Five Facts about MPCs: Evidence from a Randomized Experiment

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Motivation

Recent years have seen many fiscal stimulus policies that transfer money directly to households.

Impact of these transfers on consumption and demand depends on the propensity to consume out of these transfers.

Despite large literature, estimates of MPCs vary widely

- Tax rebates/fiscal transfers: Parker et al. 2006, 2013, Orchard-Ramey-Wieland 2022; Borusyak-Jaravel-Spiess 2022, Lewis-Melcagni-Pilossoph 2021, Sahm-Shapiro-Slemrod 2012, Karger-Rajan 2020, Baker et al. 2020, Coibion-Gorodnichenko-Weber 2020, Hsieh et al. 2010, Geng et al., 2022, and others
- Other income shocks: typical income shocks (Ganong et al. 2020), Lottery winnings (Fagereng et al. 2019, Golosov et al. 2022), Recurring lump-sum (Kueng 2018)

This Paper

Conduct RCT to estimate path of consumption response with a clean and policy-relevant source of variation: allocate €300 at random across French households through pre-paid cards

- Objective: establish a set of facts about (i)MPCs
- Emphasis on scalability and policy-relevance

Treatment arms to study **role of transfer design** (in part. through neg. interest rates)

1. No restrictions
2. Expiry date after three weeks
3. 10% negative rate each week

Implementation with a large French retail bank. Linked bank account data allows precise measurement of consumption expenditure:

- High-frequency expenditure data
- Rich set of household covariates

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1. **Wednesday April 27th, 2022**: prepaid credit cards are made and sent
2. Participants receive the cards and attached explanations around **Monday, May 2nd**
3. **Monday May 9th**: G3 participants experience the first weekly deductions, for any remaining balance
4. **Wednesday May 11th**: another letter is sent to all participants, as a reminder
5. **Monday May 16th**: second deduction for G3 participants, and so on every week from then onward
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Five Facts about MPCs

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   - 23% monthly MPC
2. **Transfer design can substantially increase MPC**
   - 61% average monthly MPC on 3-week expiry card
3. **Consumption response is concentrated early on**
   - Consumption response much higher in first 2-3 weeks
4. **Significant MPC heterogeneity by observed household characteristics**
   - Gender, current income, permanent income, liquid wealth
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   - A large fraction of households has a high MPC; not a bimodal distribution

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Roadmap

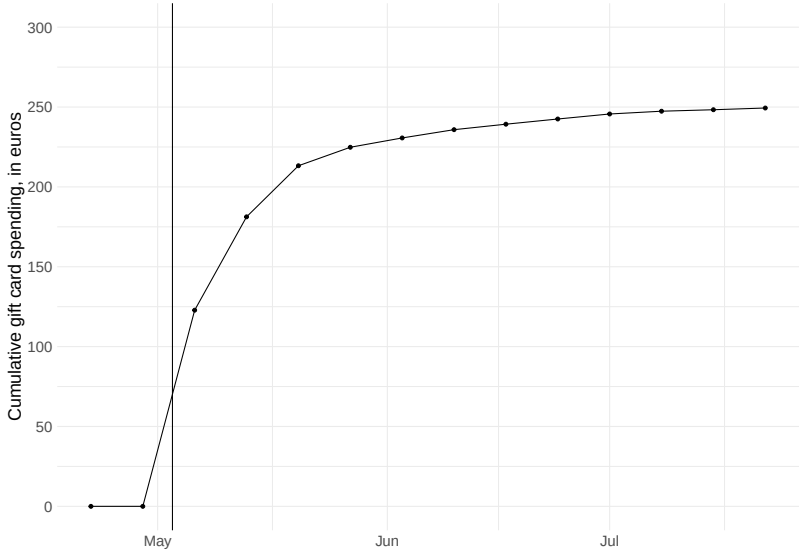
1. Data
2. Main Results: Five Facts
3. Implications for models of the consumption response to transfers

