Which Fiscal Spending Category Is the Most Inflationary?*

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PRELIMINARY, PLEASE DO NOT CIRCULATE

Abstract

We investigate which specific spending categories of the U.S. Federal Budget generate the largest non-Ricardian effects, characterized by strong inflationary pressures. Changes in discretionary spending, particularly in National Defense, exhibit pronounced non-Ricardian effects primarily during periods when funding for this category is rapidly diminishing or scarce. Limited funding for military expenditures undermines the credibility of fiscal support, leading to inflation. Variations in mandatory spending, especially Medicare and Medicaid, typically lead to Ricardian effects on output and inflation, regardless of the financing strain for this category. Social Security spending tends to produce more substantial inflationary effects when resources for expanding this type of spending are abundant. A greater availability of resources to finance an ambitious and sustained expansion of entitlements could potentially set the stage for higher inflation in the future. Inflationary effects of unbacked fiscal policies are thus contingent on both time and government spending categories.

Keywords: Monetary policy and fiscal policy interactions, Government spending, Fiscal foresight. *JEL classification:* E52, E62, E63.

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1 Introduction

Economic theory has long recognized the importance of distinguishing between Ricardian and non-Ricardian effects of fiscal shocks. Ricardian effects occur when changes in current and projected primary surpluses are expected to be backed by future fiscal adjustments aimed at keeping the debt-to-GDP ratio on a stable path. When agents anticipate such fiscal adjustments, fiscal shocks have limited or no impact on aggregate demand, as the expansionary effects on output and inflation are counterbalanced by private savings, which agents set aside in anticipation of higher future tax bills.

Conversely, when this fiscal backing is absent and the central bank does not prioritize price stability, an increase in government spending or a tax cut does not generate expectations of future fiscal contractions or higher real interest rates. Without these counterbalancing policy actions, the effects of fiscal shocks on aggregate demand become amplified, leading to increases in output and inflation and a decline in real interest rates. These inflationary effects help stabilize government debt without requiring fiscal adjustments. Recent empirical studies suggest that the Ricardian or non-Ricardian nature of fiscal shocks depends on the prevailing monetary and fiscal regimes. These regimes reflect persistent changes in the credibility of policymakers to provide the necessary fiscal backing. However, these studies have not examined whether shocks to different categories of spending have differential effects on output, inflation, and real interest rates.

This issue is important because fiscal policy is inherently multifaceted. This feature of fiscal policy raises questions about which categories of spending within the U.S. Federal Budget should be expected to lead to larger effects on output and prices and when. Have various spending categories – such as Mandatory and Discretionary spending – historically received different degrees of fiscal backing? Does it matter which fiscal levers the government uses to stimulate the economy during a recession? Additionally, which spending categories pose a greater threat to price stability? In this paper, we investigate whether specific spending categories within the U.S. Federal Budget are more likely than others to generate a monetary and fiscal coordination leading to stronger non-Ricardian effects during periods of varying degree of fiscal backing.

We first focus on anticipated shocks to Medicare and Medicaid Programs (MM) and National Defense (ND) spending, which are among the largest components of mandatory and discretionary spending, respectively.[1] We depart from the usual measures of government shocks

[1] Mandatory spending refers to expenditures that are required by law and are generally not subject to annual

and derive them directly from the US Federal Budget by exploiting the government's expenditure forecasts for each spending category. We follow the methodology of Forni and Gambetti (2014) and we calculate distinct time series of shocks for our relevant spending categories.

We study the effects of these shocks using local projections. Given that the varying degree of fiscal strain may influence the strength of fiscal backing, we make our local projections state-dependent. This step is crucial. We measure fiscal strain for MM spending by introducing a binary variable that indicates whether the combined funds – i.e. Hospital Insurance (HI) Trust Fund and Supplementary Medical Insurance (SMI) Trust Fund – are in deficit. These funds are intended to finance this category of mandatory spending.[2]

As a proxy for fiscal strain relative to National Defense (ND) spending, we use the Fiscal Democracy Index. Developed by Robert D. Reischauer and Stuart M. Steurle, this index measures the percentage of federal tax revenues that are not allocated to mandatory spending programs, indicating the portion of tax revenues available for discretionary spending over time. A lower value of this index suggests fewer resources available to the federal government to support increases in discretionary spending, which includes ND spending. The index dropped significantly from 65% in 1962 to well below zero in 2009, with two notable declines: from 1969 to 1976 (though remaining positive) and from 2009 onward (becoming negative). We assign a value of 1 to these two periods when the Fiscal Democracy Index declines sharply: 1969–1976 and from 2009 onward.

This analysis reveals that in periods of limited fiscal strain, both spending categories are expected to be supported by future fiscal adjustments, resulting in Ricardian effects. However, in periods of elevated fiscal strain for these two categories, only ND spending appears to trig-

review by Congress. Funding levels for these programs are determined by eligibility rules rather than the annual appropriations process. Examples include Social Security, Medicare, and Medicaid. Discretionary Spending, on the other hand, encompasses expenditures that Congress must review and approve annually through the appropriations process. This category covers a wide range of government programs, including defense, education, infrastructure, and many federal agency budgets. Congress decides the specific funding levels for each program within this category every fiscal year. In 2023, Health programs – primarily Medicare and Medicaid –constituted around 28% of the total budget. Defense spending, part of discretionary spending, received about 13-14% of the budget. The other large category of mandatory spending is Social Security, which received about 23% of the federal budget.

[2]The index takes a value of one to identify the following periods as times of strain for MM spending: 1968, 1970, 1972, 1976, 1980-81, 1986-87, 1994-97, 2001-05, 2009-16, 2018-19. Medicare is funded through two main trust funds: The Hospital Insurance (HI) Trust Fund and Supplementary Medical Insurance (SMI) Trust Fund. The HI Fund is primarily financed by payroll taxes paid by employees, employers, and the self-employed under the Federal Insurance Contributions Act (FICA). Employees and employers each contribute a fraction of their wages, while high-income earners pay an additional Medicare surtax. The HI Trust Fund faces solvency challenges, and its balance depends on the balance of incoming payroll taxes and outgoing Medicare Part A expenses. The SM Fund is primarily funded by general tax revenues and monthly premiums paid by Medicare enrollees. The SMI Fund relies heavily on annual appropriations.

ger monetary and fiscal coordination, leading to stronger non-Ricardian effects. In contrast, shocks to MM spending generally exhibit Ricardian effects, regardless of the fiscal strain level as indicated by the resources available in the HI and SMI funds.

We also look at the propagation of anticipated fiscal shocks to Social Security (SS) spending – another prominent category of mandatory spending in the US Federal Budget. We measure fiscal strain for SS spending by introducing a binary variable that indicates whether both the Federal Old-Age and Survivors Insurance (OASI) and the Federal Disability Insurance (DI) programs are in deficit.[3] The index takes a value of one to identify the following periods as times of strain for SS spending: 1975-87, 1992-94, 2009-15, 2018.

The transmission of shocks to Social Security (SS) spending is distinct from those to health program and national defense spending in that its effects on economic activity are not statistically significant. However, when funding allocated to SS is ample, anticipated increases in social spending tend to be more inflationary.

This finding can be interpreted in two ways. First, abundant funding may signal the government's intention to substantially expand social security programs, raising concerns about potential future scarcity of funds. Such spending programs often create *entitlements* that are difficult to eliminate. These entitlements tend to be persistent, permanent, or challenging to adjust — for example, pensions that individuals have incorporated into their financial planning cannot be easily revoked. However, the availability of funds to finance entitlements may vary over time depending on factors such as demographics, economic growth, and other economic conditions.

According to a second interpretation, a more relaxed budget constraint for social spending might lead economic agents to anticipate overly ambitious government initiatives in welfare expansion, thereby elevating inflation expectations. In contrast, a tighter budget constraint could act as a restraint, limiting the scope of social spending expansion and mitigating inflationary pressures.

Both interpretations are indeed supported by events from the 1960s when President Lyndon

[3]The Social Security Act mandates that Social Security spending be primarily financed through payroll taxes collected under the Federal Insurance Contributions Act (FICA). These taxes are allocated to two main trust funds: the OASI and the DI. The OASI Trust Fund finances benefits for retirees and their survivors. It is primarily supported by payroll taxes levied on employees and employers, with a portion of earnings subject to these taxes capped at a specific threshold. The funds collected are used to pay monthly benefits to eligible retirees and to the survivors of deceased workers. The Disability Insurance (DI) Trust Fund provides benefits to individuals who become disabled and can no longer work. Like the OASI Trust Fund, the DI Trust Fund is also funded through payroll taxes. However, the DI Trust Fund has faced challenges in recent years due to increasing claims and demographic shifts, raising concerns about the sustainability of its funding.

Johnson launched the Great Society initiatives – an ambitious plan to expand social spending and entitlements over many years. During this time, the U.S. economy was growing rapidly, and the demographic dividend was substantial, creating favorable funding conditions for the government to expand social spending. Indeed, OASI and DI funds – our proxies for financial strain in social spending – were largely in surplus in that period.

To support these interpretations, we present two key findings. First, the largest Social Security shocks in our sample occurred during the 1960s and the first half of the 1970s, a period when OASI and DI funds were abundant. Second, after excluding the shocks identified during the period spanning the 1960s and the first half of the 1970s, the effects of Social Security shocks are Ricardian, irrespective of the availability of OASI and DI funds. This second finding suggests that the non-Ricardian effects of Social Security shocks are primarily driven by the sizable shocks of the 1960s and early 1970s, a time when the federal government expanded entitlements and OASI and DI funds were plentiful. This finding, which supports the view that the non-Ricardian effects of social security spending were concentrated primarily in the 1960s and early 1970s, aligns with the narrative presented in Bianchi and Ilut (2017); Bianchi and Melosi (2022).

Finally, we extend our analysis by examining two broader categories of federal spending: Mandatory and Discretionary. We find that shocks to mandatory spending primarily yield Ricardian effects, irrespective of the level of fiscal strain, which we measure using the same proxy as for Social Security spending. In contrast, non-Ricardian effects are more likely to emerge from shocks to discretionary spending during periods when fewer resources are available for this category.

Our results are broadly consistent with the theoretical literature establishing that an increase in government spending generates inflationary non-Ricardian effects when agents do not expect fiscal baking by future taxes. Importantly, one key factor affecting the ultimate economic outcome is the timing of the fiscal policy announcement. As Ascari et al. (2023) show, the typical lag between the announcement and subsequent implementation can yield opposing effects of anticipated government spending shocks on major economic variables, depending on whether the expenditures are expected to be backed by taxes or not. Thus, we look at the effects of anticipated government spending shocks in our analysis.

Our approach features three main novelties. First, we look at different spending categories. While usually the effects of government expenditures are studied using aggregate measures –

as government consumption of goods and services and investments, or government transfers – recently the focus has been put on their heterogeneity. Cox et al. (2024), for example, examine federal government procurement contracts. Inspired by this approach, but without going into such granularity, we disaggregate federal expenditures in the Federal Budget of the United States into their respective spending domains. We consider the distinction, explicitly present in the budget since the nineties but also derivable in earlier years, between mandatory and discretionary spending, and we focus on their main subcategories. Second, we depart from the usual measures of anticipated government shocks proposed in the literature (see Ramey and Shapiro, 1998; Forni and Gambetti, 2016; Fisher and Peters, 2010) and derive these shocks directly from the US Federal budget by exploiting the government's expenditure forecasts for each spending domain. As we will explain later, this approach allows us to obtain a measure of the government spending shock that is both *anticipated* and *disaggregated*. Finally, we consider the financing capabilities of these different spending categories within the federal budget. The idea is to condition our analysis on a proxy of expected fiscal backing of the different spending categories.

Overall, our results show that the inflationary effects of unbacked fiscal policies are contingent on both time and government spending domains.

Literature Review. This paper is related to three different streams of literature. The first one deals with fiscal foresight and the identification of fiscal policy shocks. This literature examines the impact on the economy of fiscal policy in VAR models (e.g., see Blanchard and Perotti, 2002; Ramey, 2011; Auerbach and Gorodnichenko, 2012; Forni and Gambetti, 2016; Ramey and Shapiro, 1998; Mertens and Ravn, 2011, 2012; Ben Zeev and Pappa, 2017; Fisher and Peters, 2010) and stresses the importance of accurately distinguishing between anticipated and unanticipated government shocks. Legislative and implementation lags imply that private agents can adjust their behavior during the time between the announcement of a fiscal measure and its actuation. In fact, those who analyze the effects of an anticipated increase in taxes (see Mertens and Ravn, 2012, 2011) find that the production increases during the anticipation period and, as happens for unanticipated shocks, decreases once the tax increase is implemented. Ramey (2011), who analyses the effects of an anticipated government spending shock, finds that such a shock increases output but decreases consumption.

A relevant paper for our analysis is Ascari et al. (2023). They extend the results by Beck-Friis and Willems (2017), who study unanticipated changes in government expenditures under a

backed monetary regime and an unbacked fiscal regime, to consider anticipated public spending shocks. Theoretically, they show that fiscal foresight leads anticipated government spending shocks to have very different effects if one considers a monetary rather than a fiscal regime. In the monetary regime, increases in government expenditure are assumed to be fiscally backed. Following an anticipated spending shock, if agents expect high future taxes to cover the deficit, output, consumption, investment, and inflation decrease while real interest rates and debt increase. These variables show an opposite reaction when there is no anticipation of a future increase in taxes, in the fiscal regime, under unbacked fiscal expansions, as consumption increases through the expectation of positive wealth effects. Anticipated shocks can thus provide a potential identification mechanism in the data to distinguish these two regimes. They thus look at two sample periods that have been identified in the literature as a monetary and a fiscal regime and find that anticipated government spending shock have very different effects during the anticipation period, as theory would predict: in the monetary regime they are contractionary; in the fiscal regime they are expansionary.

