

Charging Myopically Ahead

Evidence on Present-Biased Preferences and Credit Card Borrowing

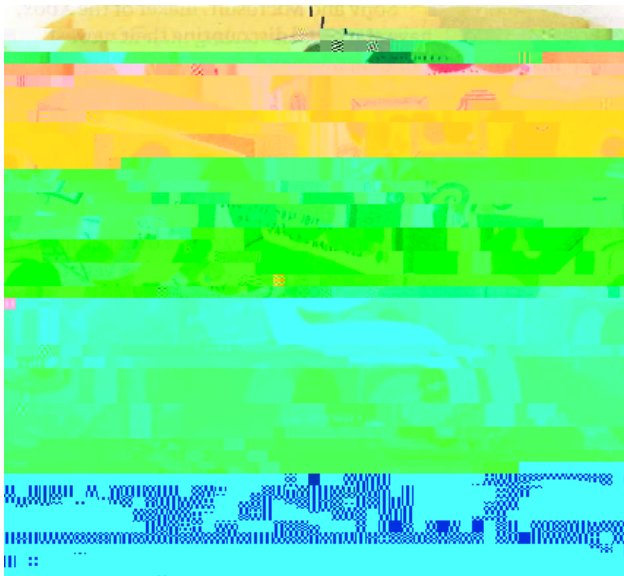
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Federal Trade Commission
November 6, 2008

... for everything else there are credit cards!



Consumer Debt in the US

- 1 Households carry large amount of debt
 - On average, \$12,900 in non-mortgage debt
 - 20% on credit cards (SCF 2004)
 - Consumers owed in total \$930b in revolving credit (Fed, 2007)
- 2 Large heterogeneity in credit card borrowing:
 - Only 58% of cardholders had a balance and, on average, \$5,100 in revolving debt (SCF 2004)

This paper:

Empirically tests whether impatience and present biased preferences explain such heterogeneity in credit card borrowing

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The Effect of Present-Biased Preferences

- We focus on two factors potentially affecting credit decisions:
 - 1 How important is the future? ! the discount factor
 - 2 How important is **instantaneous** gratification? ! present bias
- The effect of present bias:
 - People may value the present too much given their long-run plan ! dynamic inconsistency
 - Overborrowing given long-run plan (discount factor)
 - Evidence on existence of present bias:
 - **Instantaneous** benefits trigger affective decision-making system (McClure et al. 2007)
 - Survey by Frederick et al. (2002)

Should We Care About Present-Bias?

- Individuals borrow too much given their own long-run plan
 - Many individuals claim to have debt problems
 - Growing client base and revenue of counseling industry
- Competition on price might not work (Ausubel 1991, Gabaix and Laibson 2006)
 - Credit card operations are very profitable
- ! Regulation?

- Prominent in behavioral economics literature. Evidence?

Two Previous Empirical Approaches

① Measuring discount rates from aggregate data



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- 1 Measuring discount rates from aggregate data
 - Laibson et al. (2005, 2007)
 - Shui and Ausubel (2005)
 - Skiba and Tobacman (2007)
 - 2 Combining experimentally measured discount rates and *self-reported* spending patterns
 - Harrison et al. (2002)
 - Dohmen et al. (2006)
- As self-reported debt data is particularly problematic, we combine

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Preview of Results

- Field study that combines. . .
 - Choice experiments to measure time preferences
 - Objective credit data from individual credit reports
 - Income information from tax data
- ① Substantial heterogeneity in time preferences and present bias
- ② Long-run discount factors are not associated with revolving debt
- ③ Present bias is associated with revolving debt
- ④ Result is particularly strong for people with at least one credit card

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1 Conceptual Framework

2 Field Study

- Setup
- Credit Data
- Measuring Time Preferences

3 Results

- Present Bias and Credit Card Borrowing
- Borrowing Conditional on Having a Credit Card
- Robustness Tests

4 Conclusions and Future Work

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Setup
Setup



Selection of Subjects

- By design, focus on LMI individuals
 - For LMI families, suboptimal behavior can have severe implications
 - Growing market for marginal borrowers
- In addition, selection of more patient and more sophisticated individuals (Meier and Sprenger 2008b)

Socio-Demographic Characteristics

Variable	N	Mean	s.d.
Age	541	35.9	13.4
Gender (Male=1)	510	0.35	0.48
Race (African-American=1)	491	0.80	0.40
College Experience (=1)	465	0.52	0.50
Dispor]TJ SQ. (=1)	487	0.52	13.0

Credit Data

- In the US, three major credit bureaus collect detailed information

Design of Choice Experiments (1/2)

- Choices between a smaller reward ($\$X$) in period t and a larger reward ($\$Y > \X) in period $t + \Delta > t$

Example: $t = 0, \Delta = 1$: Option A (TODAY) or Option B (IN A MONTH)

Decision (1): \$ 75 guaranteed **today** - \$ 80 guaranteed **in a month**

Decision (2): \$ 70 guaranteed **today** - \$ 80 guaranteed **in a month**

Decision (3): \$ 65 guaranteed **today** - \$ 80 guaranteed **in a month**

Decision (4): \$ 60 guaranteed **today** - \$ 80 guaranteed **in a month**

Decision (5): \$ 50 guaranteed **today** - \$ 80 guaranteed **in a month**

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Design of Choice Experiments (2/2)

- $\$X$ is varied in three time frames:
 - 1 t is the present ($t = 0$) and $t = 1$ is one month ($t = 1$)
 - 2

Payments



Measures of Impatience

Our measures of impatience:

- 1 Individual discount factor (*IDF*)
 - Average monthly discount factor = 0.86
- 2 Present bias
 - 25% are present-biased (= dynamically inconsistent)
 - (2% are future-biased)

Choices in the Experiment and Credit Constraints?

