Quick-Fixing: Near-Rationality in Consumption and Savings Behavior

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CIGS Conference on Macroeconomic Theory and Policy
June 17, 2025

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- Challenges for taking this further:
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- **This paper**: confronts the near-rationality hypothesis with new evidence

Summary: "Quick-Fixing" is Prevalent, Important for Macro

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  - Quick-fixes mostly unexplained by HH characteristics, but essential for explaining MPC heterogeneity and size-dependence
- **Quantification** suggests that small optimization costs matter for macro
  - Tiny opportunity costs of quick-fixing: \$17 per quarter
  - Matters for size-dependence, front-loadedness, and incidence dependence

Today's Talk

A Simple Model

Survey Design

Empirical Results

Quantitative Model

Conclusion

1. A Simple Model

A Two-Period Problem

- Household lives for two periods $t \in \{1, 2\}$
- Receives income stream y_1, y_2
- Preferences over streams of consumption (c_1, c_2) given by:

$$u(c_1) + \beta u(c_2)$$

  where $\beta > 0$ and $u : \mathbb{R}_+ \to \mathbb{R}$ is strictly concave

- Choice: consumption vs. saving in risk-free bond $(R = 1/\beta)$ at $t = 1$

Fully Rational Household Behavior

Rational Behavior

The household solves Program (R)

$$U^*(z) = \max_{c_1, c_2} u(c_1) + \beta u(c_2)$$
$$\text{s.t.} \quad c_1 + \frac{c_2}{R} = y_1 + \frac{y_2}{R} \tag{R}$$

Consumption policy function:

$$c_1^*(y_1, y_2) = \frac{R(y_1) + y_2}{1 + R} \quad t \in \{1, 2\}$$

Near-Rationality and Quick-Fixing

- Near-rational household has a "quick-fix" consumption function c^q:

$$c_1 = c^q(y_1, y_2)$$

e.g., fixing c with $c^q(y_1, y_2) \equiv \bar{c}$, fixing s with $c^q(y_1, y_2) \equiv y_1 - \bar{s}$

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- To instead deviate and pick $c_1^*(y_1, y_2)$ costs $\kappa_q > 0$ in utility
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- To instead deviate and pick $c_1^*(y_1, y_2)$ costs $\kappa_q > 0$ in utility
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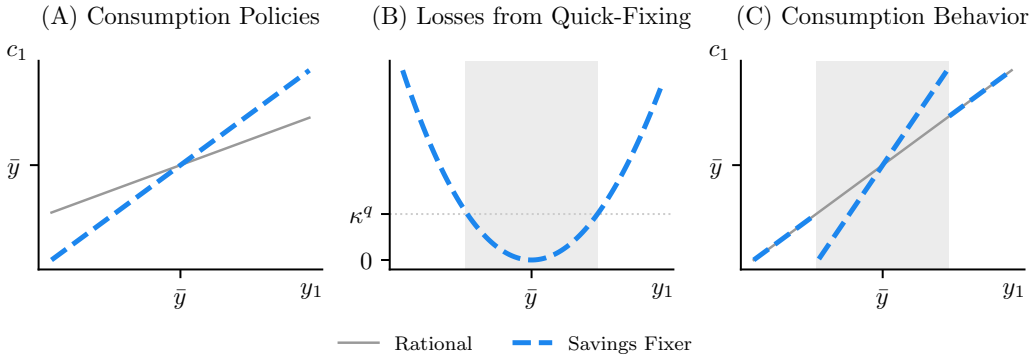
- Household quick-fixes if and only if:

$$\underbrace{U^*(y_1, y_2)}_{\text{Rational payoff}} - \underbrace{U^q(y_1, y_2)}_{\text{QF payoff}} \leq \kappa_q \qquad \text{(NR)}$$

Link

What Might Quick-Fixing Look Like?



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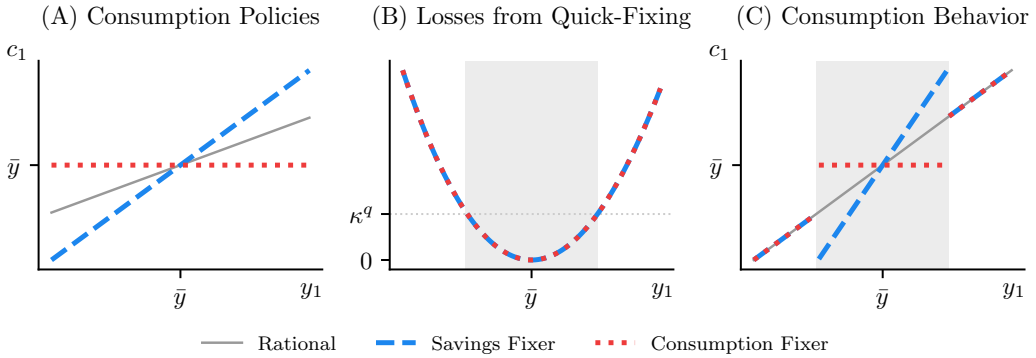

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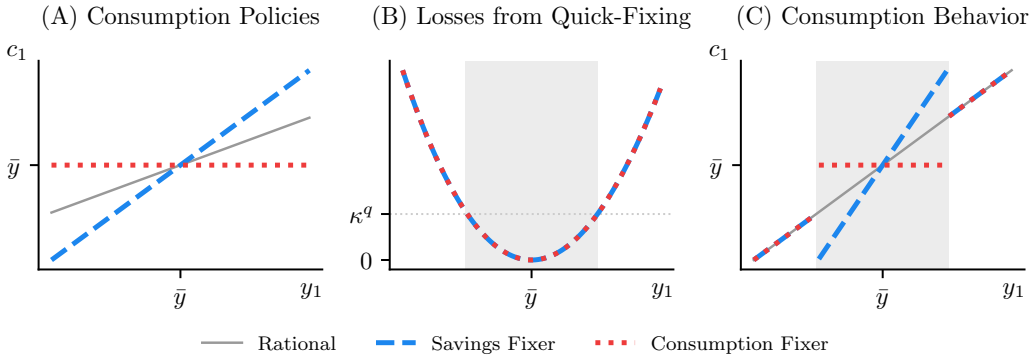

- **Desired data**: consumption policy functions
- Survey experiments, rather than observational data, are necessary

2. Survey Design

Sampling Design and Overview

- $N = 4,981$ US households, October and November 2023
- Sample approximates US population in terms of gender, age, income, education, region, and broadly captures the wealth distribution Balance

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- **Main question**: spending/saving responses to 14 scenarios [next slide]
- Additional data: household size, annual income, income risk, monthly spending, liquid wealth, illiquid wealth, debt, income expectations, income autocorrelation

Main Question: Responses to 14 Shocks

Introduction

In this survey, we are seeking to understand how your household reacts to unanticipated changes in income. By “household”, we mean everyone who usually lives with you in your primary residence including yourself (but excluding roommates and renters).

You will be presented with various hypothetical scenarios that involve shifts in your income, and we will ask you how such changes would impact your household's spending and saving. Below, we provide a short description of what we mean by “spending” and “saving”. Please read them carefully.

Spending: Spending includes all money spent on goods and services, including rent. Goods include durable goods (such as electronics, furniture, or car maintenance) and nondurable goods (such as groceries, vacations, or gasoline).

Saving: **Saving means that, instead of using money today, you reserve it for future use.** Examples of savings include cash reserves, money in bank accounts, retirement accounts, financial assets, or real estate. **Repaying debt is also an important form of saving.** By repaying debt today, you owe less money in the future, which means that more money is available for future use.

Main Question: Responses to 14 Shocks

In random order: whether you see gains or losses first

On the next pages, you will consider hypothetical situations where your household unexpectedly incurs a

one-time income loss today.

That is, your household's income will be lower for one month due to a one-time income loss. The one-time income loss comes unexpectedly.

Main Question: Responses to 14 Shocks

In random order: $50, $100, $250, $500, $1,000, $5,000, $10,000

A one-time income loss

Situation 1

Consider a hypothetical situation where your household unexpectedly incurs a

one-time income loss of $100 today.

How would this one-time income loss cause your household to change its spending and saving over the next three months?

Note: Your responses need to add up to $100.
Enter $0 if your household's spending/saving would not change.
Enter negative numbers for *in*creases in your household's spending/saving.

Decrease in spending (By how much) would your household decrease its monthly spending over the next three months?	$ 0
Decrease in saving (By how much) would your household decrease its monthly saving (which includes decreases in debt repayment or increases in debt-taking) over the next three months?	$ 0
Total	$ 0

Main Question: Responses to 14 Shocks

In random order: $50, $100, $250, $500, $1,000, $5,000, $10,000

A one-time income loss
Situation 5

Consider a hypothetical situation where your household unexpectedly incurs a

one-time income loss of $10,000 today.

