The Financial Impacts of Decision-Making Frictions

Stefano DellaVigna
UC Berkeley & NBER

Tim de Silva
Stanford GSB

Rohan Jha
Harvard

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Preliminary and Incomplete ☺

Motivation

- Behavioral Econ: individuals make **choices** that differ from neoclassical models
  - Mortgage refinancing, not claiming benefits, dominated insurance, ...

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  - Goal: frontier of distance to welfare + minimal structure + measurable

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Scope: estimate the financial impact of a large set of frictions, **not**

- Do a welfare analysis of removing frictions (Bernheim-Taubinsky 18)
- Measure the effects of specific biases (Stango-Zinman 23)
- Evaluate specific policies (Hendren-Sprung-Keyser 20)

Our List of Decision-Making Frictions

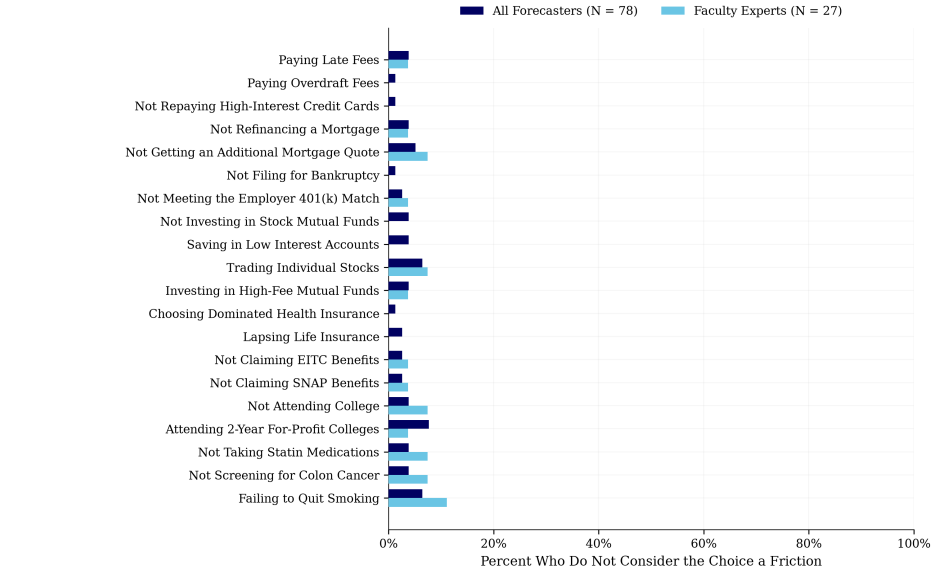
No.	Category	Friction	No.	Category	Friction
1	Borrowing	Paying Late Fees	11	Savings	Investing in High-Fee Mutual Funds
2	Borrowing	Paying Overdraft Fees	12	Insurance	Choosing Dominated Health Insurance
3	Borrowing	Not Repaying High-Interest Credit Cards	13	Insurance	Lapsing Life Insurance
4	Borrowing	Not Refinancing a Mortgage	14	Benefits	Not Claiming EITC Benefits
5	Borrowing	Not Getting an Additional Mortgage Quote	15	Benefits	Not Claiming SNAP Benefits
6	Borrowing	Not Filing for Bankruptcy	16	Education	Not Attending College
7	Savings	Not Meeting the Employer 401(k) Match	17	Education	Attending 2-Year For-Profit Colleges
8	Savings	Not Investing in Stock Mutual Funds	18	Health	Not Taking Statin Medications
9	Savings	Saving in Low Interest Accounts	19	Health	Not Screening for Colon Cancer
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- List identified by literature coverage + consulting with domain experts
  - ✓ Good overlap with topics discussed in financial literacy syllabi
  - ✗ Not meant to be exhaustive, we welcome ideas for expanding it! (especially Health)

Disagreement about Frictions from Survey



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- Individual i observed at age t in group j_{it} with survival $L_{it} \equiv \mathbf{1}$ (i alive at t)
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Not Investing in Stock Mutual Funds: reduces Capital Income

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Paying Credit Card Late Fees: creates direct losses from additional fees

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Failing to Quit Smoking: creates direct losses from cigarettes and increases mortality

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- Mortality **not** affected and $H = 1 \Rightarrow$ expected loss simplifies to

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   - Discounting and MU adjustment
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3. One-time removal creates subjectivity in defining H due to **inertia**
   - Example: increasing 401k contribution likely increases future contributions
   - Current approach: assume all future behavior stays unchanged

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- **Permanent consumable income**, $\overline{R}_j = \{\$23K, \$40K, \$83K\}$ (PSID, Rafkin et al. 25)

▸ Consumable Income

Example: Not Getting an Additional Mortgage Quote

- $s_{it} = 1$: obtained or refinanced a first mortgage in the last year
  - Annualize PSID shares using $12/(\text{months in survey window})$

Income Group (j)	S_j	A_j	F_j	E_j	$S_j A_j F_j E_j$	$S_j A_j F_j E_j / \overline{R}_j$
Low Income						
Middle Income						
High Income						

Example: Not Getting an Additional Mortgage Quote

- $s_{it} = 1$: obtained or refinanced a first mortgage in the last year
  - Annualize PSID shares using $12/(\text{months in survey window})$

Income Group (j)	S_j	A_j	F_j	E_j	$S_j A_j F_j E_j$	$S_j A_j F_j E_j / \overline{R}_j$
Low Income	0.018 (0.001)					
Middle Income	0.055 (0.001)					
High Income	0.088 (0.003)					

Example: Not Getting an Additional Mortgage Quote

- $s_{it} = 1$: obtained or refinanced a first mortgage in the last year
  - Annualize PSID shares using $12/(\text{months in survey window})$
- $a_{it} = 1$: expected rate reduction from one additional quote exceeds a cutoff
  - Cutoff $= 10$ bps $\approx$ conservative estimate of costs of obtaining/closing new mortgage

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Income Group (j)	S_j	A_j	F_j	E_j	$S_j A_j F_j E_j$	$S_j A_j F_j E_j / \overline{R}_j$
Low Income	0.018	0.600				
	(0.001)	(–)				
Middle Income	0.055	0.520				
	(0.001)	(–)				
High Income	0.088	0.470				
	(0.003)	(–)				

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  - 95% believe they got the lowest rate they could qualify for (Bhutta et al. 26)

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Low Income	0.018	0.600	0.917			
	(0.001)	(–)	(–)			
Middle Income	0.055	0.520	0.904			
	(0.001)	(–)	(–)			
High Income	0.088	0.470	0.894			
	(0.003)	(–)	(–)			

Example: Not Getting an Additional Mortgage Quote

- e_{it} contains two mechanical effects: mortgage payments and taxes
  - Expected rate reduction above cutoff: $\{31.4, 28.8, 28.1\}$ bps (Bhutta et al. 26)

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  - Sum payments over $H = 7$ years, including change in balance (Berger et al. 21)

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Low Income	0.018	0.600	0.917	\$1,129		
	(0.001)	(–)	(–)	[1,030, 1,240]		
Middle Income	0.055	0.520	0.904	\$1,371		
	(0.001)	(–)	(–)	[1,341, 1,425]		
High Income	0.088	0.470	0.894	\$2,208		
	(0.003)	(–)	(–)	[2,110, 2,277]		

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Income Group (j)	S_j	A_j	F_j	E_j	$S_j A_j F_j E_j$	$S_j A_j F_j E_j / \overline{R}_j$
Low Income	0.018	0.600	0.917	\$1,129	\$11	
	(0.001)	(–)	(–)	[1,030, 1,240]	[10, 13]	
Middle Income	0.055	0.520	0.904	\$1,371	\$35	
	(0.001)	(–)	(–)	[1,341, 1,425]	[33, 38]	
High Income	0.088	0.470	0.894	\$2,208	\$81	
	(0.003)	(–)	(–)	[2,110, 2,277]	[76, 87]	

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Income Group (j)	S_j	A_j	F_j	E_j	$S_j A_j F_j E_j$	$S_j A_j F_j E_j / \overline{R}_j$
Low Income	0.018	0.600	0.917	\$1,129	\$11	0.05%
	(0.001)	(–)	(–)	[1,030, 1,240]	[10, 13]	[0.04, 0.06]
Middle Income	0.055	0.520	0.904	\$1,371	\$35	0.09%
	(0.001)	(–)	(–)	[1,341, 1,425]	[33, 38]	[0.08, 0.09]
High Income	0.088	0.470	0.894	\$2,208	\$81	0.10%
	(0.003)	(–)	(–)	[2,110, 2,277]	[76, 87]	[0.09, 0.10]

