

Other days, other ways?

Fiscal and monetary policy reaction functions over the past seven decades

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Contributions

We investigate the evolution of fiscal (FP) and monetary (MP) policy reaction functions since the Second World War. We find:

▷ Both MP and FP have become increasingly responsive to changes in economic activity over time.

▷ FP exhibits pronounced asymmetry, with stronger counter-cyclical reactions in downturns than in upturns. MP responds evenly to economic cycles.

▷ FP has become more sensitive to interest rates over time. By contrast, MP shows limited responsiveness to debt levels.

Motivation

▷ Sustained decline in interest rates and concurrent rise in debt levels since the 1980s.

▷ Reduced firepower of policy tools.

▷ Have systematic patterns in policy responses contributed to these trends?

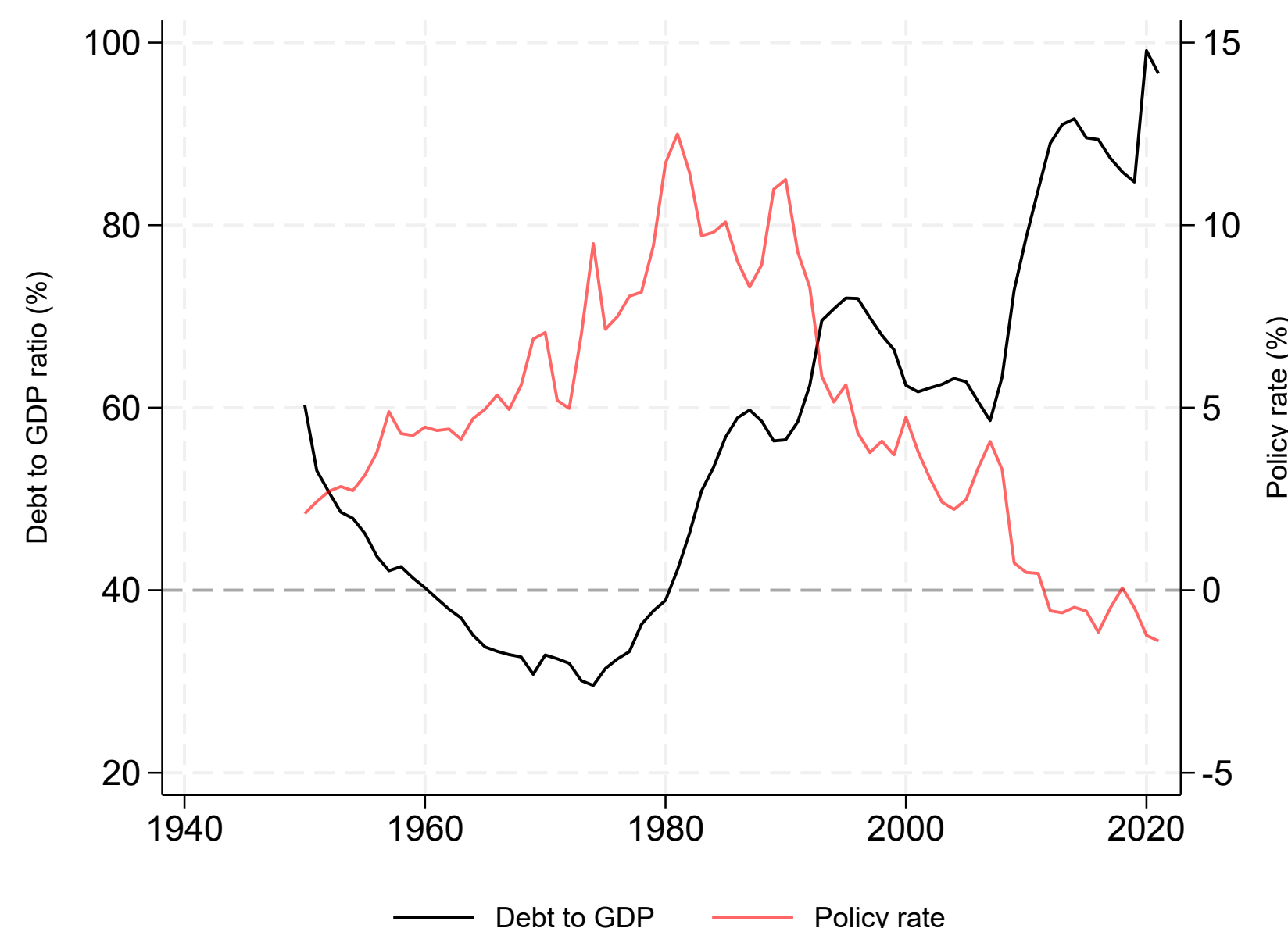


Figure: Historical evolution of policy rates and debt levels (17 AEs).