The second stream of literature is the one on the state dependence of spending multipliers (see Auerbach and Gorodnichenko, 2012; Ramey and Zubairy, 2018; Caggiano et al., 2015). Third, this paper adds to the literature on monetary-fiscal policy regimes in US data (see, among the others, Bianchi, 2012; Bianchi and Ilut, 2017; Ascari et al., 2020; Bianchi and Melosi, 2014). Our approach merges these three strands and provides some evidence on the effects of different domains of government spending.

The remainder of the paper is structured as follows. Section 2 describes the data and the methodology used to construct our new measure of anticipated and disaggregated spending shocks. Section 3 reviews the theoretical framework that we will use to interpret the empirical results, which are presented in Section 4 both for the linear local projection analysis and for the state-dependent one. In Section 5 we group some discussion topics and policy implications. Section 6 concludes.

2 Data and Methodology

Data. Rather than considering aggregate government expenditures, we categorize them according to the predominant type of spending: Mandatory or Discretionary. Mandatory spending is mandated by prior laws (it does not require an annual vote by Congress) and it comprises

entitlement programs, difficult to alter or reduce. It includes Social Security (SS), Medicare and Medicaid (MM), which offer guaranteed benefits to eligible individuals and are financed by payroll taxes. Discretionary spending is part of the annual budget process and stems from budget authority provided through appropriation acts, with no guarantees of funding from year to year. It can be adjusted or reduced according to the policy priorities and available funds.[4] Discretionary spending includes National Defense (ND) (which constitutes more than half of the total) and non-defense spending (such as education, transportation, environmental programs, and R&D).

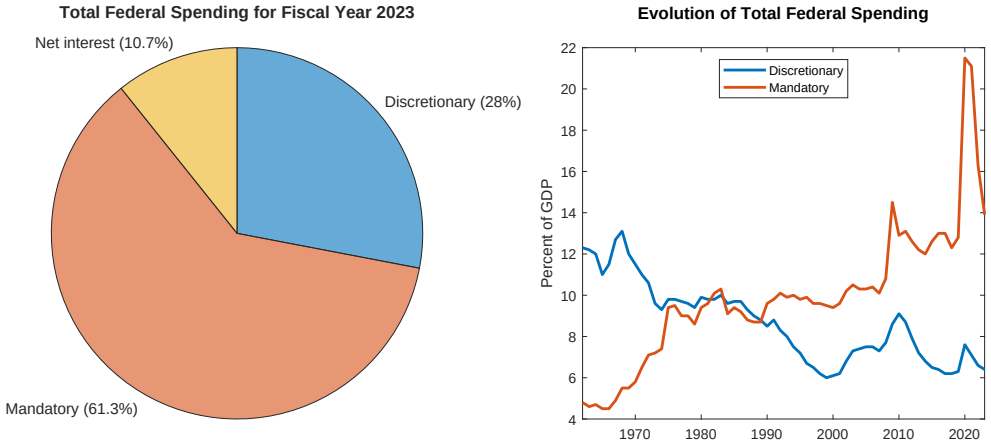


Figure 1: Mandatory vs Discretionary spending

The left panel of Figure 1 shows the total Federal spending data for FY 2023. Mandatory spending is more than double the Discretionary spending. This has not always been the case: the right panel shows how Mandatory and Discretionary spending have evolved since the 1960s. Note that, before the 1990s, Mandatory spending was lower than Discretionary spending.

Figure 2 shows the composition of Mandatory and Discretionary spending in 2023, respectively. Among the Mandatory spending categories, Social Security has the largest share at 36%, followed by Medicare and Medicaid at 22.3% and 16.4%, respectively. In contrast, slightly half of Discretionary spending is allocated to ND expenditures, with the remainder going towards non-defense spending (education, transportation, environmental programs, and R&D). Since the seventies, trends in Defense spending as a share of GDP have been larger than non-defense spending in the discretionary budget authority.[5]

[4] A few mandatory programs, for example, veterans' disability compensation and pensions and Medicaid, are also funded through appropriation acts. While pure mandatory programs receive automatic funding, these *appropriated mandatory programs* require funds to be approved through an annual budget process, even though the provision of benefits remains mandatory.

[5] See Appendix, Part C, for figures showing the components of Mandatory and Discretionary spending, both

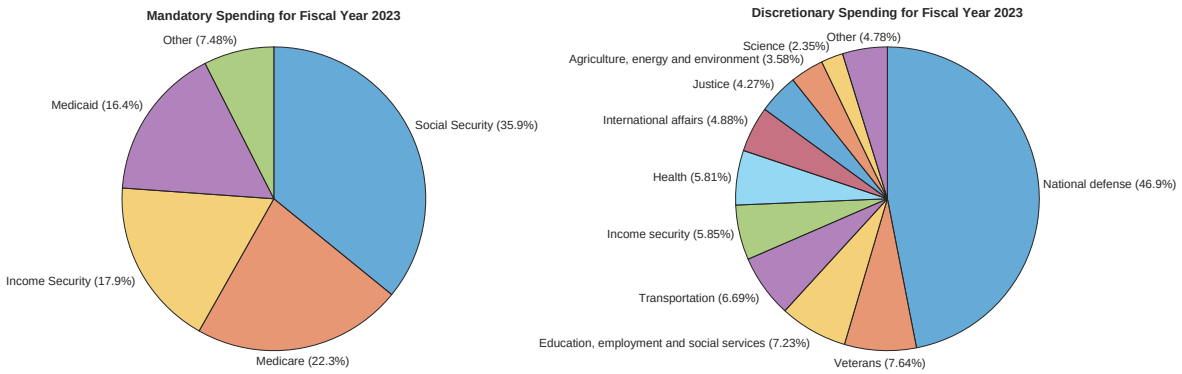


Figure 2: Composition of mandatory and discretionary spending

Methodology. We use data from the US federal budget to construct a measure of government spending shocks. The fiscal year runs from October 1 to September 30 of the following year and it is named after the calendar year in which it ends.[6] The U.S. Federal Budget for a given fiscal year is typically released in March/April of the previous year. Because the budget is released before the start of the fiscal year, many of the data points and financial projections it contains are estimates. We exploit these estimates to construct our anticipated measure of government spending shock.

Following Forni and Gambetti (2014), we compute a quarterly measure of the expected one-year-ahead change in real spending by subcategory. For example, for Defense spending in 2022Q1, we have:

$$f^{\text{defense}}_{2022Q1}(1) = \frac{\mathbb{E}_{2022Q1}(\text{real defense spending in 2023})}{\mathbb{E}_{2022Q1}(\text{real defense spending in 2022})} - 1$$

Note that this measure is non-zero only in the quarter in which the budget is released, and is equal to zero otherwise. We construct such a measure for each of the different spending domains (Mandatory, Discretionary but even for their subcategories such as Social Security (SS), Medicare and Medicaid (MM), National Defense (ND)).

We use Jorda (2005)'s local projections to compute impulse responses to a shock of our measures of anticipated and disaggregated government spending shocks. The linear model looks as follows:

$$y_{t+h} = \alpha_h + \beta_h x_t + \sum_{k=1}^{p} \boldsymbol{\gamma}_k' \boldsymbol{w}_{t-k} + v_{t+h}, \tag{1}$$

in levels and growth rates, since the 1970s.

[6]For example, FY 2025 begins on October 1, 2024, and ends on September 30, 2025.

where the shock (x_t) is our measures of disaggregated government spending shocks. The outcomes (y_t) are quarterly data from NIPA tables of aggregate federal purchases & investment (G), aggregate federal transfers (TR), as well as other outcomes such as output, consumption, investment, inflation, the real rate, the real rate minus the rate of GDP growth[7], taxes and debt over GDP. Our vector of baseline control variables, ($\boldsymbol{w}_t$), contains four lags of the controls, consistently including outcome and Y. The additional controls vary based on the spending domain we consider: it includes TR when computing IRFs to SS (and MM) shocks, G when computing IRFs to ND and Discretionary shocks, and both TR and G when computing IRFs to Mandatory shocks.

Following Ramey and Zubairy (2018), we include state dependency in our local projection framework, using state variables (z_t) to test whether the impulse responses to an anticipated shock in a given spending category differ depending on whether fiscal capacity in the relative spending domain is high or low. For the model that allows state dependence, we estimate a set of regressions for each horizon h as follows:

$$\begin{aligned} y_{t+h} = \mathcal{I}_{\{z_{t-1}=1\}} & \left(\alpha_h^1 + \beta_h^1 x_t + \sum_{k=1}^{p} \left(\boldsymbol{\gamma}_k^1\right)' \boldsymbol{w}_{t-k} \right) \\ + \mathcal{I}_{\{z_{t-1}=0\}} & \left(\alpha_h^0 + \beta_h^0 x_t + \sum_{k=1}^{p} \left(\boldsymbol{\gamma}_k^0\right)' \boldsymbol{w}_{t-k} \right) + v_{t+h}, \end{aligned} \tag{2}$$

where I is a dummy variable that indicates the state of the economy when the shock hits.

3 Baseline results

Using linear local projections (1), we analyze the impulse responses over the full sample period, from 1968Q1 to 2019Q4, to an anticipated shock to Medicare & Medicaid (MM) and to Social Security (SS) – that together account for the largest component of Mandatory spending - but even to National Defense (ND), the largest component of Discretionary spending. As Figure 3 shows, one can not detect any statistically significant difference in the response of these components. Output, consumption and investment decrease following an anticipated shock while (r-g) increases. A slightly different behavior can be seen in inflation, but again none of the impulse responses is statistically significant.

[7]The 'growth-augmented Taylor principle' (see Elfsbacka-Schmöller and McClung, 2023) claims that, to maintain economic stability under a debt-stabilising fiscal policy, central banks must raise (r-g). This helps control inflation, as higher g can contribute to inflationary pressures. In contrast, under a fiscal authority which

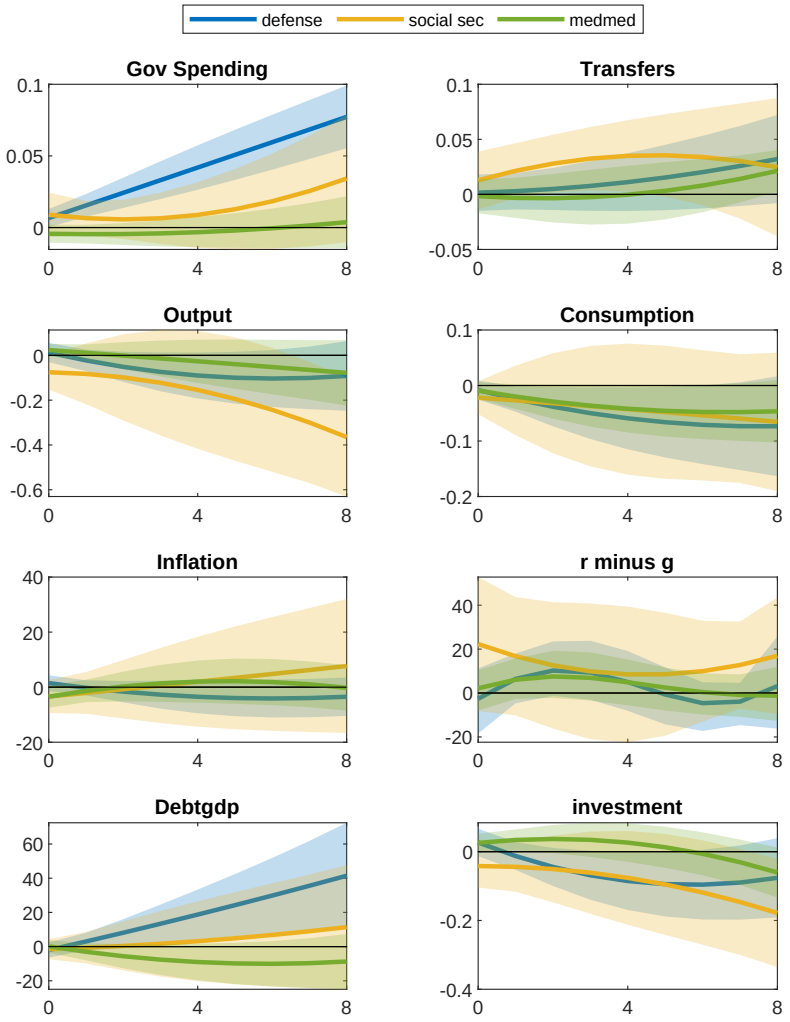


Figure 3: Anticipated shock to MM, SS and ND over the full sample-1968q1-2019q4

Since 1962, the U.S. budget has recorded a surplus on five occasions (most recently in 2001), with deficits occurring in all other years (see figure 4). Over time, various rules have been

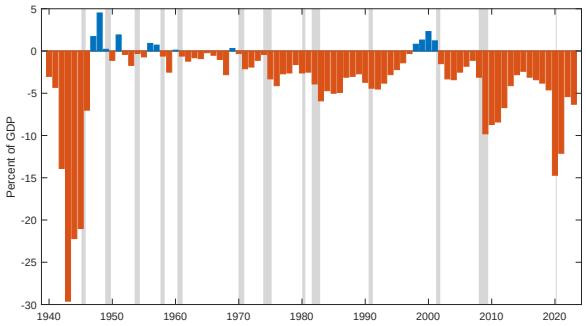


Figure 4: Surplus and deficit for the United States. Note: Grey bands indicate recessions.

does not stabilise debt, central banks can stabilise the public debt by letting r-g fall with inflation.

implemented to regulate potential deficits. These rules differ depending on whether they apply to Mandatory or Discretionary spending. One such rule is PAYGO, a budget rule requiring that new legislation affecting revenues and mandatory program spending does not increase projected budget deficits. PAYGO was established in 1990 to reduce large deficits. It was waived in the late 1990s due to a booming economy and budget surpluses, and abandoned in 2002 following, in 2001, large tax cuts without offsets. It was reinstated in 2007 with the return of large deficits. The Statutory PAYGO Act of 2010, still in effect, requires that sequestration of current spending offset any new deficit-raising legislation.[8] PAYGO does not apply to Discretionary spending. Discretionary program funds are limited by annual spending targets set in congressional budget plans and by statutory dollar limits or "caps" enacted in 2011, which continue through 2021. The debt ceiling represents the total amount the U.S. government is permitted to borrow to fulfill its existing legal obligations. When the Treasury reaches this limit, Congress may either raise the borrowing cap or suspend it temporarily to allow for additional debt to cover previously approved expenditures. In what follows, we make our local projections dependent on the fiscal strain in the corresponding budget categories. Subsection 4.1 will examine the effects of an anticipated shock to Medicare & Medicaid (MM) and National defense spending (ND), two sub-components of Mandatory and Discretionary spending, respectively. Subsection 4.2 analyses Social Security (SS), the largest component of Mandatory spending. Section 4.3 extends the analysis to assess whether the results for these sub-components can be generalized to their aggregate categories of Mandatory and Discretionary spending.

