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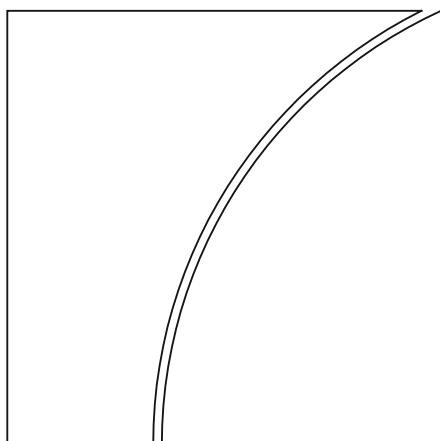
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JEL classification: E30, E40, E50, E70.

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Fiscal stimulus plans and households' expectations^{*}

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Abstract

Fiscal decisions develop through multiple stages of political discussions and lengthy legislative processes. We propose a measure of public attention to fiscal policy news based on Google Trends and investigate the reaction of households' expectations when attention is highest. We focus on three large U.S. fiscal stimulus plans: the CARES Act, the American Rescue Plan, and the Tax Cuts and Jobs Act. We find that attention peaks when the plan is approved by Congress or signed by the President. On those dates, financially literate households significantly adjust their expectations: those of inflation and earnings increase, while those of unemployment decline.

Keywords: inflation expectations, fiscal policy, stimulus plans, households

JEL Codes: E30, E40, E50, E70

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1 Introduction

In advanced economies, government expenditure amounts on average to roughly 50% of GDP and is therefore a key contributor to macroeconomic developments. Fiscal policy affects the economy directly through the impact of taxes and subsidies on households' and firms' finances but also indirectly through its impact on agents' expectations about the dynamics of prices and economic activity. When a fiscal stimulus package is announced, households can become more optimistic about the macroeconomic prospects, boost their consumption and hence generate inflation; by a similar token, they may become pessimistic about future fiscal solvency – particularly if the debt level is already high – and reduce consumption on grounds of higher expected future taxes.

The effects of news about fiscal policy on agents' expectations clearly depend on the extent to which certain fiscal decisions are already factored into their information sets. Similarly to what happens with monetary policy, an analysis of the impact of fiscal policy announcements on expectations requires isolating the surprises relative to the systematic component.

The literature on the effects of fiscal policy on expectations is less extensive compared to that on the impact of monetary policy. One key reason is the inherent difficulty in identifying fiscal surprises and placing them at a specific point in time. In contrast to monetary policy decisions, which are taken in closed-door meetings and announced at a specific date, fiscal decisions develop over time through the multiple stages of discussions that are part of the political process. This problem especially hampers studies aimed at assessing the impact of fiscal shocks on agents' expectations, as these are typically built around a comparison of expectations elicited before and after a given announcement. While one can make the case that professionals closely follow all the steps of the fiscal decision-making process, so that any news prompts them to revise their expectations, it is harder to argue along the same lines for households. Some fiscal packages receive less media coverage than others, and the intensity of households' attention varies over time as the package is designed and its approval and implementation progresses.

We study the effects of large fiscal stimulus packages on households' expectations – most importantly those about inflation – using a novel approach based on a measure of public attention towards fiscal matters constructed using Google Trends indices. More specifically, we identify moments in which the public attention towards the development and deployment of a fiscal stimulus plan is higher by selecting the days at which that measure peaks. We then rely on U.S. data from the Survey of Consumer Expectations, collected on the days around those peaks, to test the effects of the fiscal package on households' expectations.

Our analysis focuses on three large U.S. fiscal stimulus packages of a broadly similar size but widely different in scope. We start by looking at the fiscal support package deployed as an emergency measure during the outburst of the Covid-19 pandemic: the Coronavirus Aid, Relief, and Economic Security Act, also known as the CARES Act, of 2020. We then consider a different fiscal package deployed before the pandemic and consisting mainly of tax cuts rather than spending support, i.e. the Tax Cuts and Jobs Act (TCJA), deployed in 2017. Finally, we consider a fiscal package providing relief to U.S. households during the Covid pandemic, aimed at facilitating the recovery: the American Rescue Plan (ARP) of 2021.

We obtain four main sets of results. First, households' expectations react to news about the fiscal stimulus packages around the date of the largest (global) peak in the Google Trends index, while they do not significantly react around other (local) peaks of that indicator. In the fiscal plans we consider, the global peak in attention always coincides with the day the law underlying the fiscal package is finalised and formally approved – either passed by the Senate or signed by the President. We interpret this as evidence that households collect relevant information throughout the long legislative process, but wait for certainty about implementation timeline and the actual stimulus size before significantly revising their expectations and planning accordingly.

Second, the reaction of expectations to news about the fiscal packages is of the expected sign for the whole sample, but statistically significant only for financially literate households.

This result confirms the relevance of households’ financial literacy previously documented for the understanding of the transmission of both fiscal policy (Coibion et al. [2021]) and monetary policy (De Fiore et al. [2022]).

Third, after the peak of attention captured by the Google Trends index, financially literate households revise their expectations in line with a basic understanding of the transmission of fiscal policy to the economy. Inflation expectations rise consistently across the different fiscal plans; expectations of unemployment fall while those of earnings also rise. Moreover, the expected change in future taxes reflects the specific features of the plan – it is positive in reaction to news about spending plans of the CARES and the ARP, and negative in reaction to news about tax cuts of the TCJA.

Fourth, we do not find a significant reaction of households’ expectations on public debt. While prima facie puzzling, this finding is not inconsistent with households having a basic understanding of the transmission of fiscal policy to the economy. The direct positive impact of fiscal stimulus on public debt could be counteracted by the expected increase in household spending and a fall in unemployment, which boost the economy and possibly increase tax revenues. Moreover, higher inflation would partially erode the real value of outstanding public debt.¹ The lack of significant expected change in debt can thus reflect the uncertainty about the relative strength of these opposing forces.

Our approach is similar in spirit to the analysis of “natural” experiments aimed at assessing households’ reactions to monetary policy announcements (see Lamla and Vinogradov [2019], De Fiore et al. [2022]). The key difference lies in how the key dates around which the assessment is made are elicited. In this strand of literature, most contributions so far point to a relatively limited and uncertain impact of monetary policy announcements, not only on inflation but more generally on expectations. We document larger effects of fiscal policy – at least those related to large stimulus packages – potentially hinting at limited traction

¹Admittedly, to realise this households would need a very sound understanding of the interaction of public finances and inflation, as well as clear views on the expected and unexpected components of inflation.

of monetary policy decisions, which may be perceived of little consequences for households, compared to large fiscal spending packages.

Our paper relates to an extensive literature on the formation of households' expectations. Evidence is rich when it comes to evaluate the reaction of households' inflation expectations to monetary policy announcements. One strand exploits randomised experiments in laboratory, in which participants are fed with information on monetary policy decisions. Findings hint at a relatively strong reaction of households' expectations to information about monetary policy decisions. The response is stronger when households are provided with information about the Federal Reserve's inflation target or the FOMC's inflation forecast, and weaker when provided with the full FOMC statement, or a summary of that statement as reported in newspapers (Coibion et al. [2019] and Coibion et al. [2021]). The other strand of this literature uses regularly conducted surveys, which elicit responses from households who choose their exposure to news about monetary policy. Respondents are therefore not prompted to read specific material, and instead have to fetch the news themselves, as they would do in real life. In this latter strand, most contributions point to a relatively limited and uncertain impact of monetary policy shocks, not only on expectations of inflation but also of other aggregate variables and individual financial conditions (see Lamla and Vinogradov [2019], De Fiore et al. [2022]).

We also contribute to an emerging literature that links fiscal policy to inflation expectations. Households' anticipation of fiscal measures play an important role in shaping economic outcomes, including inflation (Coenen et al. [2012]). In particular, unanticipated changes in government debt levels raise professional forecasters' long-term inflation expectations, especially in those countries with already high government debt levels (Brandao-Marques et al. [2023]). The fiscal stance also influences inflation expectations of consumers and professional forecasters (Cerisola and Gelos [2009], Łyziak and Mackiewicz-Lyziak [2020]), particularly around important policy announcements such as during the pandemic (Conces Binder et al. [2022]). Results from randomised control trial approaches confirm these findings (Coibion

et al. [2021]), showing that information on future government debt exert a positive impact on household inflation expectations.

Finally, our paper connects to the literature on the identification of fiscal policy shocks. Early approaches generally relied on low-frequency macroeconomic readings to disentangle fiscal policy shocks from other economic factors with a focus on changes in the cyclically adjusted balance (Blanchard [1990]). More recent contributions build on Blanchard and Perotti [2002]’s framework, which identifies fiscal policy based on a mixed structural VAR and event study approach (see eg Perotti [2011]). Other papers use narrative methods to identify exogenous tax changes (see eg Romer and Romer [2010]), classifying tax changes into those taken in response to other factors and those taken for other reasons. We deviate from this literature in that we do not identify fiscal policy shocks. We rather identify dates when households are most exposed to fiscal policy news and test their reaction around those dates. Other papers have incorporated empirical proxies for fiscal news and agents’ perceptions of the fiscal stance, classifying fiscal policy shocks as “expected”, “unexpected” and “misexpected”, and showing that missing this important distinction can lead to significant underestimation of the effects of fiscal policy (Ricco [2015]). Other papers have attempted to assess the signalling effects of fiscal announcements (Melosi et al. [2022]), showing that fiscal stimulus can be interpreted as conveying a pessimistic view of the government on the economic outlook, leading to a negative reaction of the stock market. Conversely, exogenous fiscal events with no such information content tend to be associated with positive stock market responses.

