Spillovers in a Monetary Union with Endogenous Fiscal Limits

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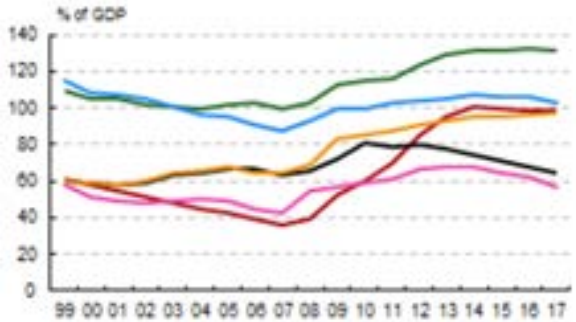
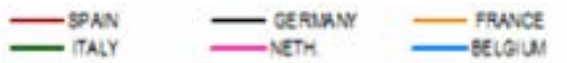
Motivation

General gov debt



10-year bond spreads



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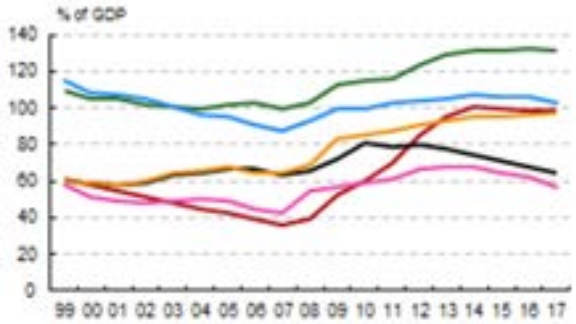

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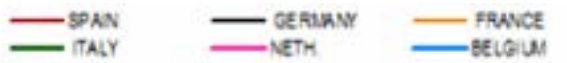

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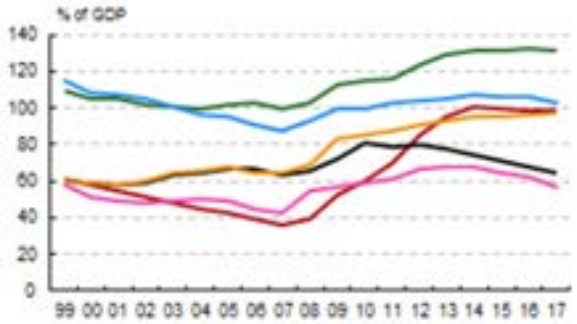

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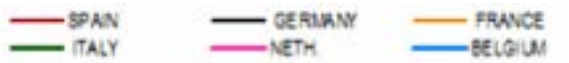

- High gov. debt/GDP in EA raise concerns about debt sustainability.
- What is the fiscal limit for a country in EMU?
- What are the spillover effects on debt sustainability in EMU?

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Structure of presentation

1. Introduction
2. Preview of results
3. Model
4. Fiscal limit
5. Long-run fiscal consolidation
6. Short-run discretionary fiscal policy
7. Conclusions

Aim of the paper

- Build a two-country DSGE framework with endogenous sovereign risk premia for countries in a monetary union, to show:
  - What are the determinants of fiscal limits?
  - How countries' fiscal limits interact in a monetary union?
- Address central policy issues in highly-indebted economies.
  - Effects of fiscal consolidations
  - Effects of discretionary fiscal policy & coordination

Literature

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- Sovereign default literature internalizes some default cost but often assumes exogenous output: Aguiar and Gopinath (2006), Arellano et al. (2017).
- Bi (2012), fiscal limits (FL) arise endogenously from dynamic Laffer curves in a closed economy model.

Preview of results

- Risk channel matters significally when debt is >90%.

- Makes long run consolidation to 60% costly, with spillovers to EA.
- Reduces significantly multiplier of discretionary fiscal policy.
- Endogenous risk premium explains 40% of that reduction.

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- Reduces significantly multiplier of discretionary fiscal policy.
- Endogenous risk premium explains 40% of that reduction.

- Policy coordination favors joint consolidation, except under ZLB.

Model highlights

Two-country New Keynesian model, modified only for:

- Periphery with high debt & Core with low debt.
- Periphery's gov. debt is subject to default risk.
- Total debt home bias.
- (Distortionary taxes on income.)

