

NBER WORKING PAPER SERIES

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EVIDENCE FROM A RANDOMIZED CONTROL TRIAL

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Working Paper 28485  
<http://www.nber.org/papers/w28485>

NATIONAL BUREAU OF ECONOMIC RESEARCH  
1050 Massachusetts Avenue  
Cambridge, MA 02138  
February 2021

We thank the Fama-Miller Center and the Initiative on Global Markets, both at the University of Chicago Booth School of Business for financial support for conducting the surveys. Coibion, Gorodnichenko and Weber also thank the NSF for financial support. The authors thank Jonathan Parker and participants of ASSA 2021 for comments. We thank Julien Weber for excellent research assistance. We also thank Shannon Hazlett and Victoria Stevens at Nielsen for their assistance with the collection of the PanelViews Survey. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

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Fiscal Policy and Households' Inflation Expectations: Evidence from a Randomized Control Trial

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NBER Working Paper No. 28485

February 2021

JEL No. E31,E62

**ABSTRACT**

Rising government debt levels around the world are raising the specter that authorities might seek to inflate away the debt. In theoretical settings where fiscal policy “dominates” monetary policy, higher debt without offsetting changes in primary surpluses should lead households to anticipate this higher inflation. Are household inflation expectations sensitive to fiscal considerations in practice? We field a large randomized control trial on U.S. households to address this question by providing randomly chosen subsets of households with information treatments about the fiscal outlook and then observing how they revise their expectations about future inflation as well as taxes and government spending. We find that information about the current debt or deficit levels has little impact on inflation expectations but that news about future debt leads them to anticipate higher inflation, both in the short run and long run. News about rising debt also induces households to anticipate rising spending and a higher rate of interest for government debt.

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*“Inflation is always and everywhere a monetary phenomenon.”* Milton Friedman, 1970  
*“Reagan proved deficits don’t matter.”* Vice-President Richard Cheney, 2014  
*“The euro has been built on the principle of monetary dominance.”* Isabel Schnabel, 2020  
*“I think we’re a very, very long way from [fiscal dominance].”* Jerome Powell, 2020

## **1 Introduction**

Public finances have become yet another victim of COVID19. To support the economy hit by the pandemic, governments implemented large fiscal stimulus programs but these programs have come at a steep price. In 2020, the advanced economies on average created extra public debt to the tune of 20 percent of GDP (Figure 1). As a result, average debt-to-GDP ratios have been pushed to heights not seen since WWII. These exceptional debt levels are raising questions about how governments will ultimately finance them. A particular concern is that such high levels will require countries to inflate away part of their debts. If rising debt levels lead individuals to raise their inflation expectations, an inflationary cycle may be difficult to stop. And in fact, even proponents of activist fiscal policy like former Treasury Secretary Larry Summers (2021)<sup>1</sup> warn that “macroeconomic stimulus on a scale closer to World War II levels than normal recession levels will set off inflationary pressures of a kind we have not seen in a generation” and reiterates that “we have no experience with fiscal stimulus like that under consideration and the impact on inflation expectations”.

While theory suggests that fiscal considerations may play an important role in driving inflation expectations, little empirical evidence exists on the matter. Using a large-scale survey of U.S. households, we provide different types of information about U.S. fiscal indicators to respondents and assess whether their inflation expectations react to the information. Some information relates to current levels of deficits and debt whereas other information focuses on projected levels of debt in the future. We find that the former has essentially no effect on inflation expectations of households nor does it affect their expectations of the fiscal outlook. However, providing households with information about how high public debt is expected to be in a decade has more pronounced effects. First, households incorporate this information into their outlook and raise their expectations about the future levels of debt. Second, they seem to assume that much of the rising debt levels will come from higher spending on the part of the government. Third, they anticipate higher inflation, both in the

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<sup>1</sup> <https://www.washingtonpost.com/opinions/2021/02/04/larry-summers-biden-covid-stimulus/>

short-run and over the next decade, in response to this information. These results suggest that households are able to distinguish between transitory fiscal changes and more permanent ones. Information about current fiscal levels does not seem to affect their broader outlook about the fiscal situation, including for future interest rates and inflation.<sup>2</sup> But information about future changes in public debt, perhaps because they are indicative of more permanent changes in the fiscal outlook, leads households to anticipate some monetization of the debt.

These responses are not universal across households and the degree to which households incorporate information about the budget outlook into their expectations, and especially their inflation expectations, varies along some predictable characteristics. Political affiliation, for example, plays an important role. While both Republicans and Democrats respond to information about rising future debt levels by raising their own forecasts of future debt along with their projected path of both spending and revenues, they do not anticipate that this rising debt will be offset with higher inflation. In contrast, Independents respond to news about rising future debt levels by revising their expectations about future revenues upward (i.e., more taxes), their expectations about future spending downward and their expectations of inflation higher, while *not* changing their views about future debt levels. In short, Independents believe that rising debt forecasts will be counteracted by both fiscal and monetary policymakers, whereas Republicans and Democrats both seem to accept that projections of rising debt levels will indeed materialize with little response from either fiscal or monetary policy. We also find that education, investment experience, and age are important. More educated households systematically adjust their inflation expectations when informed about the fiscal outlook, whereas only those with high initial inflation expectations among the less educated do so. Those with financial investments adjust their inflation expectations more when informed about future changes in government debt. While the inflation expectations of older respondents are quite sensitive to news about interest rates or inflation, it is younger respondents who primarily respond to news about rising future debt levels by strongly raising their short-run and long-run inflation expectations.

To the best of our knowledge, this is the first attempt to apply a randomized controlled trial (RCT) to characterize how information about fiscal conditions affect households' economic expectations. A recent body of work has used RCTs to assess how information about the economy

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<sup>2</sup> We discuss below why the non-response is not fully consistent with households being already aware of the current fiscal situation.

affects households' perceived outlooks (Roth and Wohlfart 2019), how information about inflation or monetary policy affects household inflation expectations (Armantier et al., 2015), and how information about home prices affect households' expectations (Armona et al., 2019), among others. This literature provides new insight on how expectations are formed as well as how expectations feed into economic decisions. Roth, Settele and Wohlfart (2020) is closest in spirit to our paper: they use an RCT on an Amazon MTurk sample to study how provision of information about U.S. government debt affects demand for government spending. Using a representative sample of U.S. households, our paper extends this literature to fiscal policy and the way in which news about fiscal conditions affect the economic expectations of households.

More generally, we view these results as speaking to the role of expectations in mechanisms involving fiscal policy. For example, in most macroeconomic models, unexpected transitory changes in government spending have negative wealth effects on households which lead them to increase their labor supply, as documented empirically in Ramey and Shapiro (1998). This wealth effect stems from the fact that households realize that the higher government spending is something they must ultimately pay for in higher taxes due to the government's intertemporal budget constraint. We find little evidence that news of higher debt levels or deficits today induce such a response of households' expectations: they do not anticipate that the government will collect more tax revenues in subsequent periods, so any wealth effect arising from an anticipated tax burden must be minimal at best. As a result, the demand side effects of government spending shocks would likely dominate the usual supply side effects.

Our paper also contributes to literatures studying the effects of fiscal policy on macroeconomic outcomes (see Ball and Mankiw (1995), Ramey (2011), Parker (2011), Blinder (2016) for surveys and the evolution of thought on the matter), the interaction/dominance of fiscal and monetary policies (see Leeper and Leith (2016) for a survey), the fiscal theory of the price level (see Cochrane (2020) for a comprehensive coverage) and the effects of public debt on macroeconomic outcomes (see e.g. Engen and Hubbard (2005), Reinhart and Rogoff (2010) for early discussions and debates). Relative to these earlier studies, our focus is on how fiscal indicators (e.g., deficit and debt) influence households' inflation expectations, a key mechanism for how fiscal policy transmits and affects the economy. Furthermore, in contrast to earlier work relying on time series analyses or DSGE modelling, we employ an RCT design to obtain causal estimates.

The rest of the paper is structured as follows. Section 2 presents the data and details of our RCT. Section 3 provides descriptive statistics and describes basic empirical patterns. Section 4 presents treatment effects of providing households with information about fiscal indicators on households' expectations about inflation and fiscal variables. Section 5 concludes.

## **2. Data and Survey Design**

In this section, we provide details on the survey design and questions and the information treatments. We ran the survey on the Nielsen Homescan panel which we first introduce before detailing the survey structure.

### **2.1 Nielsen Panel**

In December of 2018, we fielded one wave of the *Chicago Booth Expectations and Communications Survey* inviting participation by all household members in the Kilts-Nielsen Consumer Panel (KNCP). The KNCP represents a panel of approximately 80,000 households that report to AC Nielsen (i) their static demographic characteristics, such as household size, income, ZIP code of residence, and marital status, and (ii) the dynamic characteristics of their purchases, that is, which products they purchase, at which outlets, and at which prices. Panelists update their demographic information at an annual frequency to reflect changes in household composition or marital status.

Nielsen attempts to balance the panel on nine dimensions: household size, income, age of household head, education of female household head, education of male household head, presence of children, race/ethnicity, and occupation of the household head. Panelists are recruited online, but the panel is balanced using Nielsen's traditional mailing methodology. Nielsen checks the sample characteristics on a weekly basis and performs adjustments when necessary.

Nielsen provides households with various incentives to ensure the accuracy and completeness of the information households report. They organize monthly prize drawings, provide points for each instance of data submission, and engage in ongoing communication with households. Panelists can use points to purchase gifts from a Nielsen-specific award catalog. Nielsen structures the incentives to not bias the shopping behavior of their panelists. The KNCP has a retention rate of more than 80 percent at the annual frequency. Nielsen validates the reported consumer spending with

the scanner data of retailers on a quarterly frequency to ensure high data quality. The KNCP filters households that do not report a minimum amount of spending over the previous 12 months.

## **2.2 Chicago Booth Expectations and Communication Survey**

Nielsen runs surveys on a monthly frequency on a subset of panelists in the KNCP, the online panel, but also offers customized solutions for longer surveys. Retailers and fast-moving consumer-good producers purchase this information and other services from Nielsen for product design and target-group marketing. At no point of the survey did Nielsen tell their panelists that the survey they fielded was part of academic research which minimizes the concerns of survey demand effects.

In Fall 2018, we designed a customized survey consisting of 24 questions in total in cooperation with Nielsen, the *Chicago Booth Expectations and Communication Survey*. The survey also contains six different information treatments as well as one control group. We report the full survey in the online appendix. Our survey design builds on the Michigan Survey of Consumers, the New York Fed Survey of Consumer Expectations, the Panel on Household Finances at the Deutsche Bundesbank as well as Coibion et al. (2019) and D'Acunto et al. (2020a,b).

Nielsen fielded the survey in December of 2018. The survey sample was 92,390 households. 32,669 individuals from 29,348 unique households responded for a response rate of 31.7 percent and an average response time of 14 minutes 29 seconds. The response rate compares favorably to the average response rates of surveys on Nielsen and on other frequently used survey providers for academic research such as Qualtrics, which typically achieve response rates between 5 percent and 10 percent. Nielsen provides weights to ensure representativeness of the households participating in the survey.

The survey covers a wide range of questions. First, respondents are presented with a series of questions about their demographic characteristics. Given that views about government deficits and spending differ by political affiliation and the high degree of polarization in recent years (Coibion, Gorodnichenko and Weber 2020), we elicit the political leanings of respondents. We also collect information on employment status, financial constraints, savings and portfolio choice, and past spending behavior in various categories including expenses that are not covered in the KNCP.

Participants are then asked a sequence of questions about their perceptions and expectations of inflation. We follow the design in the recent New York Fed Survey of Consumer Expectations (SCE) and ask specifically about inflation, because asking about prices might induce individuals to think about specific items whose prices they recall rather than about overall inflation

(see Crump et al. (2015) for a recent analysis using the SCE data). We first ask individuals about their perception of past inflation, that is, inflation over the previous 12 months. We then ask them about their expectations for 12-month-ahead inflation and the cumulative inflation rate over the following 10 years. We elicit full probability distributions of expectations by asking participants to assign probabilities to different possible levels of the inflation rate. In addition, we also ask about the perception of the current unemployment rate and the current gas price. Finally, we told respondents that the current level of national income was around 20 trillion dollars and asked respondents how long it would take to pay down the stock of federal debt if all the income was used for debt payments. Note that the answer also allows us to construct an estimate of individuals' perception of the overall amount of outstanding federal debt.

### **2.3 Treatments**

After respondents answered the initial set of questions, they were assigned to one of seven groups: a control group and six treatment groups. We designed the treatments to disentangle the effects of different possible types of information about current and future deficits and debt levels but also interest rates and inflation. Each group consists of 1/7<sup>th</sup> of the total sample that received the survey and the treatments are randomly assigned. Appendix Table 1 confirms that treatment status is not predictable by household/individual observable characteristics.

Specifically, the treatments are true facts that (i) the Federal deficit for the fiscal year 2018 was \$779 billion or 3.9 percent relative to the level of income as reported by the Treasury; (ii) the level of Federal debt in 2018 was 21.2 trillion dollars or 103.4 percent of current income as reported by the Treasury; (iii) the interest rate on U.S. government debt in 2018 was 2.3 percent as reported by the Congressional Budget Office; (iv) the budget balance of the U.S. Federal government is projected to deteriorate so that the national debt will increase by more than 10 trillion dollars by 2028 as reported by the Congressional Budget Office; (v) prices in the U.S. economy will increase by a little over 2.0 percent per year on average over the next 10 years so that the level of prices in 2028 will increase by a little over 20 percent relative to the current level as projected by the Congressional Budget Office; and that (vi) the total debt of the U.S. Federal Government in 10 years will be more than 30 trillion, or 107 percent of the projected level of income as projected by the Congressional Budget Office. We report the treatments in Table 1.

We chose the treatments to test for different ways in which fiscal policy might affect subjective expectations. First, providing individuals with information about the current deficit



should affect expectations about inflation, discount rates, and/ or primary surpluses to the extent participants were not aware of it beforehand. A similar reasoning applies to the current level of debt, forecasts about future levels of debt, both in terms of changes and as a fraction of GDP. News about future inflation could affect the perceived real value of debt and information on discount rates provides information about the present value of primary surpluses.

Following each treatment (as well as for the control group), respondents were again asked about their inflation forecasts in 12 months as well as cumulatively over the next 10 years, but this time in the form of a point estimate to avoid having them to answer the exact same question twice. This allows us to measure the instantaneous revision in expectations (if any) after the information treatments compared to the control group. Moreover, we elicited the expected percentage change in several fiscal indicators over the next 10 years: nominal government spending, nominal tax revenues, and public debt. We also asked respondents to report their expected average interest rate the government will have to pay on its debt in 10 years.

A common concern in studies eliciting subjective expectations is the fact that some individuals report extreme expectations (D'Acunto et al., 2021) and these expectations might not matter for households' consumption and savings decisions. First, by implementing a within-subject design, we compare the changes in expectations within individuals across treatment conditions relative to the control group that did not receive any information and hence, extreme observations for the levels of expectations or perception are not material in our setting. Second, we estimate our results using robust regressions that are not influenced by outliers or extreme observations as we discuss below. Third, Coibion, Gorodnichenko, and Weber (2019) directly show in a setting similar to ours that exogenous changes in inflation expectations induced by treatments about monetary policy news result in changes in individuals' future consumption spending on the Nielsen panel in line with the consumer Euler equation.

