PRELIMINARY

THE EFFECTS OF FISCAL NEWS ON HOUSEHOLD EXPECTATIONS AND SPENDING: CAUSAL EVIDENCE FROM LINKED SURVEY-TRANSACTION DATA*

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Abstract

We provide experimental evidence on how fiscal news shape households' expectations and spending behavior. Using a new survey of 11,000 Korean individuals linked to automatically collected high-frequency spending data, we elicit respondents' fiscal and macroeconomic beliefs and then randomly provide one of five pieces of information about the current levels of public debt, fiscal deficits, and the government's plan to reduce deficits. Surprises about current fiscal conditions lead to revisions in beliefs about future fiscal conditions but are only weakly connected to other macroeconomic expectations. Individuals increase their spending in response to an exogenous increase in posterior beliefs about future public debt levels (stock), but not in response to an increase in future fiscal deficits (flow). These effects are more pronounced among younger, liquidity-constrained, and financially illiterate individuals, as well as those who perceive a lower tax burden when debt rises.

Keywords: Information RCT, Government debt, Fiscal policy, Expectations, Transaction-level data

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I. INTRODUCTION

The sharp increase in public debt across many countries during the COVID-19 crisis has reignited discussions on the role of public debt and fiscal policy. A recurring theme in policy and academic debates is whether, and how soon, these debts will accelerate inflation and slow economic growth. Indeed, the global surge in inflation from 2021 to 2023 is often partially attributed to massive fiscal expansion (e.g., Barro and Bianchi, 2024).

Economists have long studied the real effects of public debt, with theoretical channels ranging from conventional demand-side overheating to the monetization of public debt and the fiscal theory of the price level.[1] Given the contentious nature of the issue, it is crucial to empirically establish how households respond to changes in current and expected future public debt, as well as related policy actions. Unsurprisingly, this is challenging because households' information sets and beliefs about public debt are neither directly observable nor independent of other economic conditions. Similarly, it is difficult for econometricians to disentangle anticipated from unanticipated changes in fiscal variables and policy, especially with time-series data.[2] Such challenges often lead to making assumptions about the timing of shocks, the information set and expectation formation of economic agents, as well as their full understanding of the intertemporal budget constraint of the government.

In this paper, we present new empirical evidence on the effects of public debt and fiscal deficit on household expectations and spending, using an information randomized controlled trial (RCT). Through randomization, we generate exogenous shocks to individuals' information sets about fiscal variables and trace the resulting causal effects on expectations and spending at the micro level. A key advantage of our approach is its ability to identify and measure the effects of fiscal news under a credible identification strategy, while allowing for potential deviations from the full-information rational expectations (FIRE) assumption. Notably, the joint behavior of household expectations and spending in response to exogenous fiscal news, which is one of the first such findings in the literature, provides direct evidence on a key margin of interest to fiscal policymakers.

[1] See Cochrane (2023), Bianchi et al. (2023), and Barro and Bianchi (2024), and for related discussions.

[2] For a thorough treatment of the identification issue of fiscal shocks, see Ramey (2011) for government spending shocks and Mertens and Ravn (2012) for tax policy shocks. For an overview of empirical strategies and findings on this topic, see Chapter 4 of Ramey (2016).

Our laboratory is a new wave of online surveys that uses a large panel (~11,000) of Korean individuals matched with administrative-type data on consumer spending. The panel is constructed and maintained by Macromill Embrain (henceforth Embrain), a leading marketing research company in Korea. Embrain uses a smartphone app, with participants' consent, to track consumer spending made by any credit or debit card that the participant uses for payment at the transaction level and conducts commissioned online surveys. The automatic recording of spending eliminates recall bias, and the coverage is extensive, as it is not restricted to specific consumption categories or a specific credit card company. The unweighted average monthly spending of our sample participants is 1,250,000 KRW (about 880 USD), which is approximately 53% of the average monthly consumer expenditure per capita according to the official data from the Bank of Korea. Thus, our data resembles the key features of the household financial transaction data (Baker and Kueng, 2022).

We conducted the main survey on a subset of panel participants in July 2023 and a follow-up wave in November 2023, collecting detailed information on their demographics, balance sheets, and beliefs about macroeconomic and fiscal variables. Notably, we introduced randomized information treatments into the first wave. While the control group (Group 1) received no information, other groups received: (1) information about the current government debt (Group 2); (2) information about the current fiscal deficit (Group 3); and (3) information about the current fiscal deficit *along with* planned government policy measures to address it. The latter treatment is further divided based on the type of planned government response: (a) without specifying a policy instrument (Group 4); (b) reducing discretionary government expenditure, such as cash transfers and vouchers, (Group 5); and (c) increasing taxes (Group 6). The statistics in these information interventions are reported as a percentage of GDP as well as in Korean won per person.

All information provided to respondents is publicly available and factual, including the government's plan to reduce deficits, which we constructed based on contemporaneous media coverage. Under the full-information rational expectations (FIRE) assumption, our treatments should therefore have minimal impact on respondents' beliefs and spending behavior. However, individuals facing information frictions may hold divergent perceptions of the current fiscal situation, which is indeed the case in our sample, as we asked respondents about their beliefs regarding the current levels of public debt and fiscal deficits. We exploit such deviations as part of our identification strategy.

To examine the information effects, we elicited respondents' expectations both before and after the information provision. Specifically, we asked about their expected levels of public debt and fiscal deficits 10 years into the future. We also elicited expectations for the average growth rates of government expenditure and tax revenue, inflation, and real GDP growth over the next decade, along with nominal interest rates and unemployment rates over both short- and long-term horizons.

Since fiscal beliefs are noisy, we use Huber weights to systematically address outliers. Huber weights are applied to all analyses throughout the paper. Specifically, we first estimate Huber robust regressions of the posterior belief about the public debt-to-GDP ratio and the fiscal balance-to-GDP ratio on the prior, the treatment dummy, and their interaction term. The final weight used in the analysis is defined as the square root of the product of the two Huber weights obtained from these regressions for debt and balance, respectively.

Our first question is how do surprises in current fiscal conditions—specifically, the public debt-to-GDP ratio (Group 2) and the fiscal balance-to-GDP ratio (Group 3)—affect consumers' beliefs about future fiscal conditions and macroeconomic variables. The latter include expectations about the public debt-to-GDP ratio and the fiscal balance-to-GDP ratio in 10 years, as well as the average growth rates of government expenditure and revenue, the nominal interest rate on government debt, inflation, and real GDP growth over the next decade. The standard intertemporal budget constraint faced by the government implies a structural relationship between changes in current fiscal conditions and expectations about other fiscal and macroeconomic variables. In particular, beliefs about future debt levels must be consistent with expectations about the path of primary balances and the interest–growth–inflation differential.

We compare the belief responses of the treatment groups (Groups 2 and 3) to those of the control group. Surprises are defined at the individual level as the gap between the actual value provided to respondents (49.6% for public debt-to-GDP ratio and -5.6% for fiscal balance-to-GDP ratio) and their prior beliefs about those variables. We then regress revisions in beliefs—measured as the change before and after the information treatment—on the perception gap in current fiscal conditions interacted with treatment indicators, weighted by the Huber weights. The estimated coefficient captures the elasticity of beliefs with respect to an exogenous change in perceived current fiscal conditions in Korea.

We find that households appear to have a poor understanding of the government budget constraint. Specifically, while fiscal news substantially affects households' expectations about

future fiscal variables, it has virtually no impact on their expectations about macroeconomic variables. To a 1p.p. (percentage point) surprise in the current debt-to-GDP ratio, respondents on average significantly revise their expectations of future debt-to-GDP ratio in 10 years by 0.29p.p. On the contrary, they on average revise their expectations of 10-year-average real GDP growth and inflation only by -0.01p.p. and 0.02p.p., with no statistical significance. Similarly, a 1p.p. surprise in the current fiscal balance-to-GDP ratio leads to revisions in future balance-to-GDP ratio in 10 years by 0.17p.p., but revisions in 10-year-average real GDP growth and inflation expectations of 0.15p.p. and -0.01p.p., with tight confidence intervals around zero.

Overall, respondents in our sample, on average, do not perceive a clear link between fiscal conditions and long-term macroeconomic outcomes. Importantly, our finding that news about fiscal variables does not alter inflation expectations is at odds with the fiscal theory of the price level, as well as with recent findings by Grigoli and Sandri (2024). Through a similar information RCT to ours, Grigoli and Sandri (2024) found that consumers in the US, UK, and Brazil adjust their inflation expectations when they learn that their prior beliefs about public debt are incorrect. Given that Korea has much lower government debt levels than the countries studied in their work, our findings suggest that the link between the inflation rate and public debt might be state-dependent.

We next examine households' spending responses to fiscal news. Motivated by the substantial revisions in fiscal beliefs induced by the information treatments, we estimate a two-stage least squares (2SLS) regression in which we instrument posterior (after intervention) beliefs about the future debt-to-GDP ratio and fiscal balance with their respective prior (before intervention) beliefs, treatment dummies, and interaction terms, weighted by the Huber weight. The dependent variable is the log of total spending expenditure (multiplied by 100) for each individual. To trace the dynamic consumption response, we implement a local-projection approach, estimating the same specification over successive 30-day horizons: 0–30 days, 30–60 days, 60–90 days, 90–120 days, and 120–150 days following the survey date for each individual.

