Monetary-Fiscal Crosswinds in the European Monetary Union

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Fiscal-monetary Interactions and Crosswinds

Fiscal-monetary interactions:

- Arise via the inter-temporal **(general) government budget** constraint
- ... and are potentially **more sizeable** when **balance sheets are large**
- In a **monetary union** the **inflation objective** pursued by the CB may be offset by **crosswinds** from the **decentralised fiscal policies**

We propose an empirical framework to study:

1. The quantitative **importance of fiscal adjustment** for **inflation dynamics** in the medium and long-run
2. The extent to which fiscal policy can be characterised as **coordinated** with monetary policy or as leading to **crosswinds**

Our Empirical Framework

- Study how inflation adjusts to **conventional/unconventional monetary** shocks at business cycle frequency and in the long-run to rebalance the budget identity
- We characterise the EMU as following:
  - The **central bank** has a **target** in terms of **aggregate inflation**
  - ... but **each country** issues its own debt and therefore faces **different market rates**
  - The **inter-temporal budget constraint** holds in the **aggregate**
  - ... but not at the country level so that **transfers are possible**
- **New fiscal dataset** for Germany, France, Italy and Spain including market value of public debt, returns and fiscal primary surpluses
- VAR identification combining narrative and sign restrictions
- Dogmatic priors to impose long-run constraints due to budget identity

Inflation as a Fiscal-Monetary Phenomenon in the EMU

The Government Budget Constraint

Law of motion for the **market value** of the **government debt over GDP**

$$\underbrace{\frac{V_{t+1}}{P_{t+1}Y_{t+1}}}_{\text{Debt at t+1}} = \underbrace{\frac{V_t}{P_tY_t}}_{\text{Debt at t}} \underbrace{\frac{\overbrace{(1+r_{t+1})}^{\text{Debt Service}}}{(1+g_{t+1})(1+\pi_{t+1})}}_{\text{Growth and Inflation}} - \underbrace{\frac{S_{t+1}}{P_tY_t}}_{\text{Primary Surplus}} \tag{1}$$

- **Debt service** $V_t \cdot r_t$
- The **total deficit** is $V_t \cdot r_t - S_{t+1}$
- **Nominal return** r_t, all sources of payments to debt holders (Hall and Sargent, 2011):
  - explicit ones, (coupon payments and principal repayments)
  - and implicit ones (capital gains, e.g., from interest rate changes)

Budget Identity and Unexpected Inflation

Federation (Cochrane, 2020)

Linearising the **flow constraint** and taking expectations, we obtain an expression for unexpected inflation:

$$\overbrace{\Delta\mathbb{E}_{t+1}\left(\pi_{t+1} - r_{t+1}\right)}^{\text{Current Real Returns}} = -\sum_{j=0}^{\infty} \Delta\mathbb{E}_{t+1}\left(\overbrace{s_{t+1+j}}^{\text{Fiscal Adjustment}} + \overbrace{g_{t+1+j}}^{\text{Growth}}\right) + \underbrace{\sum_{j=1}^{\infty} \Delta\mathbb{E}_{t+1}\left(r_{t+1+j} - \pi_{t+1+j}\right)}_{\text{Future Real Returns}} \quad (2)$$

- **One central bank, one fiscal authority**
- Federal issuance of debt
- **Single yield curve** and common returns

Budget Identity and Unexpected Inflation

Monetary Union

$$\overbrace{\Delta\mathbb{E}_{t+1}\left(\pi_{t+1} - \bar{r}_{t+1} - \sum_{i=1}^{n}\psi_{i,t}prem_{i,t+1}\right)}^{\text{Current Real Returns}} = -\sum_{j=0}^{\infty}\Delta\mathbb{E}_{t+1}\left(\overbrace{s_{t+1+j}}^{\text{Fiscal Adjustment}} + \overbrace{g_{t+1+j}}^{\text{Growth}}\right)$$
$$+ \underbrace{\sum_{j=1}^{\infty}\Delta\mathbb{E}_{t+1}\left(\bar{r}_{t+1+j} + \sum_{i=1}^{n}\psi_{i,t}prem_{i,t+1+j} - \pi_{t+1+j}\right)}_{\text{Future Real Returns}} \quad (2)$$

- **One central bank, many fiscal authorities**
- National issuance of debt
- Risk and term premia country-specific

Budget Identity and Unexpected Inflation

Monetary Union

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- **Joint dynamics** can depend on the composition of debt...
- ... and heterogeneous behaviour at country-level
- (Differential growth and inflation can be important... we abstract from those)

The Empirical Model

Bayesian VAR

- Large VAR including 20 variables for France, Germany, Italy, Spain and EA
- Sample 1991q2 to 2019q4
- Dogmatic prior on the steady state of the VAR, consistent with our linearization:
  - **Debt-to-GDP ratios:** stationary at historical average.
  - **Primary surplus:** balanced in the steady state.
  - **Real GDP growth:** $g^\star = 1.5\%$, close to the sample average.
  - **Inflation:** $\pi^\star = 1.9\%$, "below, but close, to 2% over the medium term".
  - **Nominal returns:** $r^\star = g^\star + \pi^\star = 3.4\%$.
- "Minnesota"-style priors to shrink the parameter estimates towards stationarity

Details

Identification: Zero, Sign and Narrative Restrictions

	Conventional			Unconventional		
	Impact	Short Run (2Q)	Long Run	Impact	Short Run (2Q)	Long Run
Euro Area GDP	$+$		0	$+$		0
Euro Area inflation	$++$	$++$		$++$	$++$	
Euro Area inflation exp.	$+$	$+$		$+$	$+$	
3-m OIS rate	$--$			$-$		
Germany 10-year yield	$-$			$--$		
France 10-year yield	$-$			$--$		
Italy 10-year yield	$-$			$--$		
Spain 10-year yield	$-$			$--$		

- **Narrative Restriction 1:** The increases in 3-month OIS in **Q3 2008** and **Q1 2011** were mostly due to contractionary **conventional monetary policy** shocks
- **Narrative Restriction 2:** The decline in long-term yields in **Q1 2015** was mostly due to expansionary **unconventional monetary policy** shocks

Monetary Policy and Bond Returns

Unexpected decrease in **interest rates:**

- Decreases longer term bond yields
- Bond prices, which move inversely to yields, rise on impact
- Positive return to today's long-term bond holders
- Forward looking returns, however, decrease
- A government seeking to issue new long-term debt tomorrow will face lower servicing costs

- **Remark 1:** Unconventional policies, such as forward guidance and QE, which target long-term yields directly, will have a bigger effect on governments' financing rates the longer the maturity structure.