### **3 Preliminary Facts**

Table 2 presents some preliminary statistics about the expectations collected in the survey. Here and in what follows we use a Huber estimator to compute moments and estimate regression coefficients. This approach allows us to remove outliers and influential observations automatically and have estimates that are *robust* to extreme observations in the data (as a result, the sample size for reported estimates is reduced). We also present unfiltered moments in Table 2 for comparison.

For example, the robust average inflation expectation across all households is 2.5 percent with a standard deviation of 2.6 percent while their perceived level of recent inflation is 3.1 percent. The average perception of the Fed's target is close to 5 percent, much higher than the actual target of 2 percent. As can be seen in column 3 of Table 2, the raw means for these expectations are far higher and reflect a very small set of extreme observations that are excluded in Huber moments. Figure 2 plots the distribution of answers to the inflation questions, which illustrates how a few extreme observations can drive the results for the unfiltered mean.

One novel feature of our survey is the question regarding cumulative inflation over the next 10 years. This question is asked to all respondents in distributional form, i.e. they have to assign probabilities to different possible outcomes. This yields an average (Huber-robust) cumulative inflation of just 7 percent, implying that households expect inflation to fall in the future relative to current levels. This expected cumulative inflation is significantly lower than what is predicted by the Survey of Professional Forecasters, approximately 22.1 percent over 10 years. However, respondents were also asked to report their expected cumulative inflation over the next years with a point forecast and we can use responses of the control group to gauge the importance of how survey questions are worded. As reported in Table 2, the latter wording yields a Huber-robust average of 15 percent cumulative inflation over 10 years, much closer to the SPF estimate. The fact that point estimates yield higher reported expectations of inflation than distribution questions is a common finding in surveys like this one. The distribution of answers for cumulative inflation (measured using the distributional question) is plotted in panel D of Figure 2. Like inflation expectations at shorter horizons, there are a number of extreme observations, as well as spikes at values around zero, ten and twenty percent.

Figure 3 plots the cross-sectional correlations across different inflation expectations in binscatter form. Consistent with previous work (e.g., Jonung 1981), there is a strong positive correlation between households' perceived levels of inflation and their expectations of inflation over the next twelve months (Panel A). Panel B documents that those who believe the Fed's inflation target is higher also tend to expect higher levels of inflation. Panel C shows a strong positive correlation between the short-run inflation expectations of households and their longer-run expectations.

The survey then asked a number of questions regarding fiscal policy. First, all respondents were asked how many years it would take to pay off the government debt if all of GDP was used

for this purpose each year. The answer to this question provides an estimate of their perception of debt to GDP ratio. As shown in Table 2, the Huber-robust average response is 10 years, a significant overestimate of the actual size of U.S. government debt (approximately 100 percent of GDP). Figure 4 plots the distribution of answers. While there is a large concentration of answers below 5 years, we also observe large spikes at 10, 20, 50 and 100 years, which likely indicates the profound uncertainty households have about the level of public debt (Binder 2017).

While these responses suggest that households strongly over-estimate the level of U.S. government debt, other survey evidence indicates that the general public grossly under-estimates the level of public debt. For example, using surveys of MTurk respondents in 2017-2019 (a period that covers the time when our survey was conducted), Roth, Settele, and Wolhfart (2020) find that the median belief about U.S. government debt as percent of GDP was 60% and that 90% of respondents report a level of debt below the actual level (104% of GDP). We conjecture that this difference in perceptions about government debt is due to the difference in the wording of the questions. While we ask respondents to report time necessary to pay off debt, Roth, Settele, and Wolhfart (2020) ask respondents to report debt as percent of GDP. Because our wording of the question requires more thinking and effort on the part of households and so makes responses more prone to confusion and misinterpretation and that our treatments are measured in percent of GDP (e.g., treatments T2 and T6 report actual and projected U.S. government debt in percent of GDP), we will take the findings (i.e., the general public grossly underestimates the level of U.S. government debt) in Roth, Settele, and Wolhfart (2020) as the pre-treatment belief of households. At the same time, we will assume that, although our wording of the question yields responses that are likely off in terms of levels, it preserves the ranking of beliefs. In other words, we assume that a respondent reporting a longer time to payoff public debt (larger debt) also reports a higher debt-to-GDP ratio.

Panel D of Figure 3 shows that, on average, those respondents who think the government debt is larger also anticipate higher inflation. A priori, this positive unconditional correlation is what one might expect if households understand that government debt has to be paid off and that inflation is one of the ways to reduce it. However, this positive correlation could arise through other mechanisms. For example, households might think that current fiscal deficit is raising both inflation and current debt levels. Our subsequent information treatments help identify causal effects more clearly.

Survey respondents were also asked a number of additional questions about fiscal policy after the information treatment. Because the control group received no such information, we can view their responses as representative of the population given that treatment status is not predictable by observable characteristics. Table 2 reports their answers to these additional questions. For example, respondents on average expect the government's spending to be 25 percent higher in dollar terms 10 years from now, whereas they expect government revenues to be only 14 percent higher. Consistent with a period of growing budget deficits, the level of government debt is expected to rise by 24 percent over this time period. They also expect the interest rate that the government must pay on its debt to rise by approximately 8 percentage points. Hence, on average, U.S. households perceive a relatively gloomy fiscal future of rising deficits, rising debt, and rising interest payments. For comparison, the Congressional Budget Office was projecting that, if there is no change in legislation, U.S. debt would rise by a little less than fifty percent in nominal terms over the next ten years, or equivalent to going from 103 percent of GDP to 107 percent of GDP. Even adjusted for differences in expected inflation over that period, households were therefore significantly underestimating the projected rise in deficits and debt over the next decade relative to the CBO. In contrast, they were significantly overestimating the projected increase in the interest on government debt, which according to the CBO was only projected to rise from 2.6 percent to 3.5 percent.

Figure 5 plots the unconditional correlations between households' short-run inflation expectations and their expectations for spending growth (Panel A), revenue growth (Panel B) and growth in debt (Panel C) over the next ten years. Panels D-F plot equivalent correlations with households' long-run inflation expectations. In each case, we observe clear positive associations. Individuals who expect higher inflation also tend to expect higher spending and revenue growth as well as a larger increase in debt. In part, this correlation could arise mechanically since fiscal variables are measured in nominal terms and their growth rate therefore depends in part on inflation. But as shown in Panels D-F, most levels of expected spending, revenue and debt growth are above the 45-degree line, indicating that these growth rates are systematically higher than inflation. In other words, households expect growth in these variables to occur in real terms as well as nominal terms. Another possible mechanism behind these correlations could be that households that anticipate e.g. higher debt levels assume that inflation will be higher to help pay for that debt. The multitude of possible interpretations illustrates the need for random variation to establish causality. This is what we consider next.

## 4 Inflation Expectations and Fiscal Policy

Our main interest is in understanding how beliefs about fiscal policy shape both the inflation expectations of households as well as their broader fiscal outlook. We do so through a series of information treatments involving fiscal policy to characterize the extent to which inflation expectations respond to this information.

### 4.1 Information Treatments and Inflation Expectations

To quantify how information treatments affect inflation expectations, we begin by regressing posterior inflation expectations on households' prior beliefs, allowing the slope and intercepts to vary across treatment groups. Specifically, we regress:

$$E_j^{post} \pi = const + \alpha E_i^{pre} \pi + \sum_{k=1}^6 \beta_k T_j^{(k)} + \sum_{k=1}^6 \gamma_k T_j^{(k)} \times E_i^{pre} \pi + \mathbf{W}_j \boldsymbol{\psi} + error_j, \quad (1)$$

where  $j$  indexes respondents,  $E\pi$  is a measure of inflation expectations,  $pre$  denotes expectations measured before treatment,  $post$  denotes expectations measured after treatment,  $T_j^{(k)}$  is an indicator variable equal to one if individual  $j$  is provided with treatment  $k$ ,  $\mathbf{W}$  is a vector of household/individual characteristics. Because the provision of treatments is randomized, controls  $\mathbf{W}$  help with the precision of the estimates but have no material effect on the estimates. As a result, we focus on the specification without controls and report estimates after controlling for  $\mathbf{W}$  in the appendix.<sup>3</sup>

Intuitively, specification (1) assesses whether households put more or less weight on their prior beliefs in forming their posteriors depending on whether they are provided with new information or not. As discussed in Coibion, Gorodnichenko and Kumar (2018), Bayesian updating of information implies that  $\gamma_k$  should be negative because respondents' posterior beliefs are a weighted average of their prior beliefs and a signal. Furthermore,  $\gamma_k$  should be more negative for more informative/credible treatments, i.e., the weight on the prior is smaller. Coefficients  $\beta_k$  (the "level" effects) may be positive (a signal is above initial beliefs) or negative (a signal is below

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<sup>3</sup> Individual characteristics are gender, age, age squared, employment indicator, and race. Household characteristics are household income (binned; indicator variable for each bin), household size (indicator variable for each size), census region (indicator variable for each region), male head education (indicator variable for each group), female head education (indicator variable for each group).

initial beliefs). Thus, this specification provides a flexible way of characterizing how information treatments affect both the slope and the level of inflation expectations.

We run this regression using both 12-month ahead inflation expectations as well as expected cumulative inflation over the next 10 years. In each case, posterior expectations are measured using point forecasts while prior beliefs are measured using distributions. Using different formulations of the questions helps avoid survey fatigue on the part of respondents but introduces a form of measurement error when comparing the two sets of responses. As a result, even for the control group that receives no treatment, the expected slope of the relationship linking posteriors to priors should be less than one.

We illustrate the results of this regression visually for 12-month ahead inflation expectations in Figure 6 and present corresponding estimates in Table 3. The slope of the relationship between posteriors and priors for the control group is 0.61, indicating that while differences in expectations based on phrasing of questions are non-trivial, the correlation between answers to the two questions is nonetheless quite strong. For ease of comparison to previous work, consider first the effect of the inflation treatment T5. This consists of informing households that the CBO projects an inflation rate of 2.0 percent per year over the next ten years, so prices will be 22 percent higher in 2028. As Figure 6 makes clear, this leads to pronounced revisions in inflation expectations toward the provided signal: those with initially high inflation expectations revise those expectations downward while those with low prior expectations raise them toward 2 percent. The weight assigned to prior beliefs is only 0.35, indicating that respondents are placing a lot of weight on the signal. This high sensitivity of inflation expectations to information about inflation is consistent with prior evidence in Coibion, Gorodnichenko and Weber (2019). Also consistent with prior work is the fact that the information treatment involving current interest rates (T3) has a very similar effect on inflation expectations as does the inflation treatment (Coibion, Georgarakos, Gorodnichenko, and Weber 2019).

The effect of fiscal treatments is quite different. When we tell households about the size of the deficit in 2018 (T1) or the size of U.S. government debt (T2), we find results that are almost indistinguishable from the control group. Recall that we follow Roth, Settele, and Wolhfarth (2020) and assume households to grossly under-estimate the level of U.S. government debt so that the treatments like T1 or T2 raise households' expectations about public debt. This holds for both short-run and long-run expectations. The regression lines plotted in Figure 6 for these two

treatments almost completely overlap those of the control group, particularly for priors of inflation between 0 and 5 percent. Table 3 confirms this visual impression: both the intercept and slope coefficients are nearly indistinguishable from those of the control group.

However, when households are provided with information about either the projected increase in government debt by 2028 (treatment T4), or the expected level of future government debt (treatment T6), we see a clear upward shift in the line summarizing the relationship between priors and posteriors. Table 3 confirms that the slope for each is very close to that of the control group but both treatments induce an upward shift in the curves. This indicates that the treatment affects all respondents about equally. Those with high initial inflation expectations have approximately the same response as those with low initial inflation expectations: they all raise their inflation expectations by similar amounts. These results suggest that households treat information about the current and future fiscal outlook differently: information about the current fiscal situation has little noticeable effect on inflation expectations whereas information about future debt levels leads to an increase in short-run inflation expectations. This muted response to information about the current fiscal situation could be consistent with households already being fully aware of these numbers. Given the huge dispersion in how long it will take for the government to repay the current outstanding debt in our survey as well as findings in Roth, Settele and Wolhfart (2020), this explanation is unlikely.

Figure 7 presents equivalent results for long-run inflation expectations. The effects are similar. Information about inflation and interest rates primarily affect the slope of the relationship, meaning that they induce differential responses by those holding high vs. low initial inflation expectations leading to a convergence in views about long-run inflation. Treatments about the current debt or deficit again have little effect relative to the control group. Table 3 confirms that both the intercept and slope coefficients are not statistically different from those of the control group. Hence, information about current debt levels or the current deficit does not seem to have any effect on the longer-run inflation expectations of households. This is, however, not the case for treatments involving future debt levels. Information about the upcoming change in debt has a clear level effect on long-run inflation expectations. The information treatment about the future level of debt has little effect on those initially anticipating low levels of inflation but raises the long-run inflation expectations of those who already anticipate higher inflation, leading to an increase in the average level of long-run inflation expectations.

In summary, we find similar patterns for both short-run and long-run inflation expectations. Treatments involving inflation or interest rates lead to convergence in inflation expectations. Treatments involving future debt levels (i.e., informing households that public debt projected by the CBO will be much higher than they believe) raise inflation expectations across the board, while those involving current debt or deficits have no effect on inflation expectations.

## 4.2 How Do Households Revise their Views about the Fiscal Outlook?

Our main result so far is that inflation expectations of households respond to information about future debt levels but are largely insensitive to information about the current fiscal situation. One would expect news about either the current or future fiscal outlook to also potentially affect households' expectations for other fiscal variables. For example, finding out that the government's debt level is significantly lower than previously thought could induce households to anticipate lower taxes in the future, more spending, or lower future interest rates, among other possibilities. Similarly, finding out that debt will be higher in the future could induce households to not only anticipate higher inflation but also rising levels of government spending or higher interest rates being paid on the debt. Because the survey asked respondents a number of questions on their expectations about fiscal outcomes after the information treatments, we can consider the extent to which different information treatments lead the treated households to have different beliefs than the control group. We do so in the following regression:

$$E_j^{post}Y = const + \sum_{k=1}^6 \beta_k T_j^{(k)} + \mathbf{W}_j\boldsymbol{\psi} + error_j, \quad (2)$$

where  $E_j^{post}Y$  is the response of household  $j$  to question about variable  $Y$ . As before,  $T_j$  is an indicator variable for the different treatments and  $\mathbf{W}_j$  is a vector of observable individual and household characteristics. The outcome variables include short-run and long-run inflation expectations, the expected growth in government spending over the next ten years, the expected growth in government revenues over the next ten years, the interest rate on government debt in ten years, and the growth rate of the government debt over the next ten years. Note that unlike specification (1), specification (2) is an across-subject design and compares responses across individuals by treatments relative to the control group because we did not elicit prior beliefs for most of the variables which we study in Table 4.

The results for inflation expectations are broadly in line with those found earlier. The interest rate and inflation treatments move average inflation expectations in the direction of the



provided signal. In addition, we find positive effects on average inflation expectations when households are informed about future debt levels or the future growth in debt. Telling households that the U.S. budget balance will deteriorate so that the national debt will increase by ten trillion dollars by 2028 leads to an increase in short-run inflation expectations of 25bp and a rise in the cumulative inflation expectations of about 1 percentage point over ten years. Telling households that the debt level in 2028 will be more than 30 trillion dollars, or 107 percent of the projected level of income, leads to slightly larger increases in inflation expectations over both the short-run and long-run. In contrast, treatments involving the current level of debt or the current deficit have no effect on expected inflation.

