Market Power in Credit Markets

Manolis Galenianos [1] Tzuo Hann Law [2] Jaromir Nosal [2]

[1]Royal Holloway

[2]Boston College

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Regulating the Credit Card Market

- Interest in regulating consumer finance
  - CARD Act, increased oversight post-GFC (CFPB)
  - focus on direct regulation of interest rates via universal caps (AOC, Sanders)

    [Maimbo and Henriquez Gallegos (2014)]
- Credit card market: features consistent with imperfect competition
  - highly profitable relative to general banking
  - pricing and profitability varies by market segments

    Evans and Schmalensee (2005), Herkenhoff and Raveendranathan (2021), Raveendranathan (2020), Ausubel (1991), Agarwal, Chomsisengphet, Mahoney, Stroebel (2015), Cuesta and Sepulveda (2021), Federal Reserve, CFPB

Regulating Credit Cards

- Evaluation: do we know if and how it matters?
- Need: model capturing salient features of the market
  - Endogenous markups
  - Dynamic nature of the market
    $\rightarrow$ future opportunities affect today's contracts
- Study effect of interest rate caps in a quantitative dynamic model
  - significant welfare gains from regulation
  - driven by large GE effects

  $\rightarrow$ regulating small fraction of contracts affects entire interest rate distribution

Quantitative Model

- Based on standard incomplete markets consumption smoothing model
  Chatterjee, Corbae, Nakajima, Rios-Rull (2007), Livshits, MacGee, Tertilt (2007)
  - stoch. income y and one-period loans with option of default: $qb' \to b'$
- New here: competitive search with outside option
  - standard competitive search equilibrium ...
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- Household not matched in the competitive search market
  - get a take-it-or-leave it high markup, monopolistic offer
  - as long as surplus is positive, there is a loan
  - friction does not work through extensive margin, but pricing

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  $\Rightarrow$ mkt. tightness pins how much of surplus is captured by lender
- Has significant quantitative impact on results
  - pricing effects instead of extensive margin of credit

Competitive search + endogenous outside option

- Profits if delivering value v to household $x = (b, y)$

$$\Pi_x(v) = \max_{q,b'} \; -qb' + \frac{\rho(b', y)b'}{1+r} \text{ s.t.}$$

$$v = u(y - b + qb') + \beta(1-\delta) \int_{y' \in Y} \max[V^D, V^B, V^S] dG(y', y) - V^M(b, y)$$

$\rightarrow$ $V^M(b, y)$ is value of outside option

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future outside options $V^M(b', y')$ captured by $\rho(b', y)$ (cheaper rollover)

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- Free entry pins eqm. contracts offered Match prob. $\times \Pi_x(v_x(q^*, b'^*)) = \kappa$

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- Limit of max. v: competitive model

$$-qb' + \frac{\rho(b', y)b'}{1+r} = \kappa.$$

→ pricing pinned down solely by repayment probability $\rho(b', y)$

Quantitative Results

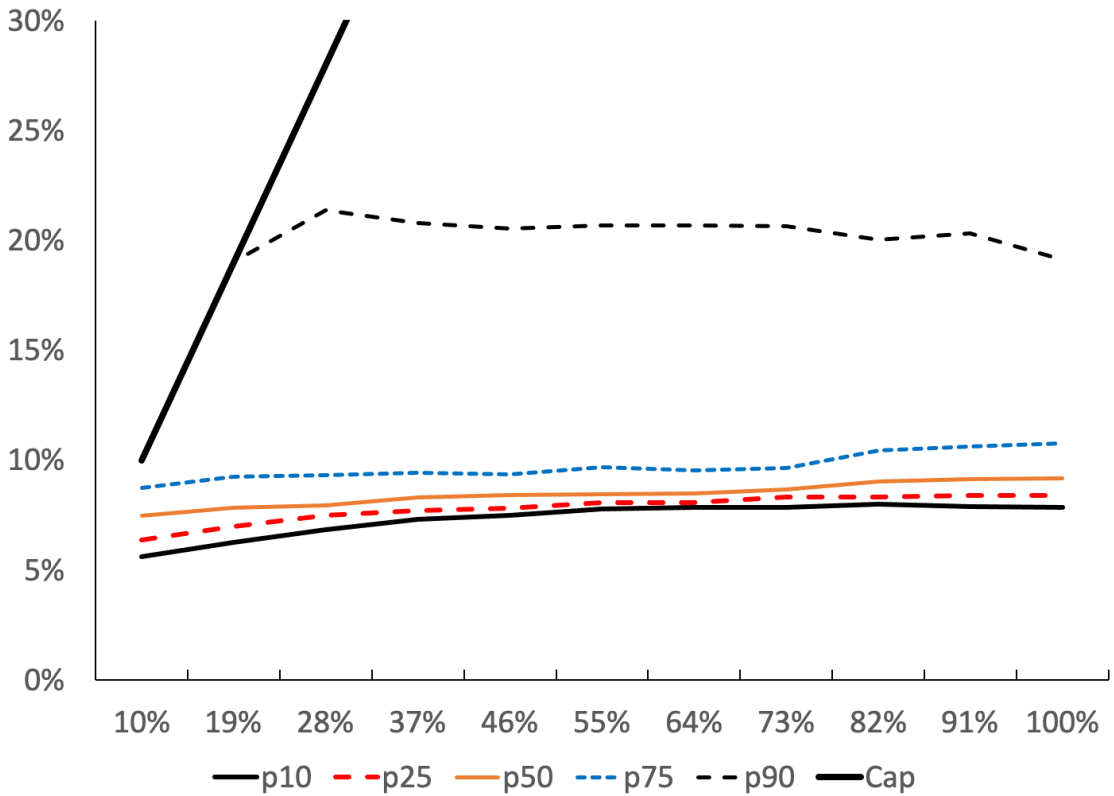
- Parameterize competitive and benchmark models [parameterization]
  - two income types based on education: High School and College [Guvenen (2009)]
  - quantitative and qualitative differences
- Aggregates ← can be parameterized to be very similar
  averages: debt, bankruptcy, interest rates, etc. [aggregate statistics]
- Distributional ← different [profitability by risk] [R distribution]
  - profitability high for high risk borrowers (profit per dollar of debt)

