The Impact of Social Insurance on Household Debt

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Social Insurance and Consumer Credit Markets

- Unsecured debt (e.g., credit cards) is an important consumption-smoothing tool
  - Of the 4 in 10 US adults anticipating difficulty meeting an unexpected $400 expense, credit cards are the **most** cited tool they expect to rely on (SHED, 2019)
  - 43% of US households experiencing an income shortfall report turning to borrowing, including credit cards (SCF, 2016)
- Lack of insurance can ↑ household reliance on debt to cope with adverse shocks
  - Expanding social insurance can **crowd out** this use of debt
- But improved **financial resilience** from better insurance can **crowd in** credit supply
  - Credit supply response can increase the welfare benefits of expanded social insurance

This Paper

1. **Empirical Analysis**

2. **Structural Analysis**

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1. **Empirical Analysis**
   - Study impact of **expanding Medicaid eligibility on household debt**
   - Exploit staggered expansions across states & **granular heterogeneity** in their impact
     - **Find a 1% increase in Medicaid eligibility increased credit card debt 0.74%**

2. **Structural Analysis**

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1 Empirical Analysis

- Study impact of **expanding Medicaid eligibility on household debt**
- Exploit staggered expansions across states & **granular heterogeneity** in their impact
  - **Find a 1% increase in Medicaid eligibility increased credit card debt 0.74%**

2 Structural Analysis

- Heterogeneous-agents model with delinquency option
- Study the impact of Medicaid expansion on borrowing
- Decompose the effect into **direct, credit demand, and credit supply** channels
  - **Model reproduces increase in unsecured debt**
  - **Credit supply is fully responsible for the increase in debt**
  - **Credit supply accounts for 33% of the net welfare gain**

Literature Contributions

- **Distributional impact of public insurance**
  Kotlikoff (1986), Hubbard et al. (1995), Gruber and Yelowitz (1999), Krueger and Perri (1999); Engen and Gruber (2001) → **Introduce role for credit supply and default/financial resilience**
- **Models of unsecured household debt**
  Chatterjee et al. (2007), Livshits et al. (2007), Chatterjee and Gordon (2012), Mitman (2016), Nakajima and Rios-Rull (2019) → **Study impact of changes to availability of insurance**
- **Relationship between household debt and the macroeconomy**
  Jordá et al. (2015), Mian et al. (2017), Gomes et al. (2019), Mian et al. (2020)
  → **Social insurance impacts relationship**
- **Health insurance weakens reliance on debt and default to cope with illness**
  Gross and Notowidigdo (2011), Finkelstein et al. (2012), Mahoney (2015), Barcellos and Jacobson (2015), Allen et al. (2017), Brevoort et al. (2017), Hu et al. (2018), Miller et al. (2018), Gallagher et al. (2019), Goldsmith-Pinkham et al. (2020) → **New focus on general equilibrium channels**

Outline

1. Background: Credit Cards and Medicaid

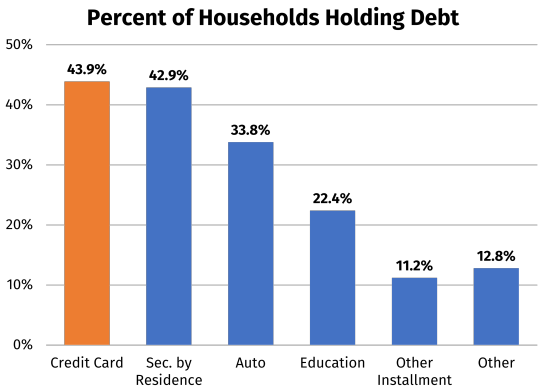
2. Estimating the Impact of Medicaid on Credit Outcomes

3. A Model with Health Insurance and Unsecured Debt

4. Conclusion

Background: Credit Cards and Medicaid

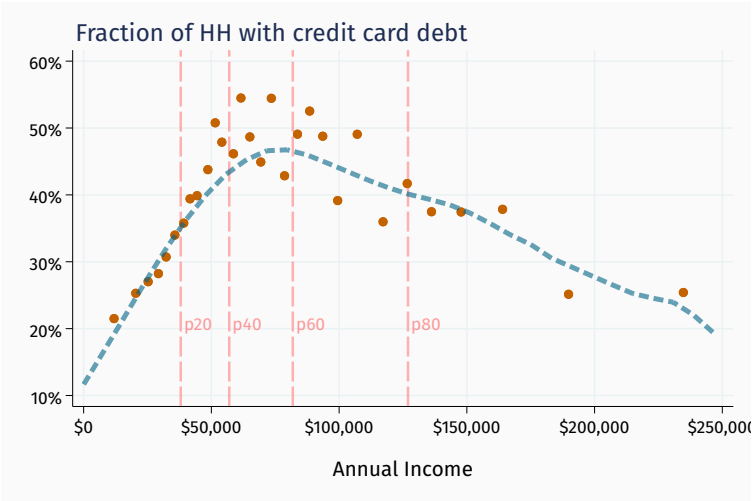
Credit Card Debt in the US



Source: 2016 SCF

- US households held **$927 bil.** in credit card balances in 2019
- Avg. credit card balances are $4,239
  - Avg. **revolving** (unpaid) balances: **$3,628**
  - 61% of US residents are revolvers
- Commercial banks earned $90 bil. in CC interest income in 2019 ($700 per HH)
- The average credit card interest rate is 14%

