Ricardian Non-Equivalence*

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Abstract

Using a survey experiment on 6,000 U.S. individuals, we establish that most people's spending decisions do not account for the impact of government transfers on their future tax liabilities. This failure leads to a higher marginal propensity to consume than would be obtained under rational expectations. We develop a model in which bounded rationality limits people's ability to anticipate future taxes, leading to a failure of Ricardian Equivalence, which we refer to as *Ricardian Non-Equivalence*. We incorporate this form of bounded rationality into a Heterogeneous Agent New Keynesian model. Other things equal, Ricardian Non-Equivalence substantially amplifies the effect of a fiscal transfer on aggregate economic activity.

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1 Introduction

How do fiscal deficits affect the economy? According to Ricardian Equivalence, changes in fiscal deficits do not impact economic activity (Ricardo, 1817; Barro, 1974). The reason is that people save in anticipation of future higher taxes, so aggregate demand is unaffected by fiscal transfers. Ricardian Equivalence holds in workhorse New-Keynesian models (e.g., Woodford, 2003, Galí, 2008, and Christiano, Eichenbaum, and Evans, 2005). There are many ways to break Ricardian Equivalence. Examples include distortionary taxation (e.g., Barro 1979), finite lives (e.g., Diamond, 1965; Blanchard, 1985; Poterba and Summers, 1987), and liquidity constraints (e.g, Hubbard and Judd, 1986; Bernheim, 1987).[1] Interestingly, David Ricardo himself rejected the Ricardian Equivalence proposition on the grounds that people do not incorporate changes in future tax liabilities arising from government transfers into their decisions. For example, he writes:

> *"...but the people who pay the taxes never so estimate them, and therefore do not manage their private affairs accordingly. We are too apt to think, that the war is burdensome only in proportion to what we are at the moment called to pay for it in taxes, without reflecting on the probable duration of such taxes."*
>
> David Ricardo in Essay on the Funding System

This paper studies *Ricardian Non-Equivalence* (RNE), i.e., the failure of Ricardian Equivalence due to people's failure to fully internalize the impact of future taxes in their decisions.[2] We proceed in three steps. First, we design and implement survey experiments to measure how people respond to government transfers and the degree to which they incorporate future tax liabilities into their decisions. Our results provide strong support for the RNE view. Second, we develop a model that is consistent with those empirical results. The key feature of the model is that people's spending responses to government transfers are subject to bounded rationality. That uncertainty reflects the difficulty people have in incorporating the future tax implications of government transfers into their current spending decisions. We show that this uncertainty leads to a higher marginal propensity to consume (MPC) out of a government transfer than obtain absent RNE. In Barro (1974)'s terminology, people act as if government bonds are net wealth.

In the third step of our analysis, we develop a quantitative general-equilibrium model to study the macroeconomic implications of RNE. We calibrate the model to moments

[1] Elmendorf and Mankiw (1999) review various reasons for the failure of Ricardian Equivalence.

[2] O'Driscoll Jr (1977) also pointed out that David Ricardo rejected the proposition that public debt and taxation are equivalent. See also Barro (1996) for an interpretation of the discussion in Ricardo (1817).

derived from our survey experiments. The model implies that, other things equal, RNE amplifies the effect of government transfers on output. This effect is particularly strong in environments where MPCs are high. So, our results highlight an important complementarity between RNE and key features of Heterogeneous-Agent New Keynesian (HANK) model.

We now elaborate on the three steps in our analysis.

Survey results Section 2 discusses the results of a survey that we conducted over the period December 2024 to February 2025. We surveyed a representative sample of 6,000 U.S. working-age people. We document three facts. First, most people spend little time obtaining news about current macro and fiscal conditions. Over 70 percent of respondents spend less than 2 hours a week on this activity. Second, over 50 percent of people obtain their information from one or two sources. Almost 65 percent of respondents rely on social media as their main source of information. Finally, most people grossly underestimate the size of the US fiscal debt. The median person believes that the gross debt to GDP ratio is 64 percent, whereas the true number is 124 percent.

Our survey incorporates specific experiments to measure how people respond to government transfers. The survey design is guided by a conceptual framework of how bounded rationality impacts spending decisions. This framework implies a dampened response of spending decisions to future tax liabilities, arising from an increase in current transfers. In other words, people have a larger MPC out of a government transfer than would be the case under rational expectations about future taxes.[3]

We use survey experiments to estimate households' MPC from a hypothetical monetary transfer using the survey methodology developed by Colarieti, Mei, and Stantcheva (2024).[4] Respondents are randomly assigned to one of three scenarios: (1) they receive an idiosyncratic $1,400 tax rebate that by design has no aggregate fiscal implications. (2) A universal $1,400 transfer to all U.S. households that gives rise to an increase in the government's current deficits. These payments have future tax implications, but we do not explicitly alert people to that fact. (3) The same universal transfer as (2) coupled with the information that future taxes will rise next year to offset the current deficit. We assess the role that information about future tax liability plays by comparing the responses to (2) and (3).

We find that the mean, the median, and the entire cross-sectional distributions of

[3]The mechanism underlying RNE is analogous to a form of behavioral attenuation which has been the focus of a recent empirical literature, see, e.g., Enke and Graeber (2023) and Enke, Graeber, Oprea, and Yang (2024).

[4]These authors argue that survey-predicted MPCs are a reliable estimate of actual observed actions.

MPCs are essentially the same in scenarios (1) and (2). This finding indicates that people do not incorporate the implications of future taxes into their current spending decisions. However, when we inform people about future taxes, scenario (3), there is a significant reduction in the average and median MPC out of the government transfer. In addition, there is a significant increase in the mass of people who save the entire government transfer.

In our survey, we also elicit people's expectations of their future tax liabilities over multiple horizons (one, two, and six years ahead). We find that people's expectations in scenarios (1) and (2) are essentially the same. In contrast, in scenario (3) people revise their expectations about future tax liabilities over multiple horizons. These findings supplement our findings about people's MPC.

Taken together, these findings support the view that people do not naturally incorporate the future tax implications of aggregate transfers into their decisions. However, they do incorporate explicit information about future tax implications into their decisions.

Theoretical results In section 4, we explore the aggregate consequences of RNE in a general-equilibrium New Keynesian model. Our analysis builds on the overlapping-generations HANK model developed by Angeletos, Lian, and Wolf (2024a,b). That model provides a tractable approach for generating MPCs that are larger than those implied by the standard Representative-Agent New Keynesian (RANK) model. We extend this framework to incorporate bounded rationality. As in Ilut and Valchev (2023), people must exert cognitive effort to learn about how their optimal spending decisions are affected by aggregate transfers. In our general-equilibrium model, bounded rationality has two key effects: (i) it leads to Ricardian Non-Equivalence, as discussed above, and (ii) it also attenuates general-equilibrium (GE) feedback mechanisms.[5] We use our model to analyze the aggregate effects of a government transfer to all agents in the economy.

Our key theoretical result decomposes the transfer multiplier on output into three distinct components: (i) the rational-expectations multiplier, (ii) the Ricardian Non-Equivalence multiplier, and (iii) a GE dampening factor. Three separate forces are at play in this decomposition. First, in the HANK-OLG model, Ricardian Equivalence fails to hold even under rational expectations because agents discount the future more heavily than in the RANK model. So, even if agents were fully rational, government transfers would stimulate aggregate demand and increase output. Second, Ricardian Non-Equivalence generates an additional boost to aggregate demand. Finally, because of bounded rationality,

[5]The impact of bounded rationality on general-equilibrium mechanisms has been extensively studied in the literature, see Angeletos and Lian (2023) for a review.

people under-weigh the implications of rising future income in their current consumption decisions. This effect dampens both the rational-expectations and RNE multipliers. While RNE always increases the transfer multiplier relative to the rational expectations benchmark, the overall impact of bounded rationality depends on the quantitative magnitudes of RNE and the GE dampening factor.[6]

The magnitude of the RNE multiplier is critically dependent on the size of the MPC. In a RANK framework, RNE induces a positive transfer multiplier. But, its quantitative impact on current aggregate demand is small because people smooth the increase in consumption over time stemming from the perceived increase in wealth. In a HANK model, RNE has a large impact on aggregate demand, because people have large MPCs. So, there is an important positive interaction between RNE and HANK: higher MPCs enhance the amplification effects of RNE. That in turn leads to a larger response in aggregate activity from a fiscal transfer.

In ongoing work, we investigate the quantitative impact of RNE on the transfer multiplier, as well as the impact on other deficit-financed fiscal policies such as government spending.

Related literature This paper contributes to the literature on the economic effects of fiscal deficits that depart from the Ricardian Equivalence theorem. Unlike prior work, we focus on departures driven by individuals' failure to incorporate future tax burdens into current spending decisions. In this dimension, our paper is closest to Gabaix (2020), Woodford and Xie (2022), and Bianchi-Vimercati, Eichenbaum, and Guerreiro (2024), who model limited foresight as a source of Ricardian Non-Equivalence (RNE). Our key contribution is to extend this analysis beyond the RANK framework, demonstrating the interaction between agent heterogeneity and bounded rationality in amplifying the transfer multiplier—an insight reminiscent of the complementarity results in Farhi and Werning (2019) and Angeletos and Huo (2021).

By studying the effects of fiscal transfers in a HANK setting under bounded rationality, we contribute to the broader literature on heterogeneous-agent models with bounded rationality, including Farhi and Werning (2019), Farhi, Petri, and Werning (2020), Auclert, Rognlie, and Straub (2020), Angeletos and Huo (2021), Pfäuti and Seyrich (2022), Guerreiro (2023), Bardóczy and Guerreiro (2023).

Empirically, our paper contributes to the growing use of survey data to quantify behavioral mechanisms in macroeconomic models (Roth and Wohlfart, 2020, Coibion et al.,

[6]This result is consistent with the discussion in Eichnebaum (Forthcoming) about the conflicting implications of bounded rationality for the efficacy of fiscal policy.

2022, 2023, and Stantcheva, 2023). In particular, our measurement of the marginal propensity to consume (MPC) builds directly on Colarieti, Mei, and Stantcheva (2024) and follows a broader literature estimating MPCs via surveys (Shapiro and Slemrod, 2003; Jappelli and Pistaferri, 2014, Bunn, Le Roux, Reinold, and Surico, 2018, Christelis, Georgarakos, Jappelli, Pistaferri, and Van Rooij, 2019, Parker and Souleles, 2019, Fuster, Kaplan, and Zafar, 2021). Our paper explicitly estimates propensities to spend out of idiosyncratic and universal transfers to assess behavioral responses to the implicit future tax burden of fiscal deficits.

Outline The paper is organized as follows. Section 2 discussed the design of the survey and presents the motivating empirical results. Section 3 begins by discussing the conceptual framework behind the Ricardian Non-Equivalence result and then discusses the empirical findings of our survey experiments. Section 4 presents the general equilibrium HANK-OLG model and derives the theoretical results. Section 5 quantifies the contribution of RNE to the overall transfer multiplier. Finally, section 6 concludes. The Appendix contains proofs, additional analyses, and the survey questionnaire.

2 Survey design

We implement a new online survey with the goal of understanding how people obtain information and reason about the future tax consequences of fiscal deficits. The survey was ran in Prolific, between December of 2024 and February of 2025, and collected a total of 6,000 responses. Participation in the survey was limited individuals between 22 and 65 years old. To ensure that the sample is representative of the US population, we impose quotas based on gender, education and political affiliation. The gender and education quotas were computed using data from the Current Population Survey for November of 2024.[7] Political affiliation quotas were computed based on Gallup data for October 2024. Participants took an average of 9 minutes to complete the survey and were compensated at an average rate of $1.80, corresponding to an hourly rate of $12.

Appendix Table A.1 compares the characteristics of our sample with the broader US population. Our sample is fairly representative of the US population, albeit with a slight over-representation of younger and unemployed households. Our sample also includes a slightly lower share of white individuals.

[7] We access ASEC-CPS data from the IPUMS CPS database Flood, King, Rodgers, Ruggles, Warren, Backman, Chen, Cooper, Richards, Schouweiler, and Westberry (2023).