  → less creditworthy borrowers generate lower surplus
  → less entry ⇒ less competition
  → higher markups and realized ex-post profits (accounting for default cost)

  in competitive model, high for low risk borrowers
  - interest rates: higher upper tail in benchmark

Policy Experiment: Interest Rates

- Introduction of universal interest rate cap: 100% to 10%
- Benchmark: downward shift in interest rate distribution
  - cheaper to roll-over debt in future → safer debt today
  - more borrowing today and less default (5.12 to 2)
  - 85% of original contracts strictly under 10% cap nevertheless adjust down



Policy Experiment: Benchmark

- Use and access to credit increases
  - debt/income: $9.05\% \rightarrow 11.4\%$
  - fraction revolving: $42\% \rightarrow 48.7\%$

[Figure Debt and Default] [Figure Welfare] [Figure By Education]

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- Welfare gain/loss at initial $b = 0$
  - average gain of 0.5-0.7% of lifetime consumption
  - up do 20% gain for lowest incomes [figure]
  - those win most from credit access due to mean-reversion

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- Two education groups
  - high school: large drop in bankruptcy
  - college: large rise in debt

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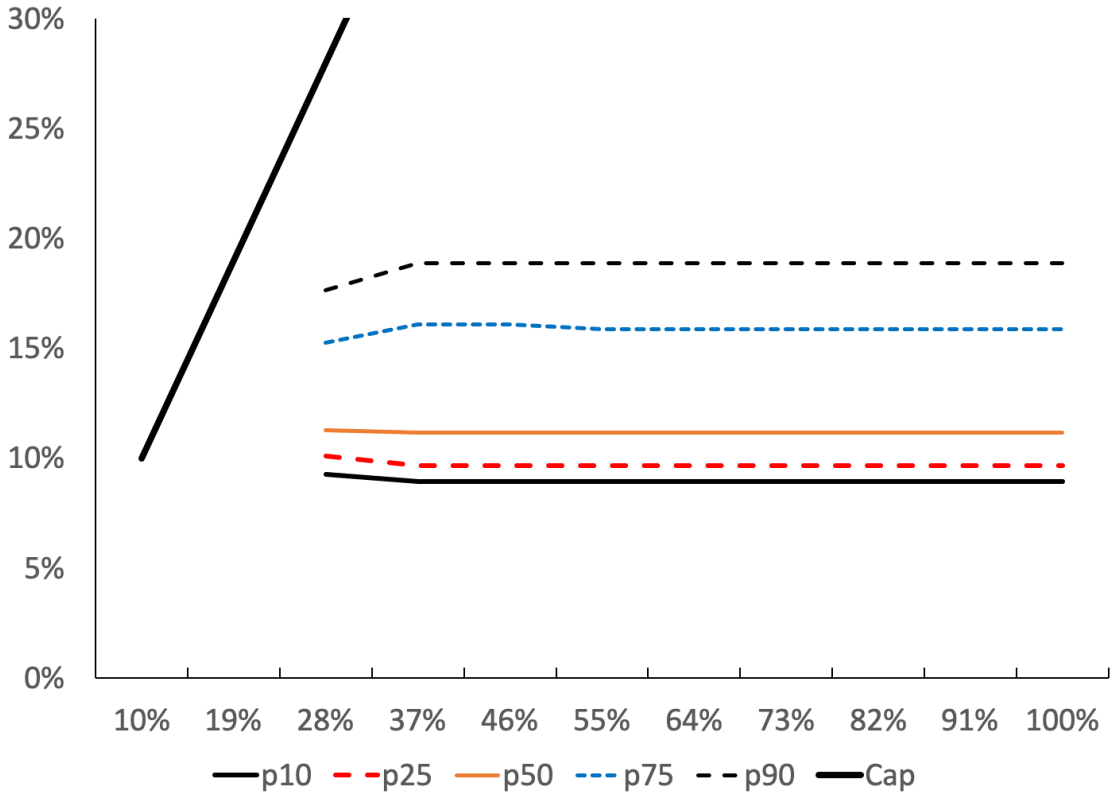
Policy Experiment: Alternative Models

