Euro Area Economic Analysis

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Contents

1 Data and Methodology

I use a number of different datasets from the instructions to create `final_data.csv`. This data is organized by country-month.

- `sovereign_yield` is obtained from the Maastricht criterion interest rates from the Eurostat Database.
- `mps_shock_ois2y` is obtained from the EA-MPD provided by Altavilla et al. (2019). I sum up the monetary policy shocks using OIS 2-year data.
- The following three columns are obtained from the ECB Data Portal:
  - `gov_debt_gdp` is derived from "Government debt (consolidated), percent of GDP, Euro area 20, Annual."
  - `hh_held_gov_debt_gdp` is derived from "Government debt held by residents, percent of GDP, Euro area 20, Annual."
  - `hh_debt_to_gov_debt` is calculated by taking the ratio of "Loans granted to households, ratio of GDP, Euro area 20, Quarterly" against "Government debt (consolidated), percent of GDP, Euro area 20, Annual."

2 Data Summary

Table 1 shows summary statistics winsorized at 1% and 99%. Figures 1 and 2 show nominal sovereign yields and debt to GDP ratios for Germany, Greece, and the Eurozone.

Table 1: Summary Statistics across Country-Months (Winsorized)

Variable	Mean	Median	SD	IQR	Observations
gov_debt_gdp	0.642	0.598	0.336	0.396	8711
hh_debt_to_gov_debt	1.057	0.722	0.897	0.639	7626
hh_held_gov_debt_gdp	0.333	0.301	0.192	0.237	7020
mps_shock_ois2y	-0.093	-0.250	4.771	4.010	7623
sovereign_yield	4.891	4.270	3.558	3.900	11684