EXAMPLE: NOT INVESTING IN STOCK MUTUAL FUNDS

- $s_{it} = 1$: financial wealth in SCF exceeds $\max\{2 \text{ mo. pre-tax salary}, \$2K\}$
  - Threshold approximates liquidity needed to avoid distress (Sabat-Gallagher 19)

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Low Income	0.328 (0.009)					
Middle Income	0.645 (0.006)					
High Income	0.869 (0.006)					

Example: Not Investing in Stock Mutual Funds

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Low Income	0.328	0.648				
	(0.009)	(0.013)				
Middle Income	0.645	0.310				
	(0.006)	(0.008)				
High Income	0.869	0.131				
	(0.006)	(0.007)				

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  - Denote share who prefer participation $= (1 - A_j) + A_j F_j \equiv P_j$

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  - Compute $F_j = 1 - (1 - P_j)/A_j$ by income group (and age)

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Income Group (j)	S_j	A_j	F_j	E_j	$S_j A_j F_j E_j$	$S_j A_j F_j E_j / \overline{R}_j$
Low Income	0.328	0.648	0.831			
	(0.009)	(0.013)	(0.004)			
Middle Income	0.645	0.310	0.906			
	(0.006)	(0.008)	(0.002)			
High Income	0.869	0.131	0.782			
	(0.006)	(0.007)	(0.012)			

Example: Not Investing in Stock Mutual Funds

- e_{it} contains two mechanical effects: capital income and taxes
  - Equity premium = 5% net of $\underbrace{\text{average fee} + \text{deposit spread on savings accounts}}_{\text{remove frictions in isolation}}$

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Low Income	0.328	0.648	0.831			
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  - Excess return = SCF conditional equity share (by income–age) $\times$ equity premium

Income Group (j)	S_j	A_j	F_j	E_j	$S_j A_j F_j E_j$	$S_j A_j F_j E_j / \overline{R}_j$
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  - Compute taxes on capital income at long-term capital gains rate

Income Group (j)	S_j	A_j	F_j	E_j	$S_j A_j F_j E_j$	$S_j A_j F_j E_j / \overline{R}_j$
Low Income	0.328	0.648	0.831			
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Income Group (j)	S_j	A_j	F_j	E_j	$S_j A_j F_j E_j$	$S_j A_j F_j E_j / \overline{R}_j$
Low Income	0.328	0.648	0.831	\$326		
	(0.009)	(0.013)	(0.004)	[277, 404]		
Middle Income	0.645	0.310	0.906	\$895		
	(0.006)	(0.008)	(0.002)	[803, 983]		
High Income	0.869	0.131	0.782	\$2,631		
	(0.006)	(0.007)	(0.012)	[2,116, 3,070]		

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  - Increase in capital income = excess return $\times$ financial wealth in SCF
  - Compute taxes on capital income at long-term capital gains rate

Income Group (j)	S_j	A_j	F_j	E_j	$S_j A_j F_j E_j$	$S_j A_j F_j E_j / \overline{R}_j$
Low Income	0.328	0.648	0.831	\$326	\$58	
	(0.009)	(0.013)	(0.004)	[277, 404]	[48, 72]	
Middle Income	0.645	0.310	0.906	\$895	\$162	
	(0.006)	(0.008)	(0.002)	[803, 983]	[144, 182]	
High Income	0.869	0.131	0.782	\$2,631	\$235	
	(0.006)	(0.007)	(0.012)	[2,116, 3,070]	[182, 280]	

Example: Not Investing in Stock Mutual Funds

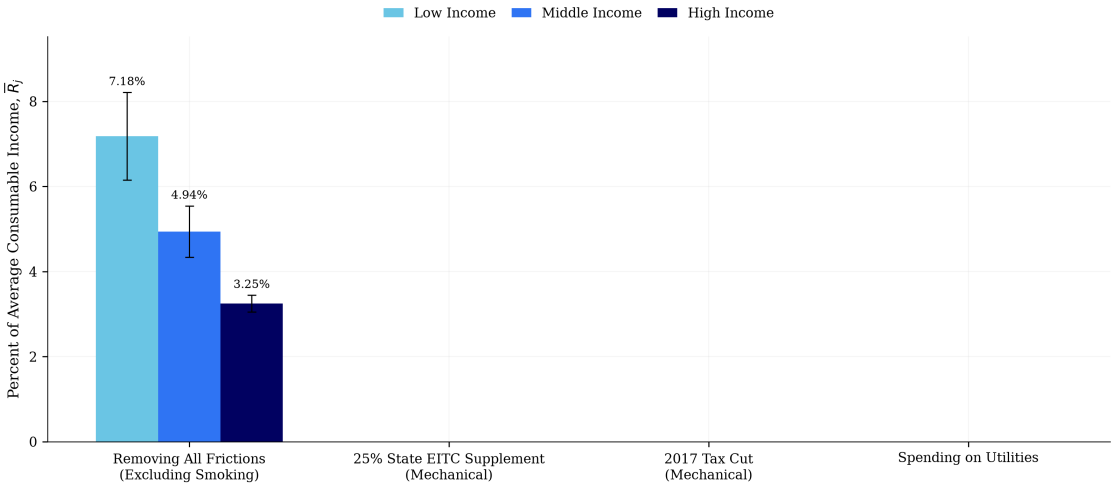
- e_{it} contains two mechanical effects: capital income and taxes
  - Equity premium = 5% net of $\underbrace{\text{average fee} + \text{deposit spread on savings accounts}}_{\text{remove frictions in isolation}}$
  - Excess return = SCF conditional equity share (by income–age) $\times$ equity premium
  - Increase in capital income = excess return $\times$ financial wealth in SCF
  - Compute taxes on capital income at long-term capital gains rate

Income Group (j)	S_j	A_j	F_j	E_j	$S_j A_j F_j E_j$	$S_j A_j F_j E_j / \overline{R}_j$
Low Income	0.328	0.648	0.831	\$326	\$58	0.25%
	(0.009)	(0.013)	(0.004)	[277, 404]	[48, 72]	[0.21, 0.31]
Middle Income	0.645	0.310	0.906	\$895	\$162	0.40%
	(0.006)	(0.008)	(0.002)	[803, 983]	[144, 182]	[0.36, 0.45]
High Income	0.869	0.131	0.782	\$2,631	\$235	0.28%
	(0.006)	(0.007)	(0.012)	[2,116, 3,070]	[182, 280]	[0.22, 0.34]