- Competitive: distribution compresses as highest rate contracts close down



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Policy Experiment: Alternative Models

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- Welfare gain/loss at initial $b = 0$
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  - up do 20% loss for lowest incomes [figure]
- Model with no high markup option gives similar results to competitive [Raveendranathan and Stefanidis (2022)]
  - smaller welfare loss, but qualitatively same patterns
  - dynamic GE effects crucial
  - helps understand the mechanism behind results in literature

[Figure Debt and Default] [Figure Welfare] [No High Markup Model]

What is Behind the Results?

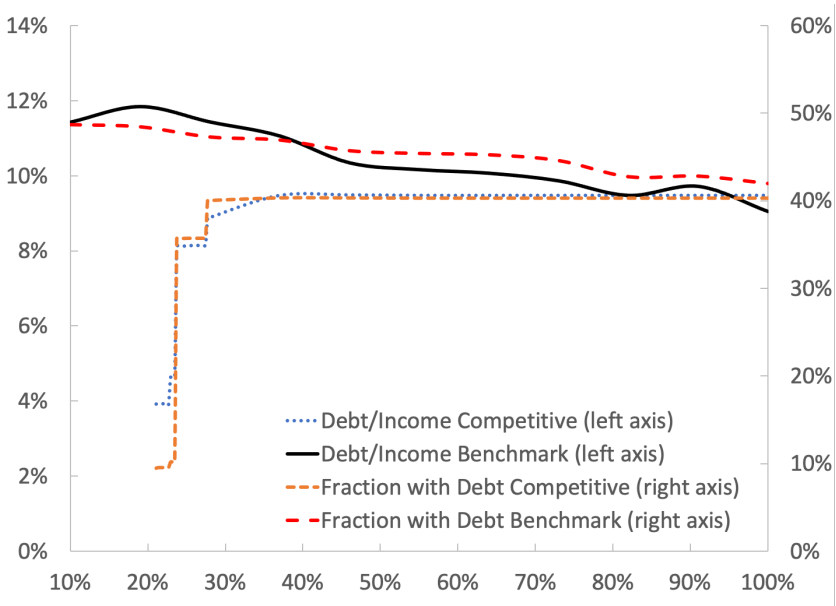
- Counterfactuals help us pin down crucial elements of the mechanism
- Changing meeting probabilities: almost no effect [figure]
- Direct effect of monopoly pricing versus indirect effect on market contracts
  - fixing at meeting prob. at 1, i.e. no monopoly contract [figure]
  - indirect effect accounts for 56% of debt and all of fraction borrowing

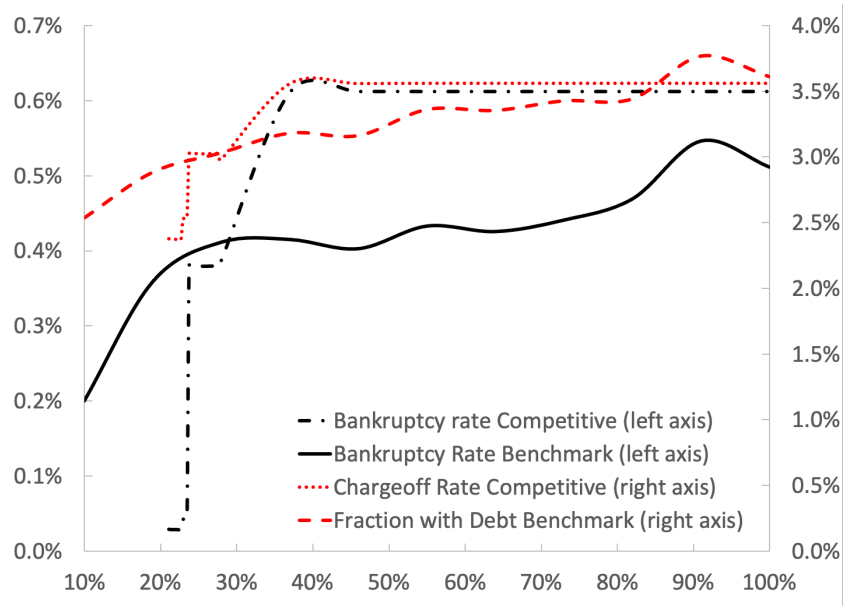
Conclusions

- Study impact of regulating market power in credit markets
  - model explicit outside options that give endogenous markups
- Quantitatively interest rate caps
  - increase credit on intensive and extensive margin
  - lower bankruptcy and chargeoffs
  - give large welfare gains
  - regulation hits minority of contracts directly
    most of effects due to GE
- Details of competition matter
  - shutting down dynamic GE effects reverses conclusions
- In paper: can we provide more evidence supporting variable markups
  - analytics+data support it. our model an implementation