The "Crédit Mutuel Alliance Fédérale" Data

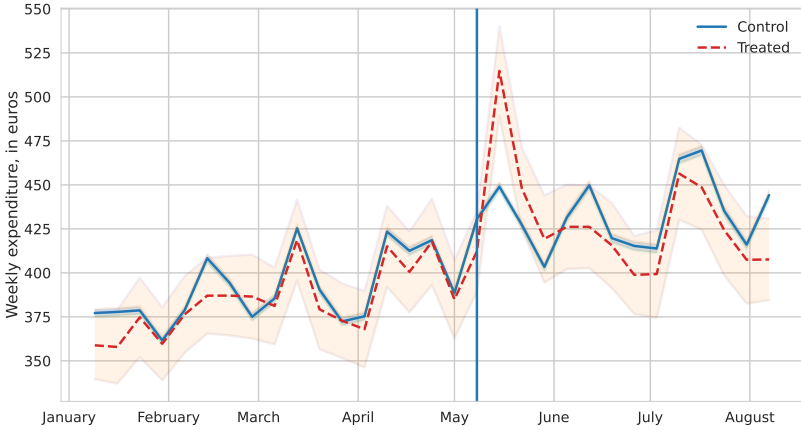
- Random sample of 85,000 households (de-identified)
  - Prior works shows sample is representative of French households and macro trends (Bounie et al. 2020, Insee 2021)
- 915 participants are selected at random from the pool of clients of the bank
  - Credit card transactions and expenditures at daily frequency
  - Balances of all current and savings accounts, mutual funds, debt held within the bank
- Eligibility criteria
  - Exclude households (i) above 75 or below 25, (ii) with financial fragility, (iii) with current accounts at other banks

