Ricardian Non-Equivalence*

Martin Eichenbaum[†] Joao Guerreiro[‡] Jana Obradović[§]

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Abstract

This paper presents new survey evidence on household spending plans following fiscal-transfer policies. Our key finding is that the planned propensity to spend out of transfers equals the marginal propensity to consume (MPC), implying that people fail to incorporate future tax liabilities into their plans. We show that despite incorporating borrowing constraints, the canonical HANK model cannot account for our survey results. The reason for this failure is that people's spending plans are too sensitive to future tax liabilities. We develop an extended HANK model in which people are partially inattentive to future tax liabilities as well as the general equilibrium consequences of fiscal policy. This inattention dampens forward-looking intertemporal MPCs, thereby rendering the model consistent with our survey findings. We use the model to analyze the aggregate impact of changes in fiscal policy. We find that the transfer and government spending multipliers in the inattentive HANK model are larger than the multipliers in the canonical HANK model.

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[†]Northwestern University and NBER; eich@northwestern.edu.
[‡]UCLA and Federal Reserve Bank of Minneapolis; jguerreiro@econ.ucla.edu.
[§]Northwestern University; janaobradovic2027@u.northwestern.edu.

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 (NK) models (e.g., Woodford, 2003b, Galí, 2008, and Christiano, Eichenbaum, and Evans, 2005). While this result provides a useful theoretical benchmark, it is well understood that a variety of empirical and institutional considerations can cause Ricardian Equivalence to fail. 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]

David Ricardo himself rejected Ricardian Equivalence 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): the idea that households do not fully internalize future tax liabilities when making current spending decisions.[2] We proceed in four steps. First, we design and implement survey-based experiments to measure how people respond to government transfers and the degree to which they incorporate future tax liabilities into their spending plans. Our key findings provide strong support for RNE: people's planned propensity to spend out of transfers equals their marginal propensity to consume (MPC). Second, we argue that our empirical findings pose a challenge to models that assume people have full information and rational expectations (FIRE), including models that incorporate borrowing constraints and incomplete

[1] Elmendorf and Mankiw (1999) review various reasons for the failure of Ricardian Equivalence. For recent empirical evidence on the impact of deficits on output and inflation see Barro and Bianchi (2024) and Hazell and Hobler (2024).

[2] O'Driscoll Jr (1977) also points 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). Gabaix (2020), Woodford and Xie (2022), and Bianchi-Vimercati, Eichenbaum, and Guerreiro (2024) model limited foresight or limited understanding of the government budget constraint as a source of RNE.

markets. Third, we extend the canonical Heterogenous-Agent New Keynesian (HANK) framework of Auclert et al. (2024b,a) to incorporate inattention to future tax liabilities and the response of aggregate variables to a fiscal policy shock. Inattentive consumers are less responsive to future tax liabilities and other general-equilibrium (GE) consequences of a transfer. The first force increases the contemporaneous spending response while the second force attenuates that response.

Finally, we show that in a calibrated version of the *inattentive HANK* model the first effect dominates the second effect. This property enables the model to account for our survey-based findings. Moreover, the transfer and government spending multipliers in this model are substantially larger than the corresponding multipliers in the canonical HANK model. The magnification effects are particularly strong in environments where MPCs are high.[3]

We now discuss these four steps in greater detail.

Survey Results Section 2 discusses the results of a survey that we conducted from December 2024 to September 2025, with 99% of our responses obtained by January 2025. We use survey experiments to estimate households' consumption responses to hypothetical government transfers, using the survey methodology developed by Colarieti, Mei, and Stantcheva (2024).[4] Each respondent is randomly assigned to one of three hypothetical experiments: (E1) they receive an individual \$1,400 tax rebate that, by design, has no aggregate fiscal implications; (E2) a universal \$1,400 transfer to all U.S. households, including theirs, that gives rise to an increase in government deficits; and (E3) the same universal transfer as E2, coupled with information that their personal future taxes will rise to offset the current deficit. We use the change in people's planned spending in experiment E1 to estimate their MPC, and the change in planned spending in experiments E2 and E3 to estimate their planned propensity to spend out of transfers.

Our central finding is that the fraction of aggregate transfers that people plan to spend is essentially the same as the marginal propensity to spend out of individual transfers, i.e., the planned propensity to spend is the same in experiments E1 and E2.[5] This finding indicates that people do not incorporate the implications of future taxes into their current spending decisions. When we explicitly inform people about the rise in their future taxes,

[3]In Appendix G, we develop a tractable HANK model in which we can formally prove that the general equilibrium consequences of RNE are amplified with higher values of the MPC.

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

[5]In reporting results, we focus on the average propensity to spend, since that is the key object for our model. In Appendix Figure B.4 we show that the entire cross-sectional distribution of planned spending propensities is essentially indistinguishable between these two experiments.

experiment E3, the average propensity to spend out of the transfer falls but is still far from the value of zero that would obtain under Ricardian Equivalence.

We also elicit people's expectations of future tax liabilities at horizons of one, two, and six years. Expectations are essentially the same in scenarios E1 and E2. In scenario E3, people revise their expectations of future tax liabilities upward.

Taken together, these findings support the view that RNE fails because people do not incorporate the future tax implications of aggregate transfers into their spending plans.

HANK Model under FIRE Section 4 analyzes the effects of a government transfer in the canonical FIRE-based HANK model (see Auclert et al. 2024b,a). The model incorporates standard reasons why Ricardian Equivalence does not hold, e.g., incomplete markets, borrowing constraints, and distortionary taxation.

We calibrate the model so that the annual average MPC equals the value in our survey experiment E1. We simulate the effects of fiscal transfers on household spending plans. In the baseline simulation, we assume that the government raises future lump-sum taxes to pay for these transfers. We find that the model-implied planned spending response is significantly lower than the corresponding value of our survey-based empirical estimate. The anticipation of higher future taxes associated with the transfers exerts substantial downward pressure on spending plans, reducing the overall propensity to spend out of transfers by 47 percent. Similar quantitative findings hold as we vary the persistence of the government debt associated with the transfers. The results also hold if the government raises income taxes rather than lump-sum taxes to finance the transfer.

In Appendix D.4, we also show that the canonical HANK model is also inconsistent with our survey results when monetary policy keeps the real interest rate constant or the government finances transfers by lowering government spending.

Taken together, our findings show that the canonical FIRE-based HANK model cannot account for the magnitude of the spending response to transfers observed in our micro-evidence. This result underlies our interest in analyzing the effects of fiscal policy in the inattentive HANK model.

Inattentiveness: A Solution The primary reason that the canonical HANK model understates the propensity to spend out of transfers is the assumption that households have fully-informed and rational expectations. This assumption implies that people's spending plans are too sensitive to the future taxes associated with transfers. To address this shortcoming, we embed inattention into the canonical HANK model using the cognitive-discounting framework of Gabaix (2020).[6]

Introducing inattention into the HANK model gives rise to two important effects: (i) it breaks Ricardian Equivalence, because people do not accurately forecast future taxes, and (ii) it attenuates general-equilibrium feedback mechanisms because people do not accurately forecast the aggregate effects of fiscal policy. The first effect raises household spending in response to transfers, while the second effect generally dampens spending responses by weakening households' sensitivity to changes in equilibrium income and prices.[7] For moderate degrees of inattention, the first effect dominates, so that people's planned propensity to spend out of aggregate transfers is larger than under FIRE. A calibrated version of the inattentive HANK can account for our finding that people's planned propensity to spend out of aggregate transfers equals their MPC.

We also show that, in contrast to the HANK model, calibrated versions of Representative-Agent or Two-Agent New Keynesian models (respectively, RANK and TANK) cannot be rendered consistent with our survey results. This result obtains whether or not we allow for inattention. That is why we focus our analysis on the aggregate effects of fiscal policy using the inattentive HANK model.

We find that inattention increases the transfer multiplier by 26 percent relative to the FIRE-based HANK model. A formal decomposition of the multiplier establishes that the increase induced by inattention primarily reflects households' failure to internalize future tax liabilities. The impact of the GE-dampening effect is relatively modest because the effect of inattention to aggregate income and interest rates largely cancel each other out.

We also study the effects of inattention on the impact of deficit-financed government spending shocks on aggregate activity. Under FIRE, the model yields a first-year multiplier of 0.95, so that aggregate consumption *falls* after an increase in government purchases. By contrast, under inattention, the multiplier rises to 1.08, so that aggregate consumption *rises* after an increase in government purchases. As with transfers, the key mechanism underlying this result is the failure of inattentive households to incorporate the present value of higher future taxes into their current consumption decisions.

[6]Despite the additional complexity associated with this departure from FIRE in a HANK framework, the model remains tractable using recent advances in sequence-space methods as developed in Auclert, Rognlie, and Straub (2020).

[7]The role of bounded rationality in dampening general equilibrium channels has been extensively studied in the literature. See Angeletos and Lian, 2023, for a comprehensive review.

1.1 Related Literature

This paper contributes to the literature on the economic effects of fiscal deficits when Ricardian Equivalence does not hold. We focus on departures driven by people's 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 or limited understanding of the government budget constraint as a reason for the failure of Ricardian Equivalence. Our key theoretical contribution is to extend this analysis beyond the RANK framework, demonstrating how agent heterogeneity and bounded rationality interact to amplify the transfer multiplier. This result is complementary to the results in Farhi and Werning (2019) and Angeletos and Huo (2021). However, their results pertain to the GE dampening effect on the economy's response to shocks. Our analysis shows that inattention to future taxation amplifies the effects of fiscal policy.

Our modeling approach is based on the cognitive-discounting framework of Gabaix (2020). The key insights extend to other models of inattention, including noisy information rational expectations (e.g., Lucas Jr, 1972, and Woodford, 2003a), rational inattention (e.g. Sims, 2003, and Maćkowiak, Matějka, and Wiederholt, 2023), behavioral inattention/sparsity (e.g. Gabaix 2014, 2019), and sticky expectations frameworks (e.g. Mankiw and Reis, 2002, Carroll et al., 2020, and Auclert et al., 2020). In Appendix C.6, we show that RNE can be generated in these different models of inattention. We also show that RNE can be microfounded using other forms of bounded rationality, including level-k thinking (e.g., Farhi and Werning, 2019, Farhi, Petri, and Werning, 2020, Bianchi-Vimercati, Eichenbaum, and Guerreiro, 2024, and Mei and Wu, 2024), reflective expectations (García-Schmidt and Woodford, 2019), limited foresight (e.g., Woodford, 2019 and Woodford and Xie, 2019, 2022), and policy function uncertainty (e.g., Ilut and Valchev, 2023, and Enke et al., 2024).[8]

By studying the effects of fiscal transfers in an inattentive HANK model, we contribute to the broader literature on heterogeneous-agent models featuring bounded rationality. Farhi and Werning (2019) and Farhi, Petri, and Werning (2020) study the transmission of monetary and government spending policies in HANK economies when people are level-k thinkers. Angeletos and Huo (2021) show how HANK features exacerbate the consequences of incomplete information and lack of common knowledge for equilibrium dynamics. Auclert, Rognlie, and Straub (2020) and Pfäuti and Seyrich (2022) study HANK models with sticky expectations and cognitive discounting, respectively, focusing on the

[8] Angeletos and Lian (2017) review recent developments in this literature, highlighting the key commonalities across different models.

implications for the monetary policy transmission mechanism. Bardóczy and Guerreiro (2023) develop a HANK model with search-and-matching frictions and study the impact of unemployment benefits on economic activity with imperfect expectations, using data on expectations. Guerreiro (2023) studies the consequences of heterogeneous beliefs in HANK economies across a large variety of shocks.