Extra Slides

Experiment: debt and default





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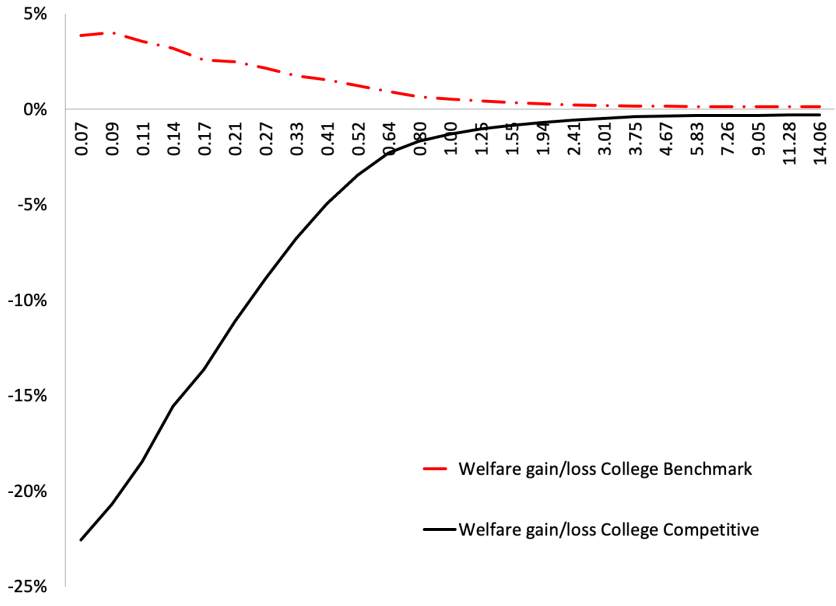
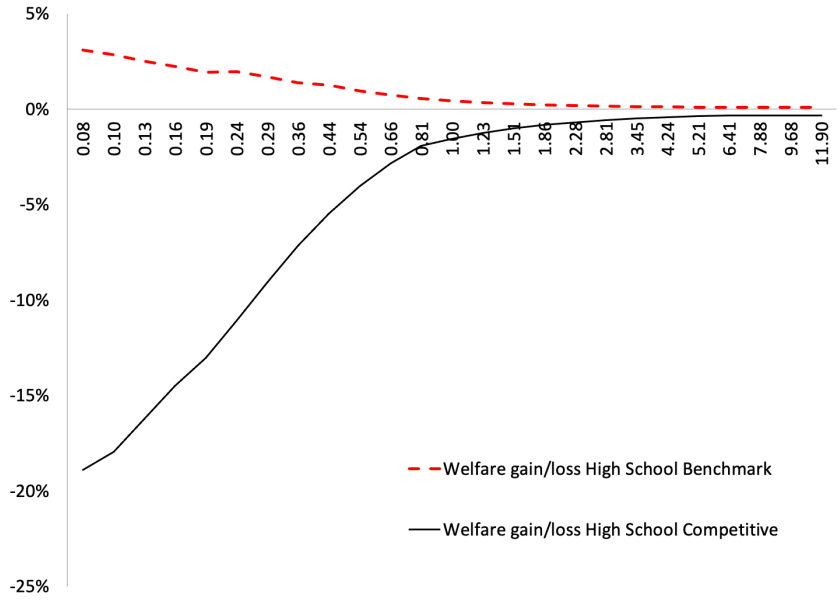
Experiment: welfare

- Welfare gain/loss 10% interest cap relative to benchmark as a function of income (relative to group specific median).