Data

Annual data: 17 AEs from 1950-2019 - Quarterly data: 10 AEs from 1995q1-2019q4

• Key monetary variables: Consensus Economics, Fagan et al.(2005), IMF, Jordà et al. (2017), Krippner (2013), OECD.

• Key fiscal variables: BIS, IMF, Eurostat, OECD.

Baseline specification

▷ Baseline MP reaction function follows Taylor (1999):

$$r_{i,t} = \rho r_{i,t-1} + (1 - \rho)(\alpha + \beta_1 \pi_{i,t} + \beta_2 Debt_{i,t} + \beta_3 \pi_{i,t} \times Debt_{i,t} + \beta_4 \hat{y}_{i,t}) + \beta_5 X_{i,t} + \xi_{i,t}$$

where:

- $r_{i,t}$: Policy rate in country i in year t (proxied by shadow rate after 2008)
- $\pi_{i,t}$: Headline inflation in country i in year t
- $\hat{y}_{i,t}$: Output gap in country i in year t

▷ Baseline FP reaction function follows Bohn (1998):

$$pb_{i,t} = \alpha_0 + \alpha_1 d_{i,t-1} + \alpha_2 \hat{y}_{i,t} + \alpha_3 X_{i,t} + \epsilon_{i,t}$$

where:

- $pb_{i,t}$: Primary balance of country i in year t
- $d_{i,t-1}$: Lagged level of sovereign debt relative to GDP.
- $\hat{y}_{i,t}$: Output gap
- $X_{i,t}$: Vector of control variables

Historical policy reaction functions

▷ We run 25Y rolling windows of MP and FP reaction functions from 1950 to 2019:



Figure: 25Y rolling window estimations of policy reaction functions.

▷ Sensitivity of MP and FP to output gap has grown over time.

Asymmetry

▷ We allow the responses of the primary balance and policy rate to differ in periods of negative and positive output gap:

MP:

Policy rate	(1)	(2)	(3)
Lagged policy rate	0.814*** (0.0205)	0.764*** (0.0413)	0.767*** (0.0422)
Inflation	0.192*** (0.0258)	0.193*** (0.0329)	0.192*** (0.0306)
Output gap	0.285*** (0.0622)	0.272*** (0.0660)	
Output gap (>0)			0.227*** (0.0879)
Output gap (<0)			0.302*** (0.0580)
Sovereign debt		-0.00756** (0.00334)	-0.00725** (0.00338)
Long-term coefficient on inflation	1.03 (0.133)	0.82 (0.155)	0.82 (0.151)
Long-term coefficient on output gap	1.53 (0.374)	1.15 (0.409)	-
Observations	630	627	627
No. of countries	9	9	9
R-squared	0.888	0.890	0.889
Wald output gap test	-	-	0.074

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

FP:

Primary balance	(1)	(2)	(3)	(4)
Lagged debt	0.0255*** (0.00970)	0.0193* (0.00985)	0.0210** (0.0102)	0.0224** (0.0102)
Output gap	0.530*** (0.0722)	0.578*** (0.0579)	0.565*** (0.0617)	
Output gap (>0)				0.455*** (0.0914)
Output gap (<0)				0.675*** (0.0723)
Real expenditure gap		-0.121*** (0.0319)	-0.126*** (0.0317)	-0.124*** (0.0303)
Inflation		-0.0951** (0.0393)	-0.161*** (0.0436)	-0.157*** (0.0436)
Effective int. rate paid on debt			0.228*** (0.0594)	0.230*** (0.0632)
Observations	1200	1200	1200	1200
No. of countries	17	17	17	17
R-squared	0.277	0.487	0.543	0.549
Wald output gap test	-	-	-	0.22*

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

▷ FP responds asymmetrically to economic cycles. MP reacts more evenly.

Monetary and fiscal policy interactions

▷ We extend the FP and MP reaction functions as follows: MP:

$$r_{i,t} = \rho r_{i,t-1} + (1 - \rho)(\alpha + \beta_1 \pi_{i,t} + \beta_2 Debt_{i,t} + \beta_3 \pi_{i,t} \times Debt_{i,t} + \beta_4 \hat{y}_{i,t}) + \beta_5 X_{i,t} + \xi_{i,t}$$

where $Debt_{i,t}$ is the sovereign debt to GDP in country i in year t .