How would this one-time income loss cause your household to change its spending and saving over the next three months?

Note: Your responses need to add up to $10,000.
Enter $0 if your household's spending/saving would not change.
Enter negative numbers for *in*creases in your household's spending/saving.

Decrease in spending (By how much) would your household decrease its monthly spending over the next three months?	$ 0
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Total	$ 0

Main Question: Responses to 14 Shocks

In random order: whether you see gains or losses first

On the next pages, you will consider hypothetical situations where your household unexpectedly receives a

one-time payment today.

That is, your household's income will be higher for one month due to a one-time payment. The one-time payment comes unexpectedly.

Main Question: Responses to 14 Shocks

In random order: $50, $100, $250, $500, $1,000, $5,000, $10,000

A one-time payment
Situation 1

Consider a hypothetical situation where your household unexpectedly receives a

one-time payment of $250 today.

How would this one-time extra income cause your household to change its spending and saving over the next three months?

Note: Your responses need to add up to $250.
Enter $0 if your household's spending/saving would not change.
Enter negative numbers for *de*creases in your household's spending/saving.

Increase in spending (By how much) would your household increase its monthly spending over the next three months?	$ 0
Increase in saving (By how much) would your household increase its monthly saving (which includes increases in debt repayment or decreases in debt-taking) over the next three months?	$ 0
Total	$ 0

Main Question: Responses to 14 Shocks

In random order: $50, $100, $250, $500, $1,000, $5,000, $10,000

A one-time payment
Situation 4

Consider a hypothetical situation where your household unexpectedly receives a

one-time payment of $5,000 today.

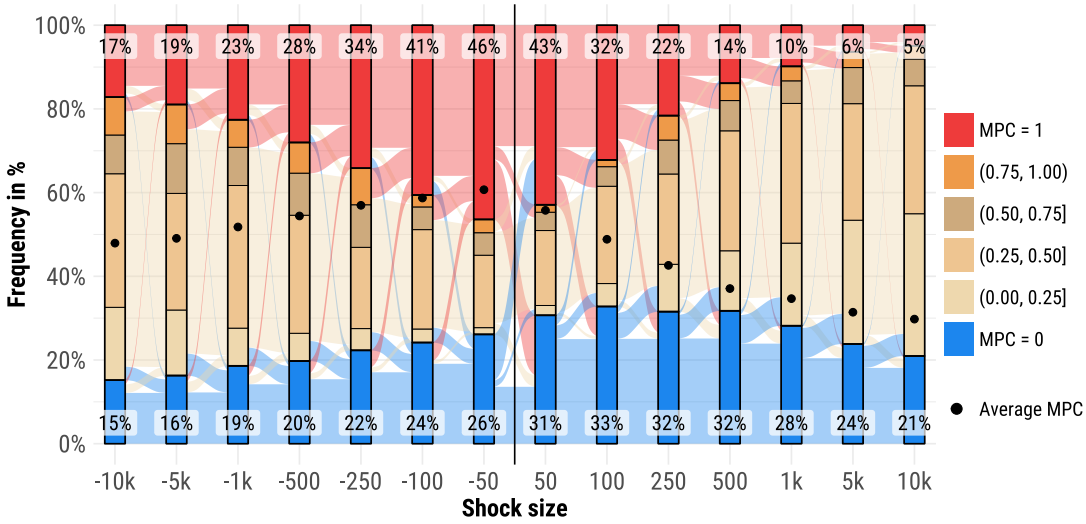
How would this one-time extra income cause your household to change its spending and saving over the next three months?

Note: Your responses need to add up to $5,000.
Enter $0 if your household's spending/saving would not change.
Enter negative numbers for *de*creases in your household's spending/saving.

Increase in spending (By how much) would your household increase its monthly spending over the next three months?	$ 0
Increase in saving (By how much) would your household increase its monthly saving (which includes increases in debt repayment or decreases in debt-taking) over the next three months?	$ 0
Total	$ 0

3. Empirical Results

The Bowtie: Extreme MPCs for Small, but not Large, Shocks



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Savings fixers (29%) MPC $= 1$. *Absorb small shocks with consumption.*

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Consumption prioritizers (11%): MPC $= 1$ for gain, 0 for loss. *Draw on savings to cover losses, and consume gains.*

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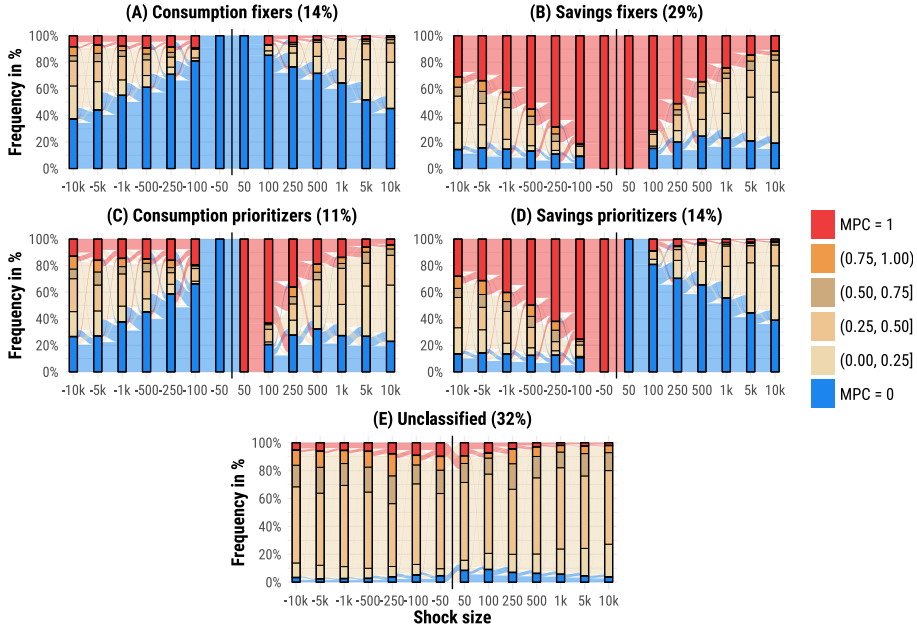
Savings prioritizers (14%) MPC $= 0$ for gain, 1 for loss. *Cut back on consumption after loss, but save gains.*


(A) Consumption fixers (14%)
(B) Savings fixers (29%)
(C) Consumption prioritizers (11%)
(D) Savings prioritizers (14%)
(E) Unclassified (32%)
Frequency in %
100%
80%
60%
40%
20%
0%
-10k -5k -1k -500 -250 -100 -50 50 100 250 500 1k 5k 10k
Shock size
MPC = 1
(0.75, 1.00)
(0.50, 0.75]
(0.25, 0.50]
(0.00, 0.25]
MPC = 0

Why Are These Behaviors "Quick-Fixes"?

1. Extreme MPCs more likely for small shocks vs. large shocks ✓
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   - Conditional on changing from MPC=1 (MPC=0) to the interior, the 20%-80% range of responses of MPCs is [0.25,0.60] ([0.20,0.50])
   - 93% of HH "stay in interior" for next largest shock

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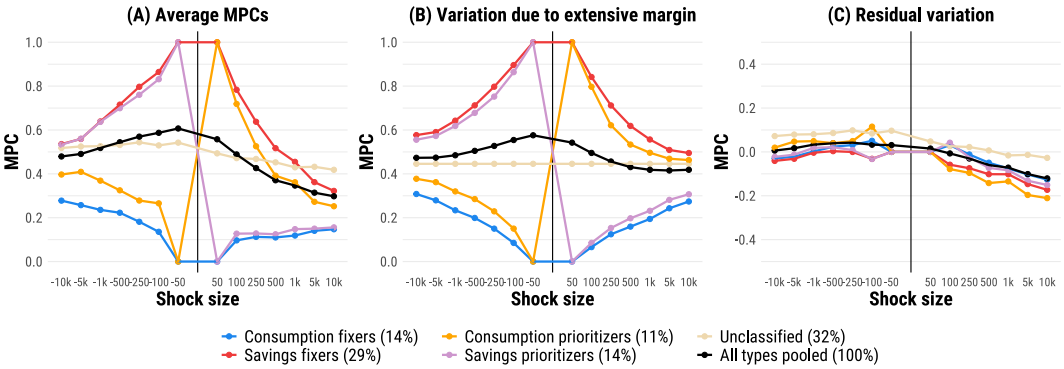
   - 93% of HH "stay in interior" for next largest shock
3. After abandoning quick-fixes, HHs choose stable and similar policies ✓
   - As shock gets bigger, average absolute difference in MPCs is 0.14 (unconditionally); 0.41 when going from extremes to interior
   - Variation in interior MPCs: only 16% of cross-sectional MPC variance

