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The Reality of Consumption: Comparing Self-Reported and Observed Marginal Propensity to Consume

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The Reality of Consumption: Comparing Self-Reported and Observed Marginal Propensity to Consume

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Abstract

Surveys are widely used in economic analyses. This study compares the self-reported and actual marginal propensity to consume by integrating survey with bank transaction data. The estimation results reveal no significant relationship between the two measures, casting a doubt on the use of self-reported consumption measures.

JEL Classification Number: E21, E01
Keywords: MPC; survey; measurement

*Waseda University (E-mail: kozo.ueda@waseda.jp). The data were made available through a strict contract between Mizuho Bank and Waseda University, and were analyzed in a setting where measures such as masking and other anonymous processing were taken to prevent the identification of individuals. The survey was approved by the Ethics Review Committee on Research with Human Subjects of Waseda University (2023-440). The author would like to thank the staff of Mizuho Bank, So Kubota, and seminar participants. The author is also grateful for the financial support from the JSPS (19H01491, 23K17562, 23H00046). The views and opinions expressed in this paper are solely those of the author and do not reflect those of Mizuho Bank.

1 Introduction

When analyzing consumption, household surveys are widely conducted. The quality of the data depends on the accuracy of self reports; however, respondents may not answer surveys correctly because they want to save survey times, forget their past consumption, or misunderstand questions. It is valuable to investigate the accuracy of self-reported consumption measures.

In this study, I compare self-reported and observed consumption, by focusing the marginal propensity to consume (MPC). The MPC is one of the key variables in macroeconomics, by which I compare not the level of consumption but the marginal change in consumption. In so doing, I utilize bank transaction data and the survey targeted to this bank account holders. The self-reported MPC is obtained by directly asking this to respondents. The observed MPC is estimated from bank transaction data. Specifically, I examine monetary outflow changes in response to the large-scale special cash program (SCP) implemented by the Japanese government during the COVID-19 pandemic in 2020, which allows me to obtain the average MPC.

Then, I compare the self-reported and observed MPC by adding the interaction term of the self-reported MPC and the income shock to explanatory variables. While its coefficient should become one if self-reported and observed MPC coincide, the estimation results show that the coefficient is insignificant. This result casts a doubt on the use of self-reported consumption measures.

Voluminous studies exist on the estimation of the MPC, in which data are obtained from surveys and transactions. The first strand of studies on the MPC that rely on surveys include Shapiro and Slemrod (1995, 2003) and Jappelli and Pistaferri (2020). Also refer to as Coibion et al. (2020) and Parker et al. (2022), where government transfers during COVID-19 are considered as an income shock to evaluate the MPC. The second strand of studies on the MPC that use actual transaction data include Baker et al. (2024), Kaneda, Kubota, and Tanaka (2021), Kubota, Onishi, and Toyama (2021), Lewis, Melcangi, and Pilossoph (2021), Yannelis and Amato (2022), and Ueda (2023), where income shocks are government transfers during the COVID-19 pandemic.

To the best of my knowledge, no study directly compares self-reported and observed MPC. A related study by Coibion, Gorodnichenko, and Weber (2022) examines consumption changes following new information about inflation. They compare stated intentions to adjust consumption with actual spending, finding that both moved in the same di-

rection. Galashin, Kanz, and Perez-Truglia (2022) compare self-reported consumption plans with actual spending, finding a significantly positive yet weak relationship. Edenbrandt and Smed (2018) report a positive correlation between self-reported preferences for nutrition labels and actual spending. Additionally, there is a growing body of research comparing self-reported and actual consumption of addictive items like alcohol and cigarettes.

The remainder of this paper is structured as follows. Section 2 explains the survey and data. Section 3 discusses results, and Section 4 concludes.

2 Data

2.1 Survey

I conducted a survey from February 13 to 19, 2024. Mizuho bank sent 200,000 bank account users an email to ask them to answer the survey, stating that we would give an Amazon gift card worth 1,000 Japanese yen (JPY) to 500 respondents.[1] The 200,000 bank account users were selected randomly from those who received their salary regularly. I collected 2,626 responses, where the response rate was 1.31%. See Online Appendix A for the English translation of the survey.

While the main objective of the survey was to study an expectation formation process and its effect on actual spending (Ueda 2024), I asked respondents directly about the MPC as the second question in the survey. Specifically, the question is as follows: "Hypothetical Question: If the government provided a one-time payment of 100,000 yen, how much would you increase your spending that month? Please answer in increments of 10,000 yen, using whole numbers equal to or greater than zero."

Figure 1 illustrates the distribution of self-reported MPC, calculated from responses to the second survey question divided by 100,000. The mean MPC is 0.2, with a significant proportion of respondents reporting a zero MPC.

2.2 Transaction Data

Transaction data record all transactions involving Mizuho Bank, including automatic teller machine (ATM) cash withdrawals, payroll receipts, and bank transfers, all of which

[1] 1 US dollar was 150 JPY as of February 15, 2024.

are assigned identification codes and remarks in Japanese. The time unit is one week. The data are a balanced panel, where there are 40 weeks from May 2020 to December 2020 including the period of the SCP in summer 2020.

I define consumption (spending) as total outflows excluding those related to savings. Outflows are defined as all transactions that decrease the amount of deposits. While my data lack detailed information on spending components, some outflows may be directed toward investments and loan repayments, which are not strictly considered consumption. To refine my definition, I exclude outflows marked as either "shoken" (securities) or "go-hensai" (repayment), indicative of transfers to securities companies and loan (mortgage) repayments, respectively. Further, I exclude outflows exceeding 10 million JPY by setting them to NA. I also use cash withdrawals from ATMs as an alternative proxy for consumption.

The income shock is the SCP provided by the government during the COVID-19 pandemic in summer 2020. The government launched the first wave of SCPs around mid-2020, which provided 100,000 JPY for each resident in Japan.

SCP receipts are identified by Mizuho Bank based on transaction remarks in Japanese that include the keywords related to special payments. Then, I restrict the transactions of inflows to those that were multiples of 100,000 JPY. SCP payments were mostly paid to head-of-household accounts.

The SCP is likely to be a one-time income shock, in which the timing is unknown *ex ante*. The timing was also dispersed from June to August 2020. Kubota, Onishi, and Toyama (2021) document that the timing was unpredictable and nearly random and exogenous to individuals' characteristics (except for the area of residence) because of the administrative overburdening that occurred at local offices. Approximately half of the respondents received the SCP payments in their bank accounts.

It should be noted that many individuals hold accounts at institutions other than Mizuho Bank, which may lead to a self-reported MPC being larger (smaller) than the estimated MPC if they spend (receive) from accounts at other institutions. However, this concern is likely moderate in my sample, as SCP recipients chose their Mizuho Bank accounts to receive the transfer, suggesting these are their main accounts.

In Online Appendix B, I present the descriptive statistics for both the survey and transaction data. Additionally, I assess the representativeness of the survey respondents compared to the broader population.