Treatments involving future inflation or future interest rates might not be expected to have much of an effect on the fiscal outlook, other than potentially through nominal effects. This is indeed what we find. Telling households that inflation is projected to be 2 percent over the next ten years does not materially affect households' expected path of government spending or revenues, nor does it affect the projected growth in debt. This suggests that the unconditional positive correlations between inflation expectations and spending, revenue and debt growth expectations are unlikely to be driven by causality running from inflation to fiscal measures. Instead, the fact that information about future debt levels both raises expectations of future debt growth and inflation expectations suggests that causality could be mainly running from the fiscal outlook to inflation expectations.

Informing households about the current interest rate on government debt affects their expectation of that interest rate in ten years but otherwise has no detectable effect. In contrast, when we inform households about the future level of debt or the future increase in debt, they raise their expectations about the future increase in debt by 2.5-3 percentage points. In the case of the future debt level treatment, they also revise their expectations about both future government spending and future tax revenues and furthermore expect the government to be paying a higher interest rate on their debt. When told about the upcoming rise in debt levels, households also anticipate a higher growth rate in government spending. Hence, in both cases but especially in the case of the future debt level treatment, households revise their expectations about the broader fiscal outlook along with their inflation expectations.

The treatments involving current debt or deficit levels, on the other hand, do not induce any meaningful revisions about future fiscal conditions. Households do not anticipate lower levels

of government spending or higher levels of revenues to compensate for the higher current debt or deficit, nor do they anticipate rising debt in the future. The absence of any meaningful impact on any fiscal variable ten years later suggests that households may view current fiscal conditions as largely transitory. This is in contrast to news about higher future debt levels, which seem to be interpreted as reflecting more structural factors and requiring higher inflation to be sustainable.

### **4.3 Effects of Treatments on Different Types of Individuals**

Do these effects apply similarly across individuals? It could be the case that fiscal factors matter more for subsets of the population, for example those who pay a large share of government revenues in taxes. Another example could be if some individuals' incomes are potentially sensitive to the budget outlook, such as those living on Social Security or receiving other government transfers. As a result, we first examine whether the inflation expectations of different subgroups are more or less sensitive to different kinds of information treatments, then consider whether their fiscal outlooks also vary differently based on specific observable characteristics. For the latter, we focus on the treatment involving future debt levels, which is the one that induces the largest revisions in fiscal expectations across the whole sample.

We focus on four specific observable dimensions of respondents. The first is political leaning. Political preferences could naturally shape perceptions of how fiscal imbalances affect subsequent economic growth, for example, or how likely it is that the existing stock of debt will be reduced via inflation, economic growth, or reductions in future primary surpluses. The survey asked respondents if they identified primarily as Republican, Democrat or Independent/Other. For each political group, we re-estimate equation (1) and present results in Table 5 for short-run inflation expectations and Table 6 for long-run inflation expectations. We find few clear differences in the effects of treatments based on political preferences. Republicans are a little less sensitive to new information about future inflation in forming their short-run inflation expectations. Information about the future rise in government debt leads Democrats to raise their average inflation expectations somewhat while Republicans instead increase the weight they assign to their prior beliefs, as if the projection of rising debt was viewed as an even less credible signal than receiving no information. Differences in the effects on long-run expectations are even more muted.

One notable difference, though, is not between Republicans and Democrats but rather between Independents and members of the two major parties. In the case of Treatment 6 (information about the future debt level), the increase in short-run inflation expectations appears to take place only for Independents.<sup>4</sup> Table 7 focuses on Treatment 6 in detail and illustrates how both inflation expectations and other fiscal expectations on average differ from the control group by political affiliations, again estimating specification (2). The results confirm that the average increase in inflation expectations in this treatment comes primarily from Independents. But Independents do not just differ in how their inflation expectations respond. Both Republicans and Democrats respond to the information about a high future debt level by raising their own expectations of future debt levels as well as their projections of both spending and revenue growth. In contrast, Independents do not change their expectations about the future growth in debt but rather raise their expected revenue growth and their long-run inflation expectations while simultaneously reducing their expectations of future spending growth, although this last effect is not statistically significant. Hence Independents seem to believe that a forecast of rising debt levels will be addressed by policies that reduce spending, raise revenues and increase inflation to such an extent that they offset the projected change in growth. Republicans and Democrats, in contrast, believe the increase in projected debt growth will materialize and raise their projections of both spending and revenues by equal amounts, consistent with the absence of any offsetting policies, be they fiscal or monetary to address the growing debt.

A second characteristic that we consider is education. One might expect, for example, more educated respondents to better understand the link between the fiscal outlook and inflation. Consistent with this hypothesis, Tables 5 and 6 suggest that the increase in short-run and long-run inflation expectations among the educated is broad-based when informed about the future level of debt or the future change in debt whereas for less educated individuals, this effect only appears for those who initially expected higher inflation. Nonetheless, Table 7 indicates that the resulting average change in inflation expectations is broadly similar across the two groups under the future debt level information treatment, and these similarities largely extend to their fiscal outlooks.

A third characteristic is exposure to financial markets, which we capture by whether households report holding any financial investments. We find in Tables 5 and 6 that those without financial investments place relatively more weight on information about interest rates than those

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<sup>4</sup> The full set of results is reported in Appendix Tables 3-12.

with financial investments, consistent with the latter being more confident in their knowledge of the matter. We do find that those with financial investments are more sensitive to information about the future level of debt: this information leads them to significantly downweigh their priors relative to others and to raise their average short-run inflation expectations by 0.95 percentage points. However, their long-run inflation expectations are not differentially affected by information about the U.S. fiscal situation. Table 7 indicates that, in the case of the future debt treatment, those with financial investments have a somewhat different fiscal interpretation of the news than those without. The two groups raise their estimates of debt growth by similar amounts, but only those with investments associate this with a corresponding increase in spending and revenue growth as well as higher interest payments.

The final characteristic that we consider is age, for which we use a simple sample split based on whether respondents are older or younger than 50. Here we see more pronounced differences. Older individuals (currently retired or likely to retire in 10 years) respond more strongly to information about inflation and interest rates as shown in Tables 5 and 6, consistent with their greater exposure to inflation uncertainty and interest rate risk. This result holds not just for their short-run inflation expectations but also for their cumulative 10-year inflation expectations. When it comes to the future debt level treatment however, it is the younger respondents who raise their long-run inflation expectations (by 3.5 percentage points) while older respondents do not. Underlying this is the fact that younger respondents expect a larger increase in debt associated with higher interest rates than do older respondents.

## **5 Conclusion**

The fiscal prospects have long been dire for many advanced economies. An aging population, rising medical costs, and a slowing rate of technological progress have all cast a pall over the fiscal outlook. But the COVID outbreak has dramatically worsened this outlook, at least in the short-run, due to the collapse in tax revenues and the dramatic increases in spending that have occurred since March of 2020. The inexorable march toward higher debt levels in most advanced economies has thus taken another giant leap.

Will this rising debt parlay into higher inflation as strapped governments turn to the printing presses? Models of fiscal dominance imply that higher debt levels without offsetting improvements in future primary surpluses should lead to higher prices today as households and

firms anticipate the rising inflation and pass it into current prices and wages. How strong are these expectations effects? Our results suggest that most households do not perceive current high deficits or current debt as inflationary nor as being indicative of significant changes in the fiscal outlook. In that sense, our results are not out of line with Dick Cheney's famous quip that "deficits don't matter". But a persistently worsening fiscal outlook, with rising debt levels into the future, does seem to have a more powerful effect on expectations, including inducing households to expect some monetization of the future debt. At least in the minds of many households then, the possibility of fiscal dominance is not so far-fetched.

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*Table 1. Description of treatment arms.*

Code	Description
T0	Control group
T1	The U.S. Treasury department reports that for the 2018 fiscal year the U.S. Federal government ran a deficit of \$779 billion or 3.9% relative to the level of income (Gross Domestic Product) generated by the economy in 2018.
T2	The U.S. Treasury department reports that the current level of the public debt of the U.S. Federal government is 21.2 trillion dollars or 103.4% of the current income (Gross Domestic Product) generated by the economy in 2018.
T3	The U.S. Congressional Budget Office reports that the interest rate on U.S. government debt is currently 2.3%.
T4	The U.S. Congressional Budget Office reports that the budget balance of the U.S. Federal government is projected to deteriorate so that the national debt will increase by more than 10 trillion dollars by 2028.
T5	The U.S. Congressional Budget Office projects that prices in the U.S. economy will increase by a little over 2.0% per year on average over the next 10 years so that the level of prices in 2028 will increase by a little over 20% relative to the current level.
T6	The U.S. Congressional Budget Office projects that the total debt of the U.S. Federal Government in 10 years will be more than 30 trillion dollars, or 107% of the projected level of income (Gross Domestic Product).



Table 2. Descriptive statistics.

	Robust moments		Moments		
	Mean	St. Dev	Mean	Median	St. Dev
	(1)	(2)	(3)	(4)	(5)
Perceived inflation, previous 12 months	3.07	3.70	9.83	3.00	14.48
Price of gasoline in your area, \$/gallon	2.33	0.38	2.48	2.35	0.52
Perceived current unemployment rate	5.57	3.81	15.51	6.40	18.32
Perceived inflation target of the Fed	4.80	4.61	19.99	5.00	28.45
Expected inflation, next 12 months	3.69	3.55	4.44	3.15	4.66
Expected (cumulative) inflation, next 10 years	8.14	12.03	12.43	8.60	23.88
Expected inflation uncertainty, next 12 months	2.33	2.29	3.17	2.29	3.03
Expected (cumulative) inflation uncertainty, next 10 years	7.28	9.71	13.42	6.29	15.52
Time to repay government debt, years	9.70	10.67	24.42	10.00	31.58
Government spending growth over next 10 years, * %	25.42	28.86	90.73	25.00	139.98
Government revenue growth over next 10 years, * %	14.29	20.35	60.46	15.00	105.82
Government debt growth over next 10 years, * %	23.87	29.88	94.12	25.00	148.17
Change in interest rate on government debt over next 10 years, * %	8.12	9.24	47.77	10.00	90.84
Expected inflation, next 12 months, point prediction*	4.05	3.86	55.09	20.00	89.80
Expected (cumulative) inflation, next 10 years, point prediction*	14.95	16.22	12.92	5.00	18.62

Notes: Uncertainty is measured as the standard deviation implied from the reported probability distribution over a range of bins. Inflation expectations are implied means, unless specified otherwise. Other expectations/perceptions are reported as point predictions. Moments in columns (1) and (2) are computed using the Huber-robust method. Moments in columns (3)-(5) are based on the data winsorized at bottom and top 5 percent. \* indicates that statistics are computed for the control group (4,491 observations). The number of observations is 28,594.

Table 3. Treatment effects on inflation expectations.

	Short-run inflation expectations (1)	Long-run inflation expectations (2)
<b>Intercept</b>		
Control	1.387*** (0.074)	7.983*** (0.309)
Relative to control:		
T1 (current deficit)	0.054 (0.102)	-0.323 (0.427)
T2 (current debt)	-0.020 (0.100)	-0.037 (0.431)
T3 (current interest rate)	0.354*** (0.100)	0.602 (0.425)
T4 (future change in debt)	0.193* (0.104)	1.236*** (0.435)
T5 (inflation projection)	0.453*** (0.102)	3.415*** (0.430)
T6 (future level of debt)	0.184* (0.106)	0.046 (0.443)
<b>Slope</b>		
Control	0.608*** (0.017)	0.491*** (0.018)
Relative to control:		
T1 (current deficit)	-0.011 (0.023)	-0.039 (0.024)
T2 (current debt)	0.038* (0.023)	0.000 (0.025)
T3 (current interest rate)	-0.197*** (0.023)	-0.100*** (0.024)
T4 (future change in debt)	0.042* (0.023)	-0.077*** (0.024)
T5 (inflation projection)	-0.244*** (0.023)	-0.212*** (0.022)
T6 (future level of debt)	0.039* (0.023)	0.045* (0.025)
Observations	20,991	19,248
R-squared	0.372	0.332

*Notes:* the table reports estimates of specification (1) for short-term inflation expectations (column 1) and long-run inflation expectations (column 2). Coefficients for groups other than the control group are relative to the coefficient for the control group. All estimates are based on Huber robust regressions. Regressions use sampling weights. The sample is restricted to respondents reporting non-negative inflation expectations in the pre-treatment responses. No household/respondent controls are included (results when controls are included are reported in Appendix Table 2). Robust standard errors are in parentheses. \*\*\*, \*\*, \* denote statistical significance at 1, 5 and 10 percent levels.

Table 4. Treatment effects on levels of expected inflation and fiscal indicators.

	Inflation expectations		Fiscal indicators in 10 years			
	12-months ahead	10-year ahead, cumulative	Spending, % relative to current level	Revenue, % relative to current level	Debt, % relative to current level	Interest rate
	(1)	(2)	(3)	(4)	(5)	(6)
Control group	3.848*** (0.058)	15.361*** (0.295)	23.018*** (0.422)	13.660*** (0.315)	21.189*** (0.424)	7.490*** (0.140)
Treatment effects relative to control						
T1 (current deficit)	0.035 (0.083)	-0.319 (0.411)	-0.821 (0.587)	0.296 (0.443)	0.788 (0.593)	-0.226 (0.198)
T2 (current debt)	0.013 (0.083)	0.132 (0.419)	-0.043 (0.599)	0.453 (0.448)	0.399 (0.598)	0.218 (0.200)
T3 (current interest rate)	-0.344*** (0.077)	-0.153 (0.416)	-0.290 (0.589)	0.370 (0.450)	0.630 (0.597)	-1.186*** (0.186)
T4 (debt projection, change)	0.249*** (0.084)	1.018** (0.426)	0.989* (0.597)	0.070 (0.452)	2.503*** (0.607)	0.135 (0.202)
T5 (inflation projection)	-0.366*** (0.079)	1.361*** (0.416)	0.948 (0.597)	0.396 (0.446)	0.531 (0.602)	0.022 (0.200)
T6 (debt projection, level)	0.359*** (0.087)	1.284*** (0.430)	1.121* (0.593)	1.699*** (0.455)	2.893*** (0.607)	0.410** (0.202)
Observations	21,217	19,741	23,795	23,377	23,414	22,936
R-squared	0.006	0.002	0.001	0.001	0.002	0.004

Notes: the table reports estimates of specification (2) for inflation expectations and fiscal indicators as the dependent variables. Inflation expectations are measured as point predictions. Coefficients for groups other than the control group are relative to the coefficient for the control group. All estimates are based on Huber robust regressions. Regressions use sampling weights. The samples for inflation expectations regressions are restricted to respondents reporting non-negative inflation expectations in the pre-treatment responses. No household/respondent controls are included (results when controls are included are reported in Appendix Table 3). Robust standard errors are in parentheses. \*\*\*, \*\*, \* denote statistical significance at 1, 5 and 10 percent levels.

Table 5. Treatment effects on short-term inflation expectations by demographic group.