Our survey is mostly composed of close-ended questions. But, following best practices, we generally include an option "Other" and a box to allow for open ended answers (Stantcheva, 2023). As discussed before, our main evidence on propensities to spend comes from randomly assigning respondents to one of three hypothetical scenarios: (1) receiving a $1,400 tax rebate, serving as a benchmark as the transfer is idiosyncratic and has no direct aggregate fiscal implications; (2) a universal $1,400 transfer to all U.S. households, introducing general equilibrium effects; and (3) the same universal transfer, but respondents are informed of a future tax increase, explicitly accounting for fiscal offset. In preliminary testing of our survey, we experimented with scenarios that replicate the individual nature of scenario 1, but where the transfer came from a source other than the government (for example, winning the lottery). We broadly found no differences between the responses of those questions and our scenario 1 and therefore excluded it from the final survey. The full questionnaire can be found in Appendix C.

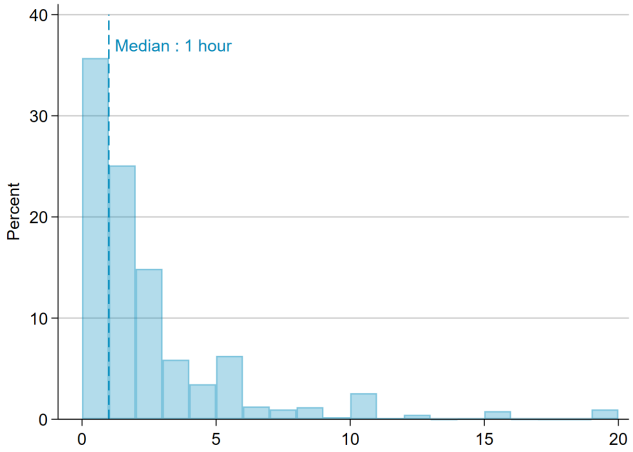
2.1 How well-informed are people about general economic conditions?

We now discuss evidence from our survey on how informed people are about aggregate economic conditions and the government's fiscal position. We find that people spend little time and effort in acquiring information on these topics. Strikingly, people grossly underestimate how much debt the government owes. This evidence motivates our interest in exploring how individual spending decisions are shaped by the presence of implicit deficits, in Section 3.

We organize our motivating facts into three groups: (1) people spend little time obtaining and processing information, (2) people rely on a small number of sources of information and most report relying on social media, and (3) people's grossly misperceive the current US fiscal situation.

(1) People spend little time obtaining information about the US fiscal situation We ask respondents how many hours they usually spend gathering information about the US economy on a weekly basis. Figure 2.1 shows the distribution of weekly time spent gathering information about the US economy. Across our respondents, the median number of hours a week spent acquiring information is 1 hour. Furthermore, over 70 percent of respondents respond spending less that 2 hours a week.

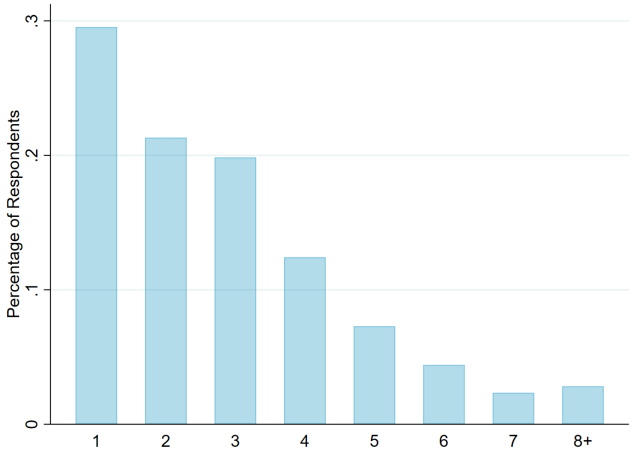
Figure 2.1: Time Spent Acquiring Information



Note: This figure depicts the distribution of weekly time allocated to gathering information about the U.S. economy, based on survey responses to the question: "How many hours per week do you typically spend gathering information about the U.S. economy?" The data have been truncated to exclude values below 0 and above 20 hours to ensure a more interpretable range. The median number of hours spent acquiring economic information is indicated within the distribution.

(2) People rely on a small number of information sources Next we ask respondents to quantify the number and types of sources from which they usually obtain information about the US economy. Figure 2.2 shows the distribution of number of sources used among our survey respondents. The median person obtains information from fewer than two sources and, in fact, almost 30 percent use exclusively a single source of information.

Figure 2.2: Number of Sources Used

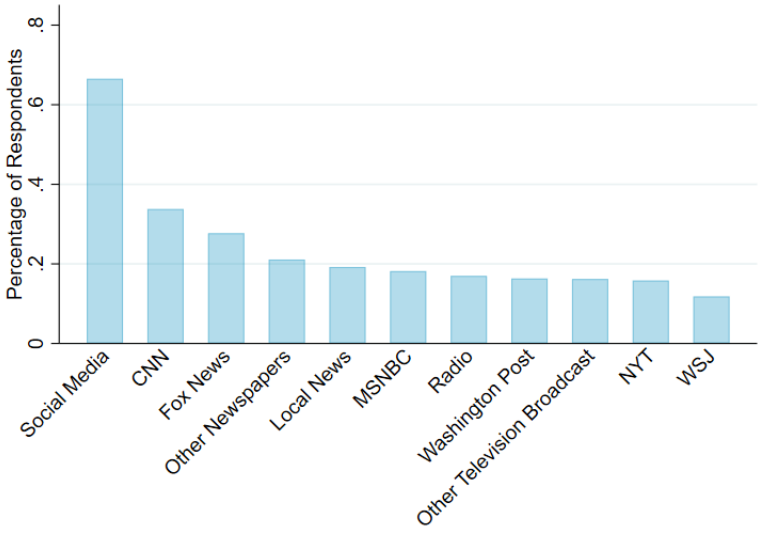


Note: This figure presents the histogram of the number of sources used by survey respondents to obtain news about the U.S. economy, based on responses to the question: "What are your sources of news about the U.S. economy?" The figure captures the total number of sources selected by each respondent from a predefined set of options.

Figure 2.3 shows the types of sources from which survey respondents obtain information about the US economy. Strikingly we find that 70 percent of people report obtaining

news from social media (X plus other social media). Social media is followed by the two major cable news channels, CNN and Fox News, which obtain close to half of the share of social media.

Figure 2.3: Types of Sources Used



Note: This figure illustrates the distribution of responses to the question: "What are your sources of news about the U.S. economy?" It displays the percentage of respondents who selected each source from a predefined set of options.

(3) People misperceive the current US fiscal situation Next, we directly elicit people's perceptions of the US fiscal situation. We ask respondents about their views of three key fiscal indicators for the year of 2023: (i) the federal-spending to GDP ratio, (ii) the tax-revenue to GDP ratio, and (iii) the federal-debt to GDP ratio. Figure 2.4 panels A, B, and C display the distribution of perceptions about federal spending, taxes, and debt, respectively.[8]

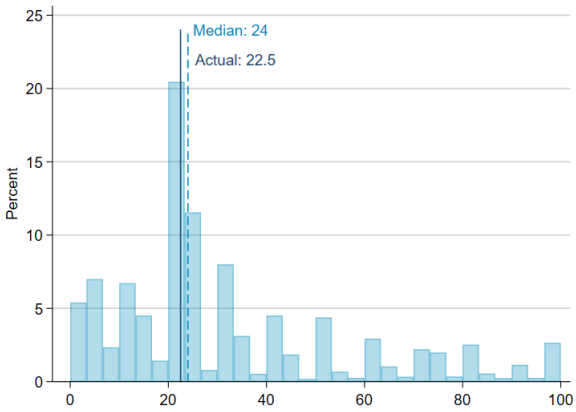
Across all measures, we see large dispersion of perceptions as most people make significant mistakes in predicting these fiscal indicators. Surprisingly, the median person only slightly overestimates federal spending and underestimates tax revenue. The average person, instead, over-estimates both indicators. The average person predicts the federal -spending to GDP ratio to be 35.3 percent, whereas the actual number was 22.5 percent, and they predict the tax-revenue to GDP ratio to be 30 percent, whereas the actual number was 16.2 percent.

However, we see that the vast majority of people grossly underestimate the fiscal debt position. In fact, the median person predicts a federal-debt to GDP ratio of 65 percent, whereas the reality was almost double, 126 percent. The average estimate is 75.4 percent,

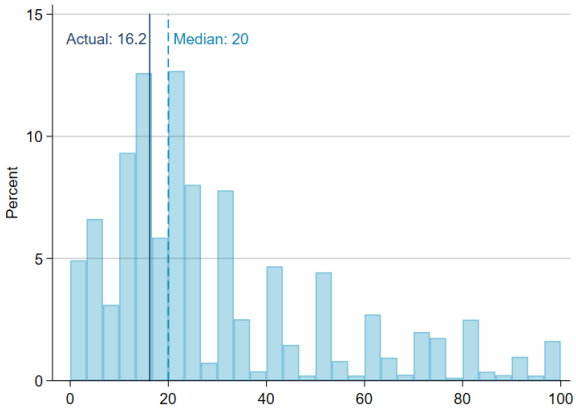
[8]Appendix Figure B.1 also displays the respondents perceptions of the US inflation target.

Figure 2.4: People's Perceptions of the US Fiscal Situation

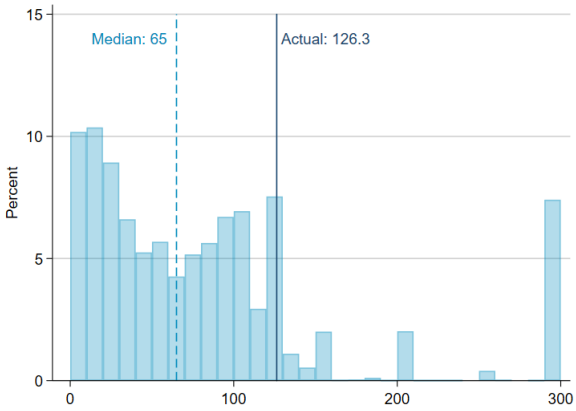
Panel A: Federal Spending



Panel B: Federal Taxes



Panel C: Federal Debt



Notes: This figure presents the distribution of responses to three survey questions regarding the U.S. fiscal situation, in which respondents were asked to estimate federal spending, tax revenue, and federal debt as percentages of Gross Domestic Product (GDP) in 2023. Panel A displays responses to the question: "What do you think federal spending was, as a percentage of GDP, in 2023?" Panel B presents responses to the question: "What do you think tax revenue was, as a percentage of GDP, in 2023?" Panel C illustrates responses to the question: "What do you think federal debt was, as a percentage of GDP, in 2023?" To enhance interpretability, the data have been truncated, excluding values above 100 percent for federal spending and tax revenue and above 300 percent for federal debt. The median estimates provided by respondents are indicated with dashed lines, while the actual values are represented by solid lines.

which still dramatically under-estimates the magnitude of the true fiscal debt position. Furthermore, only about 13.8 percent of respondents predict the fiscal debt to be at its actual level or above.

3 Survey Results: Ricardian Non-Equivalence

In this section, we employ survey experiments to examine the extent to which individuals account for the future fiscal implications of government deficits when making current consumption decisions. Specifically, we leverage our survey data to estimate individuals' marginal propensity to consume (MPC) in response to a cash transfer under three distinct hypothetical scenarios: (i) an individual cash transfer, (ii) a universal transfer distributed to all households in the U.S. economy, and (iii) a universal transfer accompanied by explicit information that future tax increases will be implemented to offset the present fiscal deficit.

Before presenting our empirical findings, it is instructive to outline the conceptual framework that underpins our empirical strategy. This discussion clarifies the economic mechanisms at play and provides a theoretical foundation for interpreting our results.

3.1 Conceptual framework

Household $i \in [0,1]$ consumes $C_{i,t}$ and works obtaining income $Y_{i,t}$. We assume standard labor market frictions, implying that households take hours worked as given (see Section 4). Each household faces a standard intertemporal consumption-savings problem, seeking to maximize the expected present discounted value of utility from consumption. Rather than explicitly solving the household's optimization problem here, we summarize the solution in terms of an aggregate consumption function, following the approach of Auclert, Rognlie, and Straub (2024) and Wolf (2021). A more detailed discussion of the specific household block is provided in Section 4.

