

Consumer Regulation as Whack-a-Mole: Evidence from Credit Card Markets

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Motivation

- Financial innovation and Fintech have significant effect on structure and pricing of retail financial services
 - Retail finance products have grown in ubiquity and complexity over the last decades, see Philippon (2016), Greenwood Scharfstein (2013)
- Credit card issuers have used “big data” for several decades to target borrowers differentially
 - **Positive:** Reduced adverse selection; greater personalization
 - **Negative:** Differential pricing for less sophisticated borrowers via shrouded contracts and design features

Motivation II

- Fluidity and multi-dimensionality of targeting tools creates dynamic challenges for regulators
 - Regulators have to stay vigilant, since financial service firms respond quickly to new regulations
 - Need to better understand the underlying models of consumer psychology and the precise channels to target consumers
- Use CARD Act of 2009 as a laboratory to test how card issuers respond to restrictions in the contract space
 - Eliminate over-limit fees and reduce late fees

Evidence of Behavioral Targeting

- Ru and Schoar (2016): Card companies target consumers based on their financial sophistication (education) with different offers
 - Less educated consumers receive more **back-loaded terms**, and more **shrouded offers**
- Issuers rely more heavily on back-loaded and shrouded contracts when credit risk of consumers is reduced
 - Use state level Unemployment insurance (UI)-shocks that increases cash flows in bad states

Models of the Credit Card Market

- Behavioral view: Myopic consumers do not understand shrouded attributes, Gabaix and Laibson (2006)
 - Firms compete by lowering “visible” costs and charge high costs on hidden features. Myopic consumers subsidize sophisticated ones
 - Alternative micro foundation: Consumers don’t understand their own demand, e.g. DellaVigna and Malmendier (2004, 2006), Heidhues and Koszegi (2010), Grubb (2010)
- Rational view: Credit constraints
 - Credit constrained borrowers want to increase current consumption and postpone charges (late fees, over-limit fee)

Implications for Design and Targeting of Offers

- Offer letter design
 - Rational consumers: Pay attention to all contract terms, no need for shrouding
 - Behavioral consumers: Choice of forms, position in offer letter or language can induce borrowers to ignore unattractive terms and focus on attractive ones; shrouding might have an impact
- Backloading of terms
 - Rational consumers: Target characteristics that proxy for credit constraints, e.g. income or fico
 - Behavioral consumers: Target lack of financial sophistication holding constant all other characteristics

Data

- Data from Comprimedia on credit card mailers sent to US households from 1999 to 2016
 - ~160,000 individual credit card mailers sent to consumers
 - Collected monthly by ~4000 “mock clients” across US, represent demographic distribution credit card owning population
 - Pre-approved credit card solicitations are done by mail, all the information that customers get is **observable to researcher**
- Use OCR and our own algorithms to code the mailers
 - **Visual dimension:** Colors, font, amount of info, complexity of language and where displayed
 - **Hard features:** Fees, interest rate, reward programs

Example:

WITH THE MISTERGOLD CARD YOUR POSSIBILITIES ARE ENDLESS

0% Intro APR for **12 months** on balance transfers and purchases



Dear Sir/Madam,

You're Pre-Approved for a MisterGold Card with a Credit Line up to \$3,000.

Isn't it time you get the credit you deserve? Your credit history shows that you're a perfect match for this card. We offer you unmatched convenience, an exclusive rewards program, no annual fee and superb client service.

Enjoy Premium 0% Intro APR for the First 12 Months.

Enjoy a 0% introductory APR for 12 months on purchases and balance transfers after your account is opened – after that, a variable APR, currently 18.99%. That's a year of savings!

Enjoy the Benefits of Being a MisterGold Card Member.

Earn one point for every dollar you spend on purchases. You can redeem points for a statement credit towards any travel purchase you have made on the Card. It gets better. With the MisterGold card, there is no annual fee and you have the flexibility to pay for your purchases over time.

Act Now and Get Your MisterGold Card.

Don't miss out on this exceptional opportunity to enjoy the benefits and buying power of your MisterGold card with a credit line up to \$3,000.

We look forward to welcoming you as a new XYZ Bank member.