We find that an exogenous 1 percentage point increase in the posterior belief about the future debt-to-GDP ratio leads to a statistically significant 0.15% *increase* in total spending during the first 30 days after the survey, controlling for prior spending over the preceding 30 days and other demographic characteristics. The response gradually declines over time and becomes

statistically insignificant 120 days after the survey date. In contrast, we find no significant spending response to surprises in the fiscal balance.

Spending response to debt-to-GDP ratio is surprising, as they appear not to be driven by changes in long-term GDP growth or inflation expectations but also contradict benchmark predictions—such as Ricardian equivalence. To understand the underlying mechanisms, we analyze spending responses across different subgroups. The effects are more pronounced among younger, liquidity-constrained, and financially illiterate individuals, as well as those who perceive a lower tax burden when public debt increases. This heterogeneity suggests that perceived fiscal burden plays an important role in shaping consumption responses. However, the positive spending response to higher expected debt levels runs counter to the Ricardian prediction that households should reduce consumption in anticipation of future taxes. Instead, the results imply that many households do not fully internalize the government's intertemporal budget constraint, which is consistent with our findings about their belief responses to surprise in current fiscal conditions.

Our work contributes to several strands of research. First, we are the first to analyze the extent to which expectation updates translate into changes in consumption by leveraging linked surveys and consumption data. While Coibion, Gorodnichenko, and Weber (2021), Roth et al. (2022), and more recently, Grigoli and Sandri (2024) and Andrade et al. (2025) have utilized information RCTs and/or surveys to analyze the effects of public debt and fiscal balance on consumer beliefs, none of these studies directly examine how actual consumption changes when information about fiscal variables is updated, due to the unavailability of data. We overcome this limitation by using the data that directly connects survey and consumption spending. We note that our findings differ from the previous literature in several dimensions, particularly in the muted response of inflation expectations to fiscal news in South Korea. As pointed out above, this appears to be due to South Korea's much lower debt-to-GDP ratio and inflation rate compared to the countries previously analyzed (the US, UK, and Brazil), making consumers less sensitive to the link between fiscal variables and other macroeconomic factors. Further research in different macroeconomic environments is needed to better understand the source of this difference.

Second, we contribute to the rich body of work on fiscal policy. Since the onset of both the Great Recession and the COVID-19 recession, substantial effort has been devoted to studying the effectiveness of fiscal policy (see Ramey (2016) for a comprehensive summary and discussion), particularly given the limited scope for monetary policy as nominal interest rates

approached the zero lower bound in both episodes. We add to this literature a unique set of empirical findings on the joint distribution of household expectations and downstream consumption behavior, conditional on an identified news shock about fiscal variables. While belief formation—and, more importantly, spending behavior—is crucial for understanding the real effects of fiscal policy, empirical evidence at the micro level remains scarce. We believe that our micro-level evidence complements the existing literature, which primarily relies on aggregate data to study the effects of fiscal policy on the broader economy.

Finally, our work contributes to the growing literature on the effects and limitations of unconventional stabilization policies aimed at managing expectations, which is an area of increasing interest among economists and policymakers. Bachmann et al. (2021) and others (cite more) show that the announcement and implementation of fiscal policy can serve as powerful stabilization tools, particularly when monetary policy is constrained. While there is a rapidly expanding body of research on how central banks communicate their policies to shape expectations, especially inflation expectations, and influence household behavior (Coibion et al., 2022), studies on fiscal policy communication remain notably limited.

The rest of the paper is organized as follows. Section II describes the data and survey design. Section III presents result on how the information treatments affect expectations of survey respondents and then Section IV provides our findings on the effects on consumption. Section V concludes the paper.

II. DATA AND SURVEY DESIGN

This section presents descriptive statistics of our sample and outlines the survey design used to elicit household expectations regarding fiscal and macroeconomic variables, as well as various treatments. We first describe the Embrain Panel Big Data, on which we conduct the survey, and then provide further details on the survey structure and treatment design.

A. Embrain Panel Big Data

Embrain Panel Big Data (henceforth EPBD) is a panel of approximately 200,000 households maintained by Embrain that collects the dynamic characteristics of their purchases. The consumers participating in the panel are asked to download a smartphone app that tracks consumer spending paid with their credit or debit cards. When either a credit or debit card is used for purchases, text messages that include information on transaction, such as date, time, outlet,

amount for transactions, and categories (food/online shopping, etc.), are sent to their cell phone. The app forwards text messages to Embrain for recording. In turn, any transaction by the participants paid by the card that sends messages to the consumer is in our data. The data generated by the app mimics the structure of transaction-level data from credit card companies, banks and financial aggregators (Baker and Kueng 2022, Gelman et al. 2023). We use the spending data in section IV to study how fiscal news and exogenous variations in fiscal expectations move individuals' spending behavior.

For our analysis, we include all transactions recorded in the raw dataset in year 2023. Focusing on the 30 days preceding each respondent's survey date, the average daily spending amounts to approximately 36,600 KRW, including days with zero recorded spending—which account for roughly 50% of all observations. Each transaction record includes detailed information on location, amount, and transaction time (measured up to the second), enabling us to infer broad consumption categories. Although transaction-level details are always available, not all purchases can be clearly assigned to a specific category; approximately 80% of transactions are successfully categorized based on merchant type and industry classification. This allows us to distinguish purchases of durables and nondurables when merchant specialization is clear (e.g., electronics stores versus supermarkets), even though we do not observe itemized baskets within multi-product retailers.

To validate our Embrain data, we compare moments of consumer spending with the moments reported by official statistics. We generally find that our data is close to official sources. For example, the unweighted (i.e., not Huber weighted) average monthly expenditure of the control group during the sample period (January to December 2023) was approximately 1,250,000 KRW (about $880), which is around 53% of the average per-person consumption expenditure in Korea, estimated at 2,330,000 KRW (~$1,638).[3] This seems to be consistent with the fact that Korea is one of the countries with the highest credit card ownership (68% according to the Global Findex Database 2021 constructed by the World Bank) in the world.

B. Survey Design

We fielded two waves of online surveys on the randomly selected sample of 11,262 EPBD participants in July and November of 2023. Embrain attempts to ensure the national

[3] Huber weighted average monthly expenditure is $1,061.91. Data from the Bank of Korea is here: https://www.index.go.kr/unity/potal/indicator/IndexInfo.do?clasCd=10&idxCd=F0145

representativeness of the sample based on age, gender, and region. Participants are at least 19 years old and receive points for answering surveys that can be converted into cash.

In the first wave of the survey, we first gathered information on participants' demographic characteristics, perceptions and expectations, and introduced five different information treatments (in addition to one control group). Table 1 provides the summary statistics of key demographic variables across different groups, along with the national averages in the last column. All the moments are computed using Huber weights. For example, the average age of respondents is 43.8, around 75 percent of respondents aged 15 to 64 are employed, and the median of monthly labor income (self-reported, after-tax) is KRW 2,700,000 per year (about 1,900 USD). While our sample is quite representative in various dimensions compared to the national averages, survey participants are on average more educated, more likely to have a job, and have more children. Importantly, the table also shows that the sample is well-balanced across different groups.

Before and after the treatment, we asked questions that measure various perceptions and expectations of fiscal and macroeconomic variables, which are described in the next subsection. In the second wave of the survey, we again elicited their expectations that we asked in the first wave after the treatment intervention. The main purpose of this wave is to track individuals' expectations over time. The retention rate for the follow-up wave was high: 7,200 out of 11,262 respondents participated in the follow-up survey.

C. Measurement

The key survey questions for our analysis are those measuring perceptions and expectations of participants. Questions about their perception about the *current* public debt and fiscal balance of the Korean economy are important because our information treatments include numerical information on the current level of public debt and fiscal deficits. In section III, we leverage the differences between participants' prior perceptions and the actual level and quantify how they revise their expectations of other macroeconomic variables.

Because the general public is unlikely to be well informed about public finances and various definitions (Stantcheva, 2020), we give survey participants background information that explains what they are asked of. For instance, we ask the following question about fiscal balance perception:

Households earn income and spend from it. Similarly, the government generates revenue (including taxes, duties, etc.) and allocates it toward expenditures (such as national projects, defense spending, and social welfare programs). The fiscal balance is equal to government revenue minus government expenditure. If the value is positive, it is a fiscal surplus, and if it is negative, it is a fiscal deficit. If government revenue and government expenditure are equal, it is said to be in fiscal balance.

Think about the Korean government spending and government revenue in 2022. How do you think each was compared to the gross domestic product (GDP, which you can think of as a country's total income) of the Korean economy? For example, if government expenditure (or revenue) was n won and GDP was 100 won, government expenditure (or revenue) would be n% of GDP. [Enter 0 or positive number]

Government spending in 2022 was ___% of GDP [0-100%]
Government revenue in 2022 was ___% of GDP [0-100%]

The fiscal balance in 2022 was __XXX__% of GDP (XXX is automatically calculated based on the response to income-expenditure) [-100~100%]

and the following question about public debt perception:

National debt refers to the debt of a country that the country has an obligation to repay in the future by borrowing money from the private sector, the central bank, or overseas for reasons such as fiscal deficit. This is the same as households taking out debt when their income is less than their consumption.

What do you think Korea's national debt level was compared to its national income (GDP) at the end of 2022?