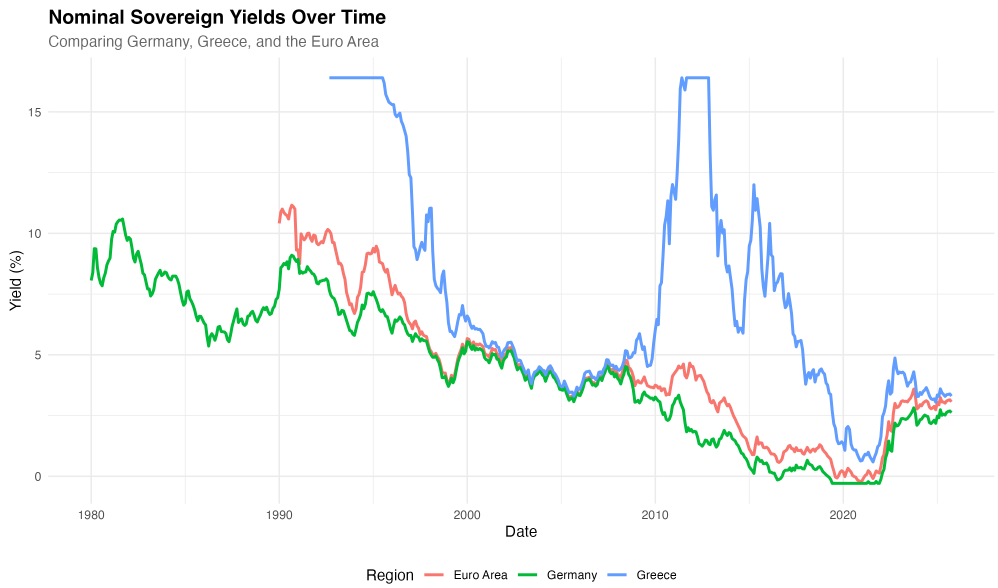

Figure 1

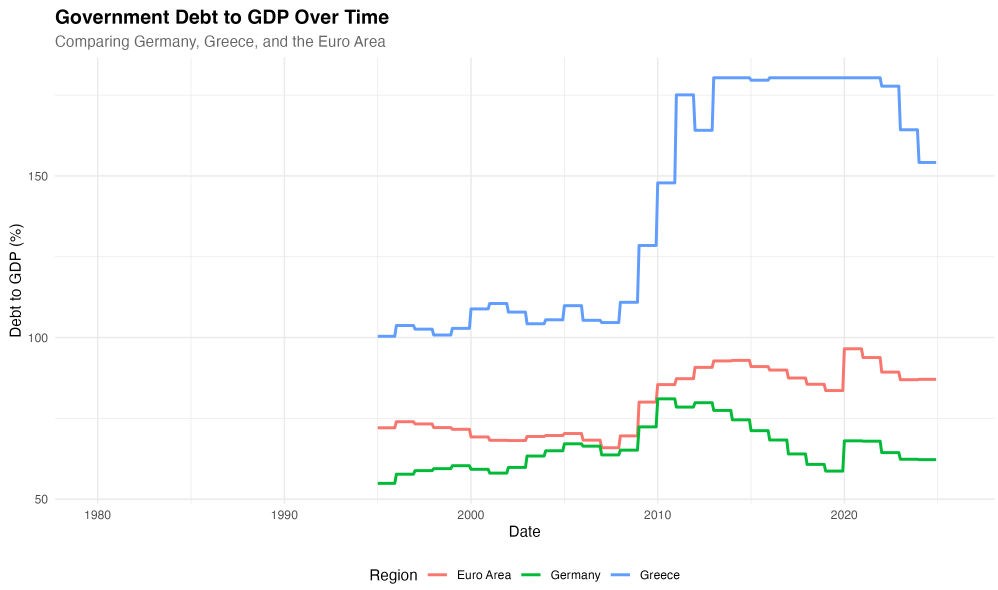

Figure 2

3 Regression Results

The figures below contain all regression results.

Table 2: Time-Series Regression of Sovereign Yields on MPS and Debt

Country	Variable	Estimate	Std. Error	t-stat	p-value
	Intercept	8.684	0.977	8.892	0.000
	MPS Shock (OIS 2Y)	-0.013	0.021	-0.598	0.550
[t]-3*DE	Govt Debt/GDP	-9.010	1.445	-6.236	0.000
	Intercept	6.259	0.217	28.905	0.000
	MPS Shock (OIS 2Y)	-0.002	0.016	-0.136	0.892
[t]-3*ES	Govt Debt/GDP	-3.614	0.277	-13.042	0.000

Notes:

Specification: $Y_{c,t+1} = betaMPS_t + gammaX_{c,t} + epsilon_{c,t}$.

Sample: Monthly obs for Germany (DE) and Spain (ES).

Data: Winsorized at 1st/99th percentiles.

Table 3: Panel Regression of Sovereign Yields on Monetary Policy Shocks

Variable	Estimate	Std. Error	t-stat	p-value
MPS Shock (OIS 2Y)	-0.002	0.002	-1.065	0.296

Notes:

Specification: $Y_{c,t+1} = betaMPS_t + alpha_c + alpha_t + epsilon_{c,t}$.

FEs: Country ($alpha_c$) and Calendar Month ($alpha_t$).

Sample: 7593 observations. Clustered SEs.