Robustness | Interior MPC Histograms | Statistical Significance | Comparisons

Quick Fixes Explain Size and Sign Dependence in MPCs



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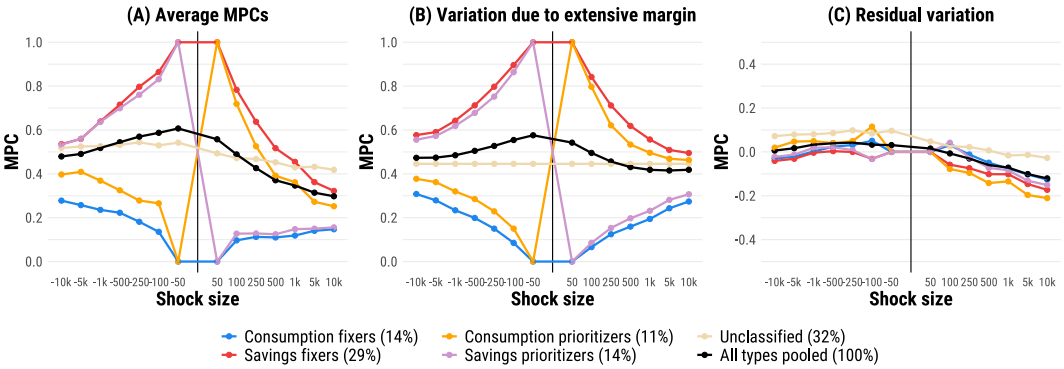

- Type distribution matters: different QF $\rightarrow$ different patterns

Quick-Fixing Helps Explain Variance in MPCs

Respondent-level regression to predict average MPC across scenarios:

$$\text{MPC}_i = \alpha + X_i'\beta + \varepsilon_i$$

- **Model 1**: "kitchen sink" of wealth, income, demographics

  $X_i = (\log \text{Monthly Spending}_i, \log \text{Annual Income}_i, \text{std. Income Risk}_i,$
  $\text{Three Bins of Liquid Wealth}_i, \text{Three Bins of Illiquid Wealth}_i,$
  $\text{Three Bins of Debt}_i, \text{Education}_i, \text{Age}_i, \text{Gender}_i, \text{Household Size}_i)$

- **Model 2**: X_i = dummies for four quick-fixing types

MPC = 1 Version Regressions

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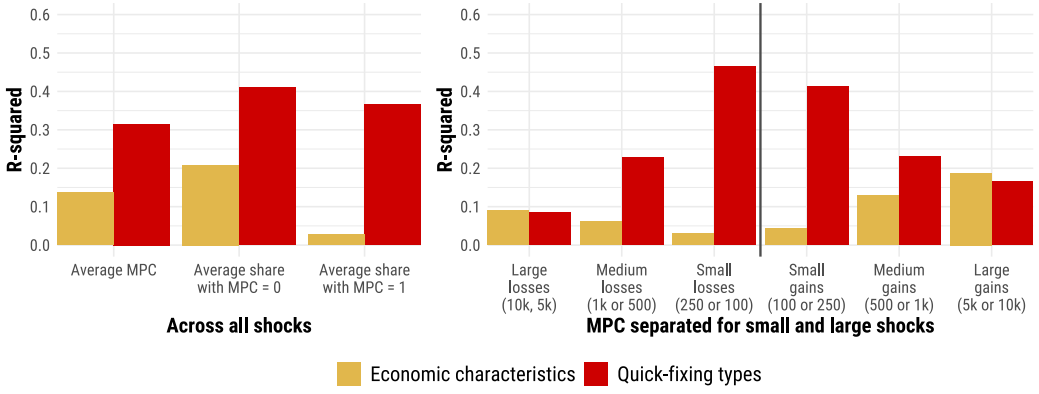


MPC = 1 Version Regressions

Household Characteristics Do Not Predict Quick-Fixing

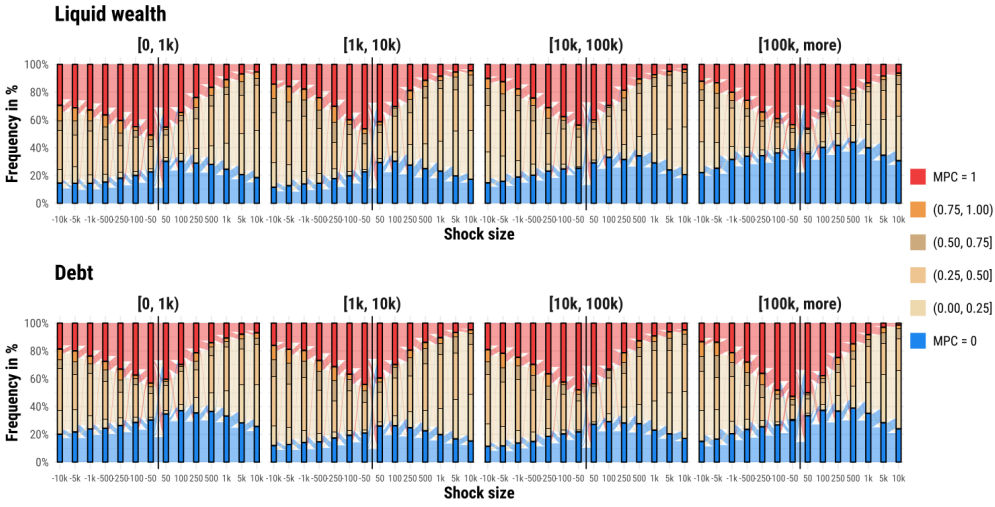
Respondent-level regression to predict quick-fixing types:

$$\text{Quick-Fix Type}_i = \alpha + X_i'\beta + \varepsilon_i$$

where X_i is the "kitchen sink" of wealth, income, demographics

Type	C-Fixer	S-Fixer	C-Prioritizer	S-Prioritzier
R^2	0.057	0.017	0.020	0.020

Household Characteristics Do Not Predict Quick-Fixing



Definitions

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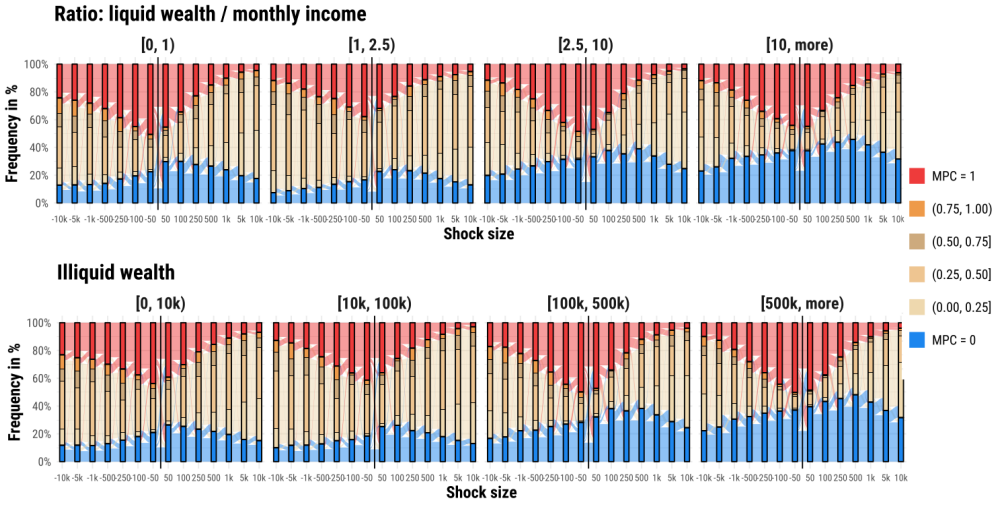

Definitions

Quick-Fixes Require Less Deliberation

- Follow-up survey of 517 additional US households (August 2024)
- Measure consumption-savings responses as before
- Ask **additional questions** to rate difficulty of making decisions
  - How carefully would they consider spending and saving decisions (1-6)
  - Percent chance they would assess financial situation before responding
  - Percent chance they would discuss with other household members