Empirically, our paper contributes to the growing use of survey data to quantify behavioral mechanisms in macroeconomic models (e.g., Roth and Wohlfart, 2020, Coibion et al., 2022, 2023, and Stantcheva, 2023). Our measurement of MPCs from survey data follows the methodology in Colarieti, Mei, and Stantcheva (2024) and connects to 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, Andre, Flynn, Nikolakoudis, and Sastry, 2025). A distinctive feature of our contribution is that we compare spending responses to idiosyncratic transfers with responses to aggregate transfers, allowing us to assess whether households internalize the future tax implications of deficit-financed fiscal policy.

Outline The paper is organized as follows. Section 2 discusses the details of the survey. Section 3 discusses the conceptual framework underlying the survey design and our empirical findings. Section 4 describes our HANK model under FIRE and our calibration of that model. We show that this model is robustly inconsistent with our empirical findings from experiment E2. Section 5 extends the HANK model to incorporate inattention. We show that this version of the model is consistent with our empirical findings. Section 6 shows that alternative models, namely RANK or TANK models, with or without inattention, cannot be rendered consistent with our survey findings. Sections 7 and 8 discuss the contribution of RNE in the inattentive HANK model to the overall government transfer and spending multipliers, respectively. We conclude in Section 9. The Appendix contains proofs, additional empirical and quantitative analyses, the additional tractable HANK model which derives additional theoretical insights, and the survey questionnaire.

2 Survey Design

We conducted an online survey to understand how people obtain information and reason about the future tax consequences of fiscal deficits. The survey was conducted via Prolific between December 2024 and September 2025. Almost all of our responses (99%) were collected between December 2024 and January 2025. We collected a total of 6,000 responses. Participation in the survey was limited to individuals between 22 and 65 years old. To ensure that the sample is representative of the US population, we imposed sample targets based on gender, education, and political affiliation. We computed gender and education targets using data from the November 2024 Current Population Survey.[9] Political affiliation targets were computed based on Gallup data from October 2024. On average, participants spent 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 presents a comparison between the characteristics of our sample and those of the broader U.S. population. The sample is broadly representative, though it exhibits a modest over-representation of younger and unemployed individuals, and a slight under-representation of white individuals. Appendix C.3 shows that our empirical results are robust to re-weighting the sample to more closely align with the demographic composition of the U.S. population.

Our survey is mainly composed of closed-ended questions. Following best practices, we generally include an "Other" option and a box for open-ended answers (Stantcheva, 2023). As discussed before, we randomly assigned respondents to one of three hypothetical experiments: (E1) the benchmark case in which people receive an idiosyncratic tax rebate of $1,400, a scenario has no aggregate fiscal implications; (E2) a universal transfer of $1,400 to all U.S. households, a scenario which does have implications for future taxes; and (E3) the same universal transfer, but respondents are informed they will have to pay more taxes in the future. The first experiment enables us to compute the marginal propensity to consume, while the second and third experiments allow us to compute people's planned propensity to spend when the policy has fiscal and aggregate consequences.

In the literature, it is standard to estimate MPCs using data from lotteries (Fagereng et al., 2021). In pretests of our survey, we experimented with alternative scenarios in which the cash transfer in experiment E1 was framed as coming from winning a lottery. We found that the responses to those questions and the responses in experiment 1 are very similar. Based on this evidence, we excluded the non-government transfer scenario from the main survey. Appendix H contains the full questionnaire.

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

2.1 How Well-Informed are People about General Economic Conditions?

We now discuss our survey-based evidence on how informed people are about aggregate economic conditions and the government's fiscal position.

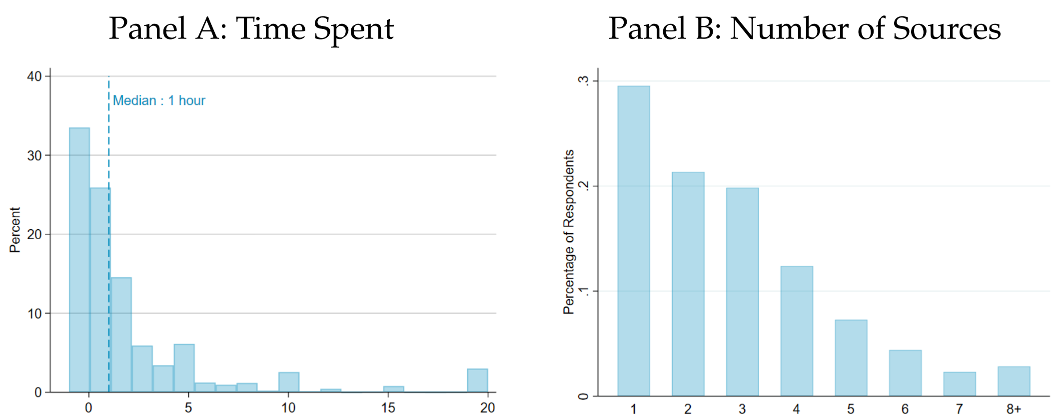

Figure 2.1: Information Acquisition

Notes: Panel A 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?" In the figure, the data from the responses were winsorized at 0 and 20 hours, replacing values below 0 with 0 and values above 20 with 20 to generate a more interpretable range. Panel B 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.

People spend little time obtaining information about the US fiscal situation We asked respondents how many hours per week they typically spend gathering information about the US economy. Figure 2.1 Panel A shows the distribution of the responses. The median time spent acquiring information is one hour per week. Over 70 percent of respondents report that they spend fewer than 2 hours a week gathering news.

People rely on a small number of information sources We asked respondents to report the number and types of sources from which they usually obtain information about the US economy. Figure 2.1 Panel B displays the distribution of the number of sources our survey respondents used. The median person receives information from fewer than two sources. Almost 30 percent report using only one information source.

Appendix Figure B.1 shows the types of sources from which survey respondents obtain information about the US economy. Strikingly, 70 percent of people report obtaining news from social media (X plus other social media). The next important two sources of news are the two cable news channels, CNN and Fox News.

People misperceive the current U.S. fiscal situation We asked respondents about the magnitude of three key fiscal indicators in 2023. Figure 2.2 displays the distribution of perceptions about the ratio of the U.S. federal debt of GDP.

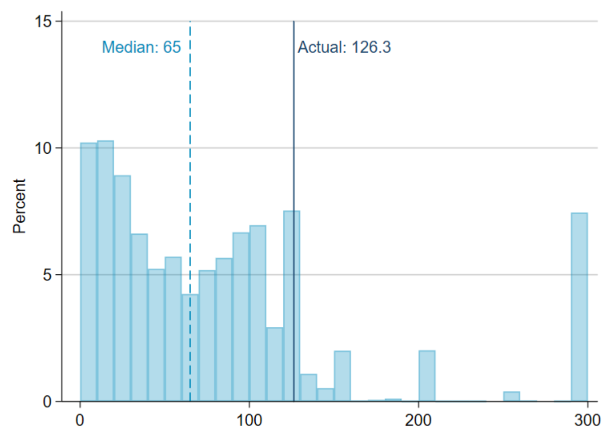

Figure 2.2: Preceptions of the Ratio of US Federal Debt to GDP

Notes: This figure presents the distribution of responses to the question "What do you think federal debt was, as a percentage of GDP, in 2023?" In the figure, the data have been top-coded at 300 percent, setting all values above 300 to 300. The median estimates provided by respondents are indicated with dashed lines, while the actual values are represented by solid lines.

Figure 2.2 shows large dispersion in people's perceptions. Most people make large mistakes about the size of the federal-debt to GDP ratio. The vast majority of people substantially underestimate that ratio: the median and mean perception of the ratio are 65 percent and is 75.4 percent, respectively. The actual size of that ratio in 2023 was 118.60 percent.[10] Only about 13.8 percent of respondents think that the ratio is equal to or greater than its actual level.

Panels A and B of Figure B.2 in the Appendix display the distribution of perceptions about federal spending and taxes, respectively. The median person slightly overestimates federal spending and underestimates tax revenue. The average response is substantially higher than the actual value of both indicators. The average person thought that the

[10]The portion of the debt held by the public is equal to 94.33 percent of GDP

ratios of federal spending to GDP and tax-revenue to GDP ratio was 35.3 percent and 22.5 percent, respectively. The actual values are 22.5 and 16.2 percent, respectively. Figure B.3 in the Appendix also displays the respondents' perceptions of the Federal Reserve's inflation target.

3 Survey Results: Ricardian Non-Equivalence

In this section, we report the results of our survey regarding the extent to which individuals account for the future fiscal implications of government deficits when making spending plans. We use the survey results to estimate individuals' propensity to spend out of a cash transfer under three distinct hypothetical scenarios: (E1) an individual cash transfer, (E2) a universal transfer distributed to all households in the U.S. economy, and (E3) a universal transfer accompanied by explicit information that there will future tax increases to offset the cost of the universal transfer. People's responses in these hypothetical scenarios correspond to their spending plans absent any other observations of how the economy would respond to the transfers. For this reason, we refer to these responses as their *planned spending responses* to the transfers.

3.1 A Simple Model of Ricardian Non-Equivalence

To motivate our empirical analysis, it is useful to consider a stylized spending-saving framework. Consider a simple model in which consumers live for two periods $t \in \{0, 1\}$. In each period, they consume C_t and obtain income Y_t. To focus on the problem of inattention to taxes, we assume the household faces no income uncertainty. Consumers maximize the expected present discounted value of utility from consumption:

$$E_0 \left[u\left(C_0\right) + \beta u\left(C_1\right) \right], \tag{3.1}$$

where $\beta \in (0, 1)$ is the subjective discount factor, $u(C)$ is increasing, concave, and twice continuously differentiable, and $E_0[\cdot]$ denotes the household's expectations. The household budget constraints are given by

$$C_0 + B = Y_0 - T_0 + \varepsilon_0, \tag{3.2}$$

$$C_1 = Y_1 - T_1 + (1+r)B. \tag{3.3}$$

Here B denotes the household's savings at time 0, ε_0 denotes a transfer from the government, T_0 and T_1 denote taxes at time 0 and 1, respectively, and r denotes the real interest rate. Taxes and transfers satisfy the government budget constraint, so $dT_1/d\varepsilon_0 = (1+r)$. Note that the household must forecast T_1 to solve its problem. We summarize the impact of the transfer policy on spending by the propensity to spend out of the transfer, denoted $dC_0/d\varepsilon_0$. To ease the exposition, we treat Y_0, Y_1, and r as exogenous in this simple model.

Spending Behavior under FIRE Under FIRE, the consumer observes ε_0 and forecasts the change in future tax liabilities perfectly. The consumer's time 0 propensity to spend out of the transfer can be decomposed as follows:

$$\frac{dC_0}{d\varepsilon_0} = m_0 - m_1 \cdot \frac{dT_1}{d\varepsilon_0}. \tag{3.4}$$

The propensity to spend out of a transfer is equal to the MPC out of current income, m_0, minus the intertemporal MPC, m_1, times the change in future taxes, $dT_1/d\varepsilon_0$. As in Auclert, Rognlie, and Straub (2024b), the MPCs m_t are *partial-equilibrium* objects which summarize the individual's time 0 spending response to an additional unit of income at time t, i.e., $m_t = \partial C_0/\partial Y_t$. Intuitively, upon receiving a transfer, individuals increase current consumption by an amount proportional to the marginal propensity to consume (MPC), m_0. Anticipating future tax liabilities, they adjust their spending today in anticipation of future taxes, an effect captured by the term $m_1 \cdot dT_1/d\varepsilon_0$. Equation 3.4 allows us to interpret the Ricardian Equivalence theorem in terms of the magnitude of intertemporal MPCs. Appendix C.5 provides analytic expressions for m_0 and m_1.