The rest of the paper is organised as follows. Section 2 offers a detailed overview of our dataset and describes the timeline of various large fiscal stimulus plans. Section 3 presents the empirical strategy. Section 4 presents our main findings and section 5 discusses the main conclusions.

2 Data

Our analysis draws upon two distinct sources of data. First, to assess households' expectations, we rely on the Survey of Consumer Expectations (SCE) conducted by the Federal Reserve Bank of New York (FRBNY). Second, we build indices using the Google Trends platform to measure households' attention and exposure to fiscal news.

2.1 Survey of Consumer Expectations (SCE)

The SCE is a monthly online survey conducted by the FRBNY, eliciting economic expectations among the U.S. population. Survey questions cover a wide range of macroeconomic as well as personal financial expectations. The survey started in June 2013, and every month features a sample of 1200 to 1400 households. Households are selected based on a stratified sampling procedure aimed at maintaining a representative sample of the population in terms of its demographic and socioeconomic composition. Selected households participate repeatedly in the survey for up to 12 months; after that they drop out and are replaced by new households. Respondents who fail to respond to three consecutive modules are not invited to complete further survey modules.²

Our paper focuses on the reaction of economic expectations of SCE respondents to announcements of three large fiscal stimulus plans, namely the TCJA, the CARES Act and the ARP. Table 1 shows details of the expectations considered in our analysis, including the survey questions and the required format for the answers. Expectations of inflation, earnings, government debt and taxes are elicited by asking respondents about the expected percent change of the variable over the 12 months following the survey response. Expectations about unemployment and interest rates refer to the expected probability of those variables to increase over the 12-months horizon.

²Armantier and Topa [2017] provide a comprehensive overview of the survey design.

Table 1: Overview of economic and financial expectations (12-months ahead)

Variable Name	Survey question	Answer format
Inflation	What do you expect the rate of inflation/deflation to be over the next 12 months?	Percent change
Unemployment	What do you think is the percent chance that 12 months from now the unemployment rate in the US will be higher than it is now?	Probability, 0–100%
Earnings	What do you expect to have happened to your earnings on this job, before taxes and deductions?	Percent change
Interest rate	What do you think is the percent chance that 12 months from now the average interest rate on saving accounts will be higher than it is now?	Probability, 0–100%
Government debt	Over the next 12 months, what do you expect will happen to the level of U.S. government debt? By about what percent do you expect the level of U.S. government debt to decrease/increase?	Percent change
Taxes	What do you expect to have happened to the total amount of taxes you will have to pay, including federal, state and local income, property and sales taxes?	Percent change

2.2 Google Trends index of attention to fiscal policy news

Google Trends is a web-based tool that provides insights into the relative popularity of search queries over time, at a daily frequency. More specifically, it enables users to explore and analyse the volume of searches for specific keywords or topics across various regions and periods. As such, it can be taken as a dynamic indicator of public interest or attention on given matters. The results reported by a given Google Trends query are normalised, offering a relative scale rather than absolute search volumes. This is meant to make comparisons fair and understandable. More specifically, the numbers are adjusted to account for variations in data over time and across different search terms within a query. This is accomplished by setting a baseline: the point of highest popularity for a given search query receives a score

of 100; all other data points are then scaled relative to this peak.³

As we argued earlier, assigning fiscal policy decisions to a specific point in time is crucial to assess their impact, but is unfortunately not easy, as fiscal policy outcomes are the result of lengthy legislative processes which in principle enable market participants and households to constantly adjust expectations as the process unfolds and the likelihood of different outcomes is reassessed.

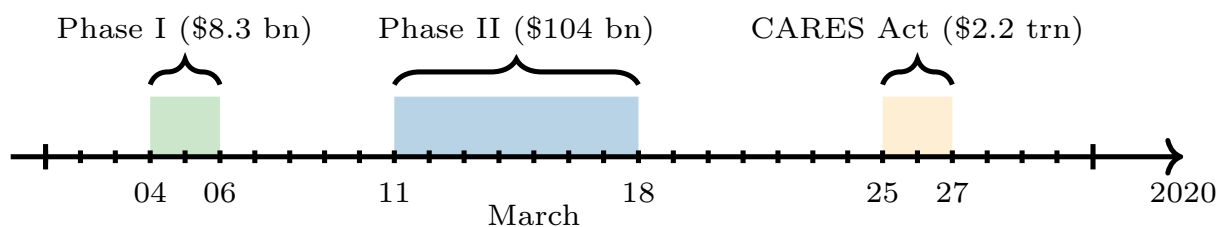
We focus on three large fiscal stimulus plans which happen to be of a similar overall size but widely differ in scope and surrounding circumstances. We start by looking at the plan deployed as an emergency measure in the context of the Covid-19 pandemic outburst: the CARES Act of 2020. We consider then a fiscal package introduced before the pandemic and consisting mainly of tax cuts rather than spending support, ie the TCJA implemented by the Trump administration in 2017. Finally, we look at the non-emergency fiscal support package introduced in 2021 by the Biden administration to facilitate the recovery from the pandemic.

As our strategy relies on measuring households' exposure to news related to fiscal policy, we construct a Google Trends index based on queries about fiscal policy. More specifically, we employ the following words in the search field: "*Fiscal stimulus*", "*Tax cut*", "*Stimulus package*" and "*Stimulus bill*". Additionally, we also use expressions related to the specific fiscal policy package, "*CARES Act*" for the CARES Act of 2020, "*Tax Cuts and Jobs Act*" for the TCJA of 2017, and "*American Rescue Plan*" for the ARP of 2021. Our focus is on searches from users located in the U.S.

³For analyses covering periods longer than nine months, Google Trends shifts to a weekly data frequency. This however does not affect our analysis, given that we examine the three fiscal stimulus plans separately, and for each the length of the legislative process was less than three months. Note also that Google Trends can categorise data by geographical position, providing insights into regional variations in search behaviour.

2.2.1 CARES Act of 2020

We first focus on a fiscal stimulus plan that stands out, at least over the sample period covered by the survey of consumer expectations, for his size and emergency nature: the stimulus bills approved during the COVID-19 outbreak.⁴ Figure 1 shows the legislative process around the individual stages of the overall fiscal plan. Different packages were deployed in batches of increasing size in the course of March 2020 as the pandemic spread. The first fiscal measure consisted of a package of USD 8.3 billion, which was then followed by a larger second one, amounting to USD 104 billion. Both packages were negligible in comparison with the third and last package, the CARES Act, which amounted to USD 2.2 trillion, or about 10% of GDP. The plan consisted of measures targeting American workers, families, small businesses and industries, including resources to help firms maintain workers, unemployment benefits, direct payments to families, and support to prevent people from losing housing. Given the multiple stages of implementation of the stimulus plan, it is particularly challenging to attribute the fiscal policy decision to a precise point in time.



Notes: Phase I, known as the *Coronavirus Preparedness and Response Supplemental Appropriations Act*; Phase 2, known as the *Families First Coronavirus Response Act* and Phase 3, known as the *Coronavirus Aid, Relief, and Economic Security Act (CARES Act)*.

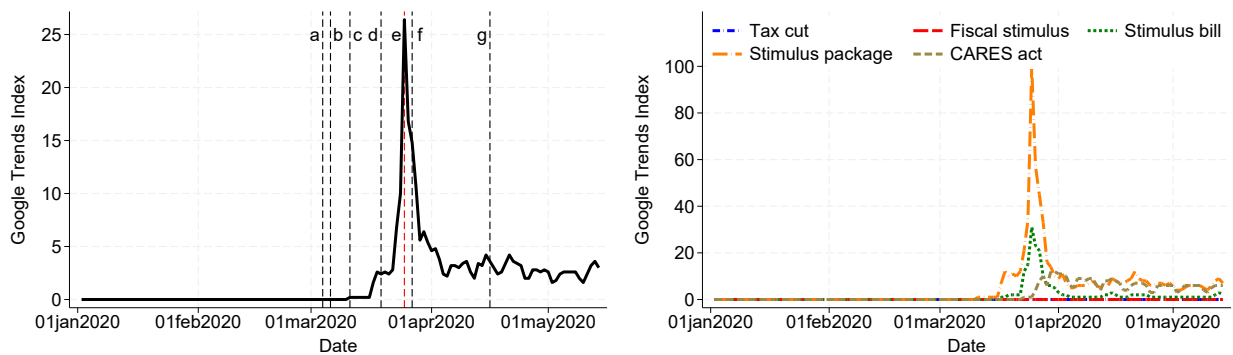
Figure 1: Timeline of the legislative processes at the onset of the COVID-19 pandemic

Figure 2, panel (a), shows the evolution of the Google Trends index around the deployment of the stimulus plan of 2020. Prior to mid-March, there was little interest in searching the internet on fiscal policy; in fact none of the selected words showed much activity. Public

⁴This includes the *Coronavirus Preparedness and Response Supplemental Appropriations Act*, signed on 6 March 2020, the *Families First Coronavirus Response Act*, signed on 18 March 2020 and the *Coronavirus Aid, Relief, and Economic Security Act (CARES Act)* signed on 27 March 2020.

interest in fiscal policy news increased suddenly later in March, as the pandemic spread, and peaked on March 25th - the day the U.S. Senate approved the CARES Act. Panel (b) disentangles the search intensity for each of the five words used to build the composite Google search index. Most of the searches related to the term “*Stimulus package*” while searches for “*Tax cut*” stayed close to zero throughout the deployment of the plan.