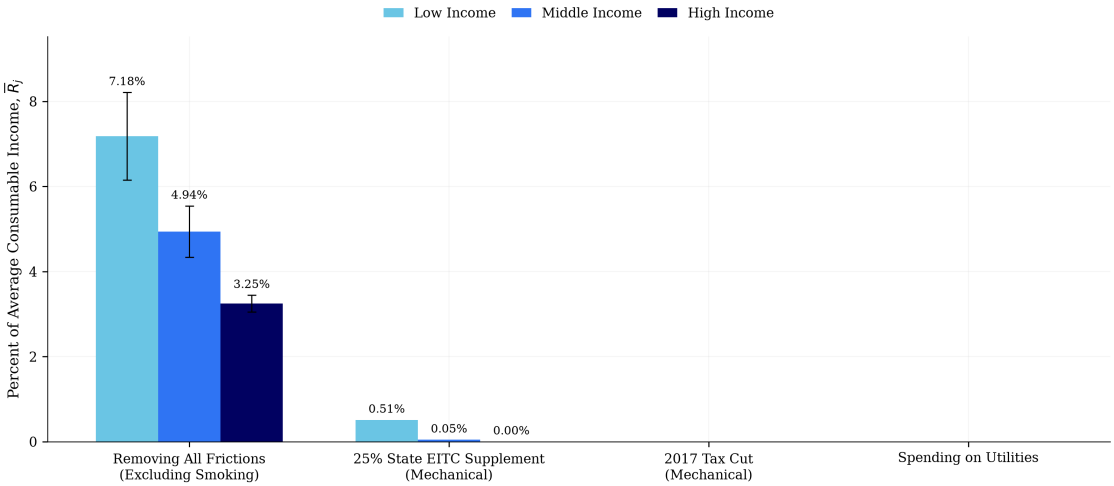
Outline

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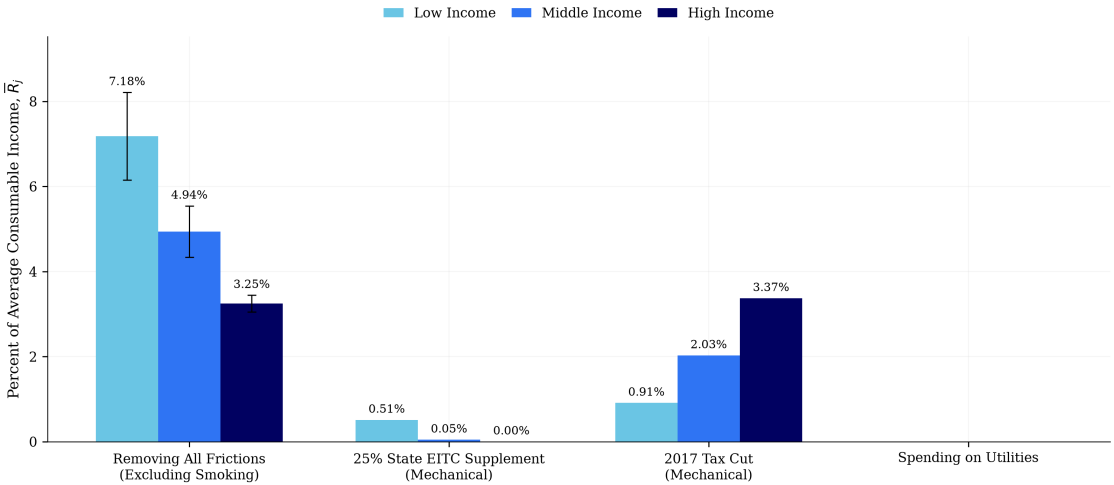
Aggregate Financial Impacts



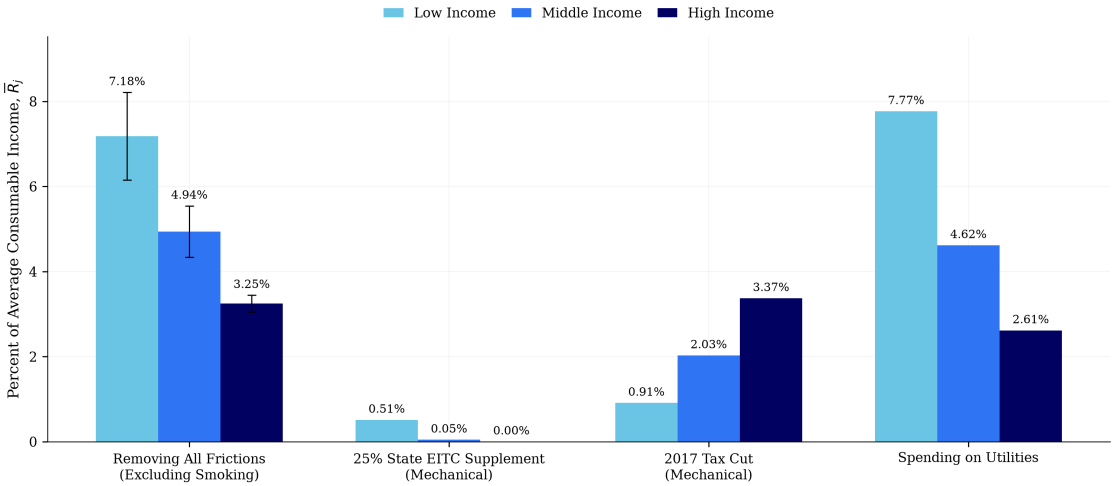
Aggregate Financial Impacts and Benchmarks



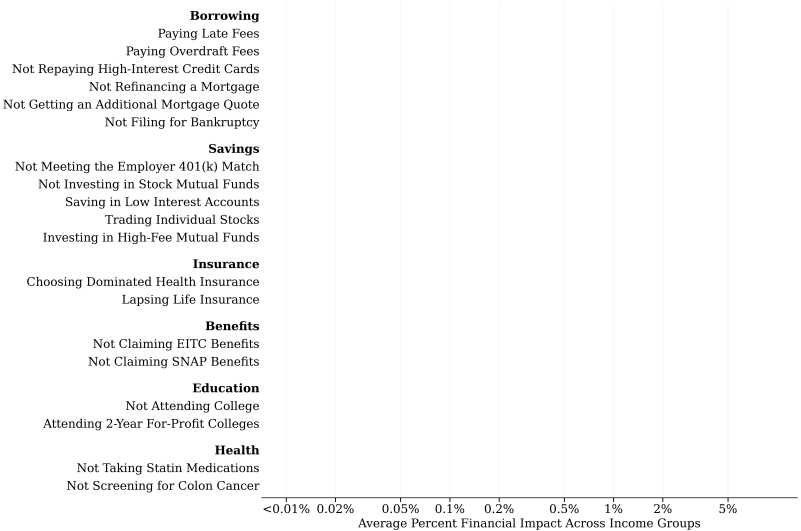
Aggregate Financial Impacts and Benchmarks



