The Inflationary Footprint of Fiscal Policy: Evidence from Disaggregated U.S. Spending

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Motivation

- The effects of fiscal shocks depend on the prevailing monetary/fiscal regimes
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- We want to examine whether shocks to different categories of spending have differential effects on output, inflation, debt...
- The effectiveness of government spending also depends on the timing of the fiscal policy announcement: effects of anticipated fiscal measures (Ascari et al., 2023 JME).

Why looking at *anticipated* government spending shocks?

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  - **Fiscal regime** (spending is not backed by future taxes)
    $\rightarrow$ *expansionary effects*: $\uparrow$ output, consumption, investment, inflation,
    $\downarrow$ real interest rates, debt

Research questions

- Which spending categories within the U.S. federal budget should be expected to lead to larger effects on output?
- Which spending categories pose a greater threat to price stability?
- Does it matter if the government actually has the funds on hand when it decides to spend?

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- **Main takeaway**: unbacked fiscal policies appear contingent on both time and government spending domains

What we find

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- Social Security (SS) spending: no statistically significant effects, but inflationary when ample funding is available
- Mandatory vs. discretionary:
  - Shocks to mandatory spending primarily yield Ricardian effects, irrespective of the level of fiscal strain
  - Shocks to discretionary spending yield non-Ricardian effects during periods of fiscal strain

Related Literature

This paper is related to three different streams of literature

- *Fiscal foresight and the identification of fiscal policy shocks*

  (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; Ascari et al., 2023)

- *State dependence of spending multipliers*

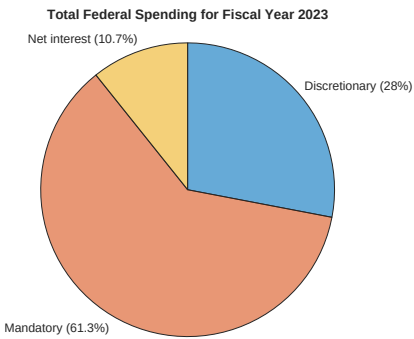
  (Auerbach and Gorodnichenko, 2012; Ramey and Zubairy, 2018; Caggiano et al., 2015; Ascari et al., 2024)

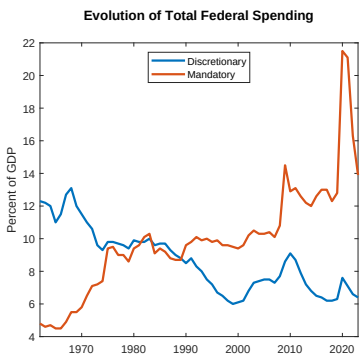
- *Monetary-fiscal interactions*

  (Leeper, 1991; Bianchi, 2012; Bianchi and Ilut, 2017; Ascari et al., 2020; Bianchi and Melosi, 2014)

Data: U.S. Federal Budget

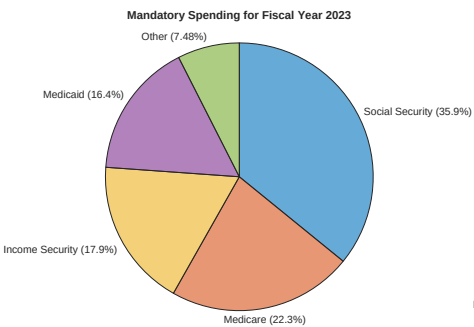
- Mandatory spending is set by existing laws (and does not require an annual vote by Congress). It is typically, but not always, funded by taxes.
- Discretionary spending is voted on by Congress in the annual appropriations process, with no guarantees for annual funding: it can be adjusted or cut based on policy priorities and available funds.
- Mandatory is more than double total discretionary.

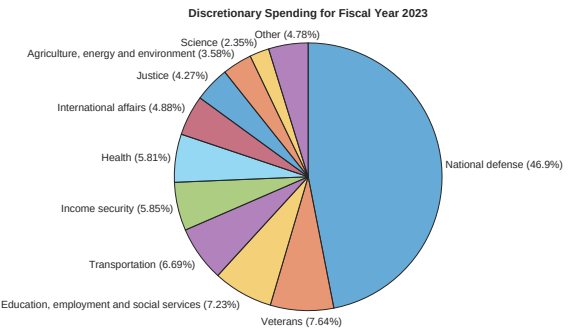




Data: U.S. Federal Budget

- Mandatory spending comprises entitlement programs like Social Security, Medicare and Medicaid, offering guaranteed benefits to eligible individuals.
- Discretionary spending includes Defense (more than half of the total) and non-defense spending (education, transportation, environmental programs, and R&D).