Average MPC

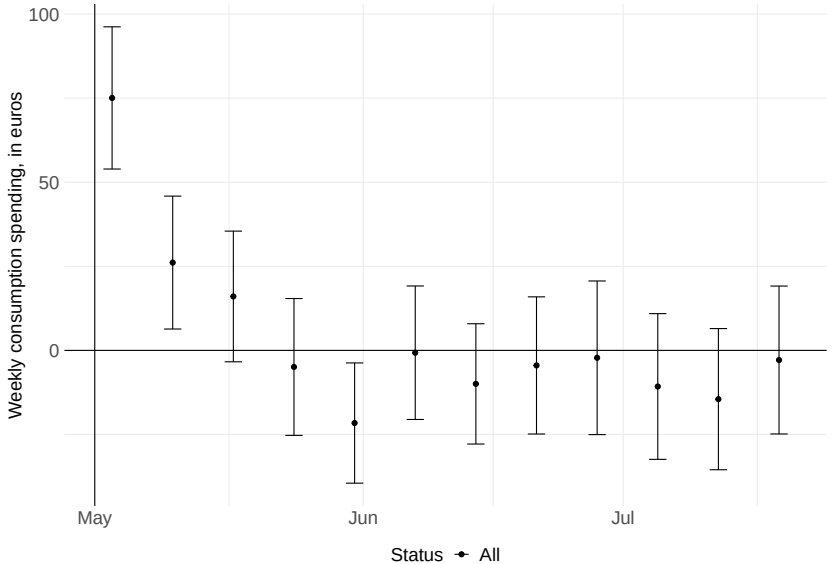
Cumulative Spending on Prepaid Card



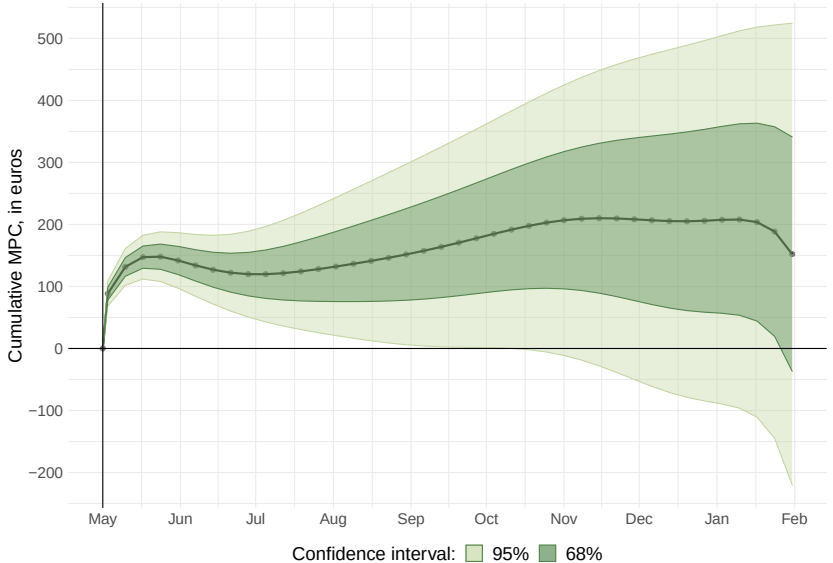
Total Spending: Raw Data, Weekly



Total Spending Response, Weekly



Total Spending Response, Cumulative



Understanding participants' spending behavior

- To understand participant's spending behavior, we combine two approaches:
  - Survey questions
  - Analyze spending categories for prepaid cards and linked bank accounts
- Takeaways:
  - Well aware that they spend less on their main account; they mention precautionary savings as key motive
  - Respondents say they use the prepaid card primarily to cover running expenses
  - Spend more on durables than usual (clothing, furniture, consumer electronics, etc.)

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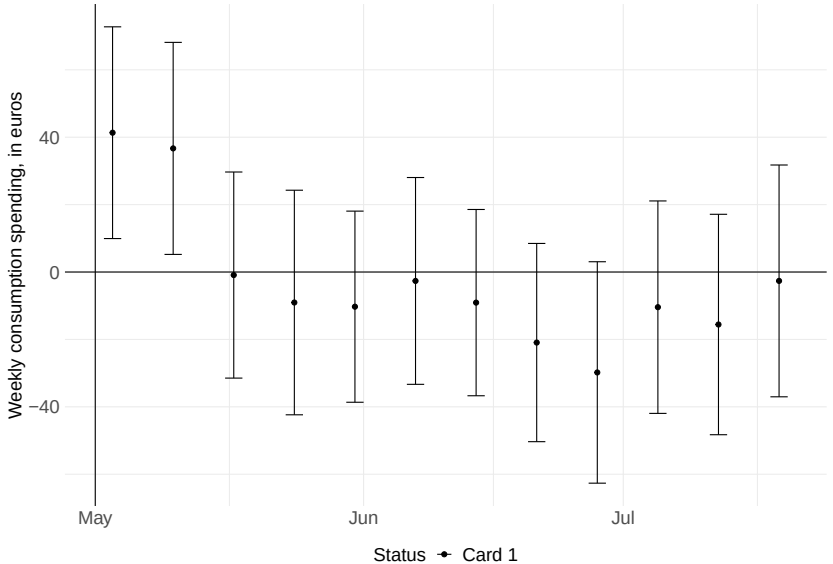
Total Spending Response: Card 1, Weekly



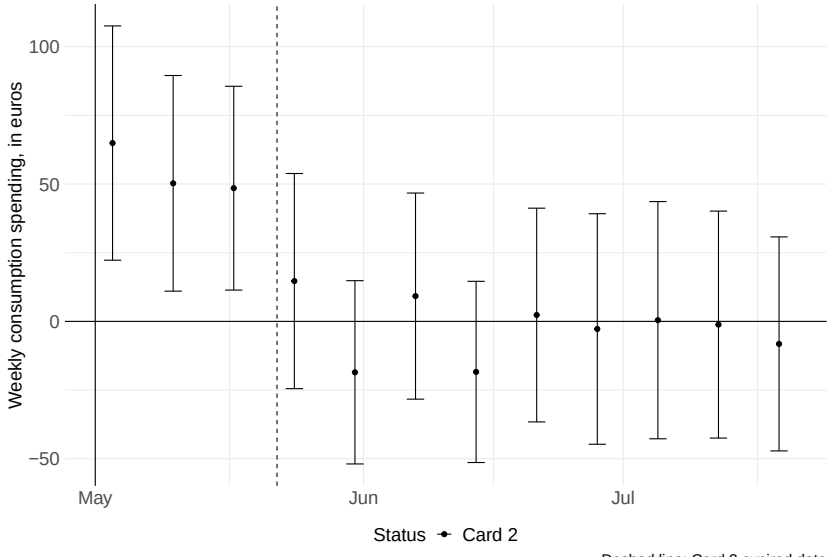
Card 1 MPC vs. Literature

Table III First-quarter MPX and MPC Estimates for Calibration of Macroeconomic Models