Theorem 1 (Ricardian Equivalence Theorem)**.** *In this model, the MPCs satisfy* $m_1 = \frac{m_0}{1+r}$. *Then,*

$$\frac{dC_0}{d\varepsilon_0} = m_0 - m_1 \cdot \frac{dT_1}{d\varepsilon_0} = m_0 - \frac{m_0}{1+r} \cdot (1+r) = 0.$$

This theorem shows how Ricardian Equivalence arises from the relationship between intertemporal MPCs: the decline in future disposable income induced by anticipated taxation exactly offsets the stimulative effect of the transfer at time 0, yielding a zero net impact on aggregate consumption.

Spending Behavior under Inattention We now illustrate how imperfect anticipation of future taxes breaks Ricardian Equivalence and increases people's propensity to spend government transfers. In reality, consumers must wrestle with the complex problem of forecasting future taxes and incorporating those forecasts into current spending decisions. To reflect this complexity, we adopt a model of inattention in which people do not fully internalize the effects of future taxation.

For arbitrary expectations regarding future taxation, $E_0\left[\frac{dT_1}{d\varepsilon_0}\right]$, the planned spending response to a transfer is given by

$$\frac{dC_0}{d\varepsilon_0} = m_0 - m_1 \cdot E_0\left[\frac{dT_1}{d\varepsilon_0}\right]. \tag{3.5}$$

Under FIRE, expectations are model-consistent, i.e., $E_0\left[\frac{dT_1}{d\varepsilon_0}\right] = \frac{dT_1}{d\varepsilon_0} = 1 + r$.

To capture inattention, we introduce a parameter λ that generates a cognitive wedge in consumers' expectations:

$$E_0\left[\frac{dT_1}{d\varepsilon_0}\right] = \lambda \cdot \frac{dT_1}{d\varepsilon_0}. \tag{3.6}$$

When $\lambda < 1$, households are partially inattentive to T_1. The limiting case of $\lambda = 1$ corresponds to FIRE. Substituting equation (3.6) into (3.5) we obtain the following result.

Proposition 1. *The propensity to spend out of an aggregate transfer is given by:*

$$\frac{dC_0}{d\varepsilon_0} = m_0 - m_1\lambda \cdot \frac{dT_1}{d\varepsilon_0} = (1-\lambda)\, m_0. \tag{3.7}$$

It follows that Ricardian equivalence fails when households are inattentive, i.e., $\lambda < 1$.

According to Proposition 1, inattention reduces the intertemporal MPC from m_1 to $m_1\lambda$. For $\lambda < 1$, future tax liabilities are less important for current spending decisions than under FIRE, an effect that amplifies the response of aggregate demand to transfers. Since agents believe that a transfer raises their permanent income, they increase current consumption, and Ricardian Equivalence fails to hold.

Appendix C.6 shows that various micro-founded models give rise to the representation of expectations given by 3.6. These models incorporate dispersed information and rational expectations (Lucas Jr, 1972; Woodford, 2003a), rational inattention (Sims, 2003), sticky information (Mankiw and Reis, 2002; Carroll et al., 2020; Auclert et al., 2020), cognitive discounting (Gabaix, 2020), behavioral inattention or sparsity (Gabaix, 2014, 2019), different forms of general-equilibrium inattention and level-k thinking (Bianchi-Vimercati et al., 2024; Mei and Wu, 2024), policy function/cognitive uncertainty (Ilut and Valchev, 2023; Enke and Graeber, 2023), and limited planning horizons (Woodford, 2019; Woodford and Xie, 2019, 2022). The equivalence among these models arises from a shared feature: the response to changes in the economic environment is attenuated relative to the FIRE benchmark.

Discussion The discussion above shows that inattention dampens forward-looking intertemporal MPCs and amplifies the spending response to transfers. Models that incorporate structural features such as finite lives and incomplete markets also weaken forward-looking MPCs. However, they do so in a way that also affects the contemporaneous MPC (m_0).[11] In contrast, inattention dampens forward-looking intertemporal MPCs without changing the contemporaneous MPC. It is precisely this property that allows the inattentive HANK model to account for our survey-based finding that the planned propensity to spend out of transfers equals the MPC.

3.2 Estimating the Planned Propensity to Spend out of Transfers

This section presents the results of our survey regarding people's planned spending in the three experiments discussed above.[12] In *Experiment 1* (E1), respondents are told that their household receives 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 of Experiment 1 is to estimate the MPC out of a typical cash transfer that does not have broader fiscal implications. Formally, we use Experiment 1 to estimate the marginal propensity to consume, m_0. The wording of Experiment 1 is given by:

Experiment 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 *Experiment 2* (E2), respondents are told that their household receives 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. Experiment 2 allows us to estimate people's planned spending response to an aggregate transfer policy. The wording of experiment E2 is given by:

[11] For example, Angeletos et al. (2024a,b) develop a tractable overlapping generations model with finite lives that breaks Ricardian Equivalence to evaluate the consequences of fiscal policy on spending behavior (see also Blanchard, 1985; Farhi and Werning, 2019). In this setting, the contemporaneous MPC is given by $m_0 = (1 - \omega\beta)$,where ω is the survival probability and β is the discount factor. The forward-looking MPCs are given by $m_t = (1 - \omega\beta)(\omega\beta)^t$, implying a tight structure linking the response of spending to current taxes responses. These functional relationships illustrate that any attenuation of forward-looking MPCs necessarily induces a corresponding change in the contemporaneous MPC, a constraint that is absent in models of inattention. This insight generalizes beyond finite-lives models; see Farhi, Olivi, and Werning (2022).

[12] In Appendix Table A.2, we show the distribution of characteristics for the sub-samples of the people who participated in each of the three experiments. There are no meaningful differences across the three groups of people.

Experiment 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.

Experiment 3 (E3) closely mirrors E2 with one important difference: respondents are informed that the government will raise their personal taxes in the following year to offset the current fiscal deficit. This scenario is useful to include in our analysis for two reasons. First, it is possible that, when responding to E2, a household thinks that other people, not them, will pay for the increase in transfers. Scenario E3 provides a check on this possibility. Second, providing households with information about how their personal taxes will change in the future reduces the cognitive burden associated with forecasting the fiscal consequences of government transfers. The wording of Experiment 3 is given by:

Experiment 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.

Following the methodology developed by Colarieti et al. (2024), our survey design has three important components. First, we provide clear definitions of spending, debt payments, and savings to ensure a consistent understanding among respondents. Second, we explicitly state that the reported spending from a transfer should be in addition to pre-transfer planned expenditures. Finally, we employ the interactive matrix design of Colarieti et al. (2024) to reduce the computational complexity that respondents face when allocating their cash transfers across different uses and times.

Figure 3.1 depicts the matrix interface used in the survey. We ask respondents to report their additional spending and debt payment plans for each of the following 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 debt payment allocations. The matrix is interactive, ensuring that an 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, allowing the total allocation to exceed $1,400. This design allows respondents to spend

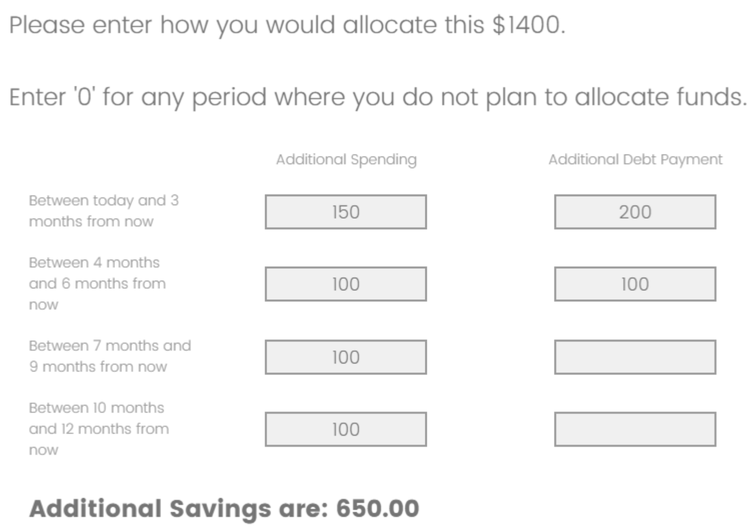

Figure 3.1: Interactive Matrix Design

Notes: This figure illustrates the interactive matrix design implemented in the survey. Participants can specify amounts for additional spending and additional debt payments in each of the four periods. Any unallocated portion of the transfer is automatically categorized as additional savings, which is displayed dynamically as respondents input their allocations.

more than the transfer they receive.

We aggregate the additional spending plan at an annual frequency and define the MPC for individual i as:

$$\Delta\text{SpendPlan}_i \equiv \frac{\sum_{t=0}^{3} \frac{1}{(1+r)^t}\text{Additional Spending}_{i,t}}{\$1,400}. \tag{3.8}$$

We set the interest rate, r, to 0.5%,implying an annual interest rate of 2 percent.[13]

Figure 3.2 displays the average propensity to spend, over all respondents, in E1 (red), E2 (green), and E3 (blue). The bars represent 99% bootstrapped confidence intervals for these statistics.[14]

In E1, people spend $440 out of an individual rebate of $1,400, implying an average

[13] In Appendix Figure B.5, we report the quarterly intertemporal MPCs associated with experiment E1,

$$\Delta\text{SpendPlan}^q_{i,t} \equiv \frac{\text{Additional Spending}_{i,t}}{\$1,400}.$$

[14] Appendix Figure B.4 reports the distribution of spending plans in the different scenarios. Panel A compares the distributions of MPCs under E1 and E2, represented in blue and red, respectively. Panel B illustrates the distributions of MPCs under E1 and E3, again using blue and red to differentiate between the two groups.

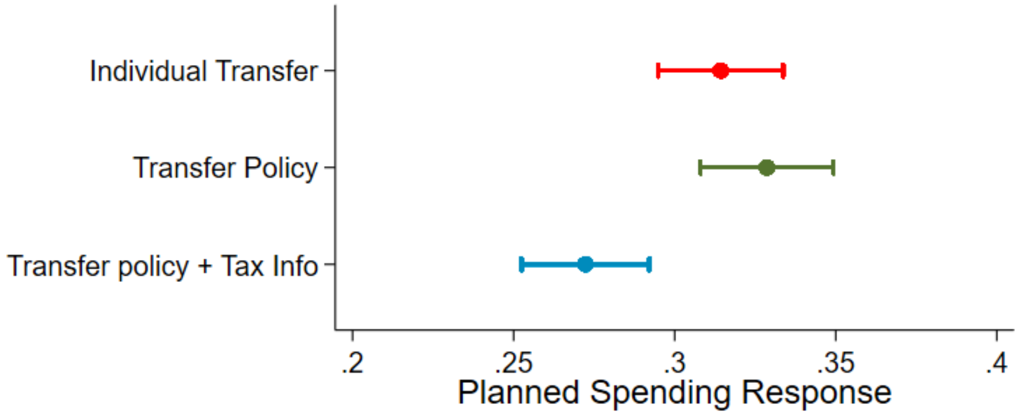

Figure 3.2: Annual Planned Propensity to Spend Across Experiments

Notes: The figure reports the average planned propensity to spend across experiments E1, E2 and E3. The planned propensity to spend is computed as total planned spending divided by the $1,400 transfer amount and aggregated to an annual rate. Each dot represents the average planned spending response in a given experiment, with horizontal lines indicating 99% confidence intervals., computed by bootstrap. "Individual Transfer" refers to the individual tax rebate of Experiment 1; "Transfer Policy" presents the universal transfer framed as government policy in Experiment 2; "Transfer Policy + Tax Info" adds information about the potential future tax implications of the policy of Experiment 3. Values above the 99th percentile are set equal to the 99th-percentile value for each expirement.