	Political leaning			Education		Financial investments		Age	
	Democrat	Republican	Other	College or more	Less than college	Yes	No	50 years or more	Less than 50 years
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Intercept									
Control	1.331*** (0.130)	1.311*** (0.107)	1.446*** (0.156)	1.206*** (0.077)	2.073*** (0.159)	2.161*** (0.190)	1.287*** (0.075)	1.178*** (0.083)	1.908*** (0.145)
Relative to control:									
T1 (current deficit)	0.265 (0.180)	0.056 (0.152)	0.408* (0.223)	-0.015 (0.108)	0.097 (0.226)	0.019 (0.267)	0.042 (0.105)	0.196* (0.116)	-0.324 (0.198)
T2 (current debt)	0.202 (0.188)	0.056 (0.142)	-0.113 (0.211)	0.042 (0.107)	-0.165 (0.218)	-0.194 (0.266)	-0.096 (0.101)	0.215* (0.112)	-0.421** (0.199)
T3 (current interest rate)	0.499*** (0.176)	0.620*** (0.142)	0.303 (0.216)	0.349*** (0.107)	0.183 (0.214)	0.087 (0.257)	0.537*** (0.103)	0.594*** (0.115)	0.003 (0.193)
T4 (future change in debt)	0.445** (0.198)	-0.137 (0.145)	0.333 (0.212)	0.449*** (0.110)	-0.079 (0.227)	0.092 (0.268)	0.267** (0.108)	0.372*** (0.121)	-0.201 (0.196)
T5 (inflation projection)	0.638*** (0.186)	0.277** (0.141)	0.700*** (0.226)	0.546*** (0.111)	0.178 (0.215)	0.440* (0.262)	0.441*** (0.104)	0.543*** (0.115)	0.342* (0.200)
T6 (future level of debt)	0.276 (0.185)	0.052 (0.156)	0.619*** (0.233)	0.322*** (0.111)	0.101 (0.230)	0.951*** (0.292)	0.072 (0.109)	0.087 (0.118)	0.440** (0.214)
Slope									
Control	0.639*** (0.027)	0.547*** (0.027)	0.689*** (0.035)	0.619*** (0.019)	0.575*** (0.033)	0.620*** (0.038)	0.581*** (0.018)	0.681*** (0.018)	0.460*** (0.033)
Relative to control:									
T1 (current deficit)	-0.027 (0.037)	-0.070* (0.038)	-0.080* (0.047)	-0.006 (0.026)	0.003 (0.046)	-0.026 (0.052)	-0.010 (0.025)	-0.089*** (0.026)	0.134*** (0.044)
T2 (current debt)	0.035 (0.040)	0.013 (0.035)	0.033 (0.046)	0.020 (0.027)	0.081* (0.044)	0.146*** (0.053)	0.052** (0.024)	-0.046* (0.025)	0.164*** (0.044)
T3 (current interest rate)	-0.211*** (0.039)	-0.276*** (0.036)	-0.231*** (0.047)	-0.183*** (0.027)	-0.156*** (0.044)	-0.145*** (0.050)	-0.235*** (0.025)	-0.303*** (0.027)	-0.026 (0.043)
T4 (future change in debt)	-0.003 (0.041)	0.120*** (0.036)	-0.002 (0.047)	-0.062** (0.026)	0.179*** (0.046)	0.088 (0.055)	0.004 (0.025)	-0.045* (0.027)	0.230*** (0.043)
T5 (inflation projection)	-0.300*** (0.039)	-0.172*** (0.036)	-0.322*** (0.049)	-0.266*** (0.026)	-0.181*** (0.045)	-0.248*** (0.051)	-0.229*** (0.025)	-0.280*** (0.026)	-0.202*** (0.045)
T6 (future level of debt)	0.042 (0.038)	0.037 (0.039)	-0.062 (0.048)	-0.040 (0.026)	0.108** (0.046)	-0.141*** (0.053)	0.068*** (0.026)	0.057** (0.026)	-0.022 (0.045)
Observations	6,959	7,228	6,887	12,104	9,242	8,178	13,169	12,712	8,321
R-squared	0.379	0.387	0.326	0.435	0.258	0.226	0.440	0.442	0.268

Notes: the table reports estimates of specification (1) for short-term inflation expectations by demographic group. Coefficients for treatment groups other than the control group are relative to the coefficient for the control group. Educational attainment is based on the highest level of male and female heads of the household. All estimates are based on Huber robust regressions. Regressions use sampling weights. The sample is restricted to respondents reporting non-negative inflation expectations in the pre-treatment responses. No household/respondent controls are included. Robust standard errors are in parentheses. \*\*\*, \*\*, \* denote statistical significance at 1, 5 and 10 percent levels.

Table 6. Treatment effects on long-term inflation expectations by demographic group.

	Political leaning			Education		Financial investments		Age	
	Democrat	Republican	Other	College or more	Less than college	Yes	No	55 years or more	Less than 55 years
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Intercept									
Control	8.223*** (0.557)	7.712*** (0.511)	8.240*** (0.567)	8.031*** (0.448)	7.928*** (0.426)	7.867*** (0.506)	7.988*** (0.408)	8.383*** (0.389)	7.369*** (0.501)
Relative to control:									
T1 (current deficit)	0.419 (0.746)	-0.577 (0.703)	-1.006 (0.780)	0.116 (0.615)	-0.660 (0.588)	-0.855 (0.703)	-0.244 (0.552)	-0.444 (0.536)	-0.172 (0.699)
T2 (current debt)	0.310 (0.770)	-0.538 (0.699)	0.011 (0.794)	0.006 (0.621)	-0.061 (0.595)	0.571 (0.720)	-0.194 (0.551)	-0.251 (0.540)	0.318 (0.707)
T3 (current interest rate)	1.519** (0.742)	0.125 (0.707)	0.067 (0.790)	0.881 (0.623)	0.249 (0.588)	0.239 (0.696)	0.839 (0.550)	0.596 (0.541)	0.659 (0.681)
T4 (future change in debt)	1.449* (0.765)	0.328 (0.725)	1.625** (0.798)	1.532** (0.634)	0.919 (0.599)	0.708 (0.721)	1.566*** (0.561)	0.493 (0.550)	2.339*** (0.709)
T5 (inflation projection)	4.272*** (0.785)	2.970*** (0.694)	2.866*** (0.791)	3.949*** (0.632)	2.894*** (0.584)	2.808*** (0.708)	3.900*** (0.560)	3.352*** (0.535)	3.474*** (0.712)
T6 (future level of debt)	0.027 (0.772)	-0.390 (0.729)	0.461 (0.816)	0.208 (0.633)	-0.123 (0.617)	0.152 (0.765)	-0.009 (0.555)	-0.419 (0.546)	0.758 (0.744)
Slope									
Control	0.487*** (0.035)	0.459*** (0.035)	0.511*** (0.029)	0.493*** (0.029)	0.489*** (0.024)	0.486*** (0.025)	0.498*** (0.028)	0.508*** (0.023)	0.458*** (0.029)
Relative to control:									
T1 (current deficit)	-0.072* (0.043)	-0.007 (0.045)	-0.025 (0.040)	-0.041 (0.037)	-0.039 (0.033)	-0.050 (0.033)	-0.019 (0.036)	-0.061* (0.032)	0.001 (0.038)
T2 (current debt)	0.031 (0.045)	0.034 (0.047)	-0.046 (0.039)	-0.000 (0.037)	-0.001 (0.033)	0.022 (0.035)	-0.028 (0.036)	-0.027 (0.032)	0.045 (0.039)
T3 (current interest rate)	-0.097** (0.041)	-0.081* (0.047)	-0.122*** (0.040)	-0.089** (0.039)	-0.104*** (0.030)	-0.097*** (0.033)	-0.104*** (0.034)	-0.126*** (0.031)	-0.058 (0.037)
T4 (future change in debt)	-0.098** (0.042)	0.010 (0.048)	-0.115*** (0.038)	-0.070* (0.038)	-0.081*** (0.030)	-0.070** (0.033)	-0.085** (0.035)	-0.076** (0.031)	-0.068* (0.037)
T5 (inflation projection)	-0.228*** (0.043)	-0.179*** (0.043)	-0.222*** (0.033)	-0.191*** (0.035)	-0.219*** (0.028)	-0.191*** (0.030)	-0.236*** (0.034)	-0.235*** (0.028)	-0.169*** (0.037)
T6 (future level of debt)	0.027 (0.044)	0.070 (0.047)	0.040 (0.039)	0.051 (0.038)	0.042 (0.032)	0.038 (0.036)	0.048 (0.035)	0.035 (0.031)	0.066 (0.040)
Observations	6,203	6,856	6,189	11,228	8,020	7,002	12,246	12,157	7,091
R-squared	0.323	0.309	0.355	0.289	0.370	0.375	0.297	0.333	0.331

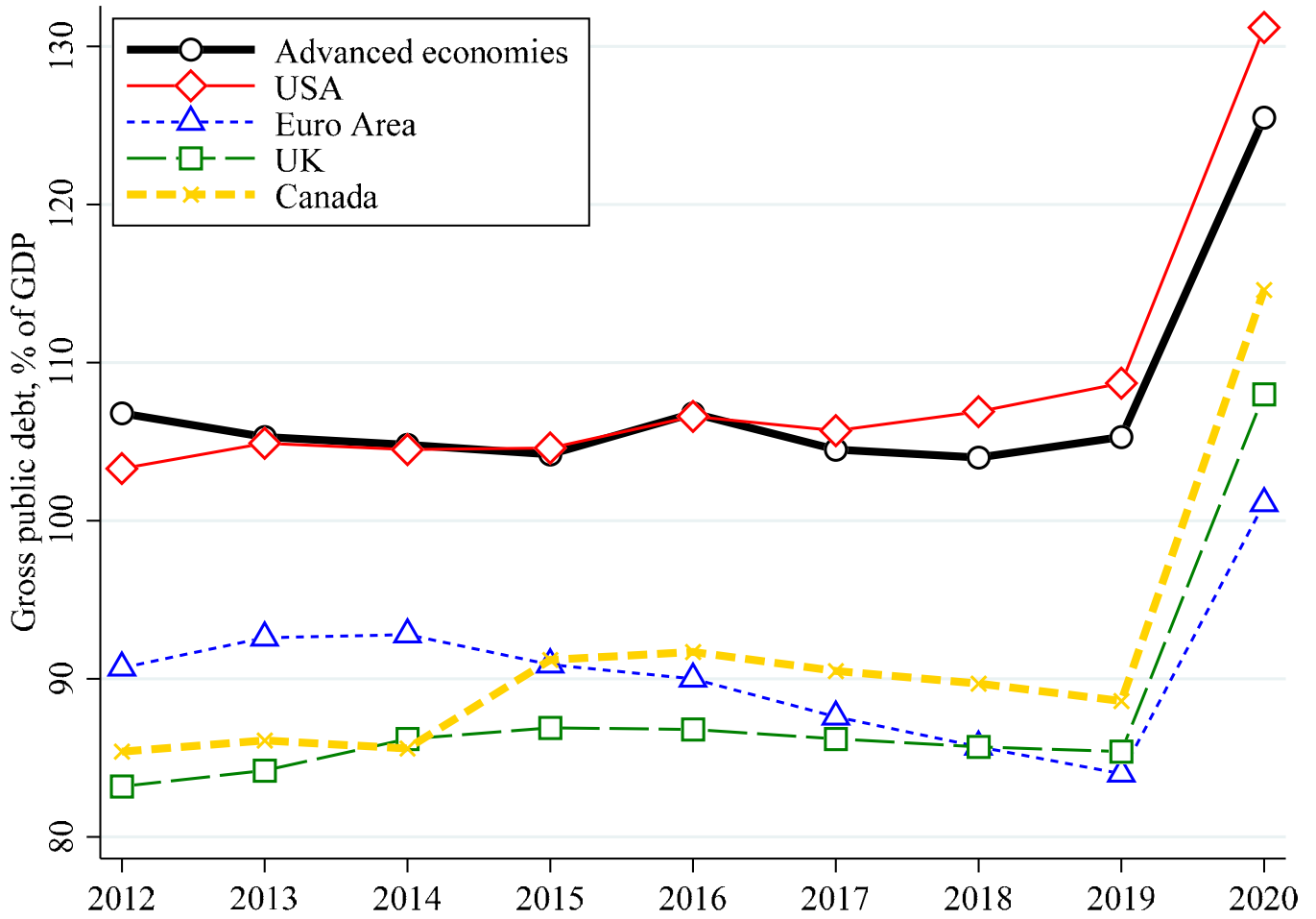
Notes: the table reports estimates of specification (1) for long-term inflation expectations by demographic group. Coefficients for treatment groups other than the control group are relative to the coefficient for the control group. Educational attainment is based on the highest level of male and female heads of the household. All estimates are based on Huber robust regressions. Regressions use sampling weights. The sample is restricted to respondents reporting non-negative inflation expectations in the pre-treatment responses. No household/respondent controls are included. Robust standard errors are in parentheses. \*\*\*, \*\*, \* denote statistical significance at 1, 5 and 10 percent levels.

Table 7. Treatment effects on levels of expected inflation and fiscal indicators, treatment effect for T6 (debt projection, level).

	Inflation expectations		Fiscal indicators in 10 years			
	12-months ahead	10-year ahead, cumulative	Spending, % relative to current level	Revenue, % relative to current level	Debt, % relative to current level	Interest rate
	(1)	(2)	(3)	(4)	(5)	(6)
Full sample	0.359*** (0.087)	1.284*** (0.430)	1.121* (0.593)	1.699*** (0.455)	2.893*** (0.607)	0.410** (0.202)
Subsamples						
Political leaning						
Republicans	0.246 (0.164)	0.559 (0.760)	2.051** (1.018)	1.589** (0.786)	3.880*** (1.043)	0.546 (0.363)
Democrats	0.169 (0.108)	0.223 (0.578)	1.605* (0.858)	1.567** (0.688)	3.161*** (0.880)	-0.322 (0.270)
Other	0.847*** (0.207)	2.107** (0.933)	-1.262 (1.209)	2.109** (0.912)	0.172 (1.254)	0.980** (0.433)
Educational attainment						
College or more	0.304*** (0.088)	1.230** (0.496)	1.539** (0.692)	2.175*** (0.555)	2.698*** (0.727)	0.452** (0.213)
Less than college	0.626*** (0.198)	1.206 (0.784)	0.335 (0.978)	1.532** (0.735)	3.080*** (0.971)	0.719* (0.392)
Financial wealth						
Yes	0.757*** (0.246)	1.435 (0.940)	2.229* (1.171)	2.968*** (0.894)	2.901** (1.139)	1.223** (0.483)
No	0.184** (0.079)	1.017** (0.459)	0.866 (0.646)	0.812 (0.518)	3.167*** (0.680)	0.209 (0.195)
Respondent's age						
50 years or more	0.236** (0.097)	0.235 (0.491)	0.989 (0.685)	1.944*** (0.551)	2.329*** (0.682)	0.030 (0.208)
Less than 50 years	0.445** (0.175)	3.641*** (0.863)	1.549 (1.104)	1.567* (0.805)	3.726*** (1.147)	1.061** (0.439)