3.1 Medicare & Medicaid and National Defense

We now want to check whether the impulse response functions of an anticipated shock to MM and ND differ when distinguishing between regimes based on the 'fiscal capacity' of each spending category. Notably, a deficit in the overall U.S. federal budget does not imply a deficit within each individual spending domain. For instance, MM, funded through dedicated taxes channeled into trust funds, is considered to be in deficit when these trust funds face a shortfall. Conversely, ND, which falls under Discretionary spending, is not tied to specific funding streams like those supporting Mandatory programs. Its financing, therefore, depends on the remaining tax revenues after Mandatory expenditures have been covered, along with debt issuance. Therefore, to

[8] Programs exempt from sequestration include Social Security and Medicaid, while Medicare can be sequestered by up to 4%.

assess when the fiscal capacity of these components is under strain, we will employ two different measures, which we explain in turn below.

Identifying sub-regimes. We look at two large Mandatory programs, Medicare and Medicaid (MM), considering them together.[9] Medicare and Medicaid have two trust funds: the Hospital Insurance (HI) and the Supplementary Medical Insurance (SMI). We focus on the combined programs (HISMI) and look at the deficit/surplus in HISMI. We assign a value of one if both are in deficit, otherwise, we assign a value of zero. Blue (red) areas in Figure 5 identify a MM deficit (surplus) regime.

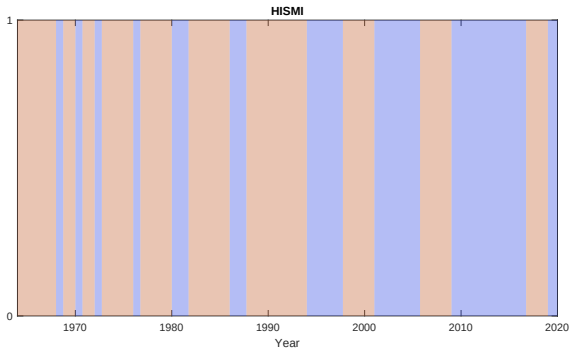


Figure 5: Sub-regimes for MM. In blue regimes in deficit.

In case of ND, we identify sub-regimes looking at the so called Fiscal democracy index, introduced by Stuerle (2014). This index measures the percentage of federal tax revenues not allocated to Mandatory spending programs, indicating the percentage of taxes available for Discretionary spending over time.[10]

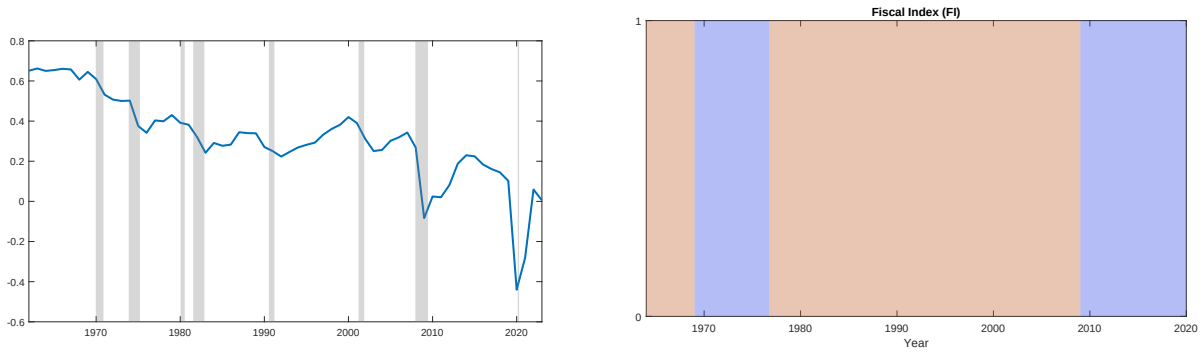
$$\text{Fiscal index (FI)} \ = 1 - \frac{\text{Mandatory spending} + \text{Interest}}{\text{Total revenues}}$$

The higher the index, the stronger the fiscal democracy, as more funds are available for non-predetermined spending. As Figure 6a shows, over the past fifty years this index has dropped significantly, from 65% in 1962 to below zero in 2009. There were two notable declines: the first occurred between 1969 and 1976 (although the index remained positive), and the second began in 2009, when it turned negative.[11] We assign a value of one to the two periods when the

[9] Results are barely unchanged if we consider them separately.

[10] About 70% of state spending is "on autopilot", determined before governors propose or lawmakers negotiate a budget (Steuerle 2014).

[11] "(...) in the year after the beginning of the current "financial crisis," mandatory expenses including interest payments exceeded total government income. This was caused by a simultaneous decline in revenue and a rapid increase in mandatory spending. As a result, all discretionary spending, including military expenditure, had to



(a) Fiscal Democracy Index. Note: Grey bands indicate recessions.

(b) Sub-regimes for ND with FI. In blue (red) regimes with fiscal strain (no fiscal strain).

Figure 6: Fiscal Democracy Index and sub-regimes for ND.

Fiscal Democracy Index markedly decreases: from 1969q1 to 1976q4, and from 2009q1 onward, anz zero otherwise. We call these sub-regimes FI states. Blue (red) areas in Figure 6b identify periods with decreasing (non-decreasing) FI.[12]

The results are robust even if one assigns a value of one only to the post-2009 period. This period, as the Figures in Appendix C show, is characterzied by more frequent changes in debt ceiling and by numerous suspensions and, according to Bianchi et al. (2023), a prevalence of unfunded spending on transfers.

Results. Figure 7 shows the results of state-dependent local projections, as in (2), for MM and ND. On the left, you find the impulse responses of the variables to an anticipated shock to MM in the period 1968q1-2019q4. The blue (red) lines represent the regime where the HISMI trust funds are in deficit (surplus). Under both regimes, impulse responses behave as they would following an anticipated *funded* spending shock. Output, consumption, investments and inflation either decrease or remain not significant. (r-g) increases or is not significant.

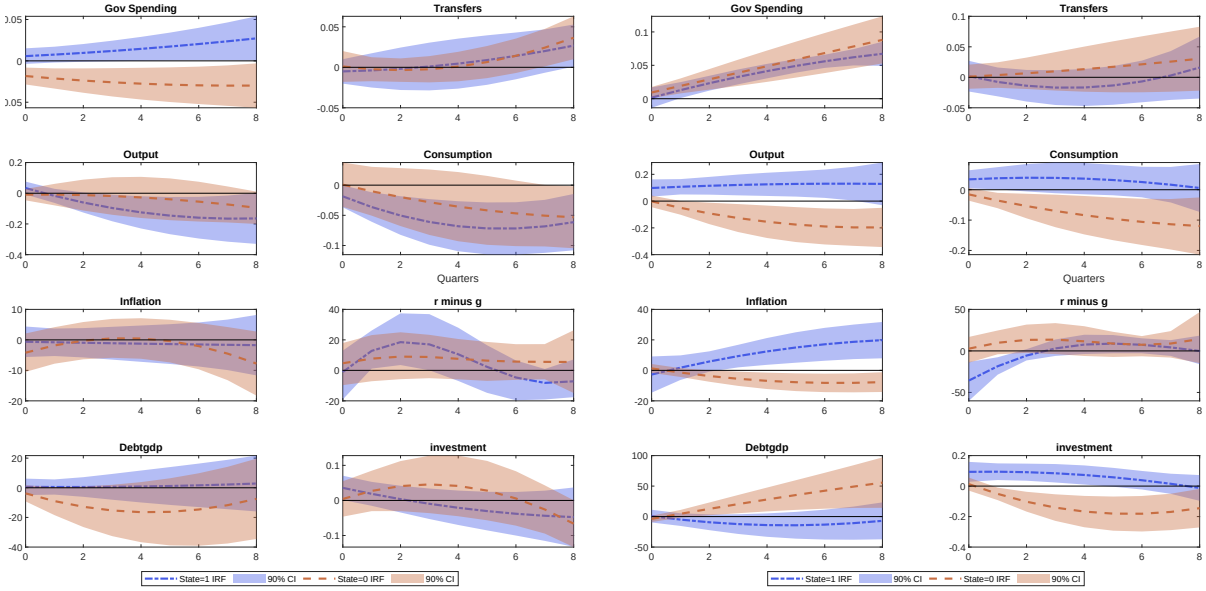
Using the FI regimes for the period 1964q1-2019q4, we look (see Figure 7 on the right) at the impulse responses of the variables to an anticipated shock to ND: when the fiscal index is high and non-decreasing (red lines), irfs behave as those following an anticipated *funded* spending shock, viceversa, in periods of decreasing fiscal index (blue lines), defense shocks seem to be *unfunded*. In periods of poor fiscal capacity, output, consumption and investments increase.

be debt-financed. (...) The global financial crisis that began in 2008 has undone any gains in fiscal democracy made in the late 1990s and the mid-2000s. In effect, the crisis seems about to eliminate almost completely any space for fiscal discretion in the foreseeable future unless governments are willing, and able economically and legally, to take up new, additional debt." (Streeck and Mertens, 2010)

[12] FI sub-regimes partially overlap with those for SS. Trust funds were in surplus from 1988q1 to 2008q4 (with the exception of 1992-1994) and in deficit from 2009q1 to 2015q4.

(r-g) clearly decreases and inflation increases, reducing real debt over GDP.

In Appendix B.1 we check the robustness of this result through an alternative identification for the sub-regimes. We divide the sample in two regimes: one is given by the Great Inflation and the ZLB period (1964q1-1979q2 and 2009q1-2015q4, respectively) and the other is the Great Moderation years (1984q1-2008q4). The first subperiods could be identified as *fiscal regimes*, the second as a *monetary regime*. We find that ND spending behaves as *funded* shocks under M and as *unfunded* under F. Note that these results are akin to those in Ascari et al. (2023), where shocks under an M regime are *funded* while those under an F regime are *unfunded*.[13]



(a) Ant. shock to MM, HISMI

(b) Ant. shock to ND: FI

Figure 7: Anticipated shocks to MM and ND in their respective states. In blue (red) regimes with fiscal strain (no fiscal strain).

3.2 Social Security (SS)

Identifying sub-regimes. To identify the corresponding states with fiscal strain for this budget category, we follow the same procedure that we adopted for MM. In the US, the Social Security Act of 1935 established Social Security, which encompasses the Federal Old-Age, Survivors, and Disability Insurance (OASDI) program. This program is administered by the Social Security Administration (SSA) and is primarily funded through payroll taxes.[14] These taxes are allocated to two trust funds: the Federal Old-Age and Survivors Insurance (OASI) and the

[13] This is not surprising given that they primarily focus on Defense spending shocks.

[14] Payroll taxes are known as the Federal Insurance Contributions Act (FICA) and the Self Employed Contributions Act (SECA).

Federal Disability Insurance (DI). Although these are two legally separate funds, assessments of the system's financing often consider the combined programs (OASDI). To identify different regimes for SS, we look at the deficit/surplus in the OASIDI.[15] We assign a value of one if both (OASI and DI) funds are in deficit (blue areas in Figure 8), zero otherwise.[16] In Figure 9 you find the impulse responses of the variables to an anticipated shock to SS in the period 1968q1-2019q4.