Credit Card Debt Along the Income Distribution



Source: 2017 PSID

▸ By Age Group ▸ Inquiry Ratio ▸ Inquiries ▸ Collections ▸ Med. Collections

Background: Medicaid Expansions

- Medicaid: gov't program providing health insurance to low-income households
- **64.7 million** Americans received health insurance through Medicaid in 2019
- ACA provided federal funds for state expansions of Medicaid eligibility in 2014
  - But 2012 NFIB v. Sebelius Supreme Court ruling made expansions **optional**

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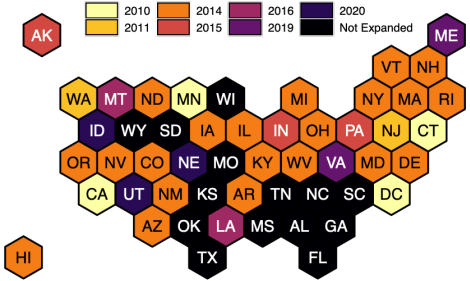
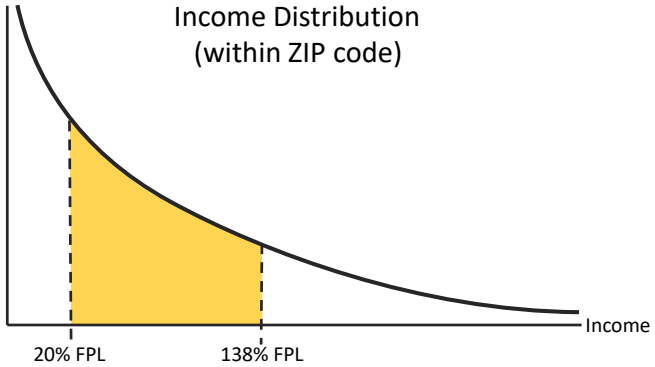
- **64.7 million** Americans received health insurance through Medicaid in 2019
- ACA provided federal funds for state expansions of Medicaid eligibility in 2014
  - But 2012 NFIB v. Sebelius Supreme Court ruling made expansions **optional**
- Staggered expansion across states ensued:



Variation in Impact of Medicaid Expansions

- Expanding under ACA ↑ Medicaid income limit to 138% of the federal poverty level
- Impact on eligibility depends on (1) pre-ACA income limit & (2) income distribution



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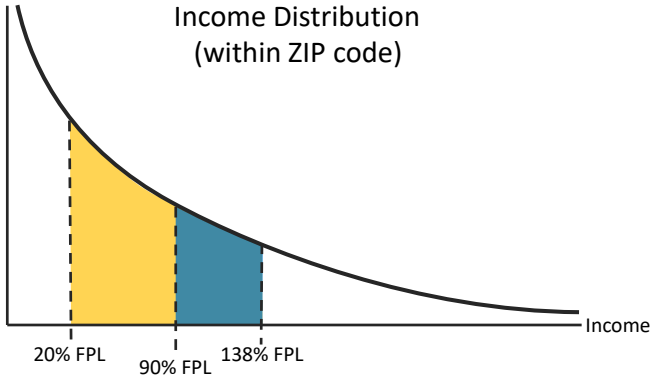

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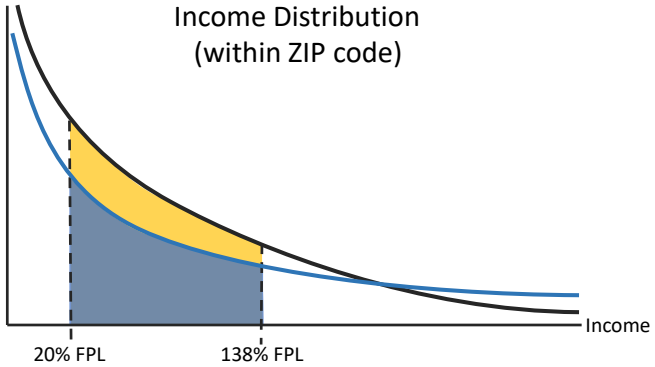

Estimating the Impact of Medicaid on Credit Outcomes

Data

- **Experian Data:** detailed credit outcomes
  - Annual panel of 10 million US residents spanning 2010-2021
  - Have revolving balances quarterly 2012-2020
  - Geographically representative

- **ZIP-Level Medicaid Eligibility**
  - IRS SOI data: distribution of income at the ZIP-level
  - ACS data: joint distribution of household size and income
  - Combine data to estimate ZIP-level eligibility

Estimating the Causal Effect of Medicaid Eligibility

- **Goal:** estimate the causal effect of expanded Medicaid eligibility on credit outcomes

- **Challenges:**
  - Medicaid eligibility is negatively correlated with income
  - Later state-level expansions coincided with other political changes (e.g., new gov't)

- **Approach:** continuous diff-in-diff comparing ZIP codes
  - Idea: compare ZIP codes with similar income but different-sized Medicaid expansions

Empirical Strategy: Continuous Diff-in-Diff

- **Idea:** compare ZIP-level outcomes before/after expansion in ZIPs with different changes in eligibility. Estimate:

$$Y_{zcst} = \alpha_1 \text{Post}_{st} + \alpha_2 \Delta\text{Elig}_{zs} + \beta\,(\text{Post}_{st} \times \Delta\text{Elig}_{zs}) + \phi_{st} + \phi_{ct} + X_{zcst} + \varepsilon_{zcst}$$

  where Y_{zcst} is an outcome in ZIP z, of county c in state s in year t and ΔElig_{zs} is the change in eligibility in ZIP z in the year before vs. after state s's expansion