Within-Respondent | Qualitative Evidence

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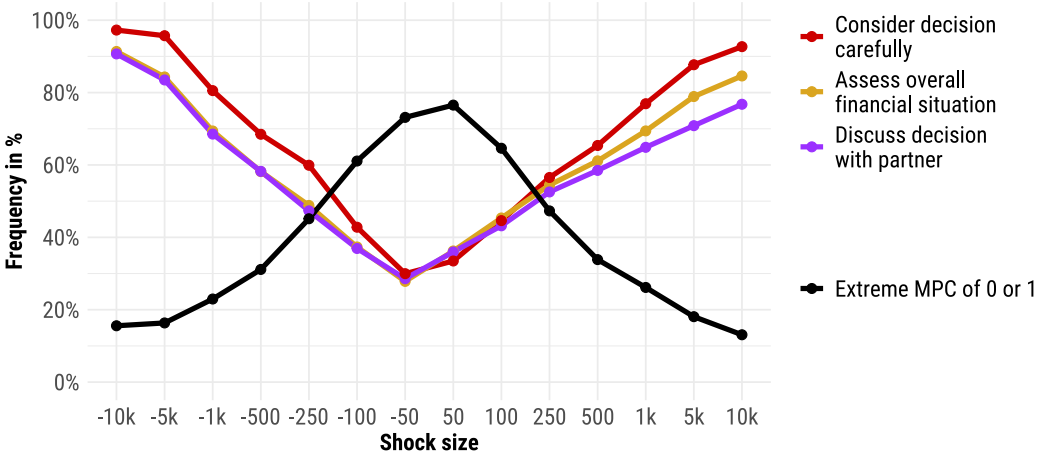

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6. Models with Infrequent Optimization and Inertia? No: many adjust behavior even in response to small shocks
   Akerlof and Yellen (1985), Gabaix and Laibson (2001), Fuster, Kaplan, and Zafar (2021)

4. Quantitative Model

A Problem with Income Fluctuations, Incomplete Markets

- Households $i \in [0, 1]$ living in discrete time $t \in \mathbb{N}$
- Flow payoffs are CRRA with RRA $\gamma > 0$, discount factor $\beta \in [0, 1)$
- **Income fluctuations**: income y follows a finite state Markov chain
- **Incomplete markets**: can save at interest rate $R \geq 1$ but cannot borrow
- Familiar problem for *rational agents*:

$$\begin{aligned} V^R(a, y) = \max_{a'} \left\{ u(c) + \beta \mathbb{E}\left[V^R(a', y') \mid y \right] \right\} \\ \text{s.t. } a' = (1 + r)a + y - c \\ a \geq 0 \end{aligned}$$

The Household Problem with Quick-Fixing

- Four quick-fix policy functions from the survey, with different costs κ_q
  - Additional states: reference consumption and income, $\bar{c}$ and $\bar{y}$

$$V^q(a, y, \bar{c}, \bar{y}) = \max_{D \in \{0,1\}} \{D\left(u(c^*(a, y)) + \beta \mathbb{E}\left[V^q(a', y', c^*(a, y), y) \mid y\right] - \kappa_q\right)$$
$$+(1 - D)\left(u(c^q(a, y, \bar{c}, \bar{y})) + \beta \mathbb{E}\left[V^q(a', y', \bar{c}, \bar{y}) \mid y\right]\right)\}$$
$$\text{s.t. } a' = (1 + r)a + y - (D(c^*(a, y)) + (1 - D)(c^q(a, y, \bar{c}, \bar{y})))$$
$$a \geq 0$$

Unanticipated shocks

The Household Problem with Quick-Fixing

- Four quick-fix policy functions from the survey, with different costs κ_q
  - Additional states: reference consumption and income, $\bar{c}$ and $\bar{y}$
- *Permanent types*: justified by unpredictability in survey
- *Naivety*: consistent with near-rationality... and adversarial

$$V^q(a, y, \bar{c}, \bar{y}) = \max_{D \in \{0,1\}} \{D\left(u(c^*(a, y)) + \beta \mathbb{E}\left[V^q(a', y', c^*(a, y), y) \mid y\right] - \kappa_q\right)$$
$$+(1 - D)\left(u(c^q(a, y, \bar{c}, \bar{y})) + \beta \mathbb{E}\left[V^q(a', y', \bar{c}, \bar{y}) \mid y\right]\right)\}$$
$$\text{s.t. } a' = (1 + r)a + y - (D(c^*(a, y)) + (1 - D)(c^q(a, y, \bar{c}, \bar{y})))$$
$$a \geq 0$$

Unanticipated shocks

Calibration: Estimating Optimization Costs to Match Data

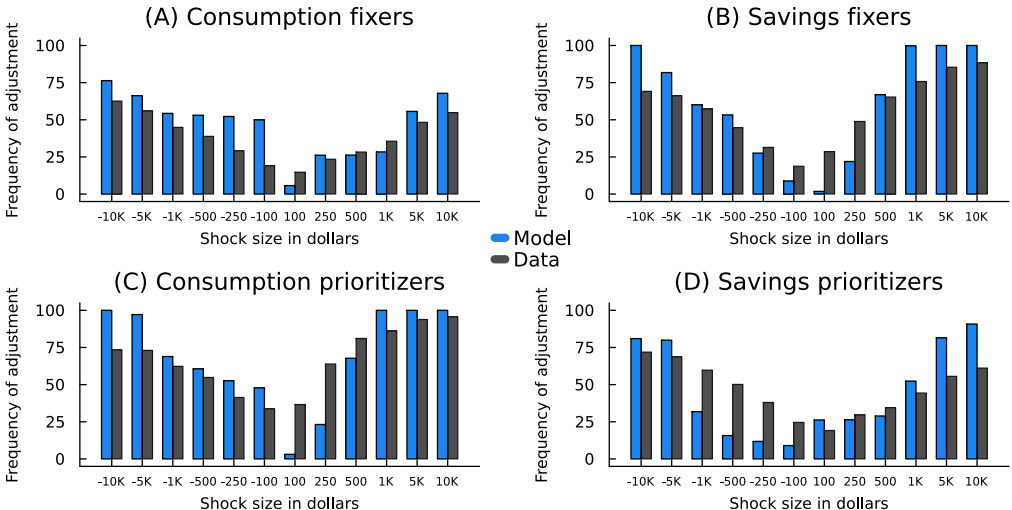
1. Fix standard parameters: $\gamma = 1$, $r = 0.01$, 5-state discretization of AR(1) earning process from Kaplan, Moll, and Violante (2018)

2. Estimate the discount factor to match MPCs of *rational households* ("unclassified" in survey), $\beta = 0.92$

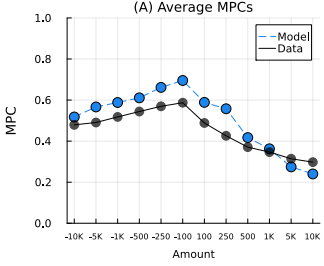
3. Estimate the four optimization costs to match the fraction of households that re-optimize in the data (excluding \$50 shocks):

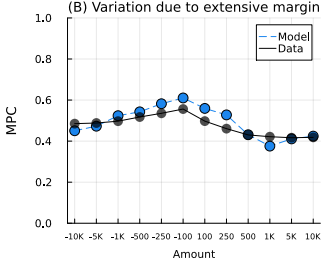
$$\kappa_q^* \in \arg\min_{\kappa_q > 0} \left\{ \sum_{i=1}^{12} \left(\text{ReoptFraction}_{x_i}^q - \widehat{\text{ReoptFraction}}_{x_i}^q \right)^2 \right\}$$

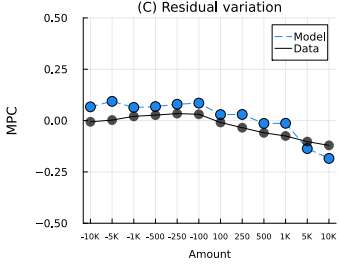
Model Fit: Reoptimization and MPCs



Model Fit: Reoptimization and MPCs







Costs of Near-Rationality are Very Small

Panel A: Optimization costs κ_q		
Household type	% reduction in consumption	Average dollar cost
Consumption fixer	1.10	\$176.67
Savings fixer	0.007	\$1.47
Consumption prioritizer	0.006	\$1.44
Savings prioritizer	0.11	\$18.58

Inaction regions

Costs of Near-Rationality are Very Small

Panel B: Value loss due to near rationality $V^R - V^q$ (per quarter)		
Household type	% reduction in consumption	Average dollar loss
Consumption fixer	0.45	\$71.67
Savings fixer	0.004	\$0.58
Consumption prioritizer	0.003	\$0.54
Savings prioritizer	0.06	\$8.68