Aggregate Financial Impacts and Benchmarks



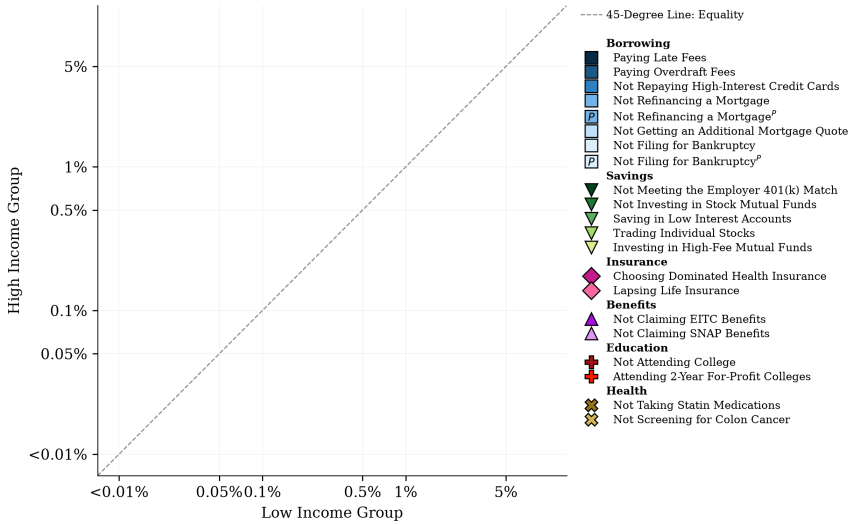
Financial Impacts Across Frictions



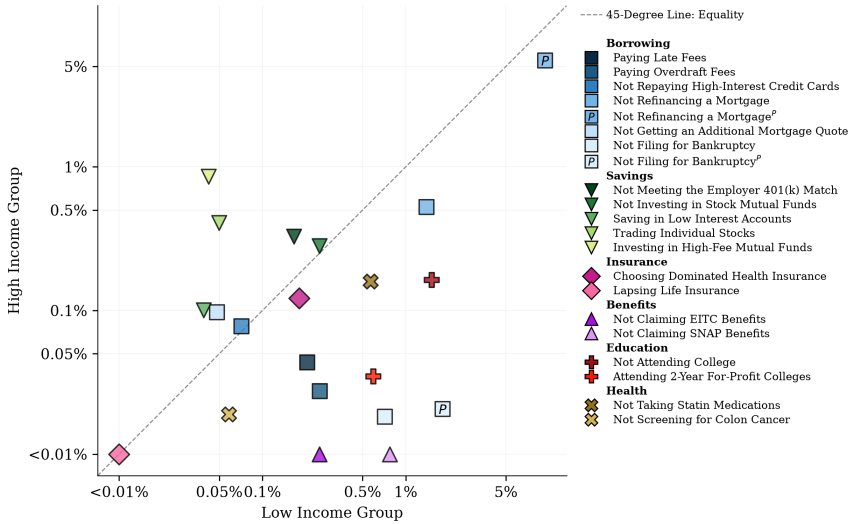
Financial Impacts Across Frictions



Financial Impacts Across Frictions

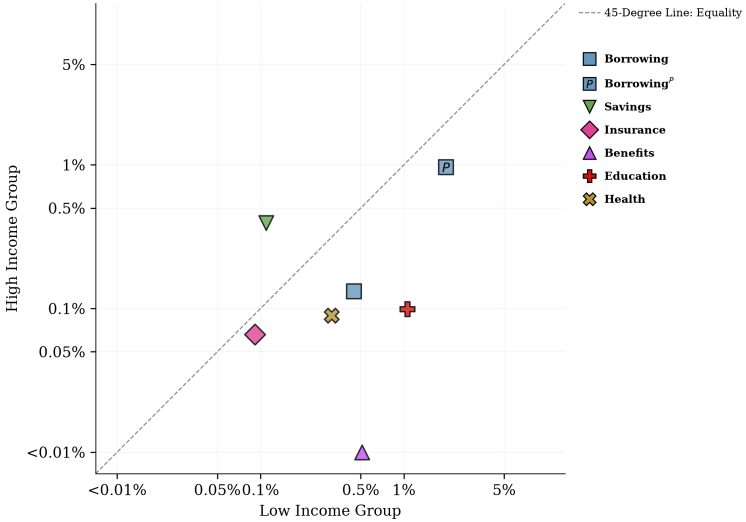


Financial Impacts Across Frictions



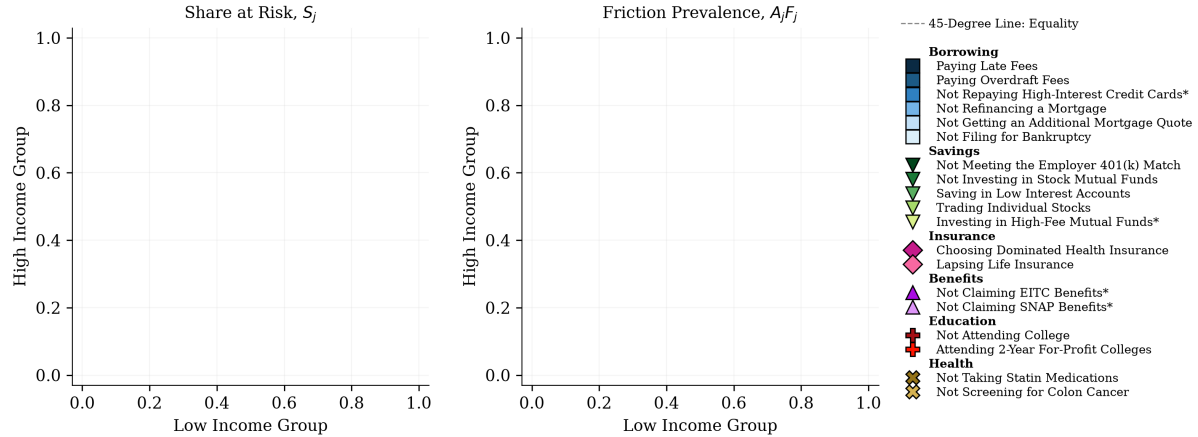
▸ Dollars

Financial Impacts Across Categories

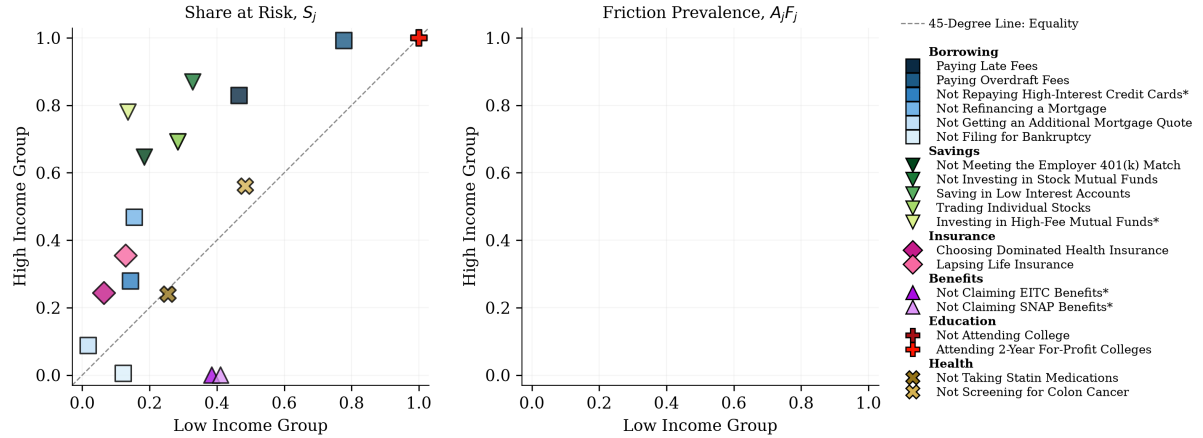


Remove Categories | Dollars

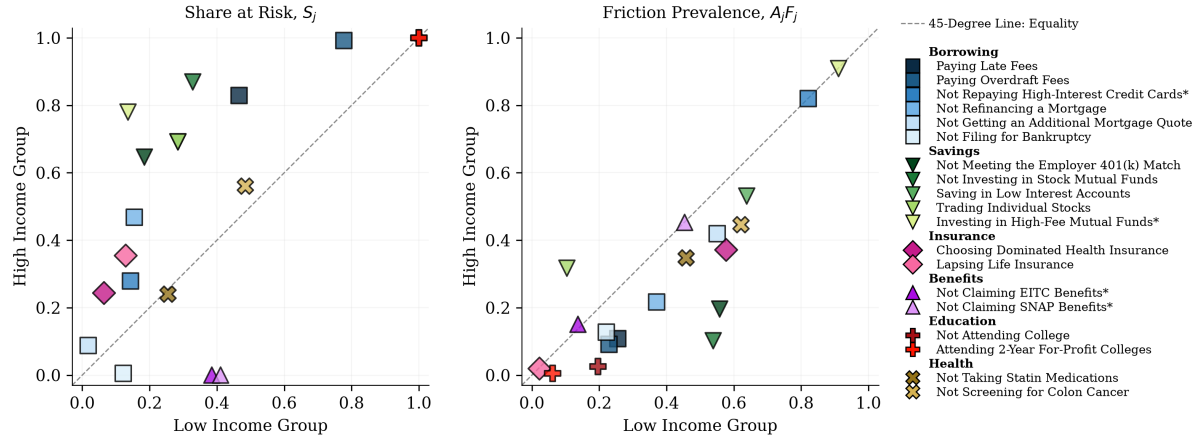
Decomposing Financial Impact: Shares and Prevalence



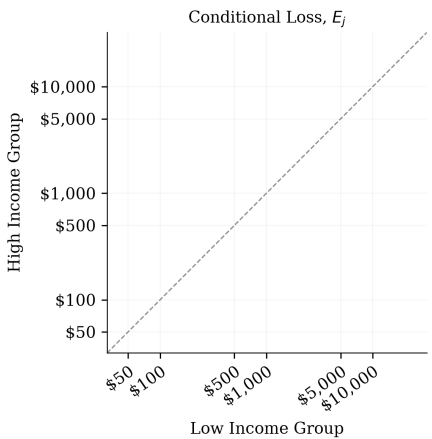
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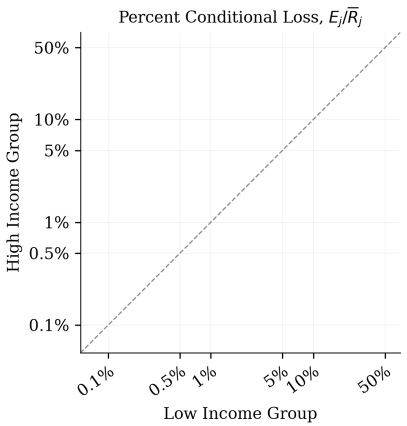


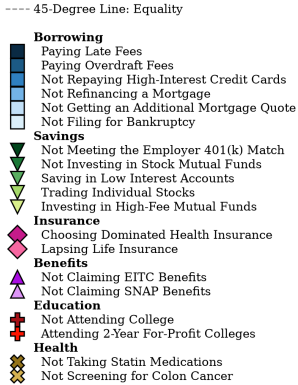
Decomposing Financial Impact: Shares and Prevalence