3 Results

3.1 Estimation Strategy

To estimate the MPC to an income shock, I run the following two-way fixed effect regression:

$$C_{it} = \alpha_i + \alpha_{tr} + \sum_{k=a}^{b} \gamma^k X_{it}^k + \varepsilon_{it}, \tag{1}$$

where C_{it} represents the amount of outflows, a proxy for consumption, for individual i in week t; X_{it}^k is the income shock that takes the amount of the income in week T_i if $t - T_i = k$, where T_i denotes the week in which individual i received the income; and X_{it}^k takes zero otherwise. By including $k < (>)0$, I consider the effect of the income shock on consumption $|k|$ weeks before (after) the event. Coefficient γ^k indicates the extent to which C_{it} has changed before and after the income shock. The lead terms for $k < 0$ are used to test the presence of the pre-trend before the income shock. I normalize the coefficient γ^k for $k = -1$ to zero and set $a = -5$ and $b = 5$ weeks. Two-way fixed effects α_i and α_{tr} control time-invariant heterogeneity across individuals and the effects of aggregate time-series developments such as the state of emergency declaration and the number of COVID-19 infections on aggregate consumption. More precisely, the time fixed effects are multiplied by the region fixed effects using prefecture r in which individual i lives. I cluster the standard error at the individual level.[2]

The ideal comparison of self-reported and observed MPC would be at an individual level. However, this is not feasible because I cannot obtain the reliable estimate on the MPC at the individual level. Estimating equation (1) yields only the average MPC across survey respondents.

Therefore, to compare the self-reported and observed MPC, I use the following equation:

$$C_{it} = \alpha_i + \alpha_{tr} + \sum_{k=a}^{b} \gamma^k X_{it}^k + \sum_{k=a}^{b} \delta^k X_{it}^k \cdot MPC_i + \varepsilon_{it}, \tag{2}$$

[2]A bias in the average treatment effects can arise in the case when treatments occur in multiple periods and treatment effects are heterogeneous across groups or periods. While de Chaisemartin and D'Haultfœuille (2020), Callaway and Sant'Anna (2021), Sun and Abraham (2021) propose robust methods for estimating treatment effects, their methods are not directly applicable because the size of treatments (i.e., income shocks) varies so that I do not use a 0 or 1 dummy variable but X_{ijt}^k as a variable of treatment. However, I do not claim that this bias is unimportant. On the contrary, heterogeneity is important in considering the MPC.

where MPC_i represents the self-reported MPC for individual i. If the self-reported MPC coincides with the observed MPC, coefficient δ^k should become one, while γ^k becomes zero.

3.2 Estimation Results

Figure 2 shows the estimation results for equation (2). In the left-hand panel, outflows significantly increase for three weeks ($k = 0, 1, 2$) following SCP payments. Individuals spend 27% of SCP payments in the week of receipt and cumulatively 50% over three weeks. The right-hand panel shows similar responses when cash withdrawals are used as the dependent variable, reinforcing the conclusion that there is sufficient statistical power to estimate the MPC in response to the SCP income shock.

Figure 3 shows the estimation results for equation (2), illustrating the estimated δ^k, which is the coefficient on the interaction between the SCP income shock and the self-reported MPC. Across all k, δ^k is insignificant, despite the expectation of perfect alignment with a unit value. This suggests that, although consumption responses to SCP payments are significant (as shown in Figure 2), these responses do not exhibit a significant correlation with the self-reported MPC from the survey. The detailed estimation results are provided in Online Appendix C.

Robustness Checks I checked the robustness of these estimation results in various ways. Details are available in Online Appendix C. First, I used a binary variable for the self-reported MPC, which takes the value of one if the self-reported MPC exceeds zero, to estimate equation (2). However, the estimated δ^k in equation (2) remained insignificant.

There could be concerns about timing since the SCP payments occurred during the COVID-19 pandemic, about four years before the survey. Respondents' financial circumstances may have changed substantially. To address this, I conducted two additional analyses. First, I compared respondents' financial characteristics between June 2020 and February 2024, finding no significant differences. Second, I used more recent income shocks, such as government transfers and bonuses, which occurred closer to the survey period (November 2023 to June 2024), to estimate the MPC. The bonus, which plays a key role in the Japanese labor market (Ito and Hoshi 2020), was included. Yet again, the estimated δ^k remained insignificant.

Additionally, I examined the interaction between self-reported MPC and other self-

reported variables from the survey to further explore why the self-reported MPC fails to capture actual consumption responses. Given the emphasis in the literature on the role of liquidity constraints, I estimated self-reported MPC using self-reported liquidity constraint, borrowing status, and education. In the survey, the first question addresses respondents' liquidity constraints, specifically their ability to cover urgent expenses, which is relevant to the MPC. I construct an ordered variable ranging from one (least constrained) to four (most constrained). Responses of "don't know, prefer not to answer" are coded as NA. The results reveal that the liquidity constraint is only weakly associated with the self-reported MPC, with significance at just the 10% level. When borrowing status and education are included as controls, the coefficient on the liquidity constraint loses significance, even at the 10% level.

4 Concluding Remarks

This study compares self-reported and actual MPC by integrating survey data with bank transaction records. The findings reveal no significant relationship between the two measures, raising concerns about the reliability of surveys in capturing household behavior.

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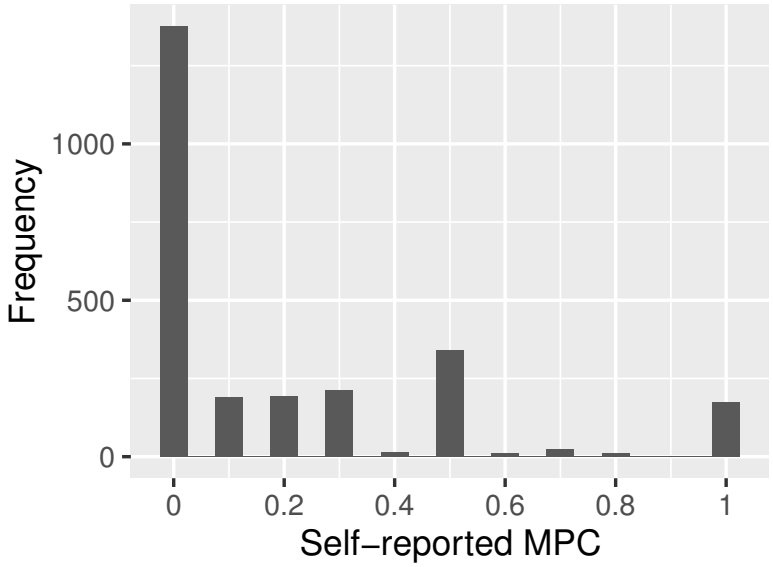