Main mechanism:

The main novel mechanism comes from the interaction between:

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1. Periphery's High debt is subject to default risk.
2. Fiscal limit (FL) distribution is endogenous

1) Risky Periphery's government debt:

- Periphery's government debt (b_{t-1}) is subject to default risk, with haircut δ and risky yield R_t

$$\delta_t = \begin{cases} 0 & \text{if} \quad b_{t-1} < \mathcal{B}(\mathcal{S}_t) \\ \delta & \text{if} \quad b_{t-1} \geq \mathcal{B}(\mathcal{S}_t) \end{cases}$$

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- Core gov debt is NOT risky: $\delta_t^* = 0$, $R_t^* = R_t^{ECB}$

2) Periphery's Fiscal Limit:

$$\mathcal{B}(\mathcal{S}_t) = \beta_t^p \pi(\mathcal{S}_t) E_t \sum_{j=0}^{\infty} \beta^j \frac{\lambda(\mathcal{S}_{t+j})}{\lambda(\mathcal{S}_t)} \frac{(\mathcal{T}(\mathcal{S}_{t+j}) - g_{t+j} - z)}{\left(TOT(\mathcal{S}_{t+j})\right)^{1-\eta}}$$

where state of the economy $\mathcal{S}_t = \{a_t, g_t, a_t^*, g_t^*, TOT_{t-1}\}$

- Periphery's Fiscal limit ($\mathcal{B}(\mathcal{S}_t)$) is the max debt that can be supported without default.

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- $\tau^{\max}$=peak of Laffer curve = 0.435 (Spain's max marginal rate)

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- FL distribution simulated using Markov Chain Monte Carlo method.

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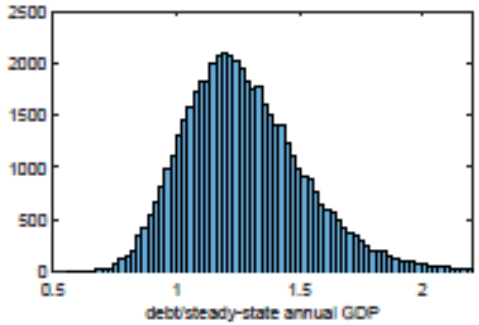
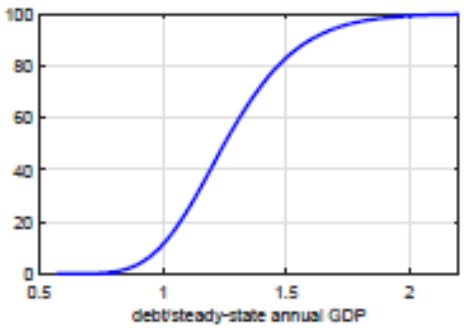
Periphery's Fiscal Limit:

Distribution of Periphery's FL computed from $B(\mathcal{S}_t)$

Histogram



Cumulative density function (cdf)



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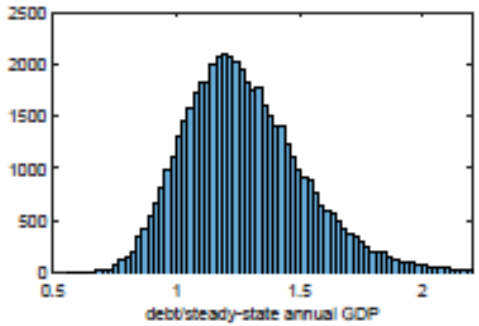

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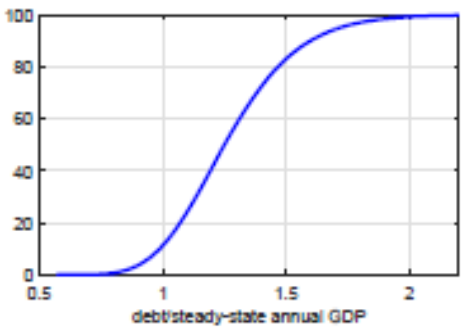

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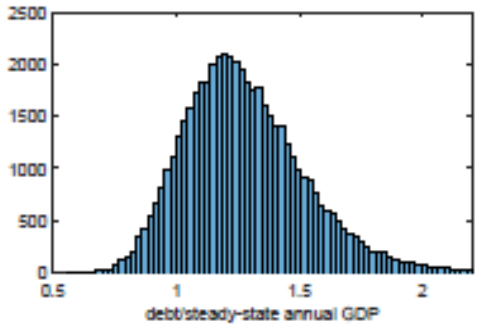

