

MONETARY UNIONS WITH HETEROGENEOUS FISCAL SPACE

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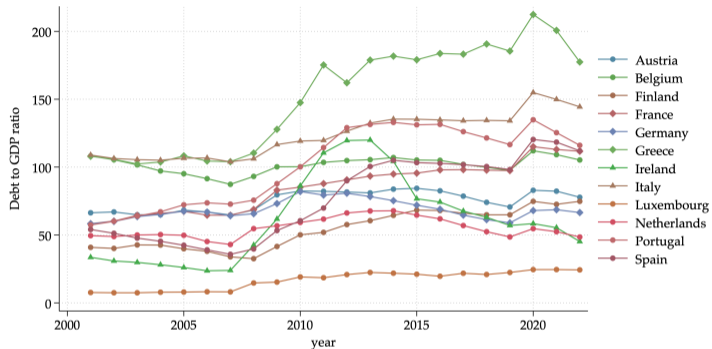
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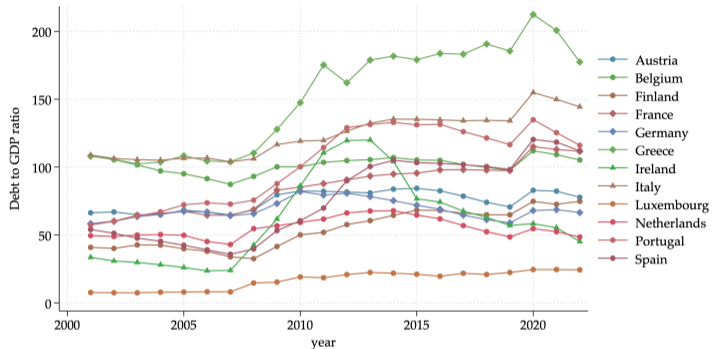
PUBLIC DEBT IN THE EUROZONE



Notes: Only countries that were members of the eurozone as of 2001 are included. Source: International Monetary Fund.

I Euro area: supra-national monetary authority, separate national fiscal authorities

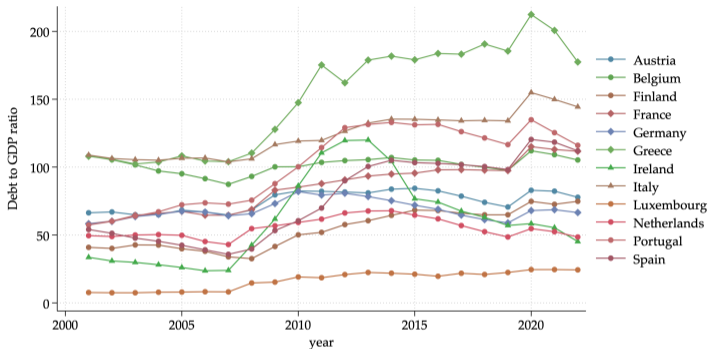
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What are the implications for monetary policy?

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Building on “The Regional Keynesian Cross” (Bellifemine, Couturier & Jamilov (2023))

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 - Consumption and inflation react more to MP shocks in high debt countries
- | Central bank faces a **stabilization-synchronization trade-off**
 - Response of MP to shocks stabilizes average inflation but transmits differently to countries
 - What architecture can alleviate the trade-off? / study policy proposals

MODEL

I Currency union with countries j , within-country incomplete markets:

$$\max_{\{c_{jit}, a_{jit}, g_t\}} E_0 \sum_{t=0}^{\infty} \beta^t u(c_{jit}, g_{jt}); \text{ s.t. } c_{jit} + a_{jit} = (1 - \delta)w_{jt}e_{jit} + t_{jt} + \frac{1 + i_t}{1 + r_{jt}} a_{jit-1}; a_{jit} \leq \bar{a}$$

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- Two consumption goods, tradables & non-tradables:

$$\text{Demand: } c_{jit} = D(c_{jit}^{NT}; c_{jit}^T); \quad ; \quad c_{jit}^T = T \left(c_{jit}^T(j^0) \right)_{j^0}^n;$$

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→ Only dimension of regional heterogeneity

