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NEWS ON ASYMMETRIC FISCAL MULTIPLIERS

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News on Asymmetric Fiscal Multipliers*

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Abstract

This paper investigates the asymmetric effects of expansionary and contractionary fiscal shocks in the U.S. economy using a state-of-the-art non-linear local projection framework. To identify fiscal shocks, I use a proxy based on revisions to the mean forecast of government spending growth from the Survey of Professional Forecasters, which represent unexpected changes in expectations about government spending. The estimated fiscal multipliers are larger following positive fiscal shocks than following negative ones, indicating asymmetric effects of fiscal policy interventions.

JEL classification: C32, E62.

Keywords: Fiscal Policy, Government Spending, Government Spending Multiplier, Sign Asymmetry.

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1 Introduction

A central question in macroeconomics is whether the effects of fiscal policy on output are linear or non-linear. Building on the influential contributions of Blanchard and Perotti (2002) and Ramey (2011), a large empirical literature has examined the impact of fiscal shocks under the assumption of linearity. As summarized in Ramey (2019), most estimates across leading identification strategies lie between 0.5 and 2.

Recently, Barnichon, Debortoli, and Matthes (2021) and Ben Zeev, Ramey, and Zubairy (2023) have provided contrasting evidence on the economic effects of positive versus negative fiscal shocks. While the former study finds that the multiplier associated with a negative shock is higher than the one associated with a positive shock, the latter paper documents asymmetries in the impulse responses of public spending and output, but not in the multipliers.

This paper employs a state-of-the-art non-linear local projection approach à la Caravello and Martinez-Bruera (2024) to disentangle the effects of expansionary and contractionary public spending shocks on the economy. As a proxy for fiscal shock, I rely on forecast revisions in expected government spending growth from the Survey of Professional Forecasters (SPF) provided by the Federal Reserve Bank of Philadelphia. This symmetric measure originally introduced by Forni and Gambetti (2016) and Caggiano, Castelnuovo, Colombo, and Nodari (2015), is particularly suited to this framework. Symmetry is crucial for this empirical application, because - conditional on the Caravello and Martinez-Bruera (2024) approach - a symmetric fiscal spending shock allows to focus on the nonlinearities induced by the sign of the fiscal intervention, abstracting from its magnitude.

My main finding is that the fiscal spending multiplier is sign-asymmetric and larger when associated with a positive fiscal shock. For instance, the estimated multipliers are about 2.72 in response to a positive shock and 0.82 in response to a negative shock, at twelve-quarters horizon.

My results differ from those of Barnichon, Debortoli, and Matthes (2021), who report a larger fiscal multiplier following negative shocks. This divergence may reflect differences in empirical strategy (the use of Functional Approximations of Impulse Responses (FAIR) and a state-dependent local projection framework à la Ramey and Zubairy (2018)) as well as their reliance on the Ramey (2011) military news instrument.[1] In contrast, I work with a framework specifically designed to separate sign and size effects when dealing with a symmetrically distributed proxy, as the one I construct.

[1] Results obtained using the same set of controls as in Barnichon, Debortoli, and Matthes (2021) are reported in the Appendix. However, these estimates cannot be meaningfully interpreted within the Caravello and Martinez-Bruera (2024) framework, as the proxy fails to satisfy the required symmetry assumption.

2 Government spending news shocks: Identification

I follow Forni and Gambetti (2016) and identify an anticipated ('news') fiscal spending shocks as:

$$\eta^g_{13_t} = \sum_{j=1}^{3}(E_t g_{t+j} - E_{t-1} g_{t+j}) \tag{1}$$

where $E_t g_{t+j}$ is the forecast of the mean growth rate of real government spending at time t for the quarter $t+j$. Hence, $E_t g_{t+j} - E_{t-1} g_{t+j}$ represents the 'news' that becomes available to private agents between time $t-1$ and t about the growth rate of government spending j periods ahead. Data come from the Survey of Professional Forecasters conducted by the Federal Reserve Bank of Philadelphia. The survey reports forecasts formed at time $t-1$ for variables up to $t+4$. The first available date is 1981Q3, which marks the beginning of the sample analyzed (1981Q3-2019Q4), while the endpoint is chosen to exclude the COVID-19 period, given its major structural break in both fiscal and macroeconomic dynamics. As shown by Forni and Gambetti (2016), this measure of fiscal shock is powerful in capturing the effects of fiscal spending shocks when the implementation lag of fiscal policy exceeds one quarter, a very plausible feature of US fiscal policy.[2]

As highlighted in Caggiano, Castelnuovo, Colombo, and Nodari (2015), the revisions of the predicted growth of government spending can be driven by other macroeconomic factors, in addition to fiscal shocks. Following Miranda-Agrippino and Ricco (2023) and Cascaldi-Garcia (2025), the proxy is cleaned by regressing $\eta^g_{13_t}$ on four lags of itself and on four lags of the eight factors identified by McCracken and Ng (2016). [3]

The identified fiscal shock is the residual ξ_t of the following regression:

$$\eta^g_{13_t} = \alpha + M(L)\eta^g_{13} + M(L)F + \xi_t \tag{2}$$

where $M(L)$ is a polynomial of order four in the lag operator and F is a vector that contains the eight factors. Figure 1 plots $\eta^g_{13_t}$ and ξ_t, which represent the raw and purged versions of the news variable, respectively. As shown in the graph, the correlation between the two series is substantial, amounting to 0.83. Moreover, the purged variable captures the most extreme realizations of the revisions, indicating that the

[2] Leeper, Richter, and Walker (2012) calibrate government spending foresight to range between three and four quarters.

[3] The key idea is to employ principal component analysis to extract a number of factors that summarize broad structural dynamics in the U.S. economy. More details on the extracted factors in the Appendix.

bulk of the informational content in $\eta^g_{13_t}$ is plausibly attributable to its exogenous component.[4] Furthermore, Granger causality test indicates that the identified fiscal news shock predicts the Ramey (2011) news shock, consistent with Caggiano, Castelnuovo, Colombo, and Nodari (2015) and Forni and Gambetti (2016).[5]

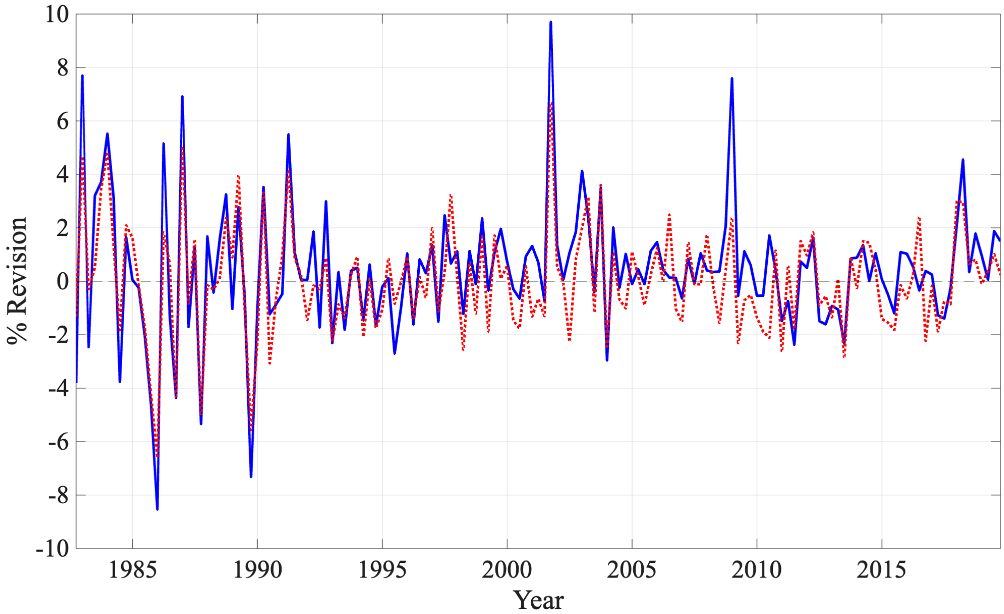

Figure 1: Raw and purged proxies for government spending shocks. The blue solid line represents the raw news variable constructed as forecast revisions for future government spending growth rates. The red dashed line displays the purged variable.