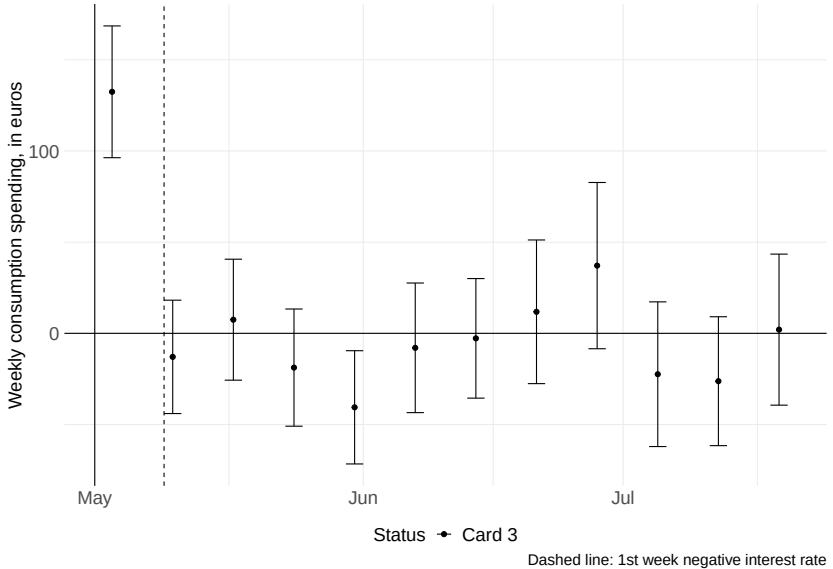
	Parker et al. (2013)	Broda and Parker (2014)	Borusyak et al. (2023)	Orchard et al. (2023b)	This paper, treatment group 1
	(1)	(2)	(3)	(4)	(5)
Total MPX	52.3% to 91.1%	50.8% to 74.8%	24.8% to 36.6%	28%	23%
Nondurable MPX	12.8% to 30.8%	14.1% to 20.8%	6.9% to 10.2%	0%	6.6%
Notional MPC	16.3% to 28.5%	15.9% to 23.4%	7.8% to 11.4%	8.8%	7.2%

Notes: This table reports the first-quarter MPX and MPC in studies of the 2008 tax rebates in the United states (columns (1) through (4)) and for treatment Card 1 participants in our experiment (column (5)). The first row reports the marginal propensity to spend on all goods and services, while the second row focuses on nondurables alone. The third row follows the methodology of Laibson et al. (2022) and reports the model-consistent ("notional") MPC that can be used as a target for macroeconomic models, equal to the total MPX divided by 3.2. The range of estimates in column (1) corresponds to different household samples (see Tables 2 and 3 of Parker et al. (2013)). The range of estimates in columns (2) and (3) corresponds to the lowest and highest values among the three rescaling methods used by Broda and Parker (2014) and Borusyak et al. (2023) to extrapolate the spending response they observe for consumer packaged goods to broader samples. The estimates in the first two rows of column (4) are taken from Tables 3 and 5 of Orchard et al. (2023b). We compare our estimates to a larger set of papers in Appendix Figure A32.

Total Spending Response: Card 2, Weekly



Total Spending Response: Card 3, Weekly



Taking Stock

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Possible Caveats

- Experimenter demand effects / Hawthorne effects
  - Study households receiving an additional "framing treatment" – paragraph encouraging them to spend the money quickly on local goods or services
  - Find they have very similar average MPCs
- External validity
  - Experimental MPC estimates are close to the observational estimates of Borusyak et al. (2023) and Orchard et al. (2023), which were obtained in a completely different time and setting
- Durables vs. non-durables
  - Differences in the estimated marginal spending increase across groups do not arise merely from differences in durables purchasing behavior
- More to wish for: no variation in size of stimulus transfer; can't measure response to anticipated transfers
  - New experiments?