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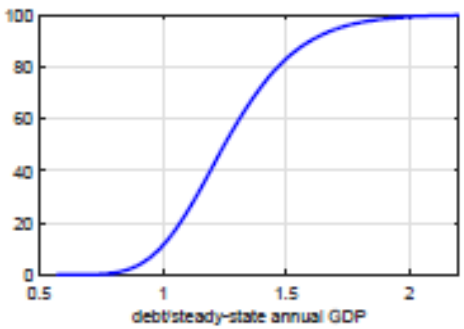

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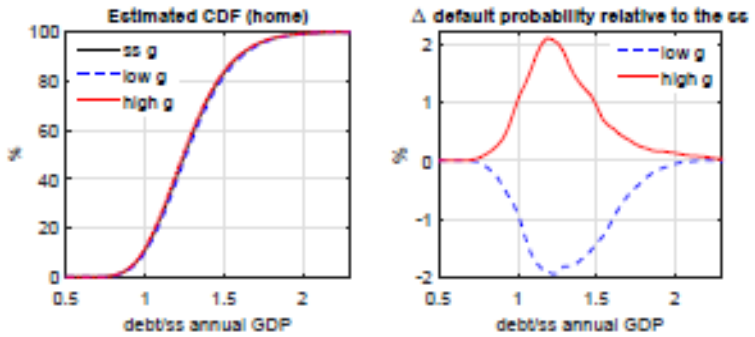
- Between 60-180%: ⇑B/Y → ⇑default Prob

Periphery's FL: Changes in g



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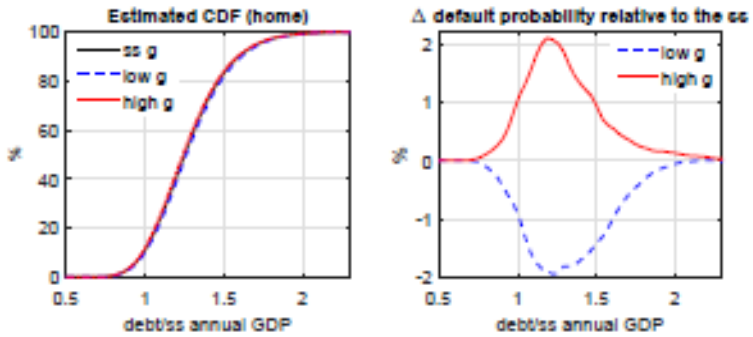
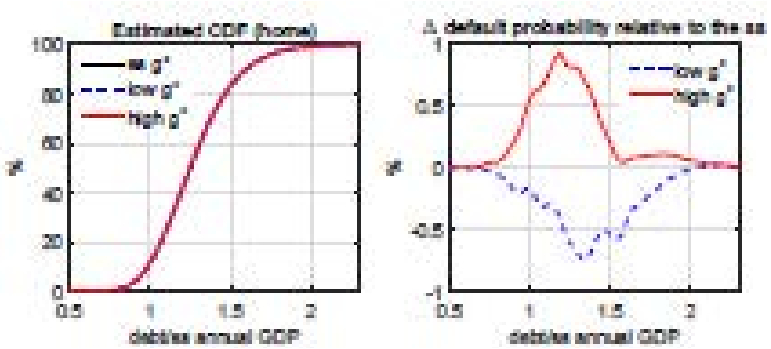


- $\Uparrow$g $\rightarrow$ $\Uparrow$deficit, Y $\rightarrow$ $\Downarrow$FL
- MP channel weak: small $\Uparrow$ Y^{EA}, π^{EA} $\rightarrow$small $\Uparrow$ R^{ECB} $\rightarrow$ $\Downarrow$FL
  $\Rightarrow$ Both negative $\rightarrow$ $\Downarrow$FL (shift left), $\Uparrow$ default prob (2% B/Y=125%)

Periphery's FL: Spillover from g*



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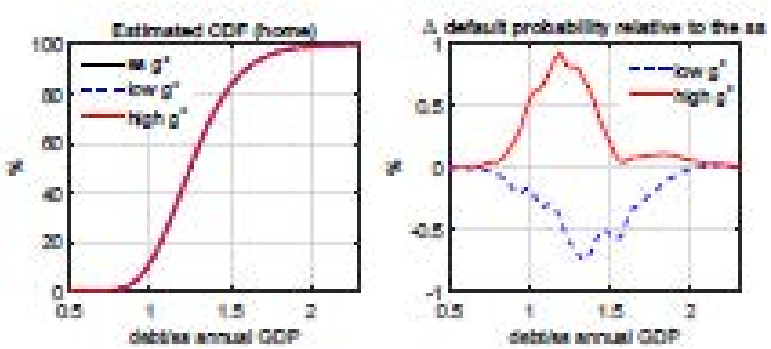