The military news shock introduced by Ramey (2011) has become a central reference in the literature on identification of fiscal policy shocks. However, as emphasized by Caravello and Martinez-Bruera (2024), properly disentangling the effects rising from the sign of a fiscal shock requires that the shock be symmetrically distributed around zero. When the distribution of the shock is symmetric, it becomes feasible to separately test for sign and size nonlinearities by estimating a local projection à la Jordà (2005), augmented with a non-linear transformation of the shock variable. If the shock distribution is asymmetric (such that positive shocks are, on average, larger than negative shocks), the econometrician cannot disentangle whether the observed differential responses are due to the sign of the shock or to differences in its magnitude. Specifically, the military news shock proposed by Ramey (2011) does not exhibit the symmetry necessary for such a distinction since positive shocks are on average higher than negative ones.[6] [7] Moreover, seventy-eight percent of the military news observations are

[4]In the Appendix I show how spikes in the variable can be interpreted in the context of fiscal developments in the United States.

[5]Table 3 in the Appendix provides the results of the test.

[6]The Appendix reports the evidence about the symmetry of the distribution according to the Randles, Fligner, Policello, and Wolfe (1980) test.

[7]The Appendix presents impulse responses obtained using the military news shock à la

zero over the 1889Q1–2015Q4 sample period, which raises questions regarding their appropriate treatment. [8]

3 Are Multipliers Asymmetric? Empirical Evidence

To distinguish between the effects of expansionary and contractionary fiscal shocks, I employ a non-linear local projection framework à la Caravello and Martinez-Bruera (2024). The baseline specification is the following:

$$y_{j,t+h} = \alpha + \beta_1 \varepsilon_t + \beta_2 |\varepsilon_t| + \beta_3 \Psi(L) X_t + u_{j,t+h} \tag{3}$$

where y_j is the variable of interest (i.e. Government Spending and Output), ε_t is the identified shock, $|\varepsilon_t|$ is the non-linear function of the shock (i.e., the absolute value of ε_t), X_t is a vector of covariates and $\Psi(L)$ is a fourth-order function in the lag operator.

To improve estimation efficiency and mitigate potential misspecification, Olea, Plagborg-Møller, Qian, and Wolf (2025) suggests controlling for strong predictors of either the outcome or the shock variable. The general approach to VAR is to determine the set of variables so that they accurately capture the economic environment that a researcher wishes to model. Based on these considerations, the local projection specified in Equation (3) is estimated using four lags of the following variables as X_t: Government Spending, Current Receipts, Output, Inflation, Effective Federal Funds Rate.[9] The sample considered spans from 1982Q4 to 2019Q4.

Figure 2 presents the impulse responses of government spending and output to positive and negative one-unit fiscal shocks. The estimated response to a positive shock is given by the sum of the linear coefficient β_1 and the non-linear coefficient β_2 of Equation (3) at each horizon, whereas the response to a negative shock is given by the difference $\beta_1 - \beta_2$. Further results, including the linear impulse response and the non-linear coefficient β_2, are reported in the appendix.[10]

The impulse response functions display clear asymmetries, most notably in output. A positive fiscal shock generates a persistent and statistically significant increase in

Ramey (2011) as the proxy in the local projection framework. The results corroborate the findings of Ben Zeev, Ramey, and Zubairy (2023). However, these estimates cannot be meaningfully interpreted within the Caravello and Martinez-Bruera (2024) framework, as the proxy violates the underlying symmetry assumption.

[8] Barnichon, Debortoli, and Matthes (2021) treat zero values as positive shocks.

[9] The Appendix reports details about the construction of the variables.

[10] Figure 10 of the appendix reports the tests of the null hypothesis of $\beta_2 = 0$. The null is rejected for the majority of the horizons, suggesting nonlinearities in the impulse response for Output.

output over the twenty quarter horizon. In contrast, a negative fiscal shock induces a short-term contraction, albeit of a smaller magnitude. This divergence in trajectories emphasizes the asymmetric nature of fiscal shock transmission: while positive shocks tend to stimulate output, negative shocks exert a contractionary effect of lower magnitude. The results are robust when the local projection is estimated in long differences.

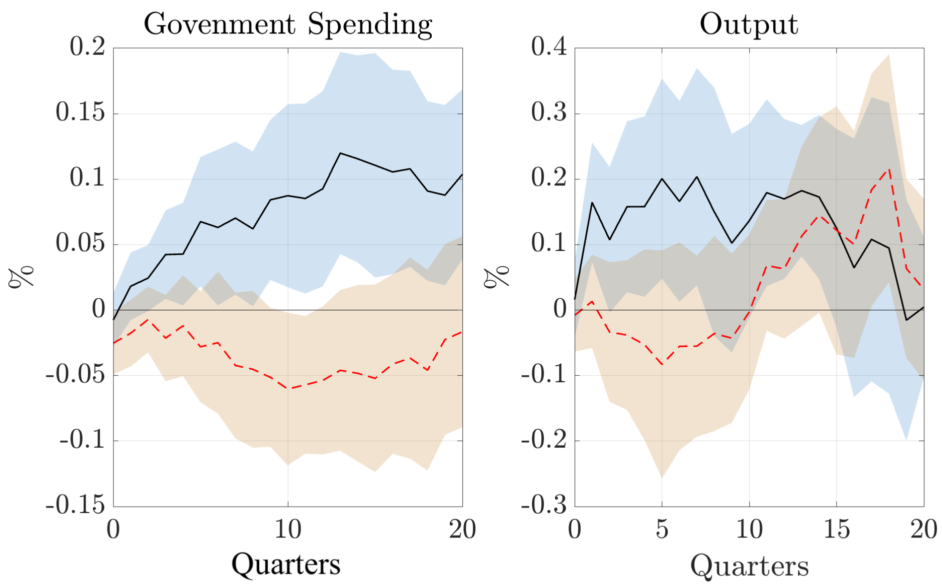

Figure 2: Impulse responses of government spending (left panel) and output (right panel) to a news fiscal shock. The solid black lines depict the responses to a positive fiscal shock, while the red dashed lines correspond to the responses to a negative fiscal shock. The shaded areas indicate the 90% confidence intervals constructed using Newey and West (1987) standard errors.

Figure 3 reports the distribution of the estimated fiscal multipliers obtained from a thousand bootstrap replications at horizons of eight, twelve, and sixteen months. Multipliers are constructed as the ratio of the cumulative output response to the cumulative government spending response at different horizons.

The estimates confirm that multipliers are larger following expansionary shocks than contractionary ones. This asymmetry suggests that fiscal policy is a powerful countercyclical tool in recessions, while spending cuts aimed at debt stabilization may be less costly than often presumed.