- **Outcomes:** credit scores, borrowing, credit supply & demand proxies, default

- **Identifying Assumption:** change in eligibility is uncorrelated with other shocks coinciding with expansion

▸ Drivers of Variation

Results: Eligibility → Borrowing

	1[Has CC]	1[New CC]	log(CC Rev. Bal.)
$\Delta\text{Elig}_{zs} \times \text{Post}_{st}$	0.33***	0.21***	0.74***
	(0.05)	(0.04)	(0.21)
ΔElig_{zs}	-0.49***	-0.24***	-1.11***
	(0.08)	(0.04)	(0.25)
log(Avg. Inc.)	0.11***	0.02***	0.56***
	(0.01)	(4e-3)	(0.02)
Obs	106,616	106,616	352,533
R2	0.781	0.707	0.819
Mean	84%	22%	$3,628

Notes: All specifications include, time, state, county, state-time, and county-time fixed effects. Standard errors are clustered by state. Significance: 0.10*, 0.05**, 0.01***.

▸ Alt Approach: State-Level Variation ▸ Alt Approach: County-Level Variation

Summary of Additional Resuls

- **Credit Supply & Demand Proxies:**
  - Credit card utilization (i.e., balance/limit) **decreases**
  - Credit limits **increase**
  - New credit cards per inquiry **increase**
  - Credit card inquiries **increase**

- **Default & Credit Risk:**
  - 30 and 90 day delinquency **decrease**
  - Likelihood and amount of debt in collections **decrease**
  - Credit scores **increase**

A Model with Health Insurance and Unsecured Debt

Households

Income shocks

- Income:

$$\ln y_{it} = \begin{cases} \rho \ln y_{it-1} + \epsilon^{y}_{it}, & \text{w.p. } \lambda_y \\ \ln y_{it-1}, & \text{w.p. } 1-\lambda_y \end{cases}$$

Expenditure shocks

- Medical expenditure: $X_{it} \sim \ln \mathcal{N}(\mu_x, \sigma_x^2)$
- Insurance by income: $M_{it} = oop\,(y_{it}) X_{it}$

Debt

- Borrow (or save) using one-period debt securities: b_{it}
  - Can choose to go **delinquent** on debt (suffer utility cost)
  - Pay endogenous interest rate $r(y_{it}, b_{it+1}) = \frac{1}{q(y_{it}, b_{it+1})}$

Delinquency and Credit Supply

Households with delinquent debt:

- Cannot save or borrow
- Medical expenditure piles up on debt
- With some probability, stochastic fraction of debt is forgiven

Credit supply

- Perfect competition among lenders
- **Hybrid of short-term and long-term debt**

Household's Problem

$$V\left(\tilde{b}, y\right) = \max\left\{ \overbrace{V^r\left(\tilde{b}, y\right)}^{\text{repayment}}, \overbrace{V^d\left(\tilde{b}, y\right)}^{\text{delinquency}} \right\},$$

$$V^r\left(\tilde{b}, y\right) = \max_{c, b'} u(c) + \beta \mathbb{E} V(b' + M', y'),$$
$$\text{s.t.} \quad c + \tilde{b} \leqslant y + q(b', y) b'$$

$$V^d\left(\tilde{b}, y\right) = u(y) - \xi + \beta \mathbb{E} V((1 - \delta)\, \tilde{b} + M', y')$$

- M – medical expenditure
- $\tilde{b}$ – total debt $(b + M)$
- y – household income
- ξ – disutility of delinquency
- δ – debt haircut
- $q(\cdot)$ – price of debt

How Does Expanding Health Insurance Affect Borrowing?

Direct channel

- Insurance **raises disposable resources** $\Rightarrow$ **less debt**

M — medical expenditure
b' — debt obligations
$q(\cdot)$ — price of debt
V^r — value of repayment
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Indirect channels

Borrowing Optimality Condition

$$\underbrace{u'(c)\frac{\partial\left(q(b',y)b'\right)}{\partial_{b'}}}_{\text{marginal benefit of borrowing}} = \underbrace{\beta\mathbb{E}\mathbb{1}_{V^r\geqslant V^d}u'(c(b'+M',y'))}_{\text{marginal cost if repaying}} + \underbrace{\beta\mathbb{E}\mathbb{1}_{V^r<V^d}V_1^d\left(b'+M',y'\right)}_{\text{marginal cost if delinquent}}$$

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- **Debt aversion motive**: $\mathbb{E}\mathbb{1}_{V^r\geqslant V^d}\uparrow$ increases mc of borrowing $\Rightarrow$ **less debt**