Overall, the Google Trends index for the CARES Act indicates the date of March 25th as the one in which households’ exposure to information about the fiscal measure was highest.



(a) Average index and relevant dates

(b) Google Trends index for selected words

Notes: (a) First stimulus bill introduced in house on March 4th; (b) First stimulus bill signed by the president on March 6th; (c) Phase II introduced in house on March 11th; (d) Phase II signed by the president on March 18th; (e) Senate approves Phase III (CARES Act) on March 25th; (f) President signs the CARES Act on March 27th.

Figure 2: Google Trends index during the CARES Act of 2020

2.2.2 Tax Cuts and Jobs Act

The TCJA, deployed by the Trump administration in 2017, consisted of large tax cuts at almost all levels of taxable income and resulted in shifted thresholds for several income tax brackets. The Congressional Budget Office projected that the TCJA would increase the total projected deficit over the 2018–2028 period by about USD 1.9 trillion, amounting to around 9.8% of GDP.⁵ Lacking the sense of urgency of the impending pandemic, the legislative

⁵See [The Budget and Economic Outlook: 2018 to 2028](#) released by the Congressional Budget Office.

process took over two months (Figure 3). Moreover, the tax cuts were a key part of the Trump’s electoral platform. As such, they could have been anticipated, which exacerbates the challenge in attributing the fiscal policy decision to a specific single date.

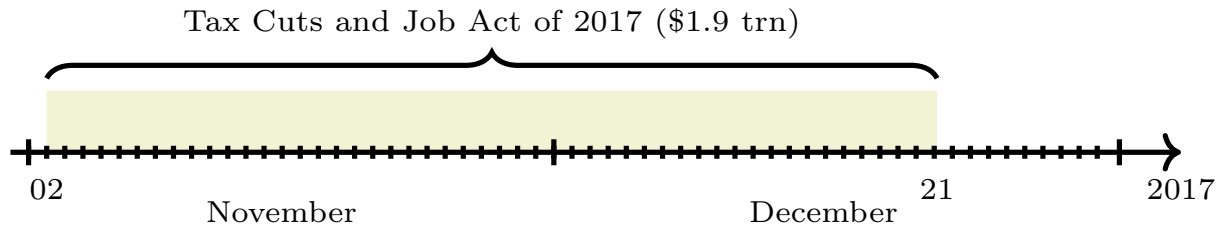
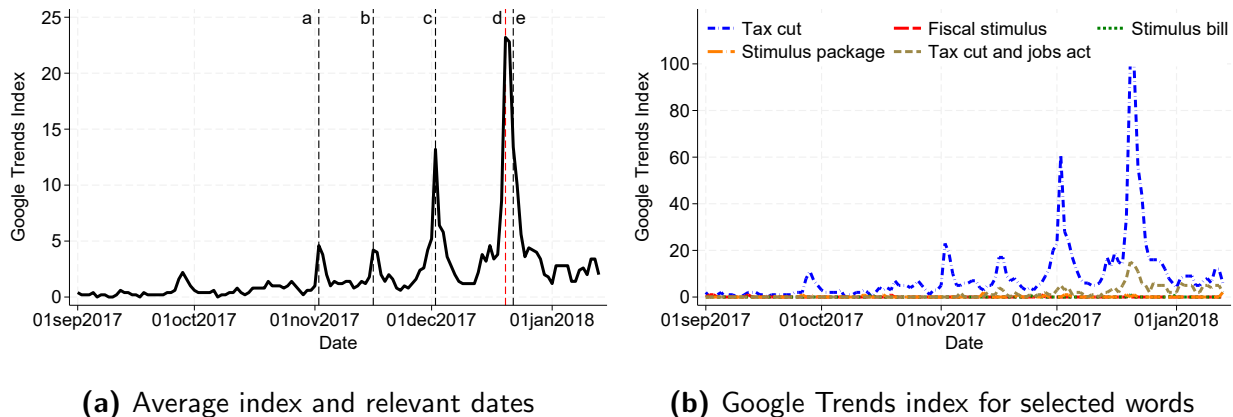


Figure 3: Timeline of the legislative processes of the Tax Cuts and Jobs Act of 2017

Figure 4 suggests that public interest in the ongoing fiscal discussions started increasing in September 2017, before the announcement of the TCJA, and peaked multiple times in November and December, at key dates of the legislative process, (panel (a)). Yet the peak of attention occurred on the day the House agreed to the Senate amendments - the moment when also the size of the tax cuts was finalised. Searches on the fiscal plan started declining thereafter. Considering separately the various terms (panel (b)) supports the validity of the Google Trends index as measure of attention to fiscal policy news. While searches for the term “Tax cut” remained around zero for the CARES Act, they were the main component driving movements in the composite Google Trends index during the legislative process of the TCJA. This confirms that information about the characterising features of each fiscal plan, as reported by the media, is transmitted to the general public.



Notes: (a) TCJA was introduced in the house on November 2nd; (b) TCJA passed in house on November 16th; (c) Senate approved with amendment on December 2nd; (d) House agreed to amendment on December 20th; (e) President signed the TCJA on December 22th.

Figure 4: Google Trends index during the Tax Cuts and Jobs Act of 2017

2.2.3 American Rescue Plan

On top of the CARES Act, we consider a second pandemic-related measure that also involved significant government spending but was not implemented as an emergency measure: the ARP Act of 2021.⁶ This package consisted in a \$1.9 trillion spending package, amounting to 8.1% of GDP, and aimed at addressing the lingering consequences of the pandemic with additional fiscal support. Specific measures included checks for families, extended unemployment insurance benefits, aid to cover rents, and tax credits. Figure 5 shows the time span in which the ARP was discussed in Congress: in contrast with the CARES Act, the legislative process took longer and spanned about two months, similarly to the TCJA.

⁶The ARP became public law on 11 March 2021; for more information on the legislative process see: <https://www.congress.gov/bill/117th-congress/house-bill/1319/actions>.

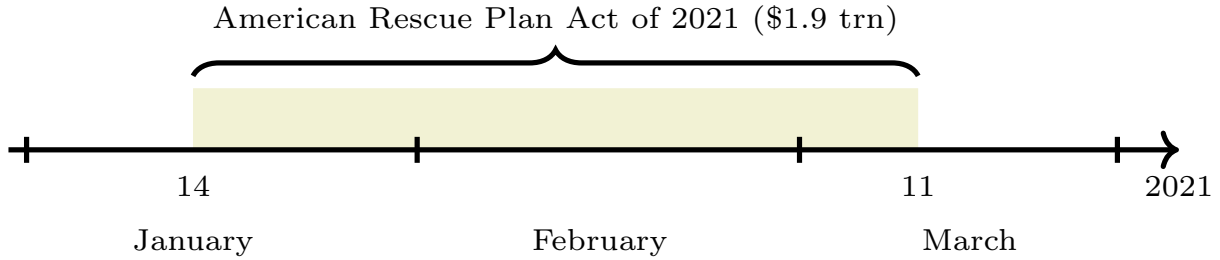
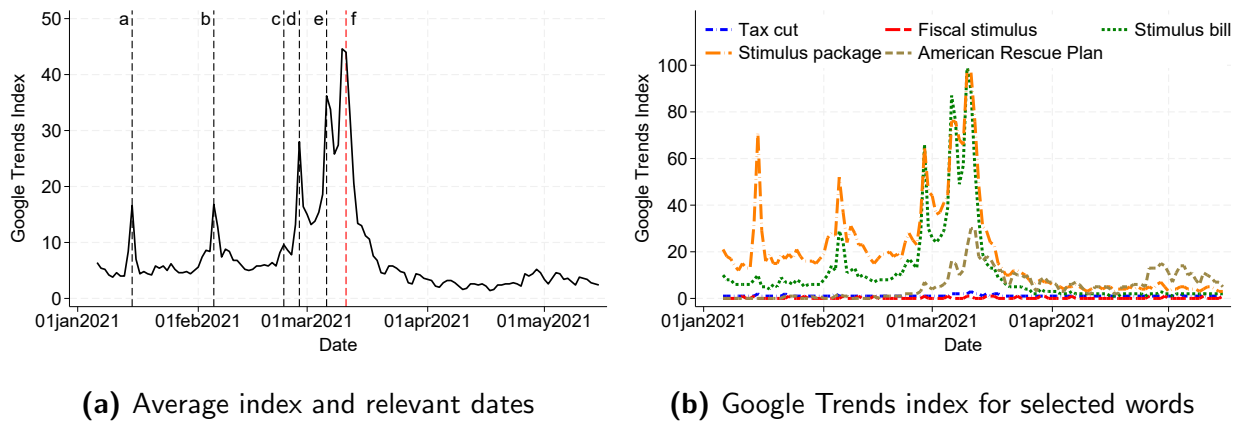


Figure 5: Timeline of the legislative processes of the American Rescue Plan (ARP)

Figure 6 shows that public interest in the package started increasing in January 2021, displaying multiple local peaks of attention in February and March (panel (a)). The global peak was on March 11th, the day the President signed the Act, before interest started fading away. Panel (b) indicates that most of the searches were done under the word “*Stimulus package*”, with no relevance for the term “*Tax cut*”, pointing to the gathering of accurate information about the plan by the public.