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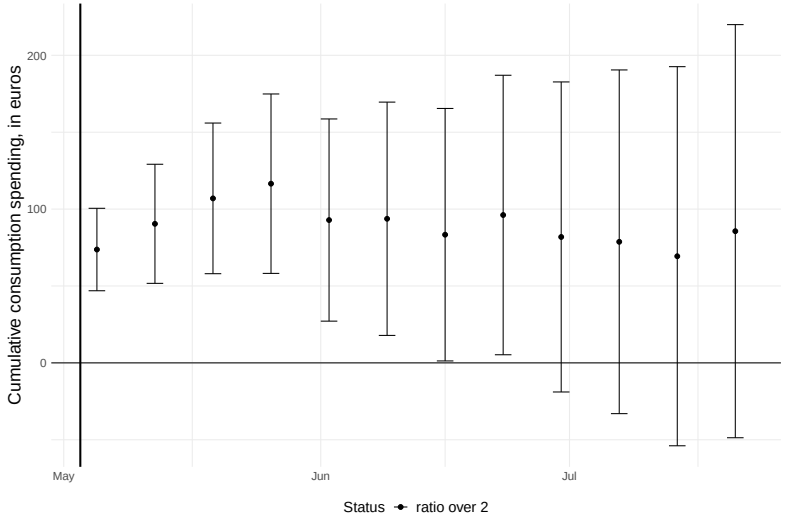
Household Heterogeneity

- Sources of MPC heterogeneity across household:
  - More liquid wealth at the onset of the experiment: ↓ MPC (but not zero)
  - Higher income in the three months prior to the experiment: ↓ MPC
  - Higher expenditures (proxy for permanent income) a year prior to experiment: ↓ MPC
  - Female recipient: ↓ MPC
- Horse race using LASSO

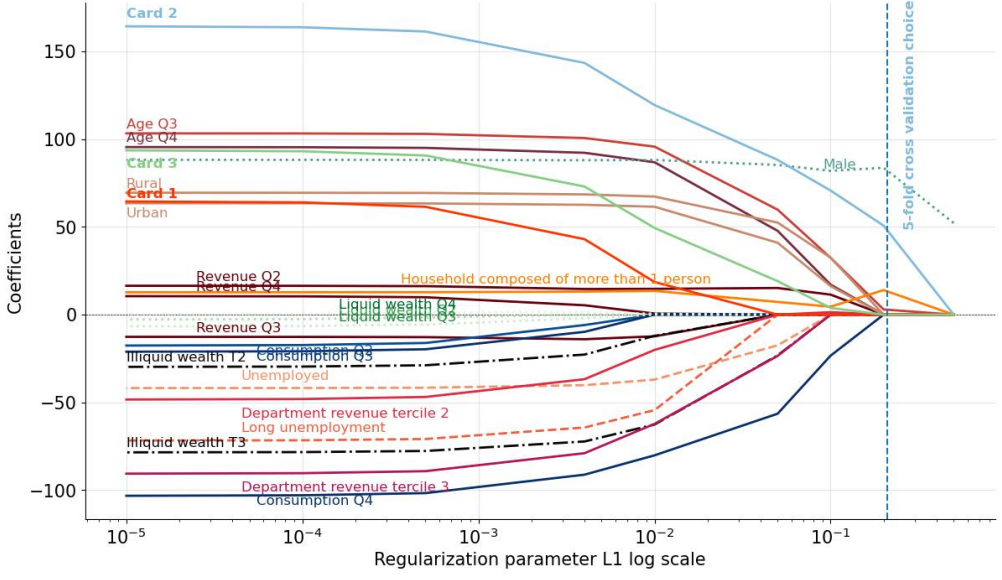
▸ Heterogeneity Details

MPC Remains High For Households with Liquid Wealth $>$ 2*Monthly Income



Number of people: 517 over 922

LASSO Estimates of Treatment Effect Heterogeneity



MPC Heterogeneity

Full MPC Heterogeneity: Deconvolution Approach

Most papers on estimating MPCs try to get at differences in MPCs by observable characteristics.