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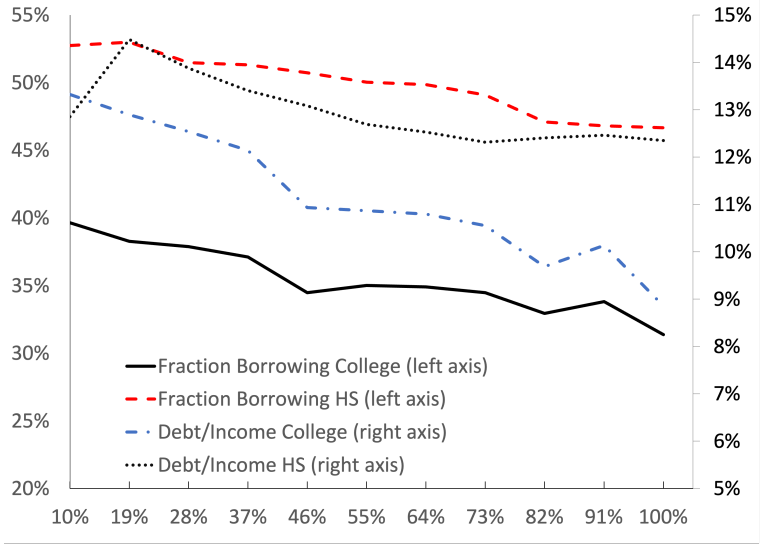
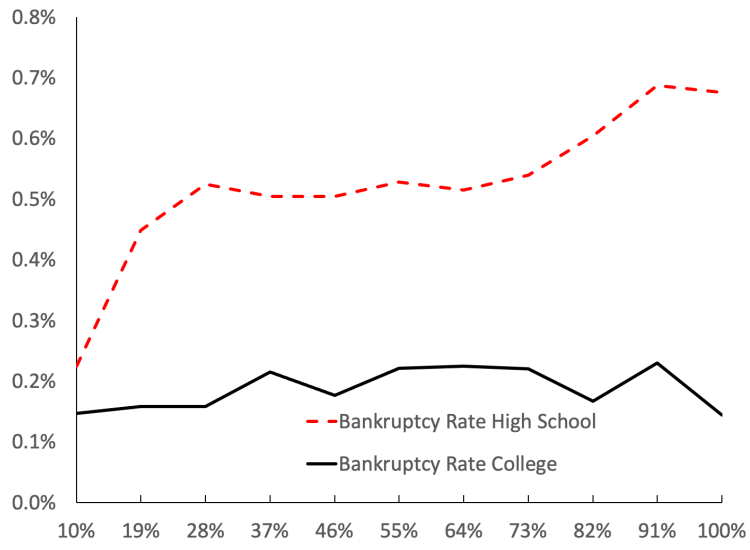
Experiment: debt and default by education

- Results by education group





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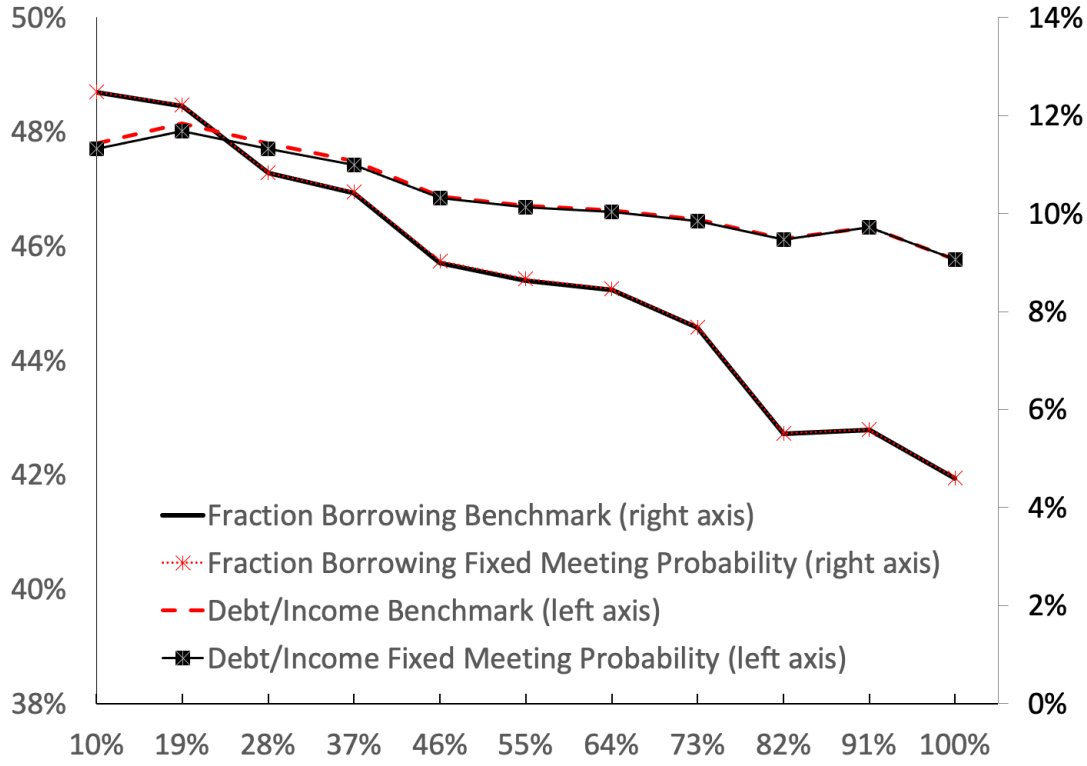
Distributions: debt