FP:

$$pb_{i,t} = \alpha_0 + \alpha_1 d_{i,t-1} + \alpha_2 iir_{i,t} + \alpha_3 d_{i,t-1} \times iir_{i,t} + \alpha_4 \hat{y}_{i,t} + \alpha_5 X_{i,t} + \epsilon_{i,t}$$

where $iir_{i,t}$ is the effective interest rate paid on sovereign debt by country i in year t .

▷ We plot the conditional reaction of MP for different levels of debts

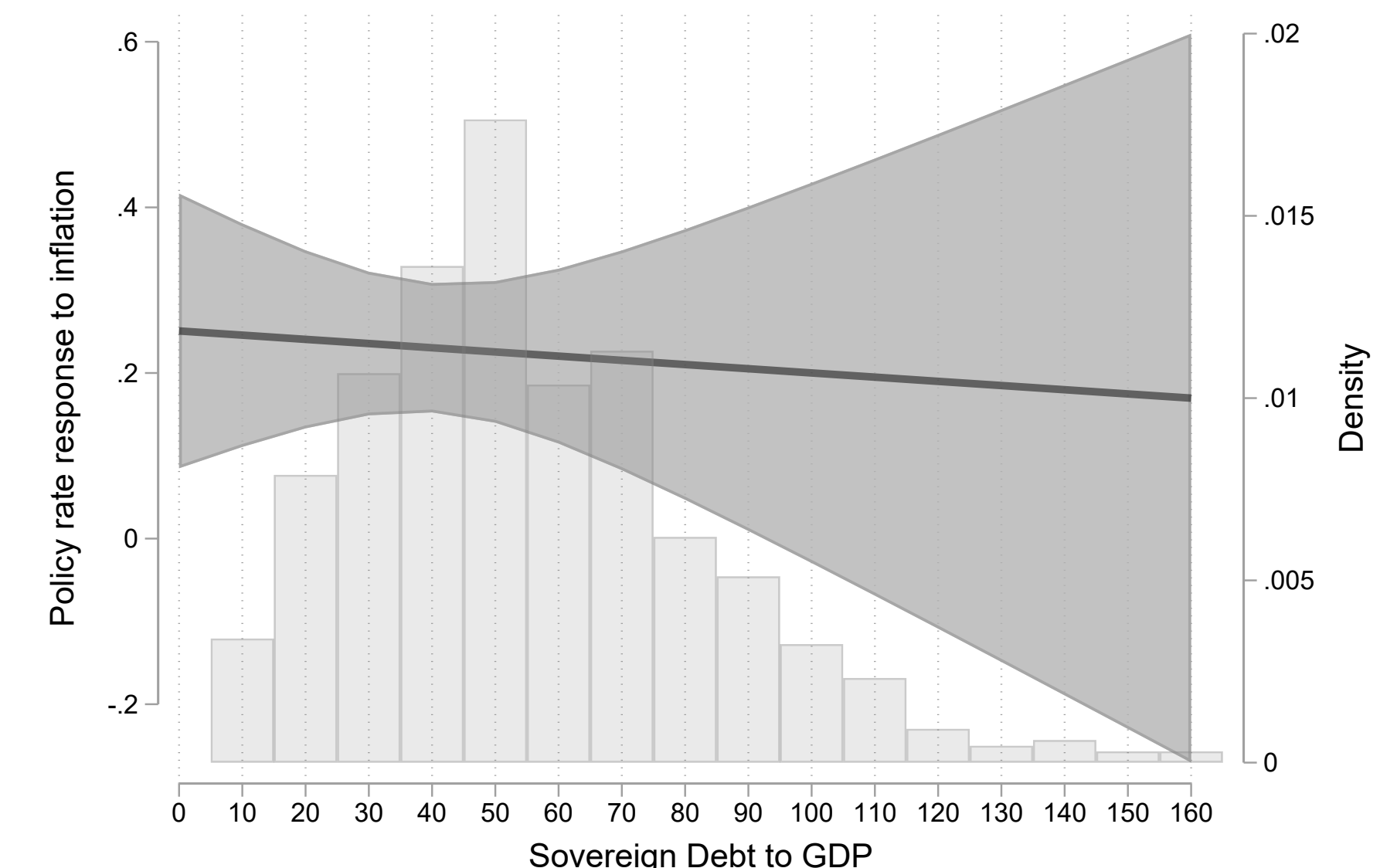


Figure: Impact of debt levels on policy rate reaction to inflation

▷ We plot the conditional reaction FP for different levels of interest rates.