Sincerely,

Julia Squire
Senior Vice President

It's All Yours

- Gold Benefits
- Credit up to **\$3000**
- No Annual Fee
- **100%** Satisfaction Guaranteed

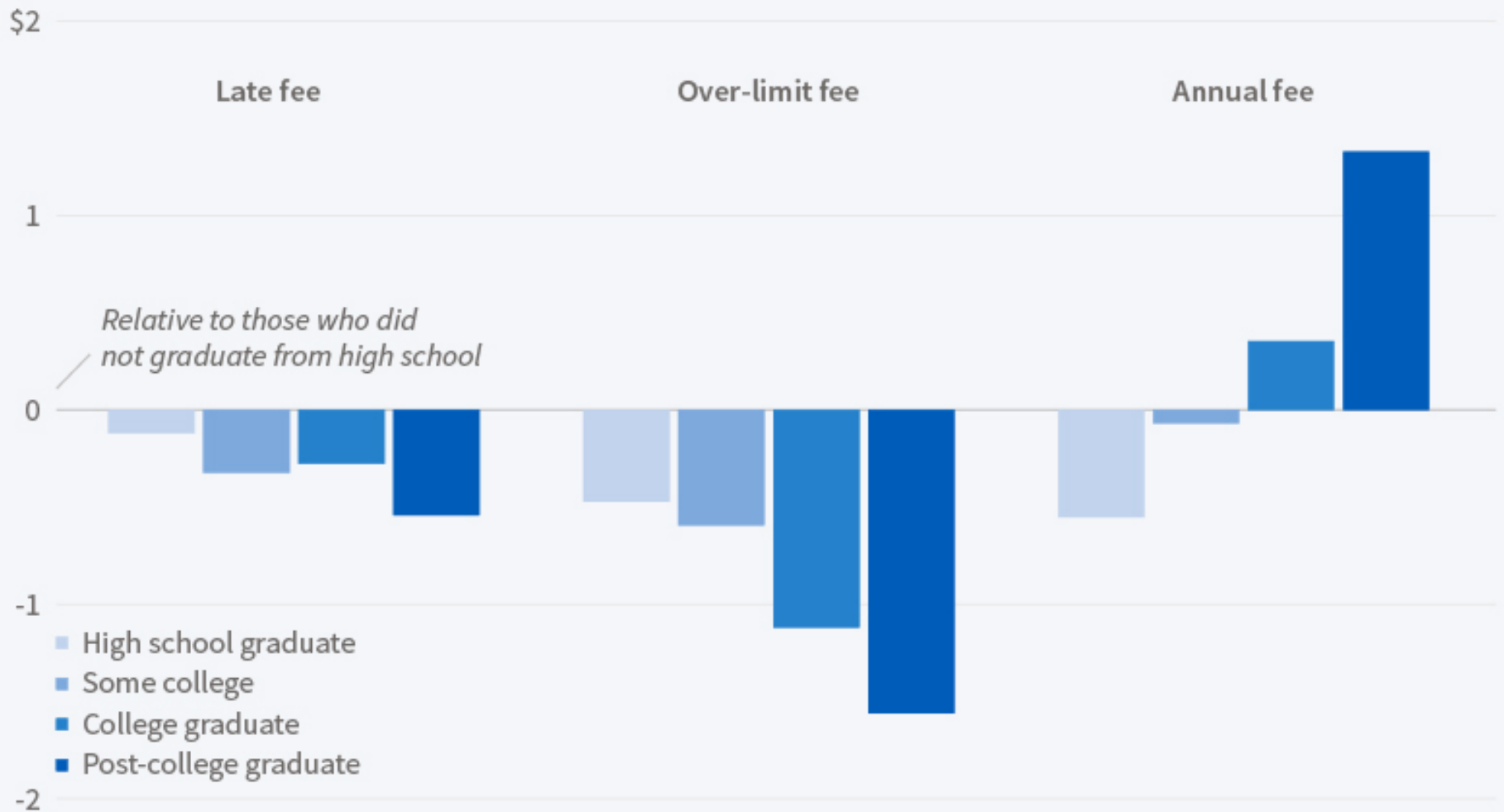


Findings: Backloading and Shrouding

- Back-loaded cards offered to less educated consumers
- Card offers show strategic placement of terms
 - Attractive features on first page, large font, bold, or in color
- Shrouding more pronounced for less educated consumers