Figure 1: Distribution of Self-Reported MPC

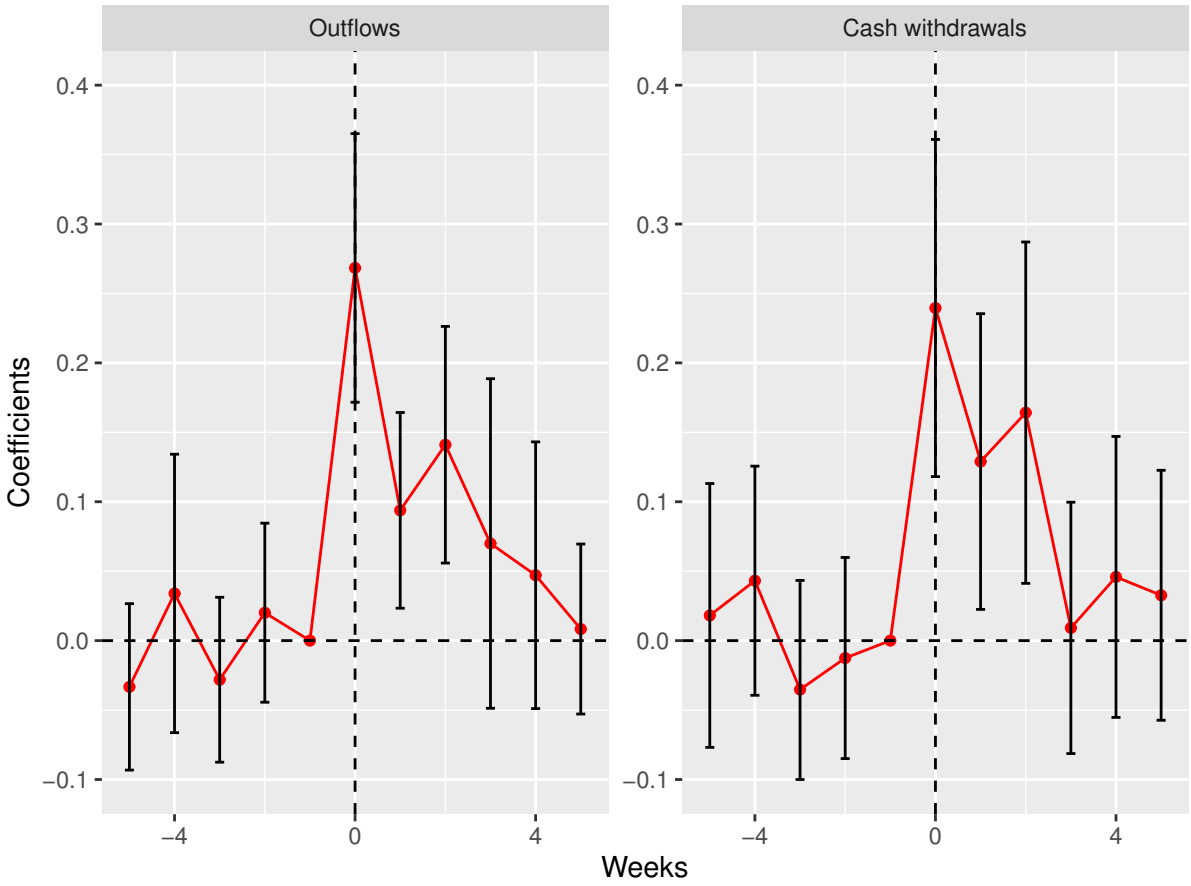

Figure 2: Consumption Responses to Income Shocks

Note: The figure shows estimated coefficients γ^k from equation (1) for $k = -5, -4, \cdots, 4, 5$, which suggests consumption responses in week $|k|$ before/after income shocks. Bars indicate 95% confidence intervals.

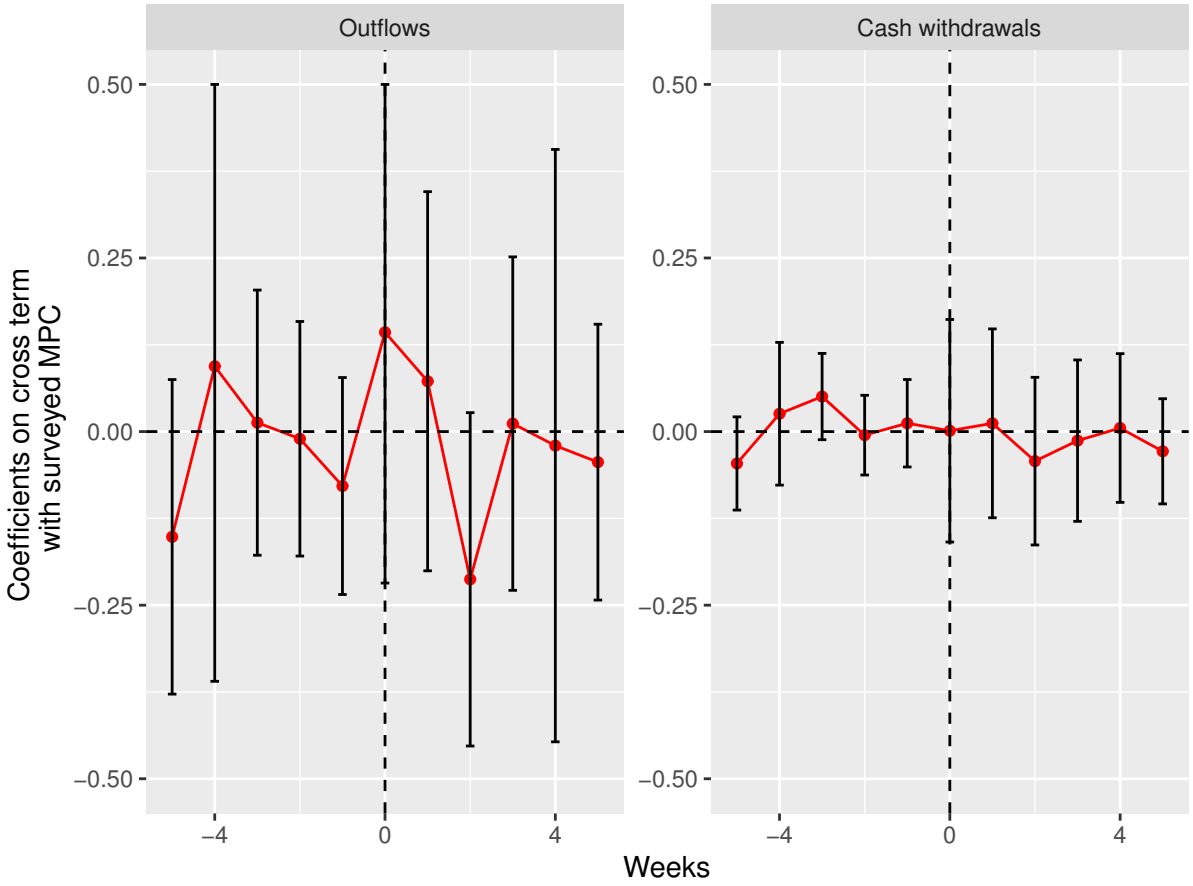

Figure 3: Relationship between Consumption Responses and Self-Reported MPC

Note: The figure shows estimated coefficients δ^k from equation (2) for $k = -5, -4, \cdots, 4, 5$, showing the relationship between consumption responses in week $|k|$ before/after income shocks and the self-reported MPC. Bars indicate 95% confidence intervals.

Appendix for "The Reality of Spending: Comparing Self-Reported and Observed Marginal Propensity to Consume"

Kozo Ueda

2024

A Survey

We conducted the RCT survey from February 13 to 19, 2024. Mizuho bank sent 200,000 bank account users an email to ask them to answer the survey, stating that we would give an Amazon gift card worth 1,000 JPY to 500 respondents. The 200,000 bank account users were selected randomly from those who received their salary regularly.

In doing the RCT, users were randomly divided into three groups with similar characteristics based on age, income, and gender. Specifically, wage earners targeted by the survey were divided into 8 groups based on age (45 and under, over 45), income (under 4 million yen, over 4 million yen), and gender (male, female). Each group was randomly assigned to one of three cases (Case 1 to 3). This assignment was carried out in advance, so there was no guarantee that the resulting respondents would perfectly adhere to this even distribution.

In total, we collected 2,626 responses (the response rate is 1.31%).

A.1 Survey Questions "Survey on Economy and Price Perceptions Amid Recent Price Increases"

This appendix provides an English translation of the survey questions.

Introduction

Thank you for your continued use of Mizuho Bank. We are conducting a survey as part of a joint research project with Waseda University. The survey responses will be used solely for research purposes and will be handled anonymously, ensuring that individual identities will not be disclosed, nor will the data be used for commercial purposes. The survey results will be published widely in the form of a report and will contribute to better policy-making and societal design. We appreciate your understanding of the purpose of this survey and ask for your cooperation in completing it.

Among those who answer all questions, 1,000 participants will be selected by lottery to receive a 500-yen Amazon gift card. Please complete the survey by 12:00 p.m. on February 19.