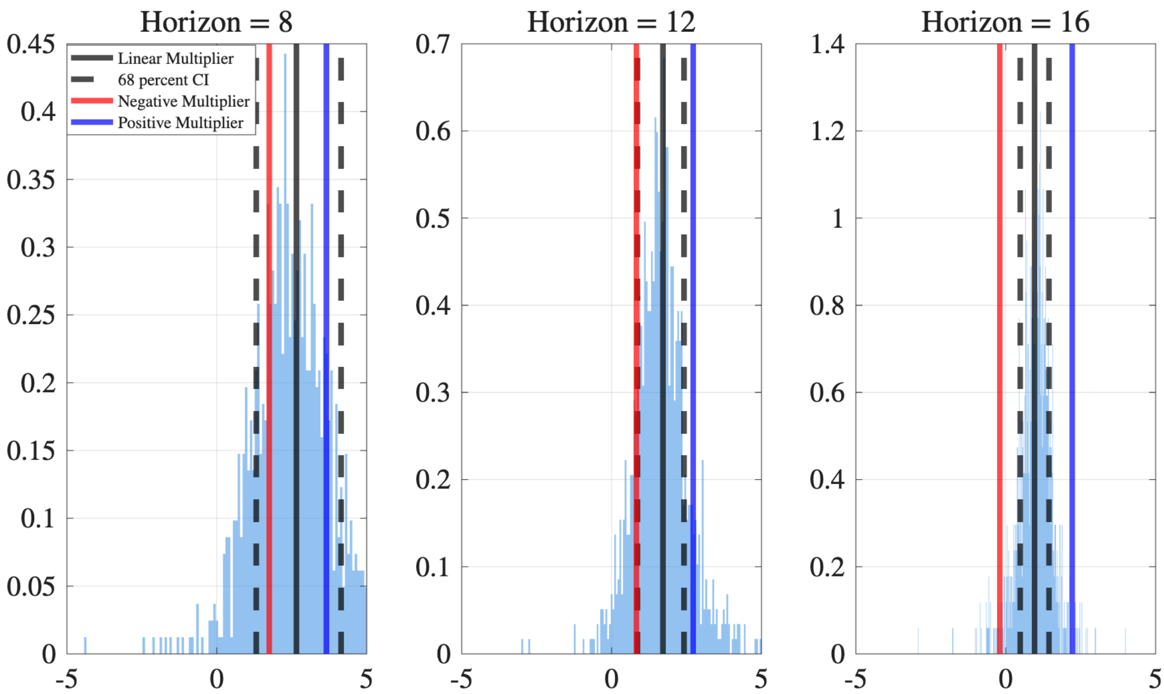

Figure 3: Linear, Positive, and Negative Multipliers. The blue bars display the histogram of the bootstrap draws, normalized to integrate to one. The solid black vertical line denotes the multiplier estimated under linear assumptions, while the dashed black lines indicate the 68 percent confidence interval in the linear case. The red line corresponds to the implied multiplier estimated after a negative fiscal shock, and the blue line corresponds to the multiplier after a positive fiscal shock.

4 Conclusions

This paper employs a state-of-the-art non-linear local projection to estimate fiscal multipliers separately for expansionary and contractionary shocks. The key empirical finding is that expansionary spending shocks are associated with larger multipliers than contractionary ones. This asymmetric response underscores the limitations of standard linearized macroeconomic models, suggesting that accounting for nonlinearities is essential for an accurate characterization of the business-cycle effects of fiscal policy. From a policy perspective, the results imply that increases in government spending can be particularly effective in stimulating the U.S. economy and facilitating recoveries from recessionary episodes.

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5 Appendix

Section	**Description**
Section 5.1	Data Description
Section 5.2	McCracken and Ng (2016) list of factors
Section 5.3	News shock distribution
Section 5.4	Ramey (2011) shock distribution
Section 5.5	Ramey (2011) shock distribution shorter sample
Section 5.6	Baseline controls
Section 5.7	Weighting scheme
Section 5.8	Controls à la Barnichon, Debortoli, and Matthes (2021)
Section 5.9	Using Ramey (2011) proxy
Section 5.10	Granger Causality test

5.1 Data

Variable	Source
Real Federal Government Consumption Expenditures & Gross Investment growth rate mean	Survey of Professional Forecasters, Federal Reserve Bank of Philadelphia
Government spending	Bureau of Economic Analysis, NIPA Table 3.2
Current tax receipts	Bureau of Economic Analysis, NIPA Table 3.2
Gross Domestic Product	Federal Reserve Bank of St. Louis
Inflation	Federal Reserve Bank of St. Louis
Effective Federal Funds Rate	Federal Reserve Bank of St. Louis and Federal Reserve Bank of Atlanta

Table 1: List of Variables and Source: Current tax receipts are constructed as the difference between current receipts and government social benefits. Government spending is the sum of consumption expenditures and gross government investment, from which I subtract the consumption of fixed capital. Real Government Spending, Real Current tax receipts and Real Gross Domestic Product are scaled by a measure of potential output proxied by a six-degree polynomial as suggested by Ramey and Zubairy (2018). When at the zero lower bound, the Federal Fund rate is replaced with the Wu and Xia (2016) shadow rate.

5.2 McCracken and Ng (2016) list of factors

Factor	Description
Factor 1	Output and Income
Factor 2	Labor market
Factor 3	Consumption and orders
Factor 4	Orders and inventories
Factor 5	Money and credit
Factor 6	Interest and exchange rate
Factor 7	Prices
Factor 8	Stock market variables

Table 2: List of factors used to clean the proxy

5.3 News shock distribution

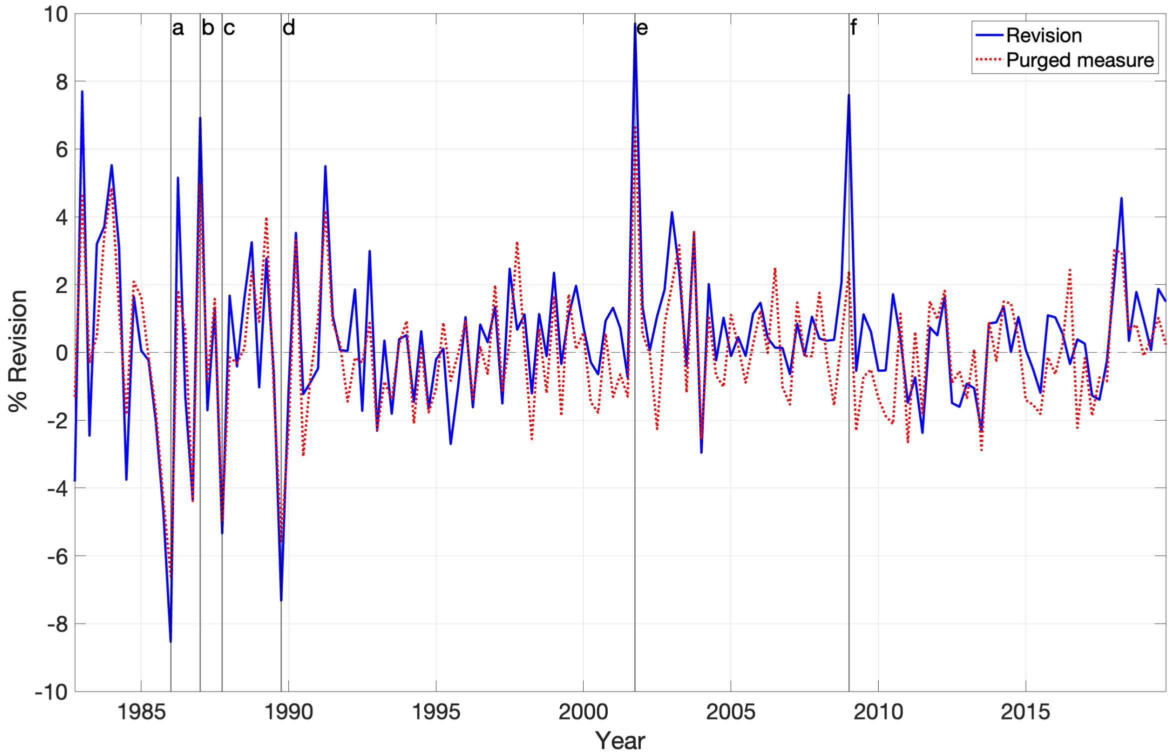

Figure 4: Raw and purged proxies for government spending shocks. The blue solid line represents the news variable constructed as the sum of the Survey of Professional Forecasters' forecast revisions for future government spending growth rates from one to three periods ahead. The red dashed line displays the news variable obtained as the residual from regressing the original news measure on a constant, four lags of the same variable, and the eight factors extracted following McCracken and Ng (2016).The vertical lines in Figure 4 mark some news shocks values that exceed 4 percent in absolute value (this threshold is equivalent to 1.96 standard deviations above the mean of the sample), and that can be interpreted in the context of fiscal developments in the United States. The variable exhibits spikes in coincidence of the following episodes: a) 1986Q1: Deficit Control Act approved one quarter before; (b) 1987Q1: Senate elections won by the Democrats a quarter before; (c) 1987Q3: Emergency Deficit Control Reaffirmation Act; (d) 1989Q4: Berlin Wall (this is in line with Ramey (2011), which estimates a spending cut of about 507.6 billion dollars in 1989 associated with the end of the Cold War) and Budget Enforcement Act; (e) 2001Q4: War in Afghanistan; (f) 2009Q1: Obama's stimulus package.