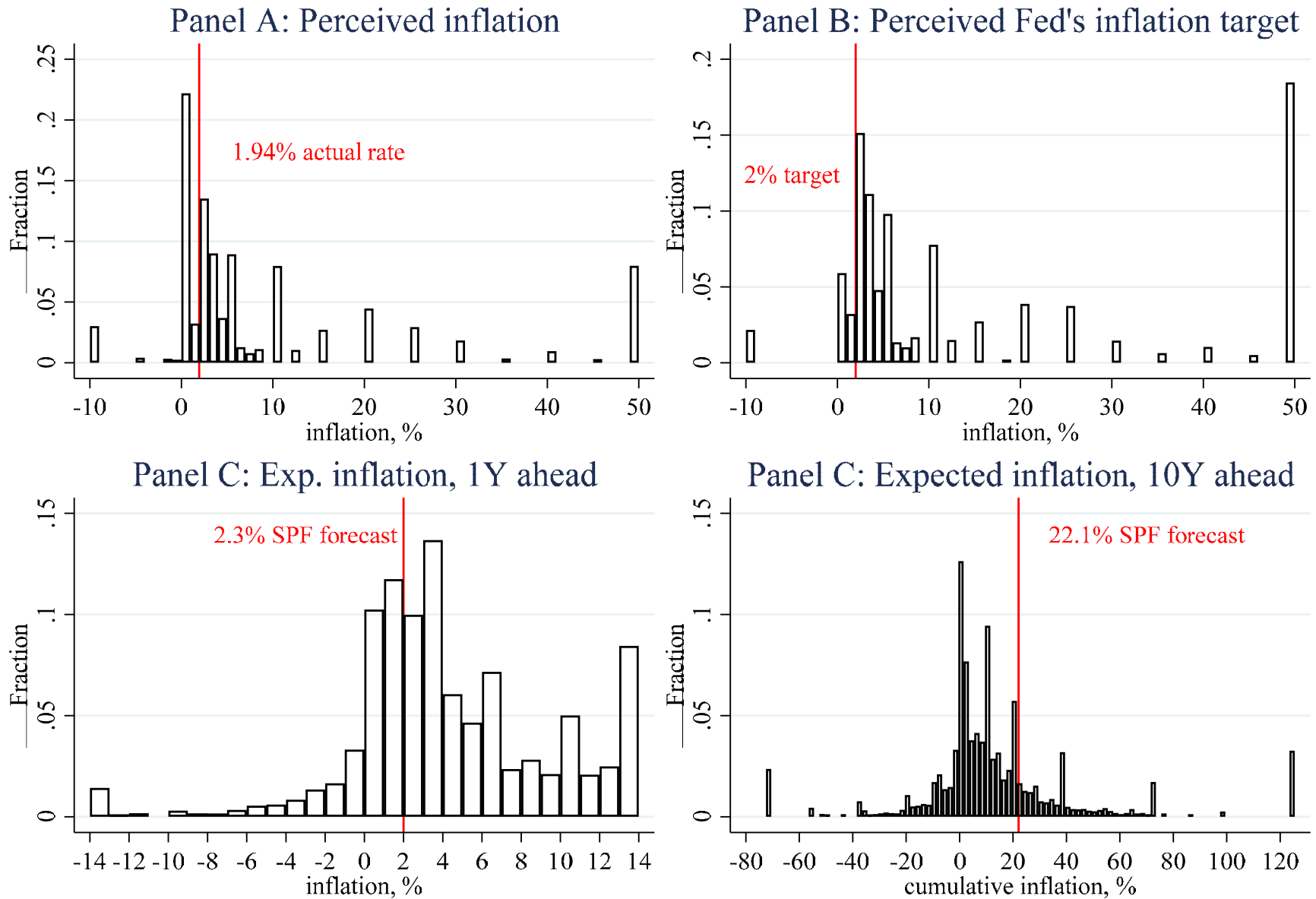
Notes: the table reports estimates of specification (2) for inflation expectations and fiscal indicators as the dependent variables by demographic group. Coefficients are reported for treatment T6. Coefficients are relative to the coefficient for the control group. The full set of results is reported in Appendix Tables 3-12. Inflation expectations are measured as point predictions. All estimates are based on Huber robust regressions. Regressions use sampling weights. The samples for inflation expectations regressions are restricted to respondents reporting non-negative inflation expectations in the pre-treatment responses. No household/respondent controls are included. Robust standard errors are in parentheses. \*\*\*, \*\*, \* denote statistical significance at 1, 5 and 10 percent levels.

Figure 1. Gross public debt in advanced economies.



Source: International Monetary Fund Fiscal Monitor, October 2020.

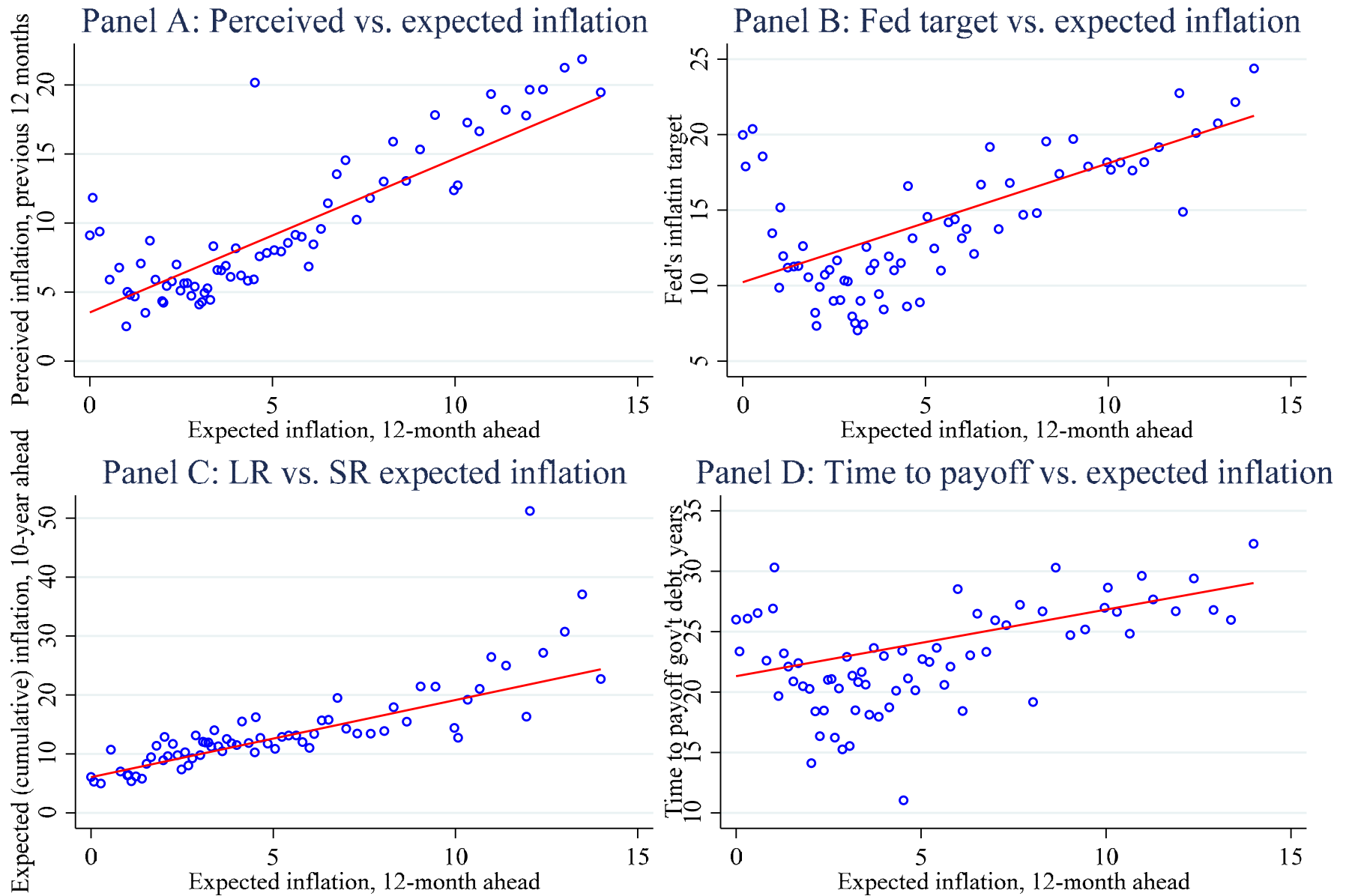
Figure 2. Distribution of pre-treatment inflation perceptions and expectations.



Notes: the figure show distributions of expected/perceived inflation and perceived inflation target of the Federal Reserve. The vertical lines show the actual values or predictions reported in the Survey of Professional Forecasters (SPF).

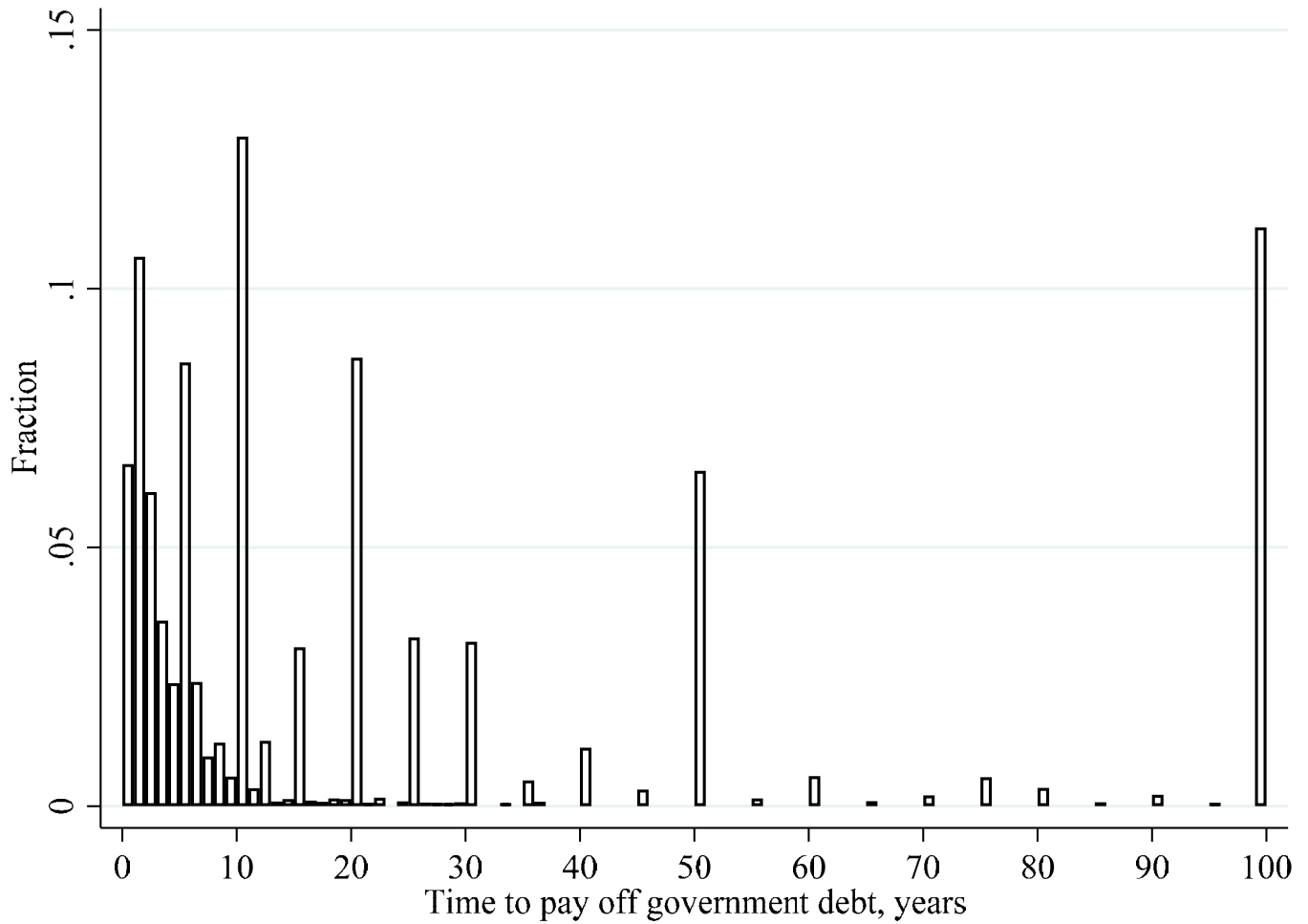


Figure 3. Correlation between expectations and perceptions.



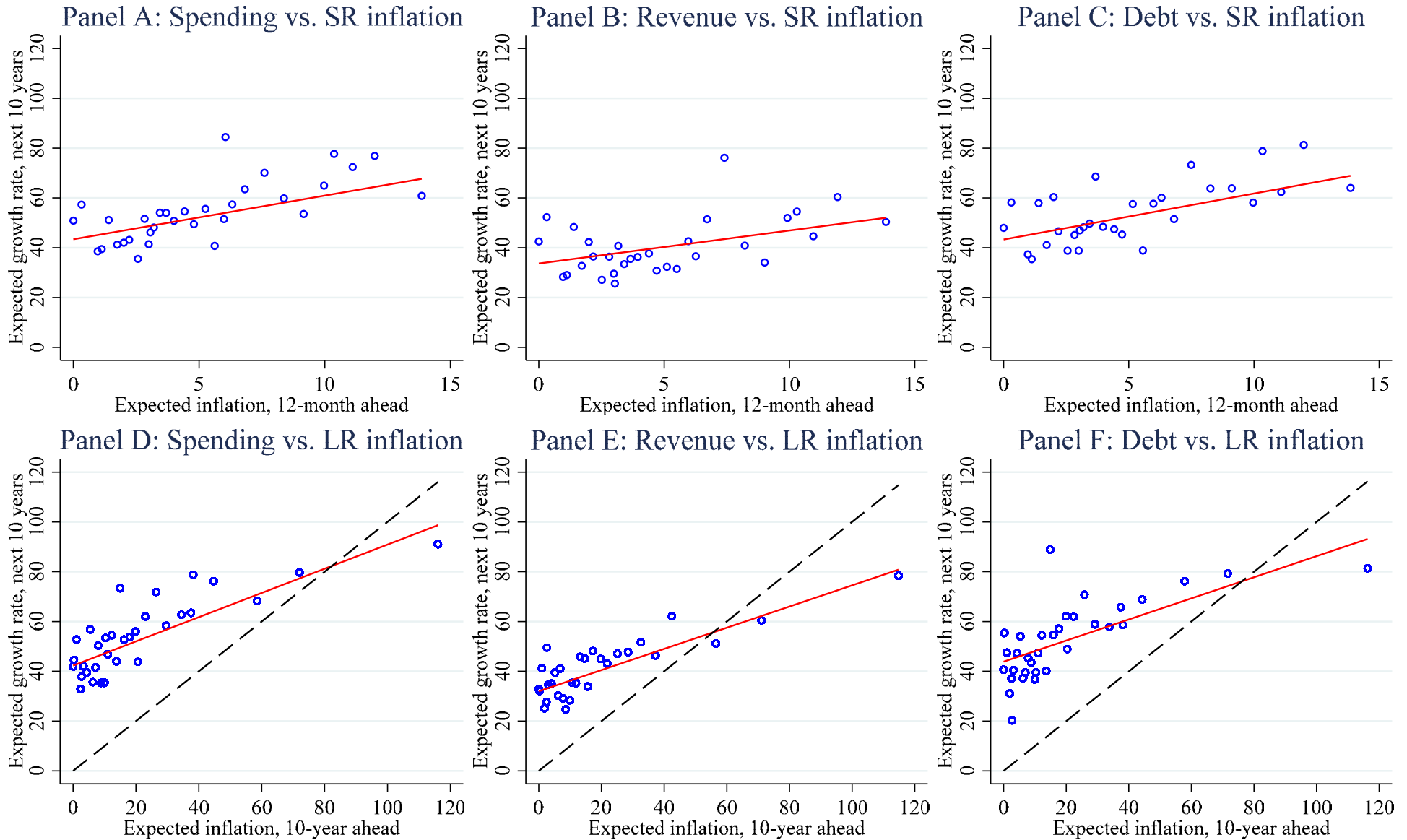
Notes: each panel present a binscatter of short-term inflation expectations vs. an outcome variable (perceived inflation over the previous 12 months, perceived inflation target of the Federal Reserve, time to payoff public debt). The sample is restricted to have only households who report non-negative expectation inflation over the next 12 months.