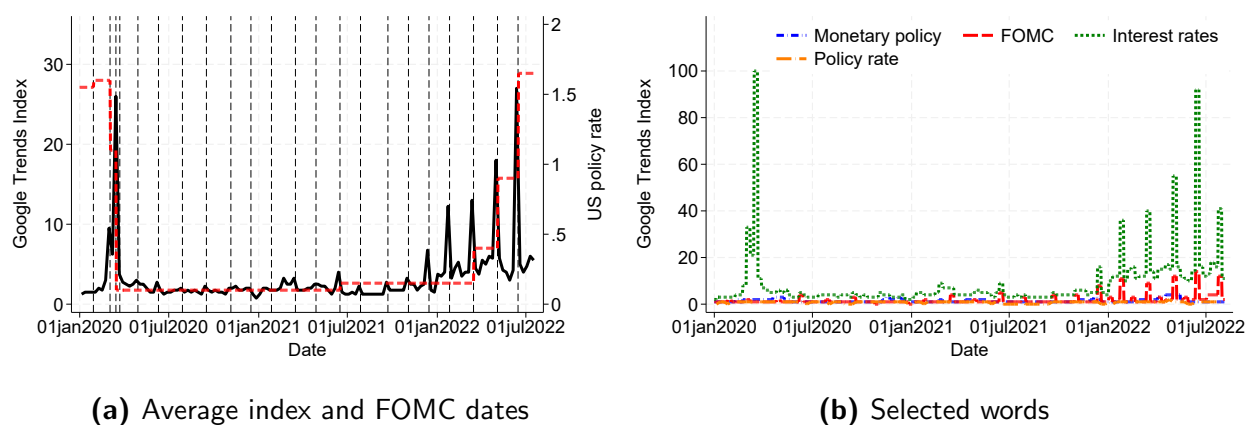


Notes: (a) Biden unveiled the American Rescue Plan on January 14th; (b) Senate passed the budget resolution on February 5th; (c) American Rescue Plan introduced in house on February 24th; (d) Plan passed in house on February 27th; (e) Senate approved with an amendment on March 6th; (f) President signed the American Rescue Plan Act of 2021 on March 11th.

Figure 6: Google Trends index during the legislative process of the American Rescue Plan act of 2021

2.2.4 Google Trends index around FOMC meetings

To validate the use of the Google Trends index as a measure of public attention to economic matters, we relate the occurrence of queries related to monetary policy to the dates of FOMC meetings, for a period that covers both the CARES Act and the ARP, ie January 2020 to July 2022. More specifically, we build a Google Trends index constructed using the keywords “*Monetary policy*”, “*FOMC*”, “*Interest rates*” and “*Policy rate*”. Importantly, the index systematically peaks on FOMC dates. Moreover, the size of the peak appears proportional to the size of the policy action taken by the FOMC. For instance, the smaller peaks correspond to the FOMC meetings where the policy rate remained nearly unchanged. Panel (a) in Figure 7 shows that the two largest peaks correspond to the significant changes in the policy stance, first when the Fed cut the policy rate by 100 basis points (15 March 2020) and second when the Fed raised the policy rate by 75 basis points (15 June 2022). Panel (b) confirms that the searches mainly related to the policy tool being used, i.e., “*interest rate*”, and “*FOMC*”.



Notes: the vertical dashed lines indicate the second day of FOMC meetings.

Figure 7: Google Trends index for a selected period

3 Empirical strategy

We estimate the treatment effects of fiscal stimulus by comparing the change in expectations (with respect to the previous month) of survey participants responding after each fiscal event to the change in expectations of those responding before. This identification strategy is borrowed from event studies on high-frequency financial market responses (see among others e.g. Swanson [2021]) and has recently been applied to household and firm survey data.⁷ As highlighted above, however, and in contrast to monetary policy decisions, it is problematic to allocate the fiscal “event” to a single date.

The Google Trends index we propose provides information about dates when public attention to fiscal policy news peaks. In our analysis, we define as “events” days when this index shows either a local or global peak. We then test for a reaction of households’ expectations to fiscal news around those specific events.

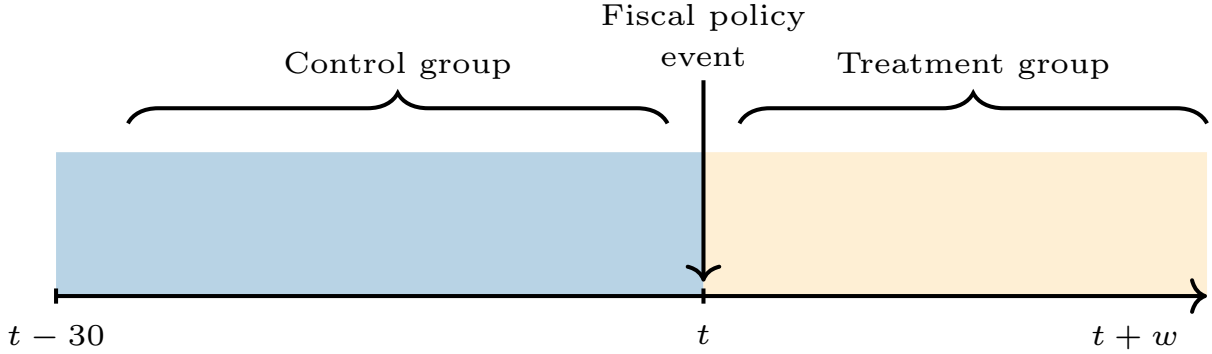
We use a time window around each fiscal event, so that the pool of respondents is split into control and treatment group based on whether the survey response for the ongoing month has been completed before or after the event. Figure 8 provides a visual representation of the event study. We then relate the change in expectations of each household compared to its previous response with the “treatment” dummy, as well as with a set of other control variables.

More formally, for each window length w we run the following cross-sectional regression:

$$\Delta y_{w,h}^e = \alpha_w + \beta_w I_{w,h} + \gamma_w X_{w,h} + \varepsilon_{w,h} \tag{1}$$

$\Delta y_{w,h}^e$ is the month-on-month change in the 12-month-ahead expectations for household h over window w in the following variables of interest: inflation, aggregate unemployment, individual job earnings, interest rates, government debt, and taxes. $I_{w,h}$ is the “treatment” dummy which takes value 0 if the household responded before the event date and 1 if up to

⁷See among others Bottone and Rosolia [2019], De Fiore et al. [2022] Lamla and Vinogradov [2019].



Note: Where t is the date in which the fiscal policy event takes place and w takes values from 3 to 20.

Figure 8: Graphical representation of the event study.

w days after the event. $X_{w,h}$ is a vector of controls that includes household characteristics such as age, education, income and the state of residency. It also includes the number of months a given household has been participating in the panel, to account for the fact that individuals may provide more informed responses as they stay in the panel for a longer duration. Additionally, the number of days between the two responses is included since respondents have the freedom to choose when to respond, and the time interval between responses can vary from 2 to 60 days. For the CARES Act of 2020 and the ARP of 2021, we also include the stringency index, which measures the level of COVID-19 related restrictions and captures their potential influence on inflation expectations. The vector of controls also incorporates the latest data release of variable y available at the time of response, which helps to account for the most up-to-date information on the current value of each variable. Finally, to take into account the potential cross-sectional correlation of errors, we cluster standard errors by state.

4 Results

In our analysis, “events” are dates in which the Google Trends index reaches either a local or global peak. Section A of the online Appendix shows that households’ expectations do not react significantly to events that coincide with local peaks in the Google Trends index.

Significant reactions can only be observed around the global peak, for each of the three fiscal support plans we consider. In the rest of the paper, we will therefore focus on the three dates that coincide with the global peak of household attention to fiscal news: March 25th 2020 for the CARES Act, December 20th for the TCJA, and March 11th for the ARP of 2021.