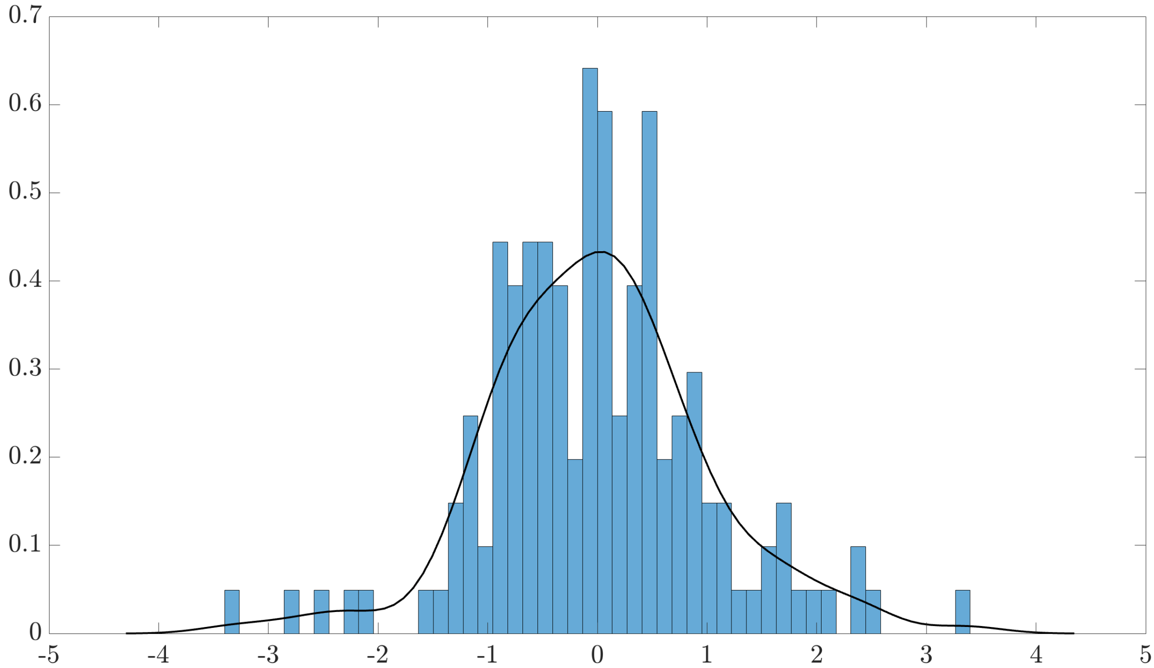

Figure 5: Distribution of the news shock. The x-axis is measured in percentage points. Bins correspond to the histogram, whereas the black line is the estimated density via kernel. P-value = 0.3521 from the Randles, Fligner, Policello, and Wolfe (1980) test for symmetry.

5.4 Ramey (2011) shock distribution

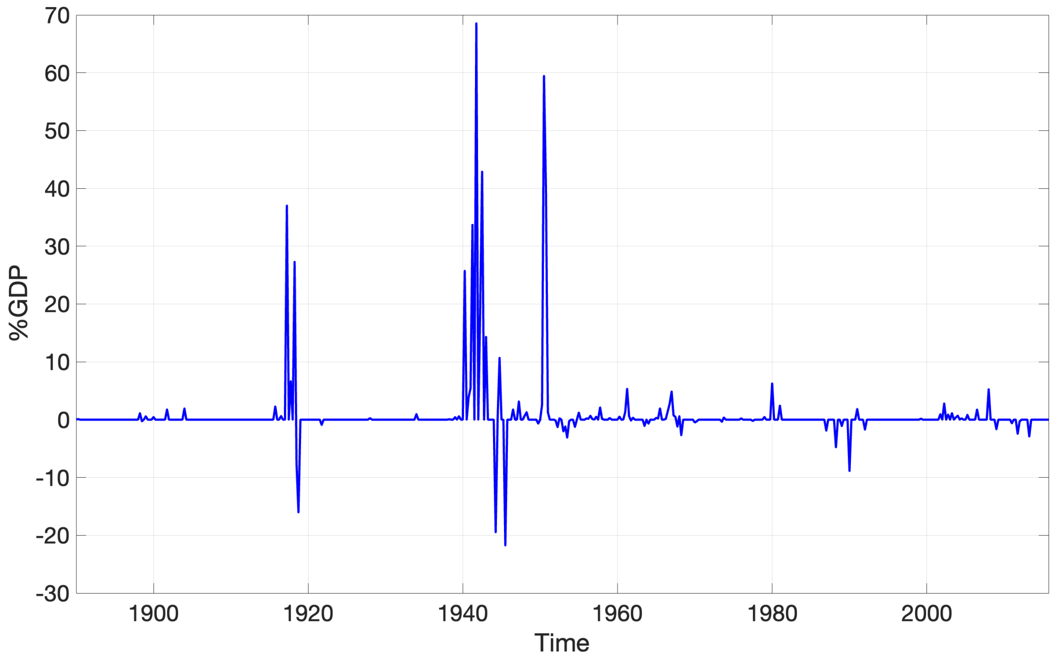

Figure 6: Ramey (2011) Military news as a % of Gross Domestic Product. Sample period: 1889Q1 - 2015Q4.