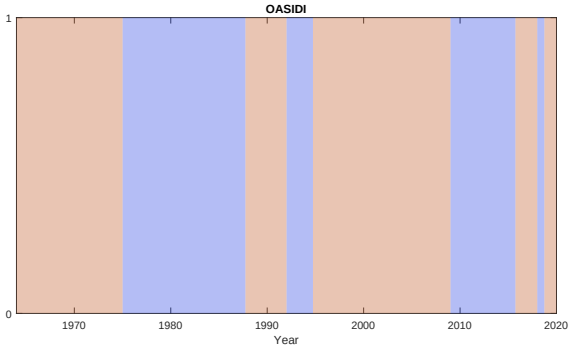


Figure 8: Sub-regimes for SS. In blue regimes in deficit.

Results. The blue (red) lines represent the regime in which the OASDI trust funds are in deficit (surplus). The transmission of shocks to SS spending is distinct from those to health program and national defense spending in that its effects on economic activity are not statistically significant. However, when the funding allocated to SS is ample, anticipated increases in SS tend to be more inflationary. This finding can be interpreted in two ways. First, ample funding may signal the government's intention to substantially expand SS programs, raising concerns about potential future funding shortages. Such programs often create entitlements that are difficult to reverse. These entitlements tend to be persistent, permanent, or challenging to adjust — for example, pensions that individuals rely on as part of their financial planning cannot be easily reduced or revoked. However, the availability of funds to finance entitlements may vary over time depending on factors such as demographics, economic growth, and other economic conditions. The second interpretation suggests that a more relaxed budget constraint for social spending might lead economic agents to expect overly ambitious government initiatives in welfare expansion, thereby increasing inflation expectations. Conversely, a stricter budget constraint could act as a check, limiting the scope of social spending expansion and reducing

[15] We extract these data, both for SS and for MM, from Table 13.1 "Cash Income, Outgo, and Balances of the Social Security and Medicare Trust Funds: 1936 - 2028" of the U.S. Budget.

[16] Results are robust if one aggregates the surplus/deficit in the two funds, if one considers primary surplus/deficit or considering just the OASI trust fund.

inflationary pressures. Both interpretations are indeed supported by events from the 1960s, when President Lyndon Johnson launched the Great Society initiatives – an ambitious plan to expand social spending and entitlements over several years. During this period, the U.S. economy experienced rapid growth, and the demographic dividend provided favorable conditions for increased government funding of social programs. In fact, OASI and DI funds—used here as proxies for financial strain in social spending—were largely in surplus at the time.

To support these interpretations, we present two key findings. First, as Figure 10 shows, the largest SS shocks in our sample occurred during the 1960s and the first half of the 1970s, a period characterized by abundant OASI and DI funds. Second, as Figure 11 shows, when the sample starts from 1975q1, thereby excluding the shocks from 1960s and early 1970s, the effects of SS are Ricardian, regardless of the availability of OASI and DI funds. This second finding suggests that the non-Ricardian effects of SS shocks are primarily driven by the sizable shocks of the 1960s and early 1970s, a period when the federal government expanded entitlements and OASI and DI funds were ample.

Taking stock. We find an asymmetry between SS, MM and ND in terms of wealth effects and Ricardian behavior. Although SS and ND may prompt wealth effects or Ricardian behavior depending on their funding mechanisms, MM consistently lead to Ricardian behavior, regardless of whether they are funded by taxes or debt. This difference in behavior suggests that the perception of public debt, and the effects of an increase in government spending depend not only on its fiscal sustainability, but also on the nature of public spending. Hence these effects vary both over time and across spending domains.

MM is not perceived as a direct transfer or as spending that generates macroeconomic returns, but instead is seen as transfers that will need to be funded by future tax hikes, given its nature of mandatory spending. MM funding is closely related to healthcare costs and demographic needs. Since MM is focused on healthcare expenditure, it has a limited impact on consumption or inflation expectations. Regardless of whether MM is funded by taxes or debt, individuals recognize that the program is an entitlement that implies future tax burdens. Therefore, MM does not trigger a wealth effect, but rather induces Ricardian behavior as individuals anticipate future tax increases.

ND spending, in contrast, is discretionary public expenditure with effects on aggregate demand. If it is unfunded, it is often associated with fiscal expansion without an immediate

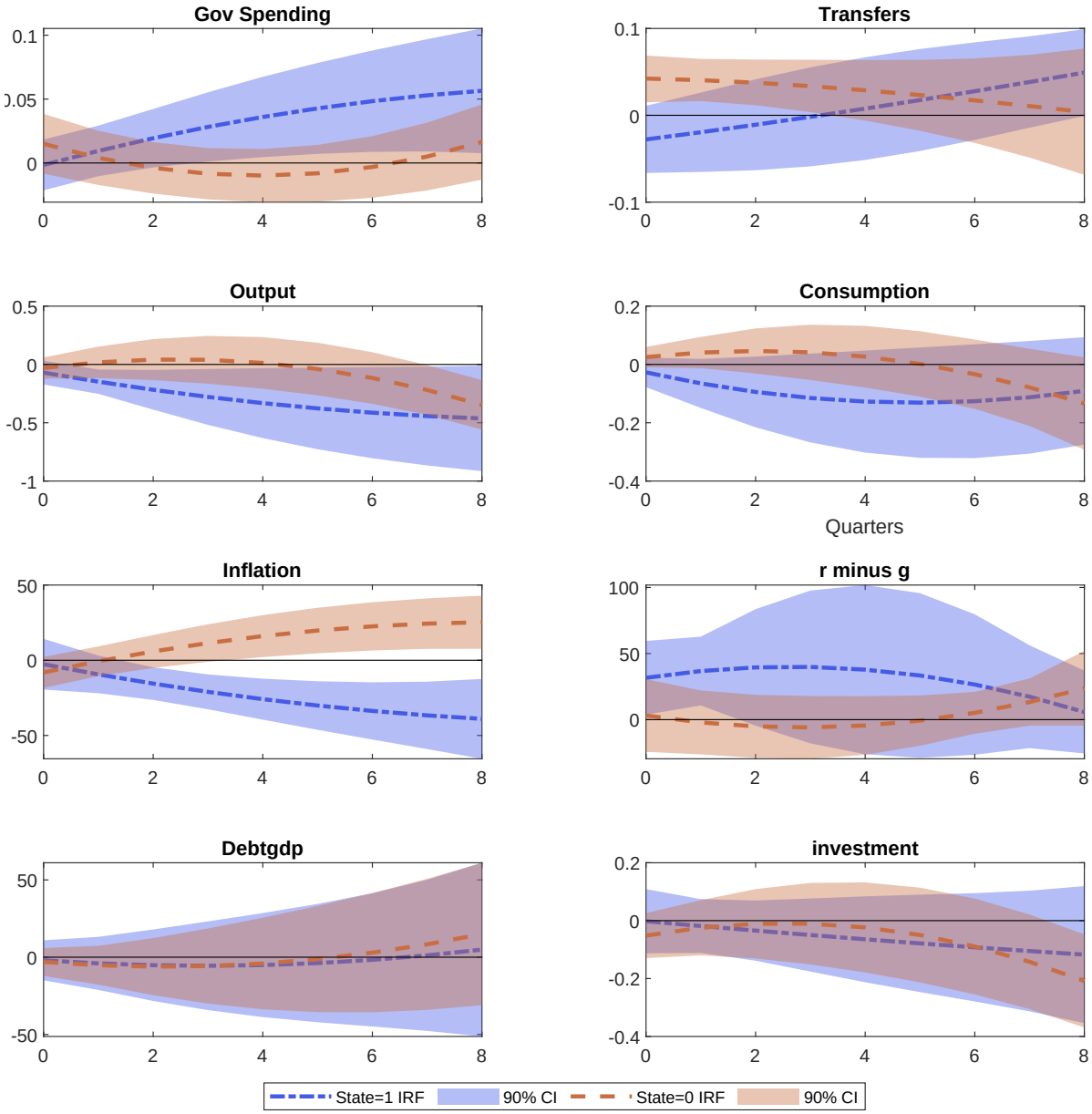


Figure 9: Anticipated shock to SS, OASIDI. In blue (red) regimes with fiscal strain (no fiscal strain).

increase in taxes, which can lead to expectations of future economic growth. This can generate wealth effects and lead to increased spending and inflation. If it is funded, it follows the standard Ricardian behavior: families know that part of their income will be taxed to cover this expenditure, so they reduce consumption.

Unlike MM or ND, the evidence for SS spending is more nuanced. SS is perceived as a direct transfer to individuals, with an immediate impact on their available resources. In the case of large increases accompanied by ample resources, as in the 1960s and early 1970s, this spending was financed by current revenues, but possibly led to overambitious welfare programs,

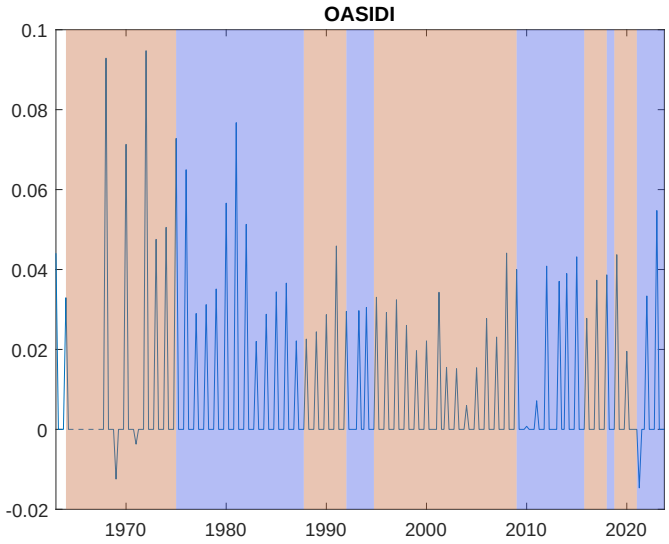


Figure 10: Sub-regimes for SS (in blue regimes in deficit) and SS shocks.

that at the time individuals expected it to create future entitlements that require continuing spending for SS in the future. Individuals perceive it as a permanent increase in their wealth and increase spending. In this case, inflation raised. On the other hand, if individuals expect a future scarcity of resources, inflation is unlikely to increase, because of its nature of mandatory spending. Agents realize that this extra spending requires extra financing. The expectation of higher taxes in the near future tends to neutralize any inflationary effects today, since individuals would reduce current consumption.

Our results are in line with Bianchi et al. (2023) where monetary-led and fiscally-led rules *coexist* and policy coordination is shock specific. In their model, this leads to the coexistence of funded and unfunded shocks, where shocks to unfunded transfers are addressed through fiscally-led policies. Typically, a funded regime goes together with the expectations of increasing taxes, while an unfunded regime is characterized by expectations of stable or decreasing taxes. However, if funded and unfunded shocks coexist, this clear separation of tax expectations becomes blurred. There might be an expectation of increasing taxes, but agents could realize that the increase is not sufficient to cover all expenses. In this scenario, IRFs after a fiscal spending shock could behave as funded for spending domains (such as Mandatory spending) covered by taxes, and as unfunded for domains (most of the time, Discretionary spending) that require debt. Therefore, it is crucial to consider both the *timing* of these expenditures (whether they occur in a period when taxes are sufficient to cover all expenses) and the spending domains themselves (akin to a spending review). In other words, unbacked fiscal policies appear contingent on both time and government spending domains.

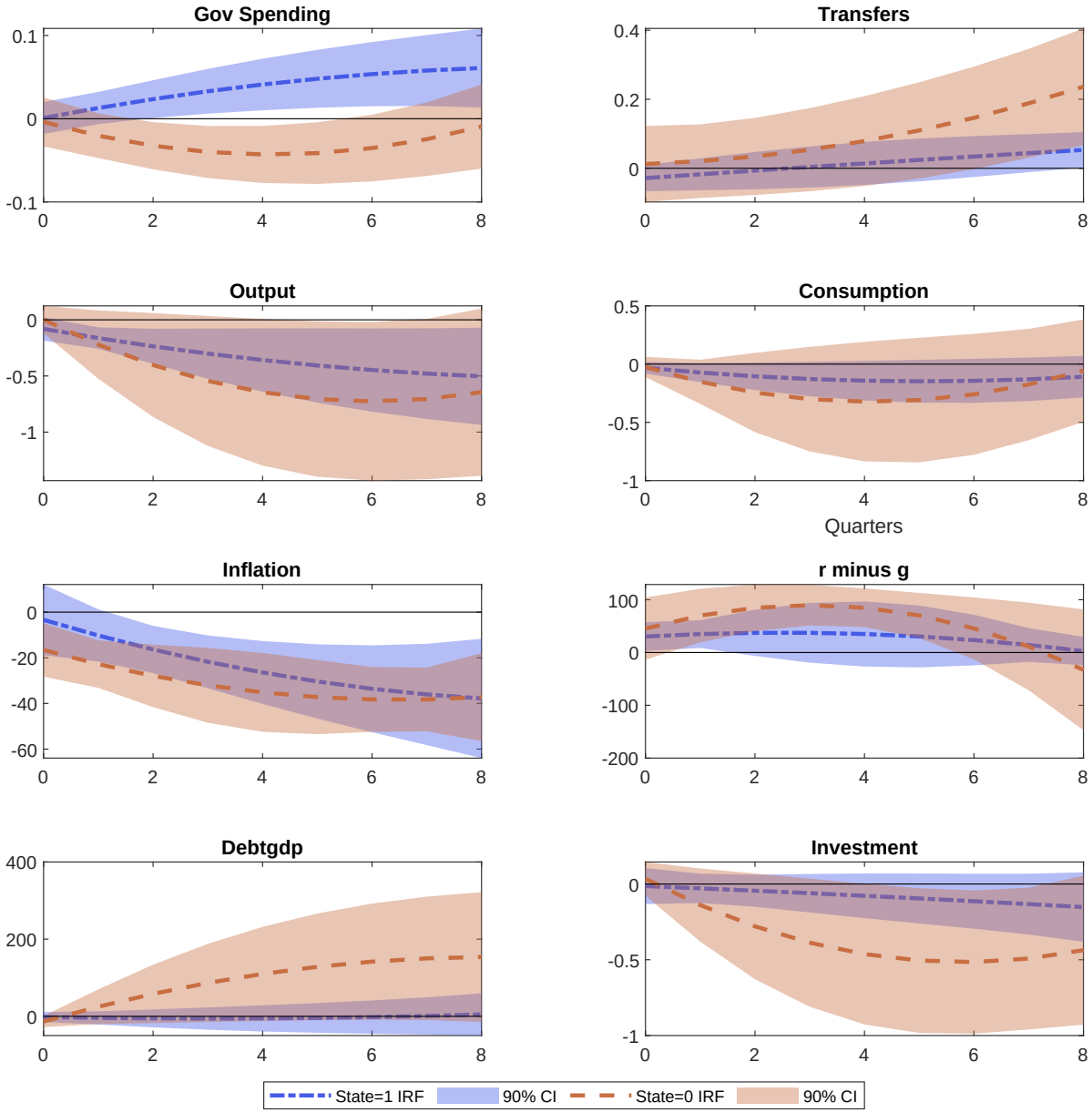


Figure 11: Anticipated shock to SS, OASIDI, starting from 1975q1. In blue (red) regimes with fiscal strain (no fiscal strain).