4.1 CARES Act of 2020

Table 2 shows the baseline results for the full sample of survey respondents around the global peak of the Google Trends index (March 25th), for the 12-months ahead inflation expectations and for windows lengths of 3, 5, 10 and 15-days. The coefficient on the “treatment” dummy β is positive but not statistically significant for any of the windows. Figure 9 shows the coefficient estimates for the full set of possible window lengths up to $w = 20$ days.

One possible reason for the lack of significance of our results is that some households might be uninterested in fiscal policy news and/or unable to appreciate the transmission of fiscal policy to the economy. In related literature, financial literacy has been shown to play a relevant role for a significant response of inflation expectations to either monetary policy announcements (De Fiore et al. [2022]) or to fiscal news provided in controlled trial experiments (Coibion et al. [2021]). We therefore rely on the information on household characteristics provided by the SCE to single out financially literate households and check the reaction of their expectations to information about the CARES Act.

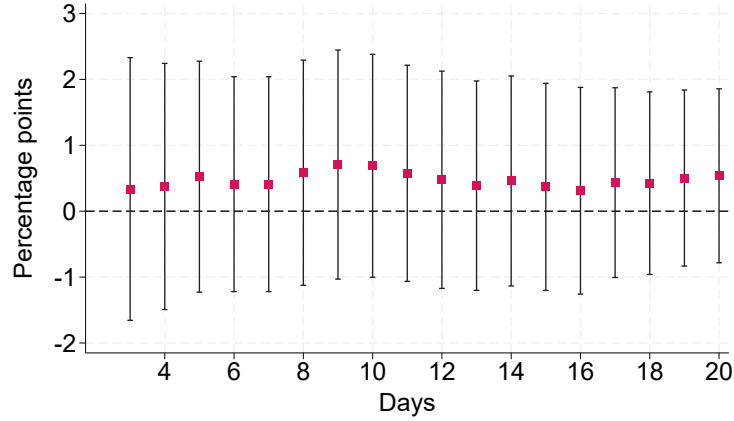
Table 2: Baseline results for the 12-months ahead inflation expectations

	<i>Window length</i>				
	3 days	5 days	10 days	15 days	20 days
$\hat{\beta}_w$	0.24	0.39	0.61	0.28	0.45
	(0.807)	(0.638)	(0.455)	(0.714)	(0.488)
Observations	590	612	674	747	876
Treated households	37	59	123	196	327
R-squared	0.087	0.091	0.084	0.076	0.059

Notes: *p<0.1; **p<0.05; ***p<0.01

In percentage points

Each respondent to the SCE is prompted to answer a few introductory questions when they join the panel. Among these, participants are also submitted seven questions to test their understanding of key mathematical and financial concepts such as compounding interest, probability, risk, and numerical reasoning. Annex A provides a detailed summary of those questions. Survey administrators typically consider “financially literate” those answering at least four questions correctly. As any cutoff point is arbitrary, we adopt the median of correct responses as our benchmark – five correct answers out of seven. This threshold ensures a more equitable split, effectively grouping our participants into two equal segments based on their financial literacy.



Note: Confidence intervals are calculated at the 95% confidence level.

Figure 9: Impact of CARES Act announcement on inflation expectations for windows up to 30 days

Equipped with this classification, we run a separate regression on the financially literate sample of respondents. Lengths below 3 days are excluded due to the limited number of treated households, the latter being 12 for $w = 1$ and 21 for $w = 2$. For our first window length, $w = 3$, the number becomes 26. Results for the 3, 5 10, and 15-days windows are shown in Table 3.

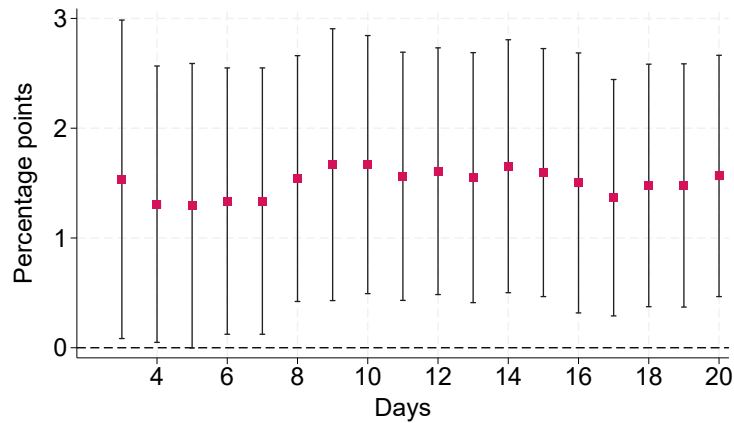
Table 3: 1-year ahead inflation expectations results for the financially literate sample

	<i>Window length</i>				
	3 days	5 days	10 days	15 days	20 days
$\hat{\beta}_w$	1.53**	1.30*	1.67***	1.60***	1.57***
	(0.043)	(0.056)	(0.008)	(0.008)	(0.007)
Observations	404	417	460	514	591
Treated households	26	39	83	137	215
R-squared	0.137	0.127	0.134	0.099	0.082

Notes: *p<0.1; **p<0.05; ***p<0.01

In percentage points

Figure 10 shows the coefficient results for a larger selection of windows. The focus on financial literate households delivers estimates of the expected sign and statistically significant at the 95% confidence level, for all the windows we consider. The magnitude of the estimated coefficients hints at a sizeable impact on households' inflation expectations, in the order of 1.5 percentage points.



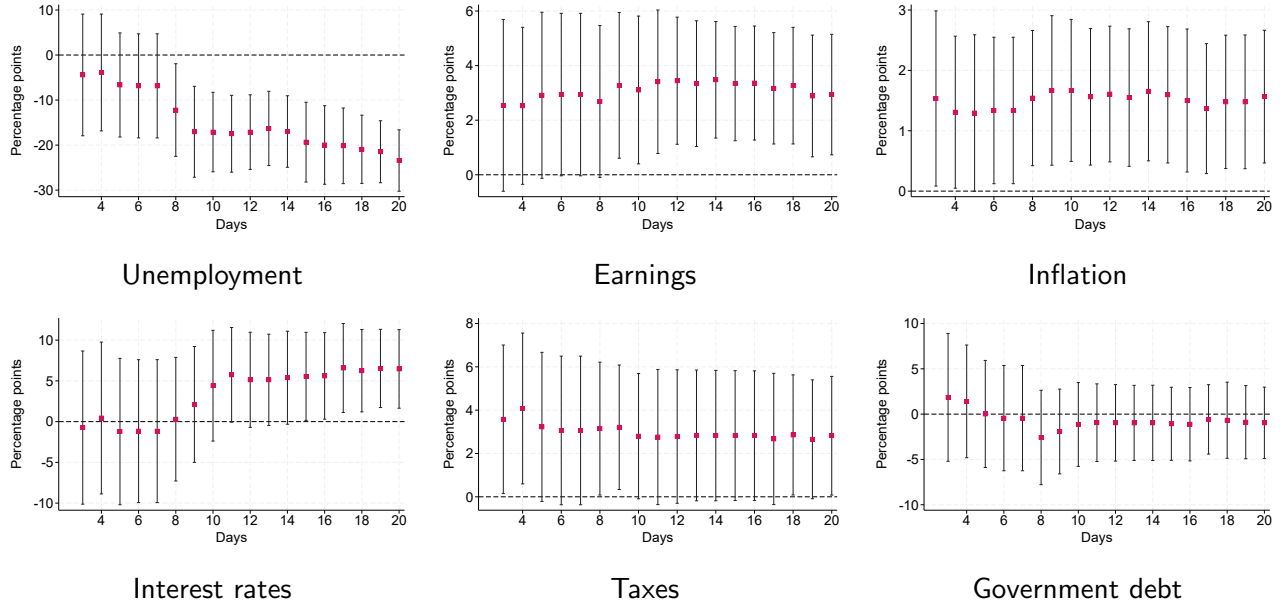
Note: Confidence intervals are calculated at the 95% confidence level.

Figure 10: Impact of CARES Act on inflation expectations for the financially literate sample

To assess whether households understand the main transmission channels of fiscal policy to inflation, we look at the reaction of expectations of other macroeconomic variables around the event date. Figure 11 shows the results for expectations about aggregate unemployment, personal earnings, interest rates, taxes and government debt, on top of inflation. Households “treated” with the fiscal stimulus news expect that the likelihood of the economy experiencing higher unemployment in twelve months is significantly reduced by about 20% (at $w \geq 8$), hinting at a sizeable effects of the stimulus package in injecting confidence that a major recession could be avoided. Accordingly, “treated” households also expect higher earnings from their job, around three percentage points for corresponding windows. The positive impact of expectations of aggregate and individual job and income prospects are consistent with the documented increase in inflation expectations. Interestingly, households perceive that the central bank will increase interest rates in reaction to higher future inflation. There

is no evidence of fear that the monetary authorities will be trapped in a situation of fiscal dominance. In the case of the CARES Act, households also expect that the stimulus plan will eventually increase their tax bill by three percentage points over the following 12 months (for most windows lengths). Finally, we do not find significant reactions of households' expectations on public debt, at all window lengths. This finding is not inconsistent with households having a correct understanding of the transmission of fiscal policy to the economy. The direct positive impact of fiscal stimulus on public debt can be counteracted by the expected increase in household spending and reduced probability of unemployment, which tends to boost the economy and increase tax revenues. Moreover, higher expected inflation can be expected to erode the real value of public debt. The lack of significant change in the expectations of government debt could thus simply reflect the uncertainty about the relative strength of these opposing forces.