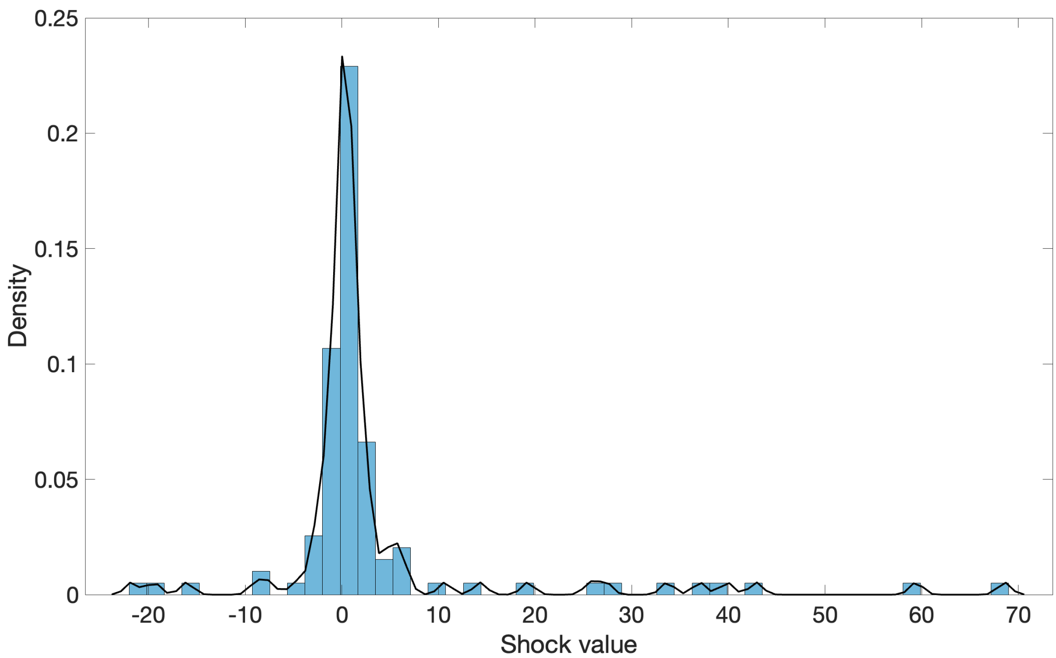

Figure 7: Distribution of the Ramey (2011) Military news. The x-axis is measured in percentage points. Bins correspond to the histogram, whereas the black line is the estimated density via kernel. P-value: 0.0000242251 for the Randles, Fligner, Policello, and Wolfe (1980) test for symmetry.

5.5 Ramey (2011) shock distribution - shorter sample

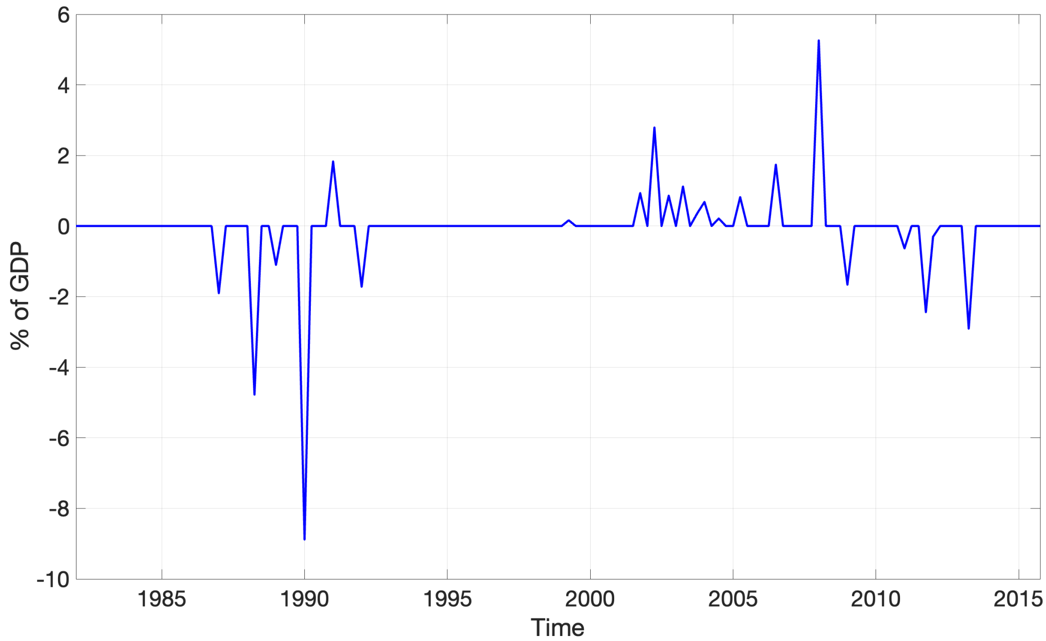

Figure 8: Ramey (2011) Military news as a % of Gross Domestic Product. Sample period: 1981Q3 - 2019Q4.

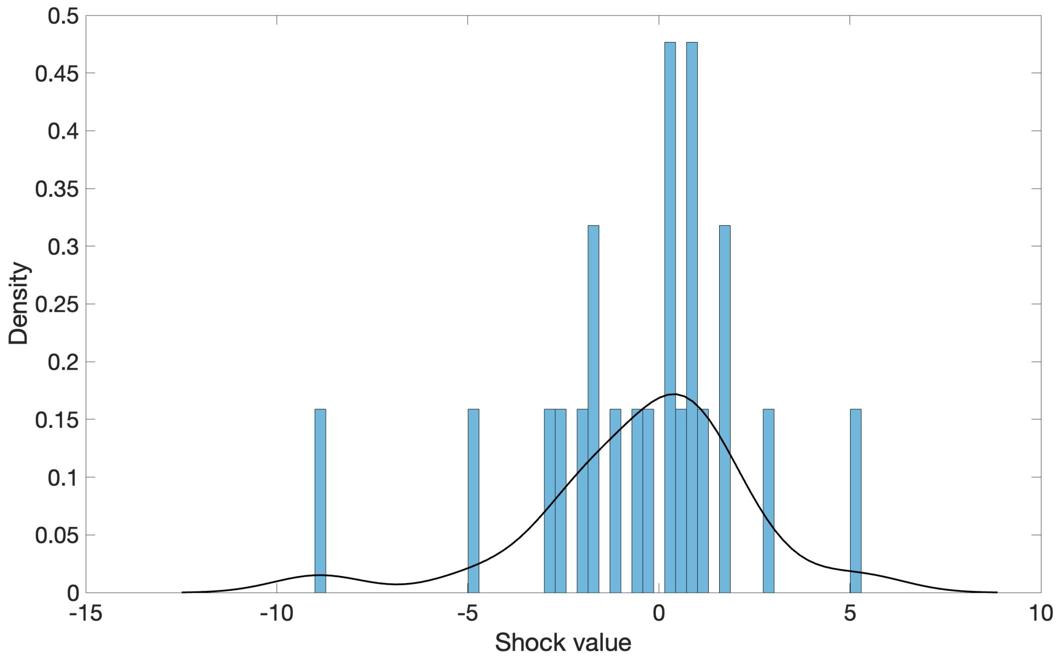

Figure 9: Distribution of the Ramey (2011) Military news. The x-axis is measured in percentage points. Bins correspond to the histogram, whereas the black line is the estimated density via kernel. The null hypothesis of symmetry is rejected by Randles, Fligner, Policello, and Wolfe (1980) test. Sample period: 1981Q3 - 2019Q4.

5.6 Baseline controls

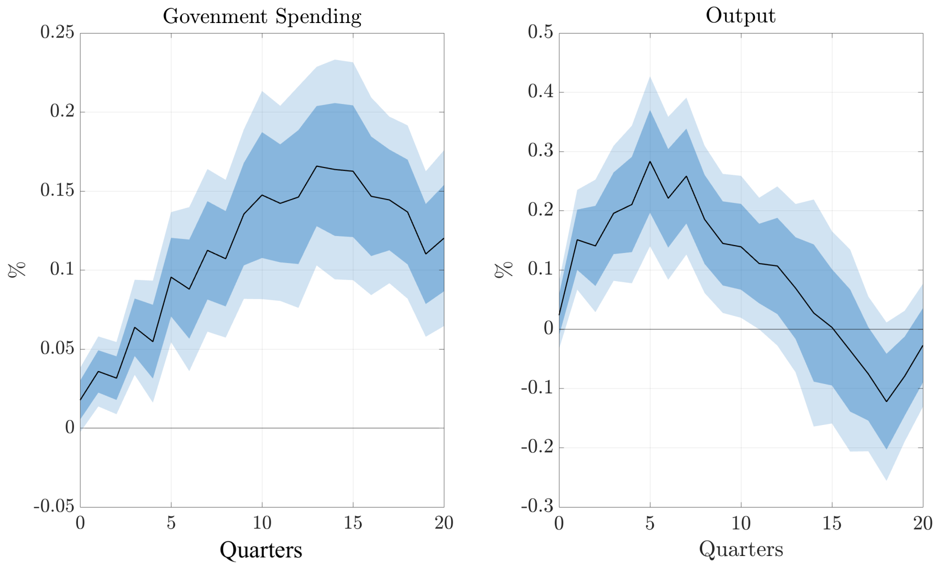

Figure 10: IRFs obtained via linear Local Projections. The panel depicts the sequence of $\beta_{j,h}$ that arises from estimating Equation (3) $y_{j,t+h} = \alpha_{j,t} + \beta_{j,t}\varepsilon_t + controls + u_{j,t+h}$ for Government Spending and Output and for horizons h = 0, ... 20. Shaded areas indicate 68 and 90 percent Newey and West (1987) confidence bands respectively. Set of controls: Four lags of Government spending, Current tax receipts, GDP, Inflation, Effective Federal Fund Rate.