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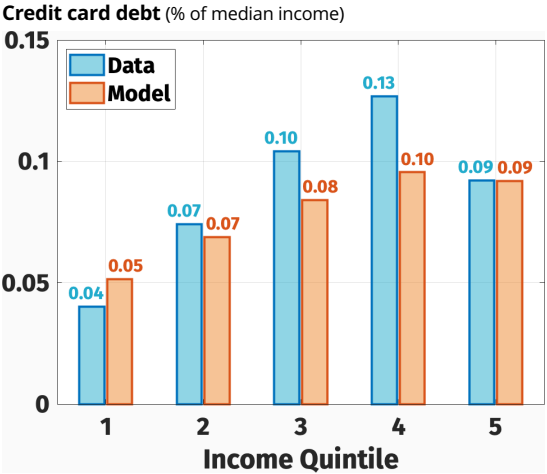
- **Credit supply channel**: $q(b',y)\uparrow$ increases mb of borrowing $\Rightarrow$ **more debt**

Calibration

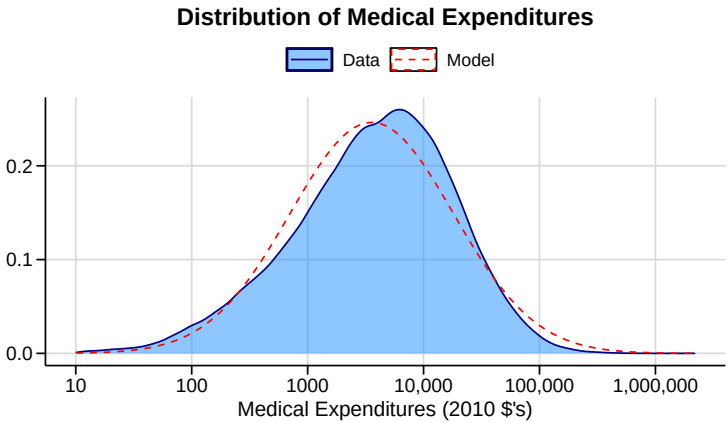
Medical Expenditure Panel Survey

- Distribution of medical expenditure
- Joint distribution of insurance type and income
- Out-of-pocket (OOP) expenses by insurance type

Panel Study of Income Dynamics



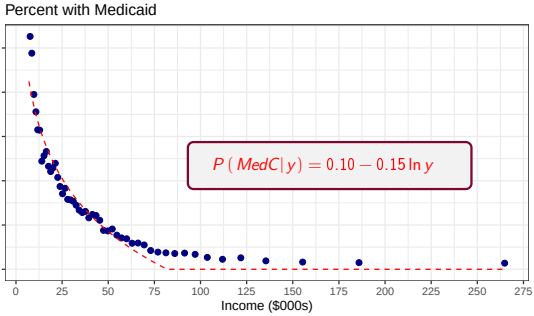
Distribution of Expenditure Shocks

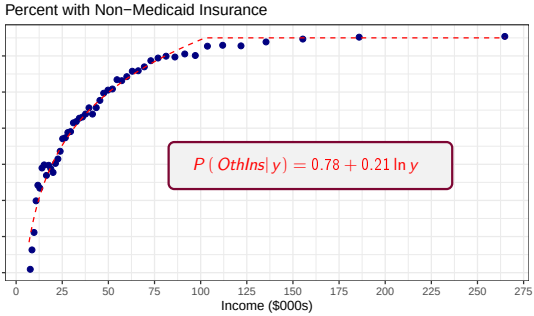


$$X_{it} \sim \ln \mathcal{N}\left(\ln(0.08), 1.6\right)$$

- Median expenditure shock = 8% annual income
- 1 SD above median = 40% annual income

Out-of-Pocket Expenditure by Income





$$oop(y) = P(MedC|y) \times 6.8\% + P(OthIns|y) \times 27.5\% + P(NoIns|y) \times 62.7\%$$

Calibrated Parameters

Utility

$$\beta = 0.92$$
$$\gamma = 3$$
$$\xi = 0.35$$
$$r_f = 2\%$$

Income Process

$$\lambda_y = 0.42$$
$$\rho_y = 0.88$$
$$\sigma_y = 0.07$$

Haircut Process

$$\lambda_d = 0.94$$
$$\beta_1^d = 1.7$$
$$\beta_2^d = 9$$

Medical Shocks

$$\mu_e = 0.08$$
$$\sigma_e = 1.6$$

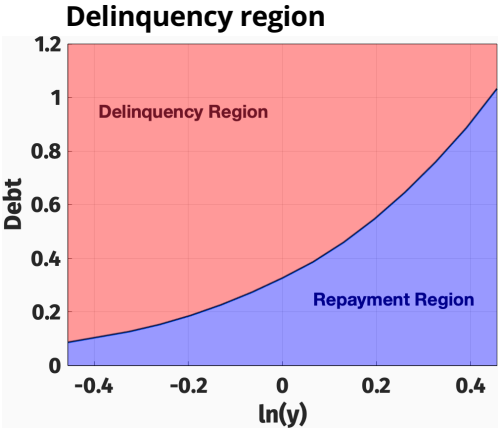
Insurance

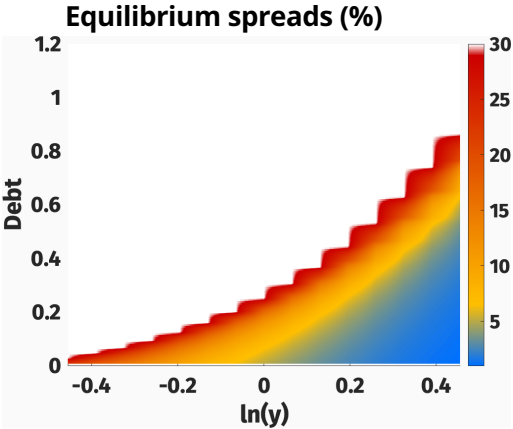
$$P_m = 0.1 - 0.15 \ln y$$
$$P_i = 0.78 + 0.21 \ln y$$
$$P_u = 1 - P_m - P_i$$