But distribution of MPCs relevant for full response of the economy to shocks (e.g. Auclert, 2019)

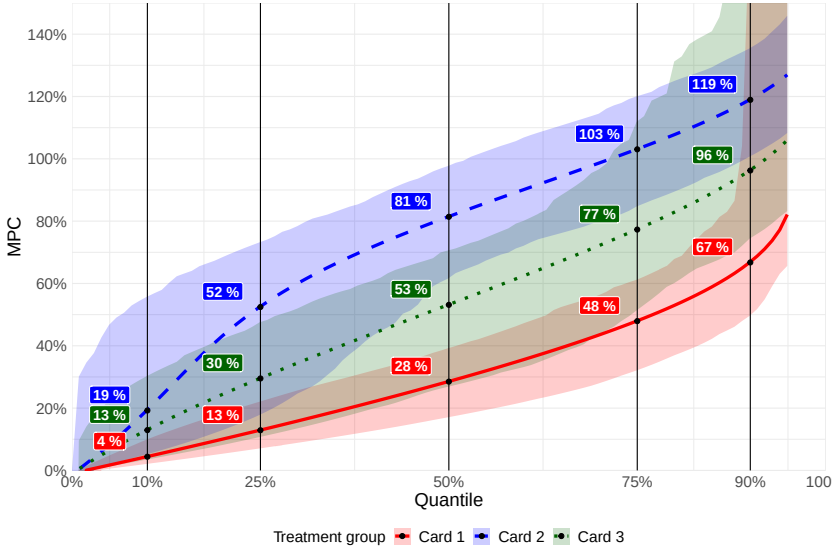
Large advantage of experiments: assumptions for identification of unconditional distribution of MPCs much more likely to be satisfied. Idea:

$$Y(1) = \beta + \varepsilon$$
$$Y(0) = \varepsilon$$

We know that the distribution of the outcome of treated differs from the distribution of the outcome of the control only through the treatment effect.

If $\beta \perp \varepsilon$, then β is (nonparametrically) identified. Estimate using flexible deconvolution procedure of Yang et al. (2020).

MPC Heterogeneity by Card Type



Full MPC Heterogeneity: Robustness

- To assess plausibility of $\tau_{it} \perp \varepsilon_{it}$, we implement a test in the spirit of Oster (2019):
  - repeat the analysis with/without observable predictors for MPC heterogeneity (age, income, gender, liquid wealth)
  - the results turn out not to be sensitive to the inclusion of these controls
    - ⋆ for our results to be biased, unobservable predictors of MPC heterogeneity τ_{it} should much more strongly correlated with unobserved shocks ε_{it} than observable predictors

Implications: Rational Models

- Result that consumption response is flat after first three weeks is difficult to reconcile with many consumption-saving models (precautionary savings/borrowing constraintes)
- According to HANK: MPC should be low for households with plenty of liquidity
- Shape of MPC distribution is not bimodal (cf. TANK)

More broadly, household behavior for Card 1 vs. Card 2 reject standard "rational" models treating money as fungible

- Consider only transactions under 300 euros:
  - 88% of households in Group 2 spent at least 300 euros on the main bank account before the expiry date of card 2
- Costless to perfectly substitute current account spending for prepaid card spending

Implications: Behavioral Models

Present-bias models

- Spender-saver model (Campbell and Mankiw 1989)
- Hyperbolic discounting models (Laibson 1997, Laibson-Maxted-Moll 2021)

$\Rightarrow$ cannot account for MPC differences between Card 1 and Card 2

Model with "salience" might be better able to match the evidence

- show "how bottom-up attention affects economic choice by distracting decision makers from relevant choice attributes"

Consistent with prior work on non-fungibility of money (Hastings-Shapiro 2013, 2018, Zelizer 1989)

Relevance for policymakers, *including central banks (!)*

- Implementation design (& household targeting) can greatly alter the MPC and the effectiveness of short-run stimulus
- Experiment was done at a time when short-term interest rates were at the ZLB
  - Textbook response that consumers would save a transfer is not correct!
- $\Rightarrow$ can be used to stimulate demand in a recession, even at the ZLB
- could be implemented via CBDCs, or via card transfers (cf. card transfers in Italy during Covid)
- CBs and Treasuries should set up the legal and operational infrastructure for such transfers while they are not (yet) needed

Thank you!