- Fiscal reaction function + heterogeneous SS public debt:

$$B_{jt} - B_{jt-1} = \tau_{jt} - L_{jt} - L_j - b(B_{jt-1} - B_j); \quad B_{jt} - B_{jt-1} = D_{jt} + r_{jt}B_{jt}$$

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PUBLIC DEBT & MONETARY TRANSMISSION

| Government's budget constraint + fiscal rule:

$$\underbrace{D_{jt}}_{\{Z\}} \Big|_{\text{Primary def.}} = \underbrace{\frac{L(L_{jt} \quad L_j)}{\{Z\}} + \frac{B(B_{jt} \quad B_j)}{\{Z\}}}_{\text{Overall deficits (fiscal rule)}} \underbrace{r_{jt} B_{jt}}_{\{Z\}} \Big|_{\text{Debt serv. costs}}$$

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Mechanism: public debt ! budget exposure to int. rates ! absorbed by primary deficit

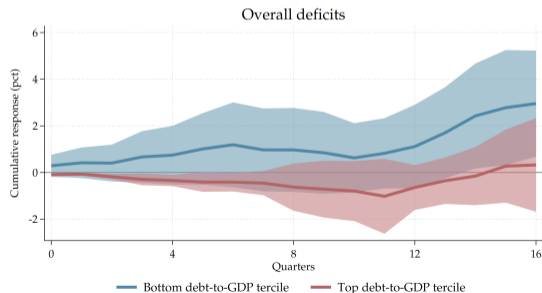
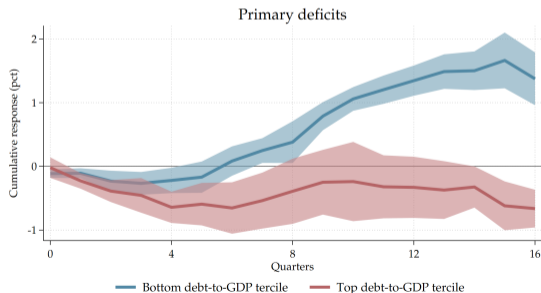
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$$\underset{\text{Direct eff.}}{\underbrace{b_j}_{\{Z\}}} = \underbrace{M^r}_{\{Z\}} \underset{\text{Fiscal react.}}{\underbrace{b_j}_{\{Z\}}} + \underbrace{M}_{\{Z\}} \underset{\text{Multiplier}}{\underbrace{b_j}_{\{Z\}}} + \underbrace{(1 \quad)}_{\{Z\}} \underbrace{M}_{\{Z\}} \underset{\text{Foreign demand}}{\underbrace{b_j}_{\{Z\}}} + \underbrace{M}_{\{Z\}} \underset{\text{Real wage}}{\underbrace{w_j}_{\{Z\}}} + \underbrace{M}_{\{Z\}} \underbrace{w_j^{NT} (1 \quad)}_{\{Z\}} \underset{\text{Expenditure switching}}{\underbrace{b_j}_{\{Z\}}}$$

$$b_j = d \log c_{j1}; d \log c_{j2}; \dots; \quad (M^r)_{ts} = \frac{\partial \log c_{jt}}{\partial \log(1 + r_{js})}; \quad (M^l)_{ts} = \frac{\partial \log c_{jt}}{\partial \log t_{js}}; \quad (M)_{ts} = \frac{\partial \log c_{jt}}{\partial \log y_{js}}; \quad b_j : \text{ToT}$$

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High public debt ! smaller primary deficit response ! larger consumption response

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New Keynesian Phillips curve: larger consumption response ! larger inflation response

HETEROGENEOUS MONETARY TRANSMISSION IN THE UNION

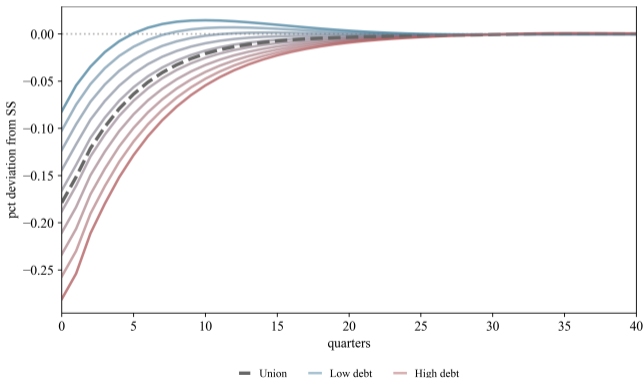
- | A monetary union with 10 countries, debt-to-GDP ratios of 8%-180% (EZ)

HETEROGENEOUS MONETARY TRANSMISSION IN THE UNION

- | A monetary union with 10 countries, debt-to-GDP ratios of 8%-180% (EZ)

Large dispersion in the consumption response

Low public debt countries less responsive more space for primary deficits



Note: consumption resp. to a shock increasing interest rates i_t by 1 p.p. (annualized) on impact, with quarterly persistence 0.85.