Q1 Hypothetical Question: Suppose you suddenly have to pay an amount equal to your or your family's monthly income due to unforeseen circumstances. If you were to liquidate your savings, sell assets, or borrow from a financial institution, friends, or relatives, do you think you could pay the full amount?

- Yes
- Probably, with some difficulty
- Difficult, but possible with significant effort
- Impossible
- Don't know, prefer not to answer

Q2 Hypothetical Question: If the government provided a one-time payment of 100,000 yen, how much would you increase your spending that month? Please answer in increments of 10,000 yen, using whole numbers equal to or greater than zero.

(Insert page break here to prevent returning to the previous page)

As of the end of December 2023, the interest rate on demand deposits was 0.001%, the interest rate on mortgage (variable rate) was 2.475%, the inflation rate was 2.6%, and the wage growth rate was 0.2%. Here, the inflation rate refers to the year-over-year change in the consumer price index, and the wage growth rate refers to the year-over-year change in cash earnings (Monthly Labour Survey). Please use this information to help provide your views on past trends and outlooks for the next year. There are no right or wrong answers; please respond with approximate figures.

Q3 How much has your spending changed compared to a year ago? Note: Please answer as a percentage. Enter numbers in half-width characters only (do not include units such as % or "percent"). If spending decreases, please enter a negative value (example: -15).

Q4 How much do you think "prices" will change in one year compared to now? "Prices" refer to the overall prices of the goods and services you purchase. (Note) Please answer as a percentage. Enter numbers in half-width characters only (do not include units such as % or "percent"). If prices decrease, please enter a negative value (example: -15).

Q5 How much do you think your income (after taxes) will change in one year compared to now? (Note) Please answer as a percentage. Enter numbers in half-width characters only (do not include units such as % or "percent"). If income decreases, please enter a negative value (example: -15).

Q6 How much do you think your spending will change in one year compared to now? (Note) Please answer as a percentage. Enter numbers in half-width characters only (do not include units such as % or "percent"). If spending decreases, please enter a negative value (example: -15).

Q7 What do you think the interest rate on demand deposits will be in one year? (Note) Please answer as a percentage. Enter numbers in half-width characters only (do not include units such as % or "percent").

Q8 What do you think the interest rate on mortgage (variable rate) will be in one year? (Note) Please answer as a percentage.

(Insert page break here to prevent returning to the previous page)

Randomized Information Experiment: One of th following three types of information is provided.

- Case 1: According to a survey of individuals, prices are expected to rise by about 10% in one year compared to now (as of December 2023, median expectation, Opinion Survey on the General Public's Views and Behavior).
- Case 2: The Bank of Japan has set a price stability target of a 2% year-on-year increase in the consumer price index and has promised to achieve this as soon as possible.

- Case 3: The inflation rate over the past 10 years was about 0.5% (fiscal years 2010–2019, year-on-year increase in the consumer price index).

Q9 Were you aware of this information? Please choose the option that best applies to you.

- I knew
- I mostly knew
- I had heard of it, but had almost forgotten
- I didn't know, but it's not surprising
- I didn't know

The following questions are somewhat complex and may take some time to answer. Please respond carefully. You will be asked to estimate the probability of various scenarios in percentages. Use whole numbers between 0 and 100, where 0 means there is no chance of it happening, and 100 means it is certain to happen. For example:

- 0 to 10 indicates very little chance
- 11 to 30 indicates a slight chance
- 45 to 55 indicates a roughly equal chance
- 70 to 80 indicates a high probability
- 90 to 99 indicates near certainty

Q10 For the change in "prices" one year from now compared to now, how likely do you think each of the following cases is? Please answer with integers from 0 to 100, ensuring the total equals 100 percent. "Prices" refers to the overall prices of goods and services you purchase.[1]

- 50% or more increase
- Around 10% increase
- Around 5% increase
- Around 2% increase
- Around 1% increase
- Around 0% with little change
- Around 1% decrease
- Around 2% decrease
- Around 5% decrease

[1] In this type of question, we provide the sum of all options to help respondents verify that the total adds up to 100 percent.

- Around 10% or more decrease

Q11 For the change in your income (after taxes) one year from now compared to now, how likely do you think each of the following cases is? Please answer ensuring the total equals 100 percent.

- 50% or more increase
- Around 10% increase
- Around 5% increase
- Around 2% increase
- Around 1% increase
- Around 0% with little change
- Around 1% decrease
- Around 2% decrease
- Around 5% decrease
- Around 10% or more decrease

Q12 For the change in your spending one year from now compared to now, how likely do you think each of the following cases is? Please answer ensuring the total equals 100 percent.

- 50% or more increase
- Around 10% increase
- Around 5% increase
- Around 2% increase
- Around 1% increase
- Around 0% with little change
- Around 1% decrease
- Around 2% decrease
- Around 5% decrease
- Around 10% or more decrease

Q13 What percentage do you think the interest rate on demand deposits will be one year from now? Please answer ensuring the total equals 100 percent.

- Around 2% or more
- Around 1%
- Around 0.5%
- Around 0.1%
- Around 0%

Q14 What percentage do you think the interest rate on mortgage (variable-rate) will be one year from now? Please answer ensuring the total equals 100 percent.

- Around 5% or more
- Around 4%
- Around 3%
- Around 2%
- Around 1%
- Around 0%

Thank you for answering the difficult questions. Now, please select one option for each of the following questions that best applies to you.

Q15 What is the composition of the family members currently living with you?

- Single-person household (living alone, single assignment)
- Household with only a couple (partner only)
- Household with a couple and children
- Three-generation household with a couple, children, and grandparents (both or one of the grandparents)
- Single-parent household (including single assignment of spouse)
- Single-parent household with children and grandparents (both or one of the grandparents)
- Other (only siblings, friends, grandparents and grandchildren, etc.)
- Prefer not to answer

Q16 Is your residence owned or rented?

- Owned
- Rented
- Other
- Don't know, prefer not to answer

Q17 Do you have large loans such as a mortgage?

- Yes, I have loans
- No, I don't have loans
- Don't know, prefer not to answer

Q18 What was the last school you graduated from? Please select one. If you are currently enrolled or have dropped out, consider it as graduated.

- Junior high school
- High school
- Vocational school
- Junior college/technical college
- University
- Graduate school
- Other
- Prefer not to answer

Q19 What is your occupation?

- Agriculture, forestry, and fisheries
- Self-employed or freelance
- Regular employment (company employee, public servant, including company executives)
- Temporary or daily labor (part-time, casual work)
- Other (housewife, student, pensioner, unemployed, etc.)
- Prefer not to answer

Thank you for taking the time to complete the survey.

B Data

In addition to the transaction data, monthly updates on wealth and annualized income are provided. Wealth is defined as the balance of deposits at Mizuho Bank, which includes the sum of demand deposits, time deposits, other banking accounts, public bonds, mutual funds, and balances from life and non-life insurance. Annualized income refers to labor earnings, either based on the actual amount of salary and bonuses received in the past year (after tax and social contributions) deposited into users' accounts or the self-reported amount. Wealth and annualized income are reported in thousands of JPY. Additionally, we have access to information on personal characteristics such as year of birth, gender, and registered address data at the municipal level.

B.1 Descriptive Statistics of the Survey Data

Table 1 shows the descriptive statistics of the survey data.

