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

Antoinette Schoar, MIT, ideas42 and NBER
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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 Compremedia 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:

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

Late fee

Over-limit fee

Annual fee

$2

1

Relative to those who did not graduate from high school

0

-1

- High school graduate
- Some college
- College graduate
- Post-college graduate

-2
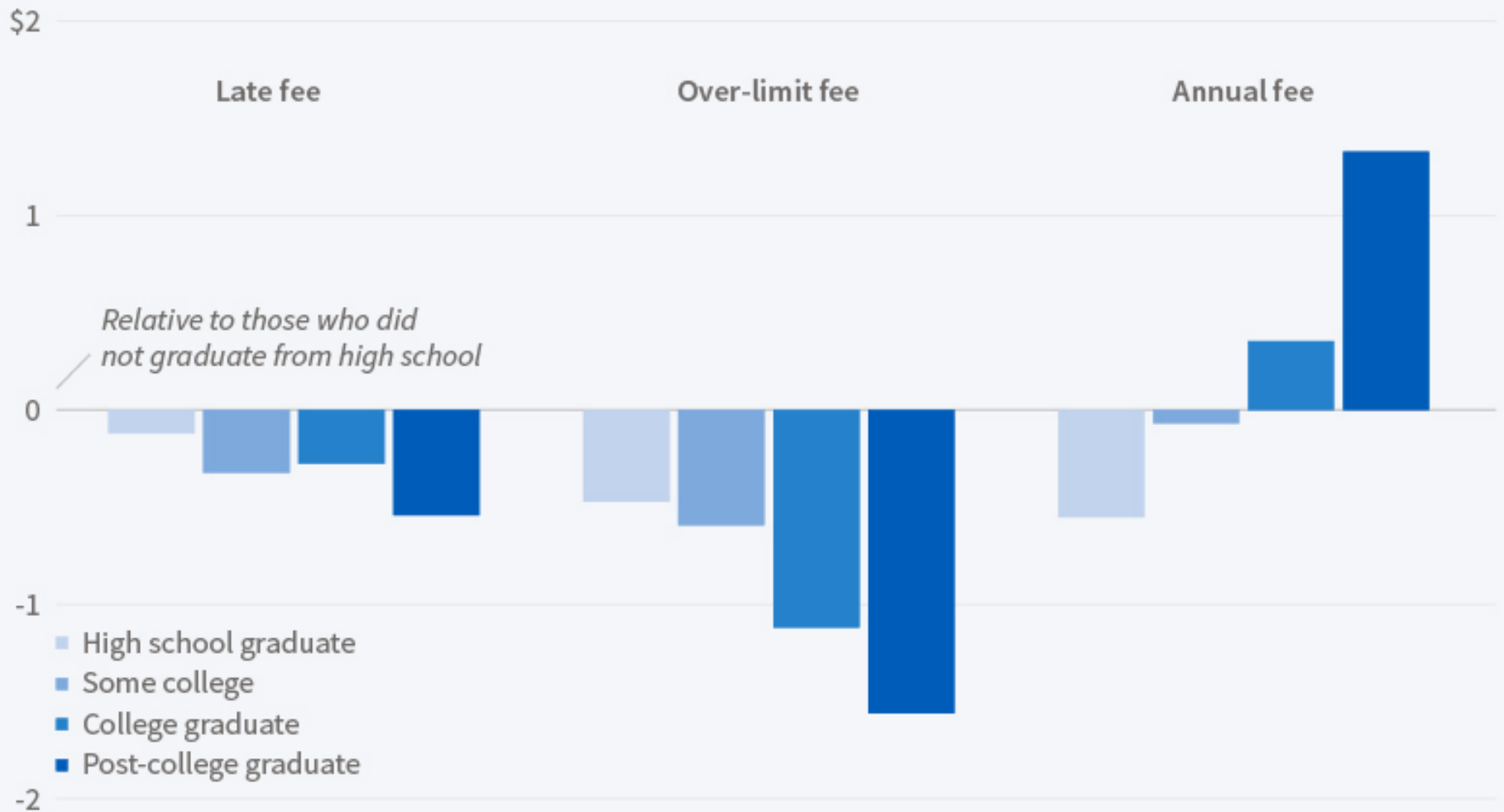
Source: Authors' calculations using Compremedia data