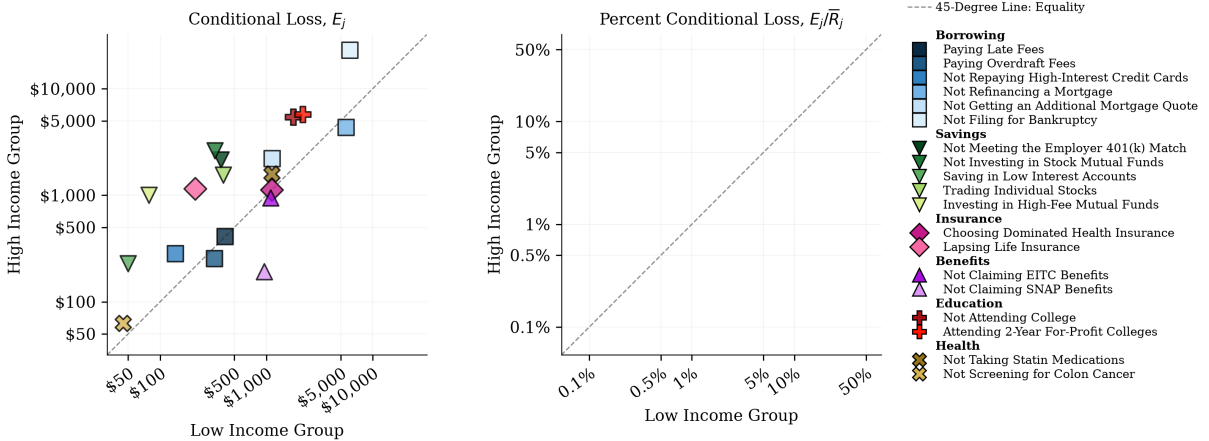
Decomposing Financial Impact: Expected Losses



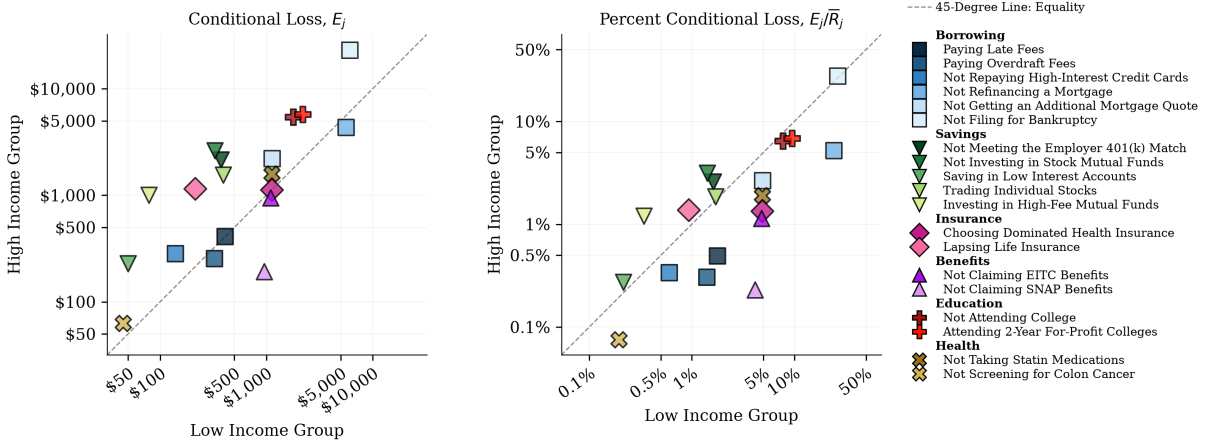




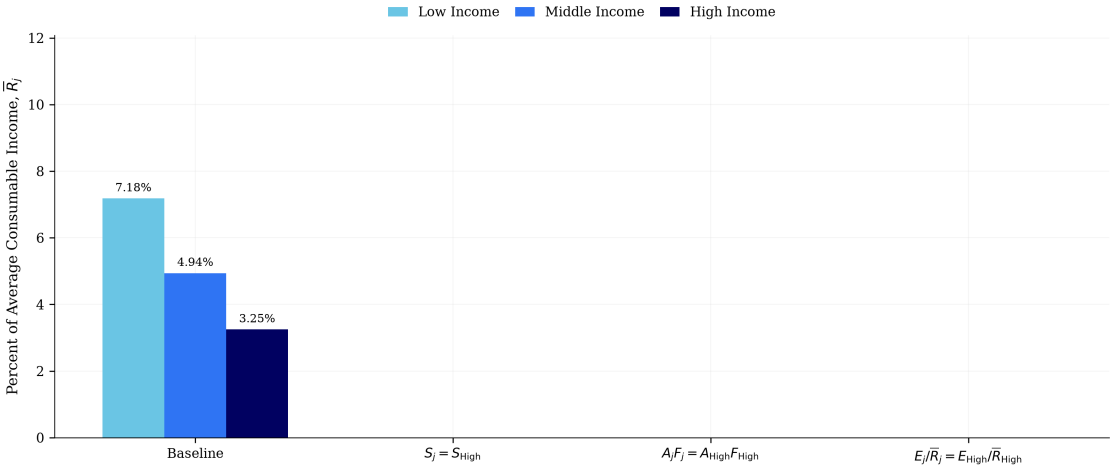
Decomposing Financial Impact: Expected Losses



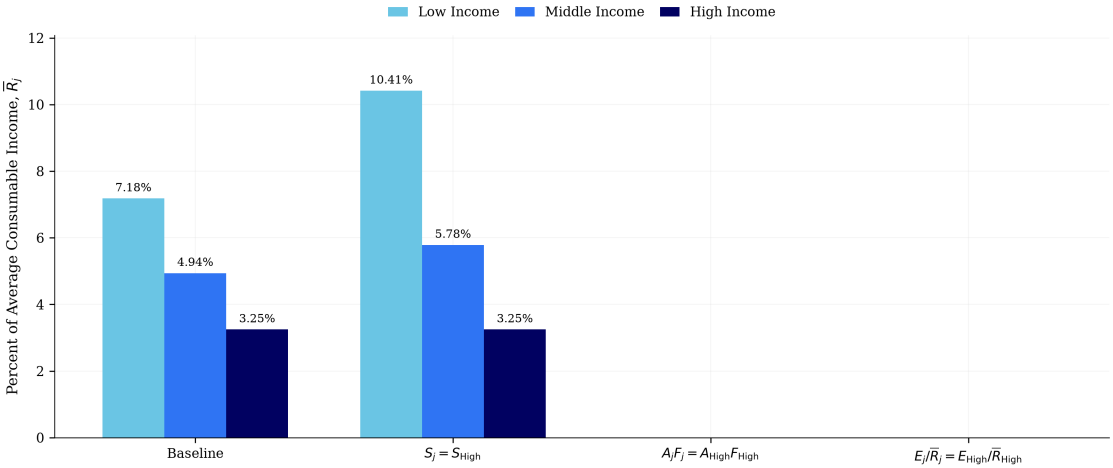
Decomposing Financial Impact: Expected Losses