Methodology

- We use data from the U.S. federal budget to construct a measure of government spending shocks

Table S–4. Proposed Budget by Category

(In billions of dollars)

	2021	2022	2023	2024	2025	2026	2027
Outlays:							
Discretionary programs:							
Defense	742	766	795	822	837	843	853
Non-defense	895	928	915	1,022	1,012	1,019	1,026
Subtotal, discretionary programs	1,636	1,694	1,709	1,844	1,848	1,862	1,879
Mandatory programs:							
Social Security	1,129	1,214	1,313	1,398	1,482	1,570	1,662
Medicare	689	753	846	853	971	1,070	1,157
Medicaid	521	562	536	567	599	631	666
Other mandatory programs	2,495	1,272	993	937	942	953	954
Subtotal, mandatory programs	4,834	3,800	3,687	3,755	3,994	4,224	4,439
Net interest	352	357	396	476	564	648	729
Total outlays	6,822	5,852	5,792	6,075	6,406	6,734	7,048

U.S. Federal Budget Fiscal Year 2023 (released 28/03/2022)

Methodology

- Following Forni and Gambetti (2016), we compute a quarterly measure of one-year ahead expected change in real spending by subcategory
  - e.g., for defense spending in 2022Q1 we have

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

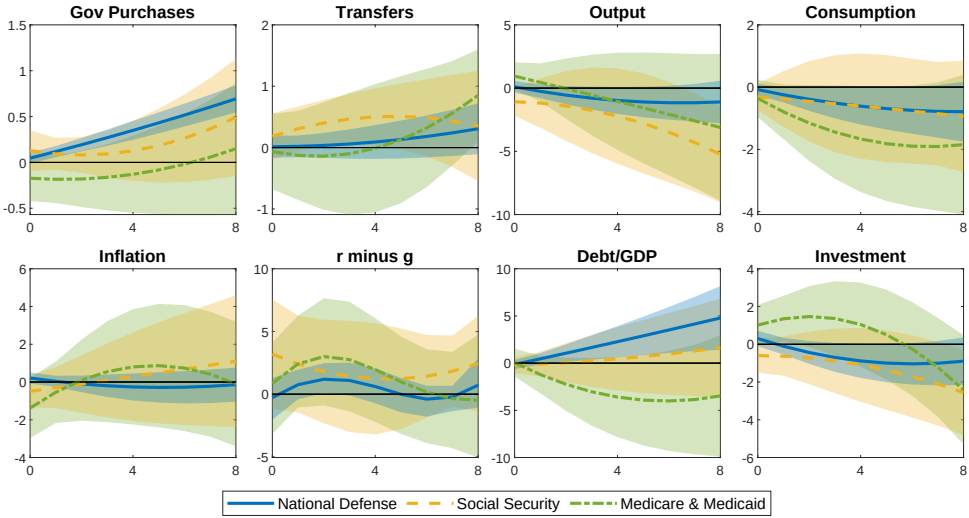
  - NB: this measure is non-zero only in the quarter in which the budget is released, and equal to zero otherwise
  - this measure is both *anticipated and disaggregated*

Computing impulse responses: local projections

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

- Shock (x_t): our measures of disaggregated government spending shocks
- Outcomes (y_t): quarterly data from NIPA tables
  - aggregate federal purchases & investment (G)
  - aggregate federal transfers (TR)
  - output, consumption, investment, etc.
- Controls ($\boldsymbol{w}_t$):
  - 4 lags of y_t, x_t, TR, and output when computing IRFs to SS, MM shocks
  - 4 lags of y_t, x_t, G, and output when computing IRFs to ND and discretionary shocks
  - 4 lags of y_t, x_t, TR, G and output when computing IRFs to mandatory shocks
  - results are robust to including taxes as controls
- Smooth LP as in Barnichon and Brownlees (2019)
- Sample: if not otherwise stated, 1968q1-2019q4

Anticipated shock to MM, SS and ND over the full sample



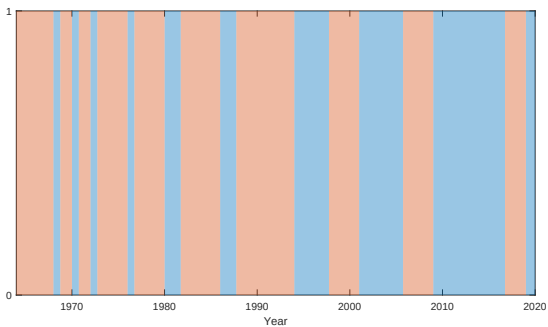
$\rightarrow$ No clear difference

Identifying fiscal capacity

- We split the full sample into two alternative states, based on fiscal capacity, to check the state-dependence of IRFs to anticipated shocks.

Identifying fiscal capacity for Medicare and Medicaid

- MM have two trust funds: the Hospital Insurance (HI) and the Supplementary Medical Insurance (SMI). We focus on the combined programs (HISMI).



- We look at the deficit/surplus in the HISMI assigning a value of 1 (in blue) if the combined programs are in deficit, otherwise 0 (in red).