Table 1: Descriptive Statistics of the Survey Data

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
Self-reported MPC	2,551	0.199	0.290	0.000	0.000	0.000	0.300	1.000
Liquid const.	2,593	1.523	0.885	1.000	1.000	1.000	2.000	4.000
Borrow	2,626	0.333	0.471	0	0	0	1	1
Education	2,577	3.629	0.880	1.000	3.000	4.000	4.000	5.000

Note: The self-reported MPC is derived from Q2. Liquidity constraint is obtained from Q1, which is transformed into an ordered variable ranging from one (least constrained) to four (most constrained). The borrowing status is obtained from Q19, where the variable takes a value of one if respondents have borrowings. Education is obtained from Q20 and transformed into an ordered variable ranging from one (junior high school) to five (graduate school).

Figure 1 presents the two-dimensional kernel density for the self-reported MPC and liquidity constraint.

B.2 Descriptive Statistics of the Bank Account Transaction Data

Table 2 shows the descriptive statistics of the bank account transaction data. The data are at the individual-week level, where the time frame spans from April 1 to December 31, 2020 (40 weeks).

B.3 Representativeness

To check the representativeness of the data, we compare the age, wealth and income distribution of survey respondents with that of all the Mizuho bank account users (specifically, salary recipients) and that of employed people based on the representative Labor Force Survey (Statistics Bureau, as of 2019).[2] The Mizuho Bank account users are salary recipients, consistent with our selection

[2]Age is grouped into bins of 10 years, that is, from 15 to 24, from 25 to 34, $\cdots$, from 55 to 64, and above. We calculate age distribution by dividing the figures by 10 for each age group. See

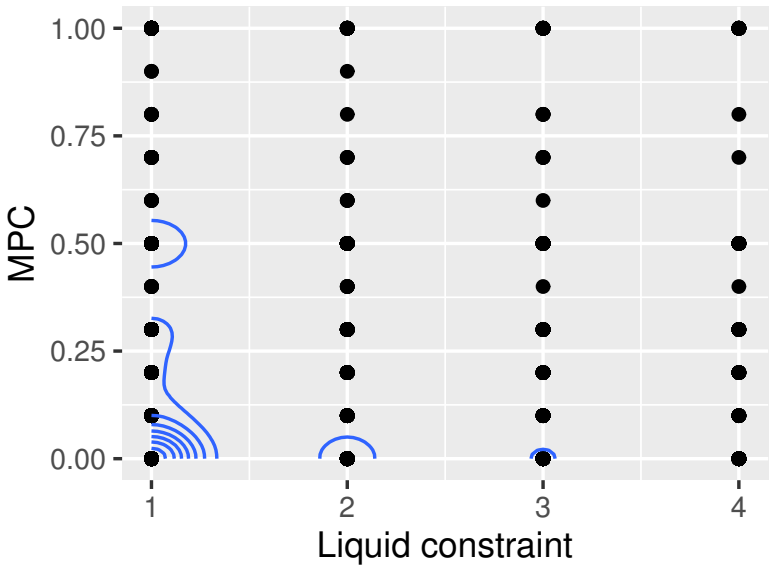

Figure 1: Distribution of Self-Reporting MPC and Liquidity Constraint

Note: The lines display two-dimensional kernel density. Liquidity constraint is obtained from Q1, which is transformed into an ordered variable ranging from one (least constrained) to four (most constrained).

Table 2: Descriptive Statistics of the Transaction Data

Statistic	N	Mean	St. Dev.	Pctl(25)	Median	Pctl(75)
Outflows	99,462	92,055.900	264,069.500	0	23,000	100,000
SCP dummy	99,520	0.011	0.104	0	0	0
SCP	99,520	2,336.214	25,644.330	0	0	0
Outflows inc. saving	99,520	107,488.500	616,820.100	0	24,000	101,107
Cash withdrawals	99,520	25,212.980	96,998.680	0	0	6,000
Inflows	99,520	131,859.000	875,824.600	0	0	116,482.5
Liquidity constraint dummy	99,520	0.197	0.398	0	0	0
Log wealth	99,520	6.997	2.652	5.864	7.399	8.777
Log income	99,520	7.168	3.880	7.747	8.287	8.631
Female dummy	99,222	0.385	0.487	0	0	1
Age	99,520	48.663	11.120	42	50	57

Note: For the transaction amount, the unit is one Japanese yen. Wealth and (annualized) income are reported in thousands of Japanese yen and taken a logarithm after adding 0.001. We do not report the maximum or minimum values to maintain anonymity.

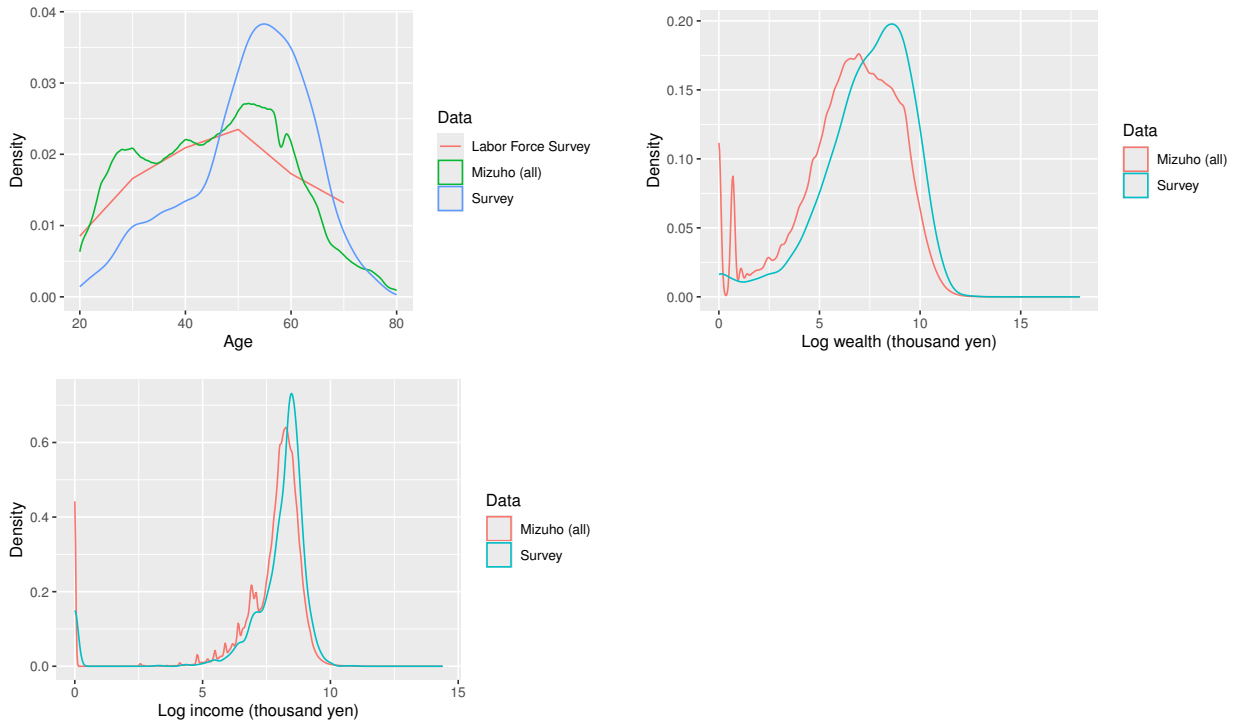

Figure 2: Distribution of Survey Respondents

Note: The Labor Force Survey is compiled by the Statistics Bureau. "Mizuho (all)" represents the distribution of all the bank account users (approximately 3.5 million) who regularly receive salary at their accounts. "Survey" represents the distribution of the survey respondents.

criteria for the RCT survey, which helps exclude dormant or secondary bank accounts. The total number of users is approximately 3.5 million.