- **Remark 2:** The transmission of unconventional policies is heterogeneous across countries due to maturity structure and risk

Conventional Monetary Policy Shock

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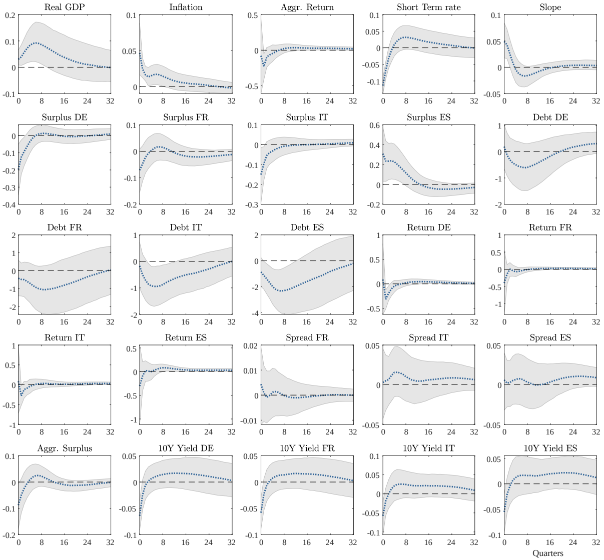

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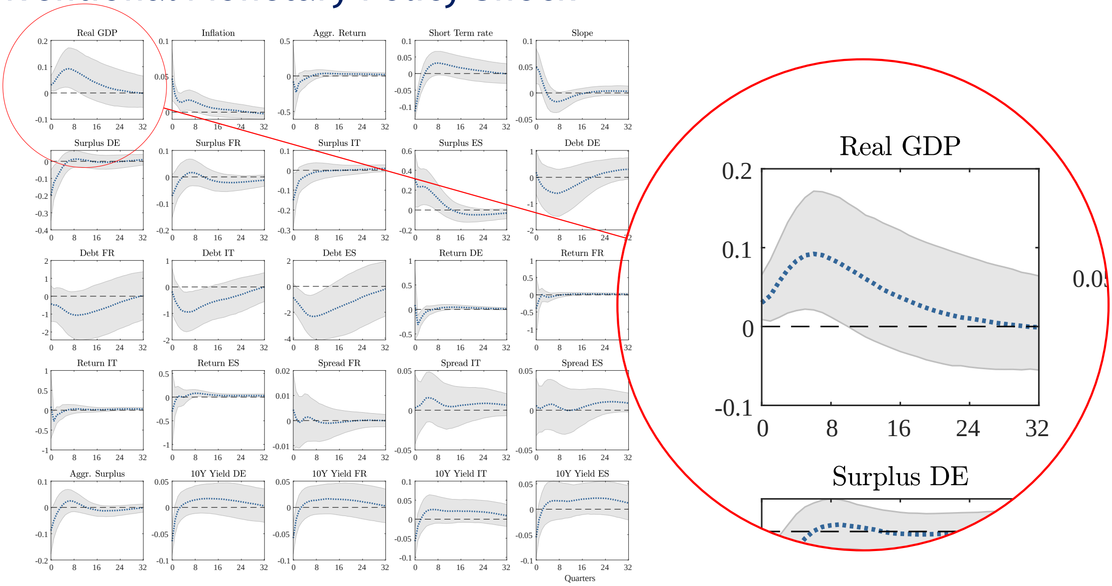

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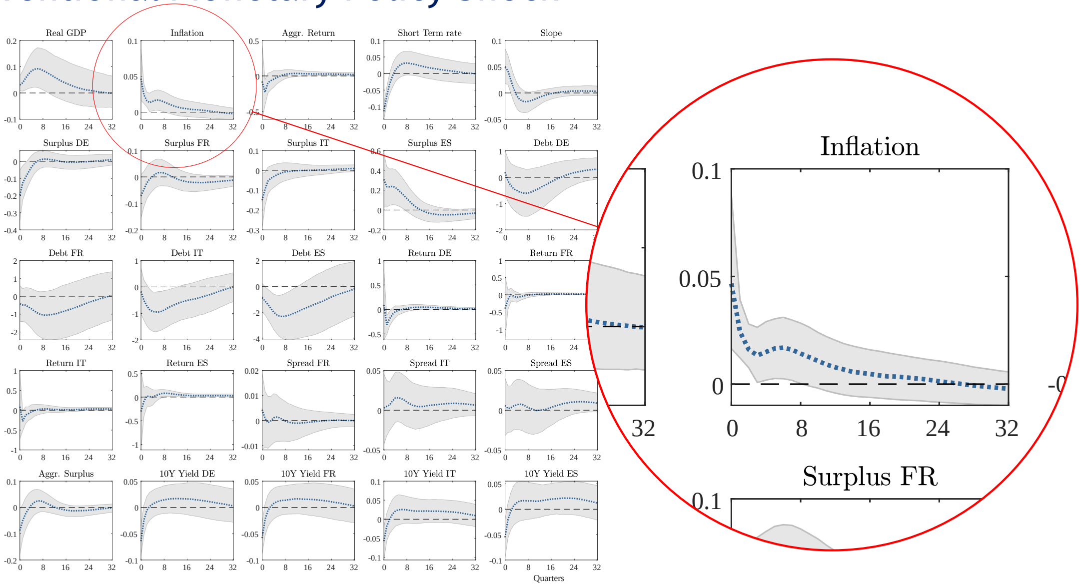

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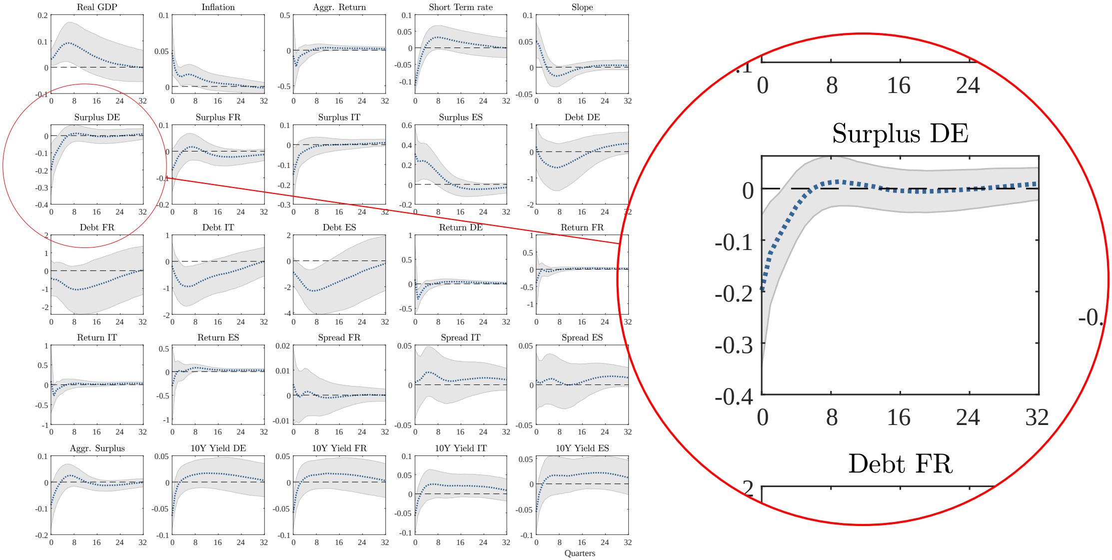