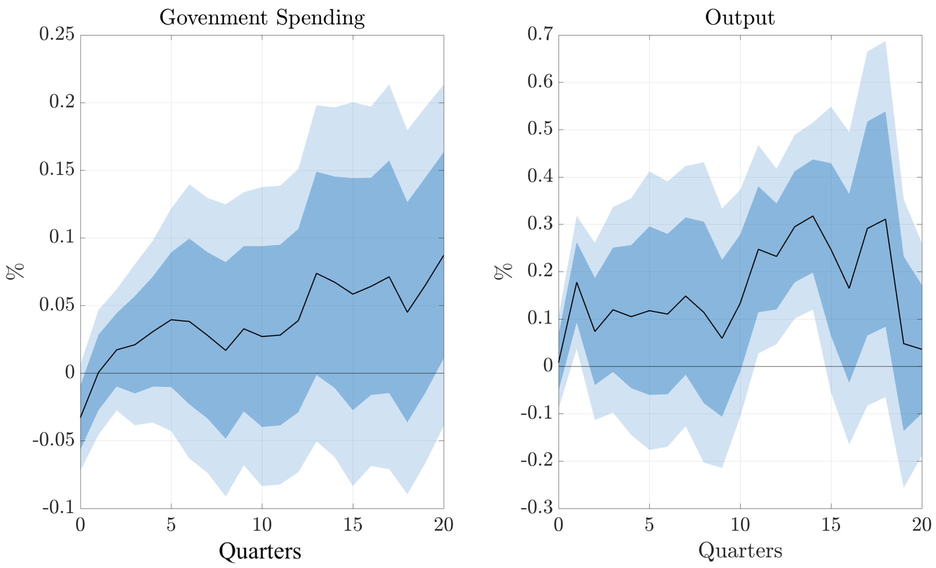

Figure 11: Estimates of the coefficients on the non-linear terms obtained via Local Projections. Each panel depicts the sequence $\beta_{j,h,2}$ that arises from estimating Equation (3) $y_{j,t+h} = \alpha_{j,t} + \beta_{j,t,1}\varepsilon_t + \beta_{j,t,2}|\varepsilon_t| + controls + u_{j,t+h}$ for Government Spending and Output and for horizons h = 0, ... 20. Shaded areas indicate 68 and 90 percent Newey and West (1987) confidence bands respectively. Set of controls: Four lags of Government spending, Current tax receipts, GDP, Inflation, Effective Federal Fund Rate.

5.7 Weighting scheme

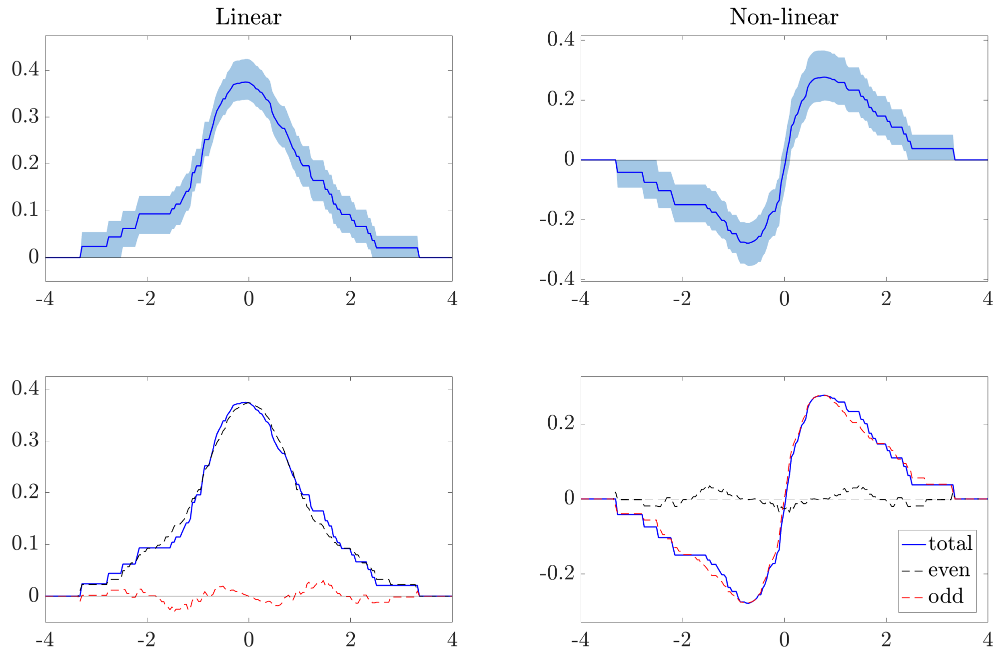

Figure 12: Weights implicit in the Local Projection. $y_{j,t+h} = \alpha_{j,t} + \beta_{j,t,1}\varepsilon_t + \beta_{j,t,2}|\varepsilon_t| + controls + u_{j,t+h}$.The shaded area indicates a 90 percent confidence band compute via bootstrap.

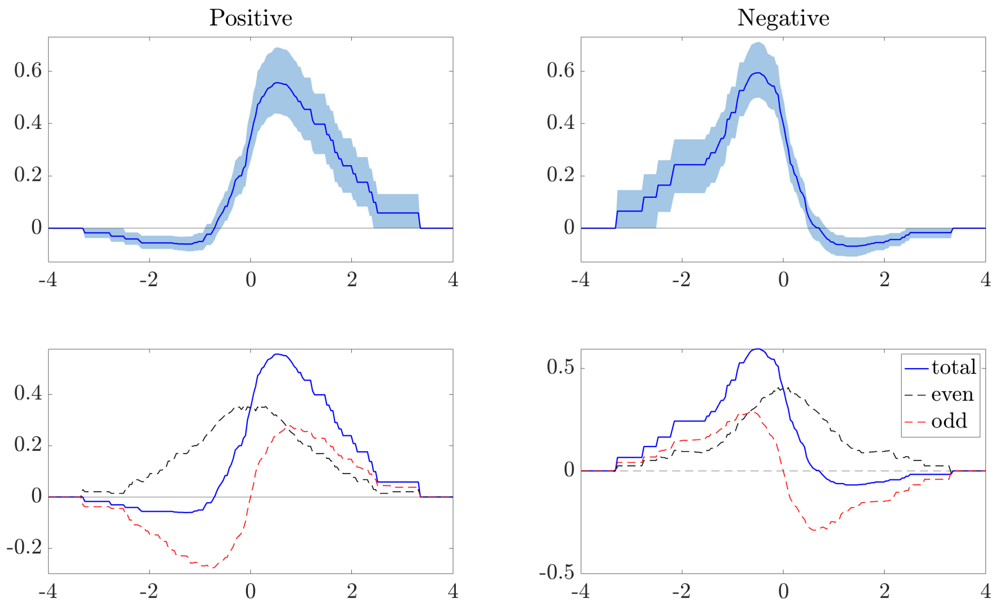

Figure 13: Weights implicit in estimates for negative and positive shocks. These are obtained by as $\beta_{j,h,1} - \beta_{j,h,2}$ (negative) and $\beta_{j,h,1} + \beta_{j,h,2}$ (positive) from running $y_{j,t+h} = \alpha_{j,t} + \beta_{j,t,1}\varepsilon_t + \beta_{j,t,2}|\varepsilon_t| + controls + u_{j,t+h}$ for Government Spending and Output and for horizons h = 0, ...20. The shaded area indicates a 90 percent confidence band compute via bootstrap.

