{j=1}^{2} n_{j1}^1 = n_1^1$

Time Line of Events



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Specification of the Consumer

- Consumer has an endowment of m at each period

$$
\begin{aligned}
U_0 &= \beta\delta\left[u(c_1) + \delta u(c_2) + \delta^2 u(c_3) + \delta^2 v(d_1,\ d_2)\right] \\
U_1 &= u(c_1) + \beta\left[\delta u(c_2) + \delta^2 u(c_3) + \delta^2 v(d_1,\ d_2)\right] \\
U_2 &= u(c_2) + \beta\left[\delta u(c_3) + \delta v(d_1,\ d_2)\right]
\end{aligned}
$$

$$
\begin{aligned}
c_1 &= m + n_1 \\
c_2 &= m + n_2 - p_2 \\
c_3 &= m - p_3
\end{aligned}
$$

Specification of the Companies

- Exponential discounted profit maximizers
  $\Pi_j = \delta^3(n_{j1} - p_{j2})r_j$
  - The interest rate on a 1-period loan is exogenously zero
  - Each company j charges an interest rate of r_j for loans more than one period
  - In case of default, the companies lose what they lent

Restrictions on Class of Contracts

- We specify the contracts by credit limit l and interest rate r
- Payment cannot be higher than income and total debt
- Consumer cannot accumulate a debt higher than his credit limit
- If the consumer cannot pay all his debt at the last period, he defaults
- We focus on pure strategy subgame perfect equilibria of this game

Result 1

There is a parameter region in terms of $\beta - \delta$ in which the consumer initially believes that he is not going to pay interest but subsequently decides to change his borrowing plan and pay interest

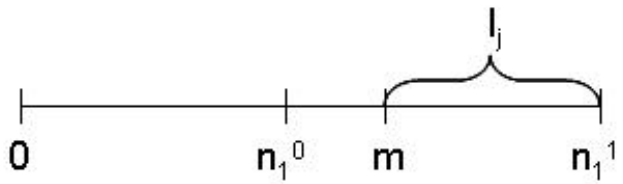
$$n_1^0 < m < n_1^1$$

Remark

$$
\begin{aligned}
\text{If } \max\{l_1,\ l_2\} &\geq n_1^0 > \min\{l_1,\ l_2\} \\
&\Rightarrow \text{consumer accepts only one contract} \\
\text{If } \min\{l_1,\ l_2\} &\geq n_1^0 \\
&\Rightarrow \text{consumer accepts only one contract} \\
\text{If } \max\{l_1,\ l_2\} &< n_1^0 \\
&\Rightarrow \text{consumer accepts both contracts}
\end{aligned}
$$

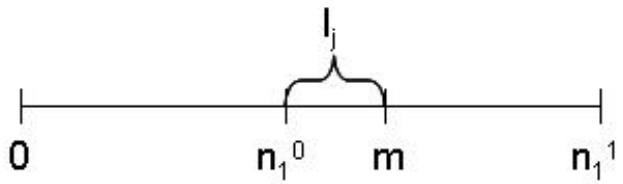
Result 2

There exist positive expected profit equilibria without competition on interest rate and credit limit if a company can offer a credit limit more than the consumer's income without triggering default.



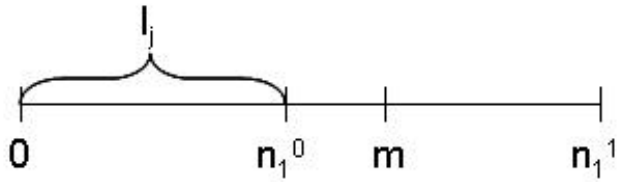
Result 3

There exist zero profit equilibria without competition on interest rate and credit limit if a company can offer a credit limit more than the consumer's initial period believed amount of borrowing and less than the consumer's income without triggering default



Result 4

There exist a zero profit equilibria with competition on interest rate if a company cannot offer more than the consumer's initial period believed amount of borrowing because of the risk of default.



Discussion

- We focus on two aspects of credit cards
- There is no contracting after period zero
- Grace period, small cost for applying a card and one period lag in using a new card are crucial
- Our results hold for $n > 3$ periods
- Our results hold with partially naive consumers as well