MPC of 0.314. This value is consistent with estimates in the literature, see Appendix C.4.

The average planned propensity to spend in experiment E2 is 0.329. The overlapping confidence intervals in the previous figure suggest that the difference in average planned spending between experiments E1 and E2 is statistically insignificant. Table 1 presents a formal test of the difference between the averages based on bootstrapping the difference statistic. Based on this test, we cannot reject the hypothesis that the difference equals zero. In our quantitative work, we assume that the annual MPC equals 0.32, the average of the corresponding numbers in experiments E1 and E2. Figure B.4 in the Appendix shows that the similarity in spending plans under E1 and E2 holds for the entire distribution of MPCs, reinforcing the view that future taxation exerts only a modest dampening effect on households' consumption plans.

Recall that in E3, we provide respondents with explicit information about the specific path of their own future taxes. Panel B of 3.2 indicates that this information leads to a statistically significant reduction in the average propensity to spend, from 0.314 to 0.272. Figure B.4, shows that the proportion of individuals who would save all of the transfer increases. These findings suggest that individuals become more responsive to anticipated future taxes when they are explicitly told that their personal tax burden will rise. But even

	Estimate	Difference vs. E1	p-value
E1	0.314	–	–
E2	0.328	0.014	0.18
E3	0.272	-0.042***	0.00

Table 1: Estimates of Annual Planned Propensity to Spend Across Experiments

Notes: This table reports the average planned propensities to spend for experiments E1, E2, and E3, as well as bootstrap tests of the difference in means relative to E1. To compare the mean MPCs between experiments E1 and E2 or E3, we construct a bootstrap confidence interval for the difference in means. In each bootstrap replication, we draw a random sample with replacement from the original data, compute the mean MPC in each experiment, and then calculate their differences. Repeating this procedure yields a bootstrap distribution for the difference in means, from which we obtain a 99% confidence interval. P-values are computed based on 1,000 bootstrap replications. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.

with this additional information, Ricardian Equivalence does not hold.

4 HANK Under FIRE

In this section, we explore the quantitative consequences of transfer policies for spending behavior through the lens of a canonical HANK model under FIRE (Auclert et al., 2024b). We begin with a concise overview of the model's key structural components. Appendix D presents further technical details.

Time is discrete and infinite $t = 0, 1, ...$ Each period corresponds to a quarter. At time 0, the economy is perturbed by a set of fiscal policy shocks, described below. The time path for these aggregate disturbances is determined at time 0, so there is no aggregate uncertainty. Households face uncertainty due to uninsurable idiosyncratic-income risk.

Households The economy is inhabited by a continuum of infinitely lived households indexed by $i \in [0, 1]$, who face uninsurable idiosyncratic-income risk. At each date t, household i consumes $c_{i,t}$ and works $n_{i,t}$. Their utility function is given by

$$\mathbb{E}_0 \left[\sum_{t=0}^{\infty} \beta^t u \left(c_{i,t}, n_{i,t} \right) \right], \tag{4.1}$$

where $u(c, n) = \frac{c^{1-\sigma^{-1}}}{1-\sigma^{-1}} - \chi \frac{n^{1+\psi^{-1}}}{1+\psi^{-1}}$, $\beta \in (0, 1)$ denotes the discount factor, and $\mathbb{E}_0 [\cdot]$ denotes the full-information rational-expectations operator.

At each date t, household i's idiosyncratic productivity state is given by $e_{i,t}$. The idiosyncratic productivity shock, which is independent across people, follows an AR(1) in logs with persistence parameter ρ and variance σ_e^2. Households can save in one-period risk-free bonds. They enter the period with $a_{i,t}$ assets on which they earn the real interest rate r_t. The household's time-t budget constraint is given by

$$c_{i,t} + a_{i,t+1} = (1-\tau_t)\left(e_{i,t}\frac{W_t}{P_t}n_{i,t}\right)^{1-\gamma} + (1+r_t)\,a_{i,t} - T_t, \tag{4.2}$$

where $w_t \equiv \frac{W_t}{P_t}$ denotes the real wage rate, and T_t denote lump-sum taxes. Given pre-tax income, $y_{i,t} = e_{i,t}\frac{W_t}{P_t}n_{i,t}$, people's after-tax income is given by the retention function $(1-\tau_t)\,y_{i,t}^{1-\gamma}$, where τ_t controls the average level of taxation and γ captures the progressivity of the income-tax code (see Heathcote et al., 2017). All households are subject to the borrowing constraint:

$$a_{i,t+1} \geq 0. \tag{4.3}$$

Firms A continuum of identical firms operate in a perfectly competitive product market. They hire labor N_t and produce $Y_t = N_t$. Profit maximization by final goods firms implies that, in equilibrium, $P_t = W_t$. It follows that price inflation π_t equals nominal-wage inflation π_t^w.

Wage NKPC Following the standard approach in the NK literature, we assume workers belong to monopolistic labor unions that face nominal wage adjustment costs (e.g., Erceg, Henderson, and Levin, 2000, Schmitt-Grohé and Uribe, 2005, and Auclert et al., 2024b). As in Auclert et al. (2024b), we assume an equal rationing rule so $n_{i,t} = N_t$ for all i. Appendix D shows that the NK Phillips curve is given by:

$$\pi_t^w = \kappa_w\left[\psi^{-1}\cdot\frac{dN_t}{N} + \sigma^{-1}\frac{dC_t}{C} - \left\{\frac{dZ_t}{Z} - \frac{dN_t}{N}\right\}\right] + \beta\mathbb{E}_t\left[\pi_{t+1}^w\right]. \tag{4.4}$$

Here κ_w is a scalar that depends on the cost of adjusting wages and $Z_t \equiv Y_t - \mathcal{T}_t^Y$ denotes after-tax labor income, where $\mathcal{T}_t^Y$ denotes total income tax revenue. The notation dX_t denotes the deviation of a variable X_t from its steady-state value.

Fiscal and Monetary Policies The government spends G and issues real debt, B_t. The government's budget constraint, defined in terms of real variables, is given by

$$G + (1+r_t)\,B_t = \mathcal{T}_t^Y + T_t + B_{t+1}. \tag{4.5}$$

The process for government debt follows:

$$dB_{t+1} = \rho_b dB_t + \varepsilon_t, \tag{4.6}$$

where ε_t denotes the transfer and $\rho_b \in (0,1)$ determines the persistence of government debt. We assume that the initial transfer is disbursed as a lump-sum payment $dT_0 = -\varepsilon_0$. The government finances this deficit with future taxes. We consider two alternative forms of financing. First, we assume that the government keeps income taxes constant $\mathcal{T}_t^Y = \mathcal{T}^Y$, and finances the deficit with future lump-sum taxation, T_t. Second, we consider the case in which $T_t = 0$, and the government finances deficits with future distortionary taxation, $\mathcal{T}_t^Y$.

Monetary policy is given by a Taylor rule:

$$(1 + i_t) = (1 + r^*)\, e^{\phi_\pi \pi_t}, \tag{4.7}$$

where i_t denotes the nominal interest rate, π_t is inflation, r^* is a scalar, and $\phi_\pi > 1$ is the Taylor coefficient on inflation. For simplicity, we do not include an output gap term in the Taylor rule.

Aggregation and Equilibrium The market clearing conditions for goods and asset markets are given by

$$C_t + G = Y_t = N_t \quad \text{and} \quad A_t = B_t,$$

respectively.

Aggregate consumption and asset demand are given by

$$C_t \equiv \int_0^1 c_{i,t} di, \quad \text{and} \quad A_t \equiv \int_0^1 a_{i,t} di.$$

We adopt the sequence-space representation of aggregate consumption, developed in Auclert et al. (2024b), which expresses aggregate demand as a functional of the underlying inputs to the household sector:

$$C_t = \mathcal{C}_t \left(\left\{ T_s, Y_s - \mathcal{T}_s^Y, r_s \right\}_{s=0}^{\infty} \right). \tag{4.8}$$

Here $Y_s - \mathcal{T}_s^Y$ denotes aggregate after-tax real labor income.

4.1 The Propensity to Spend out of Transfers

We now use our model to analyze the implications of transfer policies for aggregate spending. Our approach begins by mapping the experiments into properties of the aggregate spending function $\mathcal{C}_t(\cdot)$. To evaluate the year-one response of aggregate consumption, we define the present value of consumption over the first year as follows:

$$C_0^{\text{annual}} = \sum_{s=0}^{3} \frac{1}{(1+r)^s} C_s, \tag{4.9}$$

where r denotes the steady-state real interest rate.

In survey experiment E1, respondents report their planned change in spending following the receipt of an idiosyncratic transfer at date $t = 0$. Since this transfer is idiosyncratic, it does not affect aggregate taxes, employment, income, or interest rates. Accordingly, the average marginal propensity to consume out of the transfer is given by:

$$m_0 \equiv \frac{\partial C_0^{\text{annual}}}{-\partial T_0} = \sum_{s=0}^{3} \frac{1}{(1+r)^s} \frac{\partial \mathcal{C}_s\left(\left\{T, Y - \mathcal{T}^Y, r\right\}_{s=0}^{\infty}\right)}{-\partial T_0}. \tag{4.10}$$

The aggregate transfer in experiment E2 induces GE effects. Under FIRE, households internalize the future adjustments in taxes, employment, and interest rates into their decision rule. The derivative of annualized consumption with respect to the size of the transfer shock, ε_0, is given by:

$$\frac{dC_0^{\text{annual}}}{d\varepsilon_0} = \underbrace{m_0}_{\text{MPC}} - \overbrace{\left\{\sum_{t=0}^{\infty} m_t \cdot \frac{dT_t}{d\varepsilon_0} + \sum_{t=0}^{\infty} M_t^Y \cdot \frac{d\mathcal{T}_t^Y}{d\varepsilon_0}\right\}}^{\text{Anticipation of Future Taxes}} + \underbrace{\sum_{t=0}^{\infty} M_t^Y \cdot \frac{dY_t}{d\varepsilon_0} + \sum_{t=0}^{\infty} M_t^r \cdot \frac{dr_t}{d\varepsilon_0}}_{\text{Anticipation of G.E. Effects}}, \tag{4.11}$$

where $m_t = -\partial C_0^{\text{annual}} / \partial T_t$ and $M_t^x = \partial C_0^{\text{annual}} / \partial x_t$ for $x \in \{Y, r\}$.

This decomposition highlights three channels through which the aggregate propensity to spend out of transfers differs from the MPC, m_0. First, financing the transfers necessitates future *fiscal adjustments*–either through lump-sum taxes $\{T_t\}$ or distortionary income taxes $\{\mathcal{T}_t^Y\}$– which reduce consumption via the terms $\sum_{t=1}^{\infty} m_t \cdot dT_t$ or $\sum_{t=0}^{\infty} M_t^Y \cdot d\mathcal{T}_t^Y$, respectively. Second, transfers increase aggregate labor demand, raising *employment and income*. The resulting increase in consumption is captured by the term $\sum_{t=0}^{\infty} M_t^Y dY_t$. Finally, higher aggregate demand generates a higher inflation rate, prompting the central bank to raise nominal and *real interest rates*. The resulting contractionary effect on consumption is

Parameter	Description	Value	Parameter	Description	Value
σ	IES	0.5	ψ	Frisch	0.75
β	Discount factor	0.96	κ_w	Wage Rigidity	0.0062
r	Real interest rate	0.5%	ρ_B	Persistence of debt	0.98
ρ_e	Persistence e	0.95	G	Spending	0.20
σ_e	Variance e	0.75	B	Assets	3.92
χ	Labor disutility	0.64	ϕ_π	Taylor coefficient	1.5

Table 2: Calibrated Parameters

Notes: This table reports the parameter values used in the baseline calibrated HANK model. See text for details on the calibration.

captured by the term $\sum_{t=0}^{\infty} M_t^r \cdot dr_t$.