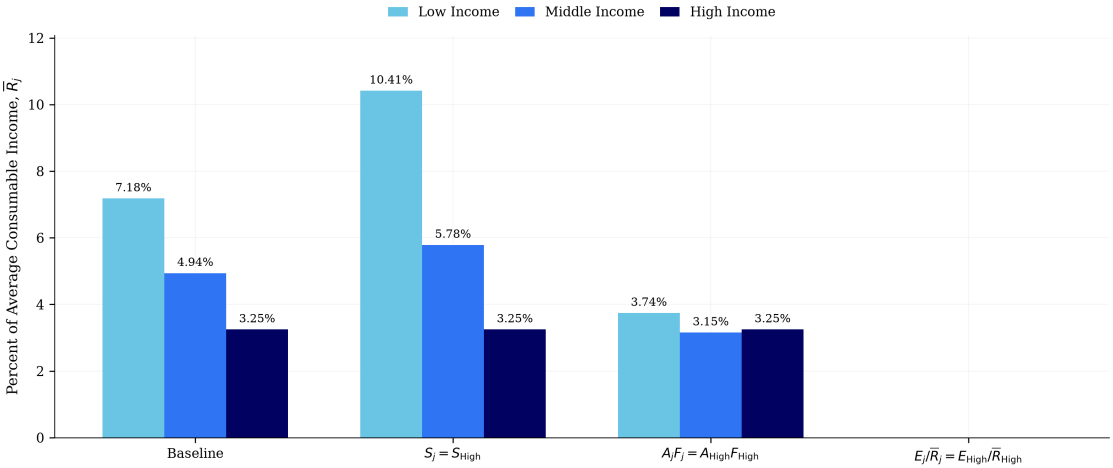
Decomposing Aggregate Financial Impacts



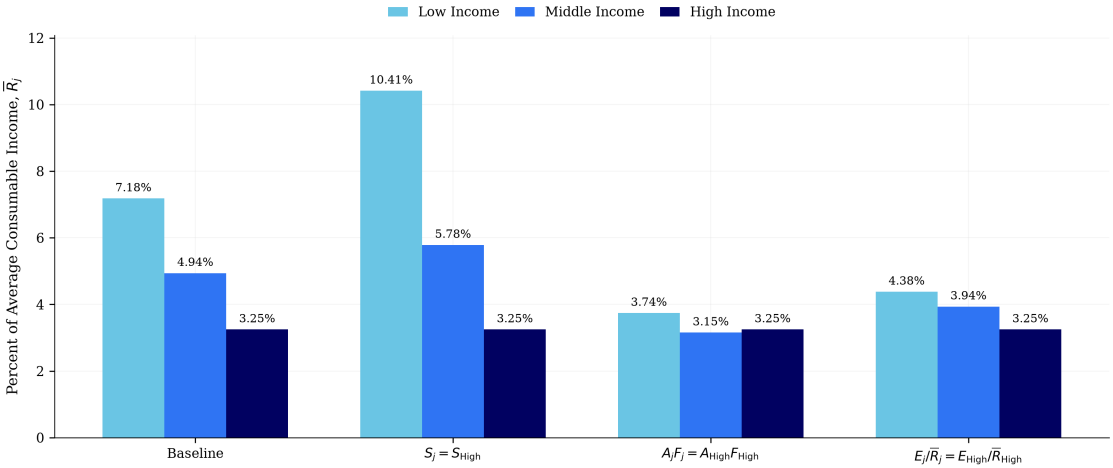
Decomposing Aggregate Financial Impacts



Decomposing Aggregate Financial Impacts



Decomposing Aggregate Financial Impacts



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Financial Impacts and Coverage Rankings

Source Top 3 Frictions	Count	Correlation of Rank in Source with Rank in $S_j A_j F_j E_j / \overline{R}_j$ Low Income	 High Income

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Coverage in university syllabi Stock Market, Trading Individual Stocks, Refinancing	2.4	-0.201	0.444

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Coverage in high-school standards College, Stock Market, Late Fees	3.0	0.205	0.417

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Coverage in journal articles College, 401(k) Match, Stock Market	4.2	0.089	0.511

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Coverage in Economic Report of the President College, For-Profit College, Colon Cancer	1.3	0.298	0.166

Forecasts of Financial Impacts

- Survey on the **Social Science Prediction Platform** (DellaVinga et al. 19)
  - 78 respondents (mostly academics)
- Asked to forecast $S_j A_j F_j E_j / \overline{R}_j$ for low- and high-income groups
  - Elicited by placing points in previous graphs, option to forecast for subset of frictions

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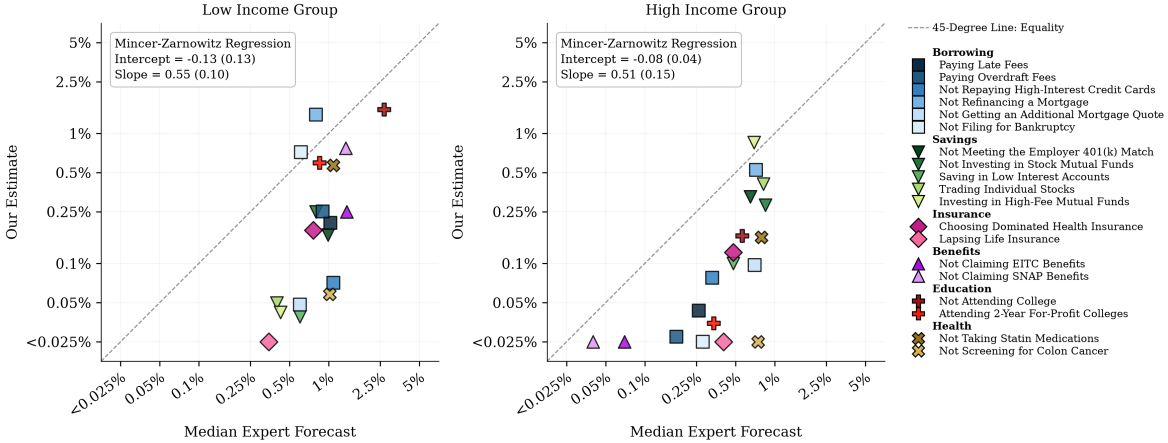
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Source Top 3 Frictions	Count	Correlation of Rank in Source with Rank in $S_j A_j F_j E_j / \overline{R}_j$ Low Income	 High Income
Rankings of financial impacts from expert forecasts, low income College, EITC, SNAP	70.7	0.616	
Rankings of financial impacts from expert forecasts, high income Stock Market, Trading Individual Stocks, Statins	70.7		0.729

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Source Top 3 Frictions	Count	Correlation of Rank in Source with Rank in $S_j A_j F_j E_j / \overline{R}_j$ Low Income	 High Income
Rankings of financial impacts from expert forecasts, low income College, EITC, SNAP	70.7	0.616	-0.277
Rankings of financial impacts from expert forecasts, high income Stock Market, Trading Individual Stocks, Statins	70.7	-0.241	0.729

Estimated Financial Impacts and Forecasts



Forecasted impacts have **larger**, more **dispersed**, and more **regressive**

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SUMMARY

1. Decision-making frictions create sizeable losses in aggregate
   - Aggregate losses are **7.2%** (**3.3%**) for low (high) income $\approx$ expenditure on utilities
   - Largest (for now): refinancing, college attendance, stock participation, fund fees
   - **But** losses are typically **smaller** than forecasters estimate

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2. Losses from decision-making frictions are **regressive**
   - Primarily reflects higher low-income **prevalence** (AF)
   - Main exception is savings frictions: high-income have more to lose
   - Financial education tilts towards high-income frictions, policy towards low-income
   - Losses are **less regressive** than forecasters estimate

SUMMARY

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... Much more to come (and results still in progress)!

THANK YOU!

CONSUMABLE INCOME ACROSS GROUPS: PSID 2011-2019

$$R_{it} = \text{Labor Income}_{it} + \text{Capital Income}_{it} + \text{Benefits}_{it} - \text{Taxes}_{it} - \lambda_{it}$$

	Income Group j		
% of R_{it}	Low	Middle	High
Labor Income	40%	77%	90%
Capital Income	2%	3%	13%
Social Security + DB Pensions	37%	22%	11%
Other Benefits	22%	4%	2%
401(k)/IRA Accrual	5%	8%	12%
Taxes	−4%	−15%	−28%
Direct Losses (λ_{it})	−1.5%	−0.9%	−0.3%

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Consumable Income across Groups: PSID 2011-2019

$$R_{it} = \text{Labor Income}_{it} + \text{Capital Income}_{it} + \text{Benefits}_{it} - \text{Taxes}_{it} - \lambda_{it}$$

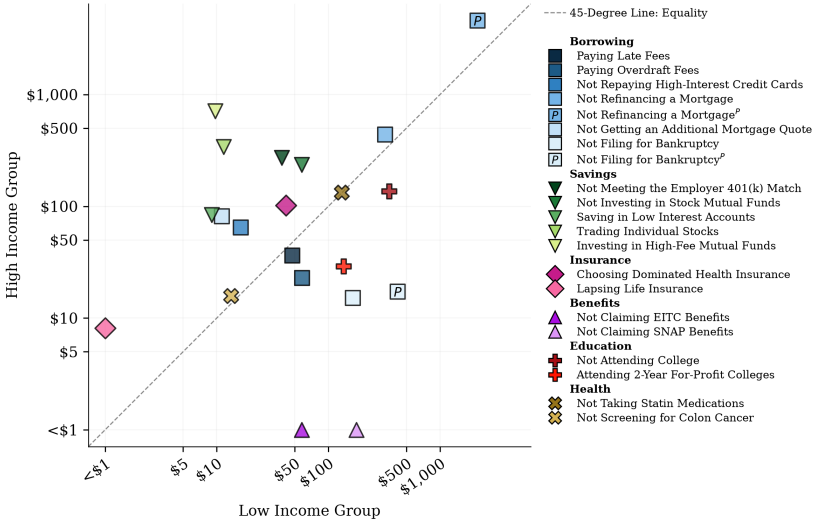
$$\overline{R}_j = \text{average } \textbf{permanent } R_{it} \text{ within income group } j \qquad \text{(same for all frictions)}$$