In December 2022, the national debt was _____% of GDP. [0~200%]

Descriptive statistics about the respondents' perceptions are summarized in Panel A, Table 3. Compared to the actual figure (49.6%), Korean households, on average, overestimate the level of public debt. This contrasts with findings by Grigoli and Sandri (2024) and Coibion et al. (2021) for households in the U.S., U.K., and Brazil, which may be due to Korea having the lowest public debt-to-GDP ratio among these countries and Koreans are more pessimistic about the state of the Korean economy. However, perceptions of the fiscal balance-to-GDP ratio are, on average, close to the actual figure (-5.6%). That said, there is significant cross-sectional variation in perceptions for both variables: the interquartile ranges for the debt-to-GDP ratio and fiscal deficit are 70% and 10% respectively.

To measure their expectations about *future* fiscal variables, we follow Manski (2004) and ask them to provide the lowest and highest values they can think of for a given variable, along with their subjective probability that the actual value exceeds the average of these two estimates. For example, we pose the following questions regarding their beliefs about the fiscal balance in 10 years:

> *Q18. This question asks your thoughts on the fiscal balance of the Korean economy (= government revenue - government expenditure) in the next 10 years. Think about the range of what the fiscal balance will be as a percentage of GDP in 10 years.*
>
> *Instructions: If you think the government's spending will be greater than its revenues (fiscal deficit), enter a negative number. If you think the government's revenues will be greater than its expenditures (fiscal surplus), enter a positive number. If you think government revenues and expenditure will be equal (fiscal balance), enter 0.*
>
> *Q18-1. What is the lowest value you think is possible? _____% [-150~150%]*
> *Q18-2. What is the lowest value you think is possible? _____% [-150~150%]*
>
> *Q19. What do you think is the probability that the fiscal balance after 10 years will be higher than the average of the values you answered earlier ((Q18-1 + Q18-2)/2%, automatically calculated)? _____% [0% - 100%]*

We use this information to calculate a split triangular distribution.[4] We repeat the same questions about the public debt-to-GDP ratio, government spending and revenue growth rates, interest rate on government bonds, as well as macroeconomic variables, including real GDP growth, inflation rate, mortgage rate, and unemployment rate. Descriptive statistics about the respondents' fiscal beliefs are summarized in Panel B in Table 3. Expectations are on average well-balanced across the control and treatment groups. The distribution of perceptions and expectations of public debt-to-GDP ratio and fiscal balance-to-GDP ratio are plotted in Figure 1.

Following the information treatments, respondents, including those in the control group who did not receive any information, were asked follow-up questions to measure the immediate effect of the treatments on their expectations. To minimize survey fatigue and avoid

[4] We code the implied mean as missing for respondents who submitted the same number for both the lowest and highest possible values. The results remain quantitatively similar when these respondents are included, with their implied means assigned to their respective lowest and highest values.

reusing the exact same questions, we collect only point estimates for their expectations in the year 2030, instead of 10 years ahead.

D. Treatments

After the pre-intervention phase of the survey, participants are randomly assigned into six different groups, with each group consisting of approximately 1,900 participants. Each group receives different information about the current fiscal status and the future trajectory of fiscal policy in Korea. The first group is the control group, which is not treated with any information. Groups 2 and 3 receive information on the current public debt to GDP ratio and fiscal balance, respectively:

> **Group 2:** "*The level of public debt in Korea was 49.6% of GDP in 2022. This debt was 20.68 million won ($16,000) per capita, the largest by historical standards. According to the IMF, between 2017 and 2022, Korea's national debt-to-GDP ratio grew more than 2.5 times faster than the average ratio of the world's 35 advanced economies.*"

> **Group 3:** "*The managed fiscal balance of the Korean government was -5.4% of GDP in 2022. That is, the government had a fiscal deficit. This deficit was 2.27 million won ($1,700) per person, the largest by historical standards."* [5]

To help households interpret the provided information and have a better sense of magnitudes, we give a historical perspective by illustrating trends over time, comparing them to peer countries, and offering qualitative assessments (e.g., "the largest by historical standards"). Because the provided information is publicly available information, zero response to the treatments should occur if households form expectations in a full-information rational expectations (FIRE) manner.

For Groups 4, 5, and 6, participants receive the same information as those in Group 3, along with additional details about the government's planned efforts to reduce fiscal deficits (the plans were also publicly available). Group 4 is informed that the government has a plan to

[5] Since the participants might not understand the meaning of the managed fiscal balance, we further provide the following information in the same screen:

"Managed fiscal balance is calculated by subtracting government expenditure and the Social Security Fund balance from the government income. The Social Security Fund balance is the income minus expenditure of the national pension, private school pension, employment insurance, and industrial accident insurance. Therefore, the managed fiscal balance can be used to clearly evaluate fiscal soundness of the government."

reduce the deficit to 3% of GDP but is not provided with a specific policy instrument. In addition to this information, Group 5 further learns that the government plans to cut discretionary spending, while Group 6 is told that the government intends to increase taxes.

> **Group 4:** "*The government plans to reduce the deficit to 3% of GDP, approximately 1.14 million won ($850) per person, in 2024.*"
>
> **Group 5:** "*The government plans to reduce the deficit to 3% of GDP, approximately 1.14 million won ($850) per person, in 2024. To this end, along with other measures, the government plans to reduce more than 10 percent of its discretionary spending, including plans to cut cash transfers and voucher programs. This spending measure takes about 50% of total government budget.*"
>
> **Group 6:** "*The government plans to reduce the deficit to 3% of GDP, approximately 1.14 million won ($850) per person, in 2024. To this end, along with other measures, the government plans to scrap gas tax cuts. The government is also considering scraping auto purchase tax cuts and restoring the fair market rate, which is used when calculating the comprehensive real estate tax, from 60% to 80%.*"

To validate the randomization in the survey, we compare pre-treatment perceptions and expectations by treatment arm. We can observe that the sample is well-balanced across different treatment groups. For instance, within group average perceived public debt-to-GDP ratio ranges from 65% to 69% with 67% as the whole sample average and fiscal balance is perceived to range from -6% to -7% within each group, with full-sample average -6.5%.

III. FISCAL NEWS AND HOUSEHOLD EXPECTATIONS

In this section, we present and discuss how news about current fiscal conditions affects individuals' expectations. We rely on the RCT-induced variation to learn what respondents think about how fiscal and macroeconomic variables are related. Our main objective here is to map exogenous variation in beliefs to the simple model.

A. Simple Arithmetic of Public Finance

Consider the following intertemporal budget constraint faced by the government:

$$d_{t+10}^{\%} = \left(\frac{1+i}{(1+g)(1+\pi)}\right)^{10}\left[d_t^{\%} - \sum_{j=0}^{9}\frac{b_{t+j}^{\%}}{(1+i)^{j+1}}\right]$$

where $d_t^{\%}$ is the initial debt-to-GDP ratio, $d_{t+10}^{\%}$: 10 year (10Y) later debt-to-GDP ratio, i is average nominal interest rate on government debt (10Y, annualized), g is average real GDP growth rate (10Y, annualized), π is average inflation rate (10Y, annualized), $b_{t+j}^{\%}$is fiscal balance in year $t+j$ (as % of GDP).

Ricardian equivalence, the fiscal theory of price level (FTPL), self-financing debt, etc., differ in the margins they emphasize (future tax burden, price level, output growth, etc.), but the above accounting identity should hold in any coherent model with transversality condition. For any given set of subjective beliefs about i, g, π, $d_t^{\%}$, $d_{t+10}^{\%}$, $b_{t+j}^{\%}$ and their changes, the following approximation should hold:

$$\Delta d_{t+10}^{\%} \approx \underbrace{\gamma^{10}\Delta d_t^{\%}}_{\text{(1) Change in initial debt}} + \underbrace{10\gamma^{10}d_t^{\%}\,(\Delta i - \Delta g - \Delta\pi)}_{\text{(2) Change in interest-growth-inflation differential}} - \underbrace{\sum_{j=0}^{9}\gamma^{10-j}\Delta b_{t+j}^{\%}}_{\text{(3) Change in primary balance path}}$$

where $\gamma \equiv \frac{1+i}{1+g+\pi}$.

The above expression indicates that changes in the belief on the 10Y later debt-to-GDP ratio can be decomposed into three components: changes in the initial debt, changes in the interest-growth-inflation differentials, and changes in the primary balance path. In the RCT, we elicit information about all variables in the above formula so that we can verify if the above identify holds in the households' minds. In particular, we give households the unexpected (precisely measured by the perception gaps) change in current public debt $d_t^{\%}$ (Group 1 vs. 2) inside the squared bracket on the right-hand side, and observe how beliefs over $d_{t+10}^{\%}$, i, g, π, and $b_{t+j,j>0}^{\%}$ change.[6]

B. Econometric specification

[6] Note that in our survey, beliefs over $d_{t+10}^{\%}$, i, g, π are measured as they are, but $b_{t+j,j>0}^{\%}$ is only measured for $j = 10$. We can back out the sequence using the growth rates of government spending and revenue, or assuming constant growth rate from $b_t^{\%}$ to $b_{t+10}^{\%}$.