Our results differ from those in [Coibion et al. \[2021\]](#) who find that households do not expect higher future taxes following news of higher fiscal deficit. They argue that this invalidates the possibility of a mitigating impact of fiscal expansions through negative wealth effects and declining labor supply. Our findings of higher expectations of future taxes following news about the CARES Act (and ARP, as argued below) do not rule out the possibility of such effects when fiscal expansions are based on spending support measures.



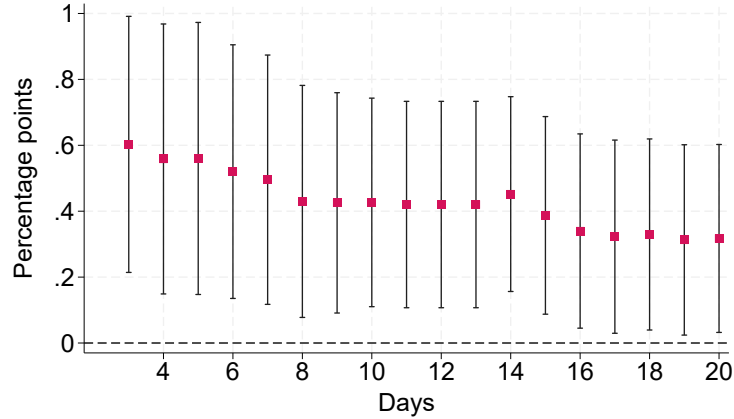
Note: Confidence intervals are calculated at the 95% confidence level.

Figure 11: Reaction of all expectations to the CARES Act of 2020

4.2 Tax Cuts and Jobs Act of 2017

In spite of being a very different fiscal stimulus plan – centred on tax breaks rather than spending, and deployed at times of relatively robust economic activity rather than amid the outburst of a pandemic – the TCJA of 2017 shows similar results to the CARES Act. Also in this case, results for the entire sample point to a positive but non-significant reaction of inflation expectations (see Figure B1 in appendix B), but when considering only the sub-sample of financially literate households the response becomes positive and statistically significant (Figure 12). In this case, however, the magnitude of the coefficient is smaller – 50 to 70 bps depending on the window length – than for the CARES Act, hinting at a possibly weaker transmission of a tax-based fiscal easing on inflation expectations.

One obvious concern with a stimulus plan such as TCJA, which was designed and deployed over an extended time horizon, is the extent to which it may have been already anticipated. To assuage this concern, we repeat the regressions on a “placebo” date, in which the Google Trends index was already high but did not peak (22 November). In this



Note: Confidence intervals are calculated at the 95% confidence level.

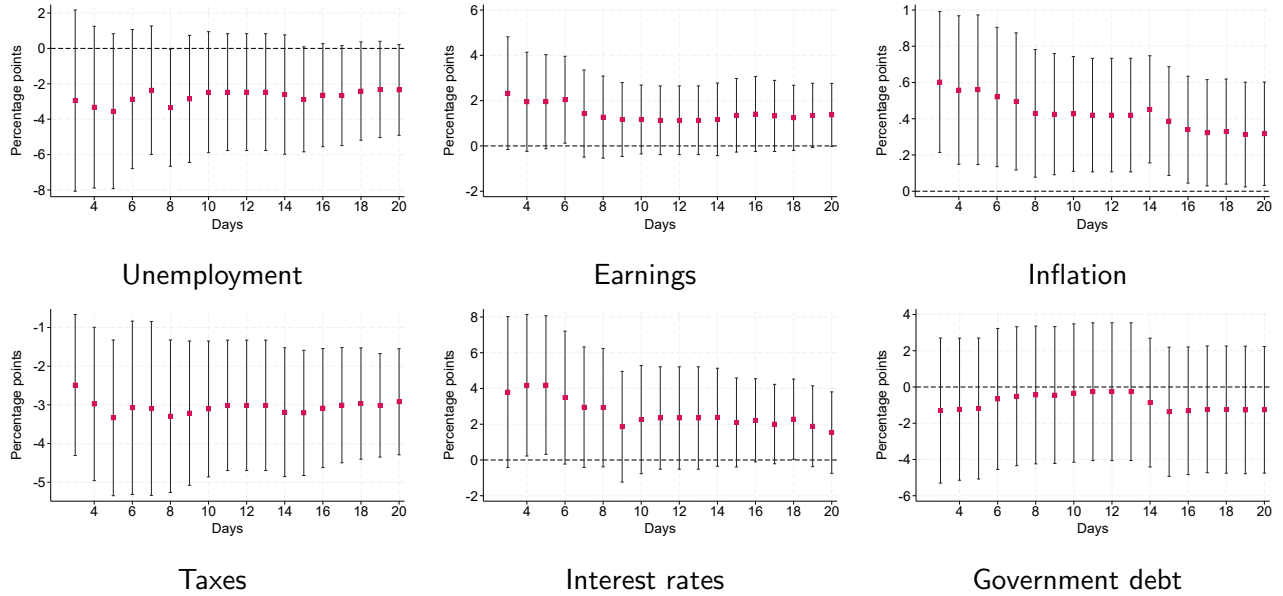
Figure 12: Impact of TCJA announcement on inflation expectations for windows up to 30 days and for the financially literate sample

case, estimates of the β coefficient are not statistically significant, for all window lengths.

Looking at the response of expectations of other macroeconomic variables first reveals that “treated” households correctly interpret the information provided by official sources and the media. Indeed, they expect lower taxes (Figure 13). While this may seem obvious, we see it as an important result validating our empirical setup: it shows that “treated” households, that is those responding after the global peak in the Google Trends index, display systematically lower tax expectations compared to the non-treated ones. This would not have been the case had the “treatment” day been misplaced in time. As for unemployment and (pre-tax) earnings, the response is less clear-cut and only marginally significant for certain window lengths, but of the correct sign in all cases. This may underscore that households see the tax cuts as less consequential for their overall macroeconomic impact. Yet the TCJA was deployed in very different circumstances compared to the CARES Act, so the absence of confidence/injection occurring in an emergency situation may also explain this result.

4.3 American Rescue Plan Act of 2021

We now turn our attention to a third large fiscal package, the American Rescue Plan of 2021. The ARP bears similarities with both the CARES Act and the TCJA: similarly to



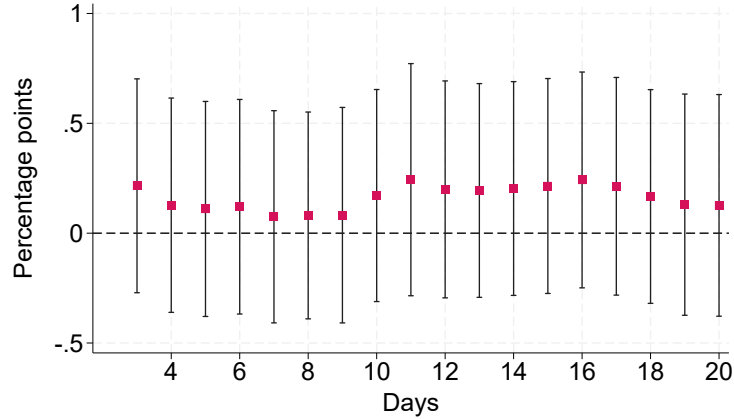
Note: Confidence intervals are calculated at the 95% confidence level.

Figure 13: All results for the TCJA of 2017

the CARES Act, it was a fiscal spending package aimed at relieving the consequences of the pandemic and at stimulating the recovery, but it was not driven by the emergency of the pandemic outburst. It was therefore discussed and approved over a much longer time horizon, closer to that of the TCJA.

Results are however less clear cut than for the CARES Act and the TCJA: estimates of the coefficient β are not significant, and albeit mostly positive they are very erratic, even when only considering financially literate households (Figure 14).

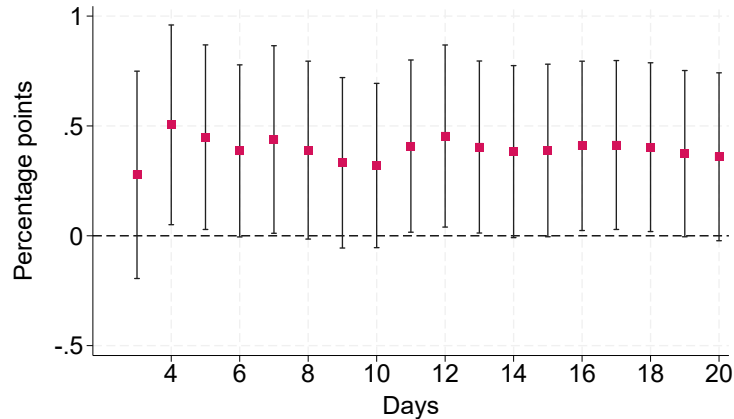
To understand this result, we consider possible confounding effects due to other relevant news releases in proximity of the identified date for the fiscal announcement. Indeed, on March 10th, just one day before signature of the ARP, there was a CPI release that surprised the markets on the upside. The month-on-month CPI inflation rate was 0.4%, up from 0.3% in January, and reaffirmed the increasing trend observed since October 2020. Consequently, all respondents who were exposed to the news on the ARP fiscal package at the event date considered were also exposed to the new CPI release. The problem of this is twofold: on one hand, it is impossible to tell whether any observed effects are due to the fiscal news or to



Note: Confidence intervals are calculated at the 95% confidence level.