Figure 4. Beliefs about time required to pay off all government debt.



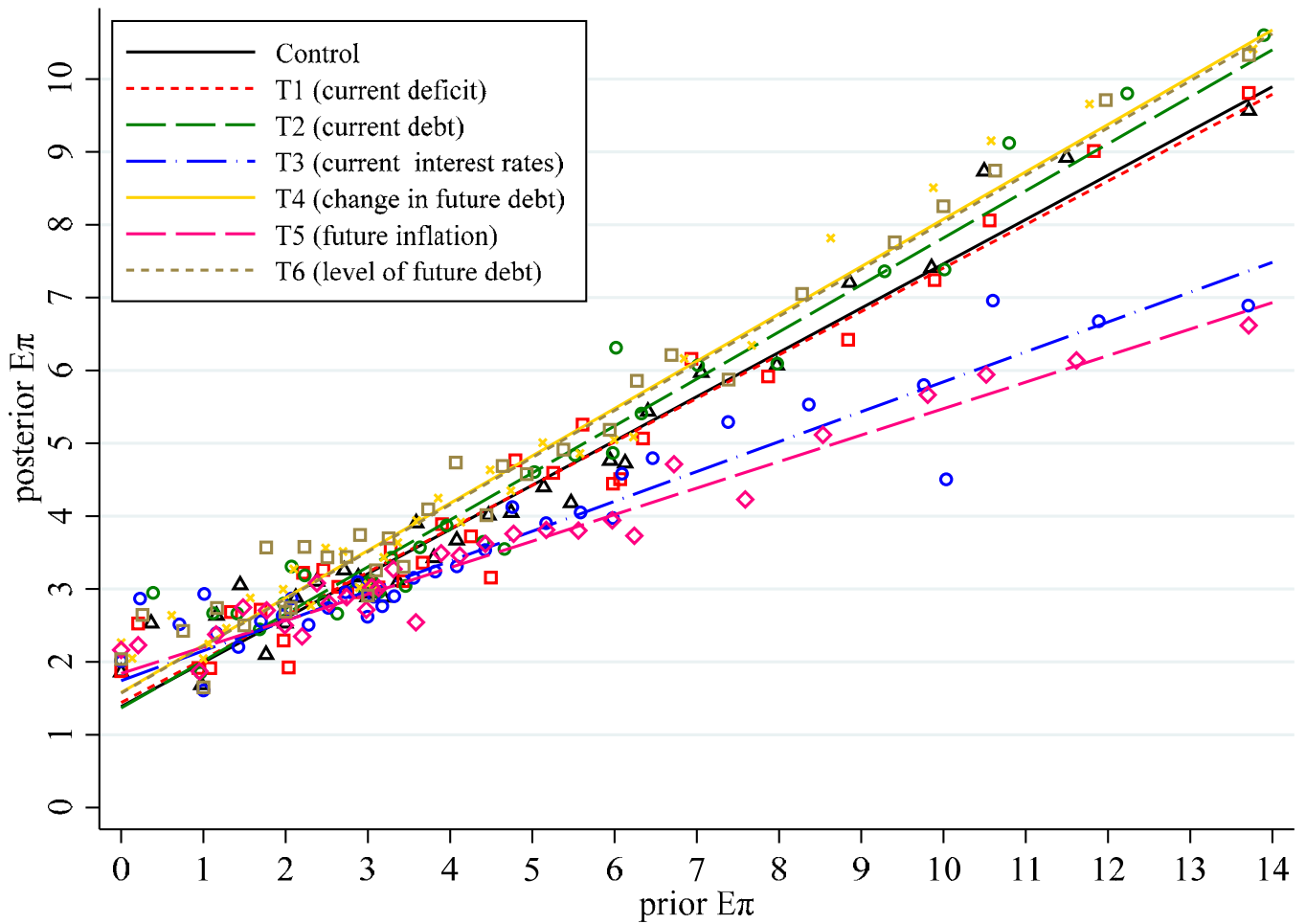
Notes: The figure show the distribution of perceived public debt. The survey question is, “The U.S. currently generates approximately 20 trillion dollars in income (Gross Domestic Product: GDP) each year. If all of this income was being used to pay off the debt of the U.S. Federal government, how long do you think it would take to pay off the entire debt? Please provide an answer in months or years.”

Figure 5. Expectations for Inflation and fiscal indicators.



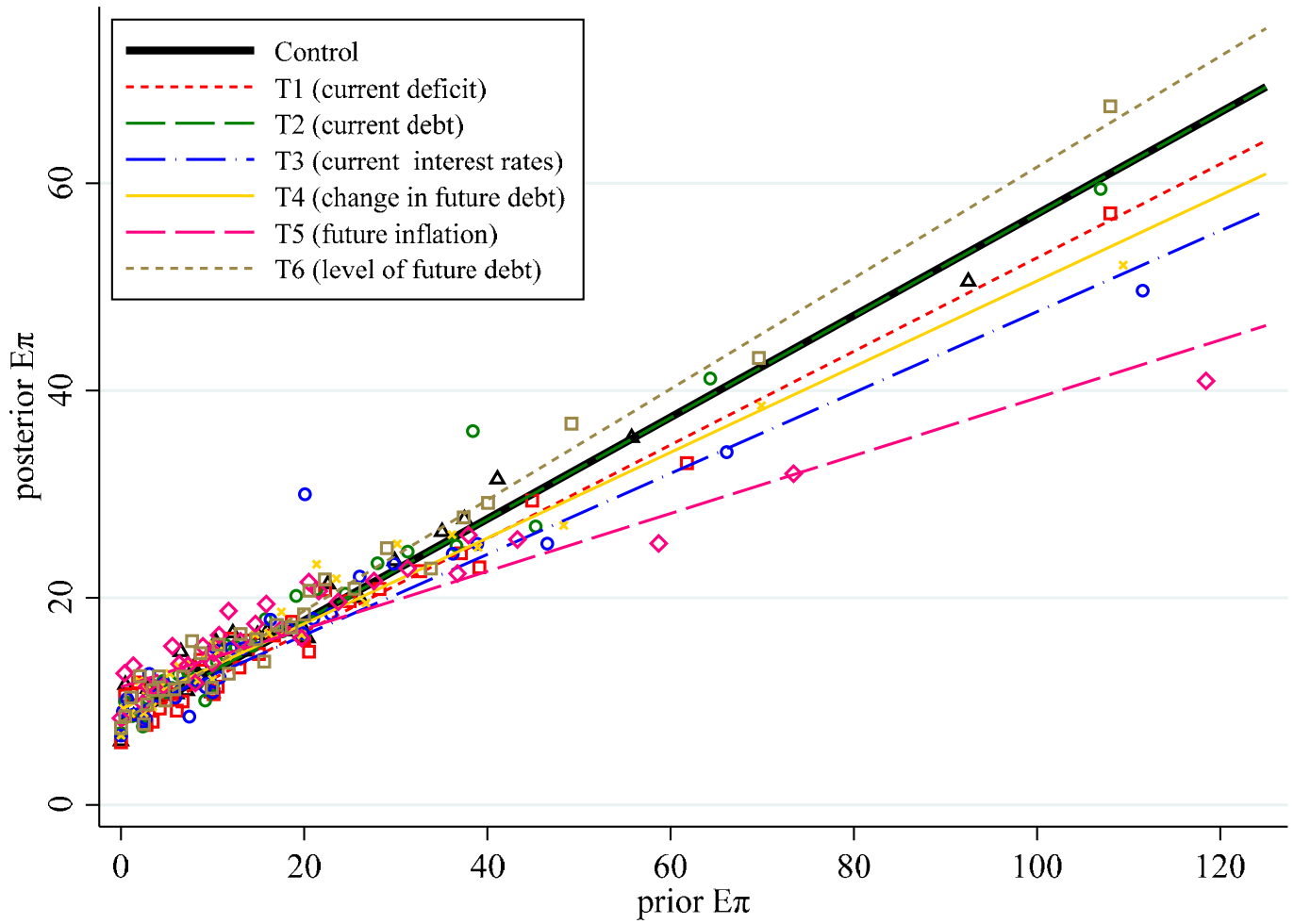
Notes: Each panel presents a binscatter of inflation expectations vs. a fiscal indicator. The red line is the fitted Huber-robust line. The black dashed line in panels D-F is the 45-degree line. The sample is restricted to the control group and respondents reporting non-negative expected inflation rate. Each circle represents approximately 100 respondents. Each panel is constructed using sampling weights. Inflation expectations are measured as mean expectations implied by reported pre-treatment probability distributions.

Figure 6. Treatment effects on short-run inflation expectations.



Notes: the figure present binscatter plots for prior vs. posterior short-term inflation expectations by treatment group. Binscatters use sampling weights. The sample is restricted to respondents reporting non-negative inflation expectations in the pre-treatment responses. Lines show fitted linear Huber-robust regressions.

Figure 7. Treatment effects on long-run inflation expectations.



Notes: the figure present binscatter plots for prior vs. posterior long-term inflation expectations by treatment group. Binscatters use sampling weights. The sample is restricted to respondents reporting non-negative inflation expectations in the pre-treatment responses as well responses that are less than 300%. Lines show fitted linear Huber-robust regressions.

**APPENDIX A**  
**ADDITIONAL FIGURES AND TABLES**

Appendix Table 1. Predictability of treatment status.

	Test against all other groups		Test against the control group	
	F-statistic	p-value	F-statistic	p-value
	(1)	(2)	(3)	(4)
T0 (control group)	1.06	0.36		
T1 (current deficit)	0.68	0.94	0.83	0.77
T2 (current debt)	0.98	0.51	0.83	0.78
T3 (current interest rate)	1.08	0.34	1.25	0.13
T4 (debt projection, change)	0.75	0.89	1.04	0.40
T5 (inflation projection)	0.76	0.87	0.82	0.79
T6 (debt projection, level)	1.02	0.44	1.19	0.19

Notes: The table reports results for estimating the following linear-probability regression for each treatment  $k$  separately:  $Treatment_i^{(k)} = \mathbf{X}_i b^{(k)} + error$  where  $i$  indexes respondents,  $Treatment_i^{(k)}$  is a dummy variable equal to one if household  $i$  is provided with treatment  $k$  and zero otherwise,  $\mathbf{X}$  is a vector of household/individual characteristics. Individual characteristics are gender, age, age squared, employed indicator, and race. Household characteristics are household income (binned; indicator variable for each bin), household size (indicator variable for each size), census region (indicator variable for each region), male head education (indicator variable for each group), female head education (indicator variable for each group). The table reports F-statistic for the joint statistical significance of  $b$ .

Appendix Table 2. Treatment effects on inflation expectations, control for demographics.

	Short-run inflation expectations (1)	Long-run inflation expectations (2)
Intercept		
Control	1.387*** (0.074)	7.983*** (0.309)
Relative to control:		
T1 (current deficit)	0.044 (0.102)	-0.663 (0.409)
T2 (current debt)	-0.020 (0.100)	-0.542 (0.411)
T3 (current interest rate)	0.354*** (0.100)	0.115 (0.406)
T4 (future change in debt)	0.196* (0.104)	0.787* (0.416)
T5 (future interest rate)	0.516*** (0.102)	2.749*** (0.415)
T6 (future level of debt)	0.199* (0.105)	-0.453 (0.425)
Slope		
Control	0.588*** (0.017)	0.407*** (0.017)
Relative to control:		
T1 (current deficit)	-0.009 (0.023)	0.020 (0.023)
T2 (current debt)	0.037* (0.023)	0.065*** (0.023)
T3 (current interest rate)	-0.195*** (0.023)	-0.045** (0.022)
T4 (future change in debt)	0.043* (0.023)	-0.022 (0.022)
T5 (future interest rate)	-0.261*** (0.023)	-0.137*** (0.021)
T6 (future level of debt)	0.035 (0.023)	0.102*** (0.023)
Observations	20,991	19,248
R-squared	0.372	0.332

Notes: the table reports estimates of specification (1) for short-term inflation expectations (column 1) and long-run inflation expectations (column 2). Coefficients for groups other than the control group are relative to the coefficient for the control group. All estimates are based on Huber robust regressions. Regressions use sampling weights. The sample is restricted to respondents reporting non-negative inflation expectations in the pre-treatment responses. Household/respondent controls are included but not reported. Robust standard errors are in parentheses. \*\*\*, \*\*, \* denote statistical significance at 1, 5 and 10 percent levels.



Appendix Table 3. Treatment effects on levels of expected inflation and fiscal indicators, control for demographics.

	Inflation expectations		Fiscal indicators in 10 years			
	12-months ahead	10-year ahead, cumulative	Spending, % relative to current level	Revenue, % relative to current level	Debt, % relative to current level	Interest rate
	(1)	(2)	(3)	(4)	(5)	(6)
Control group	4.076*** (0.118)	16.189*** (0.569)	24.787*** (0.783)	13.664*** (0.555)	23.285*** (0.803)	9.028*** (0.305)
Treatment effects relative to control						
T1 (current deficit)	0.051 (0.080)	-0.135 (0.398)	-0.498 (0.559)	0.347 (0.432)	0.915 (0.563)	-0.142 (0.189)
T2 (current debt)	0.045 (0.080)	0.285 (0.405)	0.219 (0.571)	0.448 (0.438)	0.623 (0.568)	0.287 (0.192)
T3 (current interest rate)	-0.309*** (0.075)	-0.123 (0.404)	-0.099 (0.564)	0.232 (0.439)	0.701 (0.569)	-1.159*** (0.179)
T4 (debt projection, change)	0.270*** (0.081)	1.105*** (0.412)	1.259** (0.570)	0.103 (0.440)	2.531*** (0.574)	0.236 (0.194)
T5 (inflation projection)	-0.334*** (0.076)	1.479*** (0.403)	1.093* (0.570)	0.378 (0.432)	0.628 (0.568)	0.051 (0.192)
T6 (debt projection, level)	0.361*** (0.084)	1.321*** (0.416)	1.317** (0.568)	1.670*** (0.444)	3.000*** (0.577)	0.432** (0.193)
Observations	21,148	19,723	23,660	23,311	23,268	22,854
R-squared	0.048	0.030	0.032	0.023	0.032	0.041

Notes: the table reports estimates of specification (2) for inflation expectations and fiscal indicators as the dependent variables. Inflation expectations are measured as point predictions. Coefficients for groups other than the control group are relative to the coefficient for the control group. All estimates are based on Huber robust regressions. Regressions use sampling weights. Household/respondent controls are included but not reported. Robust standard errors are in parentheses. \*\*\*, \*\*, \* denote statistical significance at 1, 5 and 10 percent levels.