The household sector must satisfy the budget constraint

$$C_t + \frac{B_{t+1}}{R} = Y_t - T_t + B_t,$$

where aggregate consumption is given by $C_t = \int C_{i,t} di$, aggregate income by $Y_t = \int Y_{i,t} di$, T_t denotes taxes, and B_t denotes savings. The government, in turn, must satisfy the in-

tertemporal budget constraint

$$\sum_{t=0}^{\infty} R^{-t} T_t = \sum_{t=0}^{\infty} R^{-t} G_t + B_0,$$

where G_t denotes government spending at time t and $B_t = A_t$ represents government debt.

Household consumption behavior can be summarized in the form of an aggregate consumption function $C_t = \mathcal{C}_t\left(\{Y_s - T_s\}_{s=0}^{\infty}\right)$,for $t = 0, 1, ...$ We focus on the first-order (linearized) response of the consumption function to a small government transfer, around a steady-state equilibrium. Letting lowercase variables denote deviations from their steady-state values, we assume, for simplicity, that Y_t remains constant at its steady-state level. General equilibrium effects on income are reintroduced in Section 4.

The linearized consumption response to an initial transfer $t_0 = -\varepsilon_0$ is given by

$$c_0 = m_0 \varepsilon_0 - \sum_{t=1}^{\infty} m_t t_t, \tag{3.1}$$

where to satisfy the government budget constraint, $\sum_{t=1}^{\infty} R^{-t} t_t = \varepsilon_0$. Here, $m_t = \frac{dC_0(\cdot)}{-dT_t} > 0$ denotes the intertemporal marginal propensities to consume (iMPCs), which represent time-0 MPC out an anticipated cash transfer at time t (see Auclert, Rognlie, and Straub, 2024).

While Ricardian Equivalence holds in the standard Representative Agent New Keynesian (RANK) model, the consumption function (3.1) is general enough to allow for potential failures of Ricardian Equivalence due to a variety of frictions.

The fundamental challenge, as noted by Ricardo himself, lies in the complexity of forecasting future taxes and incorporating these expectations into current spending decisions. This process requires individuals to engage in a complex reasoning exercise about the future fiscal consequences of current deficits. To formalize this difficulty, we adopt a model in which individuals do not have full knowledge of the true policy function $c_{i,0}^*$.

Following Ilut and Valchev (2023), we assume that while decision makers fully observe the fundamental shock ε_0, they do not possess a precise mapping from this fundamental to their optimal consumption decision. Instead, through deductive reasoning, individuals derive a noisy cognitive signal about their optimal consumption choice. The signal takes the form:

$$s_i = c_{i,0}^* + \eta_i, \tag{3.2}$$

where η_i is a Gaussian noise term with variance τ_η^{-1}, and $c_{i,0}^*$ represents the fully rational

consumption function for individual i. Each individual uses this signal to update their perception of the optimal consumption function. Individuals update their beliefs in a Bayesian manner, starting from the prior that $c^*_{i,0}$ follows a Gaussian process with mean $c^d_{i,0}$ and variance τ^{-1}. To fully specify the model, we need to define the prior mean $c^d_{i,0}$. We assume that this prior is given by the individual's observed consumption response to a small idiosyncratic cash transfer. This assumption implies that individuals have prior knowledge of how to respond to familiar and routine financial events, such as receiving a transfer from a friend or winning the lottery. Consequently, this allows us to isolate the specific difficulty of incorporating future tax liabilities into current consumption decisions. Formally, this assumption also implies that $\int c^d_{i,0} di = m_0 \varepsilon_0$.

Proposition 1 (The MPC Out of Government Transfer with bounded rationality)**.** *Suppose that, through deliberation, individuals obtain the signal (3.2) about their optimal consumption function. Furthermore, assume that their prior belief is that $c^*_{i,0}$ follows a Gaussian distribution with mean $c^d_{i,0}$ and variance τ^{-1}. Under these assumptions, the consumption function for individual i is given by $c_{i,0} = (1-\lambda)\, c^*_{i,0} + \lambda c^d_{i,0}$, where the behavioral attenuation parameter is given by $\lambda = \frac{\tau}{\tau+\tau_\eta} \in (0,1)$.*

Furthermore, the aggregate marginal propensity to consume (MPC) out of a government transfer is given by:

$$\frac{dc_0}{d\varepsilon_0} = m_0 - (1-\lambda) \sum_{t=1}^{\infty} m_t \frac{dt_t}{d\varepsilon_0}. \tag{3.3}$$

Proposition 1 establishes that bounded rationality manifests as an attenuation of the spending response to future taxes. Specifically, in the boundedly rational economy, the marginal propensity to consume deviates from that in the fully rational economy by a factor

$$\text{RNE} = \frac{dc_0}{d\varepsilon_0} - \frac{dc^*_0}{d\varepsilon_0} = \underbrace{\lambda}_{\text{Attenuation}} \sum_{t=1}^{\infty} m_t \frac{dt_t}{d\varepsilon_0}.$$

Here, $\lambda \in (0,1)$ captures the degree of behavioral attenuation. When $\lambda = 0$, people are fully rational and RNE $= 0$. Instead, when agents exhibit bounded rationality, $\lambda > 0$, the aggregate spending response is higher than in the rational benchmark because individuals attenuate the perceived impact of future taxes. This attenuation leads to a violation of Ricardian Equivalence, which we refer to as *Ricardian Non-Equivalence*.

To illustrate these results, consider once again the case of the standard Representative Agent model. As discussed earlier, Ricardian Equivalence holds in this setting, implying that the fully rational spending response is zero. However, as we will demonstrate next, the spending response in the boundedly rational economy remains strictly positive.

Example. Consider the case where c_0^* corresponds to the consumption function derived from the standard Representative Agent New Keynesian (RANK) model. In this framework, the discount factor satisfies $R = \beta^{-1}$, and the intertemporal marginal propensity to consume (iMPC) takes the form $m_t = (1-\beta)\beta^t$. Substituting these into the linearized consumption response, we obtain

$$\frac{dc_0^*}{d\varepsilon_0} = (1-\beta)\left\{1 - \sum_{t=1}^{\infty} \beta^t \frac{dt_t}{d\varepsilon_0}\right\}.$$

Given that the government budget constraint requires

$$\sum_{t=1}^{\infty} \beta^t \frac{dt_t}{d\varepsilon_0} = 1,$$

it follows that $\frac{dc_0^*}{d\varepsilon_0} = 0$. Thus, in this setting, the Ricardian Equivalence theorem holds: households fully internalize the future fiscal implications of government transfers, leading to no change in aggregate consumption.

In the boundedly rational economy, the marginal propensity to consume out of the government transfer is given by

$$\frac{dc_0}{d\varepsilon_0} = (1-\beta)\left\{1 - (1-\lambda)\sum_{t=1}^{\infty} \beta^t \frac{dt_t}{d\varepsilon_0}\right\} = (1-\beta)\lambda > 0.$$

In this case, the Ricardian Non-Equivalence (RNE) effect is RNE $= (1-\beta)\lambda$, since the rational spending response is zero in the standard RANK model.

3.2 Estimating the MPC out of transfers

In this subsection, we present the results for the marginal propensity to consume (MPC) in response to different hypothetical transfer scenarios. Our survey methodology allows us to vary both the future fiscal implications of government transfers and the information available to individuals regarding these implications. Specifically, we randomly assign respondents to one of three hypothetical scenarios.[9]

In the first hypothetical scenario, *Treatment 1* (T1), respondents are asked to envision their household receiving an unexpected cash transfer of $1,400 from the government. They are explicitly informed that they are the sole recipients of this transfer. The objective

[9] In Appendix Table A.2 we show the distribution of characteristics for the sub-samples receiving each treatment. There are no meaningful differences across these three groups.

of Treatment 1 is to estimate the MPC out of a *typical* cash transfer that carries no broader fiscal implications. Formally, we use Treatment 1 to estimate m_0. In preliminary versions of our survey, we experimented with alternative scenarios in which the cash transfer was framed as originating from a lottery win. The results indicated no significant differences in the estimated MPC across these variations, suggesting that the framing of the transfer does not materially affect consumption responses. The wording of Treatment 1 is given by:

Treatment 1:
In this scenario your household receives a one-time unexpected cash transfer of $1,400 from the government today. You know that no other household will receive such a payment. We are interested in understanding how you would use this additional cash.

In the second hypothetical scenario, *Treatment 2* (T2), respondents are asked to envision their household receiving an unexpected cash transfer of $1,400 as part of a new policy that distributes a one-time transfer to every household in the United States. Treatment 2 allows us to estimate the spending response in the presence of bounded rationality, (3.3). By comparing the estimated marginal propensity to consume (MPC) across Treatment 1 and Treatment 2, we can assess the extent to which bounded rationality influences individuals' consumption responses when transfers have broader fiscal implications. The wording of Treatment 2 is given by:

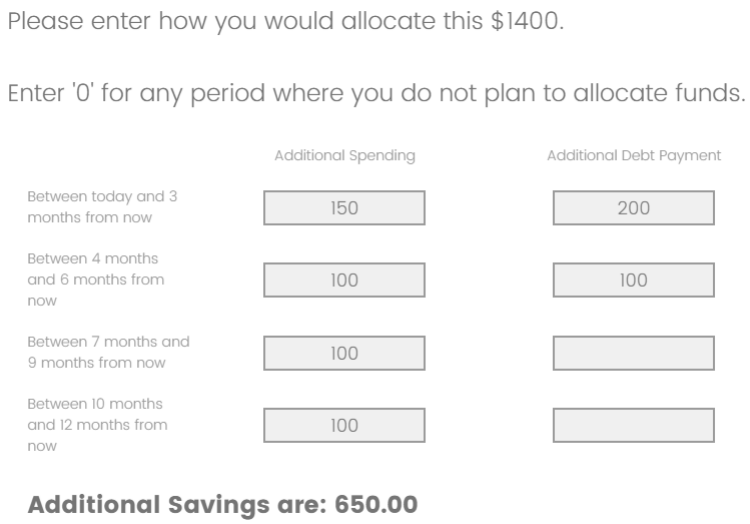
Treatment 2:
In this scenario the government sends a one-time unexpected cash transfer of $1,400 to every household in the USA today, including yours. We are interested in understanding how you would use this additional cash.

Finally, we examine a third hypothetical scenario, *Treatment 3* (T3), which closely mirrors T2 but with an additional informational component. Specifically, respondents are informed that the government will raise taxes in the following year to offset the current fiscal deficit. By explicitly providing households with information about the future path of taxation, this experiment reduces the cognitive burden associated with forecasting the fiscal consequences of government transfers. As a result, Treatment 3 allows us to assess whether directly informing individuals about future tax adjustments alters their spending response relative to Treatment 2. The wording of Treatment 3 is given by:

Treatment 3:
In this scenario, the government sends a one-time unexpected cash transfer of $1,400 to every household in the USA today, including yours. To finance this deficit, the government will raise your taxes by $1,400 next year. We want to understand how you would use the $1,400 transfer today.

We follow the methodology developed by Colarieti et al. (2024) to address the challenges associated with eliciting spending responses in a survey setting. The approach consists of three key components. First, we provide clear definitions of spending, debt payments, and savings to ensure a consistent understanding among respondents. Second, we explicitly clarify that any reported use of the cash transfer for these purposes should be considered in addition to individuals' pre-existing financial plans. Finally, we employ the interactive matrix design of Colarieti et al. (2024) to reduce the computational complexity faced by respondents when allocating their cash transfer.