Inaction regions

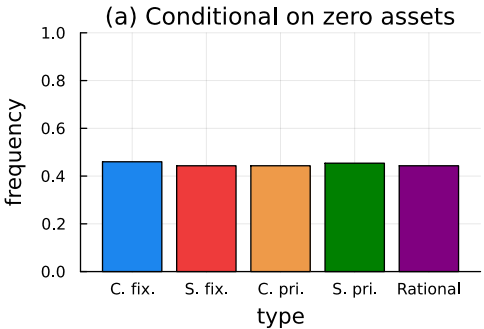
Costs of Near-Rationality are Very Small

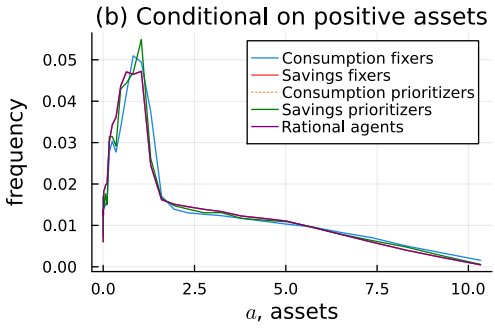
Panel B: Value loss due to near rationality $V^R - V^q$ (per quarter)		
Household type	% reduction in consumption	Average dollar loss
Consumption fixer (68%)	0.45	\$71.67
Savings fixer (53%)	0.004	\$0.58
Consumption prioritizer (52%)	0.003	\$0.54
Savings prioritizer (63%)	0.06	\$8.68

Despite frequent quick-fixing (percent of quarters QF)

Inaction regions

Near-Rationality Not Detectable from Wealth





- Savers aren't rich and spenders aren't poor
- Sharp contrast to models with behavioral hand-to-mouth (TANK) or high discounting/present bias

Variance decomposition

Three Implications for Macroeconomic Propagation

1. Size-dependence
2. Front-loadedness
3. Incidence dependence

Three Implications for Macroeconomic Propagation

1. **Size-dependence**
2. Front-loadedness
3. Incidence dependence

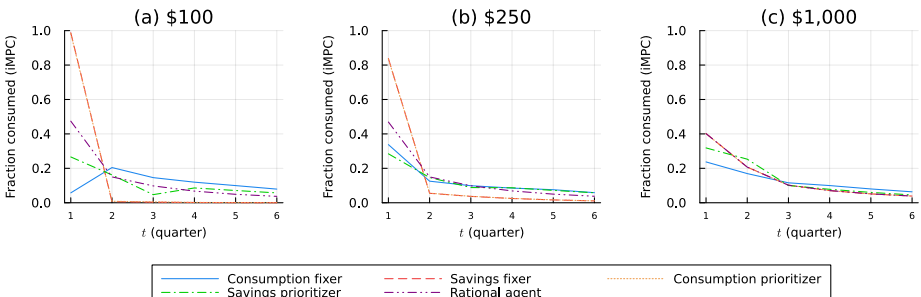
Amount	**Context**	MPC in **Full Model**	MPC in **Rational Model**
\$100	Survey	0.59	0.47
\$600	2001 Tax Rebate	0.42	0.44
\$1200	2020-21	0.35	0.39

Notes: Contemporaneous (one-quarter) MPCs in the quick-fixing model and the rational model.

Three Implications for Macroeconomic Propagation

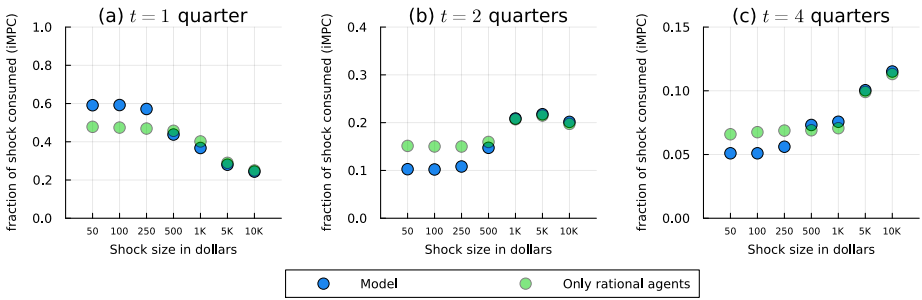
1. Size-dependence
2. **Front-loadedness**
3. Incidence dependence

Can compute **iMPCs** (Auclert, Rognlie, and Straub, 2024)



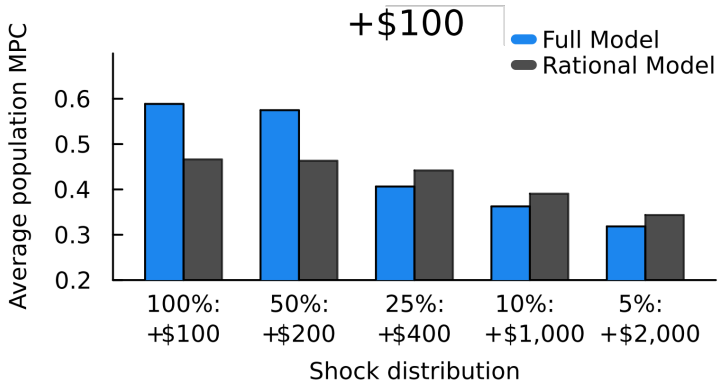
Three Implications for Macroeconomic Propagation

1. Size-dependence
2. **Front-loadedness**
3. Incidence dependence



Three Implications for Macroeconomic Propagation

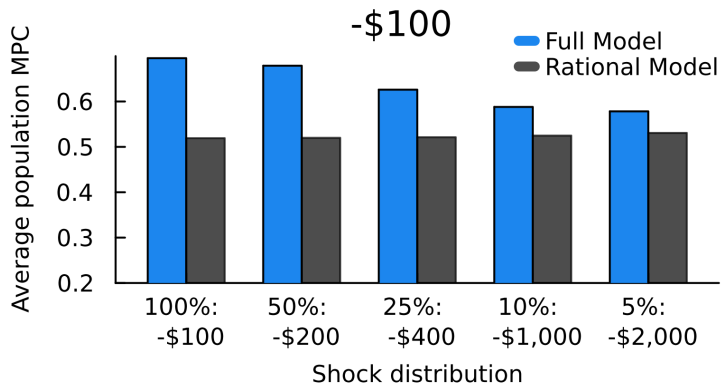
1. Size-dependence
2. Front-loadedness
3. **Incidence dependence**



Gains: more pronounced pattern

Three Implications for Macroeconomic Propagation

1. Size-dependence
2. Front-loadedness
3. **Incidence dependence**



Losses: different sign!

5. Conclusion

Our Findings in the Context of the Literature

- Near-rational household behavior. Akerlof and Yellen (1985a, b); Cochrane (1989); Krusell and Smith (1996); Smith (1991); Lettau and Uhlig (1999); Ilut and Valchev (2023, 2024)

  We "put these models to work" with direct empirical evidence...

- Evidence on the marginal propensity to consume. Fuster, Kaplan, and Zafar (2021); Coliareti, Mei, and Stancheva (2024); Parker and Souleles (2019); Jappelli and Pistaferri (2014, 2020)

  ...helping resolve puzzles in the empirical literature...

- "Consumption block" of heterogeneous-agent models: see summary in *Annual Review* article by Kaplan and Violante (2022)

  ...suggesting a rather different approach to quantitative modeling.

Theory and Evidence for Near-Rational Household Behavior

1. Household behavior is well-described by a near-rational model with a few behavioral types

2. Existing models cannot explain the findings from our survey

3. Matters for macro: small costs lead to very different shock responses

Demographic and Economic Balance

Variable	ACS (2022)	Sample
Gender		
Female	50%	50%
Age		
18-34	29%	27%
35-54	32%	33%
55+	38%	40%
Household income		
Below 50k	34%	34%
50k-100k	29%	28%
Above 100k	37%	37%
Education		
Bachelor's degree or more	33%	40%
Region		
Northeast	17%	17%
Midwest	21%	21%
South	39%	39%
West	24%	23%
Sample size	1,980,550	4,981

Variable	SCF (2022)	Sample
Liquid assets		
Below 1k	20%	29%
1k-10k	31%	25%
10k-100k	31%	28%
Above 100k	19%	18%
Illiquid assets		
Below 10k	26%	38%
10k-100k	11%	14%
100k-500k	34%	26%
Above 500k	29%	22%
Debt		
Below 1k	27%	35%
1k-10k	10%	21%
10k-100k	27%	25%
Above 100k	36%	19%
Sample size	4,602	4,981