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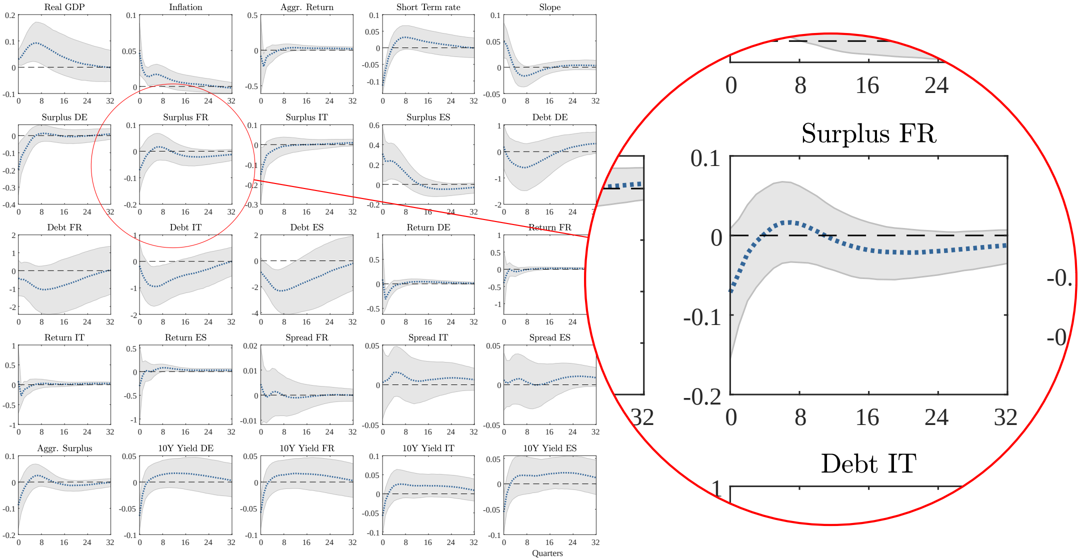

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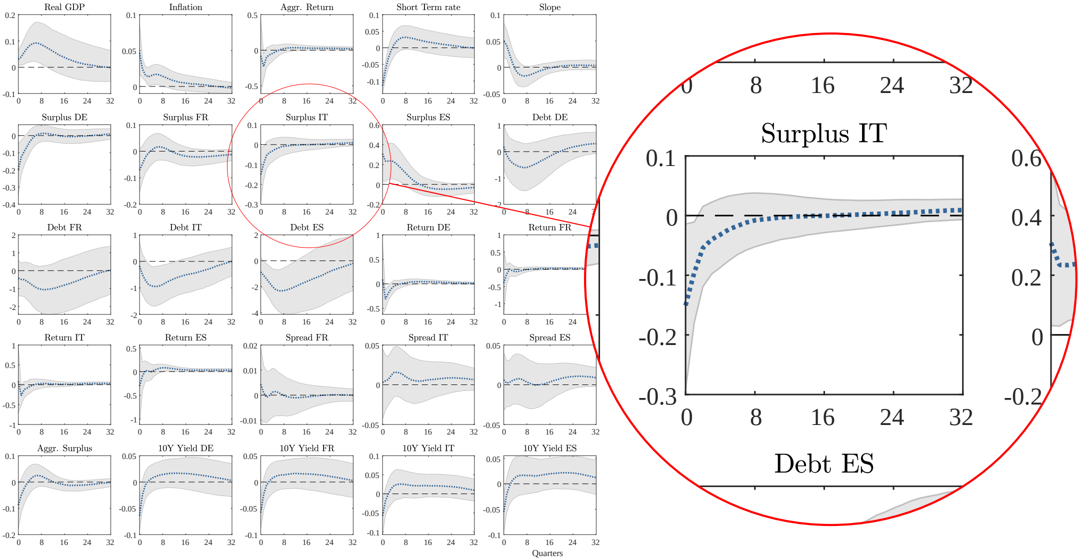

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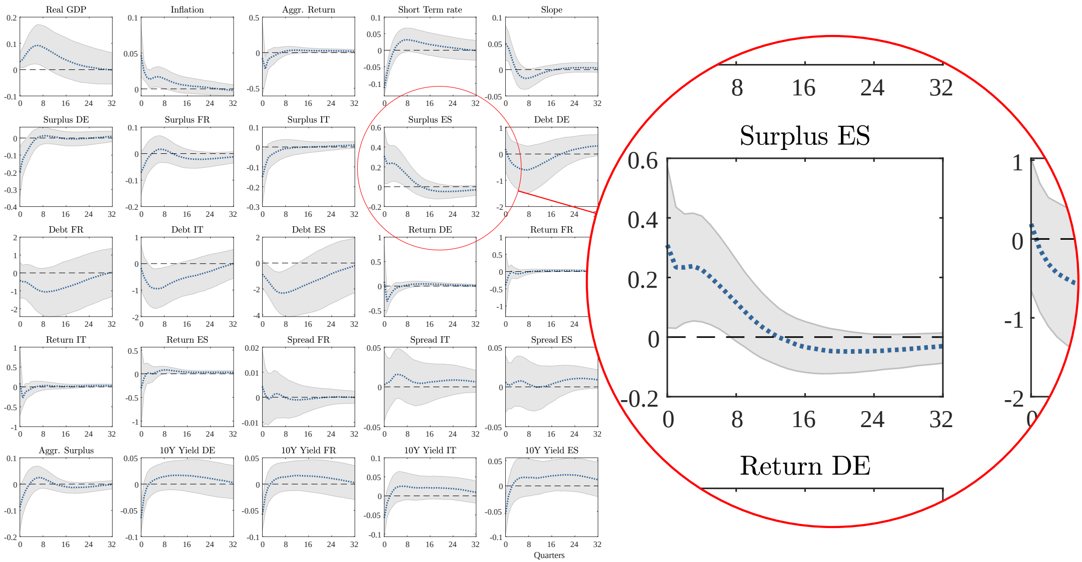