In a first pass at the data, we examine how respondents revise their beliefs to the news about public debt and fiscal deficits in response to information treatments in Groups 2 and 3. To this end, we regress the change in respondents' expectations, from before (prior) to after (posterior) the information treatment, on the perception gap interacted with a dummy variable indicating their treatment group (equal to zero for the baseline group and one otherwise). Specifically, we estimate the following equation, which is similar to the specifications in Armona et al. (2019) and Beutel and Weber (2023):

$$E_i^{\text{post}} y - E_i^{\text{pre}} y = \delta_{0,k\to j} + \mathbb{I}(i \in Treatment\ j) \times \left[\delta_{1,k\to j}\left(x - x_i^{\text{pre}}\right) + \delta_{2,k\to j}\right] + \boldsymbol{Z}_i \phi_{k\to j} + error \quad (1)$$

where i indexes survey respondents. $E_i^{\text{pre}} y$ and $E_i^{\text{post}} y$ denote pre- and post-treatment expectation of variable y for respondent i. Posterior belief $E_i^{\text{post}} y$ can be used from the first wave (immediately after treatments) or from the follow-up wave (3 months after the initial wave). $\mathbb{I}(i \in Treatment\ j)$ is the indicator variable indicating that the respondent i is assigned to the treatment group $j \in \{1,2,3\}$. x and x_i^{pre} are the actual level of fiscal variable x (public debt to GDP ratio, fiscal balance to GDP ratio) that we provide in the information treatment and the respondent's prior perception about it, respectively. Thus, the difference between the two defines the news about the fiscal variable for the respondent i. $\boldsymbol{Z}_i$ is a vector of socio-demographic characteristics. Because respondents are randomly assigned into different treatment groups, inclusion of $\boldsymbol{Z}_i$ does not affect the estimates of $\delta_{1,j}$ and $\delta_{2,j}$ but it helps to improve the precision of the estimates. $error$ is the error term in the regression.

The coefficient of interest is $\delta_{1,k\to j}$, which measures how respondents, on average, revise their expectations per unit of surprise in the treatment j. $\delta_{2,k\to j}$ controls for any potential effects of the treatments that do not operate through perception gaps. $\delta_{0,k\to j}$ controls for any potential revisions in expectations in the control group due to variations in question formats before and after the provision of information.

We estimate specification (1) separate for each treatment group. That is, we restrict the sample to groups T1 (control) and T2 to estimate the treatment effect of telling people about the level of the public debt as a fraction of GDP. This regression yields estimates $\delta_{1,1\to 2}$ and $\delta_{2,1\to 2}$. In a similar spirit, we restrict the sample to groups T1 and T3 to estimate the treatment

effect of informing survey participants about the current level of fiscal deficit. This regression yields estimates $\delta_{1,1\to3}$ and $\delta_{2,1\to3}$. Both regressions use the control group (T1) as the baseline for comparison (that is, $k = 1$).

The specification in equation (1) provides an empirical analogue to the accounting identity described in Section III.A. In that identity, beliefs about future public debt depend mechanically on current debt, the interest–growth–inflation differential, and the expected path of primary balances. In our regressions, the news term $\left(x - x_i^{pre}\right)$ isolates exogenous variation in one component of this identity, and the estimated coefficients $\delta_{1,k\to j}$measure how strongly individuals update beliefs about each of the remaining components in response. Comparing these responses across treatments thus allows us to assess whether households' belief revisions are internally consistent with the simple arithmetic of public finance.

C. Treatment effects on beliefs

We estimate equation (1) for fiscal deficit and public debt in 10 years, the average interests on government bond, growth rate of government spending and revenue over 10 years, the average real GDP growth and inflation over 10 years. Estimation results for $\delta_{1,j}$ with fiscal beliefs are reported in Table 5. News about the current level of public debt and fiscal deficits have a statistically and economically significant impact on the households' expectations about future fiscal conditions. For example, a surprise of 10p.p. in the current public debt-to-GDP ratio on average *increases* household expectations about public debt-to-GDP ratio in 10 years by 3.8p.p., although it does not last until the second wave. A surprise of 1p.p. in current fiscal balance increases the expected fiscal balance in 10 years by 0.17p.p., and the expected growth rate of government spending and revenue by 0.35p.p. and 0.25p.p., respectively. Also, an increase in the debt level increases the expected interest on government debt, while an increase in fiscal balance decreases it, which are all consistent with the basic intuitions.

Interestingly, however, neither of them has significant impact on macroeconomic beliefs. To a surprise of 1p.p. in the current public debt-to-GDP ratio, respondents on average revise their expectations of 10-year-average real GDP growth and inflation only by 0.21p.p. and -0.01p.p., with no statistical significance. Similarly, a 1 p.p. surprise in the current fiscal balance leads to revisions in 10-year-average real GDP growth and inflation expectations of 0.02p.p. and -0.02p.p.. These estimates are precise, as the confidence intervals are tightly centered around zero. Overall, the average belief responses suggest that individuals in our

sample do not perceive a strong link between fiscal variables and broader macroeconomic conditions.

These findings contrast with those of Grigoli and Sandri (2024), who find that households increase their inflation expectations when informed that public debt is higher than they had thought. This difference could arise for various reasons, such as (i) Korean households may not understand how changes in fiscal variables translate into other macroeconomic variables (lack of knowledge) or (ii) they may believe that aggregate variables are determined independently of fiscal conditions (a perceived dichotomy between the fiscal and real sectors) or (iii) the low fiscal debt with (relatively) low inflation rate environment make Koreans to be ignorant about the relationship between the two variables. While it is not the focus of this paper to identify or disentangle the driving factors, an important question for future research is whether households in different fiscal environments exhibit varying belief responses to news about fiscal conditions. For example, Weber et al. (2025) shows that economic agents in different inflation environments across different countries respond differently to exogenously provided information about inflation and monetary policy.

IV. FISCAL NEWS AND HOUSEHOLD SPENDING

In this section, we present and discuss how household spending responds to fiscal news, which is the key margin of adjustment for fiscal policymakers.

A. Hypothetical responses

Before analyzing the effects on actual household spending, we discuss households' responses to hypothetical changes in future government spending and revenue. In the first wave of the survey before giving them any information treatment, we asked questions about how their current expenditure, income, and working hours would change in response to a hypothetical reduction in government spending or increase in tax revenue. Specifically, they were asked the following:

> *Suppose the government decides to reduce the level of the national debt (the government's spending is greater than its revenue, so it owes more domestically and internationally). To do this, the government reduces annual government spending by [1%, 2%, or 5%; randomized] of GDP and maintains that low level for the next 10 years. Taxes remain unchanged. How do you expect this policy to*

affect your current expenditure (e.g., on consumption), income, and working hours? For each item, please answer by the percentage change relative to the current level. If you are not sure, please give your best guess.

Your expenditure will increase/decrease relative to your current spending [by ___%] [no change]
Your income will increase/decrease relative to your current income [by ___%] [no change]
Your working hours will increase/decrease relative to your current working hours [by ___%] [no change]

Let's continue assuming that the government has decided to reduce the national debt. However, this time, it raises taxes to collect an additional [1%, 2%, 5%; randomized] of GDP and maintains this higher tax level for the next 10 years. Government spending does not change. How do you expect this policy to affect your current expenditure (e.g., on consumption), income, and working hours? For each item, please answer by the percentage change from your current level. If you are not sure, please give your best guess.

Your expenditure will increase/decrease relative to your current spending [by ___%] [no change]
Your income will increase/decrease relative to your current income [by ___%] [no change]
Your working hours will increase/decrease relative to your current working hours [by ___%] [no change]

These hypothetical questions have been successfully applied in recent economic research, for example, to measure economic agents' subjective models of the macroeconomy (Andre et al., 2022). They are similarly useful for our research setup because they provide insight into the magnitude of household responses to changes and reveal what households perceive as the active margins of adjustment. To minimize numerical anchoring, we randomize the magnitude of changes in government spending and taxation (1%, 2%, and 5% of GDP) and normalize the responses by dividing them accordingly.

Figure 3 displays the distribution of hypothetical responses for different outcomes.[7] Several observations stand out: First, the most common response from households is that changes in fiscal policy to reduce public debt would not affect their current expenditure, income, and working hours. For example, at least 25% of households responded that changes in government spending or tax rate have no effect on their current spending. However, a

[7] The maximum and minimum possible responses are 100% and -100%, respectively. Extreme responses were trimmed at the 1% tails on both ends.

substantial portion of households chose to submit non-zero figures instead of selecting "no change.", especially for their expenditure response. The average changes of current expenditure, income, and working hours to a decrease of government spending by 1% of GDP are 3.07%, -0.39%, and 1.1%, respectively, while average changes of the same variables to an increase of taxation by 1% of GDP are 1.52%, -1.33%, and 1.17%, respectively. It is also noteworthy that the magnitude of changes that we randomized to each respondent has no strong effect on their marginal responses on average.

Therefore, on average, households expect that policy changes aimed at reducing national debt will lead them to spend more, earn less, and work more, with spending being the most active margin. Additionally, their negative income responses suggest that their increased expenditure is not driven by an improvement in real living conditions but is more likely a response to a higher price level. Such interpretation is in line with households associating high inflation with a bad state of the economy (Kamdar 2018, Candia et al. 2020, Stantcheva 2024) and believing that more inflation results in more (nominal) consumer spending just to maintain a given consumption basket.

Overall, hypothetical responses suggest that an average household expects welfare losses following debt reduction plans, due to decrease in purchasing power and less time spent on leisure. However, there is substantial heterogeneity, and as hypothetical responses have limited power in providing direct evidence, we need more analysis on how households adjust their behavior to actual changes in fiscal beliefs.