Out of Pocket

$$OOP = P_m O_m + P_i O_i + P_u O_u$$
$$O_m = 6.8\%$$
$$O_i = 27.5\%$$
$$O_u = 62.7\%$$

Equilibrium Features





Expansion of Medicaid

- **Experiment: ↑ Medicaid coverage 1.6 pps**

Medicaid Expansion Impact

Debt Level	+1.33%
Welfare	+0.18%

Expansion of Medicaid

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- Decompose **borrowing** and **welfare** response into three channels:

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  - **Direct insurance channel**: increases wealth in some states of the world ⇒ **less debt**

Medicaid Expansion Impact		Direct Effect
Debt Level	+1.33%	-1.14%
Welfare	+0.18%	+0.15%

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Medicaid Expansion Impact		Direct Effect	CD
Debt Level	+1.33%	-1.14%	-1.43%
Welfare	+0.18%	+0.15%	+0.0001%

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Medicaid Expansion Impact		Direct Effect	CD	CS
Debt Level	+1.33%	-1.14%	-1.43%	+3.90%
Welfare	+0.18%	+0.15%	+0.0001%	+0.03%

Expansion of Medicaid

- **Experiment: ↑ Medicaid coverage 1.6 pps and fund it with a uniform income tax**
- Decompose **borrowing** and **welfare** response into three channels:
  - **Direct insurance channel**: increases wealth in some states of the world ⇒ **less debt**
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Medicaid Expansion Impact		Direct Effect	CD	CS
Debt Level	+1.33%	-1.14%	-1.43%	+3.90%
(incl. tax effects)	+1.63%	-1.00%	-1.25%	+3.88%
Welfare	+0.18%	+0.15%	+0.0001%	+0.03%
(incl. tax effects)	+0.09%	+0.06%	+0.0001%	+0.03%

Conclusion

Conclusion

Q: **How does social insurance affect household debt?**

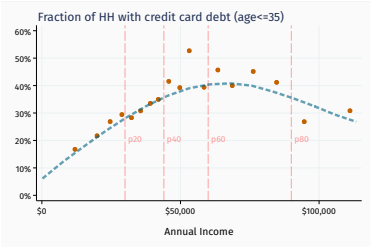
- We focus on expansion of health insurance through Medicaid
- Empirical evidence implies
  - 1% increase in Medicaid eligibility → **0.74% increase in credit card debt**
- Quantitative model
  - Credit supply channel **drives the rise in debt**
  - Credit supply response leads to **first order welfare gains (1/3 of total)**

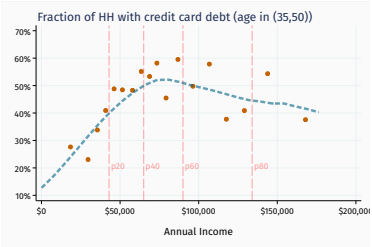
Social insurance can crowd in priv. insurance (credit access) w/ large welfare gains

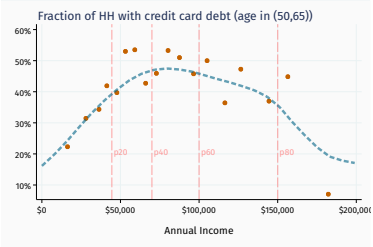
Thanks!

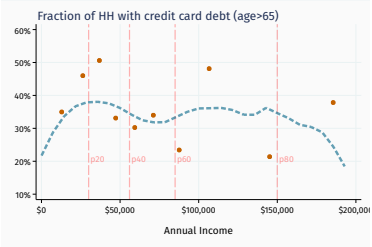
Appendix

Credit card debt versus income across age groups



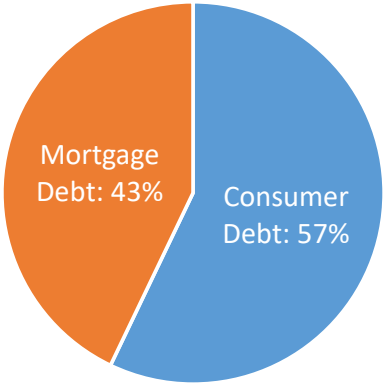


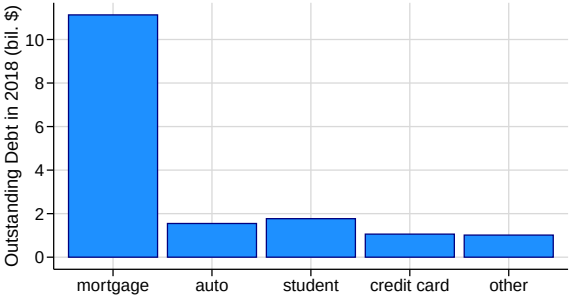




back

Share of Debt Service Payments (2018)