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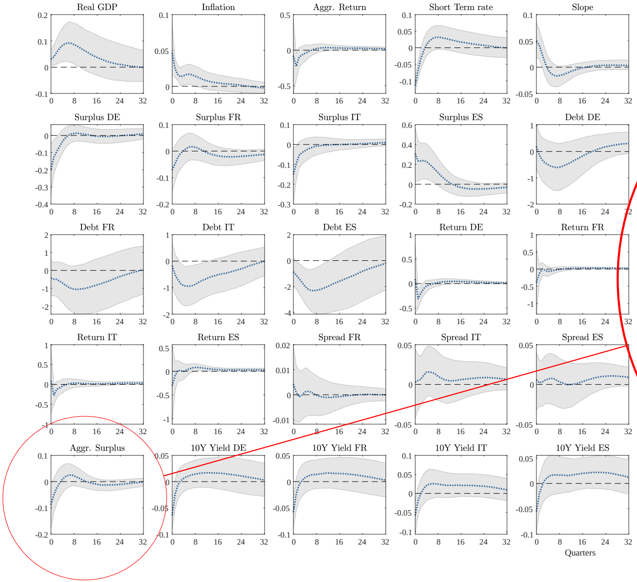

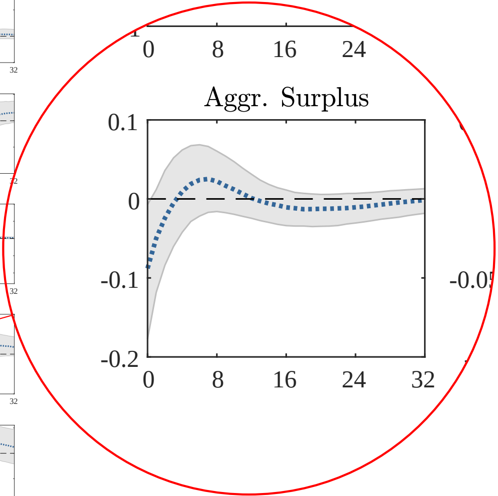

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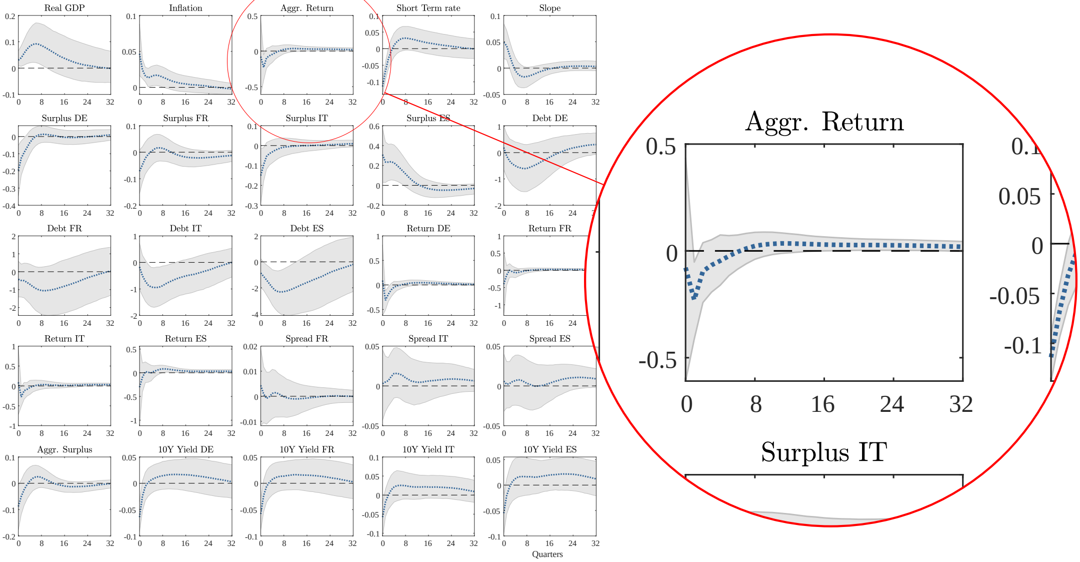

Conventional Monetary Policy Shock

Variable / Country	Germany	France	Italy	Spain	**Total**
L.H.S. Eq. (2)					$\sum_i$
$\Delta\mathbb{E}_{t+1}\pi_{t+1}$					0.05
$-\Delta\mathbb{E}_{t+1}\psi_{i,t}r_{i,t+1}$	$-(0.03)$	$-(-0.1)$	$-(0.02)$	$-(-0.04)$	$-(-0.09)$
R.H.S. Eq. (2)					$\sum_i$
$-\Delta\mathbb{E}_{t+1}\sum_{j=0}^{\infty} g_{t+j+1}$					0
$-\Delta\mathbb{E}_{t+1}\sum_{j=0}^{\infty} \psi_{i,t}s_{i,t+1+j}$	$-(0)$	$-(-0.16)$	$-(-0.05)$	$-(0.12)$	$-(-0.1)$
$\Delta\mathbb{E}_{t+1}\sum_{j=1}^{\infty} \psi_{i,t}r_{i,t+1+j}$	0.01	-0.02	0.04	0.13	0.15
$-\Delta\mathbb{E}_{t+1}\sum_{j=1}^{\infty} \pi_{t+1+j}$					$-(0.12)$

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Summary of Results – Conventional MP Expansion

Surprise decrease in short-term interest rates:

- The responses of returns are ambiguous
- Monetary-fiscal **coordination**, rather than crosswinds:
  - The aggregate primary surplus decreases in the short run
  - The cumulated aggregate primary surplus' response **seems to** be negative in the long run
- Cumulative response of inflation is positive, indicating a small positive effect on price level

Unconventional Monetary Policy Shock

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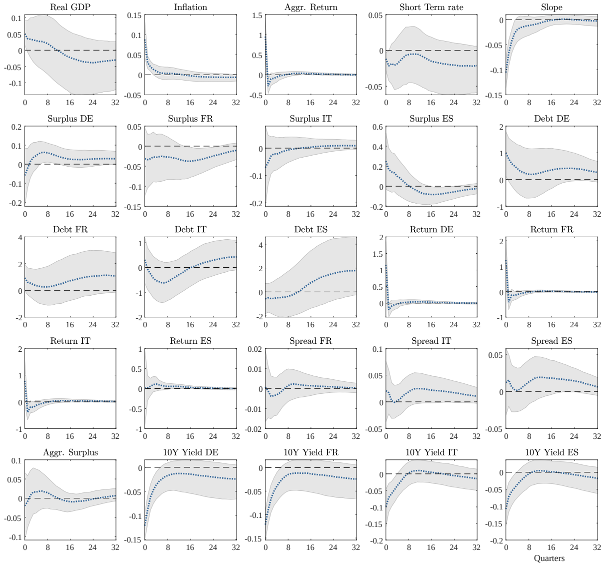