5.8 Controls à la Barnichon, Debortoli, and Matthes (2021)

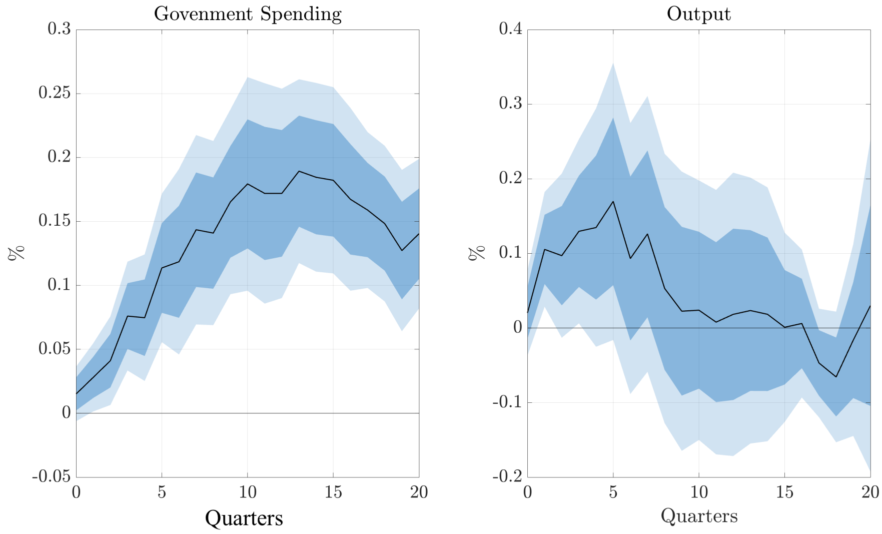

Figure 14: IRFs obtained via linear Local Projections. The panel depicts the sequence of $\beta_{j,h}$ that arises from estimating $y_{j,t+h} = \alpha_{j,t} + \beta_{j,t}\varepsilon_t + controls + u_{j,t+h}$ for Government Spending and Output and for horizons h = 0, ... 20. Shaded areas indicate 68 and 90 perfect Newey and West (1987) confidence bands respectively. Set of controls: Four lags of Government spending, GDP, news shock.

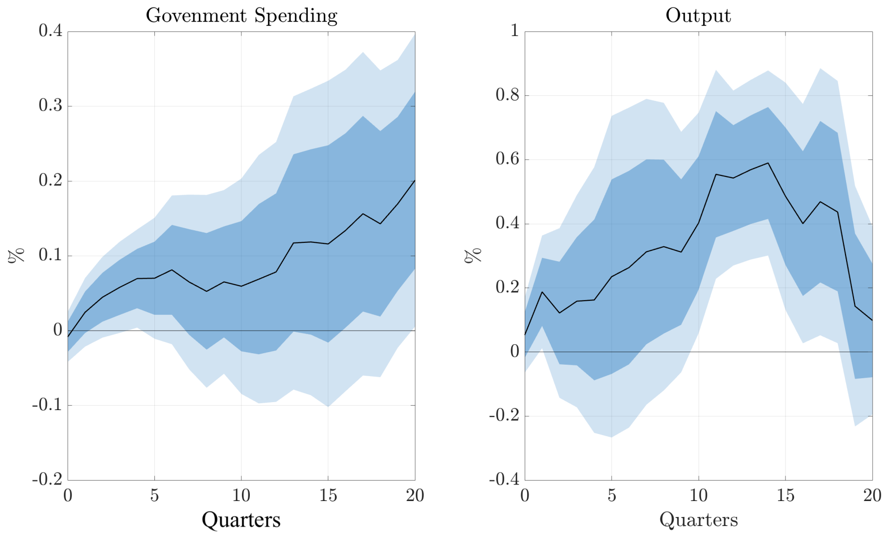

Figure 15: Estimates of the coefficients on the non-linear terms obtained via Local Projections. Each panel depicts the sequence $\beta_{j,h,2}$ that arises from estimating: $y_{j,t+h} = \alpha_{j,t} + \beta_{j,t,1}\varepsilon_t + \beta_{j,t,2}|\varepsilon_t| + controls + u_{j,t+h}$ for Government Spending and Output and for horizons h = 0, ... 20. Shaded areas indicate 68 and 90 percent Newey and West (1987) confidence bands respectively. Set of controls: Set of controls: Four lags of Government spending, GDP, news shock.

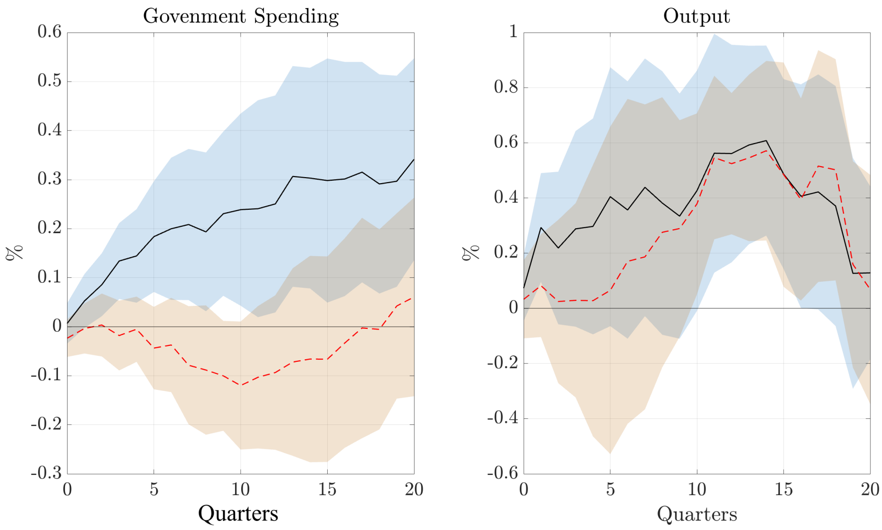

Figure 16: Impulse responses of Government Spending (left panel) and Output (right panel) to a news fiscal shock. The solid black lines depict the responses to a positive fiscal shock, while the red dashed lines correspond to the responses to a negative fiscal shock. Set of controls: Four lags of Government spending, Output, news shock. The shaded areas indicate the 90 percent confidence intervals constructed using Newey and West (1987) standard errors.