B. Spending Revisions to Fiscal News

We next examine how automatically recorded spending responds to exogenous variation in fiscal beliefs induced by the information treatments. Specifically, we estimate a two-stage least squares (2SLS) regression in which we instrument posterior beliefs about the future debt-to-GDP ratio and fiscal balance with their respective priors, treatment dummies, and interaction terms, applying Huber weights. The dependent variable is the log of total spending expenditure (multiplied by 100) for each individual. To trace the dynamic consumption response, we estimate the same specification over successive 30-day horizons: 0–30 days, 30–60 days, 60–90 days, 90–120 days, and 120–150 days following each individual's survey date.

Specifically, our first stage regression is the following:

$$E_i^{\text{post}} debt = a_0 + \sum_{j=1}^{6} \mathbb{I}(i \in Treatment\ j) \times a_j + \sum_{j=1}^{6} \mathbb{I}(i \in Treatment\ j) \times E_i^{\text{pre}}\ debt \times b_j + \sum_{j=1}^{6} \mathbb{I}(i \in Treatment\ j) \times E_i^{\text{pre}}\ balance \times c_j + error_i$$

$$E_i^{\text{post}} balance = \tilde{a}_0 + \sum_{j=1}^{6} \mathbb{I}(i \in Treatment\ j) \times \tilde{a}_j + \sum_{j=1}^{6} \mathbb{I}(i \in Treatment\ j) \times E_i^{\text{pre}}\ debt \times \tilde{b}_j + \sum_{j=1}^{6} \mathbb{I}(i \in Treatment\ j) \times E_i^{\text{pre}}\ balance \times \tilde{c}_j + error_i$$

We then regress the ex-post spending on beliefs:

$$\log(Spending^{t+h}) = a_1 + E_i^{\text{post}} debt + E_i^{\text{post}} balance + E_i^{\text{pre}} debt + E_i^{\text{pre}} balance + \boldsymbol{Z}_i \phi_{k \to j} + error$$

where $\log(Spending^{t+h})$ is the log of total spending for individual *i*, at horizon $h \in \{30, 60, 90, 120, 150\}$ after the survey date *t* for the first wave. The vector of control variables $\boldsymbol{Z}_i$ includes gender (female), age, age squared, number of children, household size, education, employment status, log income, a Seoul metropolitan area dummy, and total spending during the 30 days preceding the survey.

The estimation results are summarized in Table 6. Total spending over 3 months after the survey increases by 0.86% in response to an exogenous 1p.p. increase in posterior belief about public debt-to-GDP ratio (first column), whereas it does not significantly respond to an increase in posterior belief about fiscal balance-to-GDP ratio (second column). Figure 5 graphically summarizes our main spending results. Our findings are interesting because it runs counter to the conventional intuition in macroeconomics. When individuals learn that public debt is likely

to rise, they would typically expect, given the government's budget constraint, that fiscal policy will eventually adjust—through higher taxes and/or lower government spending—to restore balance. This expectation should reduce their current consumption due to a negative income effect. However, as shown in Table 6 and Figure 5, individuals in our data react in the opposite direction. While we do not have a definitive explanation for this, one possible interpretation draws on the older view in the literature that consumers perceive government debt as part of their wealth (see Barro (1974) for related discussions). In this view, when consumers learn that public debt is lower (higher) than they expected, they interpret it as a negative (positive) wealth shock, leading them to decrease (increase) consumption.

We then estimate the above specification for different subsamples and report the results in Table 7. The effects are more pronounced among younger, liquidity-constrained, and financially illiterate individuals, as well as among those who perceive a lower tax burden when public debt increases. This heterogeneity suggests that perceived fiscal burden plays an important role in shaping consumption responses. However, the positive spending response to higher expected debt levels runs counter to the Ricardian prediction that households should reduce consumption in anticipation of future taxes. Instead, the results imply that many households do not fully internalize the government's intertemporal budget constraint, consistent with our earlier findings regarding their belief responses to surprises in current fiscal conditions.

V. CONCLUSION

This paper utilizes an information randomized controlled trial (RCT) implemented on a new transaction-level consumption panel of Korean households to examine how news about public debt, fiscal deficits, and future fiscal policy affects household expectations and spending. We first show that while fiscal news influences households' beliefs about future fiscal conditions, it does not significantly affect their expectations regarding other macroeconomic variables, such as inflation and real GDP growth. Since this finding contrasts with previous literature based on surveys and RCTs conducted on consumers in the US and other countries, it highlights the importance of heterogeneous belief formation, potentially driven by differences in macroeconomic environments.

Importantly, we further demonstrate that an exogenous increase in beliefs about the future public debt-to-GDP ratio leads to higher current consumption spending— a novel finding in

this literature. Finally, we report that the anticipation of cuts in discretionary expenditures, including cash transfers and vouchers, can decrease household spending, whereas anticipated government deficit reduction or tax hikes do not have significant effects on consumption.

Our findings contribute to the growing literature on the interplay between fiscal policy information and household behavior by providing novel evidence from a unique consumption panel in Korea. Future research could explore the underlying mechanisms driving these heterogeneous responses and examine whether similar patterns are held in other countries with distinct fiscal structures and policy frameworks.

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[Table 1] Descriptive statistics: Demographics

	Control (T1)	T2	T3	T4	T5	T6	Full sample	Natl. avg.
Female	0.54	0.53	0.51	0.55	0.54	0.53	0.53	0.50
Liquidity constrained	0.29	0.33	0.31	0.31	0.30	0.30	0.30	-
Age	44.13	43.95	44.46	44.10	43.83	44.29	44.13	43.85
	(10.21)	(9.96)	(10.20)	(10.32)	(10.40)	(10.30)	(10.23)	
Education (years)	15.23	15.31	15.22	15.24	15.27	15.30	15.26	12.5
	(1.92)	(1.98)	(1.88)	(1.88)	(1.88)	(1.95)	(1.92)	
Labor income (KRW 1,000)	2830	3000	2800	2900	2800	2900	2900	2670
Employed (age 15-64)	0.76	0.77	0.77	0.75	0.76	0.73	0.76	0.69
Household size	2.56	2.57	2.64	2.56	2.62	2.59	2.59	2.2
	(0.82)	(0.82)	(0.82)	(0.86)	(0.81)	(0.85)	(0.83)	
Number of children	0.57	0.54	0.59	0.61	0.58	0.59	0.58	1.57
	(0.75)	(0.69)	(0.74)	(0.75)	(0.71)	(0.70)	(0.72)	
Obs. (participants)	1,265	1,239	1,239	1,280	1,250	1,215	7,488	-

Note: All moments are computed using Huber weights from the first-stage regression (standard deviations in parentheses), except for labor income that reports the medians. Liquidity constrained is a dummy variable equal to 1 if the respondent answered "No" or "Prefer not to answer" to the question, "Do you have enough resources to cover an unexpected expenditure equal to one month of your income?" Labor income refers to self-reported, after-tax monthly income. The moments are based on the first (July 2023) wave of the survey.

[Table 2] Descriptive statistics: Transaction-level spending

	Control (T1)	T2	T3	T4	T5	T6	Full sample
Monthly spending	1,017.39	1,110.81	1,020.43	1,049.93	1,080.30	1,094.19	1,061.91
(KRW 1,000)	(1,199.40)	(1,666.95)	(1,182.49)	(1,217.48)	(1,545.30)	(1,332.70)	(1,368.81)

Note: All variables are reported as weighted means (standard deviations in parentheses). All statistics are weighted using Huber weights from the first-stage regression.

[Table 3] Descriptive statistics: Perceptions and Expectations of fiscal variables.

		Control (T1)	T2	T3	T4	T5	T6	Full sample
				Panel A. Perceptions (as of year 2022)				
Public debt to GDP ratio	Mean	69.05	65.25	67.58	67.12	67.60	65.36	67.01
	Median	50.00	50.00	50.00	50.00	50.00	50.00	50.00
	SD	51.32	50.01	49.80	50.62	51.29	51.15	50.71
	IQR	70.00	70.00	70.00	70.00	70.00	70.00	70.00
Fiscal balance	Mean	-6.19	-6.21	-6.64	-7.03	-6.40	-6.66	-6.53
	Median	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
	SD	16.89	15.94	16.74	17.76	16.79	16.67	16.81
	IQR	10.00	10.00	10.00	15.00	10.00	10.00	10.00
				Panel B. Expectations (in 10 years)				
Public debt to GDP ratio	Mean	69.02	65.24	66.93	67.83	66.87	65.02	66.84
	Median	54.95	52.00	53.27	54.00	53.67	50.50	52.83
	SD	49.75	47.99	48.49	48.25	47.82	48.25	48.43
	IQR	82.67	74.33	76.00	77.87	74.83	74.00	76.67
Fiscal balance	Mean	13.39	13.07	15.10	12.82	12.55	13.25	13.36
	Median	6.83	6.20	8.37	6.50	7.40	6.83	6.85
	SD	29.97	28.99	29.77	30.33	28.58	29.56	29.54
	IQR	34.53	35.00	36.80	36.00	33.30	34.33	35.00

Note: This table reports the descriptive statistics of respondents' prior perceptions about the current level of public debt to GDP ratio and fiscal balance (Panel A) as well as expectations about future levels in 10 years (Panel B). Means and standard deviations are computed using Huber weights from the first-stage regression. Medians and IQRs are unweighted.