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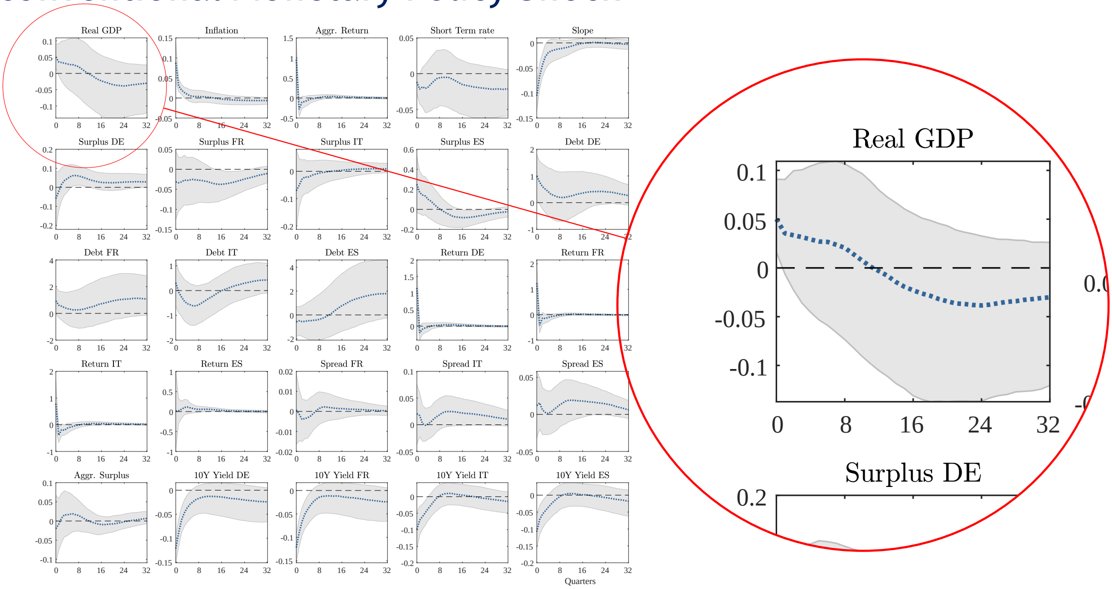

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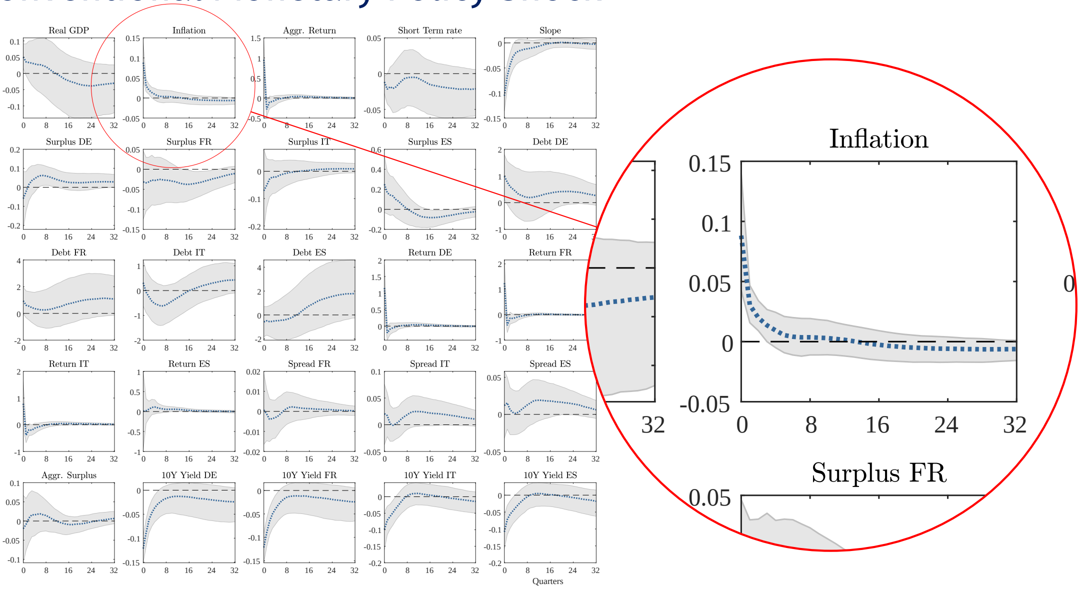

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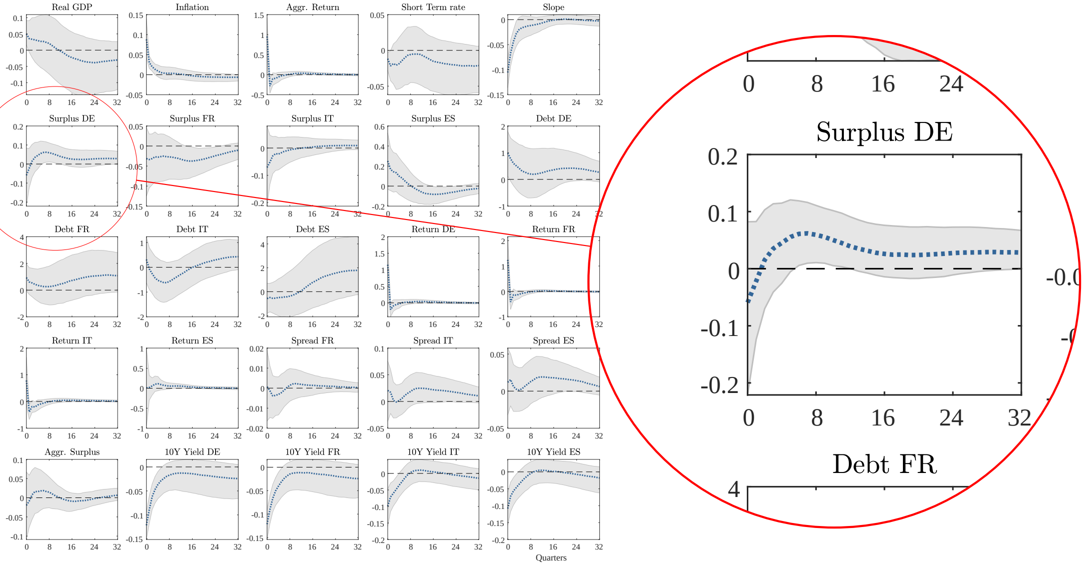