Identifying fiscal capacity for National Defense

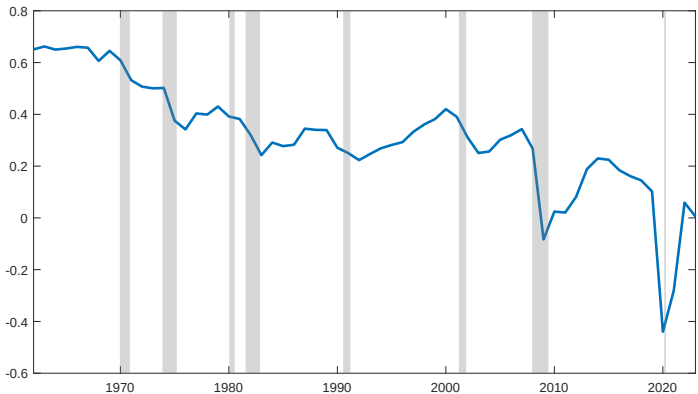
$$\text{Fiscal index (FI)} \ = 1 - \frac{\text{mandatory spending} + \text{Interest}}{\text{Total revenues}}$$

It measures the percentage of federal tax revenues not allocated to *mandatory* spending programs; i.e., **% available for discretionary spending.**

- About 70% of state spending is "on autopilot", determined before governors propose or lawmakers negotiate a budget (Steuerle, 2014).
- The higher the FI, the stronger the fiscal democracy: more flexibility, less strain.

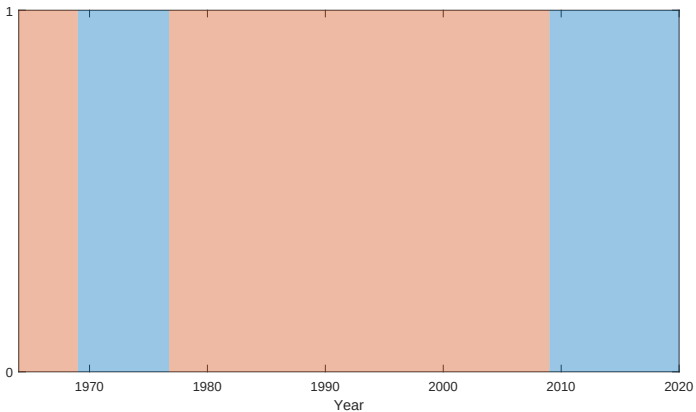
Identifying fiscal capacity for National Defense: the FI

- The FI fell sharply from 65% in 1962 to well below zero by 2009. Two major drops: from 1969 to 1976 (though it remains positive) and from 2009 on (becoming negative).



Identifying fiscal capacity for National Defense: the FI

- We assign a value of 1 (in blue) in the two periods when the FI markedly decreases: 1969q1-1976q4 and from 2009q1 on, 0 (in red) otherwise.

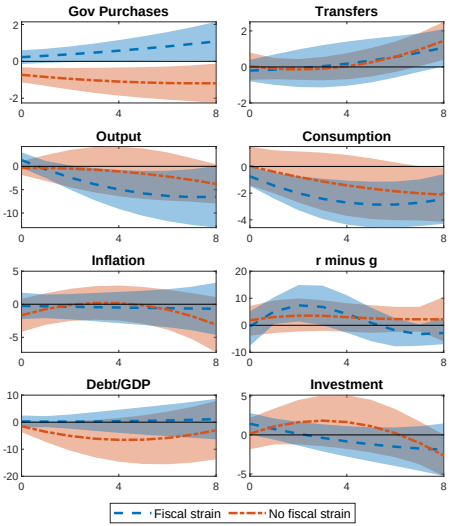


State dependent local projections

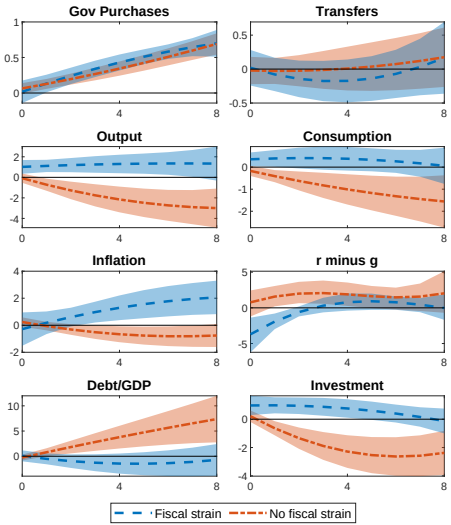
- Following Ramey-Zubairy (2018), we include state dependency in our LP framework, using HISMI or FI as our state variable (z_t)

$$y_{t+h} = \mathcal{I}_{\{z_{t-1}=1\}} \left(\alpha_h^1 + \beta_h^1 x_t + \sum_{k=1}^{p} \left(\gamma_k^1\right)' \boldsymbol{w}_{t-k} \right) + \mathcal{I}_{\{z_{t-1}=0\}} \left(\alpha_h^0 + \beta_h^0 x_t + \sum_{k=1}^{p} \left(\gamma_k^0\right)' \boldsymbol{w}_{t-k} \right) + v_{t+h},$$