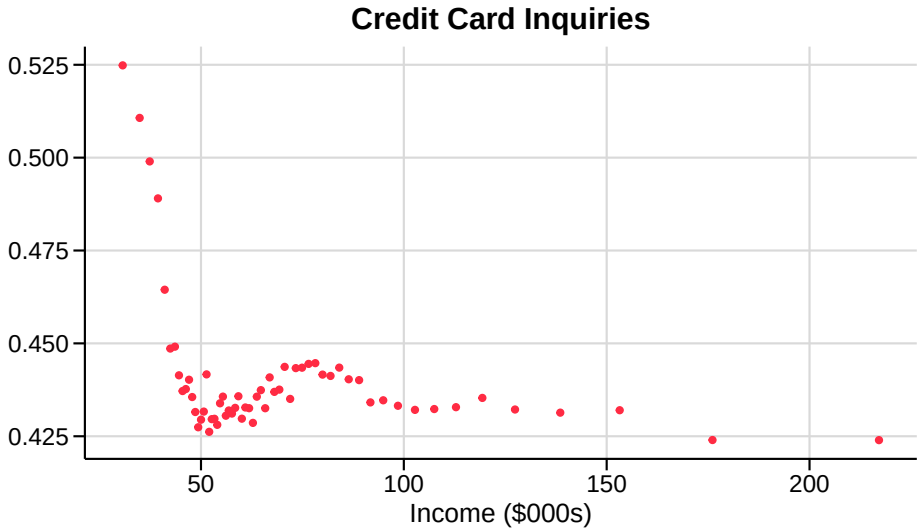




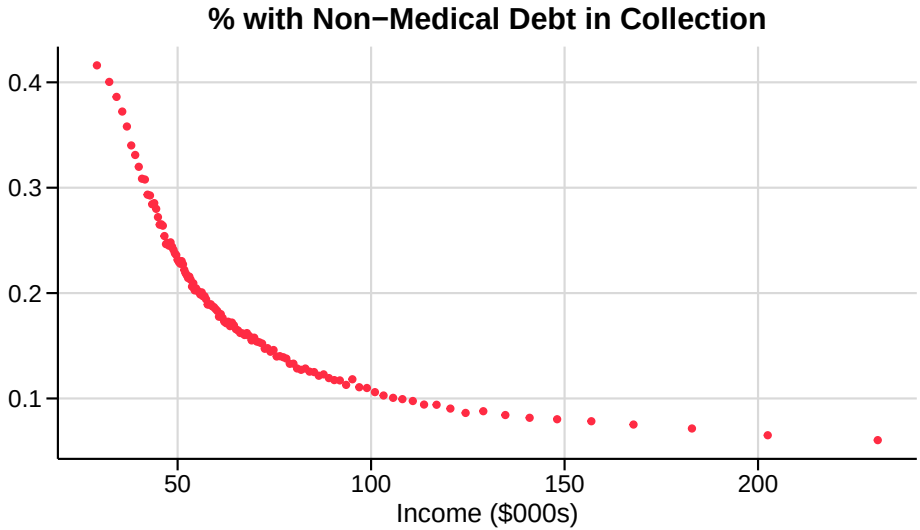
Go Back

New Credit Cards to Inquiries (ZIP-level)

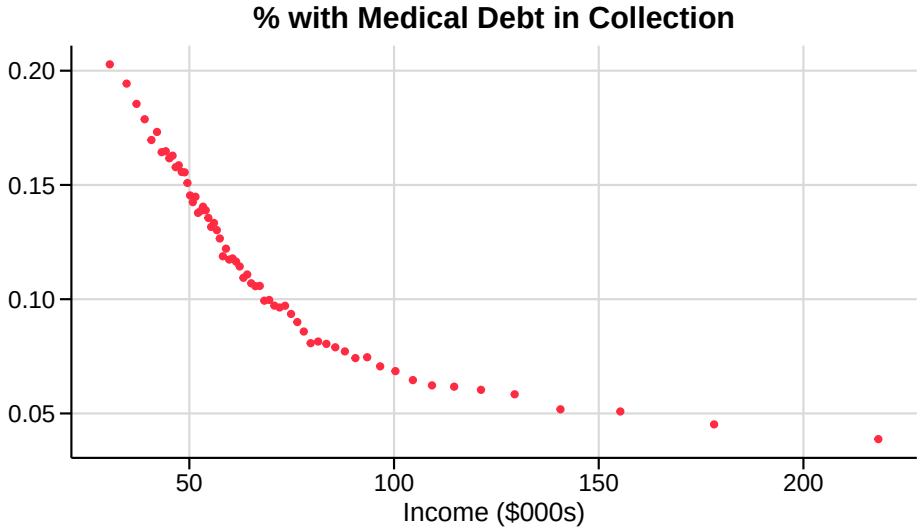
Credit Card Inquiries (ZIP-level)



Non-Medical Debt in Collection (ZIP-level)



Medical Debt in Collection (ZIP-level)