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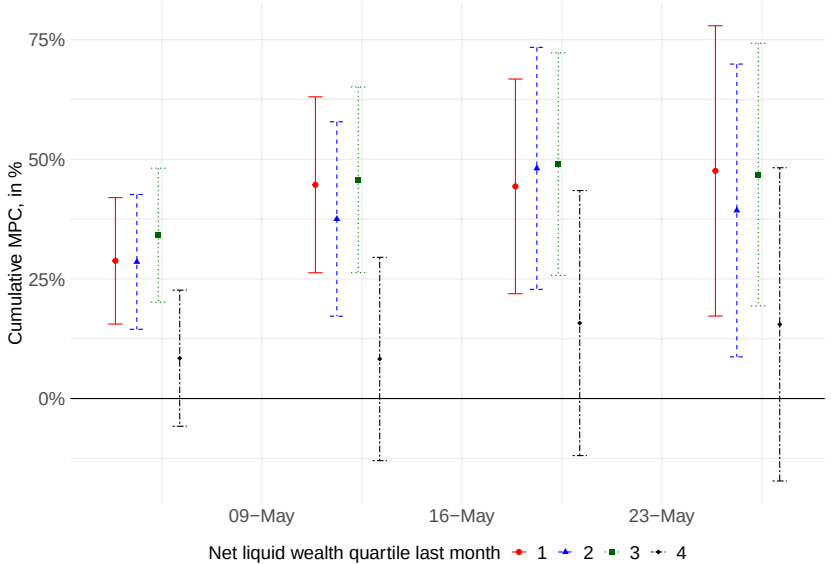
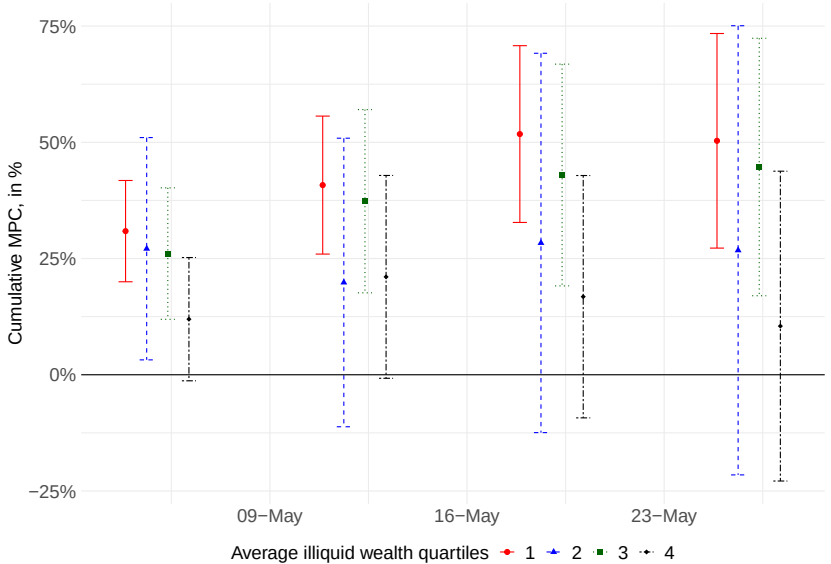
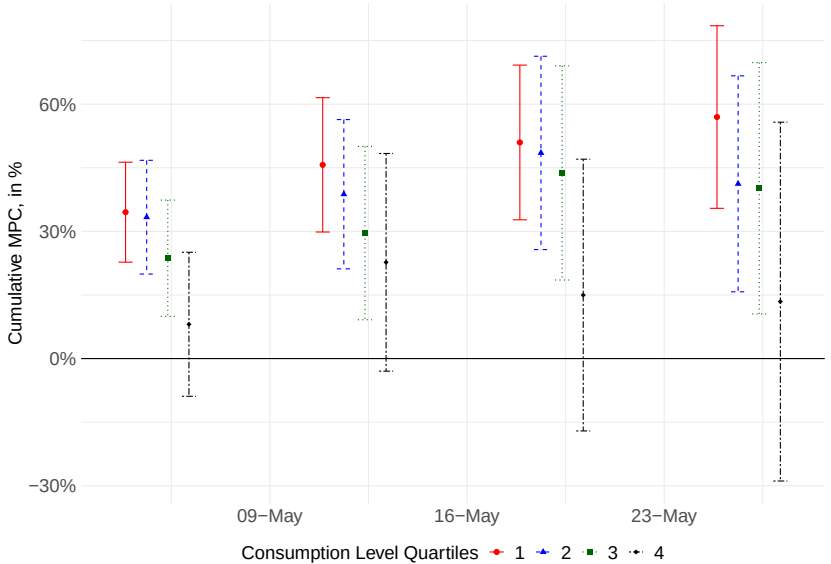
Heterogeneity: Net Liquid Assets