We now use a calibrated version of this model to understand why and by how much the propensity to spend out of economy-wide transfers deviates from the marginal propensity to consume m_0 in the quantitative HANK model.

Calibration We calibrate the model to a quarterly frequency and a steady state with zero inflation. Table 2 reports the values of the calibrated parameters. We set the intertemporal elasticity of substitution to a standard value, $\sigma = 0.5$, and the Frisch elasticity to $\psi = 0.75$, following Chetty, Guren, Manoli, and Weber (2011).

We normalize the steady state so that output $Y = N = 1$. This normalization implies that the parameter governing the disutility of labor, χ, equals 0.64. Productivity shocks are drawn from a discretized AR(1) process in logs with persistence parameter $\rho_e = 0.95$ and standard deviation $\sigma_e = 0.75$. As in Auclert et al. (2024b), we set the steady state value of G/Y to 0.20. Steady-state lump-sum taxes are set to $T = 0$, implying that the marginal tax rate that finances steady state spending and interest on debt equals $\tau = 0.19$.

Finally, we calibrate the discount factor β and the steady-state value of B/Y, so that the steady-state annual real interest rate equals 2% and the average annual MPC out of an individual transfer is 0.32. The latter value is consistent with the average MPC out of the transfer reported in survey experiment E1.This procedure yields $\beta = 0.96$ and $B = 3.92$.[15]

We assume the Taylor coefficient, ϕ_π, is equal to 1.5, a standard value in the NK literature (see for example Christiano, Eichenbaum, and Rebelo, 2011). Consistent with the

[15]Echoing results in Auclert et al. (2024b), Figure B.5 in the Appendix shows that the HANK model also provides a good match to the quarterly intertemporal MPCs out of an idiosyncratic transfer, $m_t^q \equiv \partial C_t / \partial \varepsilon_0$, observed in our survey data. That is, the model matches the fraction of the transfer that individuals consume in each quarter over the first year.

empirical results in Hazell, Herreno, Nakamura, and Steinsson (2022), we set the nominal rigidities parameter $\kappa_w = 0.0062$. Following Auclert et al. (2024b), we set the annual persistence of debt to 0.93, which implies that the quarterly persistence parameter, ρ_B, equals 0.98.

Replicating Experiment E2 in the Model Figure 4.1 displays the planned propensity to spend out of transfers under the assumption that government deficits are financed through future lump-sum taxation. The first bar (blue) represents the planned spending response to an aggregate transfer. Under FIRE, the propensity to spend out of transfers, 0.23, is substantially smaller than the MPC, m_0, 0.32. This discrepancy implies that the HANK model fails to account for the central empirical finding that individuals' planned spending out of transfers equals their MPC.

The remaining bars in the figure decompose the aggregate spending response according to equation (4.11). The second bar (green) shows the MPC out of an individual transfer, m_0, which by construction equals 0.32. The third bar (red) shows the contractionary effect of anticipated future taxes. The fourth bar (orange) reflects the expansionary general equilibrium effect of higher aggregate income. The final bar (gray) represents the contractionary effect of the higher real interest rates induced by the central bank's response to inflation.

The decomposition shows that under FIRE, households internalize future fiscal adjustments associated with aggregate transfers. The anticipation of future taxation exerts substantial downward pressure on spending, even though households face incomplete markets and borrowing constraints, and government debt is highly persistent. The income and interest rate channels partially offset each other. As a result, their combined effect is small and insufficient to align the response of planned spending to a transfer to the MPC.

Figure 4.2 displays the planned propensity to spend out of transfers under FIRE when the government finances deficits through future labor income taxation. The overall response, shown in the first bar (blue), is 0.24, which is still well below the MPC, 0.32. The remaining bars correspond to the same decomposition components as in Figure 4.1, now evaluated when deficits are paid for with labor income taxation. Compared to the lump-sum case, the tax effect is slightly smaller. This decline is due to the more progressive nature of labor income taxation. The income and interest rate effects are slightly larger, reflecting the interaction of tax rates, wages, and inflation. As in the lump-sum tax case, on net, the GE effects are modest and insufficient to reconcile the model with the empirical evidence.

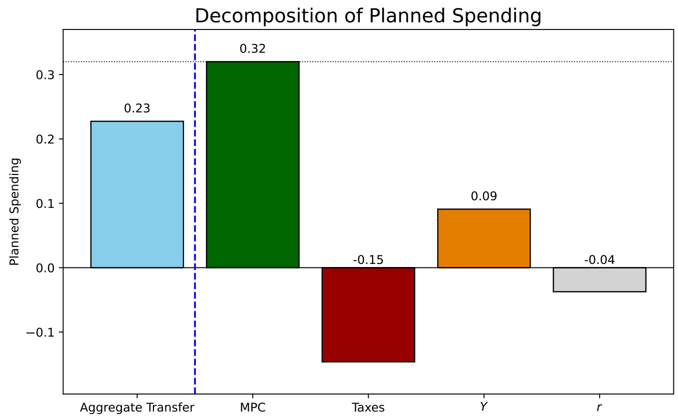

Figure 4.1: HANK under FIRE: Planned Propensity to Spend out of Aggregate Transfers under FIRE with Lump-Sum Taxes

Notes: This figure presents the decomposition of the planned propensity to spend out of an aggregate transfer under FIRE. The bars correspond to the respective components of the analytical expression for $\frac{\partial C_0^{\text{annual}}}{\partial \varepsilon_0}$ derived in equation (4.11). The green bar denotes the direct marginal propensity to consume out of an individual transfer (m_0). The red bar denotes the dampening effect of future lump-sum taxes ($\sum_t m_t \cdot \frac{dT_t}{d\varepsilon_0} + \sum_t M_t^Y \cdot \frac{d\mathcal{T}_t^Y}{d\varepsilon_0}$), while the orange bar corresponds to the positive general equilibrium response of income ($\sum_t M_t^Y \cdot dY_t$). The gray bar denotes the effect of changes in real interest rates through the monetary policy response ($\sum_t M_t^r \cdot dr_t$). The sum of all components is equal to the the aggregate spending response to the transfer in blue.

In sum, our analysis of the HANK model under FIRE indicates that, under a standard calibration, the model fails to replicate our central empirical finding: individuals' planned spending out of transfers is very similar to their MPC. While it is mechanically feasible to calibrate the model to generate a planned spending response to a transfer of 0.32, doing so requires elevating the MPC beyond levels consistent with microeconomic evidence. Put differently, the model can be rendered consistent with the micro-estimate of the MPC or the planned propensity to spend out of an aggregate transfer, but not both.

In Appendix D.4, we consider two alternative specifications for policy. First, we examine a scenario in which transfers are financed by an exogenous windfall, which eliminates the need for deficit financing via higher taxes. In our model, this case is formally equivalent to funding the transfer via a reduction in government spending, G_0. This case also approximates a scenario in which only very-high-income households with low MPCs are taxed. Second, we study a specification in which monetary policy maintains a constant real interest rate, consistent with a common assumption in the HANK literature. None of these alternatives reconciles the model's implications with our survey-based evidence. Finally, Appendix E.2 shows that the empirical results for experiment E3 are as challenging to the canonical HANK model as the results for experiment E2.

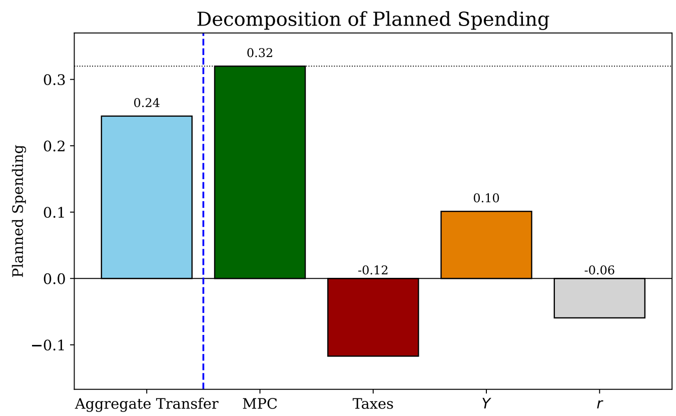

Figure 4.2: HANK under FIRE: Planned Propensity to Spend out of Aggregate Transfers under FIRE with Labor-Income Taxation

Notes: This figure presents the decomposition of the planned propensity to spend out of an aggregate transfer under full information rational expectations (FIRE). The bars correspond to the respective components of the analytical expression for $\frac{\partial C_0^{\text{annual}}}{\partial \varepsilon_0}$ derived in equation (4.11). The green bar depicts the direct marginal propensity to consume out of an individual transfer (m_0). The red bar reflects the dampening effect of future labor-income taxes ($-\sum_t M_t^Y \cdot \frac{d\mathcal{T}_t^Y}{d\varepsilon_0}$), while the orange bar corresponds to the positive general equilibrium response of income ($\sum_t M_t^Y \cdot dY_t$). The gray bar denotes the effect of changes in real interest rates through the monetary policy response ($\sum_t M_t^r \cdot dr_t$). The sum of all components yields the aggregate spending response to the transfer in blue.

5 Inattentive HANK model

In this section, we extend the model to incorporate household inattention. Inattention gives rise to two opposing forces. On the one hand, inattentiveness to future taxation leads households to increase their spending out of transfers relative to the FIRE benchmark. On the other hand, inattentiveness to the GE effects of policy on changes in employment, income, and interest rates attenuates the spending response. We show that for moderate levels of inattention, the former effect dominates.

Household Behavior under Inattention In this section, we adopt a simple and tractable formulation of inattention. Our modeling framework is based on the cognitive discounting model of Gabaix (2020).[16] We assume that households possess full information about current macroeconomic conditions but systematically under-forecast the evolution of the aggregate state variables by a factor $\lambda \in [0,1]$. As in Gabaix (2020), this implies that

[16] In Section 3.1, we argue that different modeling alternatives deliver qualitatively similar conclusions. In this section, we adopt the cognitive discounting model for its simplicity and transparency.

household expectations for each variable $X \in \{T, \mathcal{T}^Y, Y, r\}$ are given by:

$$E_t [dX_{t+h}] = \lambda^h \cdot \mathbb{E}_t [dX_{t+h}], \tag{5.1}$$

where $\mathbb{E}_t [dX_{t+h}]$ reflects the model consistent expectation of dX_{t+h}. To isolate the implications of distorted expectations about aggregate variables, we maintain the assumption that households have rational expectations with respect to idiosyncratic shocks. A value of $\lambda = 1$ corresponds to FIRE.