Anticipated shocks to MM and ND



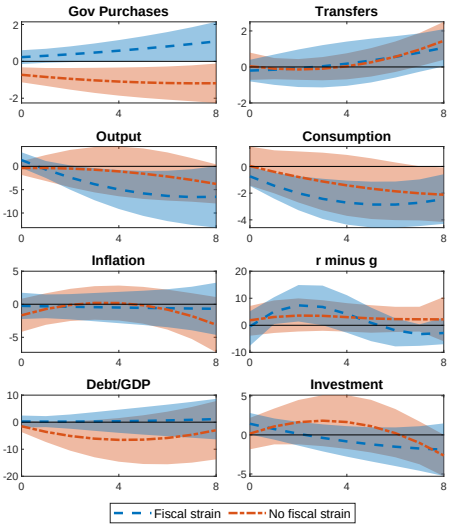
Ant. shock to MM, HISMI



Ant. shock to ND: FI

- Under no fiscal strain (red): both MM and ND yield Ricardian effects.

Anticipated shocks to MM and ND



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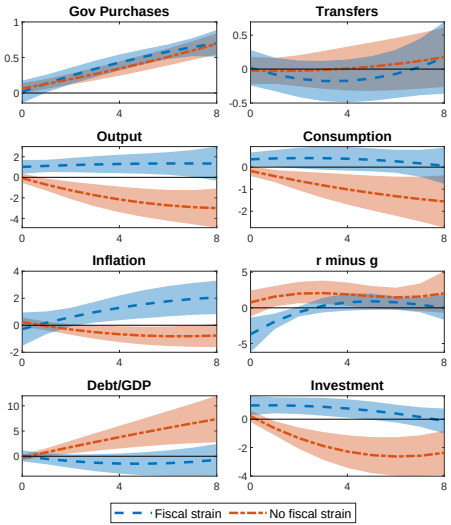
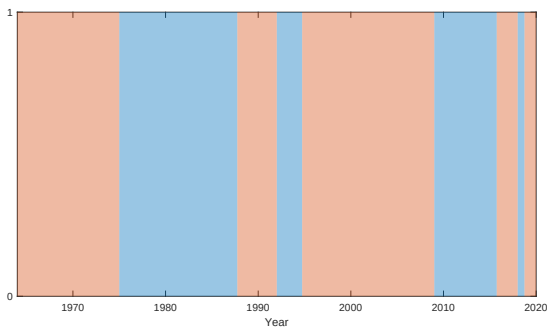


Ant. shock to ND: FI

- Under fiscal strain (blue):
  (i) ND yields non-Ricardian effects (ii) MM continues to exhibit Ricardian effects

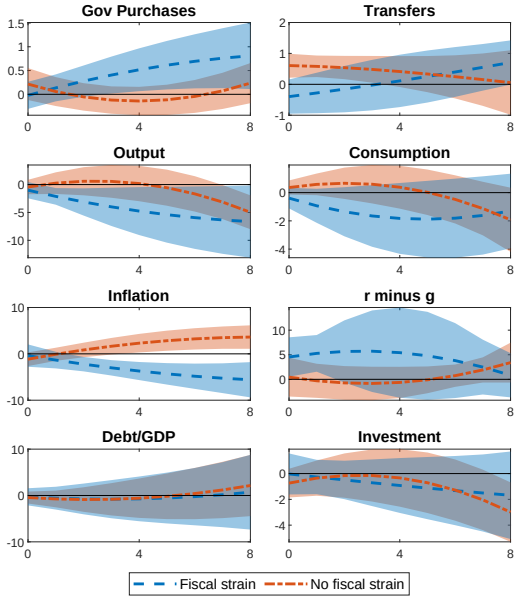
Identifying fiscal capacity for SS

- SS payroll taxes have two trust funds: the Federal Old-Age and Survivors Insurance (OASI) and the Federal Disability Insurance (DI). They are two legally separated funds but assessments of system financing often focus on the combined programs (OASDI).



- We look at the deficit/surplus in the OASDI, assigning a value of 1 (in blue) if both the funds are in deficit, 0 (in red) otherwise.

Anticipated shock to SS



→ Inflationary when no fiscal strain

Anticipated SS shock: why inflation without fiscal strain?