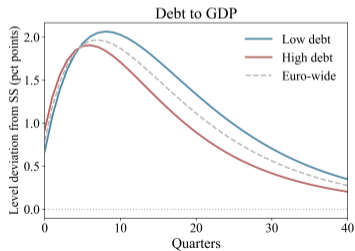
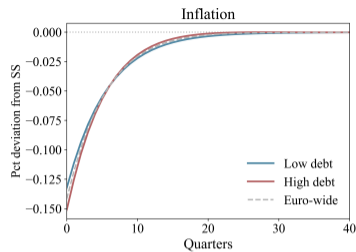
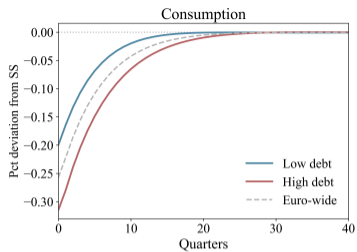
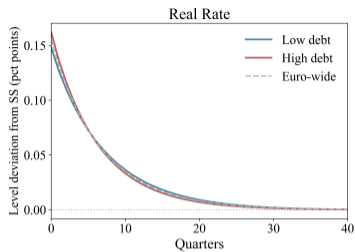
INSPECTING THE MECHANISM

- | Two-countries calibration: Germany and Italy

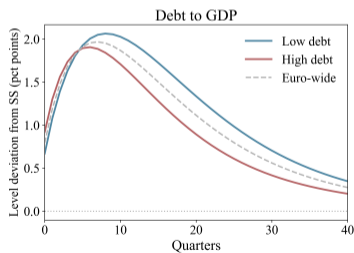
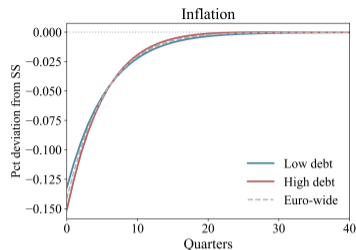
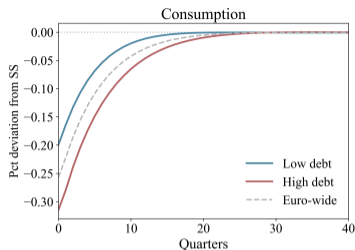
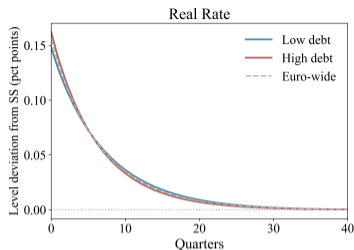
Only differ in SS debt-to-GDP ratios (60% and 134%), identical in all other parameters

- | Calibrate fiscal rules based on Galí and Perotti (2003) / $L = 1$ and $B = 0.07$ [▶ Calibration](#)

INSPECTING THE MECHANISM



INSPECTING THE MECHANISM



Same interest rate change induces different effects across countries

BUSINESS CYCLE PROPERTIES FOR DIFFERENT MONETARY STANCES

- | Business cycle properties

 - Discount factor shocks

- | MP stabilizes EZ inflation

$$i_t = \bar{i}_t + u_t^i$$

- | Dove vs Hawk

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- | Dove vs Hawk

Dove, $\alpha = 1.01$

BUSINESS CYCLE PROPERTIES FOR DIFFERENT MONETARY STANCES

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$$\dot{i}_t = \quad \quad t + \quad \quad {}^{ij}_t$$