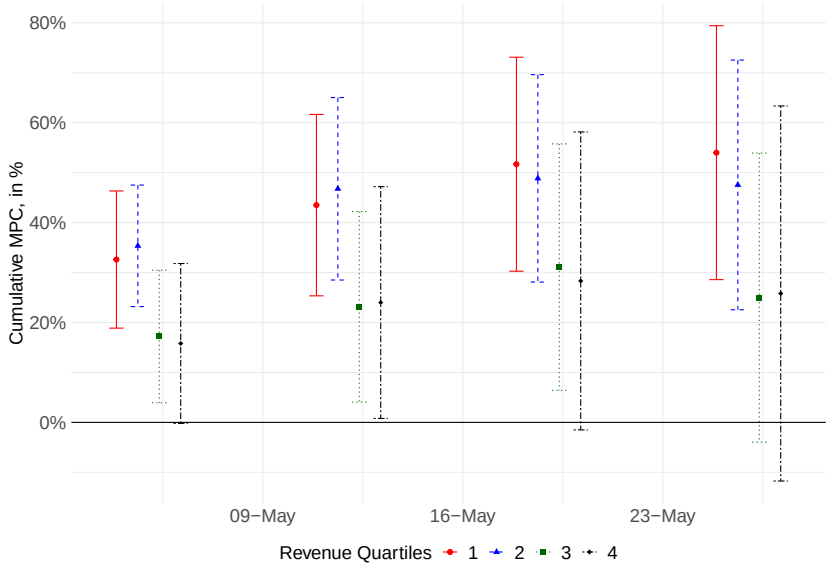
Heterogeneity: Illiquid Wealth



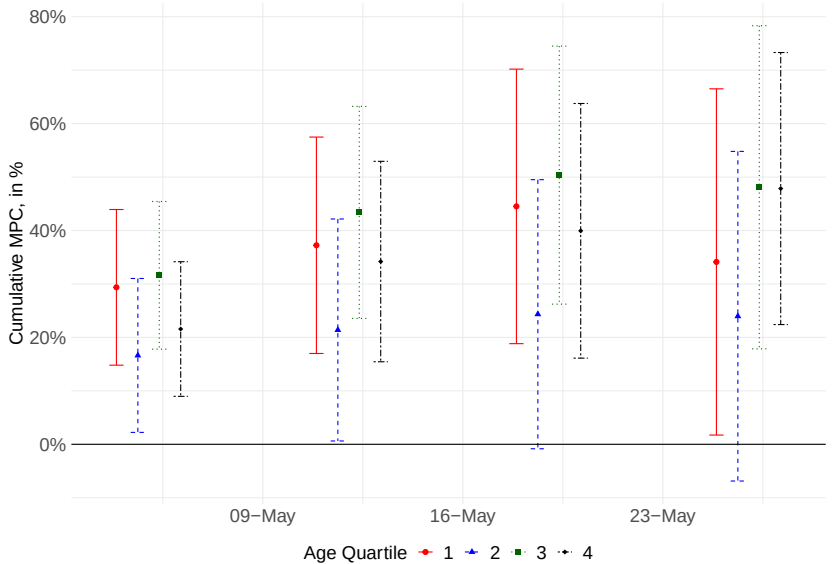
Heterogeneity: Average Consumption



Heterogeneity: Income

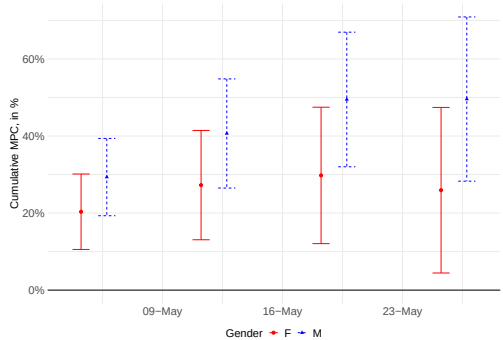


Heterogeneity: Age



Heterogeneity: Gender

Gender of the recipient



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