% of R_{it}	Income Group j Low	Middle	High
Labor Income	40%	77%	90%
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Taxes	−4%	−15%	−28%
Direct Losses (λ_{it})	−1.5%	−0.9%	−0.3%

Income Group j	Current R_{it}	Permanent $\overline{R}_j$ (Rafkin et al. 25)
Low	\$19.1K	\$23.1K
Middle	\$38.4K	\$40.2K
High	\$89.9K	\$83.5K
High / Low	4.7×	3.6×

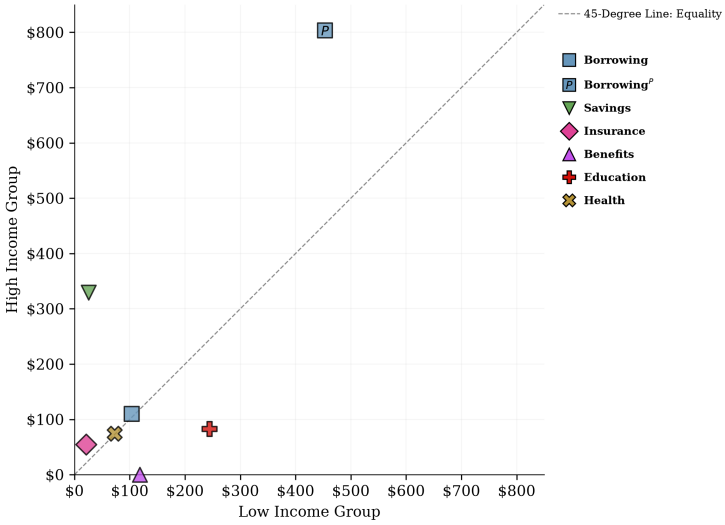
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Financial Impacts Across Frictions: Dollars



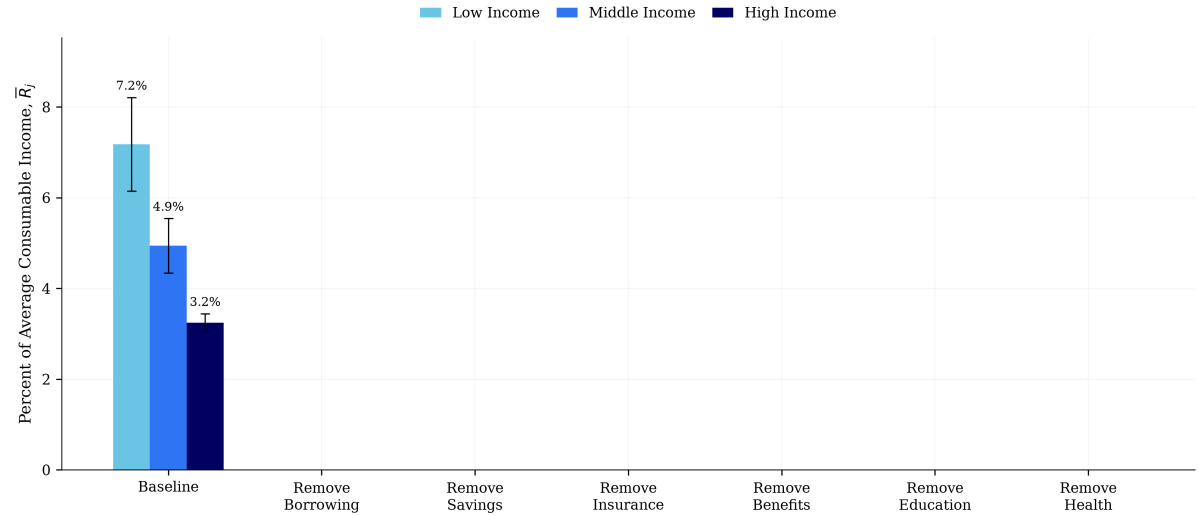
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Financial Impacts: Category Averages in Dollars



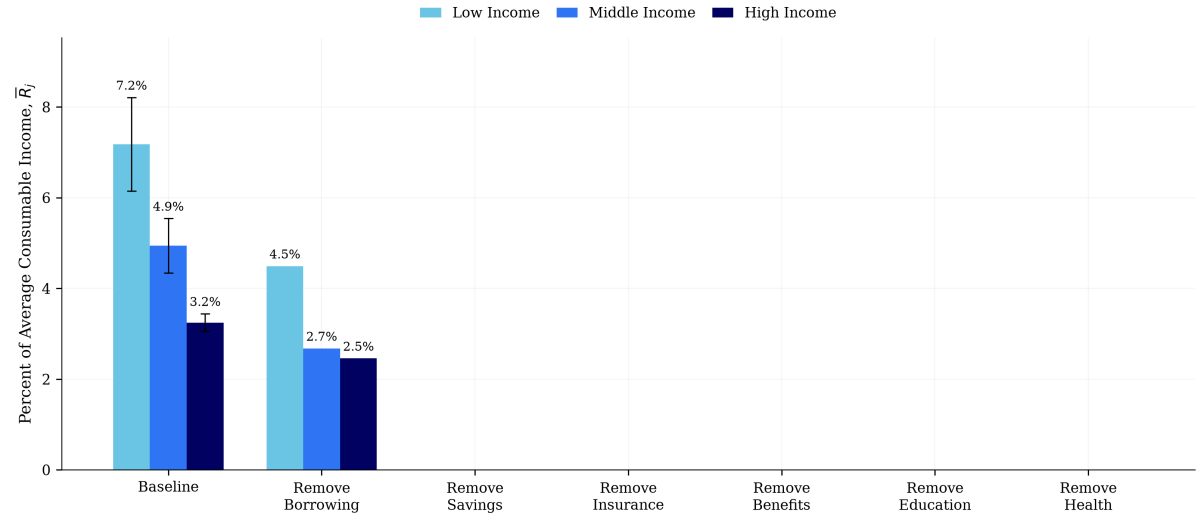
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Aggregate Financial Impact After Removing Each Category