[Table 4] First stage results for the public debt ratio and the fiscal balance

	Outcome: post-treatment beliefs					
	Public debt ratio in 2030			Fiscal balance in 2030		
	Intercept	Slope (public debt)	Slope (fiscal bal.)	Intercept	Slope (public debt)	Slope (fiscal bal.)
	(1)	(2)	(3)	(4)	(5)	(6)
T1 (control)	1.167	0.547***	-0.033	7.613***	-0.027***	0.071***
	(6.778)	(0.024)	(0.038)	(2.194)	(0.006)	(0.011)
Relative to control group						
T2 (public debt)	19.585***	-0.339***	-0.027	-5.013***	0.009	0.037**
	(1.895)	(0.030)	(0.047)	(0.787)	(0.010)	(0.017)
T3 (fiscal deficit)	0.602	-0.172***	-0.001	-1.038	0.006	-0.008
	(2.084)	(0.036)	(0.055)	(0.669)	(0.008)	(0.015)
T4 (fiscal deficit & gov. response)	-2.107	-0.169***	0.056	-0.418	0.011	-0.032**
	(2.038)	(0.035)	(0.053)	(0.641)	(0.008)	(0.014)
T5 (fiscal deficit & spending cut)	-4.915**	-0.105***	0.029	0.199	0.003	0.001
	(1.989)	(0.035)	(0.054)	(0.651)	(0.008)	(0.015)
T6 (fiscal deficit & tax hike)	-2.087	-0.143***	0.128**	0.249	0.007	-0.027*
	(2.038)	(0.036)	(0.055)	(0.649)	(0.008)	(0.015)
Demographic controls		Yes			Yes	
Observations		7,495			7,495	
R-squared		0.285			0.061	

Note: Each column reports coefficients from weighted least squares regressions of post-treatment belief outcomes on treatment group indicators interacted with pre-treatment beliefs about the public debt ratio and fiscal balance. Outcomes are respondents' beliefs about the public debt ratio (cols. 1–3) and fiscal balance (cols. 4–6) in 2030. All regressions include demographic controls (female, age, age^2, number of children, household size, education, employment status, log income, and Seoul metropolitan dummy). Weights are Huber weights from the first-stage regression. Robust standard errors, clustered at the individual level, are reported in parentheses.

[Table 5] Treatment Effects of News about Current Fiscal Variables on Expectations.

	Public debt ratio news		Fiscal balance news	
	Immediately after treatments	3 months later	Immediately after treatments	3 months later
	(1)	(2)	(3)	(4)
Public debt ratio in 2030	0.291***	0.002	-0.097	-0.025
	(0.035)	(0.064)	(0.117)	(0.190)
Fiscal balance in 2030	-0.036	-0.029	0.173**	0.279**
	(0.026)	(0.036)	(0.084)	(0.109)
Gov bond r (avg. up to 2030)	0.034	0.012	0.028	0.220*
	(0.025)	(0.042)	(0.073)	(0.119)
G growth (avg. up to 2030)	-0.006	-0.029	0.169	0.038
	(0.038)	(0.046)	(0.119)	(0.154)
T growth (avg. up to 2030)	0.007	0.004	0.299**	0.225*
	(0.037)	(0.050)	(0.118)	(0.136)
Real GDP growth (avg. up to 2030)	-0.013	0.004	0.154	0.199
	(0.031)	(0.047)	(0.095)	(0.124)
Inflation (avg. up to 2030)	0.022	0.015	-0.013	0.103
	(0.029)	(0.045)	(0.086)	(0.120)

Note: The estimated coefficients $\delta_{1,j}$ and robust standard errors (in parentheses) are presented for each revision in different expectations. The sample used is Group 1 with Group 2 or 3. Each column reports coefficients from weighted least squares regressions of post-treatment belief outcomes on treatment group indicators interacted with pre-treatment beliefs about the public debt ratio and fiscal balance. Outcomes are respondents' beliefs about the public debt ratio (cols. 1–3) and fiscal balance (cols. 4–6) in 2030. All regressions include demographic controls (female, age, age^2, number of children, household size,

education, employment status, log income, and Seoul metropolitan dummy). Weights are Huber weights from the first-stage regression. Robust standard errors, clustered at the individual level, are reported in parentheses.

[Table 6] Treatment Effects on Spending.

	Log spending after treatment				
	1 - 30 days	31 - 60 days	61 - 90 days	91 - 120 days	121 - 150 days
	(1)	(2)	(3)	(4)	(5)
Public debt ratio in 2030	0.153***	0.128**	0.155**	0.125*	0.095
	(0.054)	(0.060)	(0.062)	(0.067)	(0.066)
Fiscal balance in 2030	0.100	0.053	-0.703	-0.622	-0.952*
	(0.445)	(0.488)	(0.470)	(0.510)	(0.512)
Pre-treatment spending	0.770***	0.728***	0.713***	0.685***	0.672***
	(0.010)	(0.011)	(0.012)	(0.013)	(0.012)
Demographic controls	Yes	Yes	Yes	Yes	Yes
Observations	6,714	6,479	6,324	6,174	6,024
R-squared	0.581	0.497	0.475	0.432	0.435
KP rk Wald F	16.35	16	16.53	16.13	15.98
Cragg-Donald F	18.34	17.90	18.71	18.23	17.86
Hansen J (p)	0.270	0.462	0.616	0.665	0.563

Note: Each column reports estimates from two-stage least squares regressions of post-treatment log spending (over the indicated time window) on respondents' beliefs about the public debt-to-GDP ratio and fiscal balance in 2030. Both belief variables are instrumented with treatment group indicators interacted with pre-treatment beliefs about the public debt ratio and fiscal balance. All regressions control for pre-treatment spending (the total spending during the 30 days prior to survey) and demographic characteristics (female, age, age^2, number of children, household size, education, employment status, log income, and Seoul metropolitan dummy). Weights are Huber weights from the first-stage regression. Robust standard errors, clustered at the treatment-group level, are in parentheses. KP rk Wald F, Cragg–Donald F, and Hansen J (p-value) statistics are reported below. Log spending is winsorized at each 2.5% tail.

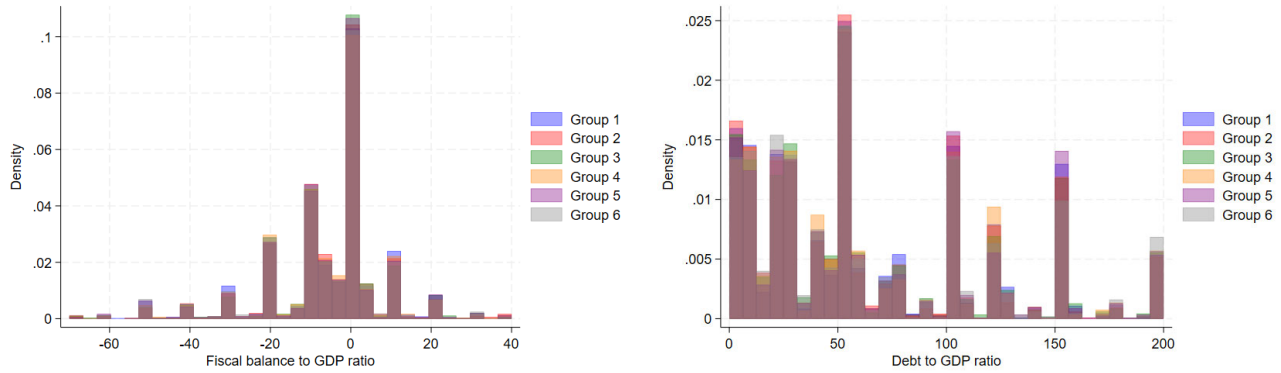
[Table 7] Treatment Effects on Spending by Subgroup.

	Log spending during 1 – 30 days after treatment				
	Low tax	Hand-to-mouth	Young	Financially illiterate	Insensitive to pension fund
	(1)	(2)	(3)	(4)	(5)
Public debt ratio in 2030	0.198***	0.425***	0.190**	0.196***	0.235**
	(0.070)	(0.111)	(0.077)	(0.073)	(0.095)
Fiscal balance in 2030	0.416	-0.422	-0.161	0.191	-0.332
	(0.556)	(0.780)	(0.526)	(0.502)	(0.792)
Pre-treatment spending	0.769***	0.767***	0.753***	0.768***	0.775***
	(0.012)	(0.018)	(0.014)	(0.013)	(0.016)
Demographic controls	Yes	Yes	Yes	Yes	Yes
Observations	4,325	2,033	3,690	4,177	2,715
R-squared	0.577	0.576	0.572	0.574	0.582
KP rk Wald F	10.56	5.280	11.01	11.50	5.370
Cragg-Donald F	11.50	5.440	12.32	12.57	5.670
Hansen J (p)	0.178	0.717	0.530	0.227	0.940