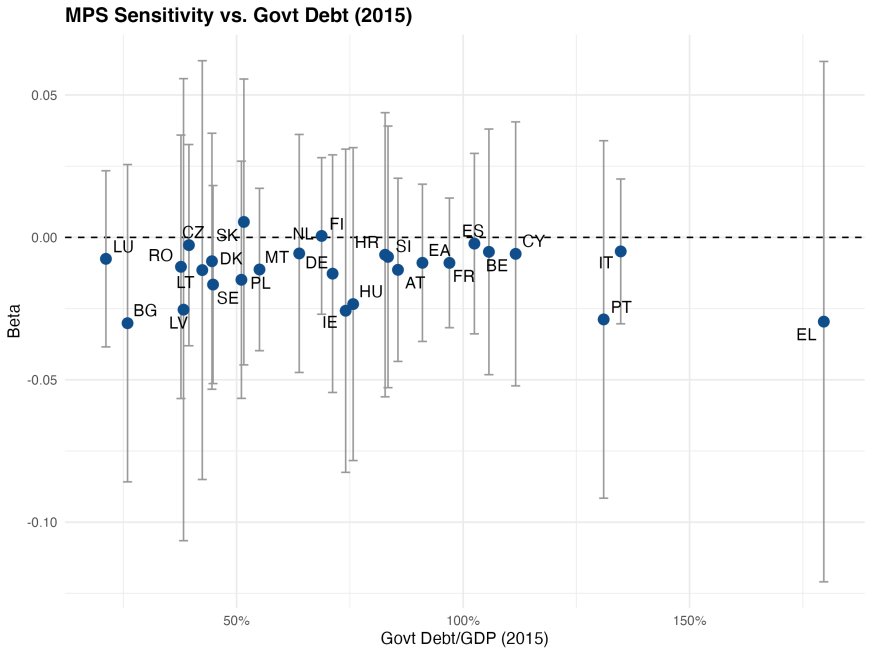

Figure 3

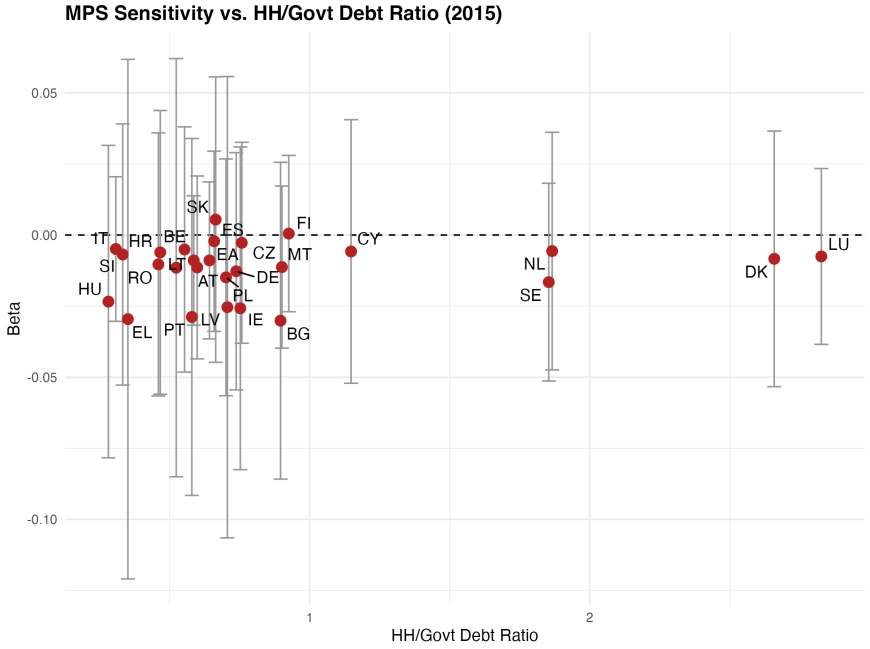

Figure 4

Table 4: Interaction Regressions (Continuous Debt Metrics)

Dependent Variable:	lead_yield		
Model:	(1)	(2)	(3)
Variables			
MPS	0.012**	-0.002	-0.009**
	(0.005)	(0.005)	(0.004)
Gov Debt	-2.22*		
	(1.27)		
MPS × Gov Debt	-0.023***		
	(0.008)		
HH-Held		-6.17***	
		(1.80)	
MPS × HH-Held		0.008	
		(0.015)	
HH Ratio			0.614**
			(0.252)
MPS × HH Ratio			0.004*
			(0.002)
Fixed-effects			
country	Yes	Yes	Yes
cal_month	Yes	Yes	Yes
Fit statistics			
Observations	6,889	5,534	6,485
Adjusted R^2	0.25771	0.28542	0.25807

Clustered (country) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table 5: Interaction Regressions (High-Debt Dummies)

Dependent Variable:	lead_yield		
Model:	(1)	(2)	(3)
Variables			
MPS	0.002	-0.0002	-0.006*
	(0.003)	(0.003)	(0.003)
High Debt (D)	-0.078		
	(0.618)		
MPS × High Debt (D)	-0.007		
	(0.006)		
High HH-Held (D)		-0.343	
		(0.422)	
MPS × High HH-Held (D)		-0.003	
		(0.006)	
High Ratio (D)			0.382
			(0.658)
MPS × High Ratio (D)			-0.0005
			(0.005)
Fixed-effects			
country	Yes	Yes	Yes
cal_month	Yes	Yes	Yes
Fit statistics			
Observations	6,889	5,534	6,485
Adjusted R^2	0.23438	0.23708	0.24467

Clustered (country) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

4 Discussion

The results indicate that the sensitivity of sovereign yields to monetary policy shocks is heterogeneous and depends on fiscal fundamentals, though the relationship is complex. In the aggregate panel regression (Table 3), the average effect of MPS on yields is statistically indistinguishable from zero, likely because the opposing responses of diverse economies cancel each other out. Indeed, country-specific regressions (Table 2) show near-zero sensitivity for both Germany and Spain individually. However, the cross-sectional analysis reveals a distinct pattern: Figures 3 and 4 demonstrate that countries with higher debt burdens generally exhibit higher estimated beta values, signifying greater vulnerability to monetary tightening. Paradoxically, the interaction model (Table 4) yields a negative and significant coefficient for the term MPS $\times$ Gov Debt, suggesting yields become *less* sensitive to tightening shocks as debt rises—a counter-intuitive result potentially driven by structural breaks like quantitative easing. The dummy variable specification (Table 5) remains statistically insignificant.

These findings must be interpreted with caution due to several data limitations, primarily endogeneity. High sovereign yields mechanically increase the debt-to-GDP ratio by raising servicing costs and depressing growth, creating reverse causality that biases the estimates. Furthermore, data obtained from the ECB (`gov_debt_gdp`, `hh_held_gov_debt_gdp`, `hh_debt_to_gov_debt`) is on an annual basis and not a monthly basis, which may lead to inaccuracies in the results. Finally, the model does not control for broader macroeconomic conditions such as inflation expectations or growth forecasts, which likely influence both policy decisions and yield movements, potentially confounding the estimated sensitivity.