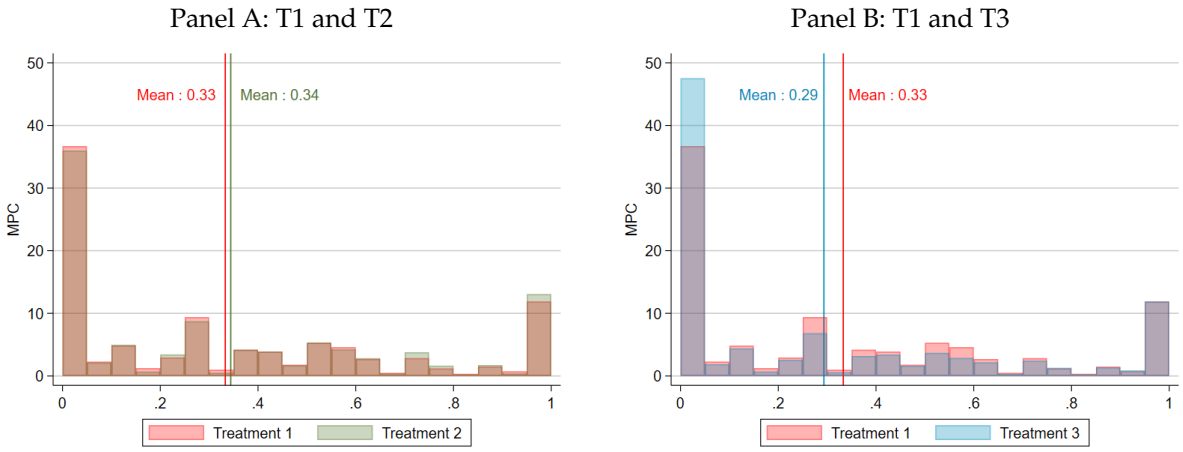
Figure 3.1: Interactive Matrix Design



Notes: This figure illustrates the interactive matrix design implemented in the survey, which enables respondents to allocate a total of $1,400 across different time periods. Participants can specify amounts for additional spending and additional debt payments in each of the four periods. Any unallocated portion is automatically categorized as additional savings, which is displayed dynamically as respondents input their allocations.

The matrix interface used in the survey is depicted in Figure 3.1. Respondents are asked to report their additional spending and debt payment plans for each of the next four quarters. The matrix structure consists of rows corresponding to different time periods: "Between today and 3 months from now", "Between 4 months and 6 months from now", "Between 7 months and 9 months from now", and "Between 10 months and 12 months from now". The columns prompt respondents to specify their additional spending and

Figure 3.2: Distribution of Marginal Propensities to Consume



Notes: The figure presents the distribution of estimated marginal propensities to consume (MPC) across different experimental treatments. Respondents' spending was aggregated at an annual frequency, and the MPC was computed as total spending divided by $1,400. To ensure interpretability, values exceeding 1 were capped in the graph. Panel A compares Treatment 1 (individual cash transfer) and Treatment 2 (universal cash transfer). Panel B compares Treatment 1 and Treatment 3 (universal cash transfer with information about future taxation). The mean MPC for each treatment is indicated in the figure.

debt payment allocations. The matrix is interactive, ensuring that any input into these categories dynamically adjusts the remaining amount allocated to additional savings. Following Colarieti et al. (2024), we impose non-negativity constraints on the amounts allocated to each box, while allowing the total allocation to exceed $1,400, thereby permitting negative additional savings.

For our analysis, we aggregate the additional spending at an annual frequency and define the marginal propensity to consume (MPC) for individual i as:

$$\text{MPC}_i \equiv \frac{\text{Additional Spending}_{i,t}}{\$1,400}. \tag{3.4}$$

Figure 3.2 presents the distribution of MPCs across different scenarios. Panel A compares the distributions of MPCs under T1 and T2, represented in blue and red, respectively. Similarly, Panel B illustrates the distributions of MPCs under T1 and T3, again using blue and red to differentiate between the two groups.

In our dataset, following the receipt of an individual rebate of $1,400, the average additional consumption amounts to $462. This corresponds to an average marginal propensity to consume (MPC) of $m_0 = 0.33$.

We find no meaningful differences in the elicited MPCs between T1 and T2. The mean MPCs are nearly identical, at 0.33 for T1 and 0.34 for T2, with this small difference lacking statistical significance. Beyond the mean, the overall distribution of MPCs remains virtually unchanged across the two treatments. Specifically, the proportion of individuals

reporting that they would not spend any portion of the transfer within the first year is 35.8% under T1 and 35.6% under T2. The median MPC for both T1 and T2 is 0.286, implying that the typical respondent spends $400 out of the $1,400 transfer. These findings suggest that the attenuation factor is very small, echoing the words of David Ricardo: *"but the people who pay the taxes never so estimate them."*

In Treatment 3 (T3), respondents are provided with explicit information regarding a specific path of future taxes. As shown in Panel B, this additional information leads to a notable reduction in the average MPC. Specifically, the average MPC declines from 0.33 to 0.29, implying a reduction in spending of approximately $60 out of the $1,400 transfer. Moreover, the provision of tax information induces a significant shift in the distribution of MPCs. The proportion of individuals reporting that they would entirely save the transfer increases to 46.7%, while the median MPC declines to 0.14. These findings suggest that individuals become more responsive to anticipated future taxes when the cognitive burden of forecasting these taxes is alleviated.

Expectations of future taxes However, it is important to acknowledge the limitations inherent in the amount of information that can be conveyed in the survey. As a result, we are unable to design experiments that fully manipulate the entire path of future taxes. In Treatment 3 (T3), respondents are explicitly informed that the transfer will be fully taxed back after one year. Consequently, differences between T2 and T3 may not solely reflect changes in tax expectations but may also arise due to differences in the actual tax path implied by each treatment.

To further corroborate our interpretation, we directly elicit respondents' expectations regarding their future tax liabilities. Specifically, we ask individuals to report how they anticipate their household's federal tax payments to evolve over the next year, in two years, and in six years.[10] The precise wording of the question is as follows:

Eliciting Tax Expectations:
By what percentage do you expect your total household's federal tax payments to change in the following periods?

- *Between Jan 1. 2025 and Dec 31. 2025*
- *Between Jan 1. 2026 and Dec 31. 2026*
- *Between Jan 1. 2030 and Dec 31. 2030*

[10] We select six years as a measure of long-run expectations. Given the timing of our survey, this corresponds to the year 2030, allowing for a clear visual distinction from the nearer-term horizons of 2025 and 2026.

We elicit individuals' expectations regarding future tax liabilities both before and after they are exposed to the hypothetical scenario. Respondents are explicitly prompted to incorporate any additional impact that the hypothetical scenario may have on their tax expectations. These elicited expectations allow us to examine how different treatments influence perceptions of future taxes.[11]

To analyze the effect of each treatment on household expectations, we estimate the following regression model:

$$E_i^{\text{Post}}\left[\Delta t_h\right] = \alpha_h + \gamma_{2,h}\mathcal{I}_{i,2} + \gamma_{3,h}\mathcal{I}_{i,3} + \rho_h E_i^{\text{Pre}}\left[\Delta t_h\right] + \xi_i, \tag{3.5}$$

where $E_i^{\text{Pre}}\left[\Delta t_h\right]$ and $E_i^{\text{Post}}\left[\Delta t_h\right]$ represent individual is expectations of tax growth for horizon $h = 1, 2, 6$ before and after being exposed to the hypothetical scenario, respectively. The indicator variables $\mathcal{I}_{i,2}$ and $\mathcal{I}_{i,3}$ take the value of 1 if individual is assigned to Treatment 2 or Treatment 3, respectively, and 0 otherwise.

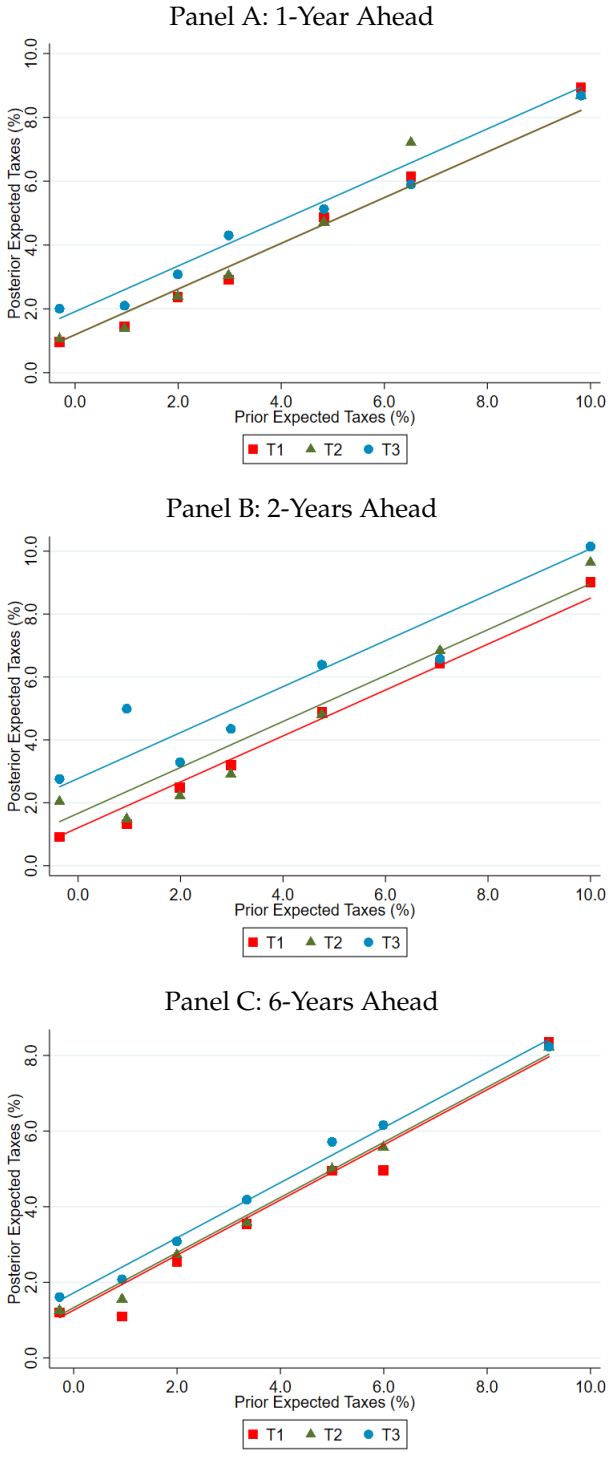
The regression results are visualized in Figure 3.3 and summarized in Appendix Table A.3. As anticipated, Treatments 1 and 2 yield similar patterns of tax expectations. This finding suggests that individuals do not significantly update their expectations of future tax liabilities at any horizon when exposed to a treatment in which the future tax implications of current deficits remain implicit.

In contrast, Treatment 3 (T3) leads to a pronounced upward revision of tax expectations at all horizons except the long run. This indicates that providing explicit information about future taxation has a significant impact on individuals' beliefs about their tax burden. Notably, respondents revise their expected tax liabilities not only for the immediate next year but also for the two-year-ahead horizon, suggesting a broader adjustment in their expectations about the trajectory of fiscal policy.

Expectations about other variables We find that, for the most part, none of the treatments significantly affect individuals' expectations regarding their personal income growth or interest rates. However, an interesting pattern emerges with respect to inflation expectations. T3 induces a notable upward revision in expected inflation, particularly at the one-year horizon, whereas T2 has no discernible impact on inflation expectations. Specifically, respondents exposed to T3 revise their one-year-ahead inflation expectations upward by approximately 0.4 percentage points.

[11] In addition to tax expectations, we similarly elicit respondents' expectations regarding their income growth, interest rates, and inflation. The results for these alternative expectations are presented in Appendix Table A.4 for income expectations, A.5 for interest rate expectations, and A.6 for inflation expectations.

Figure 3.3: Expectations of Taxes Before and After Treatment



Note: This Figure presents the relationship between prior and posterior expected taxes across treatments and at different time horizons. The bin scatter plots were constructed by splitting prior expected taxes into 10 bins and computing the average posterior expected taxes within each bin and treatment. The fitted lines are obtained from the regression specified in equation (3.5). Prior expectations were elicited using the question: "By what percentage do you expect your total household's federal tax payments to change in the following periods?" Respondents answered this question before receiving the treatment. After receiving their assigned treatment, they were asked the same question again, with the following prompt: "Now, we would like to understand your expectations about income, taxes, inflation, and interest rates in the scenario previously discussed. Please fill out the same tables again incorporating that impact (if any) into your answers."
Panel A presents responses for 1 year ahead, Panel B for 2 years ahead, and Panel C for 6 years ahead. The analysis excludes the lowest and highest 1% of values for all variables—prior expectations, posterior expectations—and further drops prior expected tax values above 10%. The results illustrate how individuals update their tax expectations in response to different treatments at different horizons.