Figure 2 illustrates the distributions of age, log wealth, and log income among survey respondents, Mizuho Bank users, and individuals in the Labor Force Survey. The age distribution of survey respondents is highly concentrated around 50, indicating an overrepresentation of middle-aged individuals compared to the broader Mizuho user base and the Labor Force Survey. Consequently, younger individuals, particularly those in their 20s and 30s, are relatively underrepresented in the survey. Additionally, survey respondents tend to be wealthier than the average Mizuho user, which aligns with the fact that the survey population skews older.

https://www.stat.go.jp/data/roudou/sokuhou/nen/ft/pdf/index1.pdf

C Further Empirical Results

C.1 Estimation Results of the MPC

Table 3 and 4 show the estimation results.

Table 3: Estimation Results 1

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable (C)	Outflows	Outflows	Outflows	Cash	Cash	Cash
Income shock (X)			SCP			
Crossed term with X (Z)	–	Surveyed MPC	Dummy of positive surveyed MPC	–	Surveyed MPC	Dummy of positive surveyed MPC
Data						
X_{-5}	-0.0333	-0.0004	0.0181	-0.0150	-0.0037	-0.0054
	(0.030)	(0.040)	(0.047)	(0.013)	(0.017)	(0.020)
X_{-4}	0.0340	0.0254	0.0432	-0.0101	-0.0090	0.0019
	(0.050)	(0.039)	(0.041)	(0.013)	(0.014)	(0.016)
X_{-3}	-0.0281	-0.0232	-0.0353	-0.0148	-0.023**	-0.0151
	(0.030)	(0.035)	(0.039)	(0.010)	(0.011)	(0.013)
X_{-2}	0.0201	0.0242	-0.0125	-0.0103	-0.0047	-0.0101
	(0.032)	(0.035)	(0.036)	(0.011)	(0.012)	(0.013)
X_0	0.2684***	0.2453***	0.2395***	0.1867***	0.1903***	0.1816***
	(0.048)	(0.053)	(0.061)	(0.028)	(0.037)	(0.044)
X_1	0.0938***	0.0868*	0.129**	0.0721***	0.0745***	0.0994***
	(0.035)	(0.046)	(0.053)	(0.020)	(0.026)	(0.031)
X_2	0.1411***	0.1879***	0.1642***	0.0412**	0.0564**	0.064**
	(0.043)	(0.054)	(0.061)	(0.021)	(0.026)	(0.031)
X_3	0.0700	0.0436	0.0092	0.0272	0.0327	0.0405*
	(0.059)	(0.052)	(0.045)	(0.017)	(0.021)	(0.025)
X_4	0.0471	0.0574	0.0459	0.0166	0.0207	0.0174
	(0.048)	(0.056)	(0.051)	(0.014)	(0.016)	(0.016)
X_5	0.0083	0.0211	0.0327	0.0109	0.0172	0.0233
	(0.031)	(0.038)	(0.045)	(0.015)	(0.016)	(0.019)
$X_{-5} \times Z$		-0.1516	-0.1052*		-0.0459	-0.0128
		(0.113)	(0.057)		(0.034)	(0.025)
$X_{-4} \times Z$		0.0940	0.0025		0.0257	-0.0109
		(0.227)	(0.112)		(0.051)	(0.024)
$X_{-3} \times Z$		0.0129	0.0356		0.0505	0.0069
		(0.095)	(0.058)		(0.031)	(0.017)
$X_{-2} \times Z$		-0.0103	0.0821		-0.0051	0.0136
		(0.084)	(0.068)		(0.029)	(0.020)
$X_{-1} \times Z$		-0.0784	-0.0078		0.0120	0.0390
		(0.078)	(0.040)		(0.031)	(0.026)
$X_0 \times Z$		0.1430	0.0780		0.0012	0.0240
		(0.181)	(0.103)		(0.080)	(0.055)
$X_1 \times Z$		0.0725	-0.0622		0.0119	-0.0484
		(0.137)	(0.068)		(0.068)	(0.039)
$X_2 \times Z$		-0.2128*	-0.0356		-0.0426	-0.0328
		(0.120)	(0.084)		(0.060)	(0.038)
$X_3 \times Z$		0.0115	0.0858		-0.0131	-0.0209
		(0.120)	(0.122)		(0.058)	(0.031)
$X_4 \times Z$		-0.0202	0.0195		0.0051	0.0123
		(0.213)	(0.105)		(0.054)	(0.028)
$X_5 \times Z$		-0.0440	-0.0440		-0.0284	-0.0240
		(0.099)	(0.058)		(0.038)	(0.027)
Fixed effects			Individual, week*prefecture			
Observations	74,597	72,408	72,408	74,640	72,450	72,450
Individuals	2,488	2,415	2,415	2,488	2,415	2,415
R^2	0.125	0.126	0.126	0.150	0.155	0.155

Note: Figures in parentheses represent standard errors, clustered at the individual level. The rows highlighted in yellow emphasize the coefficients related to on-impact spending responses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 4: Estimation Results 2

	(7)	(8)	(9)	(10)	(11)
Dependent variable (C)	Outflows	Outflows	Outflows	Outflows	Outflows
Income shock (X)			SCP		
Crossed term with X (Z)	–	Surveyed MPC	Liquidity constraint dummy	Surveyed liquidity constraint	Log wealth
Data	SCP recipients	SCP recipients			
X_{-5}	-0.0561*	-0.0281	-0.0420	-0.0590	0.0513
	(0.033)	(0.043)	(0.036)	(0.061)	(0.138)
X_{-4}	0.0065	-0.0039	0.0685	0.1307	-0.337***
	(0.053)	(0.042)	(0.065)	(0.100)	(0.110)
X_{-3}	-0.0457	-0.0385	-0.0295	0.0018	0.0396
	(0.033)	(0.038)	(0.037)	(0.058)	(0.074)
X_{-2}	0.0089	0.0106	-0.0003	0.0498	0.1395*
	(0.035)	(0.038)	(0.040)	(0.063)	(0.074)
X_0	0.2669***	0.239***	0.2147***	0.2183**	0.481***
	(0.049)	(0.054)	(0.052)	(0.091)	(0.130)
X_1	0.0961**	0.0872*	0.0516	0.1445**	0.2437**
	(0.037)	(0.048)	(0.039)	(0.070)	(0.104)
X_2	0.1488***	0.1926***	0.1176**	0.1278	0.1434
	(0.045)	(0.056)	(0.049)	(0.081)	(0.139)
X_3	0.0809	0.0491	0.0665	0.1466	-0.0234
	(0.061)	(0.053)	(0.075)	(0.121)	(0.142)
X_4	0.0528	0.0636	0.0557	-0.0021	-0.1942*
	(0.050)	(0.058)	(0.061)	(0.076)	(0.111)
X_5	0.0091	0.0221	0.0167	0.0438	-0.1268
	(0.033)	(0.041)	(0.038)	(0.057)	(0.157)
$X_{-5} \times Z$		-0.1476	0.0427	0.0176	-0.0122
		(0.115)	(0.058)	(0.029)	(0.020)
$X_{-4} \times Z$		0.0847	-0.1412**	-0.0687*	0.0511**
		(0.231)	(0.071)	(0.039)	(0.021)
$X_{-3} \times Z$		-0.0152	0.0129	-0.0205	-0.0099
		(0.099)	(0.049)	(0.026)	(0.012)
$X_{-2} \times Z$		-0.0129	0.0958*	-0.0236	-0.0171
		(0.085)	(0.055)	(0.027)	(0.011)
$X_{-1} \times Z$		-0.1091	0.0724	-0.0108	-0.0046
		(0.080)	(0.056)	(0.015)	(0.004)
$X_0 \times Z$		0.1470	0.2405*	0.0375	-0.0298
		(0.182)	(0.130)	(0.045)	(0.018)
$X_1 \times Z$		0.0612	0.1891**	-0.0368	-0.0209
		(0.138)	(0.082)	(0.034)	(0.015)
$X_2 \times Z$		-0.2106*	0.1076	0.0122	-0.0008
		(0.122)	(0.092)	(0.039)	(0.021)
$X_3 \times Z$		0.0241	0.0212	-0.0536	0.0120
		(0.121)	(0.096)	(0.048)	(0.025)
$X_4 \times Z$		-0.0409	-0.0312	0.0350	0.0316
		(0.216)	(0.075)	(0.047)	(0.019)
$X_5 \times Z$		-0.0593	-0.0307	-0.0237	0.0175
		(0.103)	(0.056)	(0.027)	(0.021)
Fixed effects			Individual, week*prefecture		
Observations	32,401	31,411	74,597	73,697	74,597
Individuals	1,081	1,048	2,488	2,458	2,488
R^2	0.146	0.150	0.125	0.125	0.126