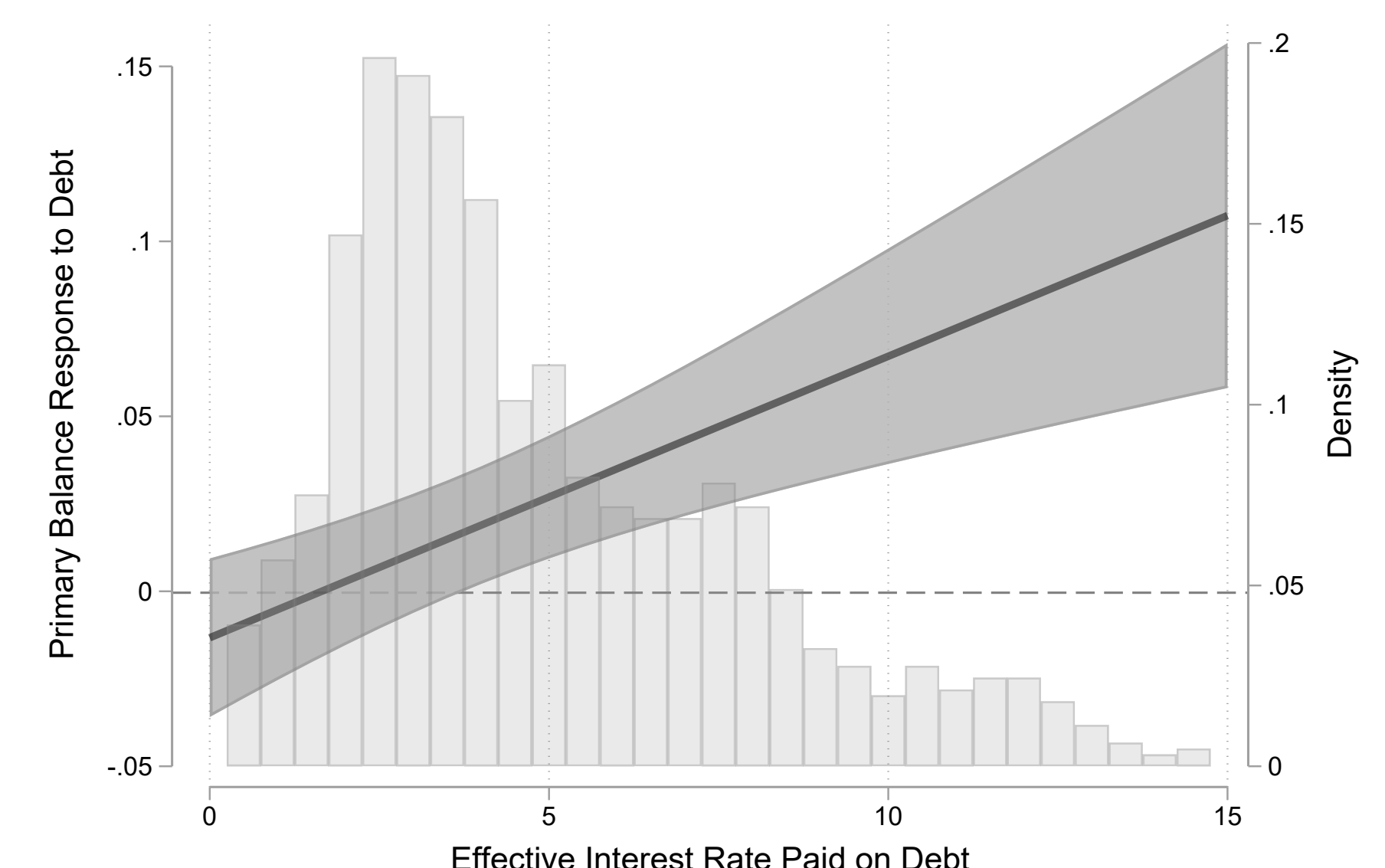


Figure: Impact of interest rates on primary balance reaction to debt

▷ Prevailing interest rates influence the fiscal stance but debt levels do not influence the monetary policy stance.

Conclusions

▷ Limited policy tool firepower leads to increased difficulties in restoring economic stability, preventing debt distress, and averting potential economic crises.

▷ Stronger policy sensitivity to economic cycles, coupled with asymmetric responses, amplifies the drift of policy instruments amidst successive negative economic shocks.

▷ Even if debt service costs revert to pre-tightening cycle levels, there are limited opportunities for further rate decreases to extend fiscal space.

▷ In the ST: Policy tools must work (better) together to restore economic stability.

▷ In the LT: MP and FP should revert to a position with sufficient space to maneuver economic fluctuations.