3.3 Mandatory and Discretionary spending

Does the variation in behavior across states appear only when examining specific subcategories of expenditure, or is it also evident in broader, aggregated categories like Mandatory or Discretionary spending? We divide government expenditure into its two main categories, Mandatory and Discretionary, and examine the impulse response following an anticipated shock to each over the full sample period (1964q1-2019q4) in a linear framework, i.e., (1). As Figure 12 shows, there are no clear differences in the responses of the variables between the two types of spending.

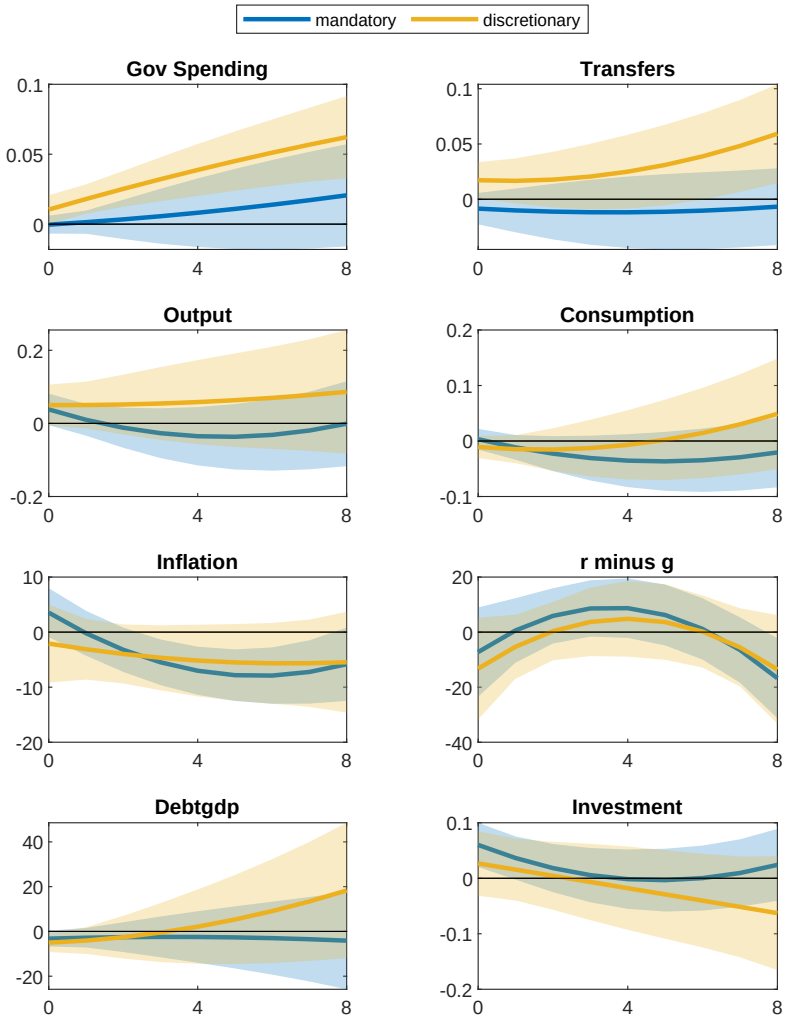
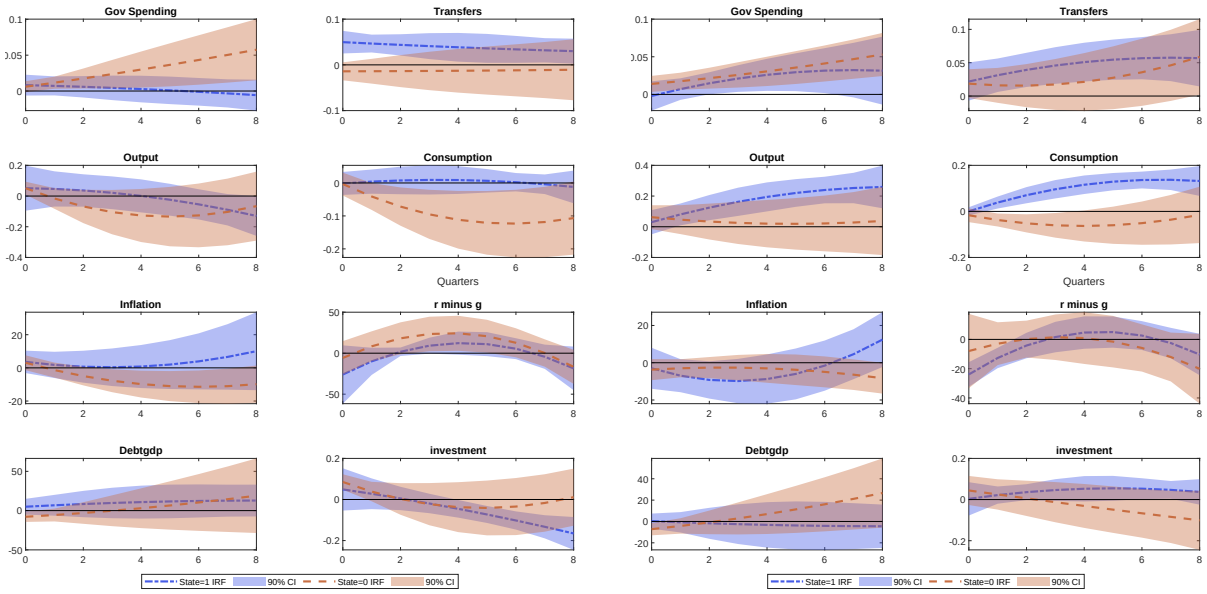


Figure 12: Anticipated shock to Mandatory and Discretionary spending over the full sample-1964q1-2019q4

As before, we employ the FI to distinguish an high fiscal capacity state (where federal tax revenues exceed the amount required to cover mandatory expenses, with the surplus available to fund discretionary spending) (in red) from a low one (in blue), using (2). Unlike in the linear case, Mandatory and Discretionary spending now exhibit different behaviors. As shown in Figure 13, the impulse response functions for Mandatory spending consistently follow the pattern of a *funded* spending shock. In contrast, the IRFs for Discretionary spending behave like *funded* shocks when the FI is high, but resemble *unfunded* shocks when the FI is low, most evidently regarding the response of output and consumption.

The result for Mandatory spending is not surprising. PAYGO, applied to mandatory spending to control deficit increases, requires that any rise in direct spending or revenue decrease



(a) Anticipated shock to Mandatory, FI.

(b) Ant, shock to Discretionary, FI

Figure 13: Anticipated shocks to Mandatory and Discretionary spending under FI states. In blue (red) regimes with fiscal strain (no fiscal strain).

must be offset by other spending cuts or revenue increases. These mechanisms ensure that such expenditures are consistently funded. Overall, the behavior of Mandatory and Discretionary spending mirrors the results we got for their respective sub-components, respectively, MM that is always funded, and ND whose financing depends on fiscal capacity.[17]

4 Defense Spending and 'Warflation'

In this Section, we want to dig deeper on the inflationary effect of ND spending. We thus adopt an alternative definition of the states according to war dates. We examine average annual ND spending as a percentage of GDP during each U.S. war period in our sample. For the Vietnam war (1964q1-1975q4), we find an average spending of 7.5%. During the Desert Storm (1990-91), the figure is 5.15%. From 2001 to 2011, during the Iraq and Afghanistan wars, defense spending averaged 4.1%, and for the years 2011-2021, corresponding to the later years of the Afghanistan war, it averaged 3.4%. We assign a value of one to the two more expensive wars, Vietnam war (1964q1-1975q4) and Desert Storm (1990-91) and zero otherwise. As theory predicts, we find (see Figure 14 that outside these dates (in red) impulse responses behave as after a funded shock, while during war dates (in blue) they behave as unfunded. In the latter case, output

[17]Note that while the distinction in behavior between high and low FI states is neat for ND, it becomes less so when looking at Discretionary spending. This is likely because Discretionary spending is an aggregate that encompasses various subcategories, whose behavior may not be as clear-cut as that of ND.

increases significantly, even though the rise in consumption (not significant) and investment is smaller and more delayed, and inflation rises markedly, reducing the debt and (r-g).

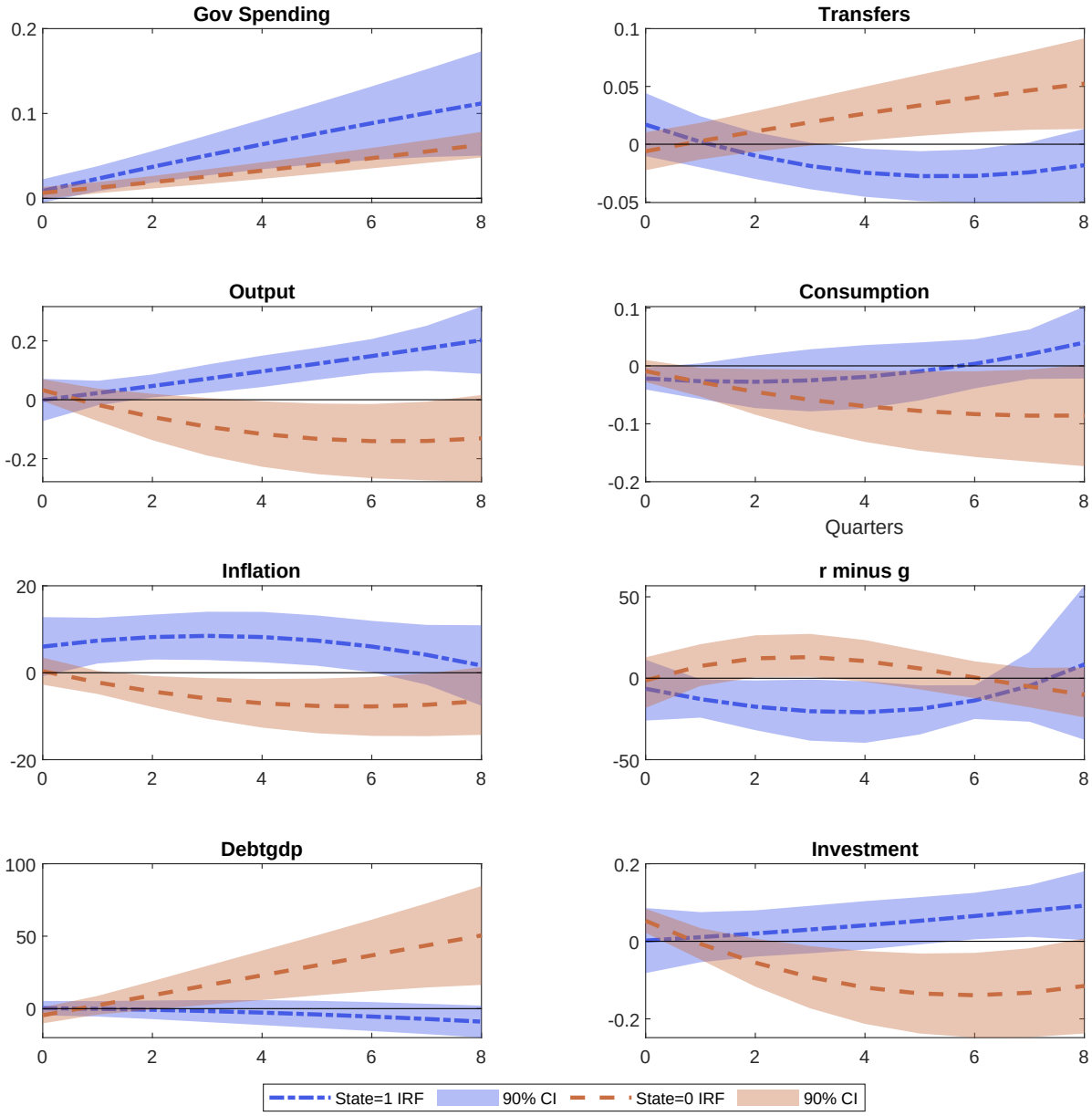


Figure 14: Anticipated shock to Defense: war dates in blue.