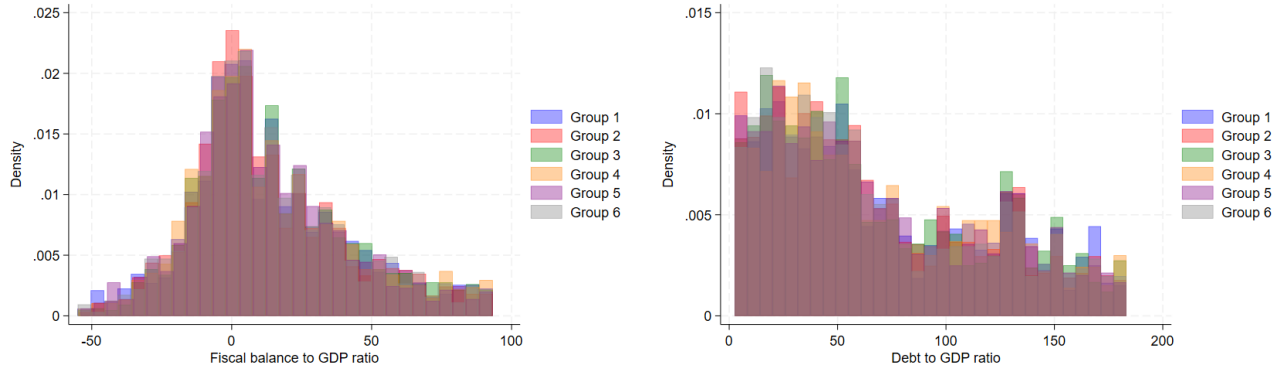
Note: Each column reports estimates from two-stage least squares regressions of log spending during the 1–30 days after treatment on respondents' beliefs about the public debt ratio and fiscal balance in 2030 by different subgroups. All regressions control for pre-treatment spending and demographic characteristics (female, age, age², number of children, household size, education, employment status, log income, and Seoul metropolitan dummy). Sampling weights are Huber weights from the first-stage regression. Robust standard errors, clustered at the treatment-group level, are reported in parentheses. "Low tax" indicates respondents who expect the government to finance less than or equal to 30% (sample median) of the fiscal expansion through tax increases. "Hand-to-mouth" denotes those reporting insufficient resources to cover an unexpected expenditure equal to one month's income. "Young" refers to respondents aged 45 or below (sample median). "Financially illiterate" indicates respondents who answered the Euler equation question incorrectly. "Insensitive to pension fund" includes those selected "spend more" or "no change" in response to D8, which asks about changes in current consumption upon learning they would not receive pension benefits at age 60. KP rk Wald F, Cragg–Donald F, and Hansen J (p-value) statistics are reported below.

[Figure 1] Histograms: Perceptions and Expectations of fiscal variables.

Panel A. Perceptions



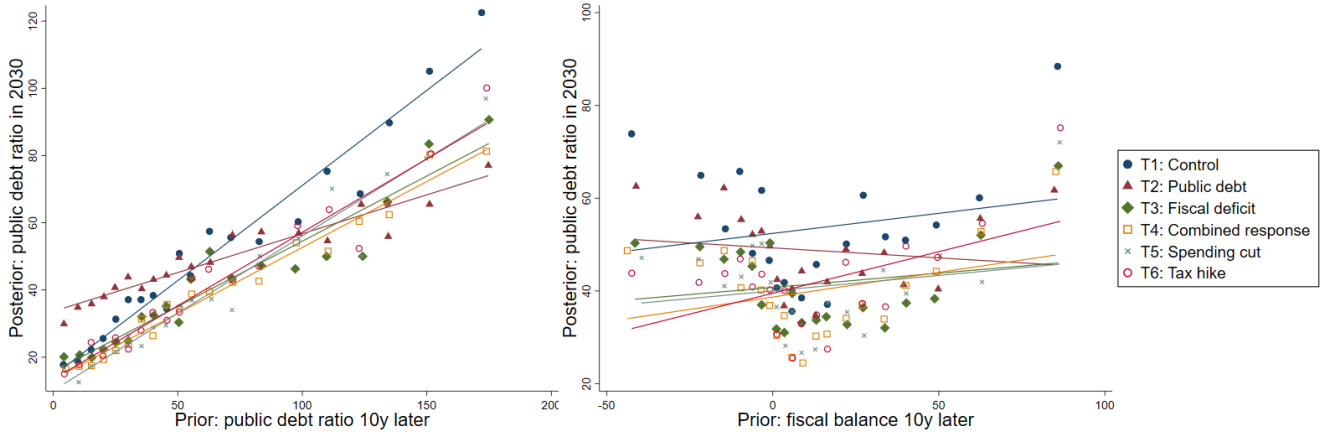
Panel B. Expectations



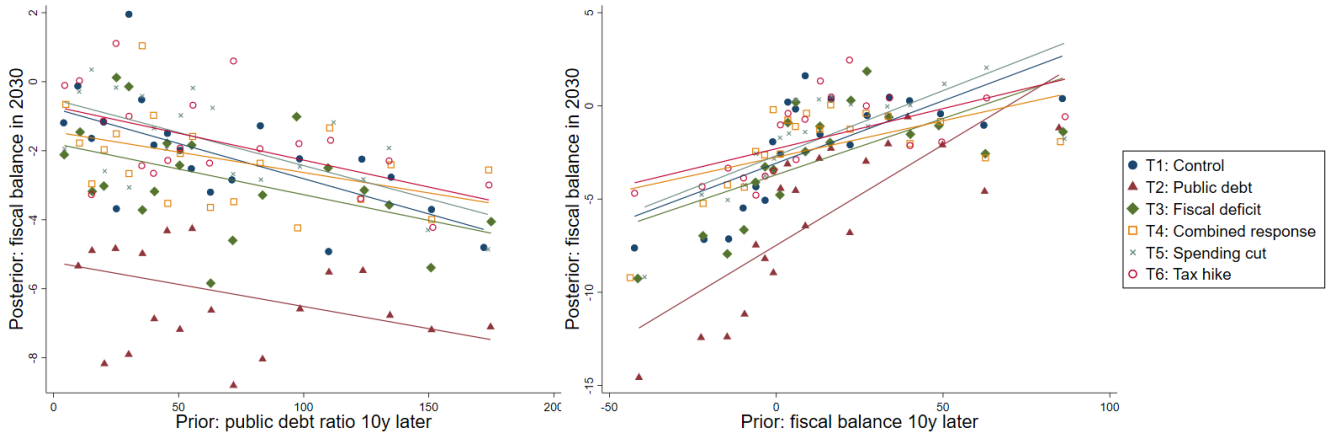
Note: Perceptions and expectations are elicited before information interventions and trimmed at 1% tails.

[Figure 2] First-stage results for the public debt ratio and the fiscal balance

Panel A. First-stage results for the public debt ratio



Panel B. First-stage results for the fiscal balance

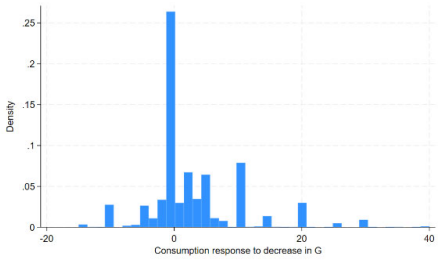


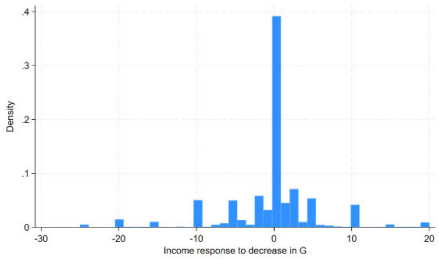
Note: Each panel plots the relationship between respondents' prior beliefs and posterior beliefs about fiscal outcomes, by treatment group. Panel A shows the association between priors and posteriors for the public debt ratio in 2030. The left figure plots post-treatment beliefs against priors on the public debt ratio, and the right figure plots them against priors on the fiscal balance. Panel B shows the association between priors and posteriors for the fiscal balance in 2030. The left figure uses priors on the public debt ratio, and the right figure uses priors on the fiscal balance. Each point represents a binned mean (Huber-weighted) within prior-belief deciles; fitted lines are estimated separately by treatment group. Observations are weighted using Huber weights from the first-stage regression.

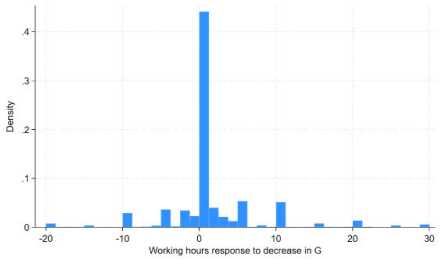
[Figure 3] Hypothetical responses to changes in government spending or taxation.

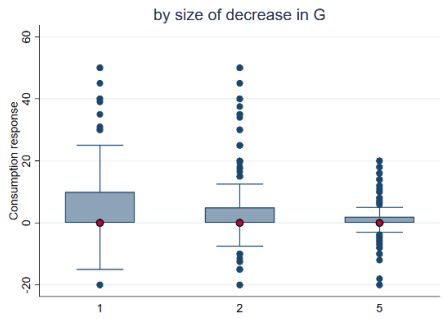
(1) Consumption response (2) Income response (3) Working hours response