Figure 14: Impact of ARP announcement on inflation expectations for windows up to 30 days

the CPI release; on the other, since we use the last available CPI figure as a control variable, the March 10th release introduces extremely high collinearity with the “treatment” dummy. Indeed, if we run the same regression by just moving the treatment day backwards by one, we obtain a significant and positive response, compounding both the CPI release and the fiscal “treatment”, as shown in Figure 15.

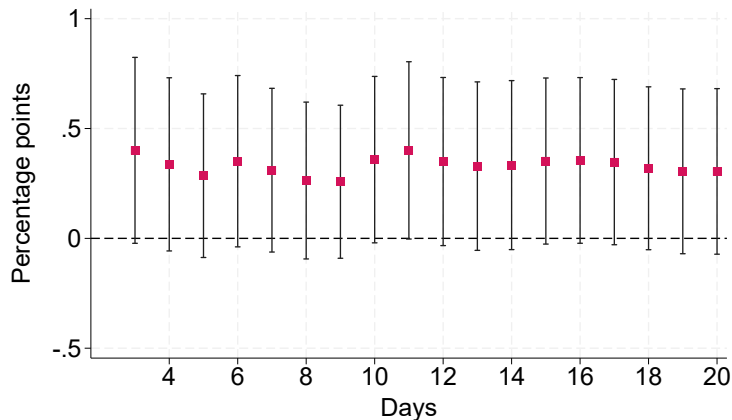


Note: Confidence intervals are calculated at the 95% confidence level.

Figure 15: Estimates of the reaction coefficient $\hat{\beta}$ obtained on the day of the CPI release of March 10th, one day before the signature of the ARP on March 11th

Similarly, results also turn out to be significant (at the 95% confidence level) if we drop

the “last inflation release” control, as shown in Figure 16. Note, however, that in neither case we can claim that the estimated effect would be due only to the fiscal announcement, as there is no way to net out the effects of the CPI release in the framework of our identification strategy. For reference, results for all expectations are shown in Figure B2 in appendix B.



Note: Confidence intervals are calculated at the 95% confidence level.

Figure 16: Estimates of the reaction coefficient $\hat{\beta}$ obtained on the day of the signature of the ARP on March 11th, after dropping the last inflation value control

We also checked whether other data releases might act as confounding factors for the other fiscal support plans we analysed but the problem arises only for the ARP. For CARES and TCJA, there were no CPI or unemployment releases in proximity of the peak in the attention to fiscal news, as shown in table 4.

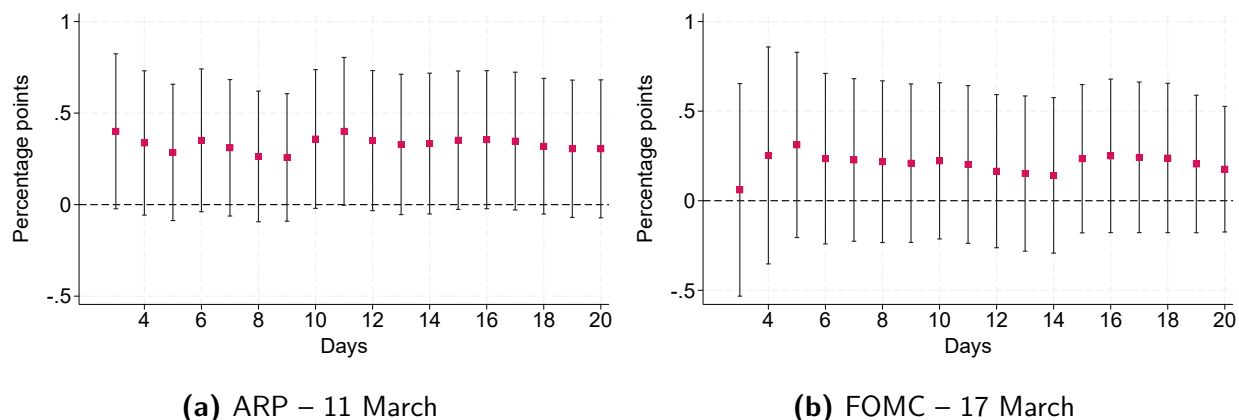
Table 4: Summary of macro releases around the three fiscal stimulus plans considered

	Fiscal news peak	Inflation	Unemployment
TCJA	20 December	13 December	8 December
CARES	25 March	11 March	6 March
ARP	11 March	10 March	5 March

4.4 What about FOMC meetings?

In addition to macroeconomic releases yet another source of possible confounding effects are monetary policy news or, more specifically, FOMC meetings around our event dates. Even if the empirical evidence from related literature hints at mixed results, monetary policy announcements could have a bearing on households' macroeconomic expectations – most notably those about inflation. Across the three fiscal support packages we have considered, there are two instances in which monetary policy decisions – that is, FOMC meetings – took place nearby the identified dates.

The first instance is on 17 March 2021, when the FOMC met 6 days after the approval of the ARP. Yet using 17 March as “treatment” date leads to non significant results (Figure 17). One could then conclude that the effect of the FOMC meeting was smaller compared to that of the fiscal announcement. That said, one alternative reason could be that the FOMC meeting was relatively uneventful: no new measures were announced, so that the extent of “monetary policy surprise” associated to the meeting could be relatively small.

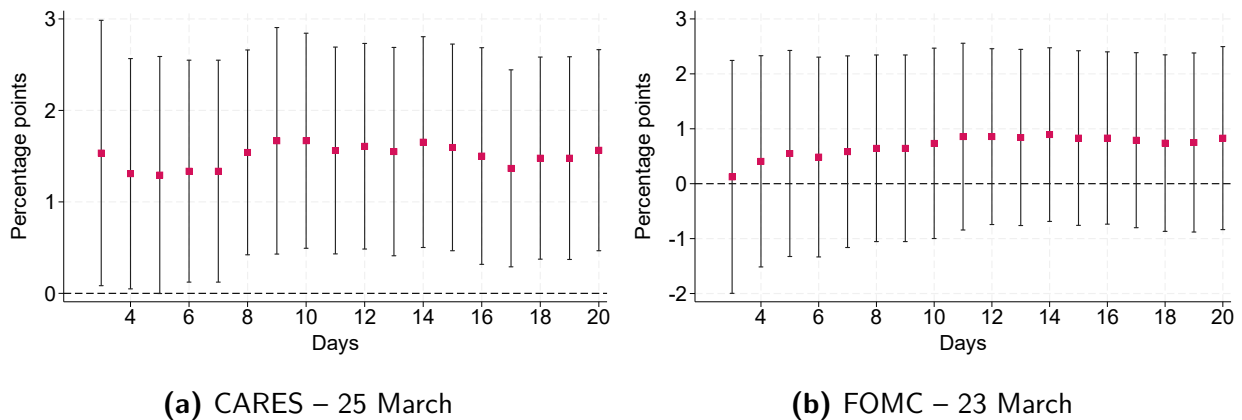


Note: Confidence intervals are calculated at the 95% confidence level.

Figure 17: Comparative results for inflation expectations between the FOMC release of 17 March and the signature of the ARP of 2021 on 11 March

Another, more eventful FOMC meeting took place on 23 March 2020, just two days before the approval of the CARES Act. That FOMC meeting – an emergency one, in which liquidity support measures were taken to prevent a financial meltdown due to the erupting

pandemic – most likely introduced a larger “monetary policy surprise” which may have contaminated the response of inflation expectations to the subsequent CARES Act approval.⁸ Yet using March 23rd as “treatment” date yields non-significant results (Figure 18). This finding provides strong support to the impact of the fiscal events we consider on households’ inflation expectations: the bulk of the effects arise in reaction to news about fiscal, rather than monetary, policy decisions.



Note: Confidence intervals are calculated at the 95% confidence level.