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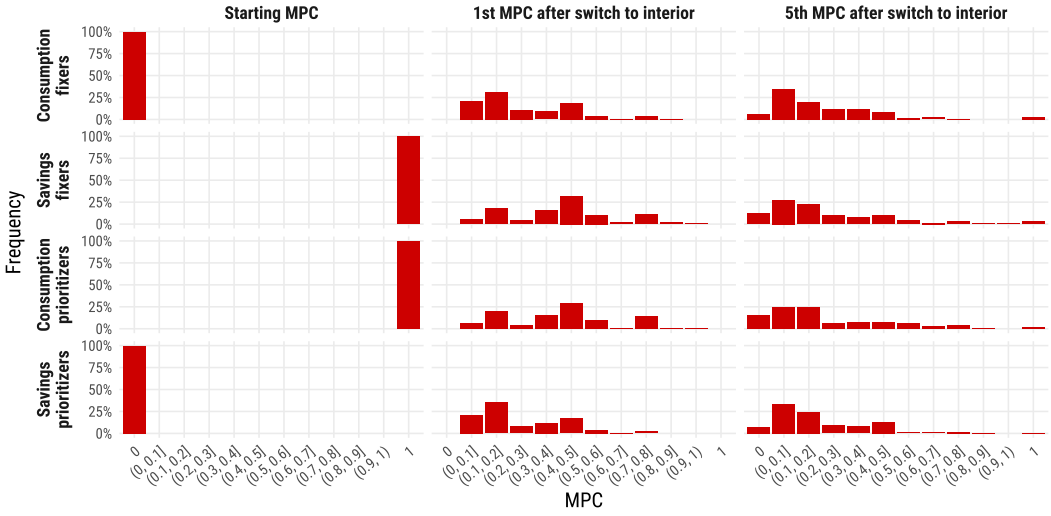
MPCs Conditional on Switching



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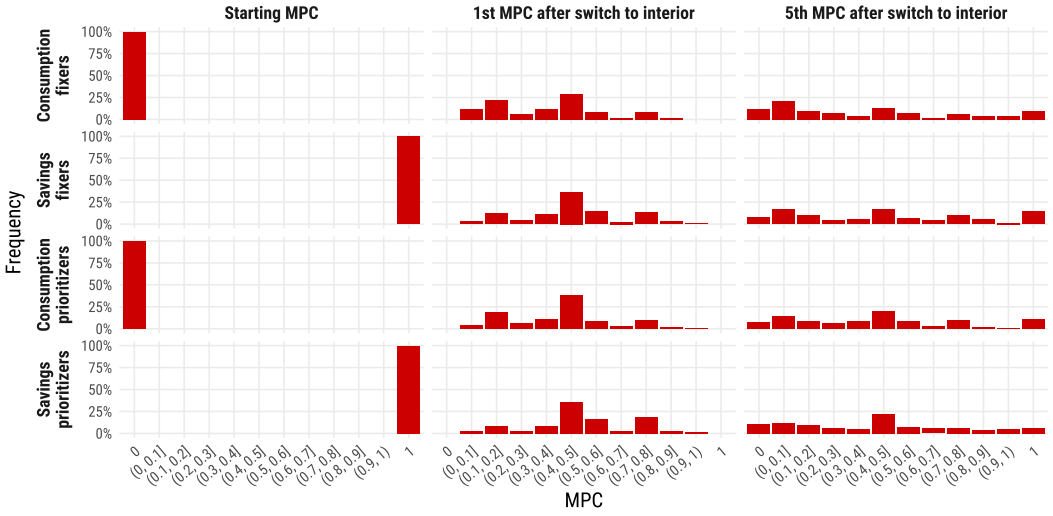
MPCs Conditional on Switching



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Deliberation and Extremes: Within-Respondent Variation

	Extreme MPC of 0 or 1 (binary indicator)					
	(1)	(2)	(3)	(4)	(5)	(6)
Deliberation (std.)	−0.263***	−0.274***	−0.248***	−0.254***	−0.257***	−0.276***
	(0.011)	(0.020)	(0.011)	(0.020)	(0.013)	(0.020)
Respondent FE	✓	✓	✓	✓	✓	✓
Weights	–	✓	–	✓	–	✓
Measure	**Carefully consider how to change spending**		**Assess overall financial situation**		**Discuss with household members**	
Observations	3,619	3,619	3,619	3,619	3,080	3,080
R^2	0.740	0.761	0.723	0.744	0.711	0.719

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Qualitative Survey and Results

- We surveyed 502 additional US households
- We first asked for their consumption-savings responses (as before) to \$100 and \$1000 income shocks
- 57% of households respond with an extreme MPC to the \$100 shock while only 23% do so for the \$1000 shock
- If a household switches from an extreme MPC to an interior MPC, we ask them to explain why

Four Themes in Responses

1. Differences in amounts are salient (mentioned by 86%)
   - "One hundred bucks is not that much" (MPC = 0 for \$100, MPC = 0.2 for \$1,000)
   - "Since the amount of \$1000 is fairly significant, and we are increasing our savings by a good amount, I think taking \$100 dollars out and saving the other \$900 is fair and feels rewarding from both a long-term and short-term perspective."(MPC = 0 for \$100, MPC = 0.1 for \$1,000)

Four Themes in Responses

1. Differences in amounts are salient (mentioned by 86%)

2. Households follow habits and routines
   - "I have a budget for a reason and generally stick to it unless there are major changes" (MPC = 0 for \$100, MPC = 0.2 for \$1,000).
   - "\$100 is not such a big amount that it will make me change my spending habits." *(MPC=0 for \$100, MPC=0.1 for \$1,000)*

Four Themes in Responses

1. Differences in amounts are salient (mentioned by 86%)

2. Households follow habits and routines

3. Extreme MPCs are easier to evaluate and appreciate
   - "[$100] is not really large enough to make an impact on our spending" (MPC = 0 for $100)
   - "the $100 is not really enough to move the needle in saving" (MPC = 1 for $100)

Four Themes in Responses

1. Differences in amounts are salient (mentioned by 86%)

2. Households follow habits and routines

3. Extreme MPCs are easier to evaluate and appreciate

4. Windfalls are an opportunity to treat themselves or their families
   - "Why not just use the unexpected $100 to spend on something you can enjoy or something that can help you in the short-term?"

Reasons Households Give Us for Why They Act Differently

Theme (and detected freq.)	**Description**
Gains	
199 cases where respondents choose an extreme MPC for small shock but not for large shock.	
Shock size (86%)	Respondent mentions the difference in the shock sizes, e.g. contrasts the two shocks or says that $100 is little or $1000 a lot.
Habit (16%)	Respondent mentions that they generally try to save/spend in situations with small income gains.
Does not make a difference (25%)	Respondent mentions that spending/saving the money would not make a meaningful difference to their spending or savings.
Household discipline (17%)	• MPC of 0 for $100: Only in case of a larger amount, respondent feels comfortable to spend part of the amount, but they avoid "frivolous" spending for the small amount. • MPC of 1 for $100: Respondent is fine with spending the small amount, but they argue it would be "irresponsible" to fully spend the larger amount.
Treat oneself (41%)	• MPC of 0 for $100: Only in case of a larger amount, respondent wants to use a part to treat themselves. • MPC of 1 for $100: Respondent wants to use the $100 to treat themselves.
Need (15%)	• MPC of 0 for $100: Respondent argues that they do not need additional purchases. • MPC of 1 for $100: Respondent immediately needs the money for essential purchases.
Lumpy consumption plans (6%)	Respondent has a specific spending plan or need, but $100 is not yet enough to realize it.

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Reasons Households Give Us for Why They Act Differently

Losses

184 cases where respondents choose an extreme MPC for small shock but not for large shock.

Shock size (84%)	Respondent mentions the difference in the shock sizes, e.g. contrasts the two shocks or says that $100 is little or $1000 a lot.
Habit (13%)	Respondent mentions that they generally try to cut saving/spending in situations with small income losses.
Buffer (49%)	• MPC of 0 for 100: Respondent can easily draw on a buffer of savings. • MPC of 1 for 100: Respondent can easily cut discretionary, non-essential consumption.
Balance required (34%)	Interior MPC for large loss because respondents do not want to or simply cannot afford to reduce their spending/savings by the full $1000.
Budget already tight (8%)	Respondent reports having such a tight spending budget they they prefer to not reduce spending any further in response to a $100 loss.