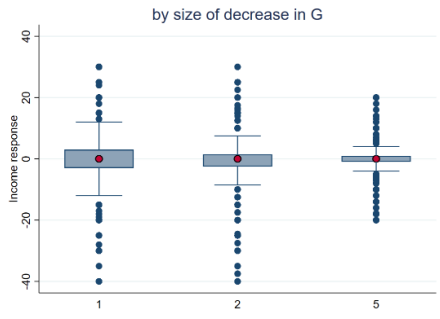
A. Decrease in G

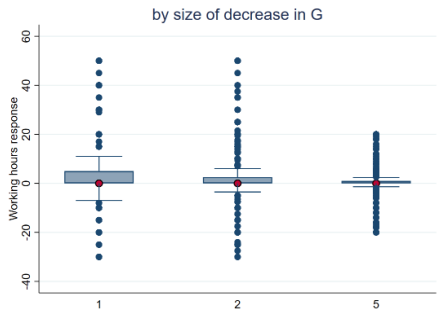




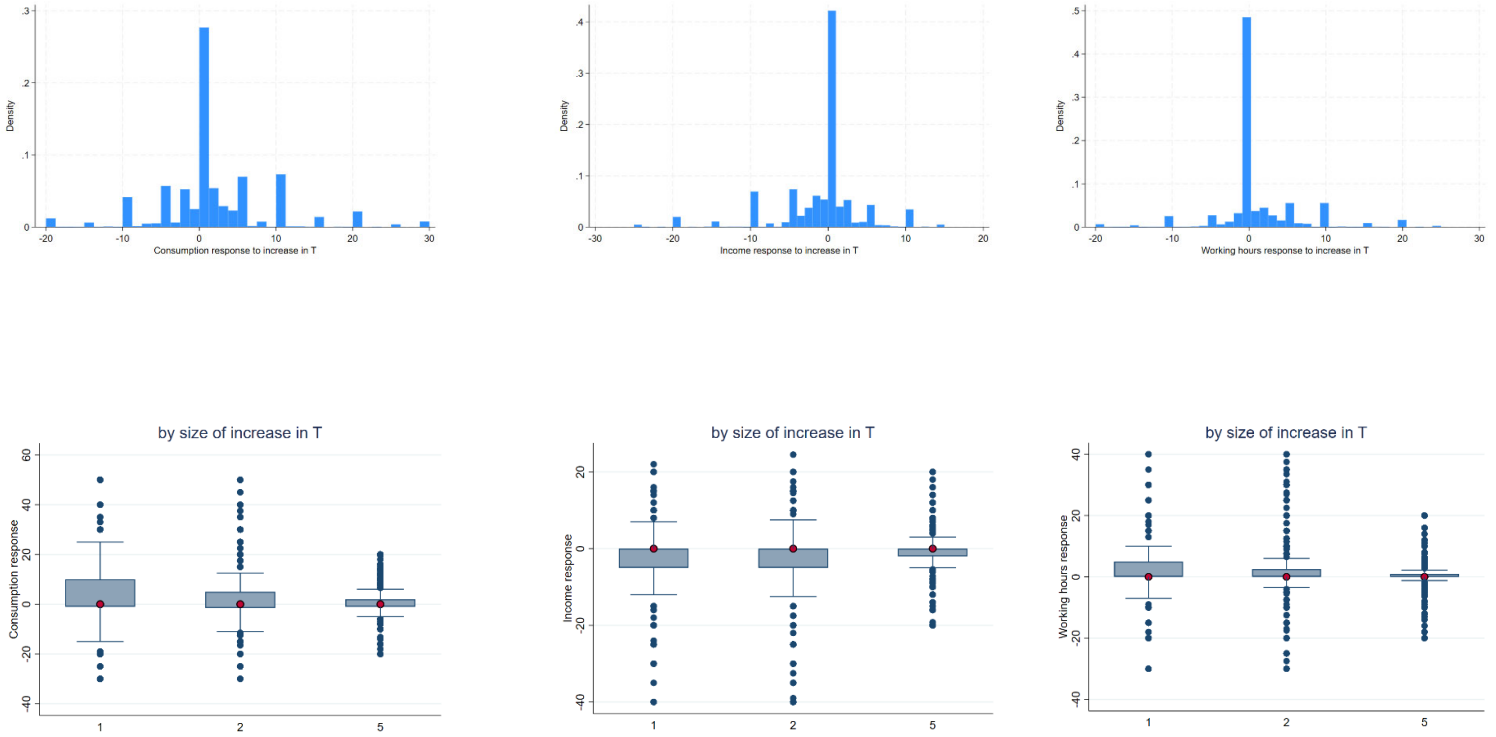






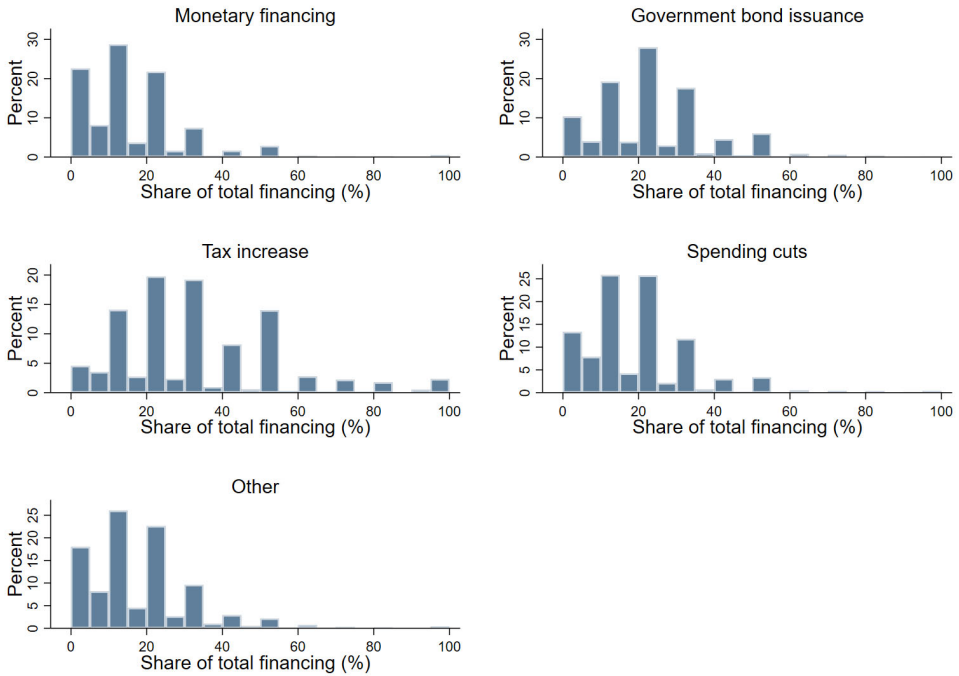


B. Increases in T



Note: Hypothetical responses are divided by the magnitudes of decrease in government spending or increase in taxes, and trimmed at 1% tails.

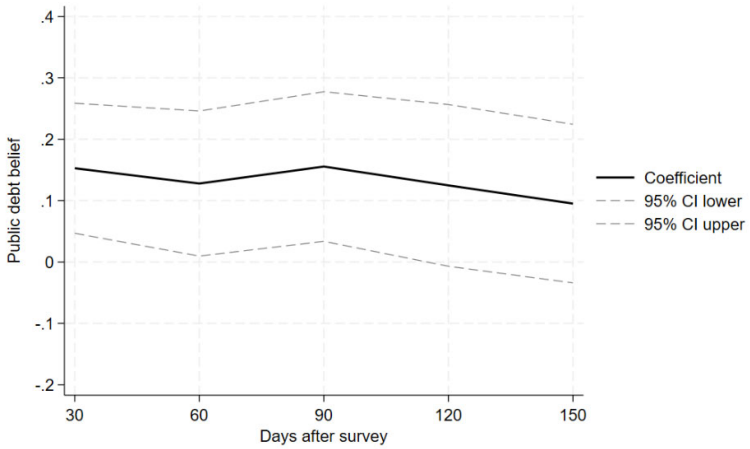
[Figure 4] Distribution of Expected Fiscal Financing Shares



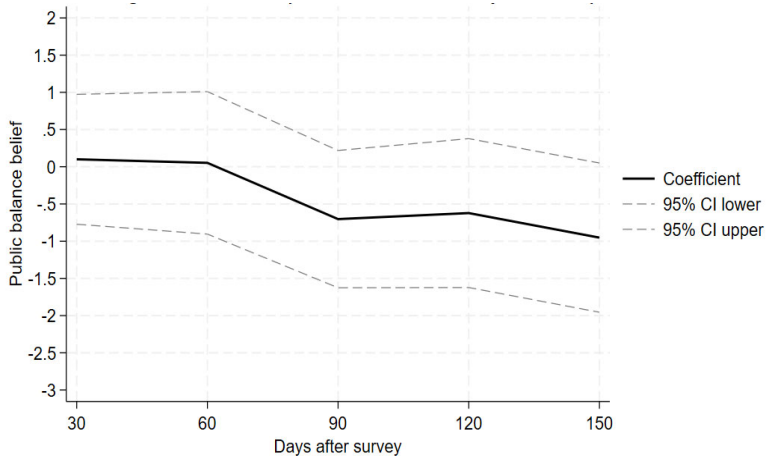
Note: Each histogram displays the distribution of individual responses to "*Suppose the government increases spending by 100 trillion KRW (approximately 5% of GDP). What combination of financing measures do you think the government will use over time to cover the additional cost?"* Respondents entered percentage values (summing to 100%) for each of the five financing sources: (i) monetary financing, (ii) new government bond issuance, (iii) tax increases, (iv) other spending cuts, and (v) other measures (e.g., privatization of state assets, administrative actions, or compulsory collections).

[Figure 5] IV results for public debt and balance

(1) Effects of public debt expectations



(2) Effects of fiscal balance expectations



Note: Each figure plots the dynamic response of post-treatment log spending to instrumented belief shocks about the public debt-to-GDP ratio and fiscal balance in 2030. Coefficients are estimated from two-stage least squares regressions over rolling 30-day windows, using treatment group indicators interacted with pre-treatment beliefs as instruments. All regressions include controls for pre-treatment spending (total spending during the 30 days prior to the survey) and demographic characteristics (female, age, age², number of children, household size, education, employment status, log income, and Seoul metropolitan dummy). Estimates are weighted using Huber weights from the first-stage regression. Log spending is winsorized at each 2.5% tail; vertical bars denote 95% robust confidence intervals clustered at the individual level.