Figure 18: Comparative results for inflation expectations between the FOMC meeting of 23 March and the signature of the CARES Act on 25 March

4.5 How persistent is fiscal news?

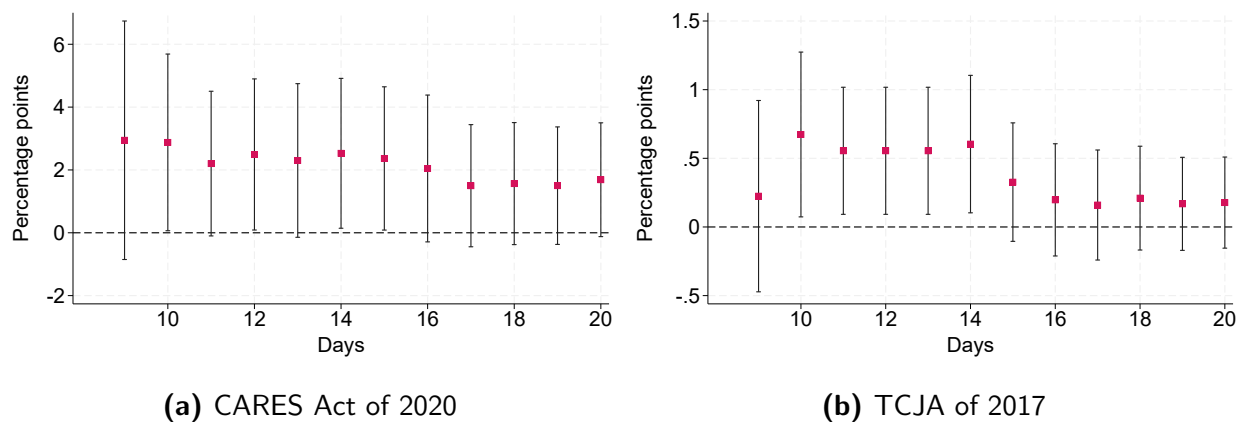
By using windows of up to 20 days after the peak in the news intensity, we are lumping together households that responded within a variable number of days after the peak. In principle, if the information is processed instantaneously, it would be preferable to use a one-day window, to prevent contamination from other news. Yet using longer windows is necessary to ensure a sufficient size in the sample of “treated” households and hence the power of the test. However, the significance of the results for longer windows could be due entirely to the households answering shortly after the peak, and the other ones could be

⁸The Federal Reserve announced its commitment to use its full range of tools to support the US economy and thereby promote its maximum employment and price stability goals. See [The Press Release](#) released by the Federal Reserve on March 23, 2020.

only a source of noise. If this is not the case, however, it may signal that the fiscal news is somehow “persistent” and affect households’ expectations even days or weeks after the “event”.

To explore this conjecture, we excluded from the regression individuals who responded during the first week. When examining the effects of the CARES Act (Figure 19, panel (a)), our findings seem to show persistence: the results remain virtually unchanged even after excluding those individuals who responded during the first week after the “event”. This suggests that the adjustments in inflation expectations observed among respondents who participated from day 8 onward are not solely driven by those who responded during the initial week, and that the impact of the fiscal news was persistent.

On the other hand, when analysing the effects of the TCJA (Figure 19, panel (b)), some degree of persistence is observed only until day 14, after which the effects seem to dissipate.



Note: Confidence intervals are calculated at the 95% confidence level.

Figure 19: Estimates of the reaction coefficient $\hat{\beta}$ for the CARES Act of 2020 and TCJA of 2017 excluding individuals who responded during the first week after the “event”

5 Conclusion

We propose a methodology based on Google Trends indices to identify the dates at which announcements of fiscal stimulus packages may have the largest effects on households. Lever-

aging on the identified dates, we investigate how three large fiscal stimulus programs (the CARES Act, the American Rescue Plan, and the Tax Cuts and Jobs Act) affected households' expectations. More precisely, we document that financially literate households raise their inflation expectations following the release of information about fiscal stimulus plans, while they expect the likelihood of higher unemployment to fall and earnings to rise. Expectations of tax levels change depending on the specific features of the plan, raising for fiscal packages based on spending support and falling for those based on tax cuts.

Our results are robust to the presence of potentially confounding macroeconomic releases, as well as FOMC meetings. And, somewhat puzzlingly, they seem to hint at a stronger effect on households' inflation of fiscal news compared to monetary policy news. In this respect, it is important to recognise that our methodology is geared specifically towards large fiscal packages, which generate a considerable news coverage. As such, they are likely to receive more media coverage compared to the average FOMC meeting, on which assessments of the role of monetary policy are typically based. That said, our results point to a lack of reaction of households' expectations even to impactful FOMC meetings such as the one of 23 March 2020. In a similar vein, we could only focus on fiscal stimulus plans, and could not investigate the differences and analogies with fiscal consolidation plans. This is due to data availability, as the SCE starts in 2013, and no fiscal consolidation plan has been proposed since then. We leave this as an avenue for future research.

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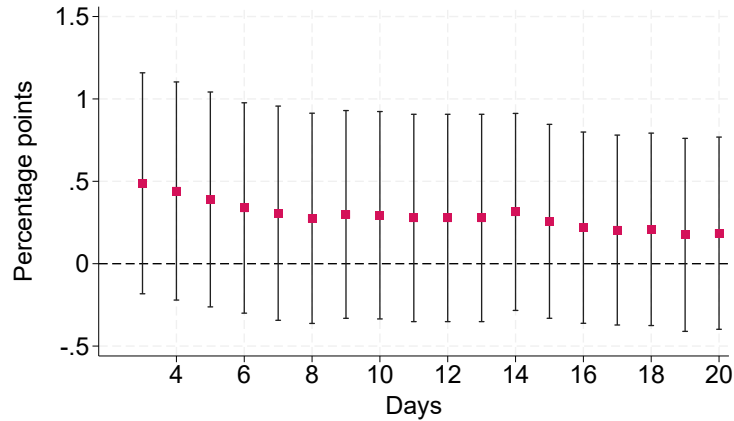
A Numerical and financial literacy questions

Table 5: Questionnaire on numerical and financial literacy

Q#	Text	Possible response	% correct
1	In a sale, a shop is selling all items at half price. Before the sale, a sofa costs \$300. How much will it cost in the sale?	Any value	94%
2	Let's say you have \$200 in a savings account. The account earns ten per cent interest per year. Interest accrues at each anniversary of the account. If you never withdraw money or interest payments, how much will you have in the account at the end of two years?	Any value	51%
3	In the BIG BUCKS LOTTERY, the chances of winning a \$10.00 prize are 1%. What is your best guess about how many people would win a \$10.00 prize if 1,000 people each buy a single ticket from BIG BUCKS?	Any value	82%
4	If the chance of getting a disease is 10 percent, how many people out of 1,000 would be expected to get the disease?	Any value	89%
5	The chance of getting a viral infection is 0.0005. Out of 10,000 people, about how many of them are expected to get infected?	Any value	78%
6	Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After one year, how much would you be able to buy with the money in this account?	(a) More than today (b) Exactly the same (c) Less than today	85%
7	Please tell me whether this statement is true or false: Buying a single company's stock usually provides a safer return than a stock mutual fund.	(a) True (b) False	92%

B Additional results

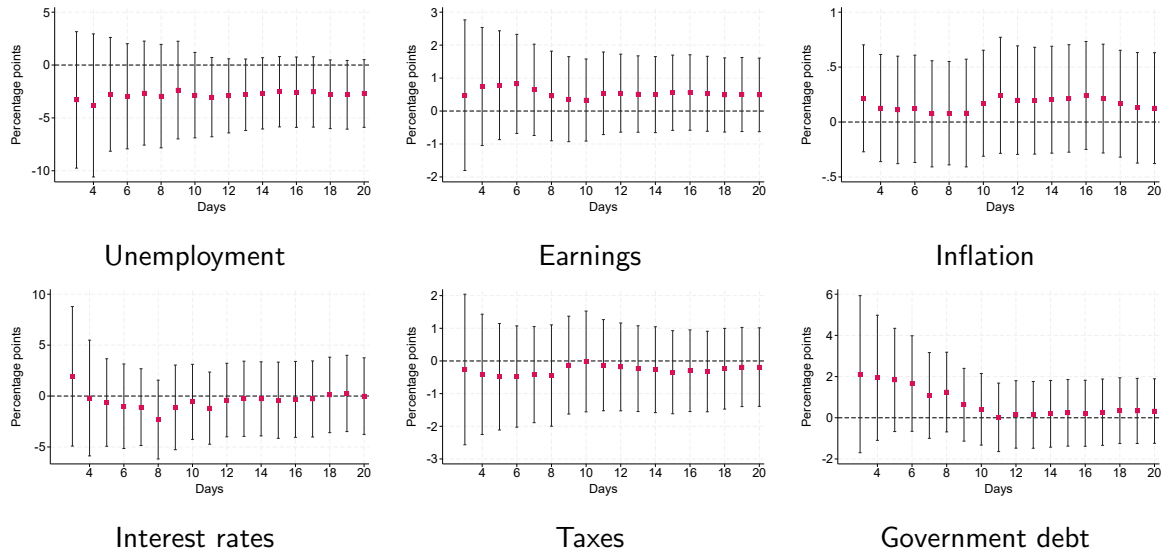
Figure B1 reports the results on the reaction of households' expectations around the peak of attention around the TJCA.



Note: Confidence intervals are calculated at the 95% confidence level.

Figure B1: Impact of TCJA announcement on inflation expectations for windows up to 30 days

Figure B2 shows the reaction of all the variables we consider after the peak of the Google Trends index during the ARP.



Note: Confidence intervals are calculated at the 95% confidence level.

Figure B2: All results for the ARP of 2021

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