This finding presents a challenge for standard theories of fiscally driven inflation, such as the Fiscal Theory of the Price Level (FTPL) and heterogeneous-agent New Keynesian (HANK) models. According to these frameworks, the promise of future tax hikes—as in T3—should lead to lower, rather than higher, inflation expectations.[12,13]

4 The General-Equilibrium Consequences of Ricardian Non-Equivalence

In this section, we examine the general-equilibrium consequences of agents' systematic misperception regarding the future tax implications of current fiscal deficits. Specifically, we analyze an overlapping-generations (OLG) economy with perpetual youth in the spirit of the New Keynesian framework. It is well established that the mortality event in these models can equivalently represent a binding borrowing constraint, as discussed in Woodford (1990), Farhi and Werning (2019), and Angeletos et al. (2024a,b).

Our model builds most directly on Angeletos et al. (2024a,b) and extends their framework to incorporate agents' imperfect foresight concerning the long-run fiscal adjustments necessitated by deficit-financed government expenditures. Time is discrete and extends infinitely, indexed by $t = 0, 1, 2, ...$

Firms and production The final consumption good is produced using a linear technology with labor as the sole input:

$$Y_t = N_t. \tag{4.1}$$

The aggregate labor input N_t is a composite of a continuum of differentiated labor varieties indexed by $u \in [0, 1]$, aggregated according to the following CES production function:

$$N_t = \left[\int_0^1 n_{u,t}^{\frac{\theta-1}{\theta}} du \right]^{\frac{\theta}{\theta-1}}, \tag{4.2}$$

where $\theta > 1$ represents the elasticity of substitution across labor varieties. A representative firm, operating in a perfectly competitive environment in both the goods and labor

[12]For a recent review of FTPL, see Cochrane (2023), and for an exploration of the relationship between HANK models and FTPL, see Angeletos et al. (2024b).

[13]One possible explanation for this anomaly is that individuals' forecasts are influenced by selective recall driven by affective associations, as proposed by Taubinsky, Butera, Saccarola, and Lian (2024). In our context, the additional negative news embedded in the explicit tax information provided in T3 may lead individuals to adopt a more pessimistic outlook on future inflation. Investigating this potential mechanism, however, lies beyond the scope of this paper.

markets, maximizes profits given by $P_t Y_t - \int_0^1 W_{u,t} N_{u,t} du$ subject to the production technology and labor demand conditions. Here, P_t denotes the price of the consumption good, and $W_{u,t}$ represents the wage associated with labor variety u. Profit maximization yields the demand for each labor variety:

$$N_{u,t} = \left(\frac{W_{u,t}}{W_t} \right)^{-\theta} N_t, \tag{4.3}$$

where the aggregate wage index is given by $W_t = \left[\int_0^1 W_{u,t}^{1-\theta} du \right]^{\frac{1}{1-\theta}}$ and $W_t = P_t$.

Households We consider a continuum of households indexed by $i \in [0, 1]$. Each household survives from one period to the next with probability $\omega \in (0, 1]$, and upon exiting, it is replaced by a newborn household. The household's lifetime utility function is given by:

$$\mathcal{U}_{i,t} = \sum_{h=0}^{\infty} (\beta\omega)^h \left[u\left(C_{i,t+h}\right) - v\left(N_{t+h}\right) \right] \tag{4.4}$$

where $C_{i,t}$ represents the consumption of household i at time t, and N_t denotes labor supply.

Households have access to actuarially fair annuities, allowing them to save or borrow. Conditional on survival, household i receives a return of R_t/ω on their savings $A_{i,t}$, where R_t is the interest rate on government debt.

To introduce nominal wage rigidities in a standard manner, we assume that each household consists of a continuum of worker types. Aggregate labor supply is given by $N_t = \int N_{u,t} du$ which aggregates individual labor supply $N_{u,t}$ across worker types. To simplify the analysis and abstract from cross-sectional heterogeneity in labor supply, we assume that $N_{u,t}$ is determined by a monopolistically competitive labor union, which sets labor supply identically across all its members.

The household budget constraint is given by

$$C_{i,t} + \omega \frac{A_{i,t+1}}{R_{t+1}} = Y_t + A_{i,t} - T_t + S_{i,t}, \tag{4.5}$$

where $Y_t = \int W_{u,t} N_{u,t} du$ and $S_{i,t}$ is a transfer from a social security fund, where $S_{i,t} = S^{new} > 0$ if the household has just been born or $S_{i,t} = -\frac{1-\omega}{\omega} S^{new} < 0$ for a old household. As in Angeletos et al. (2024a), we set $S^{new} = B$ such that, in steady state, all households have the same wealth level, ensuring that the steady state is independent of ω and $R = \beta^{-1}$.

Labor market and unions We follow the New Keynesian sticky wage literature and assume that labor $N_{u,t}$ is decided by a monopolistically competitive labor union, as in Erceg et al. (2000), Schmitt-Grohé and Uribe (2005), and Auclert et al. (2024). In order to generate nominal rigidities, we assume that unions face a quadratic cost of wage adjustment $\frac{1}{2\widetilde{\kappa}_w}\left(\frac{W_{u,t}}{W_{u,t-1}}-1\right)^2$ which is measured in terms of household utility. At every date, the union chooses a new wage $W_{u,t}$ and labor supply $N_{u,t}$ subject to the demand equation 4.3, to maximize households' valuation of resources. Finally, we assume that all unions are symmetric, so that they all set the same equilibrium wage. In the appendix, we show that, under these conditions, the linearized wage-NKPC is given by:

$$\pi_t^w = \kappa y_t + \beta \pi_{t+1}^w, \tag{4.6}$$

where $\kappa > 0$ is a rigidity parameter and π_t^w denotes wage inflation. Note that, since in equilibrium $W_t = P_t$, then price inflation equals wage inflation $\pi_t = \pi_t^w$.

Note that, in this model, inflation is given by

$$\pi_t = \sum_{h=0}^{\infty} \kappa \beta^h y_{t+h}. \tag{4.7}$$

Monetary and fiscal policy The monetary authority sets nominal interest rates i_t (in log deviations). For simplicity, we assume that they follow a rule that places a unit coefficient on future (expected) inflation:

$$i_t = \pi_{t+1}. \tag{4.8}$$

Equivalently, monetary policy is conducted so as to keep the real interest rate constant

$$r_t = 0, \tag{4.9}$$

for all t. We use this simplified real interest rate rule to make the analysis more transparent. As usual, we focus on equilibria such that the economy returns to the initial steady state.

The government taxes households T_t and issues new debt B_{t+1}. The government flow-of-funds constraint is given by

$$\frac{B_{t+1}}{R_t} + T_t = B_t + G, \tag{4.10}$$

where G denotes government spending. After linearizing the government budget con-

straint we can write

$$b_{t+1} = \beta^{-1}(b_t - t_t). \tag{4.11}$$

We assume that the tax rule is given by

$$t_0 = -\varepsilon_0, \quad \text{and } t_t = \tau_b b_t \quad \text{for } t = 1, 2, ... \tag{4.12}$$

So, the government sends out a transfer ε_0 at the initial date and taxes it back, where $\tau_b \in (0, 1]$ controls the speed at which deficits are taxed back. Note that, using the tax rule, we can write

$$b_1 = \beta^{-1}\varepsilon_0, \quad \text{and } b_t = \beta^{-t}(1 - \tau_b)^{t-1}\varepsilon_0, \quad \text{for } t = 2, 3, ...$$

For our purposes, it is also useful to represent the elasticity τ_d by the implicit persistence of government debt it induces $\rho_B \equiv \beta^{-1}(1 - \tau_b)$. We also assume that $\rho_B \in (0, 1)$ so that the path of debt converges back to the initial steady state.

Equilibrium In equilibrium, the total spending of the household sector equals total production

$$C_t + G = Y_t. \tag{4.13}$$

4.1 Rational Expectations Equilibrium

After linearizing the household's optimization problem, the rational expectations aggregate consumption function is given by:

$$c_t^*\left(\{y_{t+h}, t_{t+h}\}_{h=0}^{\infty}, b_t\right) = (1 - \beta\omega)\left(b_t + \sum_{h=0}^{\infty}(\beta\omega)^h\left[y_{t+h} - t_{t+h}\right]\right). \tag{4.14}$$

This aggregate consumption function follows a familiar form. The marginal propensity to consume (MPC) is given by:

$$m_0 \equiv 1 - \beta\omega \in (0, 1). \tag{4.15}$$

This framework nests the standard representative agent consumption function when $\omega = 1$, in which case the MPC reduces to $m_0 = 1 - \beta$. Under standard calibrations where $\beta \approx 1$, the MPC in the representative agent model is close to zero. However, the overlapping generations (OLG) structure within the Heterogeneous Agent New Keynesian

(HANK) framework allows us to generate larger MPCs in a tractable manner. Specifically, as ω decreases, the marginal propensity to consume rises, reflecting the greater likelihood of finite lifetimes leading to higher consumption out of current resources.

Following Angeletos et al. (2024a,b), we can show that in a standard Rational Expectations Equilibrium

$$y_t^* = \chi^* \left\{ (1 - \tau_b) \, d_t + \varepsilon_t \right\} = \chi^* \rho_B^t \varepsilon_0, \tag{4.16}$$

where the rational transfer multiplier, χ^*, is given by

$$\chi^* = \frac{m_0}{1 - m_0} \frac{1 - \omega}{1 - \rho_B}. \tag{4.17}$$

If $\omega = 1$, then the model features Ricardian Equivalence and $\chi^* = 0$, i.e., there are no effects of government transfers. Instead, when $\omega < 1$, individuals discount the future taxes more heavily than financial markets due to their idiosyncratic death probability. So, the current transfer leads to a larger increase in aggregate demand, than the promise of future taxes reduces it. The expansion of aggregate demand then leads to an increase in output generating a multiplier effect. The fact that deficits persist, also generates an expansion in aggregate demand in the future, thus generating an further dynamic multiplier effect. Note that, the higher ω the lower is the MPC and the closest is the discounting of future taxes to the one used by financial markets. It follows that χ^* is decreasing in ω, i.e., the higher the contemporaneous marginal propensity to consume, the higher the transfer multiplier.

4.2 Equilibrium with Bounded Rationality

Beyond the equilibrium under full rationality, we seek to characterize the equilibrium when consumption decisions are subject to uncertainty about their policy function. As in Section 3, we assume that consumers must exert cognitive effort to account for the future tax implications of deficits in their current spending decisions. At each point in time, through deliberation, individual i

$$s_{i,t} = c_{i,t}^* + \eta_{i,t}, \qquad \eta_{i,t} \sim \mathcal{N}\left(0, \tau_\eta^{-1}\right). \tag{4.18}$$

To make the problem analytically tractable, we assume that individuals' beliefs imply that $c_{i,t}^*$ are independent across time. This assumption precludes the use of past signals to refine current forecasts of the optimal policy function, thereby ruling out learning dynamics in the sense that individuals do not aggregate signals over time to improve their expecta-

tions.[14] As before, we assume that $c^d_{i,t}$, the prior mean, is given by the individual's optimal consumption response to their current cash on hand, i.e., $c^d_{i,t} = (1 - \beta\omega)\{b_{i,t} + y_t - t_t\}$.

Proposition 2 (Aggregate Consumption with Bounded Rationality)**.** *Suppose that, at each date t, individuals receive the signal (4.18) about their optimal consumption function through deliberation. Furthermore, assume that their prior belief is that $c^*_{i,t}\left(\{y_{t+h}, t_{t+h}\}_{h=0}^{\infty}, b_{i,t}\right)$ follows a Gaussian distribution with mean*

$$c^d_{i,t}\left(\{y_{t+h}, t_{t+h}\}_{h=0}^{\infty}, b_{i,t}\right) = m_0\{b_{i,t} + y_t - t_t\} \tag{4.19}$$

and variance τ^{-1}. Under these assumptions, aggregate demand $c_t = \int c_{i,t}di$ is given by:

$$c_t\left(\{y_{t+h}, t_{t+h}\}_{h=0}^{\infty}, b_t\right) = c^*_t\left(\{y_{t+h}, t_{t+h}\}_{h=0}^{\infty}, b_t\right) + \overbrace{\lambda m_0 \sum_{h=1}^{\infty}(\beta\omega)^h t_{t+h}}^{RNE} \underbrace{-\lambda m_0 \sum_{h=1}^{\infty}(\beta\omega)^h y_{t+h}}_{GE\ Attenuation} \tag{4.20}$$

where $c^*_t\left(\{y_{t+h}, t_{t+h}\}_{h=0}^{\infty}, b_t\right)$ is given by equation (4.14), and $\lambda \equiv \tau/\left(\tau + \tau_\eta\right) \in (0,1)$ denotes the degree of behavioral attenuation.