This suggests that large defense spending is financed with debt, and not through taxes – as optimal tax policy would prescribe – but agents expect these debt – or at least part of it – not to be backed by future taxes.[18] This is also consistent with the observation of low inflation after the increase in ND spending, large tax cuts and deficits during the Reagan administration.[19]

[18] "*The Johnson Administration made an explicit decision to allow the federal deficit to rise, rather than to seek a tax increase to finance Vietnam War outlays. In this instance, higher defense outlays, without compensating action on the revenue side, were a direct cause of higher deficits. A significant increase in inflation followed, as monetary policy was not restrictive enough to offset the fiscal stimulus in a boom economy.*"

[19] During the Reagan Administration, "*an increase in defense outlays has been accompanied by large tax cuts*

This is a period characterized by high FI (and active monetary policy), suggesting that the presence of inflation depends on the size and the timing of ND spending.

5 Conclusions

Fiscal policy is inherently complex, raising questions about whether certain spending categories in the U.S. Federal Budget have a larger impact on output and prices. Have categories such as Mandatory and Discretionary spending historically received varying levels of fiscal support? Does the choice of fiscal tools matter for stimulating the economy during a recession? And, importantly, which spending categories pose a greater risk to price stability? This paper examines whether certain types of spending within the U.S. Federal Budget are more prone to drive monetary and fiscal coordination, generating stronger non-Ricardian effects under varying levels of fiscal backing.

Shifts in Discretionary spending, particularly in National Defense, display notable non-Ricardian effects mainly during times of sharply reduced or limited funding. Insufficient resources for military expenditures can weaken the perceived fiscal support, leading to inflation. In contrast, changes in Mandatory spending, especially in Medicare and Medicaid, generally produce Ricardian effects on output and inflation, irrespective of funding pressures for these programs. Social Security spending, however, tends to have stronger inflationary impacts when resources to expand this spending are plentiful. An ample funding base for a sustained expansion of entitlements could potentially create conditions for heightened inflation in the future.

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and reductions in non-defense government outlays. The result has been large deficits and rapid growth in federal interest payments. However, the high federal deficits of the 1980s have coincided with lower inflation, thus calling into question the claim that a defense buildup, combined with large deficits, is automatically inflationary." (Defense Spending and Inflation by G. Adams and D. Gold Stimson Center, 1987)

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A Evidence with alternative states

A.1 The Monetary-Fiscal regime (MF)

We now exploit the well-known distinction between a monetary-led regime (regime M) and a fiscally-led regime (regime F) found in the literature on monetary-fiscal interactions (see Bianchi, 2012; Bianchi and Ilut, 2017; Bianchi and Melosi, 2014, 2017; Chung et al., 2007).[20]

We assign a value of one to the unfunded fiscal sub-periods: the Great Inflation years (1964q1-1979q2) and the periods when monetary policy operated at the zero lower bound (2009q1-2015q4), while we assign a value of zero to the funded monetary regime: the Great Moderation years (1984q1-2008q4).[21] Blue (red) areas in Figure 15 identify a fiscal unfunded (monetary funded) regime.

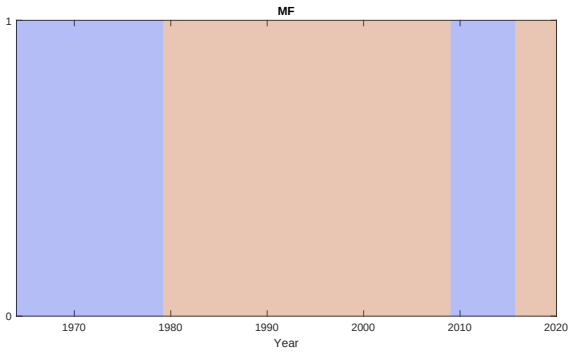


Figure 15: Sub-regimes for MF. In blue (red) F (M) regimes.

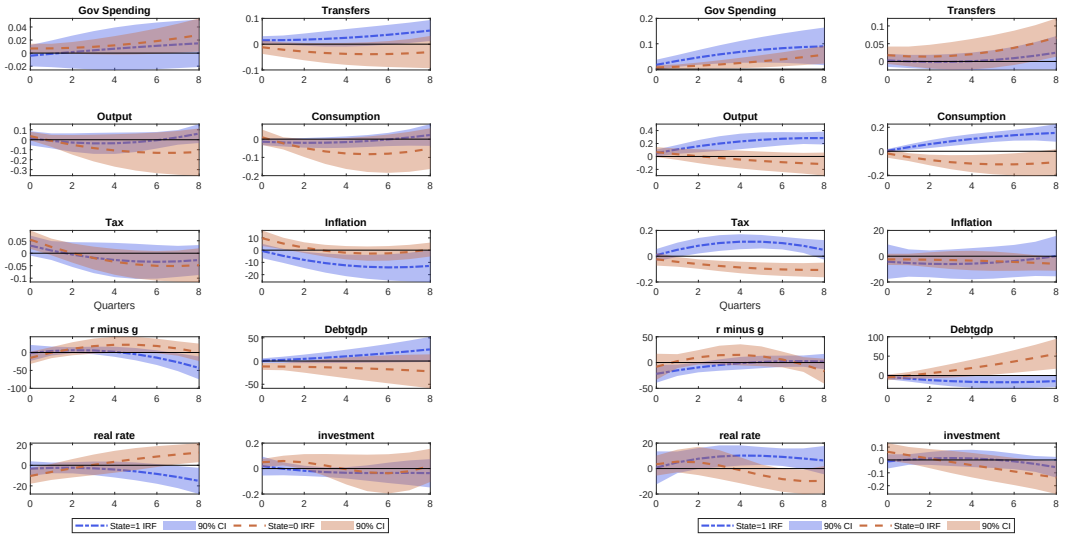
The decision to extend the fiscal regime beyond the Great Inflation years to the post-2009 period is motivated by several factors. Firstly, the post-2009 period is characterized by the zero lower bound (ZLB), indicating a passive monetary policy typical of a fiscal regime. Secondly, while pre-2009 changes in debt ceilings were relatively limited, in the post-2009 period, changes

[20] According to Leeper (1991), the monetary regime assumes an active monetary policy, adhering to the Taylor principle, and a passive fiscal policy. In this regime, fiscal expansions are always backed by future fiscal surpluses. Conversely, the fiscal regime assumes a passive monetary policy and an active fiscal policy: here, fiscal expansions are unbacked and generate wealth effects.

[21] While there is a broad consensus on considering the Great Moderation as a monetary regime, the Great Inflation regime is more debated. Papers assuming a constantly passive fiscal policy detect, in the Great Inflation period, a double passive (hence indeterminate) regime (see Lubik and Schorfheide, 2004)). However, when allowing for a possible switch in fiscal policy, the pre-Volcker era is found to be consistent with a fiscally-led regime (see Davig and Leeper, 2007, 2011; Sims, 2011)), in which the increasing inflation is attributed to a lack of fiscal discipline.

in debt ceilings were much more frequent, with different suspensions occurring. This implies that the ability to finance Discretionary spending in general, and ND spending in particular, was subject to greater uncertainty and variability. Third, as Bianchi et al. (2023) stress, the amount of unfunded spending accelerates in the aftermath of the Great Recession.

Looking at Mandatory and Discretionary spending across the MF states we find that results under FI states are confirmed. As Figure 16 shows, Discretionary spending behaves as funded (unfunded) shocks under the Monetary regime and as unfunded under the Fiscal regime. On the other hand, Mandatory spending always behaves as a funded shock both under the Monetary regime and under the Fiscal regime.



(a) Ant. shock to Mandatory, MF

(b) Ant, shock to Discretionary, MF

Figure 16: Anticipated shock to Mandatory and Discretionary spending under MF states

Figure 17 shows, for the sample 1964q1-2019q4, the responses of the variables to an anticipated shock to Defense spending under the fiscal regime (in blue) and under the monetary regime (in red). Under regime M (F) output, consumption and investment decrease (increase), while the real rate and r-g increase (decrease) or are not significant. Inflation decreases (increases) under M (F), increasing (reducing) debt. Therefore, under regime M, irfs behave as those following an anticipated funded spending shock; under regime F, irfs behave as those following an anticipated unfunded spending shock. Results we get employing the FI are therefore confirmed.

When we look at how the sub-components of Mandatotry spending, namely SS and MM, behave under MF states we get Figure 18.

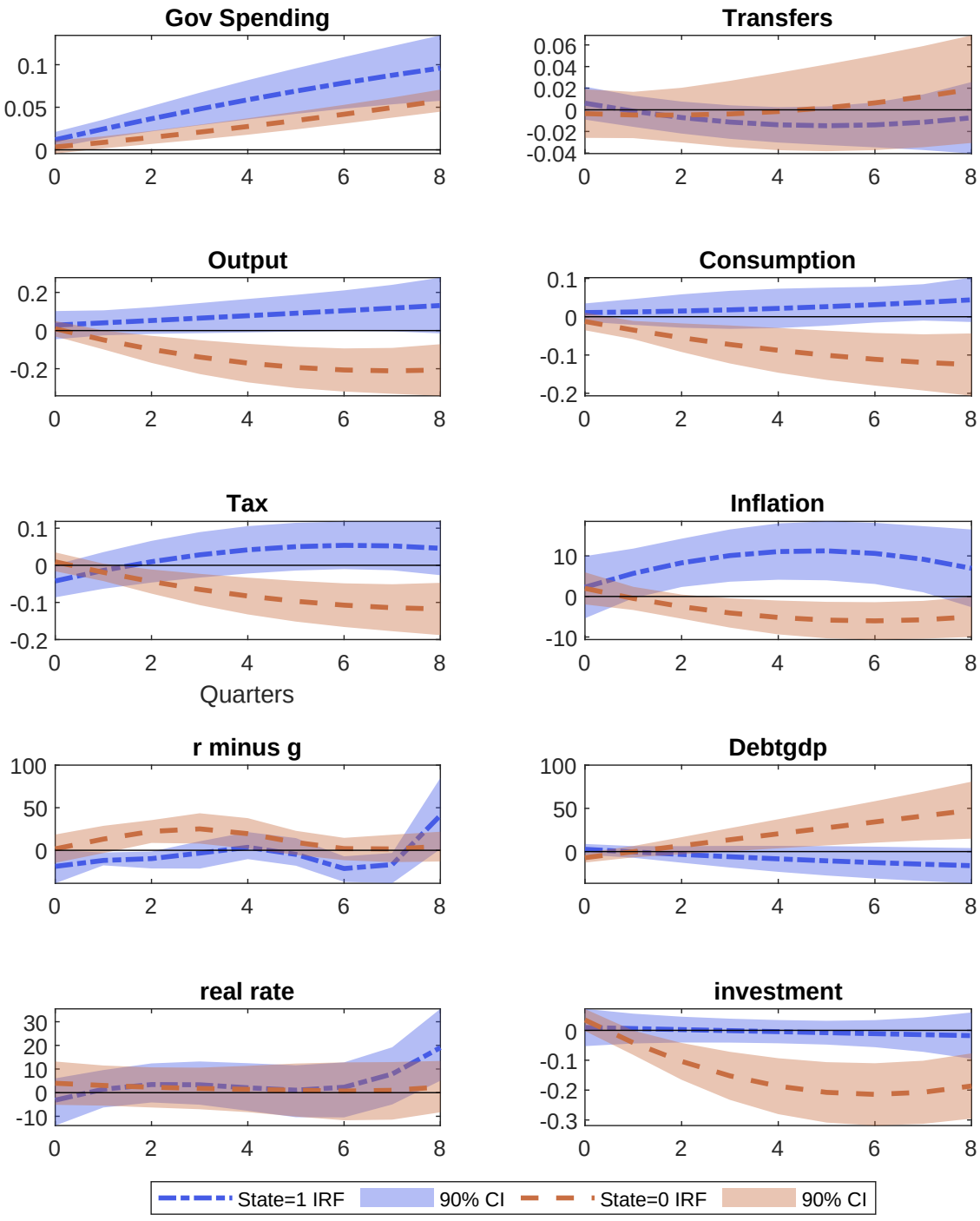
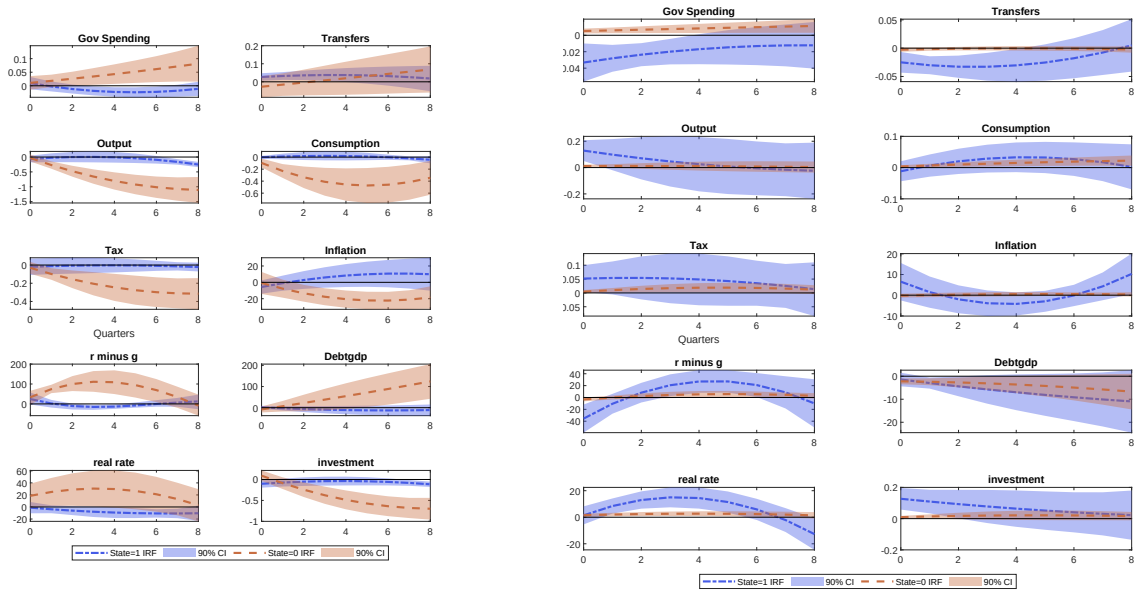


Figure 17: 1964q1-2019q4, Anticipated shock to Defense: MF states

As in the case with FI states, we get that SS behaves as funded in M and as almost funded in F. MM, except for investment, always behave as funded. In other words, SS stays backed but with some difficulty. Exactly as with FI in the text, even employing MF states we get that



(a) Ant. shock to SS, MF

(b) Ant, shock to MM, MF

Figure 18: Anticipated shocks to Discretionary and Mandatory spending under MF states

while Mandatory is always funded, the behavior of the subcomponents is blurred, as confirmed from the response to a shock to Other mandatories in Figure 19 that behave as *almost funded* in M and *almost unfunded* in F.