Credit Card Offers and Education

Less-educated more likely to be offered cards with higher late and over-limit fees



Source: Authors' calculations using Compremedia data

Differential Targeting of Consumers

Dependent Variable	1 APR	2 Late Fee	3 Default APR	4 Over-limit Fee	5 Annual Fee	6 Intro_APR	7 Backward
FFR	0.736*** (0.004)	0.067*** (0.007)	1.495*** (0.004)	-0.349*** (0.008)	0.515*** (0.023)	-0.013*** (0.000)	0.007*** (0.001)
Education_2	-0.156*** (0.030)	-0.169*** (0.048)	-0.151*** (0.025)	-0.272*** (0.047)	-0.528*** (0.168)	-0.007** (0.003)	0.008 (0.008)
Education_3	-0.072** (0.032)	-0.395*** (0.048)	-0.144*** (0.027)	-0.386*** (0.051)	-0.177 (0.178)	-0.019*** (0.003)	-0.008 (0.008)
Education_4	-0.234*** (0.032)	-0.366*** (0.050)	-0.217*** (0.028)	-0.790*** (0.053)	0.342* (0.185)	-0.030*** (0.003)	-0.036*** (0.009)
Education_5	-0.137*** (0.034)	-0.652*** (0.056)	-0.279*** (0.030)	-1.179*** (0.060)	1.290*** (0.212)	-0.048*** (0.003)	-0.087*** (0.010)
Fixed Effects	Y	Y	Y	Y	Y	Y	Y
Observations	785,950	798,936	586,259	749,306	800,546	808,430	746,656
R-squared	0.341	0.151	0.507	0.203	0.265	0.151	0.038

Differential Targeting of Design

Dependent Variable	9 Back_LateFee	10 Back_APR_ Default
FFR	0.007*** (0.000)	0.086*** (0.001)
Education_2	-0.010*** (0.002)	-0.010*** (0.003)
Education_3	-0.014*** (0.002)	-0.022*** (0.003)
Education_4	-0.020*** (0.002)	-0.022*** (0.003)
Education_5	-0.026*** (0.002)	-0.037*** (0.004)
Fixed Effects	Y	Y
Observations	587,292	587,292
R-squared	0.291	0.261

Targeting Through Readability

VARIABLES	1 Fog_Front	2 Grade_Front	3 Fog_Back	4 Grade_Back	5 Fog Front-Back	6 Grade Front-Back	7 Intro_APR_Size Front
FFR	-0.020*** (0.002)	0.038*** (0.002)	0.056*** (0.002)	0.004*** (0.001)	-0.022*** (0.003)	0.052*** (0.002)	-0.229*** (0.004)
Education_2	-0.020 (0.013)	-0.002 (0.011)	-0.066*** (0.011)	-0.018** (0.007)	0.044*** (0.015)	0.014 (0.012)	-0.013 (0.024)
Education_3	-0.012 (0.014)	0.008 (0.011)	-0.086*** (0.011)	-0.019** (0.007)	0.068*** (0.016)	0.024* (0.013)	0.004 (0.026)
Education_4	-0.013 (0.014)	0.016 (0.012)	-0.124*** (0.012)	-0.045*** (0.007)	0.109*** (0.017)	0.059*** (0.014)	-0.038 (0.026)
Education_5	0.033** (0.015)	0.041*** (0.013)	-0.138*** (0.013)	-0.039*** (0.008)	0.174*** (0.018)	0.080*** (0.015)	-0.085*** (0.030)
Cell Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	561,053	559,397	593,717	592,784	556,456	554,307	166,279
R-squared	0.184	0.138	0.121	0.111	0.191	0.134	0.272