Proposition 2 characterizes the aggregate consumption behavior when individuals are boundedly rational. Compared to the rational benchmark, the equilibrium under bounded rationality introduces two additional effects.

First, the Ricardian Non-Equivalence (RNE) term implies that individuals only partially internalize future tax liabilities, leading to an amplified response of current consumption relative to the rational benchmark. As discussed in Section 3, this attenuates the effects of future taxation, generating a higher consumption response than in the fully rational case.

Second, bounded rationality induces a general equilibrium (GE) attenuation effect. Because individuals do not fully incorporate expected changes in future income into their current decisions, the responsiveness of aggregate demand to anticipated future output is dampened. This mechanism leads to a muted propagation of general equilibrium effects, a phenomenon widely studied in the literature (see, for instance, Angeletos and Lian, 2023).

[14] In contrast, Ilut and Valchev (2023) analyze a framework in which individuals exploit perceived correlations among optimal policies for different state variables to update their beliefs beyond the current period's problem..

We now turn to the general-equilibrium solution under bounded rationality and computing the transfer multiplier. Our main result, Proposition 3, shows that the transfer multiplier under bounded rationality χ can be decomposed into three objects: (1) the rational transfer multiplier χ^*, (2) an additional RNE transfer multiplier χ^{RNE}, and (3) a GE-attenuation factor, δ^{GE}.

Proposition 3 (The Transfer Multiplier with bounded rationality)**.** *Suppose that, at each date t, individuals receive the signal (4.18) about their optimal consumption function through deliberation. Furthermore, assume that their prior belief is that $c^*_{i,t}\left(\{y_{t+h}, t_{t+h}\}_{h=0}^{\infty}, b_{i,t}\right)$ follows a Gaussian distribution with mean given by (4.19) and and variance τ^{-1}. Under these assumptions the equilibrium in this economy is given by*

$$y_t = \chi \rho_B^t \varepsilon_0, \tag{4.21}$$

where the transfer multiplier χ is given by:

$$\chi = \left(\chi^* + \chi^{RNE}\right) \cdot \delta^{GE}. \tag{4.22}$$

The transfer multiplier is decomposable into three terms:

1. The rational transfer multiplier χ^* given by (4.17).

2. An additional Ricardian Non-Equivalence transfer multiplier

$$\chi^{\text{RNE}} \equiv \frac{1-\beta\rho_B}{\beta\left(1-\rho_B\right)} m_0 \lambda > 0. \tag{4.23}$$

3. A General-Equilibrium attenuation factor

$$\delta^{\text{GE}} = \frac{1-\rho_B}{1-\rho_B\left\{1-m_0\lambda\right\}} \in (0,1). \tag{4.24}$$

Proposition 3 establishes that, relative to the rational transfer multiplier χ^*, the transfer multiplier under bounded rationality features two additional components. The first is an additional transfer multiplier, χ^{RNE}, which arises from the expansion in aggregate demand induced by Ricardian Non-Equivalence (RNE). This term is positive, thereby increasing the overall transfer multiplier relative to the rational benchmark.

To illustrate this mechanism, consider the limiting case where $\omega = 1$, corresponding to the standard Representative Agent New Keynesian (RANK) model. In this case, Ricardian Equivalence holds under full rationality, implying $\chi^* = 0$. However, in an economy

with bounded rationality, individuals fail to fully internalize the implications of future taxes, leading to an aggregate demand stimulus captured by

$$\chi^{\text{RNE}} = \frac{1 - \beta\rho_B}{\beta\,(1 - \rho_B)}\,(1 - \beta)\,\lambda.$$

It follows that the overall transfer multiplier remains positive even if the rational benchmark exhibits Ricardian Equivalence.

However, while RNE provides an independent source of aggregate demand stimulus from government transfers, its quantitative significance crucially depends on the size of the marginal propensity to consume, m_0. To see this, observe that in the representative agent case, where standard calibrations imply $\beta \approx 1$, it follows that $\chi^{\text{RNE}} \approx 0$, indicating that the effect vanishes in environments with a low MPC.

Corollary 1 (Properties of the Ricardian Non-Equivalence Transfer Multiplier)**.** *The Ricardian Non-Equivalence transfer multiplier exhibits the following key properties:*

1. **Boundedness**:
$$\chi^{\text{RNE}} \in \left[0, \frac{1 - \beta\rho_B}{\beta\,(1 - \rho_B)}\right]$$
and is equal to zero if and only if there is no behavioral attenuation, $\lambda = 0$.

2. **Dependence on behavioral attenuation**:
$$\frac{d\chi^{\text{RNE}}}{d\lambda} = \frac{1 - \beta\rho_B}{\beta\,(1 - \rho_B)} m_0 > 0.$$
That is, the RNE multiplier increases with the degree of behavioral attenuation.

3. **Dependence on the MPC**:
$$\frac{d\chi^{\text{RNE}}}{dm_0} = \frac{1 - \beta\rho_B}{\beta\,(1 - \rho_B)}\lambda > 0.$$
That is, The RNE multiplier is larger when the MPC is higher.

4. **Complementarities between MPC and behavioral attenuation**:
$$\frac{d^2\chi^{\text{RNE}}}{d\lambda dm_0} = \frac{1 - \beta\rho_B}{\beta\,(1 - \rho_B)} > 0.$$
This implies that the effects of behavioral attenuation and the MPC reinforce each other, amplifying the overall transfer multiplier.

Corollary 1 highlights several key insights regarding the determinants of the RNE transfer multiplier.

First, the magnitude of the multiplier crucially depends on the degree of behavioral attenuation, λ. As cognitive signals become more informative (i.e., as τ_η increases), individuals incorporate more information about future taxes into their current consumption choices, thereby reducing behavioral attenuation (i.e., λ decreases). Consequently, the expansion in aggregate demand is dampened, lowering the transfer multiplier.

Second, as suggested in the preceding discussion, the RNE multiplier is highly sensitive to the size of the marginal propensity to consume (MPC). If the MPC is low, then the demand response to government transfers is quantitatively small, leading to a negligible multiplier effect. In contrast, when the MPC is high, government transfers generate a strong demand response, amplifying the RNE multiplier.

Finally, there exist strong complementarities between the MPC and behavioral attenuation: the two effects reinforce each other, leading to a larger overall spending multiplier. Intuitively, this follows from the fact that a higher MPC increases the aggregate demand response to additional attenuation of future taxes. That is, when individuals already exhibit a strong propensity to consume out of current income, cognitive distortions that reduce the perceived burden of future taxation further amplify this effect.

Corollary 2 (Properties of the GE Attenuation Factor)**.** *The General-Equilibrium Attenuation factor exhibits the following key properties:*

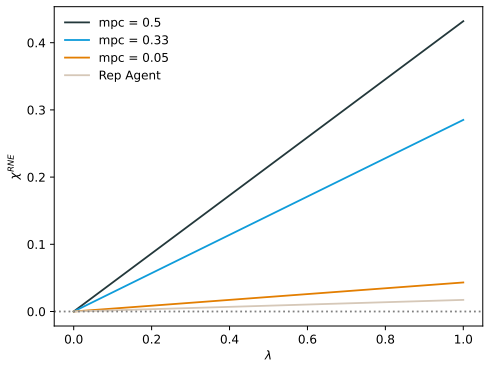
1. **Boundedness**:
$$\delta^{\text{GE}} \in (0, 1)$$
and is equal to 1 if and only if there is no behavioral attenuation, $\lambda = 0$.

2. **Dependence on behavioral attenuation**:
$$\frac{d\delta^{\text{GE}}}{d\lambda} = -\frac{1-\rho_B}{\left(1-\rho_B\left\{1-m_0\lambda\right\}\right)^2}\rho_B m_0 < 0.$$
That is, the RNE multiplier increases with the degree of behavioral attenuation.

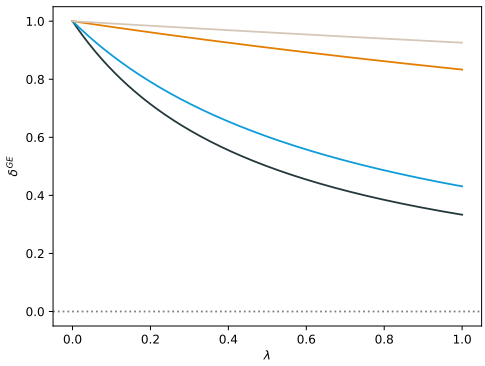
3. **Dependence on the MPC**:
$$\frac{d\delta^{\text{GE}}}{dm_0} = -\frac{1-\rho_B}{\left(1-\rho_B\left\{1-m_0\lambda\right\}\right)^2}\rho_B \lambda > 0.$$
That is, The RNE multiplier is larger when the MPC is higher.

Figure 4.1: Behavioral Effects on the Transfer Multiplier

Panel A: RNE Multiplier



Panel B: GE Attenuation



Note: This Figure shows the Ricardian Non-Equivalence multiplier, χ^{RNE}, and the general-equilibrium dampening factor, δ^{GE}, in panels A and B, respectively. We depict these statistics for different levels of behavioral attenuation (x-axis). Different color lines represent different calibrations for ω to target: (1) $m_0 = 0.5$ in black, (2) $m_0 = 0.33$ in blue, (3) $m_0 = 0.05$ in orange, and (4) the representative agent benchmark, $\omega = 1$. See the text for more details.

Corollary 2 establishes similar properties for the general-equilibrium dampening factor in this model with cognitive uncertaint. Specifically, we show that the dampening factor decreases as behavioral attenuation increases and as the marginal propensity to consume (MPC) rises.

Figure 4.1 illustrates these relationships by depicting the effects of varying degrees of behavioral attenuation and MPC on the Ricardian Non-Equivalence (RNE) multiplier, χ^{RNE}, and the general-equilibrium (GE) attenuation factor, δ^{GNE}, in Panels A and B, respectively. The patterns predicted by the theoretical analysis are evident in this figure. On the one hand, the RNE multiplier increases the overall transfer multiplier, particularly when MPCs are high and when behavioral attenuation is strong. On the other hand, the GE attenuation factor dampens the transfer multiplier, with its effect being more pronounced when either the MPC or the degree of behavioral attenuation is high.

5 Quantitative analysis

[TBA]

6 Conclusions

In this paper, we provide empirical evidence that people do not internalize future tax liabilities stemming from government transfers into their current spending decisions.

Specifically, we design and implement a novel survey to measure households' spending responses under alternative policy scenarios. We find that people display an elevated marginal propensity to consume out of government transfers relative to the rational benchmark. It follows that Ricardian Equivalence does not hold. In Barro (1974)'s terminology, people behave as if government bonds are net wealth.

We develop a model that micro-founds this failure of Ricardian Equivalence using insights from the literature on bounded rationality. We embed this mechanism into a Heterogeneous-Agent New Keynesian model and demonstrate that Ricardian Non-Equivalence can substantially magnify the aggregate impact of fiscal policy. Critically, we highlight a strong complementarity between HANK and Ricardian Non-Equivalence: the larger is the MPC, the greater is the quantitative importance of this behavioral channel. Taken together, our results suggest that fiscal transfers can have a significant impact on economic activity and play a useful role in stabilization policies.