Summary for MF states

- Discretionary: as *funded* (*unfunded*) when the FI is high (low).

→ Defense: as *funded* (*unfunded*) when the FI is high (low).

→ Non-Defense: no clear path.

- Mandatory: always as *funded*.

→ SS: as *funded* (*almost funded*) when the FI is high (low).

→ MM: always as *funded*.

→ Othermandatory: as *almost unfunded* (*almost funded*) when the FI is high (low).

A.2 Identifying sub-regimes: ALL states

We want to stress the robustness of the results by considering an alternative regime. Specifically, we now want to see how the IRFs to an anticipated shock to Social Security (SS) and Defense spending change when all the trust funds for both SS (OASDI) and Medicare/Medicaid (HISMI)

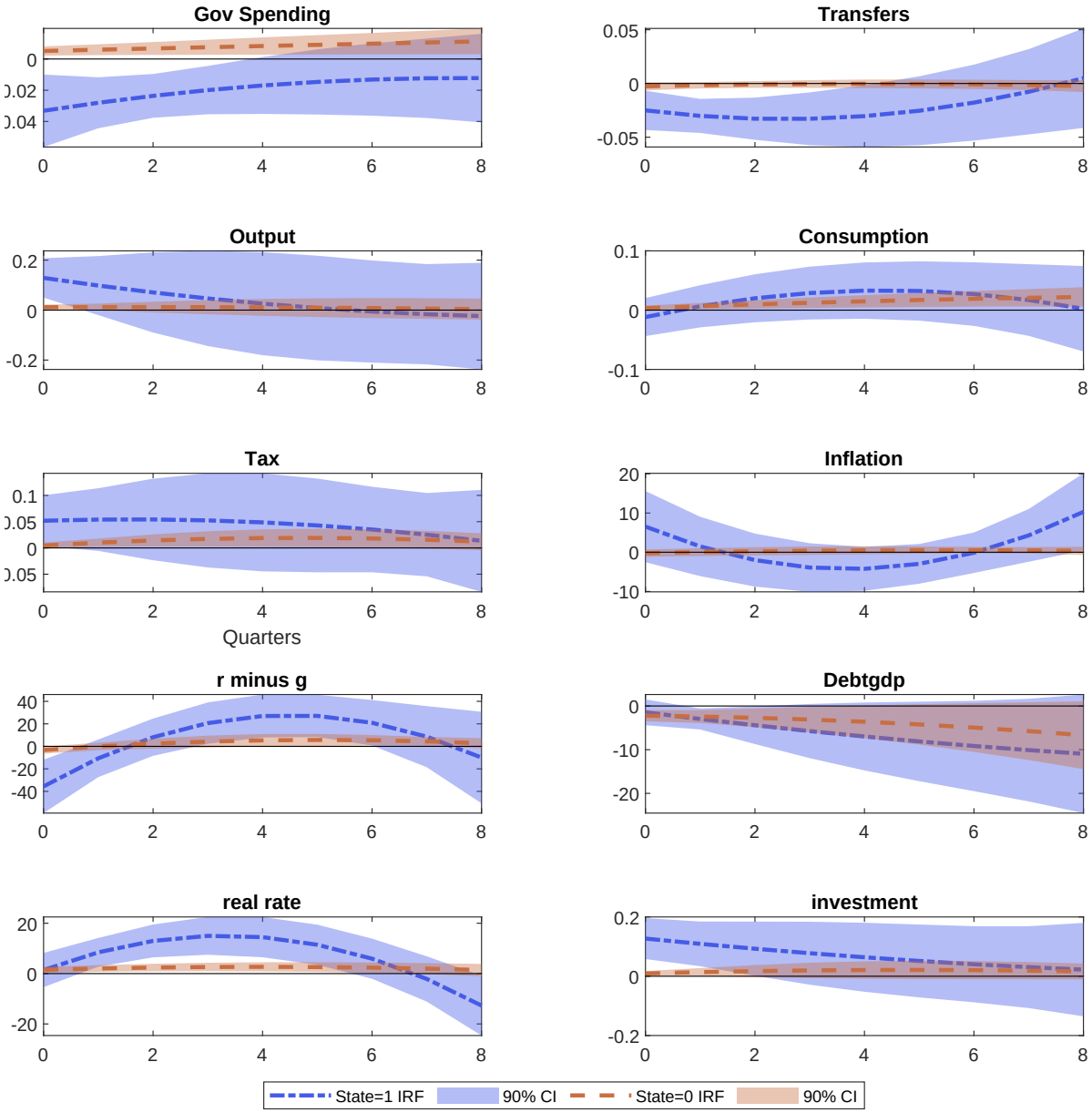


Figure 19: Ant. shock to Othermand, MF

are simultaneously in deficit. Regimes are depicted in Figure 20: we assign a value of 1 (in blue) if both are in deficit, 0 (in red) otherwise. The blue lines in the following figures depict the responses of the variables in the case of a joint deficit, while the red lines depict the case of a surplus.

Mandatory behaves as *funded* in surplus and as *unfunded* in deficit, Discretionary behave as *funded*.

As Figure 22 shows, the results for SS and MM are confirmed: even with this regime specification, the IRFs for SS (on the left) and those for MM (on the right) behave as *funded*.

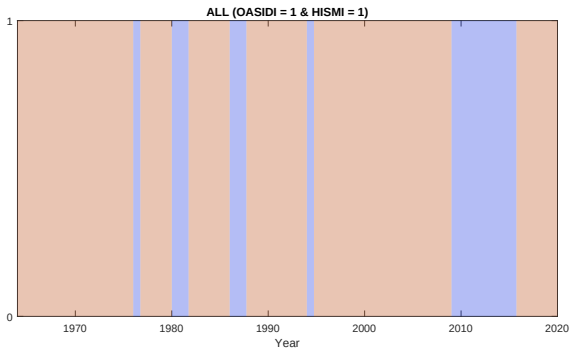
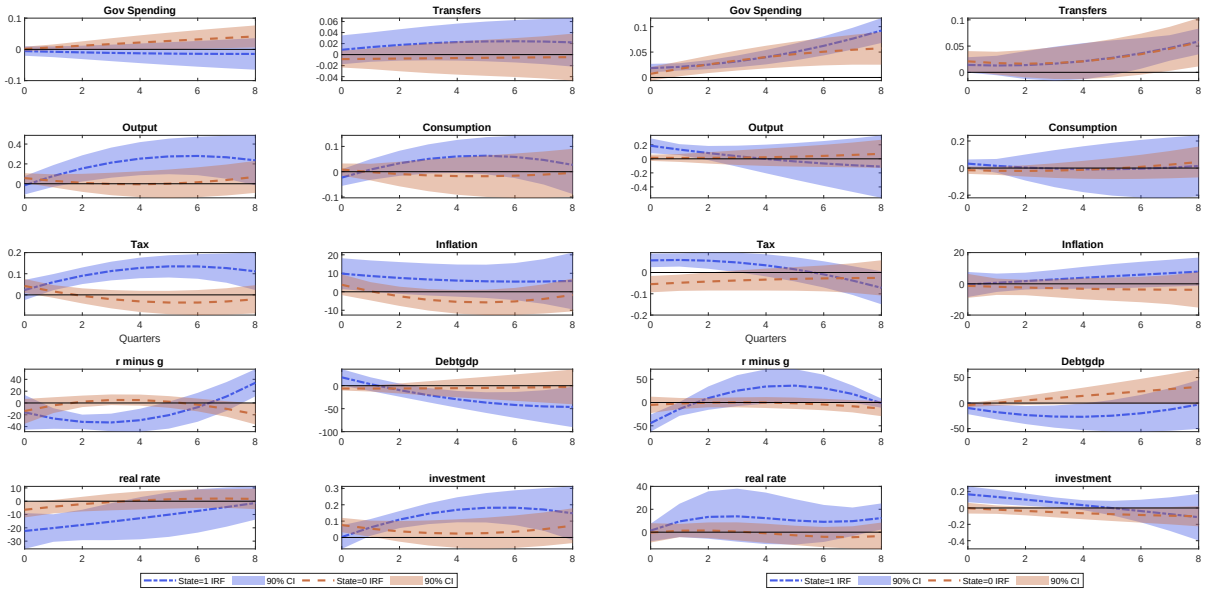


Figure 20: Sub-regimes ALL states. In blue regimes in deficit.



(a) Ant. shock to Mandatory, ALL

(b) Ant. shock to Discretionary, ALL

Figure 21: Anticipated shocks to Mandatory and Discretionary spending under ALL states

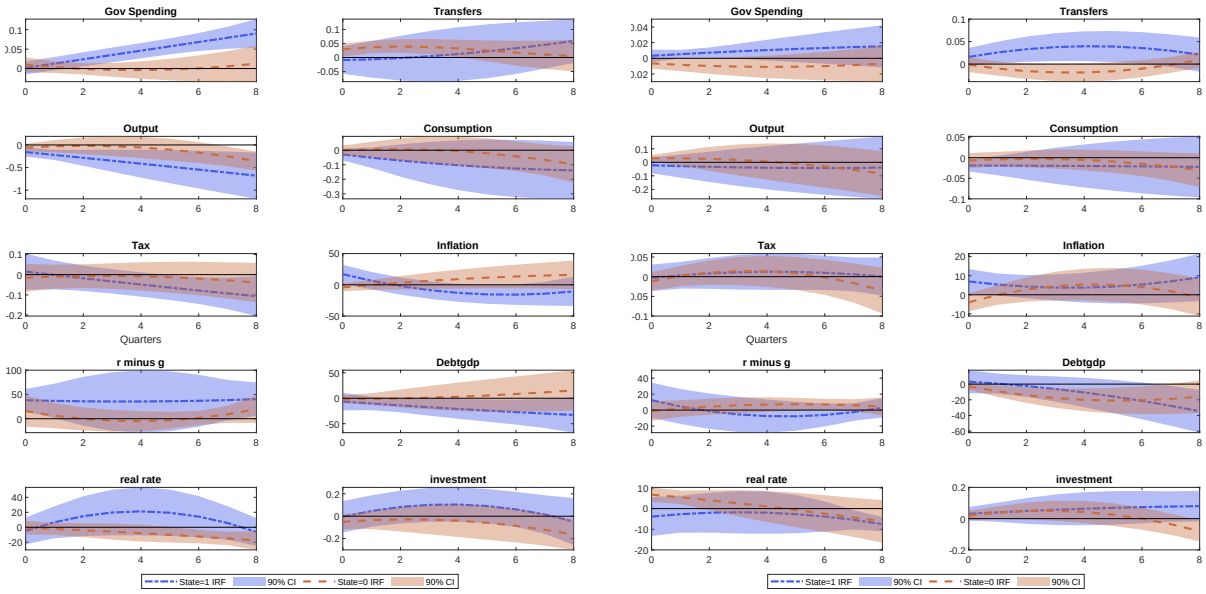
Other mandatory (see Figure 23) behave as almost unfunded in surplus and funded in deficit.

Considering the sample period 1964q1-2019q4, we find (see Figure 24) that after an anticipated shock to ND, i.r.f. behave as *funded* in surplus and as *unfunded* in deficits. Unlike the case when either OASIDI or HISMI are in deficit – when ND spending always behaves as funded – here, the deficit in both SS and MM appears to outline a more severe shortfall, causing defense spending to behave as unfunded.

Summary: ALL states

- Discretionary: always as *funded*.

→ Defense: as *funded* in surplus and as *unfunded* in deficit.



(a) Ant. shock to SS, ALL

(b) Ant. shock to MM, ALL

Figure 22: Anticipated shocks to SS and MM under ALL states

→ Non-Defense: no clear path.

- Mandatory: as *funded* in surplus and as *unfunded* in deficit.

→ SS: always as *funded*.

→ MM: always as *funded*.