Finding II: Shock to Credit Risk

- Use changes in state level unemployment insurance (UI)
 - Reduces exposure to one of the largest negative economic shock that customers might suffer
 - UI increased in staggered way across US states during 2000s
 - Instrument from Hsu, Matsa and Meltzer (2014)
- Standard Difference in Difference estimator

$$Y_{i,t} = UI_{dummy} + UI_{pre-trend} + CellFE + BankFE + TimeFE + \varepsilon$$

- UI dummy for states where the change in UI is >10% (first jump)
- Keep offers for one year before after jump
- Checked many other cut-offs as well

Unemployment Insurance Shock

Panel A	1	2	3	4	5	6
	APR	Default APR Dummy	Late Fee	Annual Fee	IntroAPR All	Backward
FFR	0.421*** (0.043)	-0.048*** (0.003)				0.006 (0.005)
UI	-0.276 (0.353)	0.044 (0.028)	0.909** (0.389)	0.271 (0.454)	0.123** (0.056)	0.061* (0.035)
UI_Pre_3M	-0.005 (0.120)	0.022 (0.021)	0.655*** (0.185)	-0.036 (0.361)	0.140* (0.077)	0.050 (0.040)
UI_Pre_6M	0.156 (0.269)	-0.068*** (0.024)	-0.204 (0.450)	-0.159 (0.714)	0.066 (0.043)	0.058** (0.024)
UI_Small	-0.052 (0.158)	-0.015 (0.015)	0.125 (0.402)	-1.321 (0.925)	0.065 (0.042)	0.020 (0.034)
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	93,224	93,491	92,876	93,215	93,940	90,700
R-squared	0.263	0.410	0.179	0.193	0.121	0.100

UI and Design Features

Panel A	7	8	9
	Color	DefaultAPR MainPage	LateFee MainPage
FFR			
UI	0.027** (0.012)	-0.011*** (0.003)	-0.012** (0.005)
UI_Pre_3M	0.015 (0.017)	-0.005 (0.005)	-0.010 (0.009)
UI_Pre_6M	0.012 (0.008)	-0.004 (0.004)	-0.001 (0.010)
UI_Small	0.010 (0.012)	-0.006 (0.004)	0.012 (0.010)
Fixed Effects	Yes	Yes	Yes
Observations	81,968	46,161	46,161
R-squared	0.038	0.054	0.029

In sum ..

- Card issuers target households' behavioral biases
 - Strategic placement of attractive features and shrouding of less attractive features
 - Unsophisticated households: receive more back-loaded fees and shrouded offers
- Reduced credit risk (UI shock) leads to more back-loaded and shrouded credit terms
 - Card issuers take into account trade-off between short term fees and long-term exposure to worse credit risk
- Suggests issuers use “naiveté based price discrimination”

Credit Card Accountability Responsibility and Disclosure Act (CARD)

- Comprehensive credit card reform legislation that aims "to establish fair and transparent practices relating to the extension of credit." Main provisions:
 - Eliminate "fee harvester cards": Limit late fees and over limit fees
 - Give people enough time (at least 21 days) to pay their bills
 - No retroactive rate increases
- Passed by Congress in May 2009, implemented in 2 phases
 - May 2009 to February 2010: increased timeline and no retroactive rate
 - February 2010 and onward: regulatory limits on the ability of banks to charge late fees and over-limit fees.
 - **Fees reset at end of Intro APR period and earlier if HH pays late!**

Approach: CARD Act

- Use phased implementation of CARD act
 - Reduces some dimension of back-loaded pricing
 - E.g. late fees, over-limit fees
 - Heterogeneity through
 - prior reliance of a card campaign on late fees and over limit fees
 - Sophistication levels
- Standard Difference in Difference estimator

$$Y_{i,t} = CRD_D * PriorExposure + CellFE + BankFE + TimeFE + \varepsilon$$

- Keep offers from 2005 to 2015
- Checked many other cut-offs as well

Overall Findings

- Card issuers target households based on education levels
 - Unsophisticated: more backward loaded fees, teaser rates and more shrouded attributes
 - Sophisticated: less backward loaded pricing
- CARD act changes the nature of backward loading
 - Regulation restricts over-limit and late fees
 - APR increases, but use of Intro-APR pricing goes up especially for less educated customers
 - Salience is shifted to Intro APR

Thank you