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A Additional Tables

Table A.1: Distributions in Survey Sample vs. Population

		Survey	US
Gender			
	Female	50%	51%
	Male	48%	49%
	Other (Non-binary/Prefer not to say)	2%	-
Political Affiliation			
	Democrat	32%	32%
	Republican	30%	29%
	Independent/Non-affiliated	36%	37%
	Other	2%	2%
	None	-	7%
Age Group			
	22-30 years old	30%	21%
	31-40 years old	31%	24%
	41-50 years old	21%	22%
	51-60 years old	13%	22%
	61-65 years old	4%	11%
Ethnicity			
	White	65%	75%
	Black or African American	18%	14%
	Asian	5%	7%
	Native American/Alaska Native	1%	1%
	Native Hawaiian or Other Pacific Islander	0%	0%
	Other	3%	2%
Employment Status			
	Full-time	56%	66%
	Part-time	17%	10%
	Not in paid work (e.g., homemaker, retired, or disabled)	12%	22%
	Unemployed (and job-seeking)	11%	3%
	Other	4%	0%
Education			
	No formal education	1%	4%
	Secondary education	3%	4%
	High school diploma	39%	42%
	Technical/community college	15%	11%
	Undergraduate degree	27%	25%
	Graduate degree	12%	12%
	Doctorate degree	2%	2%

Table A.2: Distributions in Each Experiment Sample vs. Population

		T1	T2	T3
Gender				
	Female	50%	49%	52%
	Male	48%	49%	46%
	Other (Non-binary/Prefer not to say)	2%	2%	2%
Political Affiliation				
	Democrat	33%	32%	31%
	Republican	28%	31%	30%
	Independent/Non-affiliated	36%	35%	37%
	Other	2%	2%	2%
Age Group				
	22-30 years old	31%	31%	28%
	31-40 years old	31%	30%	33%
	41-50 years old	22%	20%	22%
	51-60 years old	12%	15%	13%
	61-65 years old	4%	4%	4%
Ethnicity				
	White	65%	64%	66%
	Black or African American	19%	18%	17%
	Asian	5%	5%	5%
	Hispanic/Latino	7%	8%	7%
	Native American/Alaska Native	1%	1%	1%
	Native Hawaiian or Other Pacific Islander	0%	0%	0%
	Other	3%	3%	3%
Employment Status				
	Full-time	55%	57%	55%
	Part-time	18%	16%	17%
	Not in paid work (e.g., homemaker, retired, or disabled)	12%	12%	12%
	Unemployed (and job-seeking)	11%	11%	10%
	Other	5%	4%	6%
Education				
	No formal education	1%	2%	2%
	Secondary education	3%	3%	2%
	High school diploma	40%	39%	39%
	Technical/community college	15%	14%	15%
	Undergraduate degree	26%	28%	27%
	Graduate degree	13%	12%	13%
	Doctorate degree	2%	3%	2%

Table A.3: Tax Expectations

Horizon	1 year		2 years		6 years	
Treatment 2	-0.003	0.050	-0.254	0.017	-0.361	-0.027
	(0.258)	(0.188)	(0.235)	(0.169)	(0.301)	(0.215)
Treatment 3	0.843***	1.037***	0.749***	0.941***	0.335	0.357*
	(0.260)	(0.189)	(0.236)	(0.170)	(0.301)	(0.216)
Prior		✓		✓		✓
Observations	5,706	5,640	5,673	5,577	5,688	5,555

Standard errors in parentheses.* $p < 0.10$,** $p < 0.05$, *** $p < 0.01$

Table A.4: Income Expectations

Horizon	1 year		2 years		6 years	
Treatment 2	0.007	0.079	-0.260	0.232	-0.369	-0.005
	(0.310)	(0.236)	(0.309)	(0.209)	(0.400)	(0.294)
Treatment 3	0.585*	0.434*	0.549*	0.433**	-0.101	-0.156
	(0.311)	(0.237)	(0.310)	(0.209)	(0.402)	(0.296)
Prior		✓		✓		✓
Observations	5,651	5,613	5,721	5,611	5,646	5,573

Standard errors in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.5: Interest Rate Expectations

Horizon	1 year		2 years		6 years	
Treatment 2	-0.0778	-0.0614	-0.112	-0.0260	-0.136	-0.0817
	(0.151)	(0.100)	(0.176)	(0.115)	(0.223)	(0.143)
Treatment 3	0.176	0.0856	0.119	0.0225	-0.118	-0.344**
	(0.152)	(0.101)	(0.177)	(0.115)	(0.224)	(0.144)
Prior		✓		✓		✓
N	5,607	5,748	5,625	5,754	5,656	5,779

Standard errors in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

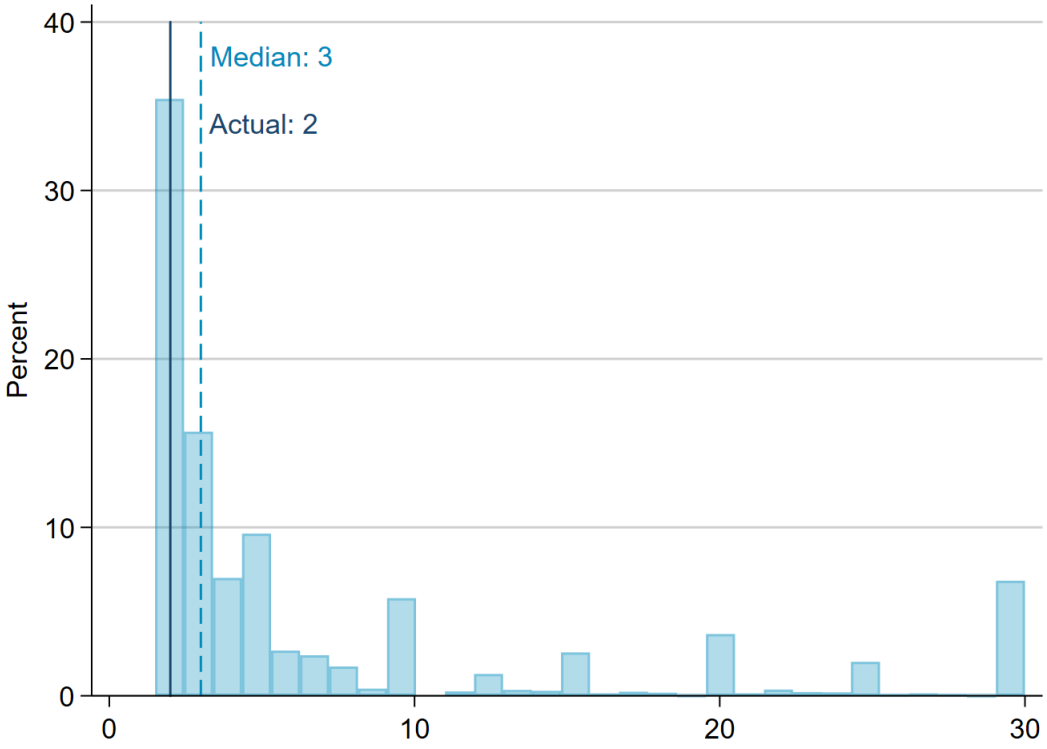
Table A.6: Inflation Expectations

Horizon	1 year		2 years		6 years	
Treatment 2	0.236	0.188*	0.144	0.0304	0.183	0.221
	(0.169)	(0.110)	(0.182)	(0.115)	(0.236)	(0.159)
Treatment 3	0.486***	0.396***	0.386**	0.223*	0.368	0.355**
	(0.170)	(0.111)	(0.182)	(0.116)	(0.236)	(0.159)
Prior		✓		✓		✓
Observations	5,752	5,650	5,702	5,576	5,711	5,619

Standard errors in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

B Additional Figures

Figure B.1: People's Perception of the Federal Reserve Bank's Inflation Target



Note: This figure presents the distribution of responses to three survey questions regarding the Federal Reserve Bank's inflation target: "What is the Federal Reserve Bank's target inflation rate over the long run?" To enhance interpretability, the data have been truncated, excluding values above 30. The median estimates provided by respondents are indicated with dashed lines, while the actual true values are represented by solid lines.

C Survey questionnaire

Bot verification

[Captcha]

Before we begin, please enter your Prolific ID below.

[Text box]

C.1 Consent Form

This is a consent form. Please read and click below to continue.

Study background: This study is conducted by researchers at Northwestern University. Your participation in this research will take approximately 9 minutes.

What happens in this research study: if you decide to participate, you will be asked to complete a series of questions about your perceptions of the state of the economy and how these perceptions influence your spending and savings decisions. You will also answer basic questions about demographics.

Compensation: After completing the survey, you will be redirected to Prolific. You will be paid around $1.8 for completing the survey.

Risks: Your involvement in this study poses no additional risks beyond those encountered daily.

Benefits: Participating in this research offers compensation, as detailed earlier. Additionally, the findings may contribute to society by informing better policymaking.

Voluntary participation: participating in this research is voluntary. You can withdraw from the study at any time.

Confidentiality: We will collect data through a Qualtrics questionnaire overseen by our Research Team. All gathered data will be securely stored in a password-protected Dropbox account dedicated to this research project. Identifiable data will not be collected as part of this study. If you decide to withdraw, any collected data will be permanently deleted. De-identified information from this study may be used for future research or shared with other researchers without your additional informed consent.

Contact: For questions, concerns, or complaints about this research, contact the researchers at fiscal.survey@gmail.com. For inquiries regarding the IRB process for this study, reach out to the Northwestern University IRB team at irb@northwestern.edu.

Agreement to participate: by clicking continue, you indicate that you have read this consent form and voluntarily agree to participate in the study.

C.2 Demographics

1. What is your current age in years?

   [Text box]

2. What gender do you identify as?
   [Male; Female; Non-binary; Prefer no to say; Other. Specify: [Text box]]

3. What is your marital status?
   [Single; Married; Legally separated or divorced; Widowed; Cohabiting/Living with a partner; Other. Specify: [Text box]]

4. In which US state/region do you live in?
   [Alabama; Alaska; Arizona; Arkansas; California; Colorado; Connecticut; Delaware; Florida; Georgia; Hawaii; Idaho; Illinois; Indiana; Iowa; Kansas; Kentucky; Louisiana; Maine; Maryland; Massachusetts; Michigan; Minnesota; Mississippi; Missouri; Montana; Nebraska; Nevada; New Hampshire; New Jersey; New Mexico; New York; North Carolina; North Dakota; Ohio; Oklahoma; Oregon; Pennsylvania; Rhode Island; South Carolina; South Dakota; Tennessee; Texas; Utah; Vermont; Virginia; Washington; West Virginia; Wisconsin; Wyoming; Puerto Rico; District of Columbia; Other US region; I live outside of the USA]

5. Please tell us how many of the following people usually live in your primary residence besides yourself (including those temporarily away):
   [Spouse/partner; Children; Other relatives; Non-relatives]

6. How would you describe your ethnicity/race?
   [White; Hispanic/Latino; Black or African American; Native American/Alaska Native; Asian; Native Hawaiian or Other Pacific Islander; Other. Please specify: [Text box]]

7. Which of the following best describes the financial decision-making process in your household?
   [Someone else in my household makes all financial decisions; I share financial decisions with someone else in my household; I make all financial decisions myself]

8. What is the highest level of education you have completed?
   [No formal qualifications; Secondary education (e.g. GED/GCSE); High school diploma; Technical/community college; Undergraduate degree (BA/BSc/other); Graduate degree (MA/MSc/MPhil/other); Doctorate degree (PhD/other); Don't know / not applicable]

9. What is your employment status?
   [Full-time; Part-time; Due to start a new job within the next month; Unemployed (and job-seeking); Not in paid work (e.g., homemaker, retired, or disabled); Other (please specify)]

9. Generally speaking, what do you consider to be your political affiliation?
   [Republican; Democrat; Independent/Non-affiliated; Other. Specify: [Textbox]]

10. [If 3 is "Married" or "Cohabiting/Living with a partner"] What is your spouse/partner's current employment status

[Full-time; Part-time; Unemployed (and job-seeking); Not in paid work (e.g.; homemaker, retired, or disabled); Other. Specify: [Textbox]]

C.3 Attention Check

1. People often rely on various sources for economic news and updates. To confirm that you're paying attention, please select ABC News regardless of which sources you actually use. When there is a big news story, which website would you visit first? (Please only choose one)
   [The Drudge Report; ABC News; Fox News; New York Times website; Washington Post website; National Public Radio (NPR) website]

C.4 Expectation Questions – First Stage

People's expectations are an important determinant of their spending decisions. There are no right or wrong answers to the following questions about your expectations.