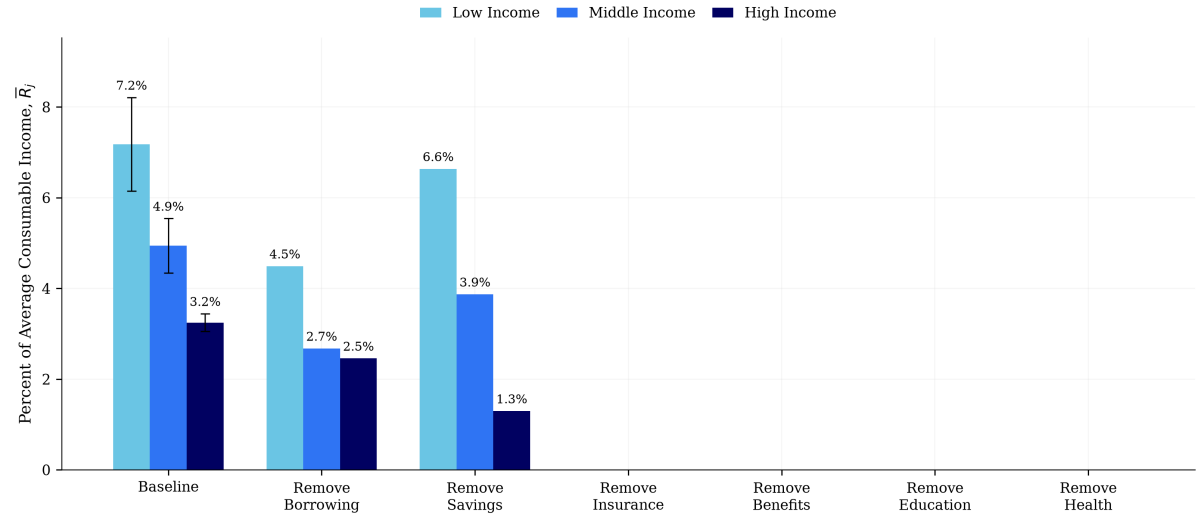
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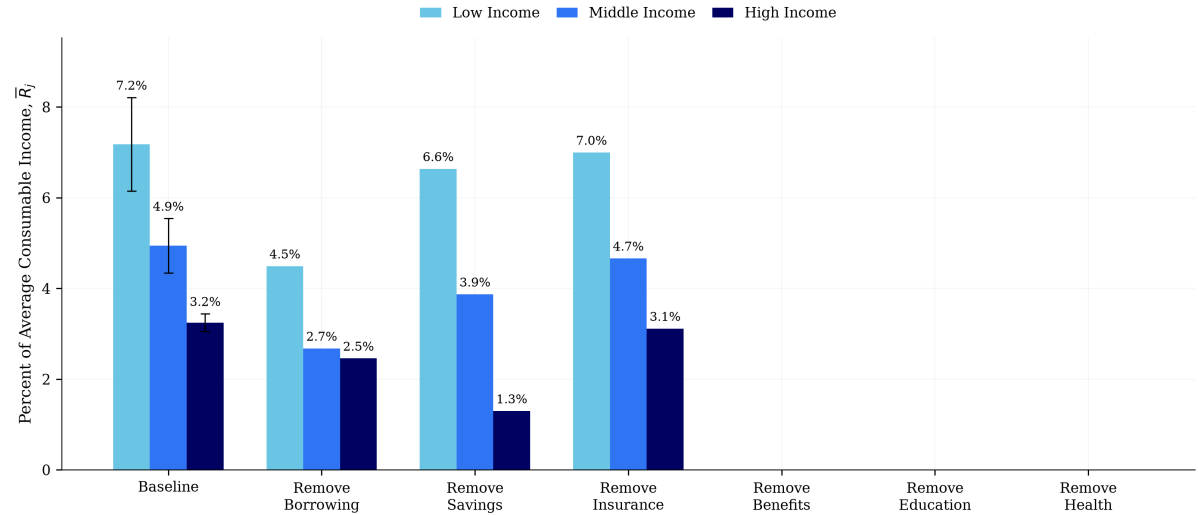
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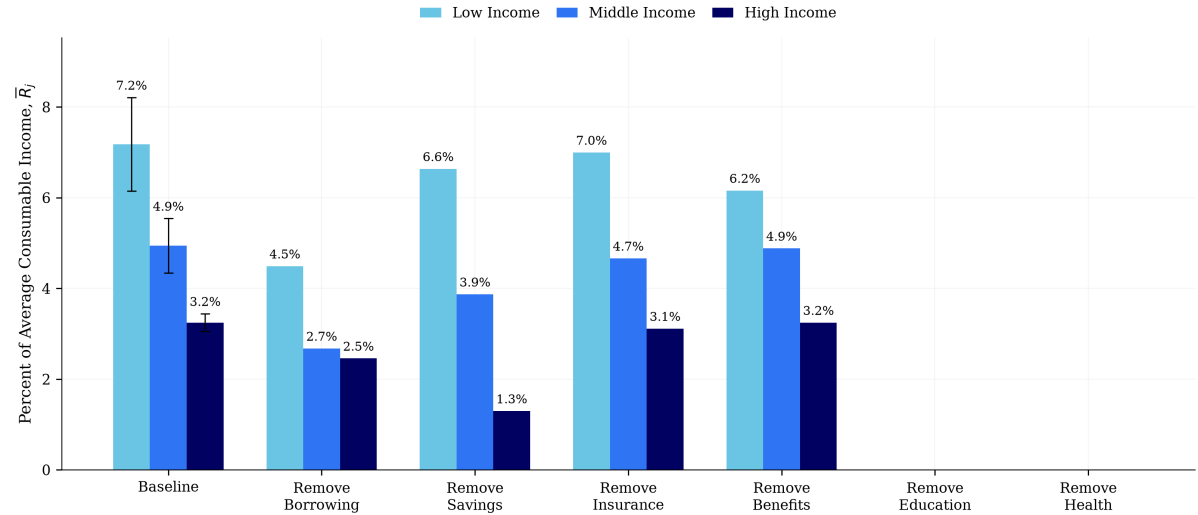
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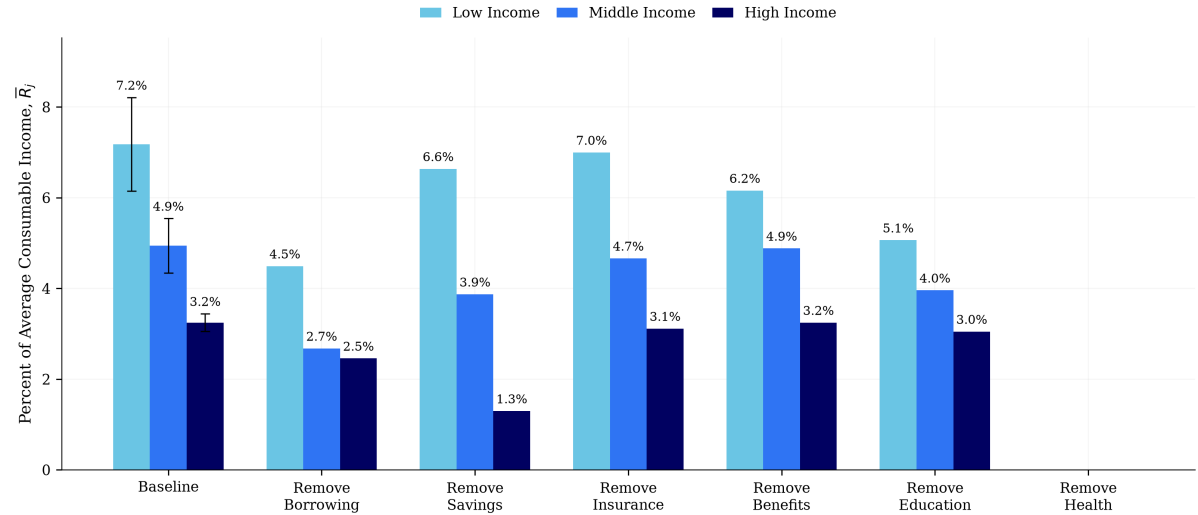
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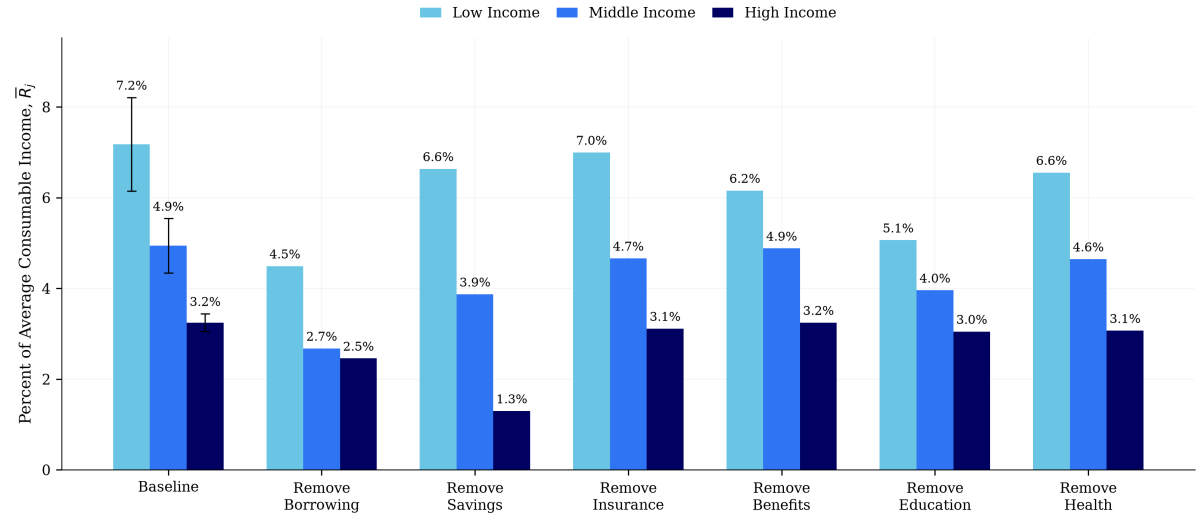
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