- SS creates entitlements perceived as permanent (e.g., pensions) and hard to reverse $\Rightarrow$ A relaxed budget constraint can fuel expectations of overly ambitious expansions in welfare programs $\rightarrow \uparrow$ wealth effects $\rightarrow \uparrow$inflation

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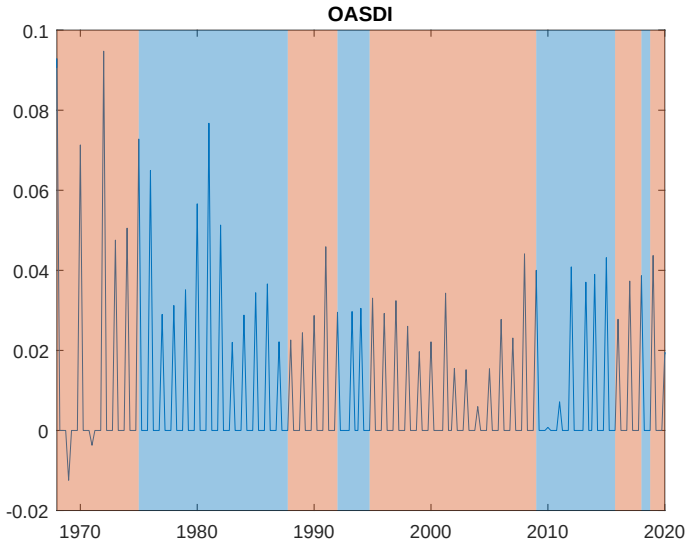
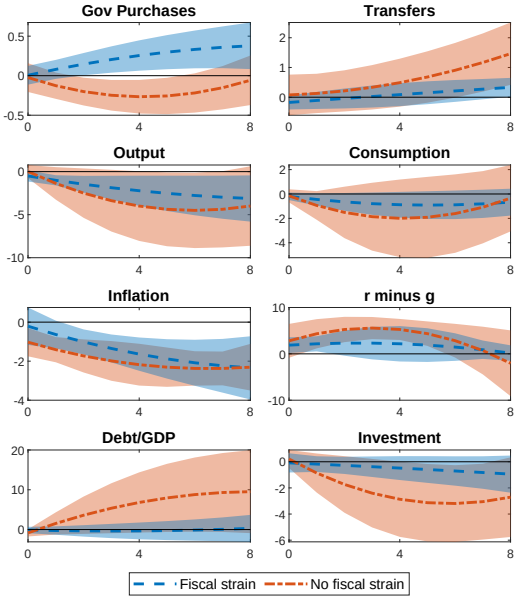
- $\Rightarrow$ The observed non-Ricardian effects were primarily driven by the sizable shocks concentrated in that earlier phase, when the federal government increased entitlements, and OASI and DI funds were plentiful.

Largest SS shocks up to 1975



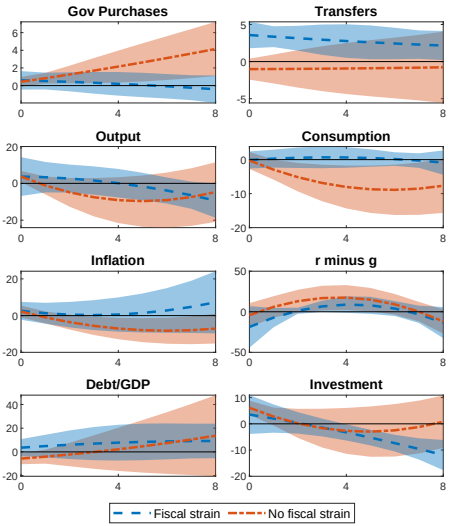
States for SS (in blue deficit states) and SS shocks.

Anticipated shock to SS from 1975

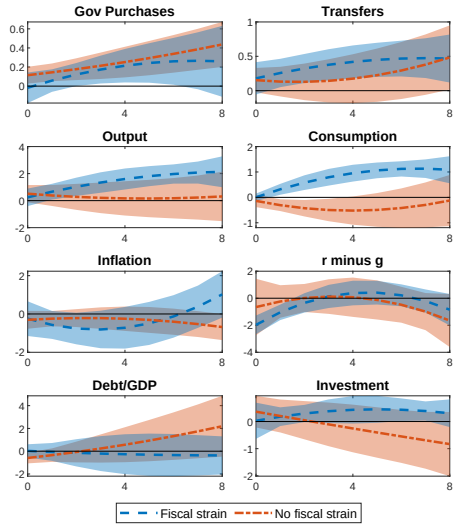


→ Ricardian effects, regardless of fiscal strain

Anticipated shocks to mandatory and discretionary



Ant. shock to mandatory, FI



Ant. shock to discretionary, FI

→ Shocks to mandatory yield Ricardian effects, irrespective of fiscal strain
Shocks to discretionary yield Non-Ricardian effects during periods of fiscal strain.