1. By what percentage do you expect your total household's pre-tax income to change in the following periods? By pre-tax income we mean your income before you pay any taxes. Please write your answer in percent; For example, if you expect your household income to increase by x% relative to your current household income, input x; if you expect it to decrease by x% input -x; if you expect your household income to remain constant, input 0.
   [Between Jan 1, 2025 and Dec 31, 2025: [Text box]; Between Jan 1, 2026 and Dec 31, 2026: [Text box]; Between Jan 1, 2030 and Dec 31, 2030: [Text box]]

2. By what percentage do you expect your total household's federal taxes to change in the following periods? Please write your answer in percent; For example, if you expect your federal taxes to increase by x% relative to your current federal taxes, input x; if you expect it to decrease by x% input -x; if you expect your federal taxes to remain constant, input 0.
   [Between Jan 1, 2025 and Dec 31, 2025: [Text box]; Between Jan 1, 2026 and Dec 31, 2026: [Text box]; Between Jan 1, 2030 and Dec 31, 2030: [Text box]]

3. What do you expect the inflation rate to be in the following periods? [The annual inflation rate measures how much prices in the economy rise from year to year.] Please write your answer in percent; if you mean x%, input x.
   [Between Jan 1, 2025 and Dec 31, 2025: [Text box]; Between Jan 1, 2026 and Dec 31, 2026: [Text box]; Between Jan 1, 2030 and Dec 31, 2030: [Text box]]

4. What do you expect the average interest rate on one-year Treasury bills to be in the following periods? [The one-year Treasury bill rate reflects the yield received from investing in a U.S. government-issued security with a one-year maturity.] Please write your answer in percent; if

you mean x%, input x.
[Between Jan 1, 2025 and Dec 31, 2025: [Text box]; Between Jan 1, 2026 and Dec 31, 2026: [Text box]; Between Jan 1, 2030 and Dec 31, 2030: [Text box]]

C.5 Eliciting the Marginal Propensity to Consume

[In this section, participants were randomly assigned to one of 3 possible hypothetical transfer scenarios: Government Rebate, Government Transfer Policy, and Government Transfer Policy + Information]

Please answer the remaining questions in the survey assuming that you are in the following scenario:

[1. Government Rebate] In this scenario your household receives a one-time unexpected cash transfer of $1,400 from the government today. You know that no other household will receive such a payment. We are interested in understanding how you would use this additional cash.

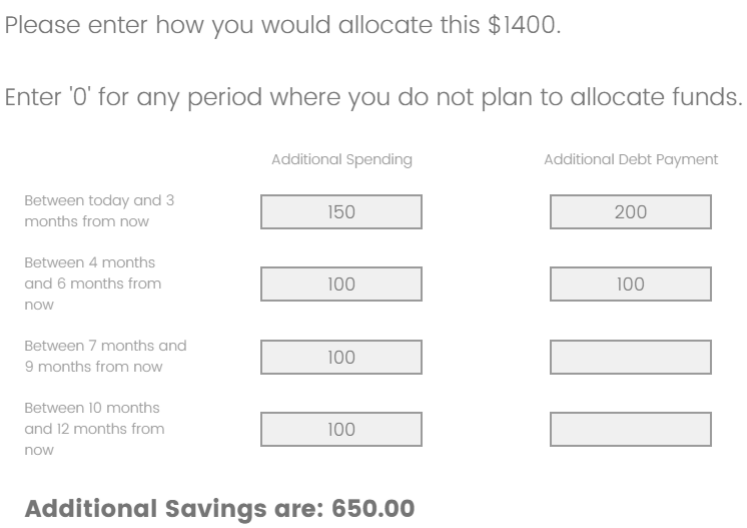
[2. Government Transfer Policy] In this scenario the government sends a one-time unexpected cash transfer of $1,400 to every household in the USA today, including yours. We are interested in understanding how you would use this additional cash.

[3. Government Transfer Policy + Information] In this scenario, the government sends a one-time unexpected cash transfer of $1,400 to every household in the USA today, including yours. To finance this deficit, the government will raise your taxes by $1,400 next year. We want to understand how you would use the $1,400 transfer today.

There are 3 ways your household could use this additional income:

- Additional spending: purchases of durable goods (e.g., cars, furniture, jewelry, etc.) or non-durable goods and services (e.g., food, clothes, vacation, etc.) in addition to those you already planned to purchase.
- Additional debt repayments: principal and interest payments to reimburse outstanding debt (e.g., credit card debts, mortgages, student and consumer loans, etc.) in addition to those you already planned to make.
- Additional Savings: the additional income that is neither spent nor used to repay debt.

Please enter how you would allocate this $1400. Enter '0' for any period where you do not plan to allocate funds.
[We next display an image of the matrix displayed to answer this.]



C.6 Expectation Questions

[Next, we elicit people's expectations after the cash transfer. The prompt depends on which scenario people received, but the questions are the same across scenarios.]

[If Government Rebate:] Now, we would like to understand your expectations about income, taxes, inflation, and interest rates in the scenario previously discussed (the government's cash transfer of $1,400 only to your household).

[If Government Transfer Policy and Government + Tax Information:] Now, we would like to understand your expectations about income, taxes, inflation, and interest rates in the scenario previously discussed (the government's cash transfer of $1,400 to all households).

Please fill out the same tables again incorporating that impact (if any) into your answers.

1. By what percentage do you expect your total household's pre-tax income to change in the following periods? By pre-tax income we mean your income before you pay any taxes. Please write your answer in percent; For example, if you expect your household income to increase by x% relative to your current household income, input x; if you expect it to decrease by x% input -x; if you expect your household income to remain constant, input 0.
   [Between Jan 1, 2025 and Dec 31, 2025: [Text box]; Between Jan 1, 2026 and Dec 31, 2026: [Text box]; Between Jan 1, 2030 and Dec 31, 2030: [Text box]]

2. By what percentage do you expect your total household's federal taxes to change in the following periods? Please write your answer in percent; For example, if you expect your federal taxes to increase by x% relative to your current federal taxes, input x; if you expect it to decrease by x%

input -x; if you expect your federal taxes to remain constant, input 0.
[Between Jan 1, 2025 and Dec 31, 2025: [Text box]; Between Jan 1, 2026 and Dec 31, 2026: [Text box]; Between Jan 1, 2030 and Dec 31, 2030: [Text box]]

3. What do you expect the inflation rate to be in the following periods? [The annual inflation rate measures how much prices in the economy rise from year to year.] Please write your answer in percent; if you mean x%, input x.
[Between Jan 1, 2025 and Dec 31, 2025: [Text box]; Between Jan 1, 2026 and Dec 31, 2026: [Text box]; Between Jan 1, 2030 and Dec 31, 2030: [Text box]]

4. What do you expect the average interest rate on one-year Treasury bills to be in the following periods? [The one-year Treasury bill rate reflects the yield received from investing in a U.S. government-issued security with a one-year maturity.] Please write your answer in percent; if you mean x%, input x.
[Between Jan 1, 2025 and Dec 31, 2025: [Text box]; Between Jan 1, 2026 and Dec 31, 2026: [Text box]; Between Jan 1, 2030 and Dec 31, 2030: [Text box]]

C.7 Economic Information on the Household

Next, we want to understand more about your household's economic situation. By household, we mean the people who usually live in your primary residence (including yourself), excluding roommates and renters.

1. Which category below represents the total combined pre-tax income of all household members (including you) during the past 12 months?
[Less than $10,000; $10,000 to $19,999; $20,000 to $29,999; $30,000 to $39,999; $40,000 to $49,999; $50,000 to $59,999; $60,000 to $74,999; $75,000 to $99,999; $100,000 to $149,999; $150,000 to $199,999; $200,000 to $249,999; $250,000 or more.]

2. Which illiquid assets do the people in your household (including you) have?
[Real estate properties; Vehicles; Retirement Accounts (401k,403b, 457, IRA, thrift savings plans, etc.); Private ownership of farms/businesses; Insurance holdings; None of the above]

3. What is your household's net illiquid wealth? Net illiquid wealth is equal to the sum of the value of all the illiquid assets that your household owns minus the value of any outstanding loans associated with these illiquid assets (e.g., mortgages, car loans, farm/business loans). Note that the value of your net illiquid wealth may be negative if the value of the associated outstanding loans exceeds that of your illiquid assets.
[Less than -$50,000; -$49,999 to -$30,000; -$29,999 to -$20,000; -$19,999 to -$10,000; -$9,999 to -$5,000; -$4,999 to -$2,000; -$1,999 to -$1,000; -$999 to -$500; -$500 to $0; $0 to $500; $500 to $999; $1,000 to

$1,999; $2,000 to $4,999; $5,000 to $9,999; $10,000 to $19,999; $20,000 to $29,999; $30,000 to $49,999; $50,000 to $99,999; $100,000 to $249,999; $250,000 to $499,999; $500,000 to $749,999; $750,000 to $999,999; $1,000,000 or more.]

4. Which liquid assets do the people in your household (including you) have? Please do not include any investments in retirement accounts (401k,403b, 457, IRA, thrift savings plans, etc.) or employer-sponsored pensions.
   [Checking account or cash; Savings accounts; Money market funds; CDs (Certificates of Deposit); Government/Municipal Bonds or Treasury Bills; Stocks or bonds in publicly held corporations, stock or bond, mutual funds, or investment trusts (held outside of 401 k's); Cryptocurrency; None of the above]

5. Which of the following types of debt do the people in your household (including you) have?
   [Credit card debt; Student loans; Personal loans; Other debt; None of the above]

   5. What is your household's net liquid wealth? Net liquid wealth is equal to the sum of the value of all the liquid assets that your household owns minus the value of any outstanding debt (excluding mortgages, car loans and farm/business loans). Remember that liquid asset categories are checking accounts or cash, savings accounts, money market funds, CDs, Government/Municipal Bonds or Treasury Bills, Stocks or bonds in publicly held corporations, mutual funds, or investment trusts. Debt categories you should include are Credit card debt, Student loans, Personal loans, and Other debt (unrelated to illiquid assets).
   [Less than -$50,000; -$49,999 to -$30,000; -$29,999 to -$20,000; -$19,999 to -$10,000; -$9,999 to -$5,000; -$4,999 to -$2,000; -$1,999 to -$1,000; -$999 to -$500; -$500 to $0; j. $0 to $500; $500 to $999; $1,000 to $1,999; $2,000 to $4,999; $5,000 to $9,999; $10,000 to $19,999; $20,000 to $29,999; $30,000 to $49,999; $50,000 to $99,999; $100,000 to $249,999; $250,000 to $499,999; $500,000 to $749,999; $750,000 to $999,999; $1,000,000 or more.]

6. When you review or plan for your household's regular spending and savings, how far in advance do you usually try to plan for?
   [Between 2 and 4 weeks; Between 1 and 2 months; Between 2 and 3 months; Between 3 and 6 months; Between 6 and 9 months; Between 9 and 12 months; More than 12 months]

C.8 How informed individuals are?

Next, we are interested in your individual views and perceptions of the US economic and fiscal situation.

1. What do you think the Federal Spending was, as a percentage of Gross Domestic Product, in 2023? [Annual gross domestic product (GDP) is the market value, measured in dollars, of all final goods and services produced by a country in a given year.] Please write your answer in percent; if you mean x%, input x.
   [Text box]

2. What do you think the Tax Revenue was, as a percentage of Gross Domestic Product, in 2023? [Tax revenue is the income that the federal government collects from taxes imposed on individuals, businesses, and other entities.] Please write your answer in percent; if you mean x%, input x.
   [Text box]

3. What do you think the Federal Debt was, as a percentage of Gross Domestic Product, in 2023? [The federal debt is the total amount the government owes, as a percentage of GDP.] Please write your answer in percent; if you mean x%, input x.
   [Text box]

4. What is the Federal Reserve Bank's target inflation rate over the long run? [The rate of inflation that the central bank aims to achieve and maintain over the long run.] Please write your answer in percent, if you mean x%, input x.
   [Text box]

5. How many hours a week do you usually spend gathering information about the US economy?
   [Text box]

6. What is your primary source of news about national issues:
   [WSJ, Other national newspapers, Local newspapers, CNN, Fox News, MSNBC, Other television broadcasts; Radio; Social media, including podcasts; Washington Post; X (formerly Twitter); Other. Specify: [Text box]]

C.9 Feedback

Thank you for participating in this survey. In this section, we kindly request your feedback on your experience to improve this survey for future iterations.

1. How easy/difficult was it to respond to the questions in this survey?
   [Very easy; Easy; Neutral; Difficult; Very Difficult]

2. If you selected difficult or very difficult above, please tell us some examples of how we can make it easier to respond to this survey?
   [Text box]

We thank you for your time spent taking this survey. Please click next to be redirected back to Prolific and register your submission.