Note: Figures in parentheses represent standard errors, clustered at the individual level. The rows highlighted in yellow emphasize the coefficients related to on-impact spending responses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

C.2 Comparisons of the SCP and Survey Periods

We compare the basic variables from the period of SCP payments (June 2020) and the survey period (February 2024), as detailed in Tables 5 and 6, respectively. Table 7 presents the individual-level changes between June 2020 and February 2024. These tables indicate negligible differences between the two periods, despite the earlier timeframe being during the height of the COVID-19 pandemic.

Table 5: Descriptive Statistics of the Transaction Data as of June 2020

Statistic	N	Mean	St. Dev.	Pctl(25)	Median	Pctl(75)
Outflows	2,488	505,450.600	947,359.200	156,751.8	311,036	580,061.2
Inflows	2,488	855,297.100	1,213,194.000	269,978.5	608,058.5	1,106,941.0
Salary	2,488	293,252.700	297,558.700	125,538.5	236,909.5	360,249
SCP	2,488	56,872.990	115,891.500	0	0	100,000
Log wealth	2,488	6.887	2.707	5.668	7.276	8.742
Log income	2,488	7.120	3.973	7.736	8.293	8.635

Note: For the transaction amount, the unit is one Japanese yen. Wealth and (annualized) income are reported in thousands of Japanese yen and taken a logarithm after adding 0.001. We do not report the maximum or minimum values to maintain anonymity.

Table 6: Descriptive Statistics of the Transaction Data as of February 2024

Statistic	N	Mean	St. Dev.	Pctl(25)	Median	Pctl(75)
Outflows	2,600	684,989.700	4,607,534.000	165,469.5	314,256.5	535,234.8
Inflows	2,600	882,760.700	8,533,979.000	200,001.5	333,899	516,969.8
Salary	2,600	251,665.300	233,206.000	102,300.8	240,480.5	346,157.5
SCP	2,600	0.000	0.000	0	0	0
Log wealth	2,600	7.183	2.723	6.029	7.654	9.002
Log income	2,600	7.443	3.296	7.671	8.326	8.645

Note: For the transaction amount, the unit is one Japanese yen. Wealth and (annualized) income are reported in thousands of Japanese yen and taken a logarithm after adding 0.001. We do not report the maximum or minimum values to maintain anonymity.

Table 7: Descriptive Statistics of the Transaction Data: Change from June 2020 to February 2024

Statistic	N	Mean	St. Dev.	Pctl(25)	Median	Pctl(75)
Outflows	2,469	195,994.700	4,793,025.000	−171,451	−1	147,507
Inflows	2,469	51,425.070	8,799,073.000	−635,025	−192,425	24,330
Salary	2,469	−39,762.380	290,939.600	−65,219	4,499	57,448
SCP	2,469	−57,310.650	116,228.800	−100,000	0	0
Log wealth	2,469	0.409	1.985	−0.229	0.284	0.977
Log income	2,469	0.396	4.150	−0.106	0.038	0.192

Note: For the transaction amount, the unit is one Japanese yen. Wealth and (annualized) income are reported in thousands of Japanese yen and taken a logarithm after adding 0.001. We do not report the maximum or minimum values to maintain anonymity.

C.3 Estimation Results for 2023–2024

I estimate equations (1) and (2) in the main text using different income shocks and a time period from November 2023 to June 2024, centered around the February 2024 survey. I consider two types of income shocks: government transfers, identified by inflow transactions labeled with Japanese terms like "teate," "shien," or "kyufu," and in multiples of 50,000 JPY; and winter bonuses, widely paid to regular employees in Japan around December, identified by the term "shoyo." The dependent variable is outflows excluding savings.

Table 8 provides the descriptive statistics of the bank account transaction data, which is organized at the individual-week level. The government transfer dummy indicates whether a specific individual receives government transfers in a given week. The mean value is 0.007, which is slightly lower than the SCP payment figure (0.011, as shown in Table 2). The mean amount of transfers is 462 JPY, whereas the SCP payments average 2,336 JPY. Although the government transfers occur less frequently and involve smaller amounts, these figures are not so low as to significantly undermine the statistical power of our MPC estimation.

The estimation results of equation (1) are shown in Figure 3. The left-hand panel illustrates that the spending response to government transfers is insignificant. This lack of significance may be partly due to lower statistical power; however, another possible explanation is that individuals paid less attention to government transfers compared to the unprecedented large-scale SCP payments in 2020. In contrast, the right-hand panel demonstrates a significantly positive response to bonuses for two weeks following their receipt, highlighting a more pronounced effect of this type of income shock.

However, as shown in Figure 4, the estimation results for equation (2) suggest that the interaction terms with the self-reported MPC remain insignificant.

Table 8: Descriptive Statistics of the Transaction Data for 2023–2024

Statistic	N	Mean	St. Dev.	Pctl(25)	Median	Pctl(75)
Outflows	94,263	111,555.500	334,318.300	0	23,016	113,392
Gov transfer dummy	94,356	0.007	0.087	0	0	0
Gov transfers	94,356	461.969	8,972.807	0	0	0
Bonus dummy	94,356	0.030	0.169	0	0	0
Bonuses	94,356	17,463.500	177,224.500	0	0	0
Cash withdrawals	94,356	21,797.610	88,538.170	0	0	0
Inflows	94,356	168,435.900	1,675,094.000	0	0	115,511.5

Note: For the transaction amount, the unit is one Japanese yen. We do not report the maximum or minimum values to maintain anonymity.