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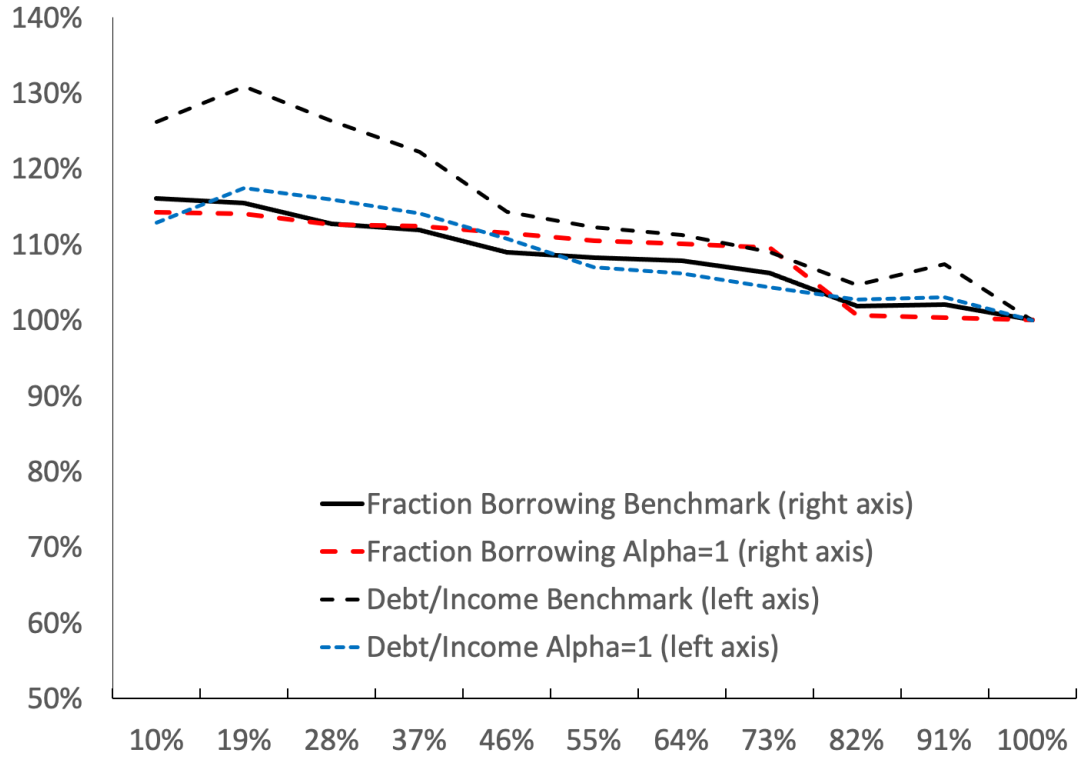

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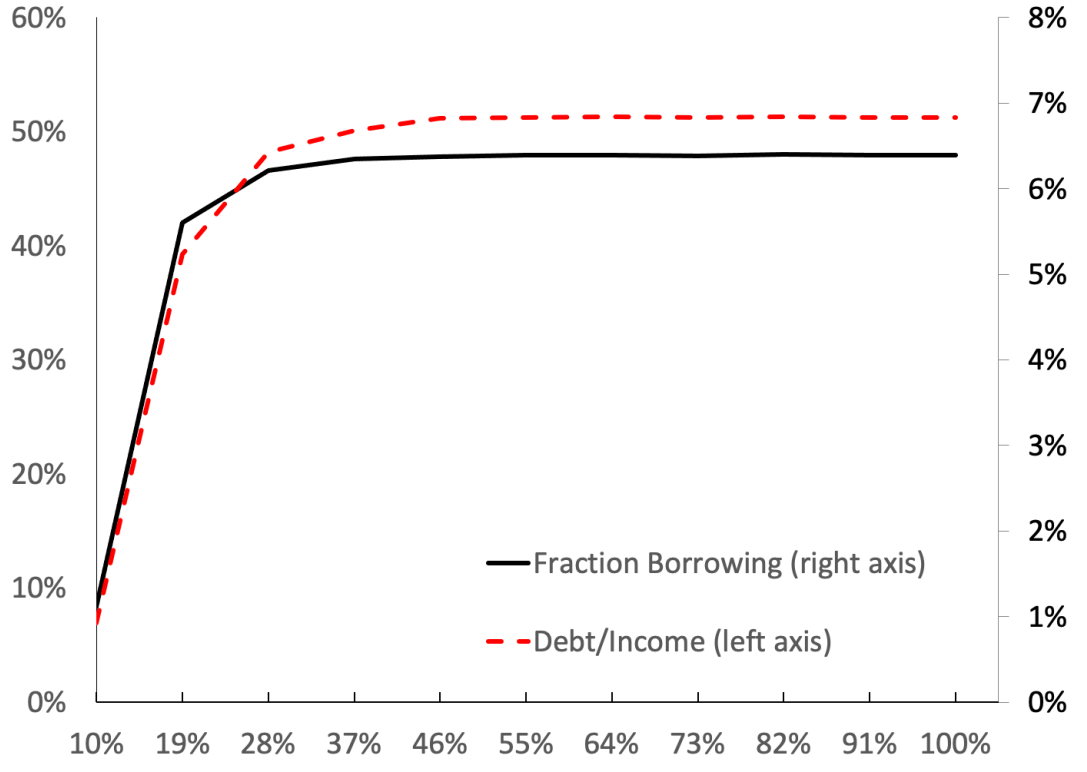
Distributions: debt