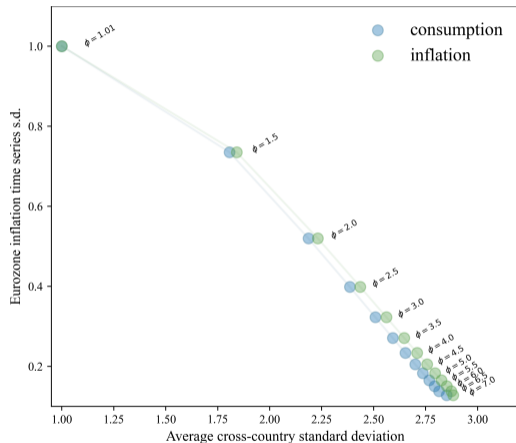
- | Dove vs Hawk

Dove, $\theta = 1.01$

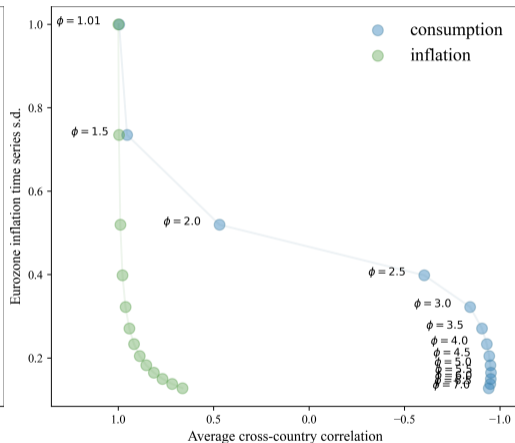
Hawk, $\theta = 7$

STABILIZATION-SYNCHRONIZATION TRADE-OFF

Dispersions



Correlations



Note: we normalize all std measures to one for the smallest Taylor coefficient. Correlation measures are not normalized.

POLICY EXPERIMENTS

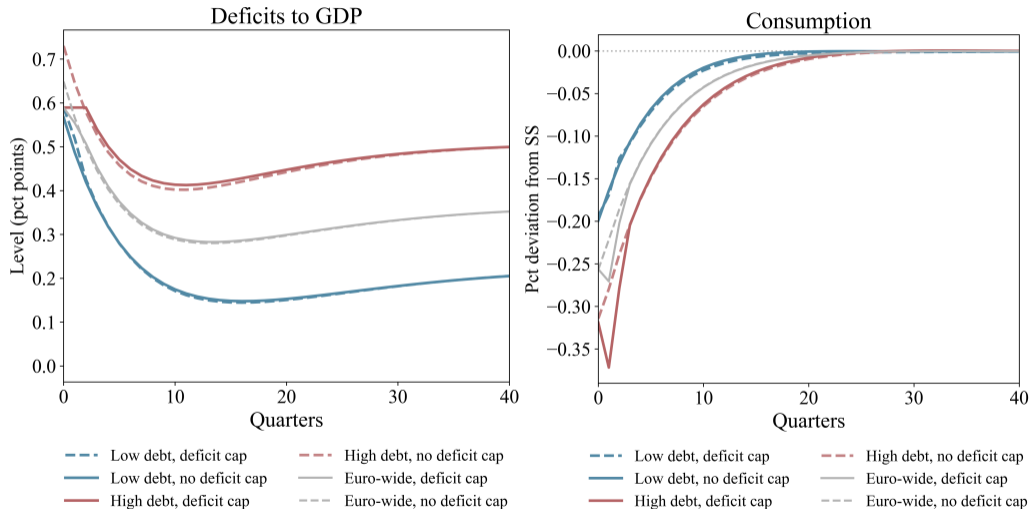
I Deficit caps

II Fiscal union

III Political Union

IV Augmented Taylor rule

DEFICIT CAPS AMPLIFY THE TRADE-OFF



FISCAL UNION

- | Issue bonds to send lump-sum transfers equally across countries (€-bonds)

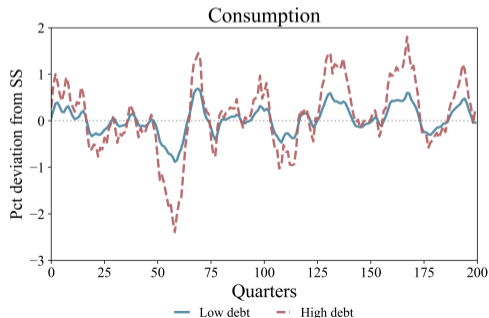
Stabilizes average activity

Does *not* improve synchronization

GE effects on interest rates

No Fiscal Integration (Baseline)