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The Bellman Equation for Unanticipated Shocks

Receive shock x in "interim" after observing income y and choosing a consumption level

$$\begin{aligned}\max_{D_x \in \{0,1\}} \{ & D_x \left(u(c^*(a, y+x)) + \beta \mathbb{E}\left[V^q(a', y', c^*(a, y+x), y) \mid y\right] - \kappa_q\right) \\ & + (1 - D_x)\left(u(c^q(c^{q^*}, x)) + \beta \mathbb{E}\left[V^q(a', y', \bar{c}, \bar{y}) \mid y\right]\right)\} \\ \text{s.t. } & a' = (1+r)a + y - (D_x(c^*(a, y+x)) + (1 - D_x)(c^q(c^{q*}, x))) \\ & a \geq 0\end{aligned}$$

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Quick-Fixing Generates "Latent" Heterogeneity in the MPC

Table: Variance in MPCs Conditional on Assets and Income

Model	**Overall**	**Conditional on** $a = 0$	**Conditional on** $a > 0$
Quick-fixing	28%	43%	70%
Rational	0%	0%	0%

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Large Tolerance for Consumption "Mistakes"

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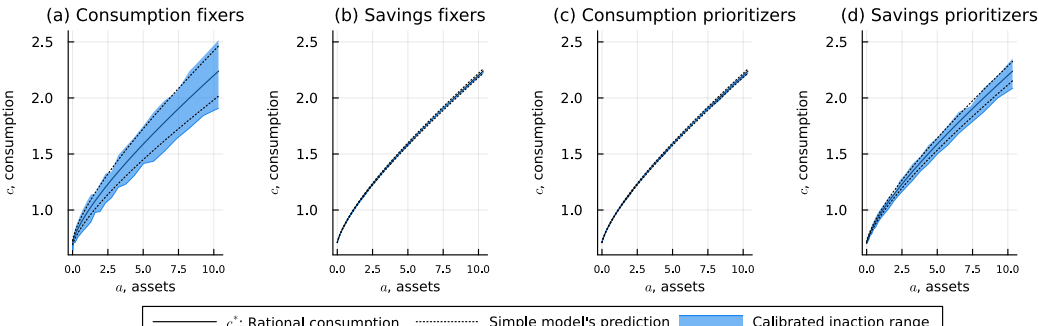
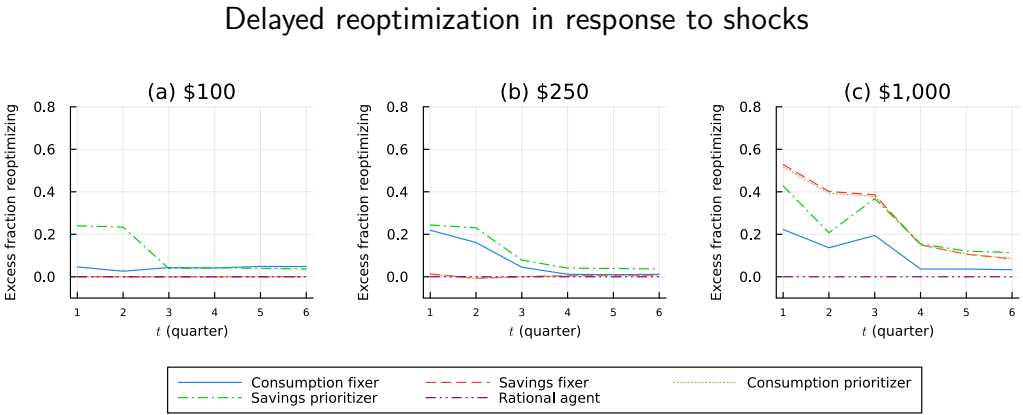


Delayed Reoptimization After Shocks



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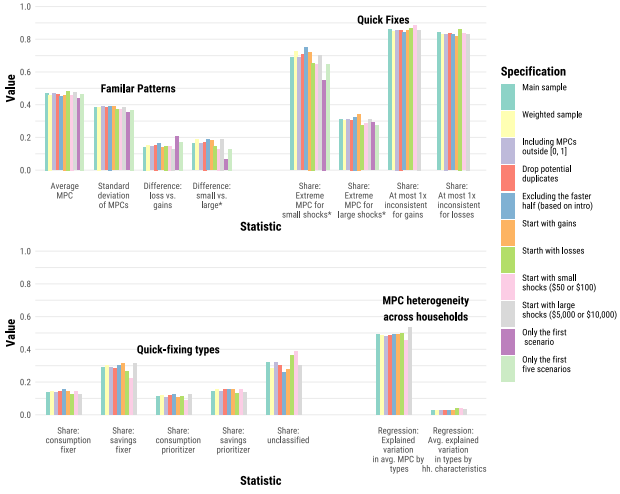
Robustness of Results to Various Scenarios



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Quick-Fixing Helps Explain HtM Behavior

Respondent-level regression to predict share of MPC = 1 responses:

$$\text{ShareMPC1}_i = \alpha + X_i'\beta + \varepsilon_i$$

- **Model 1**: "kitchen sink" of wealth, income, demographics

  $X_i = (\text{log Monthly Spending}_i, \text{log Annual Income}_i, \text{std. Income Risk}_i,$
  $\text{Three Bins of Liquid Wealth}_i, \text{Three Bins of Illiquid Wealth}_i,$
  $\text{Three Bins of Debt}_i, \text{Education}_i, \text{Age}_i, \text{Gender}_i, \text{Household Size}_i)$

  $R^2 = 0.03$: i.e., nothing financial or demographic is a good predictor of "hand to mouth" behavior

- **Model 2**: X_i = dummies for four quick-fixing types

  $R^2 = 0.56$

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Costs of Near-Rational Behavior

Proposition (Second-Order Costs of Near-Rational Behavior)

The loss from following a quick-fix c^q in state z is:

$$\mathcal{L}^q(z) = \frac{1}{2}(1+R)|u''(c^*(z))|(c^q(z) - c^*(z))^2 + O(|c^*(z) - c^q(z)|^3)$$

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Significance Tests

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Table B.1: Additional significance tests

Statement	*t*-test	Randomization test	
	p-value	Statistic under H_0	*p*-value
Familiar Observations			
MPCs decline for larger shocks; e.g., for gains, 0.56 for $50 gain versus 0.30 for $10,0000 gain. Difference: 0.26.	< 0.001	0.000	< 0.001
The average MPC is larger for losses (0.54) than for gains (0.40). Difference: 0.14.	< 0.001	0.000	< 0.001
Quick Fixes			
From one shock to the next larger shock, a net share of 7% of households transition from an extreme MPC to a more moderate interior MPC.	–	0.000	< 0.001
Most households — namely 68% for gains and 67% for losses — switch to an interior MPC at most once and stick to interior MPCs thereafter. Average: 68%.	–	0.413	< 0.001
86% (for gains) and 84% (for losses) of households deviate from this pattern at most once. Average: 85%.	–	0.602	< 0.001
Extreme MPCs more common for small than large shocks, e.g. 74% for $50 gain versus 0.26% for $10,000 gain. Difference: 0.48.	< 0.001	0.000	< 0.001
Once households adopt their first interior MPC, their MPCs are relatively stable. While they continue to vary, the average absolute difference is only 0.14.	–	0.236	< 0.001

Notes: This table reports whether the statistics reported in the statements are significantly different from the patterns we would expect to result from pure chance. The *t*-test column reports *p*-values from two-sided *t*-tests that test for differences in MPCs between shocks. We also use a more flexible randomization test that derives the distribution of the statistics under the null hypothesis that there is no link between MPCs, shock sizes, and valence. To achieve this, we permute the data within each household by (i) reshuffling MPCs within gains, and (ii) reshuffling MPCs within losses, and (iii) randomly replacing all gain MPCs with loss MPCs and vice versa. We draw 10,000 permuted data sets. The column "Statistic under H_0" reports the average value of the statistic in the permuted data sets. The last column reports the *p*-values of the randomization tests.