5.9 Ramey (2011) Military news

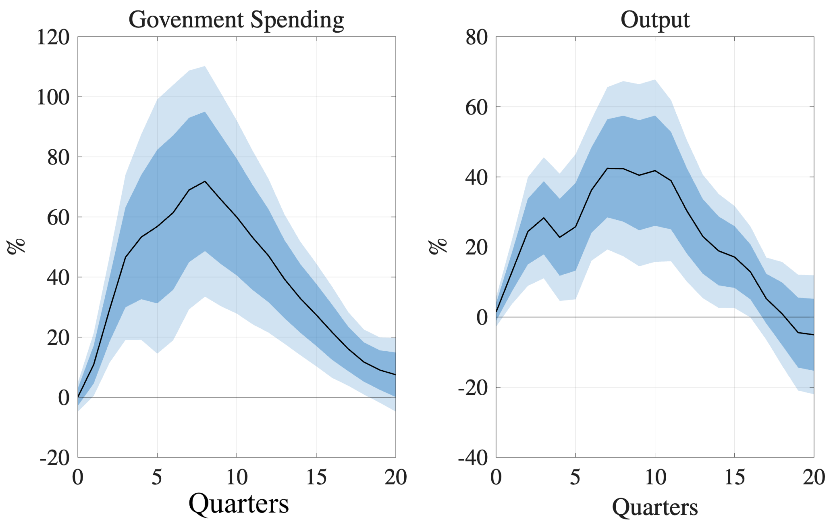

Figure 17: IRFs obtained via linear Local Projections. The panel depicts the sequence of $\beta_{j,h}$ obtained from estimating $y_{j,t+h} = \alpha_{j,t} + \beta_{j,t}\varepsilon_t + \text{controls} + u_{j,t+h}$ for Government Spending and Output, for horizons $h = 0, \ldots, 20$, using the Local Projection approach of Caravello and Martinez-Bruera (2024) and the military news shocks of Ramey (2011). Sample period: 1889Q1–2015Q4. Shaded areas indicate 68 percent and 90 percent Newey and West (1987) confidence bands, respectively. Set of controls: Four lags of Government spending, Current tax receipts, GDP, Inflation, Effective Federal Fund Rate.

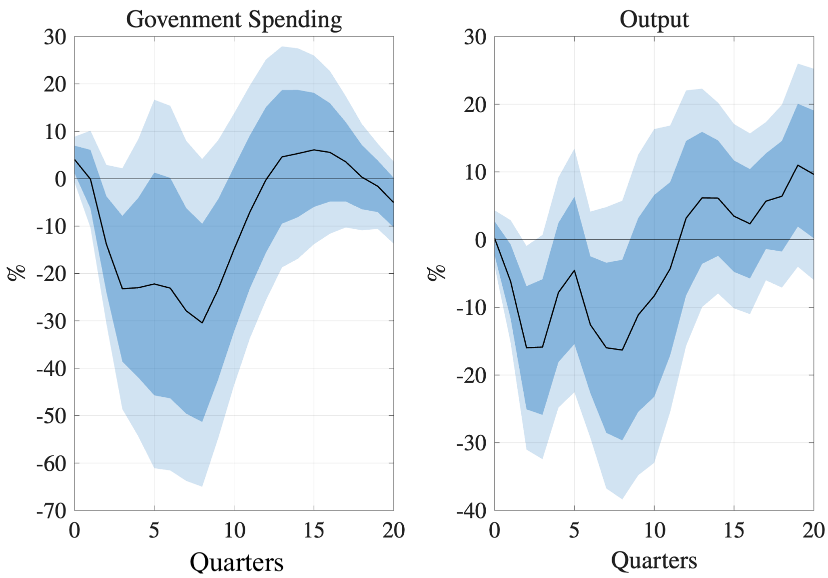

Figure 18: Estimates of the coefficients on the non-linear terms obtained via Local Projections. Each panel depicts the sequence $\beta_{j,h,2}$ obtained from estimating $y_{j,t+h} = \alpha_{j,t} + \beta_{j,t,1}\varepsilon_t + \beta_{j,t,2}|\varepsilon_t| + \text{controls} + u_{j,t+h}$ for Government Spending and Output, for horizons $h = 0, \ldots, 20$, using the Local Projection approach of Caravello and Martinez-Bruera (2024) and the military news shocks of Ramey (2011). Sample period: 1889Q1–2015Q4. Shaded areas indicate 68 percent and 90 percent Newey and West (1987) confidence bands, respectively Set of controls: four lags of Government spending, Current tax receipts, GDP, Inflation, Effective Federal Fund Rate.

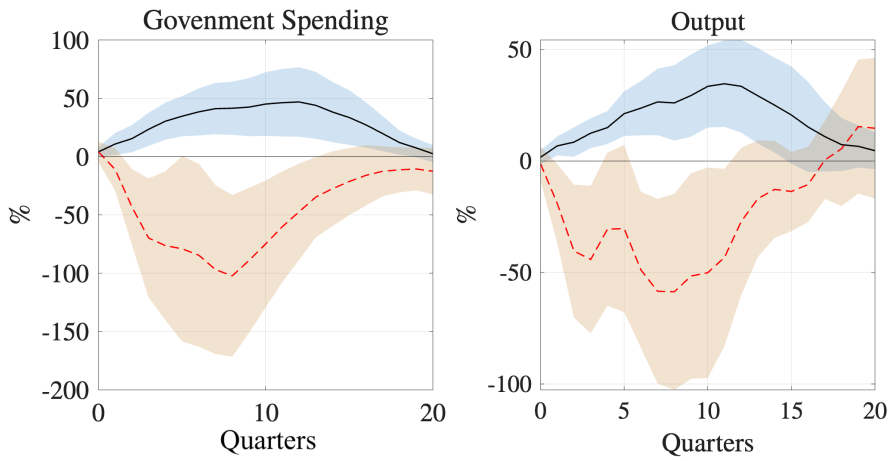

Figure 19: Impulse responses of government spending (left panel) and output (right panel) to a news fiscal shock. The solid black lines depict the responses to a positive fiscal shock, while the red dashed lines correspond to responses to a negative fiscal shock, using the Local Projection approach of Caravello and Martinez-Bruera (2024) and the military news shocks of Ramey (2011). Sample period: 1889Q1–2015Q4. Set of controls: four lags of Government spending, Current tax receipts, GDP, Inflation, Effective Federal Fund Rate. Shaded areas indicate 90 percent confidence intervals constructed using Newey and West (1987) standard errors.

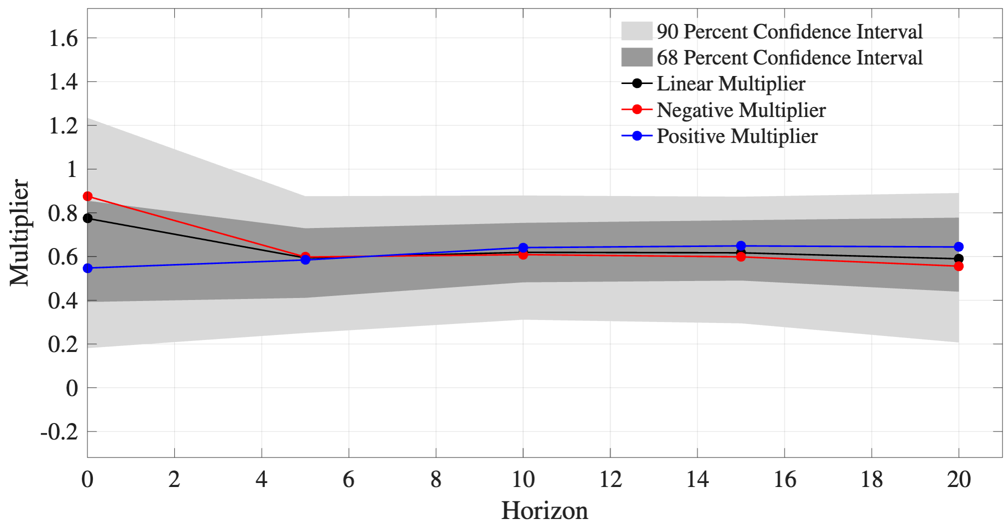

Figure 20: Linear, Positive, and Negative Multipliers. The figure plots the implied linear multipliers across horizons (black dots), along with the implied multipliers following negative (blue dots) and positive (red dots) shocks. Shaded areas denote the 68 and 90 percent confidence intervals for the linear multiplier, respectively.

5.10 Granger Causality test

Variable	Value
p-value	0.0162
Critical value of the test	3.8415
Test statistic	5.7772

Table 3: Granger Causality test. Results obtained using the `gctest` function in Matlab. The above results indicate the rejection of the null hypothesis in favor of Granger causality and endogeneity.