Appendix Table 4. Treatment effects on levels of expected inflation and fiscal indicators, subsample: Republicans.

	Inflation expectations		Fiscal indicators in 10 years			
	12-months ahead	10-year ahead, cumulative	Spending, % relative to current level	Revenue, % relative to current level	Debt, % relative to current level	Interest rate
	(1)	(2)	(3)	(4)	(5)	(6)
Control group	4.327*** (0.110)	16.420*** (0.542)	23.832*** (0.722)	13.341*** (0.545)	21.280*** (0.741)	7.939*** (0.255)
Treatment effects relative to control						
T1 (current deficit)	-0.050 (0.153)	-0.207 (0.740)	-0.063 (1.017)	0.472 (0.765)	3.246*** (1.049)	-0.063 (0.354)
T2 (current debt)	0.069 (0.159)	1.407* (0.786)	0.252 (1.041)	1.135 (0.795)	1.741* (1.052)	0.990*** (0.374)
T3 (current interest rate)	-0.474*** (0.143)	1.139 (0.755)	0.379 (1.024)	1.515* (0.793)	2.652** (1.061)	-0.993*** (0.339)
T4 (debt projection, change)	0.193 (0.158)	0.907 (0.773)	1.073 (1.040)	-0.528 (0.798)	4.920*** (1.098)	0.147 (0.370)
T5 (inflation projection)	-0.674*** (0.145)	1.363* (0.739)	0.100 (1.027)	0.112 (0.778)	2.755** (1.072)	-0.242 (0.355)
T6 (debt projection, level)	0.246 (0.164)	0.559 (0.760)	2.051** (1.018)	1.589** (0.786)	3.880*** (1.043)	0.546 (0.363)
Observations	7,083	6,424	7,844	7,715	7,680	7,553
R-squared	0.009	0.001	0.001	0.002	0.003	0.005

Notes: the table reports estimates of specification (2) for inflation expectations and fiscal indicators as the dependent variables. Inflation expectations are measured as point predictions. Coefficients for groups other than the control group are relative to the coefficient for the control group. All estimates are based on Huber robust regressions. Regressions use sampling weights. No household/respondent controls are included. Robust standard errors are in parentheses. \*\*\*, \*\*, \* denote statistical significance at 1, 5 and 10 percent levels.

Appendix Table 5. Treatment effects on levels of expected inflation and fiscal indicators, subsample: Democrats.

	Inflation expectations		Fiscal indicators in 10 years			
	12-months ahead	10-year ahead, cumulative	Spending, % relative to current level	Revenue, % relative to current level	Debt, % relative to current level	Interest rate
	(1)	(2)	(3)	(4)	(5)	(6)
Control group	3.195*** (0.073)	12.697*** (0.391)	18.518*** (0.591)	13.111*** (0.470)	17.204*** (0.582)	6.608*** (0.190)
Treatment effects relative to control						
T1 (current deficit)	-0.191* (0.103)	-0.410 (0.559)	-1.023 (0.822)	0.080 (0.665)	-0.743 (0.815)	-0.802*** (0.264)
T2 (current debt)	-0.032 (0.103)	-0.428 (0.556)	-0.289 (0.837)	-0.218 (0.659)	0.171 (0.828)	-0.589** (0.261)
T3 (current interest rate)	-0.292*** (0.096)	-0.805 (0.555)	0.168 (0.818)	0.603 (0.667)	-0.133 (0.823)	-1.234*** (0.248)
T4 (debt projection, change)	0.044 (0.107)	0.522 (0.581)	1.979** (0.858)	0.138 (0.683)	2.270*** (0.855)	-0.164 (0.274)
T5 (inflation projection)	-0.296*** (0.098)	1.433** (0.563)	1.278 (0.825)	1.375** (0.664)	-0.207 (0.826)	-0.292 (0.268)
T6 (debt projection, level)	0.169 (0.108)	0.223 (0.578)	1.605* (0.858)	1.567** (0.688)	3.161*** (0.880)	-0.322 (0.270)
Observations	7,265	6,800	7,983	7,939	7,845	7,765
R-squared	0.005	0.003	0.003	0.002	0.005	0.004

Notes: the table reports estimates of specification (2) for inflation expectations and fiscal indicators as the dependent variables. Inflation expectations are measured as point predictions. Coefficients for groups other than the control group are relative to the coefficient for the control group. All estimates are based on Huber robust regressions. Regressions use sampling weights. No household/respondent controls are included. Robust standard errors are in parentheses. \*\*\*, \*\*, \* denote statistical significance at 1, 5 and 10 percent levels.

Appendix Table 6. Treatment effects on levels of expected inflation and fiscal indicators, subsample: Other political preferences.

	Inflation expectations		Fiscal indicators in 10 years			
	12-months ahead	10-year ahead, cumulative	Spending, % relative to current level	Revenue, % relative to current level	Debt, % relative to current level	Interest rate
	(1)	(2)	(3)	(4)	(5)	(6)
Control group	4.473*** (0.138)	18.337*** (0.646)	27.341*** (0.879)	14.879*** (0.642)	26.529*** (0.901)	8.309*** (0.298)
Treatment effects relative to control						
T1 (current deficit)	0.463** (0.202)	-0.597 (0.901)	-1.457 (1.216)	0.354 (0.901)	-1.331 (1.230)	0.530 (0.439)
T2 (current debt)	0.255 (0.199)	-0.504 (0.909)	-0.940 (1.222)	0.493 (0.900)	-1.234 (1.251)	0.752* (0.431)
T3 (current interest rate)	-0.360* (0.188)	-0.511 (0.923)	-1.463 (1.221)	-1.028 (0.898)	-1.255 (1.234)	-1.183*** (0.402)
T4 (debt projection, change)	0.437** (0.194)	0.529 (0.894)	-1.187 (1.198)	0.221 (0.879)	-0.886 (1.218)	0.179 (0.416)
T5 (inflation projection)	-0.078 (0.195)	1.356 (0.930)	1.362 (1.250)	-0.524 (0.899)	-1.031 (1.268)	0.751* (0.442)
T6 (debt projection, level)	0.847*** (0.207)	2.107** (0.933)	-1.262 (1.209)	2.109** (0.912)	0.172 (1.254)	0.980** (0.433)
Observations	7,112	6,619	7,840	7,746	7,740	7,612
R-squared	0.007	0.002	0.001	0.002	0.000	0.004

Notes: the table reports estimates of specification (2) for inflation expectations and fiscal indicators as the dependent variables. Inflation expectations are measured as point predictions. Coefficients for groups other than the control group are relative to the coefficient for the control group. All estimates are based on Huber robust regressions. Regressions use sampling weights. No household/respondent controls are included. Robust standard errors are in parentheses. \*\*\*, \*\*, \* denote statistical significance at 1, 5 and 10 percent levels.

Appendix Table 7. Treatment effects on levels of expected inflation and fiscal indicators, subsample: College or more.

	Inflation expectations		Fiscal indicators in 10 years			
	12-months ahead	10-year ahead, cumulative	Spending, % relative to current level	Revenue, % relative to current level	Debt, % relative to current level	Interest rate
	(1)	(2)	(3)	(4)	(5)	(6)
Control group	3.447*** (0.060)	13.685*** (0.342)	20.197*** (0.488)	12.340*** (0.379)	19.645*** (0.510)	6.440*** (0.151)
Treatment effects relative to control						
T1 (current deficit)	-0.061 (0.083)	0.146 (0.480)	-0.981 (0.678)	0.501 (0.536)	-0.428 (0.705)	-0.103 (0.214)
T2 (current debt)	-0.072 (0.083)	0.144 (0.484)	-0.007 (0.693)	0.961* (0.549)	0.766 (0.726)	0.480** (0.217)
T3 (current interest rate)	-0.264*** (0.079)	-0.126 (0.478)	-0.570 (0.674)	0.602 (0.535)	-1.219* (0.704)	-1.342*** (0.192)
T4 (debt projection, change)	0.196** (0.084)	0.981** (0.495)	0.935 (0.687)	0.445 (0.542)	1.803** (0.729)	-0.042 (0.210)
T5 (inflation projection)	-0.228*** (0.081)	2.658*** (0.497)	1.957*** (0.705)	1.571*** (0.553)	1.361* (0.726)	0.472** (0.221)
T6 (debt projection, level)	0.304*** (0.088)	1.230** (0.496)	1.539** (0.692)	2.175*** (0.555)	2.698*** (0.727)	0.452** (0.213)
Observations	12,284	11,082	12,980	12,978	12,746	12,721
R-squared	0.006	0.005	0.002	0.002	0.004	0.009

Notes: the table reports estimates of specification (2) for inflation expectations and fiscal indicators as the dependent variables. Inflation expectations are measured as point predictions. Coefficients for groups other than the control group are relative to the coefficient for the control group. All estimates are based on Huber robust regressions. Regressions use sampling weights. No household/respondent controls are included. Robust standard errors are in parentheses. \*\*\*, \*\*, \* denote statistical significance at 1, 5 and 10 percent levels.

Appendix Table 8. Treatment effects on levels of expected inflation and fiscal indicators, subsample: less than college.

	Inflation expectations		Fiscal indicators in 10 years			
	12-months ahead	10-year ahead, cumulative	Spending, % relative to current level	Revenue, % relative to current level	Debt, % relative to current level	Interest rate
	(1)	(2)	(3)	(4)	(5)	(6)
Control group	5.177*** (0.131)	18.787*** (0.535)	26.168*** (0.697)	15.364*** (0.509)	22.886*** (0.675)	9.455*** (0.266)
Treatment effects relative to control						
T1 (current deficit)	0.076 (0.187)	-1.453** (0.732)	-0.942 (0.973)	0.131 (0.718)	1.231 (0.947)	-0.266 (0.378)
T2 (current debt)	0.274 (0.189)	-0.224 (0.754)	0.292 (0.994)	0.428 (0.723)	0.303 (0.950)	0.023 (0.379)
T3 (current interest rate)	-0.622*** (0.176)	-0.215 (0.768)	-0.388 (0.983)	0.439 (0.740)	2.197** (0.965)	-0.554 (0.373)
T4 (debt projection, change)	0.678*** (0.198)	1.194 (0.779)	0.723 (0.993)	0.083 (0.739)	3.356*** (0.977)	0.666* (0.395)
T5 (inflation projection)	-0.535*** (0.180)	-0.430 (0.729)	-0.325 (0.965)	-0.521 (0.710)	-0.027 (0.952)	-0.684* (0.368)
T6 (debt projection, level)	0.626*** (0.198)	1.206 (0.784)	0.335 (0.978)	1.532** (0.735)	3.080*** (0.971)	0.719* (0.392)
Observations	9,502	8,750	10,407	10,382	10,283	10,270
R-squared	0.008	0.002	0.000	0.001	0.002	0.002

Notes: the table reports estimates of specification (2) for inflation expectations and fiscal indicators as the dependent variables. Inflation expectations are measured as point predictions. Coefficients for groups other than the control group are relative to the coefficient for the control group. All estimates are based on Huber robust regressions. Regressions use sampling weights. No household/respondent controls are included. Robust standard errors are in parentheses. \*\*\*, \*\*, \* denote statistical significance at 1, 5 and 10 percent levels.

Appendix Table 9. Treatment effects on levels of expected inflation and fiscal indicators, subsample: have financial wealth.

	Inflation expectations		Fiscal indicators in 10 years			
	12-months ahead	10-year ahead, cumulative	Spending, % relative to current level	Revenue, % relative to current level	Debt, % relative to current level	Interest rate
	(1)	(2)	(3)	(4)	(5)	(6)
Control group	5.407*** (0.164)	18.568*** (0.643)	25.736*** (0.812)	15.080*** (0.617)	23.062*** (0.773)	9.885*** (0.320)
Treatment effects relative to control						
T1 (current deficit)	0.024 (0.232)	-0.651 (0.907)	-0.789 (1.133)	1.194 (0.872)	1.264 (1.086)	0.538 (0.464)
T2 (current debt)	0.520** (0.242)	1.002 (0.907)	0.934 (1.146)	2.735*** (0.880)	2.276** (1.096)	0.753 (0.465)
T3 (current interest rate)	-0.482** (0.220)	-0.275 (0.890)	-0.176 (1.112)	1.173 (0.869)	1.662 (1.094)	-0.800* (0.449)
T4 (debt projection, change)	0.273 (0.239)	1.015 (0.925)	1.057 (1.155)	2.186** (0.891)	3.661*** (1.141)	0.407 (0.467)
T5 (inflation projection)	-0.326 (0.229)	0.810 (0.902)	0.144 (1.121)	0.720 (0.854)	-0.467 (1.080)	-0.241 (0.453)
T6 (debt projection, level)	0.757*** (0.246)	1.435 (0.940)	2.229* (1.171)	2.968*** (0.894)	2.901** (1.139)	1.223** (0.483)
Observations	8,394	7,655	9,527	9,492	9,361	9,262
R-squared	0.005	0.001	0.001	0.002	0.002	0.003

Notes: the table reports estimates of specification (2) for inflation expectations and fiscal indicators as the dependent variables. Inflation expectations are measured as point predictions. Coefficients for groups other than the control group are relative to the coefficient for the control group. All estimates are based on Huber robust regressions. Regressions use sampling weights. No household/respondent controls are included. Robust standard errors are in parentheses. \*\*\*, \*\*, \* denote statistical significance at 1, 5 and 10 percent levels.

Appendix Table 10. Treatment effects on levels of expected inflation and fiscal indicators, subsample: no financial wealth.

	Inflation expectations		Fiscal indicators in 10 years			
	12-months ahead	10-year ahead, cumulative	Spending, % relative to current level	Revenue, % relative to current level	Debt, % relative to current level	Interest rate
	(1)	(2)	(3)	(4)	(5)	(6)
Control group	3.488*** (0.054)	14.231*** (0.316)	21.548*** (0.458)	13.479*** (0.360)	19.730*** (0.477)	6.553*** (0.140)
Treatment effects relative to control						
T1 (current deficit)	-0.040 (0.076)	0.028 (0.443)	-0.541 (0.650)	-0.197 (0.508)	0.643 (0.673)	-0.438** (0.196)
T2 (current debt)	-0.088 (0.076)	-0.433 (0.448)	-0.644 (0.664)	-0.788 (0.512)	-0.550 (0.677)	0.088 (0.200)
T3 (current interest rate)	-0.354*** (0.071)	-0.001 (0.457)	-0.497 (0.657)	-0.080 (0.519)	0.343 (0.679)	-1.068*** (0.184)
T4 (debt projection, change)	0.216*** (0.078)	1.081** (0.459)	0.920 (0.657)	-1.195** (0.513)	2.214*** (0.674)	0.096 (0.200)
T5 (inflation projection)	-0.330*** (0.072)	1.848*** (0.453)	1.409** (0.670)	0.185 (0.519)	1.215* (0.690)	0.095 (0.201)
T6 (debt projection, level)	0.184** (0.079)	1.017** (0.459)	0.866 (0.646)	0.812 (0.518)	3.167*** (0.680)	0.209 (0.195)
Observations	13,265	12,249	14,180	14,069	13,877	13,758
R-squared	0.007	0.003	0.001	0.001	0.003	0.005

Notes: the table reports estimates of specification (2) for inflation expectations and fiscal indicators as the dependent variables. Inflation expectations are measured as point predictions. Coefficients for groups other than the control group are relative to the coefficient for the control group. All estimates are based on Huber robust regressions. Regressions use sampling weights. No household/respondent controls are included. Robust standard errors are in parentheses. \*\*\*, \*\*, \* denote statistical significance at 1, 5 and 10 percent levels.