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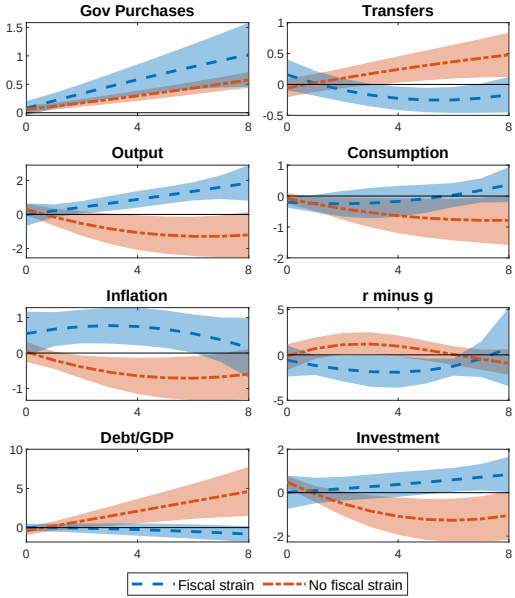
  - → MM (and *mandatory*) spending consistently exhibits Ricardian effects, regardless of fiscal strain.
  - → ND (and *discretionary*) spending shows Ricardian effects when fiscal resources are abundant, and non-Ricardian effects when resources are scarce.
  - → SS mostly behaves like MM, except for a set of large anticipated shocks in the '60s and early '70s. Despite ample fiscal resources at the announcement, these shocks were highly inflationary, reflecting their scale and perceived permanence.

An application: Warflation



Ant. shock to Defense, war dates

- We look at average annual ND spending as a % of GDP during each U.S. war period in 1964q1-2019q4.
  - Vietnam (1964-75): 7.5%
  - Gulf War (1990-91): 5.15%.
  - Iraq War and Afghanistan War (2001-11): 4.1%
  - Afghanistan War (2011-21): 3.4%
- We assign a value of one (in blue) to the two more expensive wars, Vietnam war and Desert Storm; zero (in red) otherwise.

→ During (outside) expensive wars, effects are *non-Ricardian* (*Ricardian*).

Conclusions

→ **Unbacked fiscal policies appear contingent on both time and government spending domains.**

THANK YOU!

Main theoretical reference

Monetary (*funded*) regime (M) $\Rightarrow$ central bank sets interest rates, government adjusts deficits to stabilize real debt.
$\Rightarrow$ Ricardian equivalence holds, no wealth effects on debt.

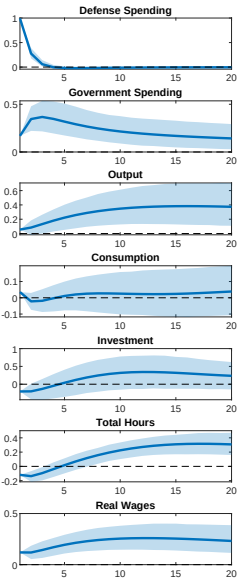
$\rightarrow$ Great Moderation

Fiscal (*unfunded*) regime (F) $\Rightarrow$ government sets deficits, central bank accommodates rates to let inflation stabilize real debt.
$\Rightarrow$ fiscal theory at work, no Ricardian equivalence, wealth effects on debt.