State-Level Analysis: Econometric Approach

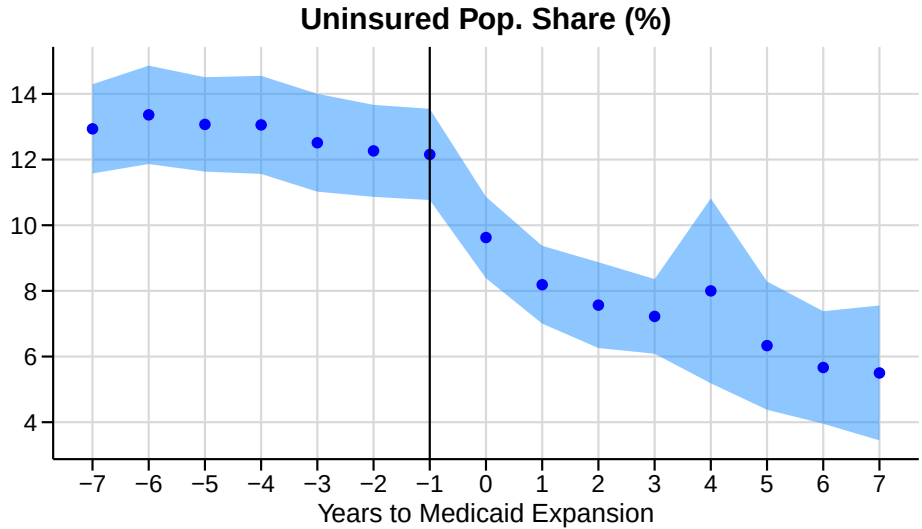
- How does health insurance affect credit card debt?

$$ln(\text{cc}_{s,t}) = \text{Insured}_{s,t}\beta + X_{s,t}\gamma + \theta_s + \tau_t + \varepsilon_{s,t}$$

  - $\text{cc}_{s,t}$ = credit card debt per capita in state s at time t
  - $\text{Insured}_{s,t}$ = % pop. w/ health insurance in s at time t
  - $X_{s,t}$ = state-level controls

- Instrument for insured rate using indicator for adopting Medicaid expansion
  - Expect negative OLS bias: cc debt is countercyclical, insurance coverage procyclical
  - Identifies the causal effect when expansion only affects cc debt through insurance

Uninsured rates fell after Medicaid expansion



Drivers of Variation in Change in Eligibility

Back

- Expanding under ACA ↑ Medicaid income limit to 138% of the federal poverty level
- Impact on eligibility depends on (1) pre-ACA income limit & (2) income distribution

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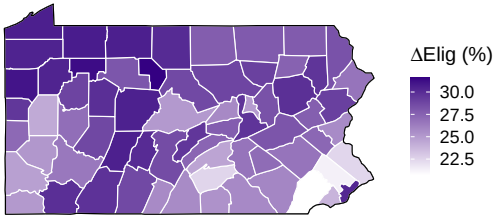

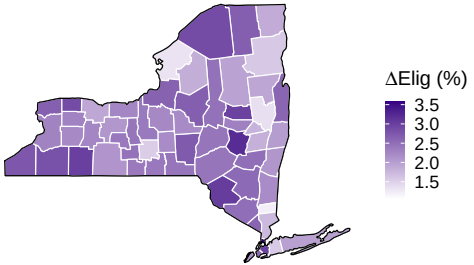

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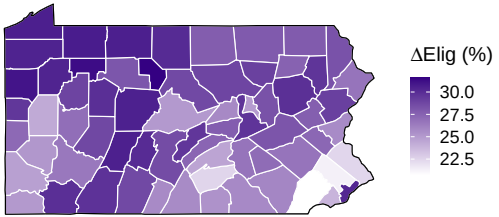

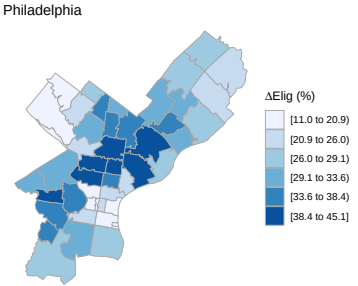

State-level: Health Insurance and CC Debt

Go Back

	TSLS		OLS	
	(1)	(2)	(3)	(4)
Insured$_{s,t}$	1.34**	1.41***	0.01	0.06
	(0.43)	(0.35)	(0.11)	(0.09)
	First Stage			
1[Adopted]$_{s,t}$	1.44***	1.56***		
	(0.19)	(0.19)		
Controls		✓		✓
Stage 1 F	55.7	65.8		
Obs.	765	765	765	765

$$ln(cc_{s,t}) = \text{Insured}_{s,t}\beta + X_{s,t}\gamma + \theta_s + \tau_t + \varepsilon_{s,t}$$

$$\mathbb{1}[\text{Adopted}]_{s,t} \xrightarrow{\text{IV}} \text{Insured}_{s,t}$$

Notes: Each regression includes state and year fixed effects and robust standard errors. Control variables include the unemployment rate, log(population), log(house prices), house price growth, and state-level GDP growth. Statistical significance: 5%*, 1%**, and 0.1%***.

CC Debt Share

State-level: Health Insurance and CC Debt

Go Back

	TSLS		OLS	
	(1)	(2)	(3)	(4)
Insured$_{s,t}$	1.34**	1.41***	0.01	0.06
	(0.43)	(0.35)	(0.11)	(0.09)
	First Stage			
1[Adopted]$_{s,t}$	1.44***	1.56***		
	(0.19)	(0.19)		
Controls		✓		✓
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$$ln(cc_{s,t}) = \text{Insured}_{s,t}\beta + X_{s,t}\gamma + \theta_s + \tau_t + \varepsilon_{s,t}$$

$$\mathbb{1}[\text{Adopted}]_{s,t} \xrightarrow{\text{IV}} \text{Insured}_{s,t}$$

Expanding Medicaid → ↑ **cc debt 2.2%**
→ ↑ **$20.4 bil**

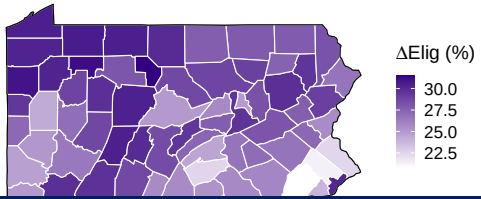
Notes: Each regression includes state and year fixed effects and robust standard errors. Control variables include the unemployment rate, log(population), log(house prices), house price growth, and state-level GDP growth. Statistical significance: 5%*, 1%**, and 0.1%***.