To solve the model numerically, we employ the sequence-space Jacobian method of Auclert et al. (2020). Let $\mathcal{J}^X = \left[\mathcal{J}^X_{t,s}\right]_{t,s=0,1,...}$ denote the Jacobian matrix of aggregate consumption with respect to variable X evaluated at the steady-state under FIRE,

$$\mathcal{J}^X_{t,s} = \frac{\partial \mathcal{C}_t \left(\{T, \mathcal{T}^Y, Y, r\}\right)}{\partial X_s}, \quad t,s = 0,1,\ldots$$

Following the representation in Bardóczy and Guerreiro (2023), the aggregate consumption response in the model with inattention is given by

$$d\boldsymbol{C} = \sum_{X \in \{T, \mathcal{T}^Y, Y, r\}} \left\{ \mathcal{J}^X \cdot E_0 [d\boldsymbol{X}] + \sum_{h=1}^{\infty} \mathcal{R}^X_h \cdot FR_h [d\boldsymbol{X}] \right\}.$$

Here $d\boldsymbol{X} = [dX_t]_{t=0,1,...}$ is the time path of shocks to variable X, $FR_h [d\boldsymbol{X}] \equiv E_h [d\boldsymbol{X}] - E_{h-1} [d\boldsymbol{X}]$ denotes the forecast revision at time h, and $\mathcal{R}^X_h$ is the forecast-revision Jacobian defined by

$$\mathcal{R}^X_h = \begin{bmatrix} \mathbf{0}_{h\times h} & \mathbf{0}'_{h\times 1} \\ \mathbf{0}_{h\times 1} & \mathcal{J}^X \end{bmatrix}.$$

This representation can be interpreted as follows. At time $t = 0$, households behave as if their expectations are correct so their initial response coincides with the FIRE benchmark, $\mathcal{J}^X$. As time progresses, households recognize that their earlier expectations were incorrect and revise them accordingly. These forecast revisions are treated by households as new information and elicit the same response as would a new shock. That response is captured by a time-shifted version of the Jacobian. From the perspective of the econometrician/modeler, these revisions are predictable, and their accumulation alters the equilibrium dynamics in a manner that systematically deviates from the FIRE benchmark (see Angeletos et al., 2025, for a discussion).

In the inattentive HANK model, people's expectations are given by $E_t [d\boldsymbol{X}] = \Lambda_t \cdot d\boldsymbol{X}$

where Λ_t is a diagonal matrix with entries $\Lambda_{t,(s,s)} = 1$ if $s \leq t$ and $\Lambda_{t,(s,s)} = \lambda^{s-t}$ for $s > t$. So, we can write

$$dC = \sum_{X \in \{T, \mathcal{T}^Y, Y, r\}} \widetilde{\mathcal{J}}^X \cdot dX,$$

where $\widetilde{\mathcal{J}}^X = \mathcal{J}^X \cdot \Lambda_0 + \sum_{h=1}^{\infty} \mathcal{R}_h^X \cdot (\Lambda_h - \Lambda_{h-1})$ denotes the generalized Jacobians.

The Propensity to Spend out of Transfers We now show that the inattentive HANK model can account for our central empirical finding: individuals' planned propensity to spend out of transfers coincides with their marginal propensity to consume.

Establishing this connection requires careful treatment of timing, given how survey responses are elicited. Throughout, we have interpreted our empirical estimates as measuring planned spending responses. Under FIRE, this distinction is immaterial, as planned and realized behavior coincide. However, when deviating from FIRE, households revise their expectations in real time as new information arrives and past forecast errors are revealed. As a result, realized consumption behavior may diverge from the initial plans made under incorrect forecasts of current and future aggregate macroeconomic variables.

Let $E_{-1}\left[dC_0^{\text{annual}}/d\varepsilon_0\right]$ denote the individual's planned propensity to spend out of a transfer at the time of the survey response. Proposition 2 characterizes how cognitive discounting influences the planned spending. Two implications are worth emphasizing. First, Proposition 2 shows that the response to purely idiosyncratic transfers is identical to the response under FIRE. Second, inattention attenuates the forward-looking components of the consumption response associated with anticipated changes in taxes, income, and interest rates.

Proposition 2. *Suppose that households form expectations according to the cognitive discounting model with discount factor $\lambda \in [0,1]$. Then, their planned spending response to an aggregate transfer, prior to observing any realized general equilibrium effects of the policy, is given by:*

$$E_{-1}\left[\frac{dC_0^{annual}}{d\varepsilon_0}\right] = m_0 - \sum_{t=1}^{\infty} m_t \lambda^{t+1} \cdot \frac{dT_t}{d\varepsilon_0} - \sum_{t=1}^{\infty} M_t^Y \lambda^{t+1} \cdot \frac{d\mathcal{T}_t^Y}{d\varepsilon_0} + \sum_{t=0}^{\infty} M_t^Y \lambda^{t+1} \cdot dY_t + \sum_{t=0}^{\infty} M_t^r \lambda^{t+1} \cdot dr_t. \tag{5.2}$$

Figure 5.1 plots the planned spending response to an aggregate transfer as a function of the cognitive discounting parameter. In this experiment, we assume that future taxation takes the form of lump-sum taxes.[17] When $\lambda = 1$, the planned spending response

[17] Alternative, we could have considered calibrating λ assuming that future taxes take the form of distortionary taxation. In Appendix E.1, we show that this alternative calibrated λ to essentially the same level.

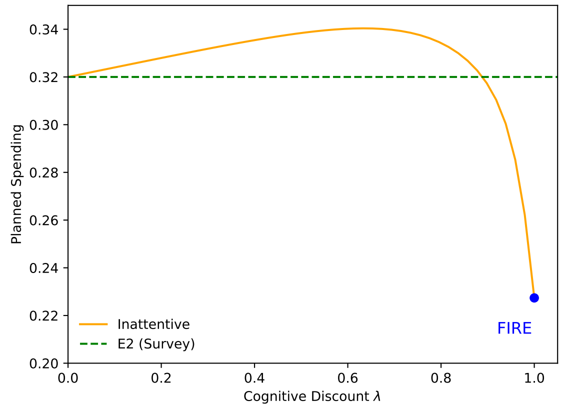

Figure 5.1: Inattentive HANK: Planned Propensity to Spend out of Aggregate Transfers as a Function of Inattention

Notes: The figure shows the relationship between the cognitive discount λ and the planned propensity to spend out of a transfer. The dashed green line denotes the empirical target from the survey (0.32). The solid orange line displays model-implied spending for different values of λ.

coincides with the FIRE benchmark.

As λ decreases from 1, the planned response initially increases, reflecting the RNE effect, i.e., inattention to future taxes. This pattern arises because government debt is highly persistent in the baseline calibration, i.e., fiscal adjustments occur only in the distant future. By "distant future" we mean large values of t where cognitive discounting has strong effects. In contrast, the general-equilibrium effects of the policy, such as changes in income and interest rates, materialize in the near term (low values of t) and are subject to less discounting. For values of λ closer to zero, the RNE effect becomes weaker, the GE dampening effect dominates and the planned spending response begins to decline.

Figure 5.1 shows that, for a moderate degree of inattention, the inattentive HANK model can account for the finding that the planned propensity to spend out of transfers is equal to the MPC.

Model Calibration With one exception, all of the parameters in the inattentive HANK model are equal to their values in the HANK model under FIRE. We calibrate the additional parameter, λ, governing inattention to match our empirical estimate of the planned propensity to spend out of a government transfer (0.32). This choice yields $\lambda = 0.89$, implying that one-year-ahead expectations are discounted by approximately 35% relative to the FIRE benchmark. This level of inattention is broadly consistent with estimates from the literature on information rigidities (e.g., Coibion and Gorodnichenko, 2012, 2015). Because experiment E1 does not involve future tax liabilities or other GE effects, the inattentive HANK model makes the same prediction as the model under FIRE.

The model's ability to account for the fact that the planned propensity to spend equals the marginal propensity to consume is mainly driven by a significant dampening of the response to future taxes. See Figure 5.2 for the decomposition of planned spending when lump-sum taxes finance deficits.[18]

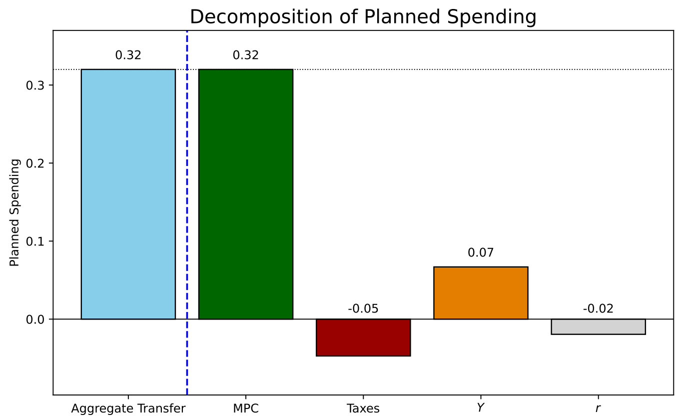

Figure 5.2: Inattentive HANK: Planned Propensity to Spend out of Aggregate Transfers with Lump-Sum Taxes

Notes: This figure presents the decomposition of the marginal propensity to spend out of an aggregate transfer in the inattentive HANK model. The bars correspond to the respective components of the analytical expression for $\frac{\partial C_0^{\text{annual}}}{\partial \varepsilon_0}$ derived in equation (5.2). The green bar denotes the marginal propensity to consume out of an individual transfer (m_0). The red bar reflects the dampening effect of future lump-sum taxes ($\sum_t m_t \cdot \frac{dT_t}{d\varepsilon_0}$), while the orange bar corresponds to the response of spending to an increase in aggregate income, ($\sum_t M_t^Y \cdot dY_t$). The gray bar denotes the impact of monetary policy on real interest rates, ($\sum_t M_t^r \cdot dr_t$).

Appendix E.1 shows that the calibrated value of λ for the case of distortionary taxation is equal to 0.9. Appendix E.2 reports the results of calibrating λ to match the evidence from experiment E3. The implied value of λ is 0.91. The qualitative results are robust to these alternative calibrations of λ.

6 Can RANK or TANK Models Account for the Survey Evidence?

In this section, we show that RANK and TANK models cannot account for our survey-based findings. These shortcomings motivate why we analyze the aggregate effects of

[18]Appendix Figure B.6 replicates these findings for the case of distortionary labor-income taxes.

transfers using the HANK model. We first discuss our main findings regarding the RANK models, with and without inattention. We then discuss our findings regarding the TANK model. All details are relegated to Appendix Section F.

6.1 The RANK Model

We consider a RANK economy with cognitive discounting as in Gabaix (2020). Standard calibrations of the RANK model set β to match the steady-state real interest rate. In our calibration, we target an annual real interest rate of 2%.

Consider experiment E1 in our calibrated RANK model. The implied MPC out of income is $m_0 = 1 - \beta^4 \approx 0.02$. This finding reproduces the well-known fact that the RANK model implies very low MPCs. So that model cannot match our findings for experiment E1.

Next, we consider experiment E2. Under FIRE ($\lambda = 1$), the average propensity to spend out of an aggregate transfer/tax is zero, i.e., Ricardian Equivalence holds. With inattention ($\lambda < 1$), the equilibrium level of consumption depends on the level of debt because households under-forecast future taxes.

Appendix F shows that the average planned spending out of a transfer is below 0.02 for all values of λ. This result reflects the fact that planned spending is tightly pinned down by the MPC.

These results highlight the complementarity between the MPC and the magnitude of the RNE effect on people's spending. Inattention breaks Ricardian Equivalence in the RANK and HANK models. In the inattentive RANK model, agents feel wealthier after a transfer, but the low value of their MPC implies that they increase spending by a small amount. The larger value of the average MPC in the inattentive HANK model generates a larger response in spending plans. In Appendix G, we analyze a tractable HANK framework that allows us to analytically formalize the complementarity between high MPCs and the degree of RNE.

We conclude that a RANK model with inattention cannot account for our survey-based findings regarding experiment E2 or to generate quantitatively significant deviations from Ricardian Equivalence.

6.2 The TANK model

In standard TANK models, a constant fraction $(1 - \mu)$ of consumers are hand-to-mouth and a fraction μ of consumers are not liquidity constrained (e.g., Campbell and Mankiw, 1989, and Bilbiie, 2008). We refer to the latter consumers as Permanent-Income-Hypothesis (PIH) consumers.