→ Othermandatory: as *almost unfunded* in surplus and as *almost funded* in deficit.

B Supplementary Figures

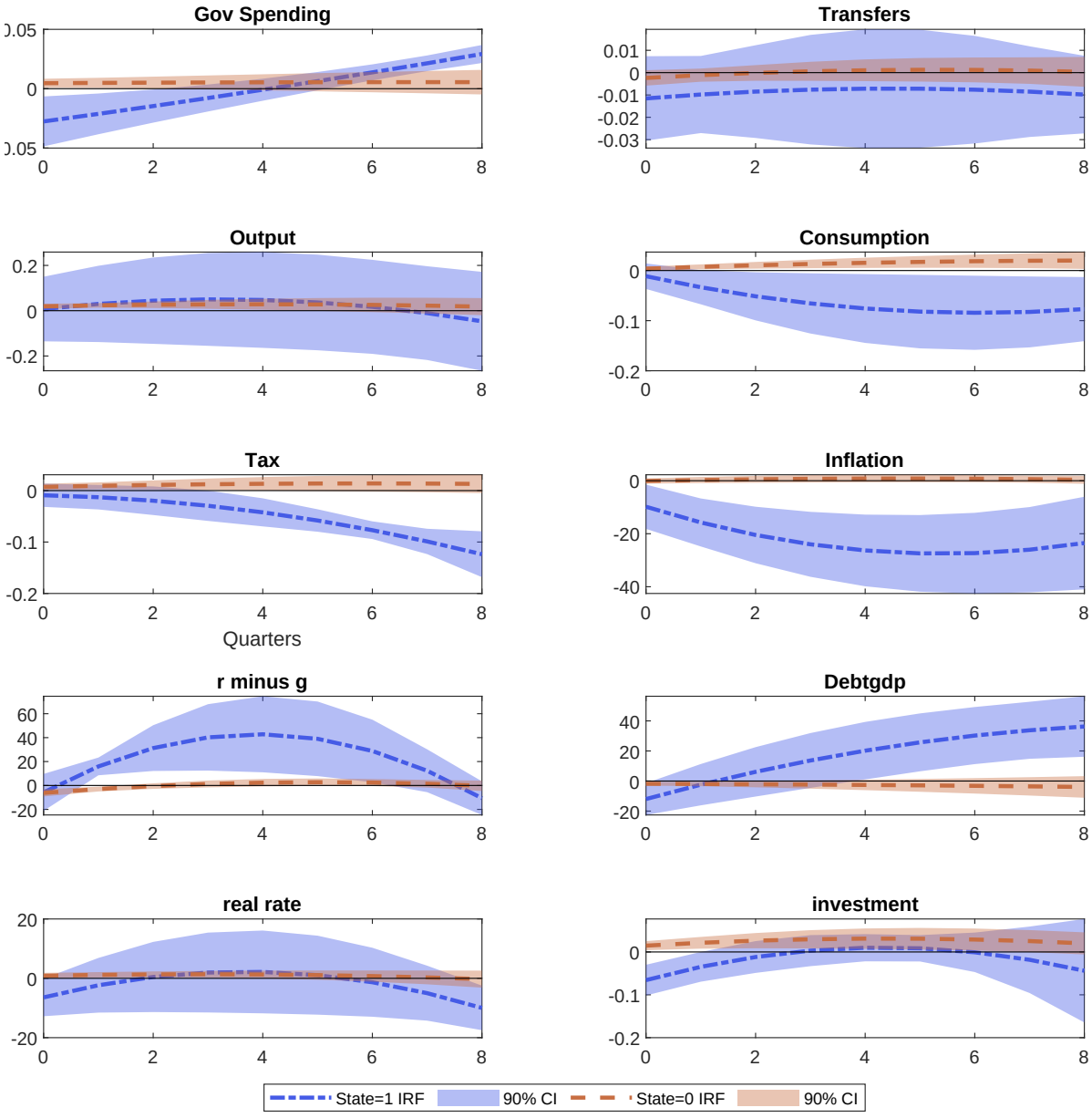


Figure 23: Ant. shock to Othermand, ALL

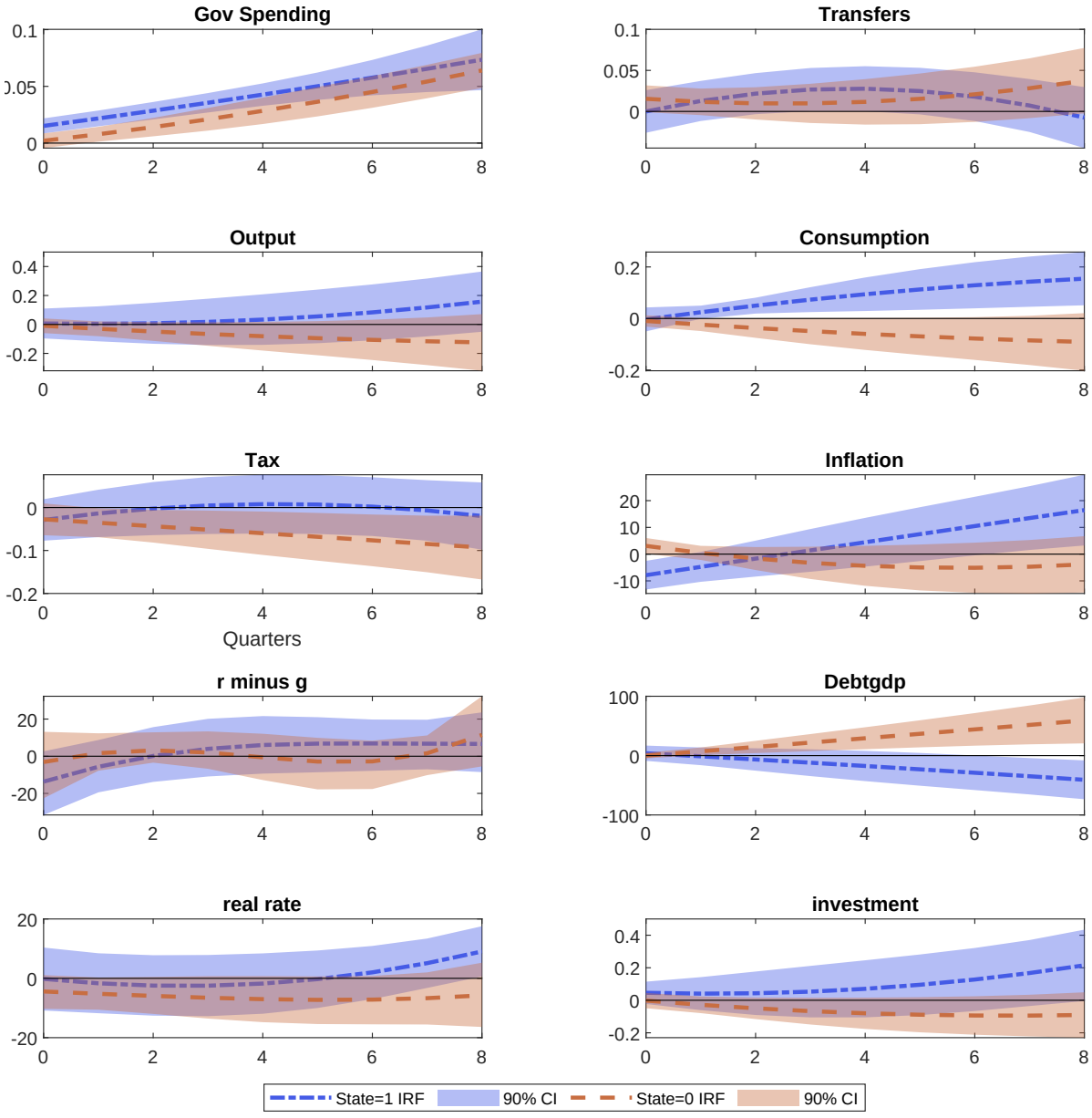
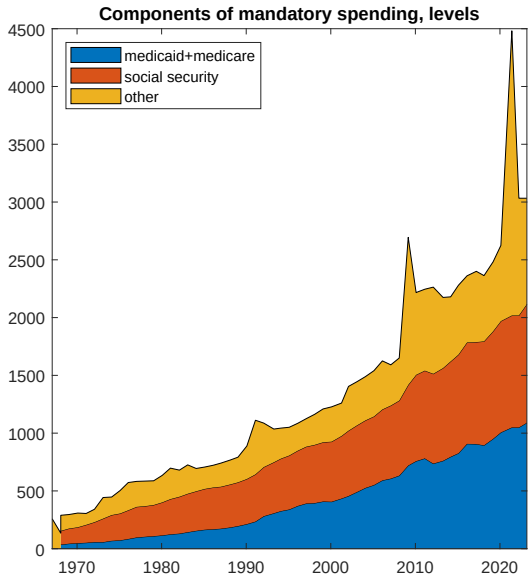
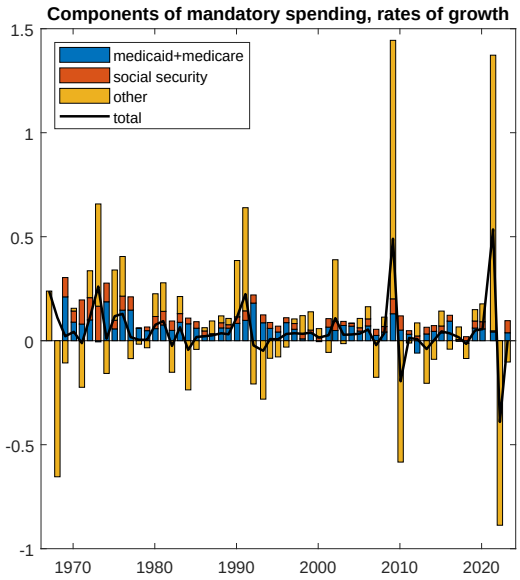
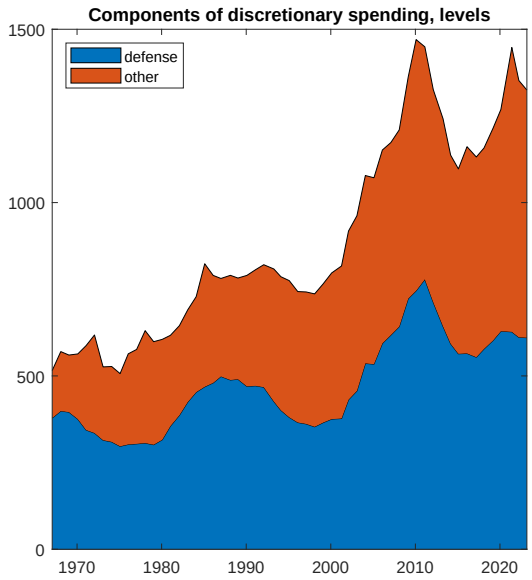


Figure 24: Ant. shock to Defense, ALL


Components of mandatory spending, levels
medicaid+medicare
social security
other
4500
4000
3500
3000
2500
2000
1500
1000
500
0
1970
1980
1990
2000
2010
2020


Components of mandatory spending, rates of growth
medicaid+medicare
social security
other
total
1.5
1
0.5
0
-0.5
-1
1970
1980
1990
2000
2010
2020


Components of discretionary spending, levels
defense
other
1500
1000
500
0
1970
1980
1990
2000
2010
2020

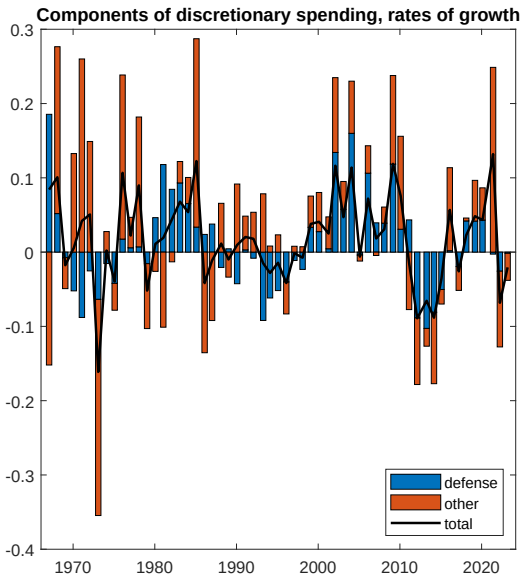

Components of discretionary spending, rates of growth
defense
other
total
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
1970
1980
1990
2000
2010
2020

Table 1: Historical debt ceiling levels

Date	**Debt Ceiling**	**Change in Debt Ceiling**
August 5, 1997	5,95	450
June 11, 2002	6,4	450
May 27, 2003	7,384	984
November 16, 2004	8,184	800
March 20, 2006	8,965	781
September 29, 2007	9,815	850
June 5, 2008	10,615	800
October 3, 2008	11,315	700
February 17, 2009	12,104	789
December 24, 2009	12,394	290
February 12, 2010	14,294	1,900
January 30, 2012	16,394	2,100
February 4, 2013	Suspended	-
May 19, 2013	16,699	305
October 17, 2013	Suspended	-
February 7, 2014	17,212	213
March 15, 2015	18,113	901
October 30, 2015	Suspended	-
March 15, 2017	19,847 (de facto)	1,734
September 30, 2017	Suspended	-
March 1, 2019	22,030 (de facto)	2,183
August 2, 2019	Suspended	-
July 31, 2021	28,500 (de facto)	6,470
October 14, 2021	28,9	400
December 16, 2021	31,4	2,500