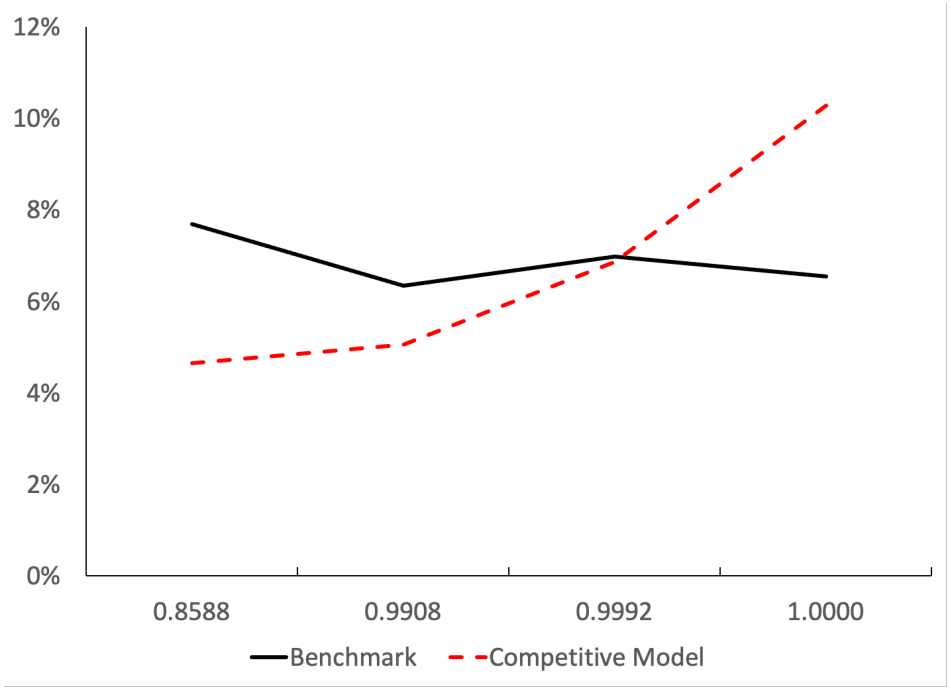
- Debt in the No High Markup Option model



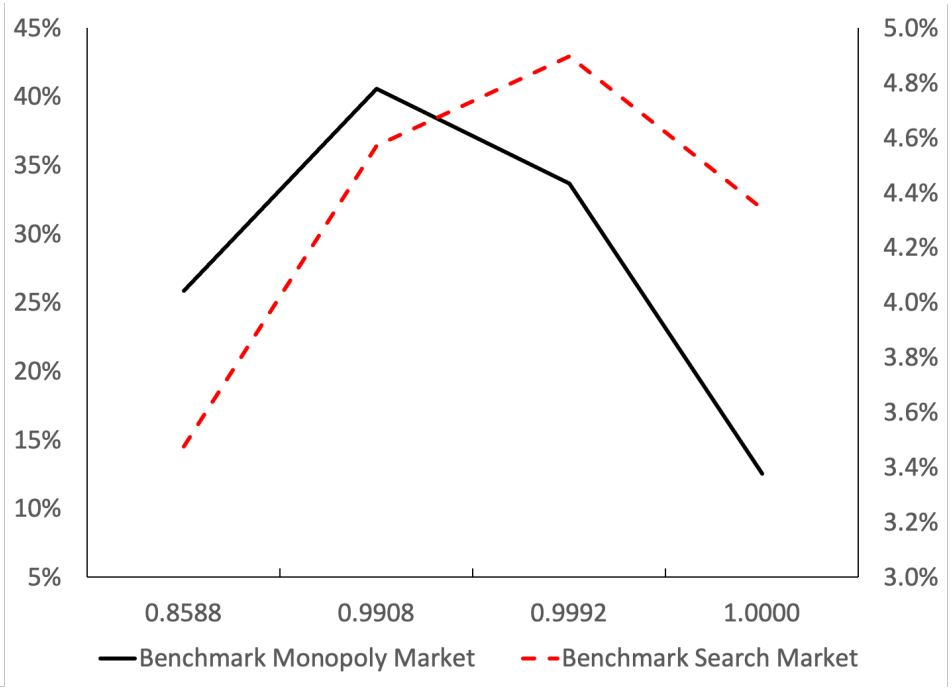
[back robustness] [back results]