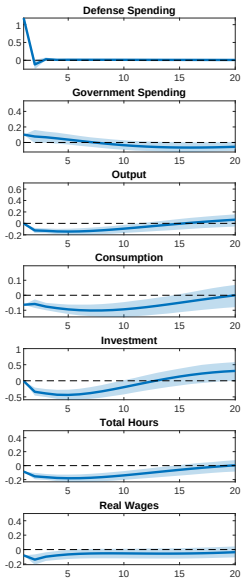
$\rightarrow$ Great Inflation

Ascari et al. (2023, JME): Anticipated government spending shocks

F: 1960q1-1979q2

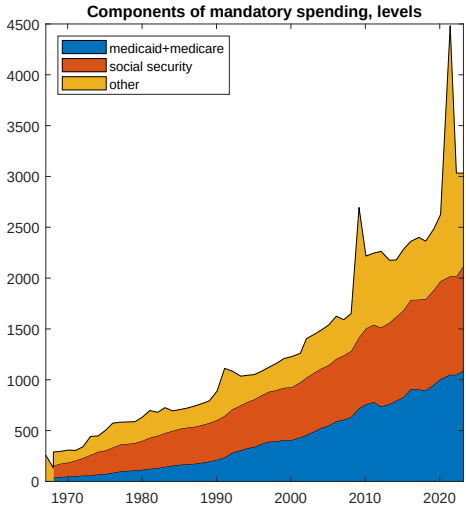


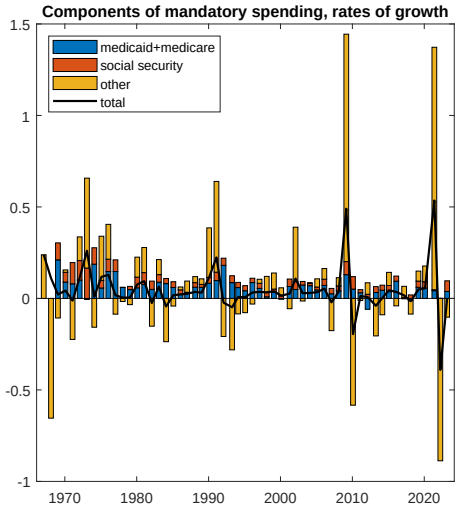
M: 1984q1-2007q2



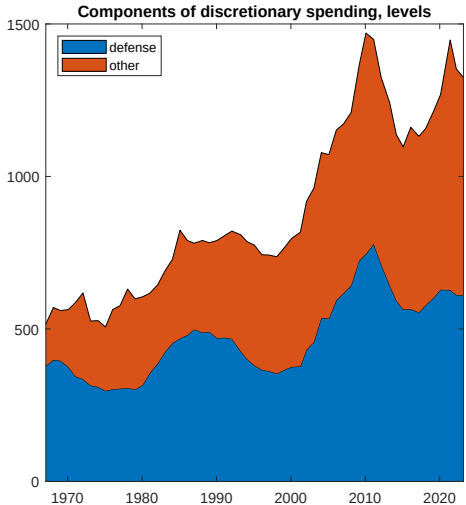
- Ramey (2011) defense spending shocks
- Announcements of future government spending are contractionary under M but expansionary under F.

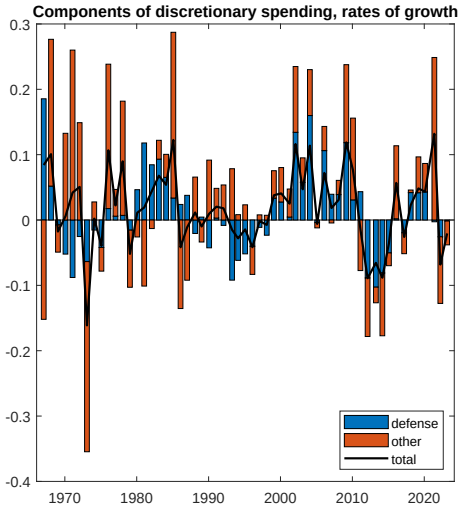
Composition of mandatory spending





Composition of discretionary spending

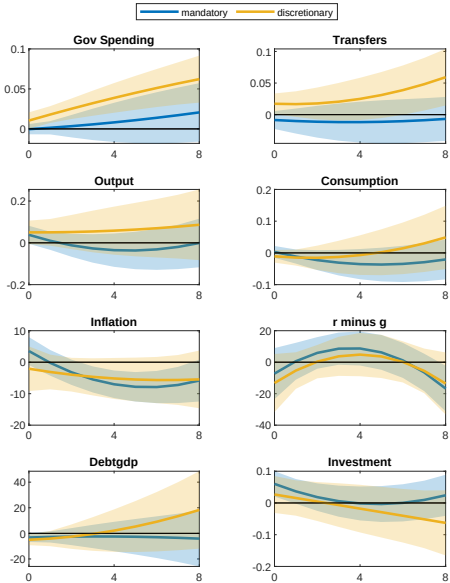




Identifying sub-regimes - Some basics to limit deficits

- PAYGO is a budget rule requiring that new legislation affecting revenues and *Mandatory* program spending does not increase projected budget deficits.
- PAYGO does not apply to *discretionary* spending. Discretionary program funds are limited by the annual spending targets set in congressional budget plans.
- Debt ceilings: total amount that the US government is authorized to borrow to meet its existing legal obligations (not to allow new spending but to pay the bills already authorized by congress).
- Suspensions: when the Treasury spends the max amount authorized under the ceiling, Congress can suspend or raise the limit on borrowing

Anticipated shocks to mandatory and discretionary over the full sample, 1964q1-2019q4



Ant. shock to mandatory and discretionary, full sample

→ No clear difference among the two

Another identification for ND spending: war dates

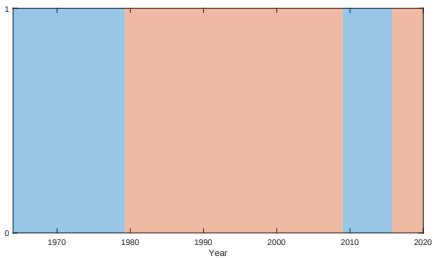
- How to finance military spending: tax or debt?

→ "Tax rates should be determined by the level of permanent government expenditure, whereas temporary shocks to government spending should be financed by debt" (Bäckström, 2019).