Table B.2: Exploring the variation in MPCs across households

	MPCs		Type membership					Switching point	
	Average MPC		Consump. fixer	Savings fixer	Consump. priori.	Savings priori.	Unclass-ified	Average log(shock size)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Consumption and income									
Mthly spending (log.)	0.012***	−0.012***	0.011**	0.005	0.000	−0.005			−0.091***
	(0.003)	(0.004)	(0.005)	(0.003)	(0.004)	(0.005)			(0.023)
Annual income (log.)	0.007	0.005	0.000	−0.009	−0.018**	0.022**			0.126***
	(0.005)	(0.007)	(0.010)	(0.007)	(0.008)	(0.010)			(0.044)
Income risk (std.)	0.020***	−0.022***	−0.021***	−0.020***	−0.022***	0.084***			0.057*
	(0.004)	(0.005)	(0.007)	(0.004)	(0.005)	(0.007)			(0.031)
Liquid wealth: dummies with reference group: [0k, 1k)									
[1k, 10k)	−0.052***	0.012	−0.051***	0.003	−0.010	0.046**			−0.438***
	(0.009)	(0.013)	(0.019)	(0.013)	(0.015)	(0.018)			(0.082)
[10k, 100k)	−0.069***	0.020	−0.086***	0.005	−0.026	0.088***			−0.205**
	(0.010)	(0.015)	(0.020)	(0.015)	(0.017)	(0.019)			(0.087)
[100k, more)	−0.072***	0.070***	−0.088***	0.037**	−0.045**	0.026			0.052
	(0.013)	(0.020)	(0.026)	(0.019)	(0.020)	(0.023)			(0.104)
Illiquid wealth: dummies with reference group: [0k, 10k)									
[10k, 100k)	−0.018*	−0.002	−0.000	−0.003	0.015	−0.009			−0.053
	(0.010)	(0.015)	(0.022)	(0.014)	(0.017)	(0.021)			(0.100)
[100k, 500k)	−0.025***	0.001	0.050**	0.016	0.020	−0.086***			0.111
	(0.010)	(0.014)	(0.020)	(0.014)	(0.016)	(0.019)			(0.084)
[500k, more)	−0.067***	0.061***	0.082***	0.003	0.043**	−0.189***			0.141
	(0.012)	(0.019)	(0.024)	(0.017)	(0.019)	(0.021)			(0.098)

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Debt: dummies with reference group: [0k, 1k)									
[1k, 10k)	0.030***	−0.057***	−0.002	0.008	0.009	0.042**			−0.364***
	(0.009)	(0.013)	(0.018)	(0.012)	(0.014)	(0.018)			(0.083)
[10k, 100k)	0.039***	−0.051***	0.046**	−0.000	0.017	−0.012			−0.269***
	(0.009)	(0.013)	(0.018)	(0.012)	(0.014)	(0.017)			(0.076)
[100k, more)	0.018*	−0.039**	0.045**	0.034**	0.038**	−0.077***			−0.363***
	(0.010)	(0.016)	(0.020)	(0.015)	(0.016)	(0.018)			(0.080)
Other characteristics									
College	0.004	−0.011	−0.021	0.007	−0.019*	0.045***			−0.005
	(0.007)	(0.011)	(0.015)	(0.010)	(0.011)	(0.013)			(0.061)
Age (in 10y)	−0.015***	0.016***	0.010**	0.011***	0.007**	−0.045***			0.100***
	(0.002)	(0.003)	(0.004)	(0.003)	(0.003)	(0.004)			(0.018)
Female respondent	0.009	−0.009	0.015	−0.017*	−0.003	0.014			−0.011
	(0.006)	(0.010)	(0.013)	(0.009)	(0.010)	(0.012)			(0.056)
Household size	0.010***	−0.013***	0.005	0.003	−0.007	0.012**			−0.029
	(0.003)	(0.004)	(0.005)	(0.004)	(0.004)	(0.005)			(0.025)
Quick-fixing types									
Consump. fixer	−0.346***							0.236***	
	(0.007)							(0.085)	
Savings fixer	0.165***							−0.218***	
	(0.006)							(0.073)	
Consump. prioritizer	−0.094***							−0.555***	
	(0.008)							(0.093)	
Savings prioritizer	−0.073***								
	(0.006)								
Constant	0.492***	0.396***	0.138*	0.134	0.089	0.324***	0.315***	7.960***	6.987***
	(0.003)	(0.050)	(0.077)	(0.099)	(0.067)	(0.082)	(0.103)	(0.059)	(0.459)
Obs.	4,981	4,981	4,981	4,981	4,981	4,981	4,981	3,381	3,381
R^2	0.492	0.109	0.057	0.017	0.020	0.020	0.174	0.024	0.058

Adding Realistic Quick-Fixes

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Adding Realistic Quick-Fixes

- *As before*: HH have default policy functions c^{q_i}, optimization costs κ_{q_i}
- *New*: the quick-fixing patterns uncovered by the survey: fixing consumption, fixing savings, prioritizing consumption, and prioritizing savings
- New state variables: reference consumption $\bar{c}$ and reference income $\bar{y}$
- Quick-fixing rules are

$$c^{CF}(\bar{c}, y - \bar{y}) = \bar{c} \qquad c^{CP}(\bar{c}, y - \bar{y}) = \bar{c} + \max\{y - \bar{y}, 0\}$$
$$c^{SF}(\bar{c}, y - \bar{y}) = \bar{c} + (y - \bar{y}) \qquad c^{SP}(\bar{c}, y - \bar{y}) = \bar{c} + \min\{y - \bar{y}, 0\}$$

Back

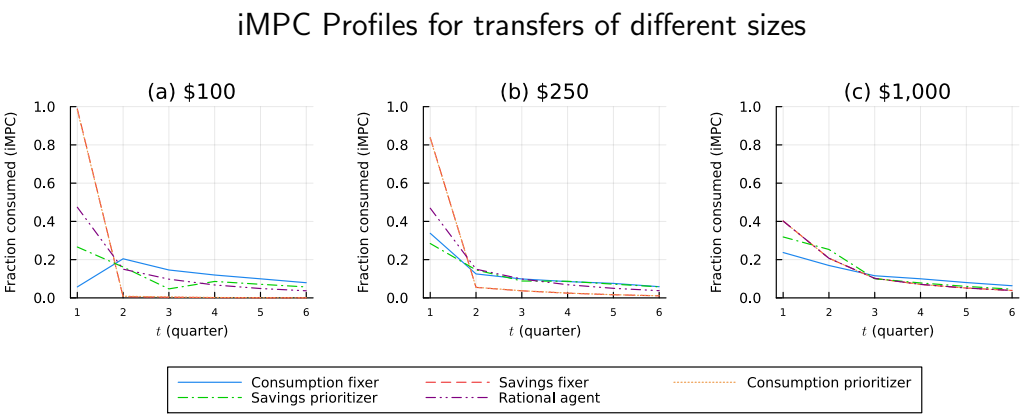
Near-Rationality Generates Very Different iMPC Profiles

- Summary statistic for aggregate response to transfer shocks: intertemporal marginal propensity to consume (Auclert, Rognlie, and Straub, 2024)
- How much does a transfer at t affect consumption at horizon $t + h - 1$?

Delayed Reoptimization

Back

Near-Rationality Generates Very Different iMPC Profiles



Delayed Reoptimization

Back

Small Optimization Costs, Large Tolerance for Mistakes Back

Classic observation: losses from $c^q \neq c^*$ are *second-order* in $c^q - c^*$ Link

Small Optimization Costs, Large Tolerance for Mistakes

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With $u(c) = \log c$ and $R = 1$,

Consumption deviation	1%	5%	10%	15%	20%
Consumption-equivalent loss	0.01%	0.25%	1.00%	2.22%	3.92%

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Classic observation: losses from $c^q \neq c^*$ are *second-order* in $c^q - c^*$ Link

With $u(c) = \log c$ and $R = 1$,

Then you will tolerate any quick-fix that is within 10% of c^*

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Wealth Category Definitions

- Wealth, Liquid: The total value of a household's financial savings and investments, such as cash holdings, checking and savings accounts, money market funds, government/municipal bonds or treasury bills, stocks and bonds in publicly held corporations, stock and bond mutual funds.

- Wealth, Illiquid: The sum of (i) the total value of the land and real estate a household owns, including primary residence, second homes and other real estate, and (ii) the total value of a household's currently non-withdrawable financial savings and investments, such as the value of your retirement accounts (401(k)s, IRAs, thrift accounts, and future pensions), the cash value of life insurance policies, certificates of deposit, and saving bonds.

- Wealth, Debt: Total household debt including credit card debt, mortgages, and other debt, such as student loans, auto loans, and personal loans.

Back

Benchmarking Familiar Facts

Back

- High average MPC: e.g., 0.35 over one quarter for $1000 gain
  - In surveys:
    - Japelli and Pistaferri, 2014 (Italy): 0.48
    - Christelis et al., 2019 (Netherlands): 0.39
    - Fuster et al., 2021 (USA): 0.07 [driven by 74% MPC = 0]
  - In observational data:
    - Borusyak et al., 2024, and Orchard et al., 2024 (2008 US Tax Rebate): 0.30
    - Boehm, Fize and Jaravel, 2024 (randomized experiment in France): 0.23 in *one month* for 300 Euro transfer
    - Ganong et al., 2019 (income shocks in US): 0.29
- MPCs decline in shock size
  - For *gains*, observed by Kueng (2018; Alaska Permanent Fund), Fagereng et al. (2021; Norwegian lottery), and Colarieti et al. (2021; survey in US)
- MPCs are larger for losses
  - Observed by Bunn et al. (2018), Christelis et al. (2021), Fuster et al. (2021), and Colarieti et al. (2021)