- Measuring time preferences using monetary rewards:
 - Similar to using primary rewards (Reuben et al. 2008)
 - Similar to using response rate data (Chabris et al. 2008)
- Present Bias does not correlate with credit limit
- Present Bias predicts borrowing one-year later
- Controlling for credit limit and FICO does not affect results

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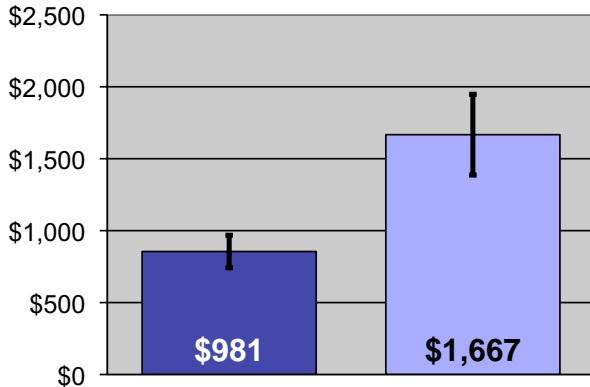
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Empirical Specifications

$$\begin{aligned}
 \text{Borrowing}_i = & \beta_1 \text{Discount Factor}_i + \beta_2 \text{Present Biased}_i \\
 & + \beta_4 Y_i + \beta_5 X_i + \epsilon_i
 \end{aligned}$$

- Borrowing_i : individual i 's balance on revolving accounts
- Discount Factor_i : i 's discount factor (the closer to one the more patient)
- Present Biased_i : Dummy = 1 if individual i is present-biased
- Y_i : dummy for the year of study
- X_i : control variables (age, gender, race, education, future-biased, disposable income and the number of dependents)

Difference in Outstanding Balances & Present Bias



Note: Outstanding Balance on Revolving Accounts. N = 541. Standard errors of the mean. $p < 0.01$ in *t*-test.

Borrowing One Year After Choice Experiments

- Does choice experiments in period t predict borrowing in $t + 1$?
- For 2006 sample, we got access to credit reports one year later

Borrowing One Year After Choice Experiments

Dependent variable: Outstanding balance one year after choice experiment

	(1)	(2)
<i>IDF</i>	5613.736 (7568.913)	2229.050 (7099.805)
Present Bias (=1)	3069.762* (1649.718)	3013.868* (1595.827)
Control Variables	No	Yes
Log Likelihood	-701.50	-694.10
N	123	123

Note: This is table 3. Tobit regressions. Standard errors in parentheses. The sample consists of participants in 2006. Control variables include $\ln(\text{disposable income})$, number of dependents, age, gender, race, college experience, a constant term and dummies for imputed gender, race, education, and future bias.

Level of significance: * $p < 0:1$

Borrowing Conditional on Having a Credit Card

- Commitment not to have a credit card or to have a low credit limit
- ! Control for credit limit > 0 and level of limit
- Firms might charge higher rates for present-biased individuals
- ! Control for FICO score as a proxy for interest rate

Borrowing Controlling for Limit and FICO

Dependent variable: Outstanding balance on revolving accounts

	(1)	(2)
\overline{IDF}	-147.858 (1586.510)	-234.196 (1316.621)
Present Bias (=1)	1842.106*** (526.882)	2101.634*** (432.810)
ln(Credit Limit)		1448.964*** (137.079)
FICO Score		-6.755*** (2.579)
Dummy for Year of Study	Yes	Yes
Control Variables	No	Yes
Log Likelihood	-2057.74	-1993.89
N	269	269

Note: This is Table 5. Tobit regressions. Standard errors in parentheses. Control variables include ln(disposable income), number of dependents, age, gender, race, college experience, future-biased and dummies for imputed income, age, gender, race, and education.

Level of significance: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$



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THANK YOU!

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5 Additional Materials

Information on Credit Behavior

Variable	N	Mean	s.d.
Debt (=1)	541	0.41	0.49
Revolving Balance	541	1,059	2,414
Credit Constrained (=1)	541	0.55	0.50
Revolving Credit Limit	541	4,764	11,850
Amount Able to Borrow	541	3,754	10,709
Having a Revolving Account (=1)	541	0.53	0.50
FICO Score	390	610	84

Panel B in Table 1

Challenges

- “Multiple switchers”?
 - 11% are excluded in the main analysis
 - Inclusion does not change results qualitatively
- Outside borrowing and lending opportunities?
 - Invest money if higher outside interest rate
Interest rate in = 1 > than in = 6 ! but still more patient choices in latter
 - Borrow externally and pay off with lab money
But, not many choose \$Y
- Credit constrained individuals appear impatient?
 - Credit constraints are not correlated with \overline{IDF} or present/future bias
 - Controlling for credit constraints does not change results

Decisions Affected by Outside Borrowing and Lending Opportunities?

- Arbitrage experiment if higher lending opportunities
 - $\ln = 1$ implied interest rate is 27% (2007) and 116% (2006),