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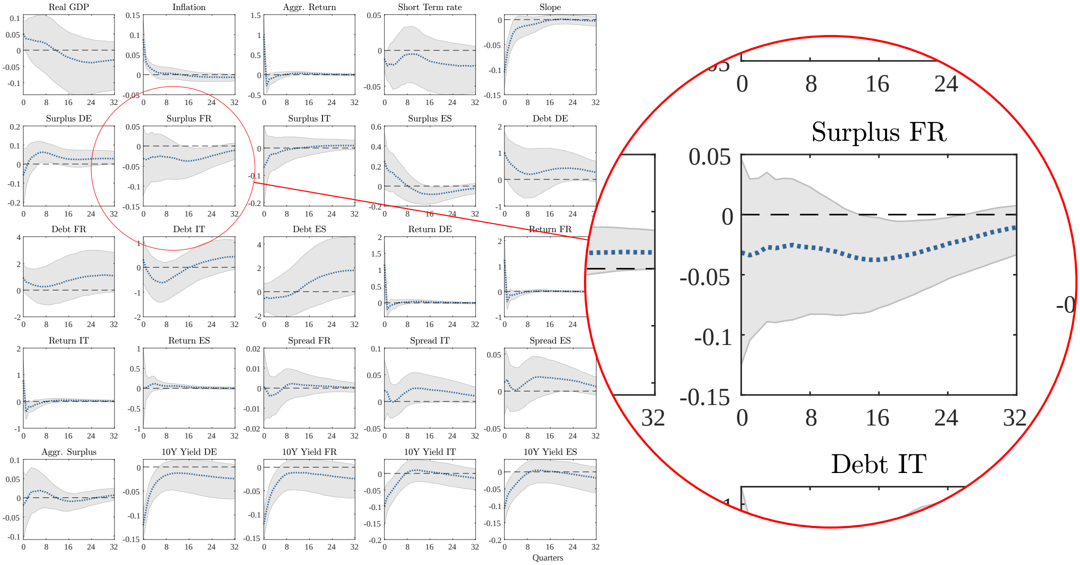

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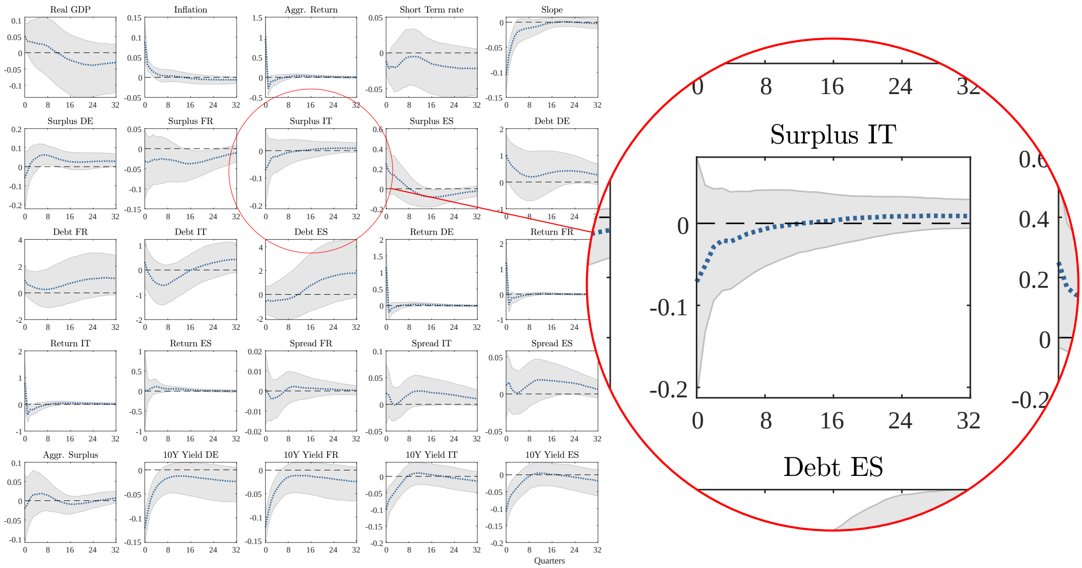

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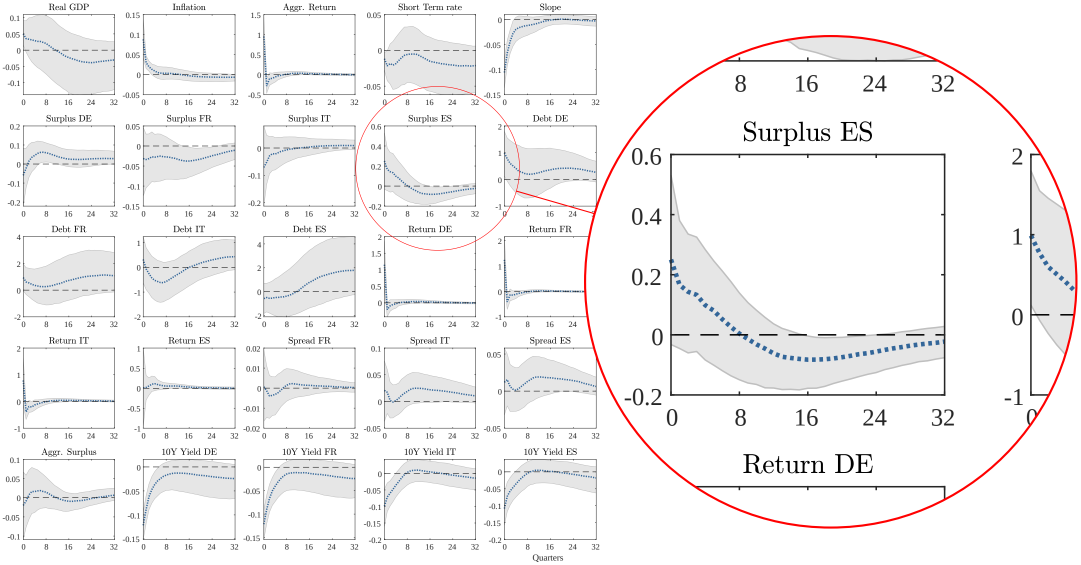

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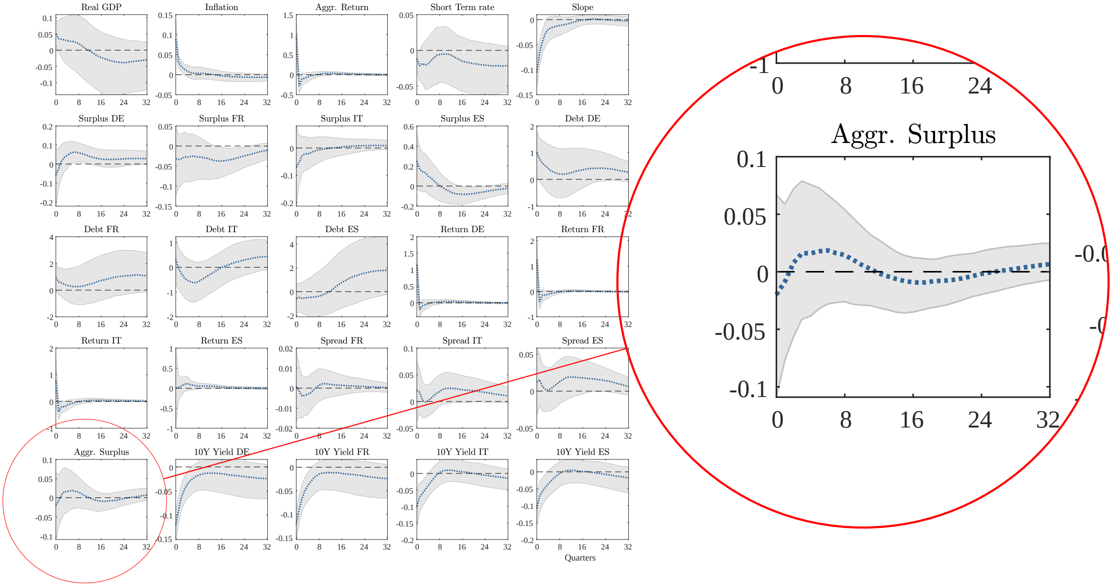