CC Debt Share

Strategy #2: Treatment Intensity Across Counties

Go Back

- Expansion of Medicaid ➔ **change in eligibility criteria**
- **Can calculate eligibility at a granular level** using data on the distribution of income
  - And data on the joint distribution of income and household size
- **Continuous Treatment DID**: compare county level debt-to-income before/after expansion in counties with different impact on **eligibility**
- **Regression result:** 1 p.p. ↑ in eligibility ➔ 0.8 p.p. ↑ in debt-to-income (3.6% ↑ in debt)



Calibrated parameters

Utility

$$\beta = 0.92$$
$$\gamma = 3$$
$$\xi = 0.35$$
$$r_f = 2\%$$

Income Process

$$\lambda_y = 0.42$$
$$\rho_y = 0.88$$
$$\sigma_y = 0.07$$

Haircut Process

$$\lambda_d = 0.94$$
$$\beta_1^d = 1.7$$
$$\beta_2^d = 9$$

Medical Shocks

$$\mu_e = 0.08$$
$$\sigma_e = 1.6$$

Insurance

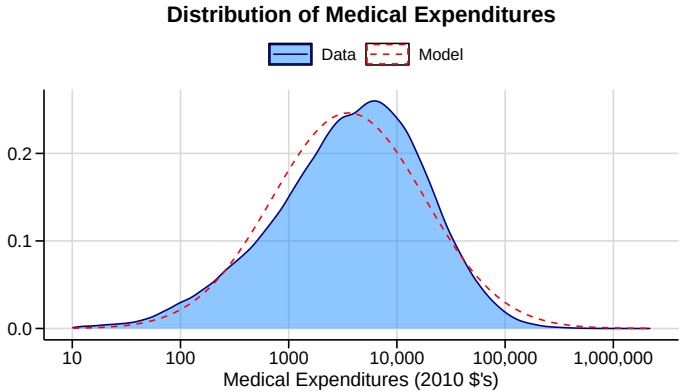
$$P_m = 0.1 - 0.15 \ln y$$
$$P_i = 0.78 + 0.21 \ln y$$
$$P_u = 1 - P_m - P_i$$

Out of Pocket

$$OOP = P_m O_m + P_i O_i + P_u O_u$$
$$O_m = 7\%$$
$$O_i = 27\%$$
$$O_u = 63\%$$

back

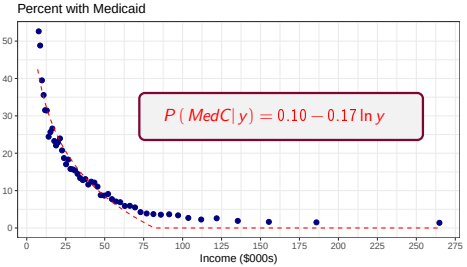
Distribution of expenditure shocks

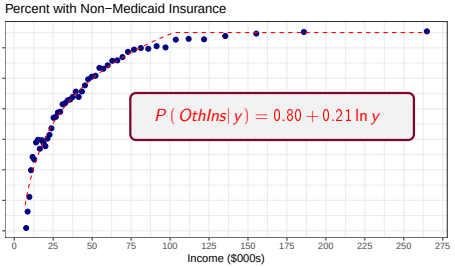


$$X_{it} \sim \ln \mathcal{N}\left(\ln(0.08), 2.62\right)$$

- Median expenditure shock = 8% annual income
- 1 s.d. above median = 40% annual income

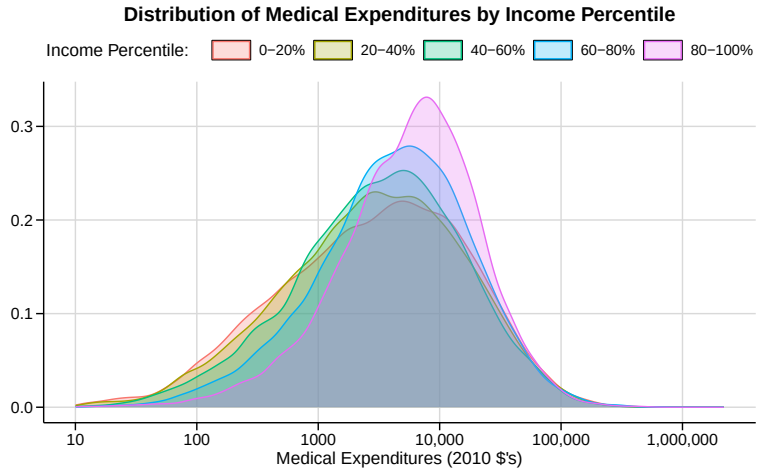
Out-of-pocket expenditure by income





$$oop(y) = P(MedC|y) \times 6.8\% + P(OthIns|y) \times 27.5\% + P(NoIns|y) \times 62.7\%$$

Medical expenditure distribution by income



back