Fiscal Union



POLITICAL UNION

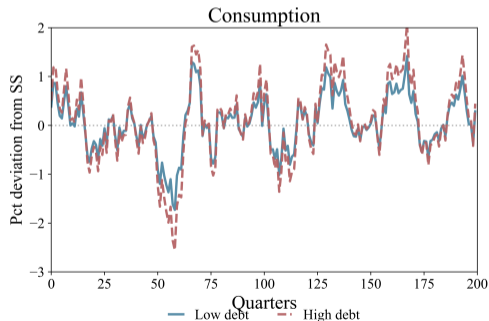
I Political union: cross-country transfers under balanced budget

Effective at improving synchronization

Countries' net contributions zero on average

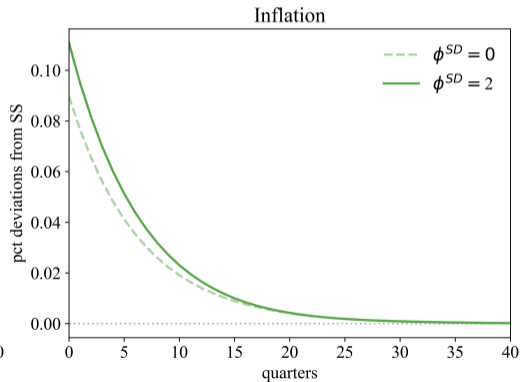
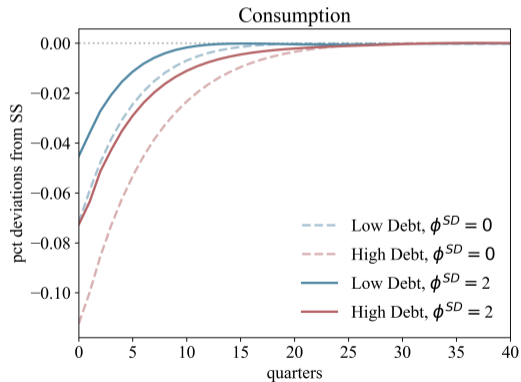
No Fiscal Integration (Baseline)

Political Union



AUGMENTED TAYLOR RULE

$$i_t = \bar{i} + \phi^{SD} \frac{1}{\text{Var}(\hat{c}_j)} \hat{c}_j + \epsilon_t^i$$



CONCLUSION

- I Heterogeneity in fiscal space across members of a monetary union:
 - I Leads to **unequal transmission** of monetary policy
 - II Gives rise to a **trade-off** between stabilization and synchronization for MP
 - III Deficit caps & fiscal union cannot address the trade-off; political union could

Appendix

Parameter	Description	Value	Comment
β	Discount factor	0.98	Standard
σ	Inverse IES	1	Standard
φ	Frisch Elasticity	1	Chetty et al. (2011)
ω	Preference for non-trad. consumption	0.66	Hazell et al. (2022)
α	Preference for non-trad. labor supply	0.66	Hazell et al. (2022)
ν	Cons. elasticity of subs. btw sectors	1.5	Hazell et al. (2022)
ψ	Elasticity of subs. btw tradables	1.5	Equal to ν for exposition
η	Labor elasticity of subs. btw sectors	0.45	Berger et al. (2022)
ρ_e	Pers. of log-productivity process	0.92	Auclert et al. (2021)
σ_e	Std. of log-productivity process	0.6	Auclert et al. (2021)
\underline{b}	Borrowing limit	0	Standard
μ	Union market power	21	Schmitt-Grohé and Uribe (2005)
θ	Wage rigidity	210	Target 0.1 slope of wage NKPC
τ	Income tax rate	30%	Eurozone average
\bar{B}_1/\bar{Y}_1	Debt to GDP in country 1	134%	Italy, 2019 (source: AMECO)
\bar{B}_2/\bar{Y}_2	Debt to GDP in country 2	60%	Germany, 2019 (source: AMECO)
γ^L	Response of deficits to L	1	Galí and Perotti (2003)
γ^B	Response of deficits to debt	0.07	Galí and Perotti (2003)

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