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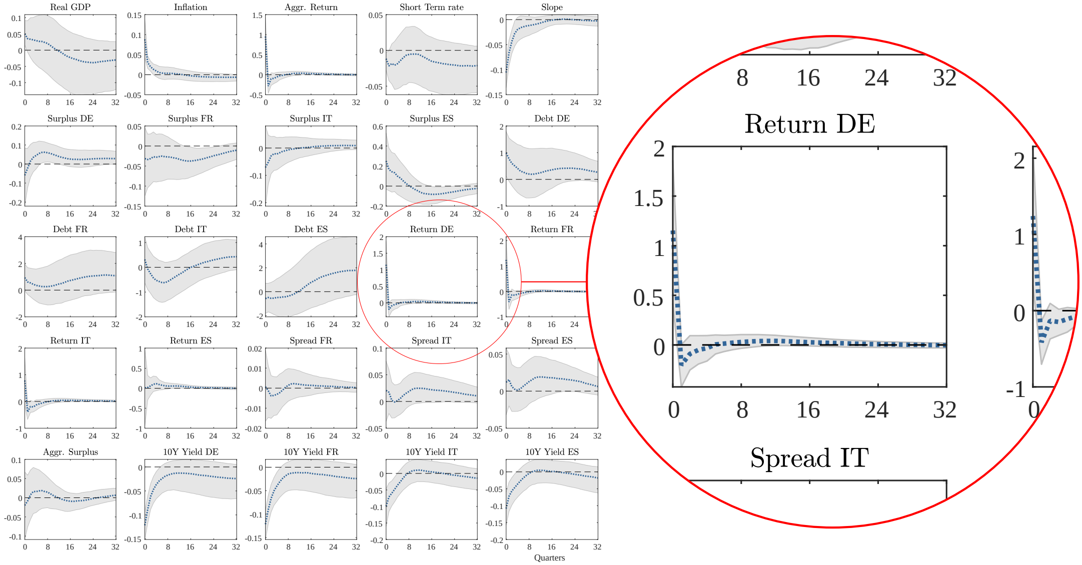

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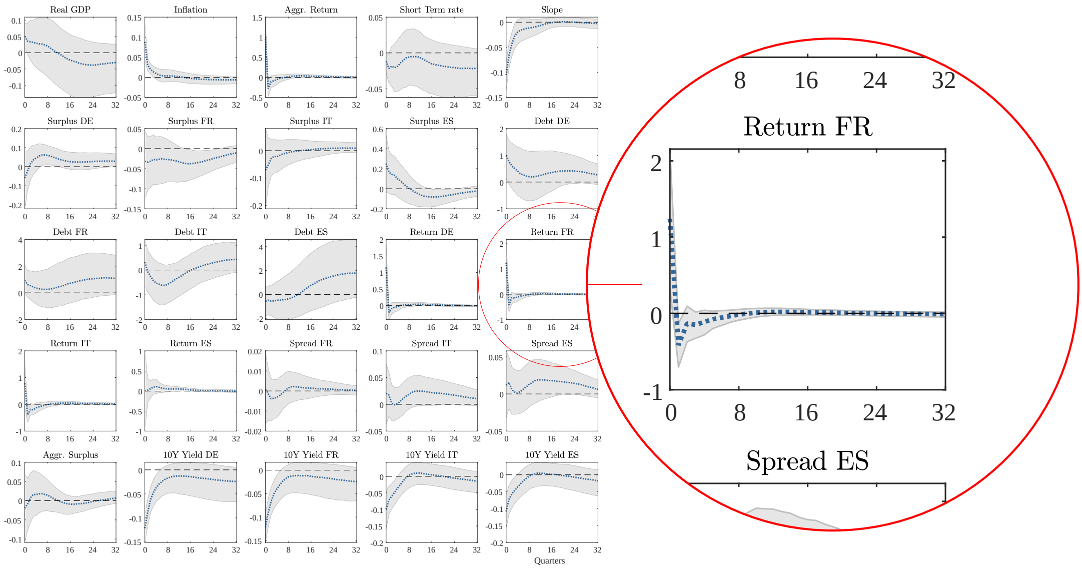

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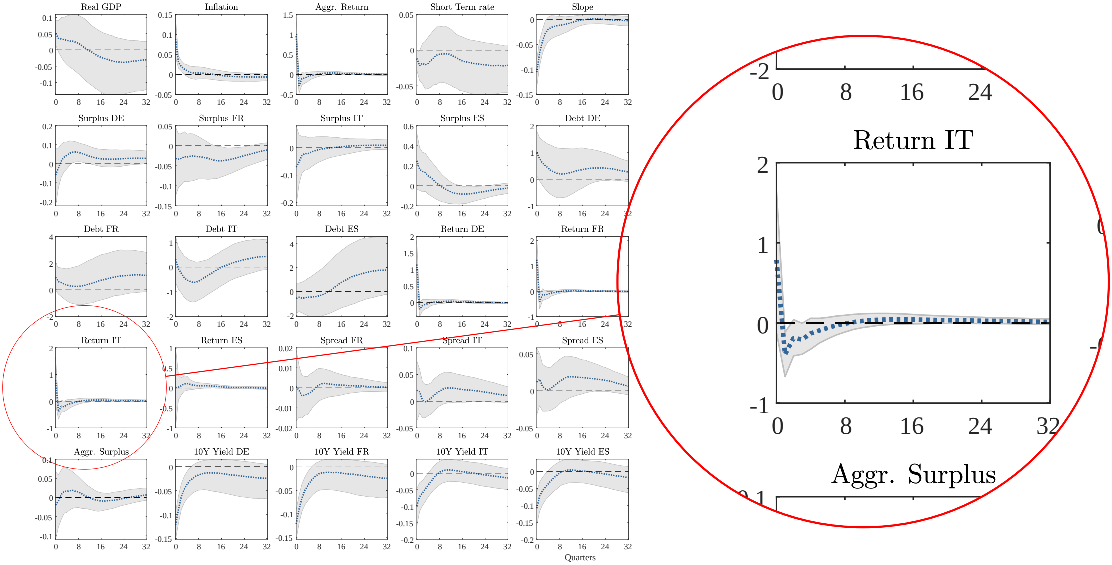