Results: Profitability

- Profitability (profit per unit of debt) by repayment probability



(a) Benchmark and Competitive models



(b) Search Market and Monopoly Market

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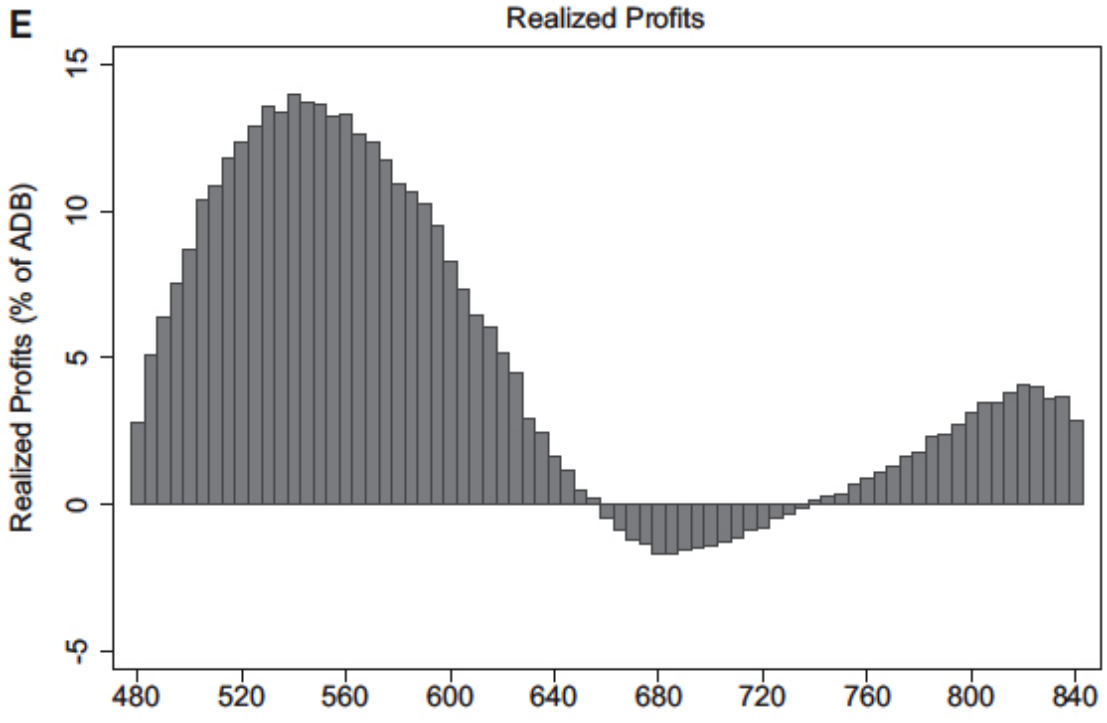
Motivation: Heterogeneity by Risk

- Agarwal, Chomsisengphet, Mahoney, Stroebel (*QJE* 2015)



- Analytics in paper
  - Competitive: must be upward sloping
  - Monopoly power: can be downward sloping

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Parameterization

- Period: one year, CRRA utility, $u(c) = \frac{c^{1-\sigma}}{1-\sigma}$, risk aversion $\sigma = 2$
- Risk-free rate $r = 1.44\%$ (1990-2004 real rate of 3-month T-bills)
- Usury law, 100% per annum, $q_{min} = 0.5$
- Death hazard rate, $\delta = 0.02$ (life span 50 years)
- Matching function

$$m(H, L) = LH(L^\gamma + H^\gamma)^{-1/\gamma}$$

$\gamma = 1$

[back]

Parameterization

- Income process taken from Guvenen (*RED* 2009)

$$\begin{aligned} \ln y &= \ln z + \eta \\ \ln z &= \rho \ln z_{-1} + \varepsilon \end{aligned}$$

- 2 education groups: *High School* [69%] and *College* [31%]
- 25-state discretized Markov process for each group (Rouwenhorst 1995)

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- 25-state discretized Markov process for each group (Rouwenhorst 1995)
- Δ_i, β_i, κ for $i = \{HS, C\}$, to match
  - debt/income ratio by i [12.45%, 6.7%]
  - fraction with revolving balance by i [39%]
  - bankruptcy rate by i [7.73,1.54]
- Data counterparts: aggregate data + SCF 2001-2004
- Not targeted:
  charge-off rate, interest rate, profit margins, acquisition costs

[back]

Results: Distribution of Interest Rates

Moments	p10	p50	p90	p95
Benchmark	7.8	9.2	19.1	44
Competitive	8.9	11.2	18.9	20
Galenianos and Gavazza (2021)				
sub-prime	11.9	20.65	30	
near-prime	10.5	18.24	29	
prime	9.9	16.7	26	
Agarwal et al.(2015)				
fee-inclusive charges highest risk				45^a

^{a} From Agarwal et al. (2015), Table III and is the income (interest and fee charges) as a fraction of average daily balance for accounts below FICO score of 620.

[back]

Results: Aggregates

Moments	Data 2000-04	Benchmark	Competitive
Debt/Income %	9.24	9.05	9.5
Bankruptcies per 1000	5.81	5.12	6.12
Revolvers %	39.7	42	40
Interest rates %	13-15	14	13
ChargeOffs %	4.9	3.6	3.6

- Model fit education by education group similar: sum of sq. deviations
- Difference: acquisition costs $[\kappa_c, \frac{\kappa_b}{\alpha}]$

[back]