Appendix Table 11. Treatment effects on levels of expected inflation and fiscal indicators, subsample: age is 50 or more.

	Inflation expectations		Fiscal indicators in 10 years			
	12-months ahead	10-year ahead, cumulative	Spending, % relative to current level	Revenue, % relative to current level	Debt, % relative to current level	Interest rate
	(1)	(2)	(3)	(4)	(5)	(6)
Control group	3.859*** (0.066)	15.294*** (0.346)	22.080*** (0.486)	13.960*** (0.381)	19.816*** (0.476)	6.876*** (0.146)
Treatment effects relative to control						
T1 (current deficit)	-0.116 (0.092)	-1.082** (0.477)	-0.982 (0.676)	-0.062 (0.539)	0.503 (0.672)	-0.446** (0.203)
T2 (current debt)	-0.089 (0.093)	-0.595 (0.483)	-0.909 (0.689)	-0.531 (0.539)	-0.114 (0.677)	-0.018 (0.208)
T3 (current interest rate)	-0.525*** (0.086)	-0.537 (0.486)	-0.745 (0.683)	-0.022 (0.550)	0.375 (0.681)	-1.212*** (0.191)
T4 (debt projection, change)	0.129 (0.095)	-0.043 (0.498)	0.480 (0.693)	-0.932* (0.547)	1.962*** (0.688)	-0.026 (0.213)
T5 (inflation projection)	-0.366*** (0.089)	1.274*** (0.486)	0.197 (0.686)	0.360 (0.543)	-0.375 (0.676)	-0.034 (0.210)
T6 (debt projection, level)	0.236** (0.097)	0.235 (0.491)	0.989 (0.685)	1.944*** (0.551)	2.329*** (0.682)	0.030 (0.208)
Observations	12,847	12,217	14,130	14,052	13,848	13,713
R-squared	0.007	0.003	0.001	0.002	0.002	0.004

Notes: the table reports estimates of specification (2) for inflation expectations and fiscal indicators as the dependent variables. Inflation expectations are measured as point predictions. Coefficients for groups other than the control group are relative to the coefficient for the control group. All estimates are based on Huber robust regressions. Regressions use sampling weights. No household/respondent controls are included. Robust standard errors are in parentheses. \*\*\*, \*\*, \* denote statistical significance at 1, 5 and 10 percent levels.

Appendix Table 12. Treatment effects on levels of expected inflation and fiscal indicators, subsample: age is less than 50.

	Inflation expectations		Fiscal indicators in 10 years			
	12-months ahead	10-year ahead, cumulative	Spending, % relative to current level	Revenue, % relative to current level	Debt, % relative to current level	Interest rate
	(1)	(2)	(3)	(4)	(5)	(6)
Control group	4.076*** (0.118)	16.189*** (0.569)	24.787*** (0.783)	13.664*** (0.555)	23.285*** (0.803)	9.028*** (0.305)
Treatment effects relative to control						
T1 (current deficit)	0.237 (0.171)	1.158 (0.802)	-0.596 (1.082)	0.931 (0.779)	1.157 (1.108)	0.532 (0.440)
T2 (current debt)	0.200 (0.172)	1.487* (0.818)	0.788 (1.101)	2.277*** (0.801)	0.996 (1.108)	1.123** (0.444)
T3 (current interest rate)	-0.092 (0.159)	0.501 (0.793)	0.652 (1.083)	1.123 (0.782)	1.250 (1.110)	-0.911** (0.416)
T4 (debt projection, change)	0.624*** (0.173)	2.980*** (0.819)	1.526 (1.098)	1.611** (0.794)	3.556*** (1.135)	0.275 (0.428)
T5 (inflation projection)	-0.327** (0.160)	1.606** (0.799)	2.561** (1.112)	0.582 (0.779)	2.619** (1.141)	-0.049 (0.427)
T6 (debt projection, level)	0.445** (0.175)	3.641*** (0.863)	1.549 (1.104)	1.567* (0.805)	3.726*** (1.147)	1.061** (0.439)
Observations	8,566	7,637	9,599	9,410	9,439	9,275
R-squared	0.005	0.004	0.001	0.001	0.002	0.003

Notes: the table reports estimates of specification (2) for inflation expectations and fiscal indicators as the dependent variables. Inflation expectations are measured as point predictions. Coefficients for groups other than the control group are relative to the coefficient for the control group. All estimates are based on Huber robust regressions. Regressions use sampling weights. No household/respondent controls are included. Robust standard errors are in parentheses. \*\*\*, \*\*, \* denote statistical significance at 1, 5 and 10 percent levels.

## Appendix B: Surveys and Treatments

*This survey is about your household's finances and opinions about the economy. As with any of our surveys, the information you provide is confidential and is only shared in an aggregate (not individual) level.*

*Please tell us about yourself...*

1. What is your date of birth? (Please select the month, day and year)

2. Which political party do you lean towards?

- Democrats
- Republican party
- Green party
- Libertarian party
- Other
- Prefer not to answer

3. Over the last three months on average, how much did your household spend (per month) on goods and services in total and for each of the individual components listed below?

*Please enter a number between 0 and 99,999 for each category. The sum of the expenditures for the individual categories should add up to the total amount. (Enter a "0" if you did not purchase anything in a given category)*

Total monthly spending TOTAL [AUTOSUM] [RANGE: 0-99,999] \$ \_\_\_\_\_  
 [PN: HAVE THIS AUTOMATICALLY SUM]

- Debt payments (mortgages, auto loans, student loans,...) \$ \_\_\_\_\_
- Housing (including rent, maintenance and home owner/renter insurance but *not* including mortgage payments) \$ \_\_\_\_\_
- Utilities (including water, sewer, electricity, gas, heating oil, phone, internet) \$ \_\_\_\_\_
- Food (including groceries, dining out, and beverages) \$ \_\_\_\_\_
- Clothing, footwear, and personal care \$ \_\_\_\_\_
- Gasoline \$ \_\_\_\_\_
- Other regular transportation costs (including public transportation fares and car maintenance) \$ \_\_\_\_\_
- Medical care (including health insurance, medical bills, prescription drugs) \$ \_\_\_\_\_
- Travel, Recreation, and entertainment \$ \_\_\_\_\_
- Education and child care \$ \_\_\_\_\_
- Furniture, jewelry, small appliances and other small durable goods \$ \_\_\_\_\_
- Other (including gifts, child support or alimony, charitable giving, and other miscellaneous) \$ \_\_\_\_\_
- Prefer not to answer

4. What percent of your financial wealth (excluding housing) do you invest in the following categories? (Please enter a whole number if you invest in a given category. Percents should total 100%.)

- Checking and Savings Account ..... percent
- Cash ..... percent
- US Bonds ..... percent
- US Stocks ..... percent
- Foreign Stocks and Bonds ..... percent
- Gold and precious metals ..... percent

Bitcoin and other cryptocurrencies ..... percent  
 Other ..... percent  
**% Total** ..... 100

I have no financial investments

**Consumption Plans:**

5. Did you buy a new home in the last 6 months?  
 Yes  
 No

ASK IF: Q5=YES

5a. What price did you pay for the new house?  
 \$ \_\_\_\_\_ [PN: MAX=10,000,000]  
 Don't know/Prefer not to answer

6. Did you buy a new car in the last 6 months?  
 Yes  
 No

ASK IF: Q6=YES

6a. What price did you pay for this car?  
 \$ \_\_\_\_\_ [PN: MAX=100,000]  
 Don't know/Prefer not to answer

7. Did you purchase any other big-ticket household items (TV, fridge, furniture, and similar items) in the last 6 months?  
 Yes  
 No

ASK IF: Q7=YES

7a. How much did you spend on these big-ticket household items over the last 6 months?  
 \$ \_\_\_\_\_  
 Don't know/Prefer not to answer

8. How much higher or lower do you think your household's total after-tax income will be over the next six months compared to the last six months?

Please provide an answer with a percent. If you think that your household's total after-tax income will decrease, please fill in a negative percent (insert a minus sign before the number). If you think that your household's total after-tax income will increase, please fill in a positive percent. If you think that your household's total net income will not change, please fill in 0 (zero).

\_\_\_\_\_ % [RANGE: (-100) to 100]

9. How many total hours per week do you and other members of your household work in a typical week? Please do not include volunteer hours or hours that are unpaid. (Please enter a zero if you or others do not work)

You: \_\_\_\_\_ hours per week  
 All others in household: \_\_\_\_\_ hours per week

**;Inflation and Aggregate Expectations - DON'T SHOW**

10. We would like to ask you about the rate of inflation/deflation (Note: Deflation is the opposite of inflation).

Over the **last** 12 months...

(Please enter a number in one of the boxes below. The number you enter should be greater than 0 or equal to 0. If you do not think there was any inflation/deflation in the last 12 months, please enter a "0" in one of the boxes.)

The rate of inflation was ..... percent [RANGE: 0-100]  
 The rate of deflation (the opposite of inflation) was ..... percent [RANGE: 0-100]

11. In THIS question, you will be asked about the PERCENT CHANCE of something happening. The percent chance must be a number between 0 and 100. Numbers like 2% or 5% indicate "almost no chance," 19% or so may mean "not much chance," a 47% or 55% chance may be a "pretty even chance," 82% indicates a "very good chance," and 95% or 98% mean "almost certain."

What do you think is the percent chance that, **over the next 12 months...**  
 [RANGE OF EACH OPTION BELOW: 0-100]

- the rate of inflation will be 12% or more* \_\_\_\_\_
- the rate of inflation will be between 8% and 12%* \_\_\_\_\_
- the rate of inflation will be between 4% and 8* \_\_\_\_\_
- the rate of inflation will be between 2% and 4* \_\_\_\_\_
- the rate of inflation will be between 0% and 2%* \_\_\_\_\_
- the rate of deflation (opposite of inflation) will be between 0% and 2%* \_\_\_\_\_
- the rate of deflation(opposite of inflation) will be between 2% and 4%* \_\_\_\_\_
- the rate of deflation(opposite of inflation) will be between 4% and 8%* \_\_\_\_\_
- the rate of deflation(opposite of inflation) will be between 8% and 12%* \_\_\_\_\_
- the rate of deflation(opposite of inflation) will be 12% or more* \_\_\_\_\_

**% Total** \_\_\_\_\_

12. What do you think is the probability that, in **10 years from now**, the overall level of prices in the economy (as measured by the Consumer Price Index) will...

[RANGE OF EACH OPTION BELOW: 0-100 ALLOW FOR UP TO 2 DECIMAL POINTS]

- fall by 50% or more* \_\_\_\_\_
- fall by 25% to 50%* \_\_\_\_\_
- fall by 15% to 25%* \_\_\_\_\_
- fall by 5% to 15%* \_\_\_\_\_
- fall but by less than 5%* \_\_\_\_\_
- stay about the same* \_\_\_\_\_
- grow but at less than 5%* \_\_\_\_\_
- grow by 5% to 15%* \_\_\_\_\_
- grow by 15% to 25%* \_\_\_\_\_
- grow by 25% to 50%* \_\_\_\_\_
- grow by 50% to 100%* \_\_\_\_\_
- grow by 100% or more* \_\_\_\_\_

**% Total** \_\_\_\_\_ [PN: TOTAL ANSWERS FROM ABOVE]

13. What is your best guess about the annual inflation rate that the Federal Reserve tries to achieve on average over long periods of time? Please use a percent between -100 to 100)

\_\_\_\_\_ % per year [RANGE: -100 to 100 Whole numbers]

14. What is your best guess about the current unemployment rate in the U.S.? (Please use a percent between 0 and 100, may enter up to 2 decimal points)

\_\_\_\_\_ % [RANGE: 0-100]

15. What is your best guess at the current unleaded gas price in your area? (Please enter dollars and cents)

\$\_\_\_\_\_ [PN: ADD two DECIMAL FOR DOLLARS AND CENTS]

**Treatments: Randomly assign respondents to one of 7 groups (Control plus Treatment 1-6) using least fill so each are seen equally.**

**Control group (go straight to question 17 below)**

**Treatment 1:** The U.S. Treasury department reports that for the 2018 fiscal year the U.S. Federal government ran a deficit of \$779 billion or 3.9% relative to the level of income (Gross Domestic Product) generated by the economy in 2018. [go to question 17 below]

**Treatment 2:** The U.S. Treasury department reports that the current level of the public debt of the U.S. Federal government is 21.2 trillion dollars or 103.4% of the current income (Gross Domestic Product) generated by the economy in 2018. [go to question 17 below]

**Treatment 3:** The U.S. Congressional Budget Office reports that the interest rate on U.S. government debt is currently 2.3%. [go to question 17 below]

**Treatment 4:** The U.S. Congressional Budget Office reports that the budget balance of the U.S. Federal government is projected to deteriorate so that the national debt will increase by more than 10 trillion dollars by 2028. [go to question 17 below]

**Treatment 5:** The U.S. Congressional Budget Office projects that prices in the U.S. economy will increase by a little over 2.0% per year on average over the next 10 years so that the level of prices in 2028 will increase by a little over 20% relative to the current level. [go to question 17 below]

**Treatment 6:** The U.S. Congressional Budget Office projects that the total debt of the U.S. Federal Government in 10 years will be more than 30 trillion, or 107% of the projected level of income (Gross Domestic Product). [go to question 17 below]

**Follow-up questions:**

17. What is your best guess about the overall level of prices in the economy (as measured by the Consumer Price Index) in 12 months? Will it be higher/lower/same relative to the level of prices today? Please provide a percent change (use positive values for increases, negative values for decreases, and zero for no change).

..... % [RANGE: -100 to 100]

18. What is your best guess about the overall level of prices in the economy (as measured by the Consumer Price Index) in 10 years from now? Will it be higher/lower/same relative to the level of prices today? Please provide a percent change (use positive values for increases, negative values for decreases, and zero for no change).

\_\_\_\_\_ % [RANGE: -100 to 100]

19. What is your best guess about the total dollar spending by the U.S. Federal government in 10 years from now? Will it be higher/lower/same relative to the level of total dollar spending today? Please provide a percent change (use positive values for increases, negative values for decreases, and zero for no change).

\_\_\_\_\_ % [RANGE: -100 to 100]

20. What is your best guess about the total dollar revenue of the U.S. Federal government in 10 years from now? Will it be higher/lower/same relative to the level of total dollar revenue today? Please provide a percent change (use positive values for increases, negative values for decreases, and zero for no change).

\_\_\_\_\_ % [RANGE: -100 to 100]

21. What is your best guess about the size of the total public debt of the U.S. Federal government in 10 years from now? Will it increase, decrease or stay the same relative to the size today? Please provide a percent change (use positive values for increases, negative values for decreases, and zero for no change).

\_\_\_\_\_ % [RANGE: -100 to 100]

22. What is your best guess about the average interest rate that the US government will be paying on its debt in 10 years? Will it increase, decrease, or stay the same relative to its level today? Please provide an answer in terms of the difference in interest rates. (may enter up to 2 decimal points)

\_\_\_\_\_ % [RANGE: -100-100]

23. Are you? (Select one)

Male

Female

24. What is your first name?

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