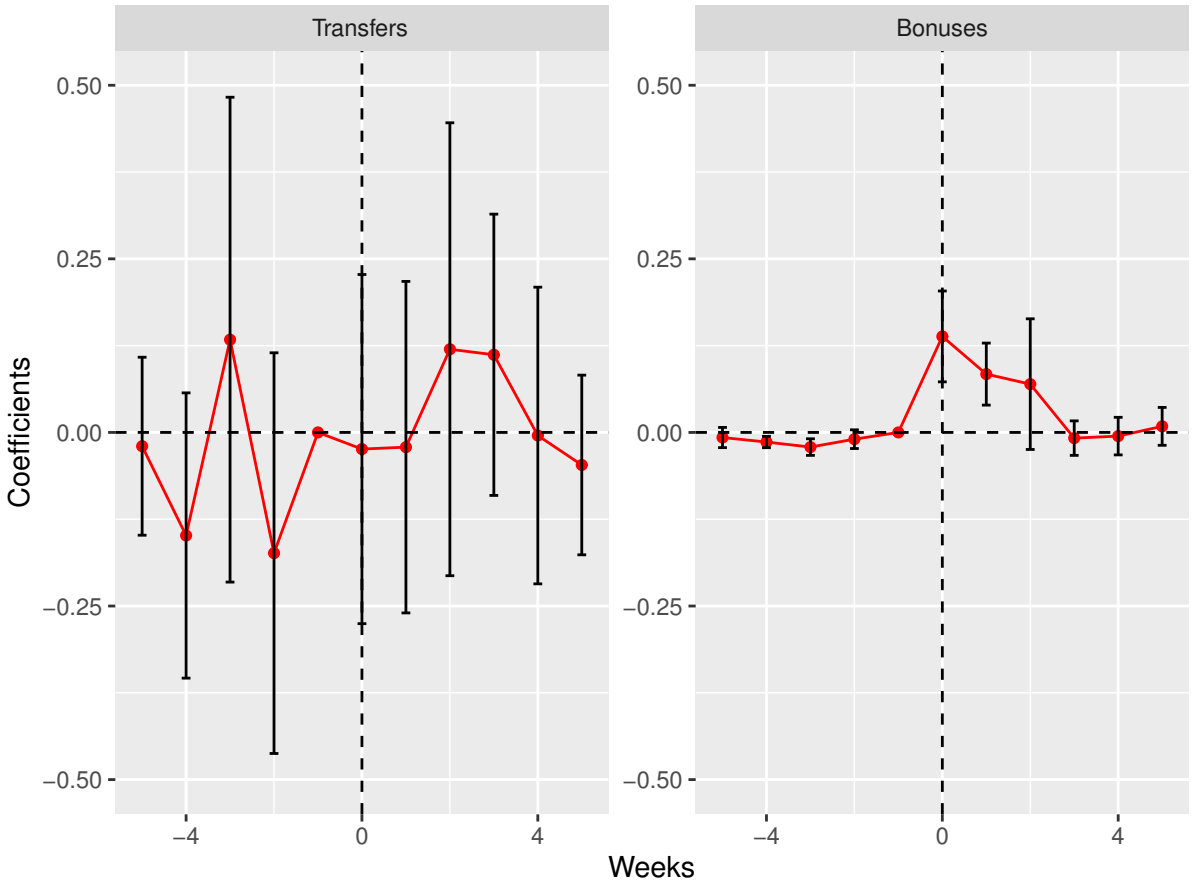

Figure 3: Consumption Responses to Income Shocks in 2023–2024

Note: The figure shows estimated coefficients γ^k from equation (1) for $k = -5, -4, \cdots, 4, 5$, which suggests consumption responses in week $|k|$ before/after income shocks. Bars indicate 95% confidence intervals.

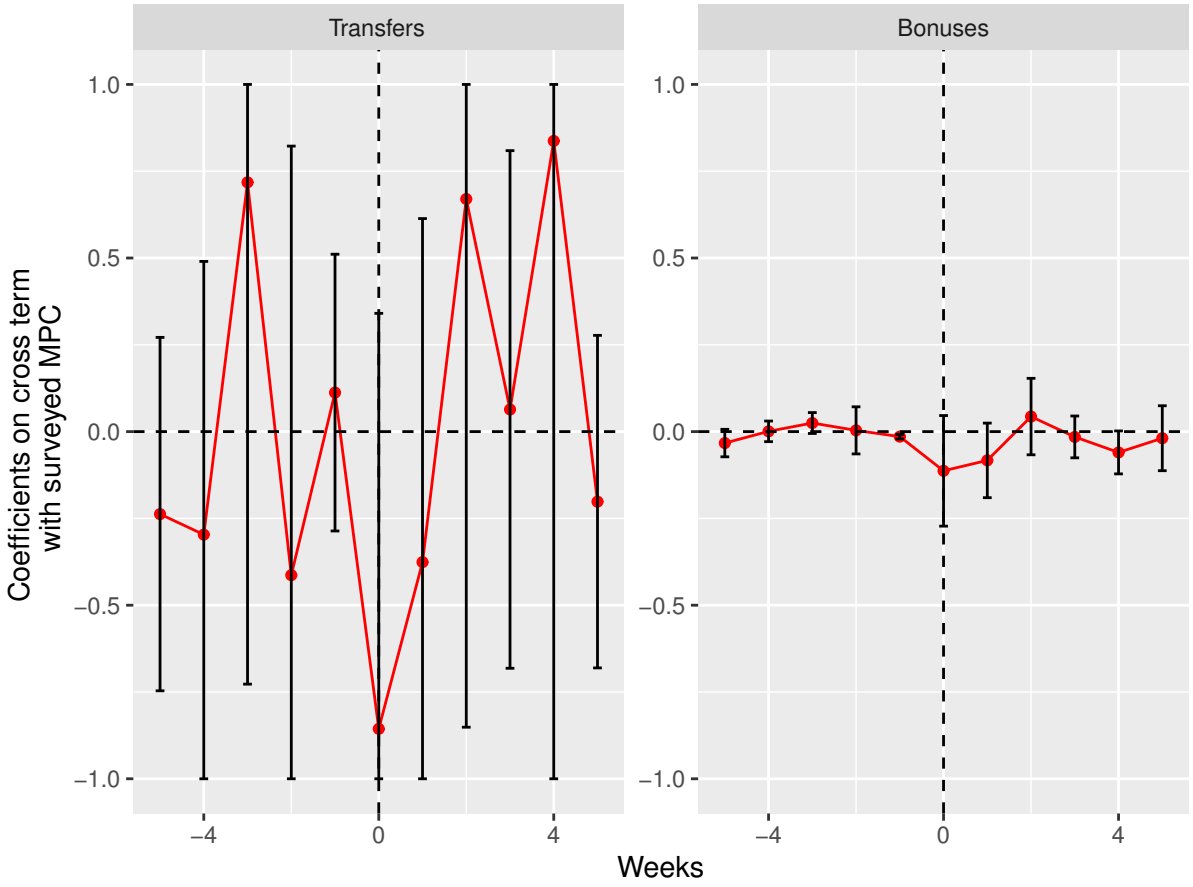

Figure 4: Relationship between Consumption Responses and Self-Reported MPC in 2023–2024

Note: The figure shows estimated coefficients δ^k from equation (2) for $k = -5, -4, \cdots, 4, 5$, showing the relationship between consumption responses in week $|k|$ before/after income shocks and the self-reported MPC. Bars indicate 95% confidence intervals.

C.4 Estimation of the Self-Reported MPC

Table 9 show the estimation results on the self-reported MPC in the survey. The estimation results reveal that the liquidity constraint is only weakly associated with the self-reported MPC, with significance at just the 10% level. When borrowing status and education are included as controls, the coefficient on the liquidity constraint loses significance, even at the 10% level.

Table 9: Estimation on the Self-Reported MPC

	Dependent variable:	
	Self-reported MPC	
	(1)	(2)
Liquid const.	0.012^{*}	0.009
	(0.007)	(0.007)
Borrow		0.008
		(0.012)
Education		-0.010
		(0.007)
Constant	0.181^{***}	0.219^{***}
	(0.012)	(0.030)
Observations	2,521	2,481
R^2	0.001	0.002

Note: Figures in parentheses represent standard errors. The self-reported MPC is derived from Q2. Liquidity constraint is obtained from Q1, which is transformed into an ordered variable ranging from one (least constrained) to four (most constrained). The borrowing status is obtained from Q19, where the variable takes a value of one if respondents have borrowings. Education is obtained from Q20 and transformed into an ordered variable ranging from one (junior high school) to five (graduate school). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.