In Appendix Section F, we show that, in the TANK model under FIRE, the average first-year MPC is $m_0 = (1-\mu)\left(1-\beta^4\right)+\mu$. We calibrate β and μ so that the annual interest rate is 2% and the annual MPC is 0.32. The latter value is consistent with the results from our survey experiments.

Auclert et al. (2024b) argue that TANK models generate counterfactual intertemporal MPCs. Consistent with their argument, the standard TANK model features intertemporal MPCs, $m_t^q \equiv \frac{\partial C_t}{\partial \varepsilon_0}$, that are inconsistent with our survey findings. Here m_t^q denotes the fraction of the initial transfer in the E1 experiment that individuals consume in quarter t. A basic property of the standard TANK model is that the MPC is high in the first quarter and low and constant thereafter. For example, in our calibrated TANK model, $m_0^q = 0.3098$, and $m_t^q = 0.0034$ for $t \geq 1$. This pattern is inconsistent with our survey results, according to which m_t^q remains elevated for a prolonged period of time (see Figure F.3 in Appendix F).

We now consider experiment E2 in a version of the TANK model where households are inattentive. Under FIRE, the average planned first-year spending response is equal to 0.44, substantially exceeding the empirical estimate of 0.32 obtained in experiment E2 (see Appendix F). This outcome reflects that the average consumption response is predominantly driven by hand-to-mouth households. So, allowing for moderately inattentive consumers does not enable the TANK model to account for the survey-based estimate of the average planned first-year spending response to a uniform transfer.

7 The Macro Consequences of Stimulus Checks

In the previous section, we argued that RANK and TANK models cannot account for the survey-based evidence from experiment E2. For this reason, we analyze the aggregate implications of uniform transfers using the calibrated inattentive HANK model. In Subsection 7.1, we assume that a fiscal deficit stemming from transfers is financed by future lump-sum taxation. In Subsection 7.4, we consider the implications of financing deficits via future distortionary labor income taxes.

7.1 The Transfer Multiplier

Panel A of Table 3 reports the first-year transfer multiplier in the HANK model under FIRE and inattention. Ricardian Equivalence does not hold in the HANK economy under FIRE because some households are liquidity constrained. In that model, the first-year transfer multiplier is 0.23, a value substantially smaller than the model-implied average MPC, 0.32. The reason is that, under FIRE, the anticipation of higher future taxes reduces aggregate demand, which acts as a partial offset to the high average MPC out of individual-specific transfers, m_0.

Panel A: The Transfer Multiplier

Model	Response	% Change from FIRE
Inattention	0.29	+26%
FIRE	0.23	–
RNE-only	0.30	+30%

Panel B: GE Attenuation

GE Component	Change from RNE
Inattention to Y	–0.03
Inattention to r	+0.02
GE-dampening	–0.01

Table 3: The Transfer Multiplier with Lump-sum Taxes

Notes: Panel A reports the first-year output multiplier to a transfer, financed with lump-sum taxes, under three model specifications: the inattentive HANK model, the HANK model under FIRE, and a model incorporating inattention with respect to GE effects. Panel B decomposes the GE dampening effect into components arising from aggregate output and interest rate effects.

In the inattentive HANK model, the multiplier equals 0.29, a 26 percent increase relative to the FIRE version of the model. To gain further insight into the mechanisms behind this increase in the transfer multiplier, we consider a counterfactual economy in which households are perfectly attentive to income and real interest rates, but are inattentive to future taxes. We call this the *RNE-only* economy. Formally, we solve this counterfactual economy by replacing the Jacobians with respect to income and interest rates with their FIRE counterparts, while assuming that the response to taxes is still given by their values in the inattentive HANK model. The difference between the multiplier with inattention and the RNE-only economy measures the effects of GE dampening, i.e., how much inattention to the GE effects of the transfer on Y and r affect the final output multiplier.[19]

The third row of Panel A in Table 3 reports the transfer multiplier in the RNE-only economy. This multiplier is slightly higher than in the Inattentive HANK model (0.30 versus 0.29). So, inattention to general equilibrium forces reduces the multiplier by approximately 0.01. This finding implies that the larger transfer multiplier in the inattentive HANK model mainly reflects inattention to future taxes, rather than to GE effects.

To provide intuition for the last result, we decompose the GE dampening effect into

[19] In Appendix G, we consider a tractable HANK model and solve analytically for this decomposition, gaining further insight into the elements shape the magnitude of the FIRE, RNE, and GE-dampening components of the overall transfer multiplier.

two channels: the impact of inattention to income and the effect of inattention to interest rates. To isolate these components, we introduce a second auxiliary economy in which households are inattentive to taxes and income but are fully attentive to the real interest rate. This intermediate specification allows us to measure the marginal contribution of aggregate output inattention to the overall GE dampening effect. The difference in multipliers between the fully inattentive economy and this second auxiliary economy isolates the impact of inattention to interest rates.[20]

Consistent with Panel A, Panel B of Table 3 reports that the GE dampening effect on the transfer multiplier is quantitatively small. The modest impact reflects the offsetting effects of inattention to output and the real interest rate. Inattention to income *reduces* the multiplier by approximately 0.03, while inattention to real interest rates *increases* the multiplier by 0.02. The net effect of the two opposing effects is small.

7.2 The Dynamic Response of Economy-Wide Aggregates to Transfer Payments

Following the COVID-19 pandemic, the US government made direct payments of $931 billion to individuals, roughly 16% of quarterly GDP.[21] In this subsection, we analyze the consequences of an aggregate transfer of that size.

Figure 7.1 presents the dynamic impulse response functions for output, the real interest rate, inflation, and lump-sum taxes in response to a one-time transfer at date $t = 0$ in the model. Panels A and B display the impulse response functions in the inattentive and FIRE HANK models, respectively. For exposition purposes, we report the impulse response functions at an annual frequency, which corresponds to how we report our survey results.

Figure 7.1 shows that the effect of the transfer on output and inflation is both larger and more persistent in the inattentive HANK model than in the HANK model under FIRE. To understand the dynamic effects of inattention, Figure 7.2 displays the evolution of people's expectations that underlie the response of output to the transfer payment. The dotted lines display people's expectations about the future evolution of aggregate variables at different horizons. The solid lines correspond to the actual impulse response functions of aggregate variables. Note that people's expectations of future taxes are always muted relative to their actual values. For example, at time 0, individuals do not

[20]By construction, the sum of the income and interest rate dampening effects is equal to the total GE dampening effect.

[21]See U.S. Government Accountability Office: https://www.gao.gov/products/gao-22-106044.

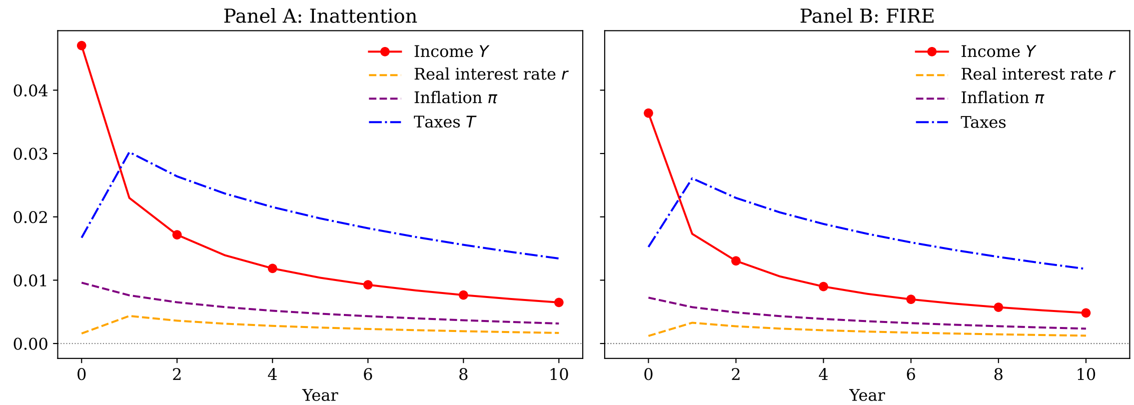

Figure 7.1: Dynamic Responses to an Unanticipated Increase in Transfers with Lump-Sum Taxes

Notes: This figure displays the economy's response to a one-time transfer shock at time zero, financed by lump-sum taxes. Panel A displays the impulse response function of output (dotted red line), total tax revenues (dash-dot blue line), the percentage point changes in inflation (dotted purple line) and the real interest rate (dash yellow line), respectively, in the inattentive HANK model. Panel B displays the analog impulse responses for the HANK model under FIRE. Inflation and the real interest are expressed as percentage point deviations from steady state. Output and taxes are expressed as percentage deviations from steady state. The size of the transfer shock is 16% of GDP.

anticipate substantial changes in future lump-sum taxes. A concomitant of this misperception is that they also underestimate the evolution of other aggregate variables.

People revise their expectations at the beginning of each time period. Since people pay more attention to variables that are closer in time to their decisions, their expectations of lump-sum taxes and other aggregate variables at year t are closer to their actual values in that year. Nevertheless, at each point in time, people substantially underestimate the magnitude of *future* taxes and future aggregate variables. This pattern of expectations about future taxes lies at the core of RNE.

7.3 How fast does the government finance deficits?

Panels A and B of Figure 7.3 display the sensitivity of aggregate output and inflation to variations in the parameter which governs the persistence of government debt. Consistent with the literature (e.g., Auclert et al., 2024b and Angeletos et al., 2024a), in the HANK model under FIRE, more persistent fiscal debt (a higher value of ρ_B) amplifies the response of output and inflation to a fiscal transfer. However, the output multiplier is larger under inattention than under FIRE for all values of ρ_B that we considered.

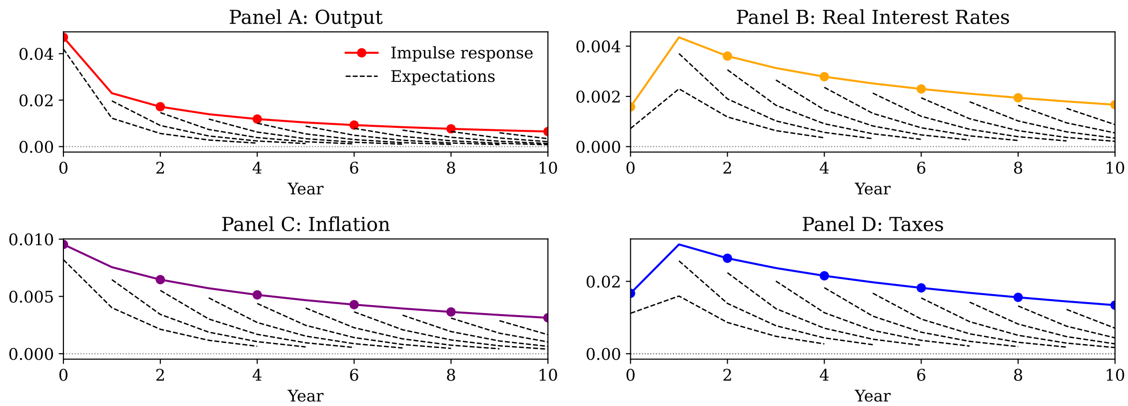

Figure 7.2: Inattentive HANK: The Evolution of Expectations to an Unanticipated Increase in Transfers with Lump-Sum Taxes

Notes: This figure displays the response of output (Panel A), the real interest rate (Panel B), inflation (Panel C), and total tax revenues (Panel D) to a one-time transfer shock at time zero, financed with lump-sum taxes, in the inattentive HANK model. In each panel the dashed lines represent people's expectations for each variable at each point in time and for different horizons. Inflation and the real interest are expressed as percentage point deviations from steady state. Output and taxes are expressed as percentage deviations from steady state. The size of the transfer shock is 16% of GDP.