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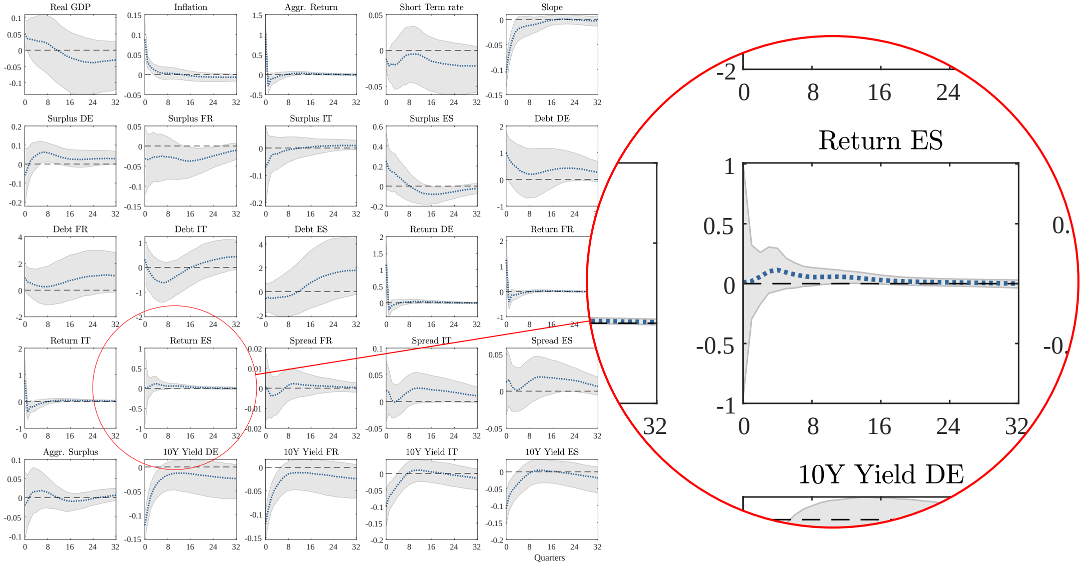

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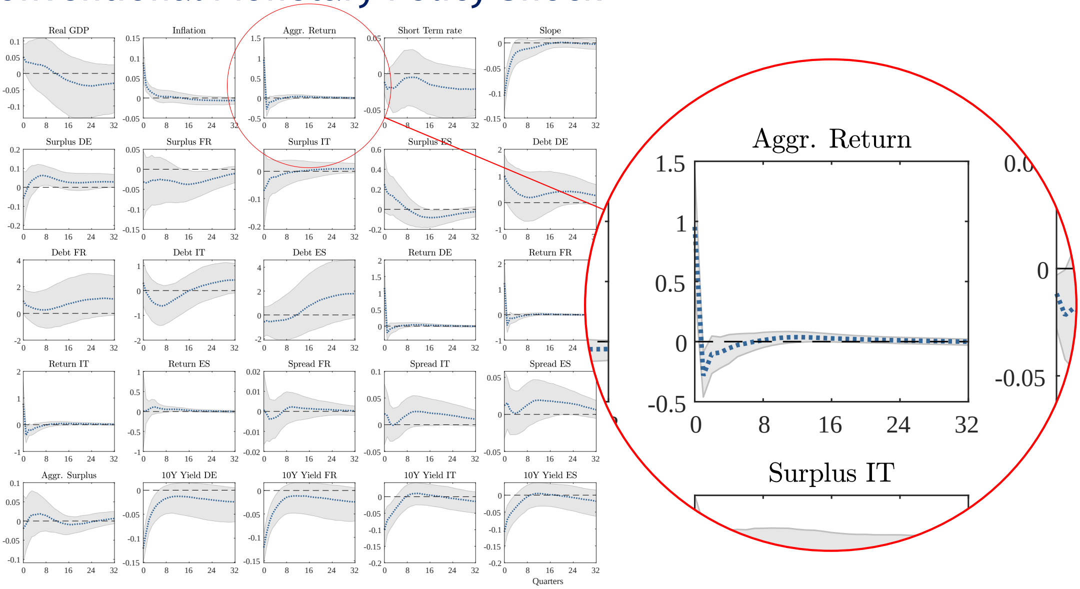

Unconventional Monetary Policy Shock

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$\Delta\mathbb{E}_{t+1}\pi_{t+1}$					0.09
$-\Delta\mathbb{E}_{t+1}\psi_{i,t}r_{i,t+1}$	$-(0.43)$	$-(0.34)$	$-(0.17)$	$-(0)$	$-(0.95)$
R.H.S. Eq. (2)					$\sum_i$
$-\Delta\mathbb{E}_{t+1}\sum_{j=0}^{\infty} g_{t+j+1}$					0
$-\Delta\mathbb{E}_{t+1}\sum_{j=0}^{\infty} \psi_{i,t}s_{i,t+1+j}$	$-(0.6)$	$-(-0.33)$	$-(-0.08)$	$-(-0.05)$	$-(0.14)$
$\Delta\mathbb{E}_{t+1}\sum_{j=1}^{\infty} \psi_{i,t}r_{i,t+1+j}$	0.03	-0.48	-0.21	-0.03	-0.69
$-\Delta\mathbb{E}_{t+1}\sum_{j=1}^{\infty} \pi_{t+1+j}$					$-(-0.01)$

Unconventional Monetary Policy Shock

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$-\Delta\mathbb{E}_{t+1}\sum_{j=1}^{\infty}\pi_{t+1+j}$					$-(-0.01)$

Summary of Results – Unconventional MP Expansion

Surprise decrease in long-term interest rates:

- The response of the aggregate returns is unambiguously positive on impact, then negative
- Cumulative response of inflation is twice smaller than in the Conventional MP case
- Monetary-fiscal **crosswinds**, rather than coordination:
  - The aggregate primary surplus' response is ambiguous in the short run
  - The cumulated aggregate primary surplus' response **seems to** be positive in the long run
  - ... largely due to the idiosyncratic behaviour of **Germany**

Conclusions

Conclusions

- Monetary-fiscal interactions are **important** in the transmission of both Conventional and Unconventional policies
- Our results are indicative of monetary-fiscal **coordination** in the Conventional MP case, and **crosswinds** in the Unconventional MP case
- A potential explanation of the small effects on inflation of unconventional monetary policy easing is that fiscal policy in **Germany leaned against it**
- Results seem to be robust in the short-run. Long-run tables are more sensitive to assumptions such as the dogmatic prior on the steady state
- **More coordination desirable** in the latter case when monetary policy less effective

Prior

Prior

Standard Normal-Inverse Wishart prior on the reduced form coefficients:

- Centred around autoregressive coefficients being 0 for real GDP growth, inflation minus inflation expectations, returns
- Centred around autoregressive coefficients being 0.5 for more persistent variables – i.e. short-term interest rate, slope of the yield curve, spreads, surpluses, and debt values
- Centred around an autoregressive coefficient equal to 1 for inflation expectation
- Tightness of the prior increases with the lag length and is governed by a parameter λ which we set to 0.1

Back