→ "While the regular and long-lasting need to increase defence spending is a structural shift at the end of the 30 years of peace dividend and should *not* be funded by deficits, the increase in defence purchases to support Ukraine is temporary and can therefore be funded by deficits." (European Defence Industrial Strategy, Wolff)

Appendix: Evidence with alternative states

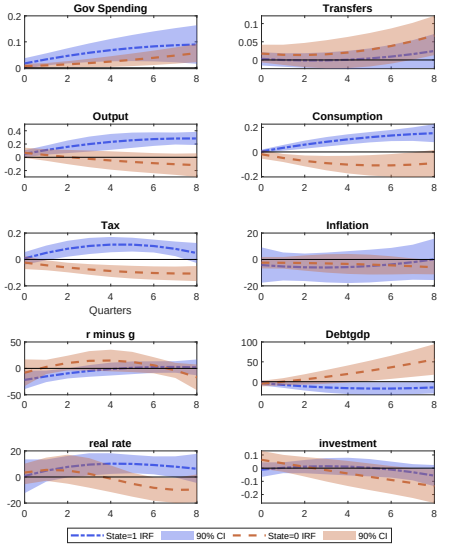
Monetary and Fiscal (MF) states



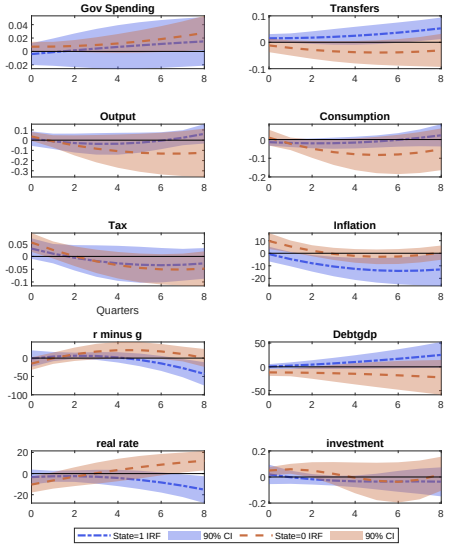
We assign a value of 1 (in blue) to the Great Inflation period (1964q1-1979q2) and the ZLB (2009q1-2015q4), 0 (in red) otherwise (i.e., the Great Moderation: 1984q1-2008q4).

→ The first subperiods could be identified as *fiscal regimes*, the second as *monetary regime*.

Discretionary and Mandatory spending: MF states



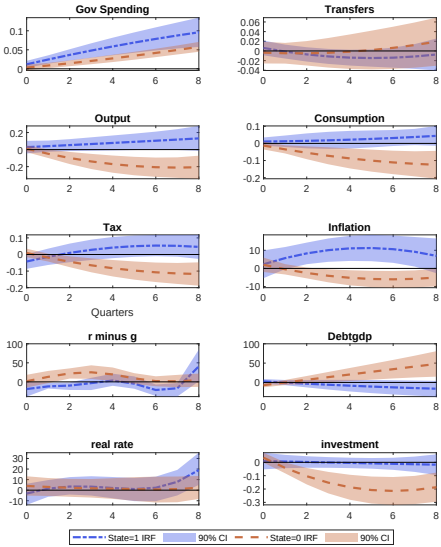
Ant. shock to discretionary, MF



Ant. shock to mandatory, MF

→ Discretionary Ricardian (non-Ricardian) under M (F). Mandatory always Ricardian.

Defense spending: MF states



Ant. shock to Defense, MF

- Sample: 1964q1-2019q4
- Same results as with FI

→ Under regime M (F) IRFs behave as Ricardian (non-Ricardian).

Results and policy implications

Our results are in line with:

- Roosevelt policy in 1933: "Early in his presidency, Roosevelt chose both, backing ordinary spending with taxes while allowing inflation to finance emergency expenditures. His distinction between ordinary and emergency government expenditures was central to communicating that unbacked fiscal expansion was state-contingent. By demonstrating fiscal responsibility with the ordinary budget, he could reassure his critics that once the crisis passes, he would balance the budget." (Jacobson, Leeper and Preston, 2023)

- Draghi (2023), who suggests that member states handle *funded mandatory* expenditures, while the central level manages state-contingent *unfunded discretionary* spending: "Europe must now confront a host of supranational challenges that will require vast investments in a short time frame, including defence as well as the green transition and digitisation. This can be resolved only by transferring more spending powers to the centre, which in turn makes possible more automatic rules for the member states. That is broadly the situation in America, where an empowered federal government sits alongside largely inflexible fiscal rules for the states, which are mostly prohibited from running deficits. Balanced-budget rules are credible—with the ultimate sanction of default—precisely because the federal level takes care of the bulk of discretionary spending."

Results and policy implications

"The use of a common safe asset (. . .) would require a stronger set of fiscal rules which ensure that an increase in common debt is matched by a more sustainable path of national debt. In this way, all EU Member States could contribute to such an asset without prejudging the sustainability of their public debt. **Issuance would also have to remain mission and project specific."**

Draghi (2024), "The future of European competitiveness", part B, p. 290

States comparison