Differential Targeting of Consumers

Dependent Variable	1	2	3	4	5	6	7
	APR	Late Fee	Default APR	Over-limit Fee	Annual Fee	Intro_APR	Backward
FFR	0.736***	0.067***	1.495***	-0.349***	0.515***	-0.013***	0.007***
	(0.004)	(0.007)	(0.004)	(0.008)	(0.023)	(0.000)	(0.001)
Education_2	-0.156***	-0.169***	-0.151***	-0.272***	-0.528***	-0.007**	0.008
	(0.030)	(0.048)	(0.025)	(0.047)	(0.168)	(0.003)	(0.008)
Education_3	-0.072**	-0.395***	-0.144***	-0.386***	-0.177	-0.019***	-0.008
	(0.032)	(0.048)	(0.027)	(0.051)	(0.178)	(0.003)	(0.008)
Education_4	-0.234***	-0.366***	-0.217***	-0.790***	0.342*	-0.030***	-0.036***
	(0.032)	(0.050)	(0.028)	(0.053)	(0.185)	(0.003)	(0.009)
Education_5	-0.137***	-0.652***	-0.279***	-1.179***	1.290***	-0.048***	-0.087***
	(0.034)	(0.056)	(0.030)	(0.060)	(0.212)	(0.003)	(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***	0.086***
	(0.000)	(0.001)
Education_2	-0.010***	-0.010***
	(0.002)	(0.003)
Education_3	-0.014***	-0.022***
	(0.002)	(0.003)
Education_4	-0.020***	-0.022***
	(0.002)	(0.003)
Education_5	-0.026***	-0.037***
	(0.002)	(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***	0.038***	0.056***	0.004***	-0.022***	0.052***	-0.229***
	(0.002)	(0.002)	(0.002)	(0.001)	(0.003)	(0.002)	(0.004)
Education_2	-0.020	-0.002	-0.066***	-0.018**	0.044***	0.014	-0.013
	(0.013)	(0.011)	(0.011)	(0.007)	(0.015)	(0.012)	(0.024)
Education_3	-0.012	0.008	-0.086***	-0.019**	0.068***	0.024*	0.004
	(0.014)	(0.011)	(0.011)	(0.007)	(0.016)	(0.013)	(0.026)
Education_4	-0.013	0.016	-0.124***	-0.045***	0.109***	0.059***	-0.038
	(0.014)	(0.012)	(0.012)	(0.007)	(0.017)	(0.014)	(0.026)
Education_5	0.033**	0.041***	-0.138***	-0.039***	0.174***	0.080***	-0.085***
	(0.015)	(0.013)	(0.013)	(0.008)	(0.018)	(0.015)	(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 APR	2 Default APR Dummy	3 Late Fee	4 Annual Fee	5 IntroAPR All	6 Backward
FFR	0.421***	-0.048***				0.006
	(0.043)	(0.003)				(0.005)
UI	-0.276	0.044	0.909**	0.271	0.123**	0.061*
	(0.353)	(0.028)	(0.389)	(0.454)	(0.056)	(0.035)
UI_Pre_3M	-0.005	0.022	0.655***	-0.036	0.140*	0.050
	(0.120)	(0.021)	(0.185)	(0.361)	(0.077)	(0.040)
UI_Pre_6M	0.156	-0.068***	-0.204	-0.159	0.066	0.058**
	(0.269)	(0.024)	(0.450)	(0.714)	(0.043)	(0.024)
UI_Small	-0.052	-0.015	0.125	-1.321	0.065	0.020
	(0.158)	(0.015)	(0.402)	(0.925)	(0.042)	(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 Color	8 DefaultAPR MainPage	9 LateFee MainPage
FFR			
UI	0.027**	-0.011***	-0.012**
	(0.012)	(0.003)	(0.005)
UI_Pre_3M	0.015	-0.005	-0.010
	(0.017)	(0.005)	(0.009)
UI_Pre_6M	0.012	-0.004	-0.001
	(0.008)	(0.004)	(0.010)
UI_Small	0.010	-0.006	0.012
	(0.012)	(0.004)	(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