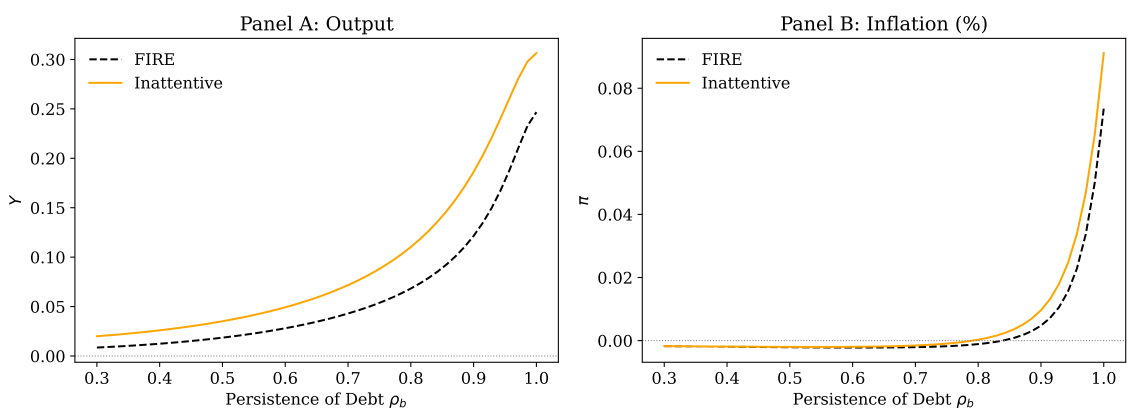

Figure 7.3: The Transfer Multiplier as a Function of the Persistence of Debt

Notes: This figure displays the first-year responses of output and inflation to a transfer at time zero, financed by lump-sum taxation, as a function of the persistence parameter ρ_B. The continuous orange line displays these responses in the inattentive HANK model, and the dashed black line displays the responses in the HANK model under FIRE. Output is expressed as percentage deviations from steady state. Inflation is expressed as percentage point deviations from steady state.

7.4 Distortionary Labor Taxation

In this section, we consider the case in which the government changes labor-income taxes $\mathcal{T}_t^Y$ to finance transfer payments. Future lump-sum taxes are set to zero.

Panel A of Table 4 decomposes the overall transfer multiplier into the effects of RNE and the GE dampening effect. The results are consistent with those discussed in Table 3. The transfer multiplier under inattention is 0.30, slightly larger than the value under lump-sum taxes. This result reflects the fact that labor-income taxes are more progressive than lump-sum taxes, leading to a larger spending response. Panel B decomposes the response of aggregate output into inattention to aggregate output, the real interest rate and the net effect of inattention to the GE effects of the transfer. As in the case of lump-sum taxes, the net GE dampening effect is small relative to the impact of RNE.

Figure 7.4 displays the dynamic responses of output, inflation, real interest rates, and the tax rate under inattention (Panel A) and FIRE (Panel B). Comparing Figure 7.4 to Figure 7.1, we see that the results under distortionary and lump-sum taxes taxes are similar.

Panel A: The Transfer Multiplier

Model	**Response**	**% Change from FIRE**
Inattention	0.30	25%
FIRE	0.24	–
RNE-only	0.30	25%

Panel B: GE Attenuation

GE Component	**Change from RNE**
Inattention to Y	–0.03
Inattention to r	+0.03
GE-dampening	0.00

Table 4: The Transfer Multiplier with Labor-Income Taxation

Notes: Panel A reports the first-year output multiplier to a transfer, financed with labor-income taxes, under three model specifications: the inattentive HANK model, the HANK model under FIRE, and a model incorporating inattention with respect to GE effects. Panel B decomposes the GE dampening effect into components arising from aggregate output and interest rate effects.

8 The Macro Consequences of Fiscal Spending

We now use our HANK model to analyze the response of output to government spending shocks. We focus on the distortionary income taxation case. The debt rule is given by $dB_{t+1} = \rho_B (dB_t + dG_t)$. As in Auclert et al. (2024b), we assume that $dG_t = \rho_G dG_0$ where $\rho_G = 0.934$, implying an annual spending persistence parameter of 0.76.

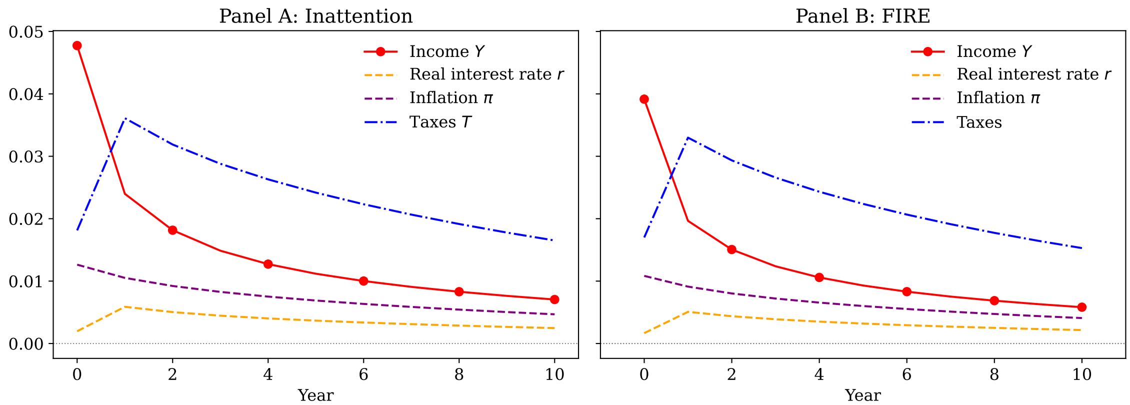

Figure 7.4: Dynamic Responses to an Unanticipated Increase in Transfers with Labor-Income Taxation

Notes: This figure displays the economy's response to a one-time transfer shock at time zero, financed by labor-income taxes. Panel A displays the impulse response function of output (dotted red line), total tax revenues (dash-dot blue line), the percentage point changes in inflation (dotted purple line) and the real interest rate (dash yellow line), respectively, in the inattentive HANK model. Panel B displays the analog impulse responses for the HANK model under FIRE. Inflation and the real interest are expressed as percentage point deviations from steady state. Output and taxes are expressed as percentage deviations from steady state. The size of the transfer shock is 16% of quarterly GDP.

8.1 The Fiscal-Spending Multiplier

Define the first-year government-spending multiplier as

$$\frac{\sum_{t=0}^{3}(1+r)^{-t}\,dY_t}{\sum_{t=0}^{3}(1+r)^{-t}\,dG_t}.$$

Panel A of Table 5 reports the first-year government spending multiplier in the HANK model under FIRE and under inattention. Under FIRE, the first-year value of this multiplier under FIRE is 0.95, implying that consumption *falls* after the increase in government spending. In contrast, under inattention, the multiplier is 1.09, implying that consumption *rises* after the increase in government spending.

To further analyze the effects of inattention, we consider the RNE economy in which people are inattentive to taxes but fully attentive to all other GE channels. The procedure that we use to calculate the equilibrium in this economy is the same as the one discussed in Section 7.1. The fiscal-spending multiplier in the RNE-only economy is equal to 1.15, a value larger than the multiplier under full inattention. As in the response to the transfer shock, the GE dampening effect is small but negative. The small magnitude reflects opposing forces from inattention to income and real interest rates.

Panel A: Fiscal-Spending Multiplier			Panel B: GE Dampening	
Model	**Response**	**% Change from FIRE**	**GE Component**	**Change from RNE**
Inattention	1.09	+15%	*Inattention to Y*	–0.18
FIRE	0.95	–	*Inattention to r*	+0.12
RNE-only	1.15	+21%	*GE Dampening*	–0.07

Table 5: The Fiscal-Spending Multiplier

Notes: Panel A reports the first-year output multiplier to an increase in government spending, financed with labor-income taxes, under three model specifications: the inattentive HANK model, the HANK model under FIRE, and a model incorporating inattention with respect to GE effects. Panel B decomposes the GE dampening effect into components arising from aggregate output and interest rate effects.

8.2 The Dynamic Response of Economy-Wide Aggregates to an Increase in Fiscal Spending

Figure 8.1 presents the dynamic impulse response functions for output, the real interest rate, inflation, and lump-sum taxes to a government spending shock. For comparability to the transfer case, we set the initial spending shock equal to 16% of quarterly GDP. Panels A and Panel B display the impulse response functions (at an annual frequency) in the HANK economy under inattention and FIRE, respectively. The key result is that fiscal spending leads to a larger and more persistent rise in output and inflation under inattention than under FIRE.

9 Conclusions

This paper provides empirical evidence that people do not internalize future tax liabilities stemming from government transfers into their spending plans. Specifically, we design and implement a novel survey to measure households' planned spending responses under alternative policy scenarios. Our results indicate that people exhibit a stronger spending response to government transfers, relative to the FIRE benchmark.

We embed a model of inattention into a HANK model and demonstrate that Ricardian Non-Equivalence substantially magnifies the aggregate impact of transfers and government spending on the economy. Critically, inattention renders the HANK model consistent with our central empirical finding: people's planned propensity to spend out of ag-

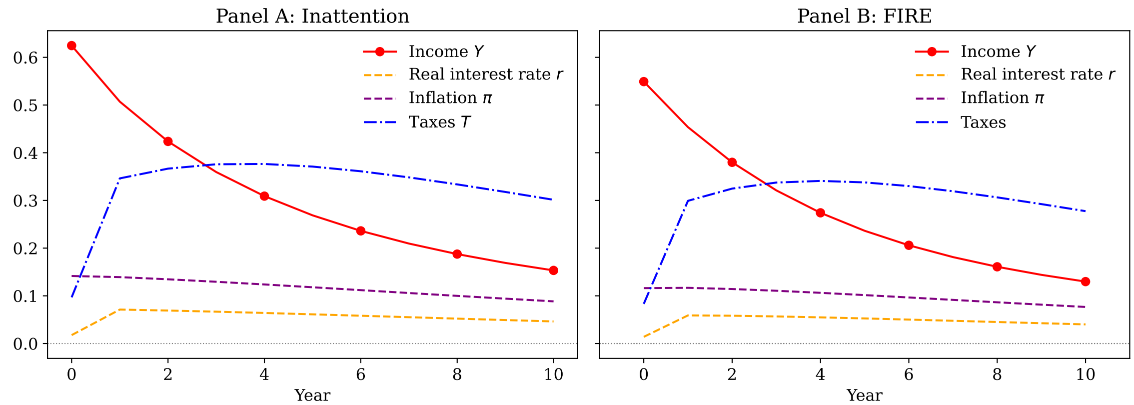

Figure 8.1: Dynamic Responses to an Unanticipated Increase in Fiscal Spending

Notes: This figure displays the economy's response to a n increase in government spending at time zero, financed by labor-income taxes. Panel A displays the impulse response function of output (dotted red line), total tax revenues (dash-dot blue line), the percentage point changes in inflation (dotted purple line) and the real interest rate (dash yellow line), respectively, in the inattentive HANK model. Panel B displays the analog impulse responses for the HANK model under FIRE. Inflation and the real interest are expressed as percentage point deviations from steady state. Output and taxes are expressed as percentage deviations from steady state. The size of the initial spending shock is 16% of quarterly GDP.

gregate government transfers is the same as their marginal propensity to consume. Taken together, our results suggest that fiscal policy can significantly impact economic activity and play a useful role in stabilization policy.

A limitation of our analysis is that our model does not incorporate capital and investment. As a result, the model is silent on the extent to which fiscal policy crowds out private investment. Investigating how departures from FIRE influence these effects and the overall response of the economy to fiscal policy is an important task that we leave for future research.

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