- $\Uparrow$g* $\longrightarrow$ $\Uparrow$deficit*, Y^*, π^*
  - MP channel: $\Uparrow R^{ECB} \longrightarrow \Uparrow$ financing costs of debt $\longrightarrow \Downarrow$ FL

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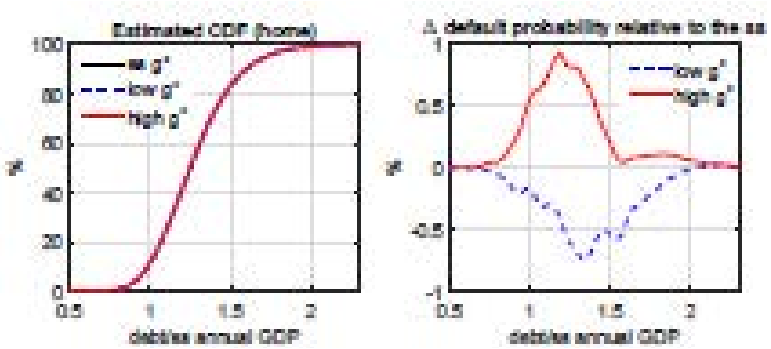

- $\Uparrow$g* $\longrightarrow$ $\Uparrow$deficit*, Y^*, π^*
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  - Trade channel: $\Uparrow M^* = X \longrightarrow \Uparrow$ FL

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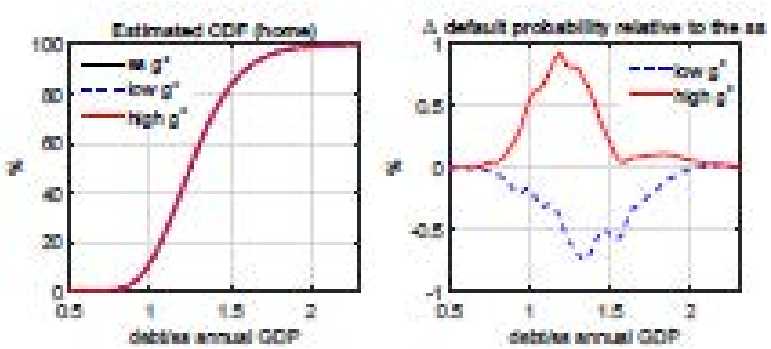

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  - Net negative effect $\longrightarrow$ ⇓FL, ⇑default prob (0.75% B/Y=125%)

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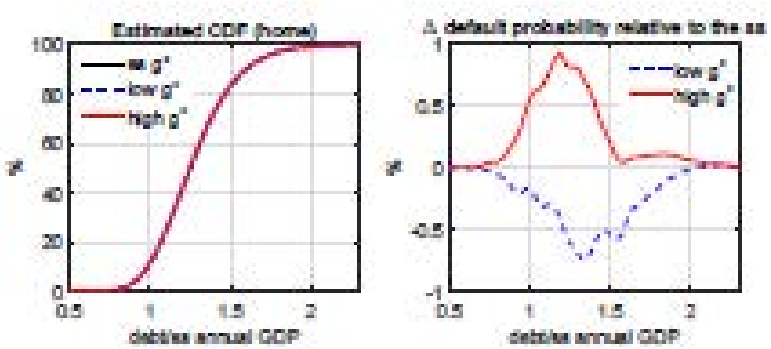

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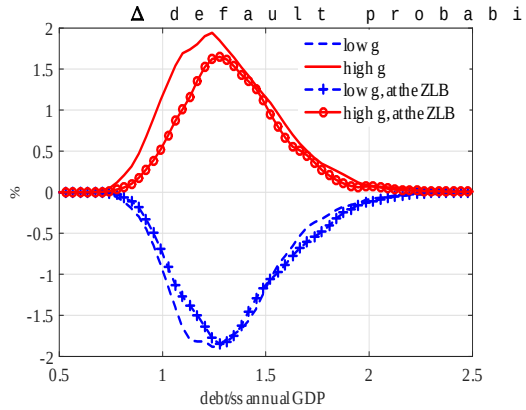
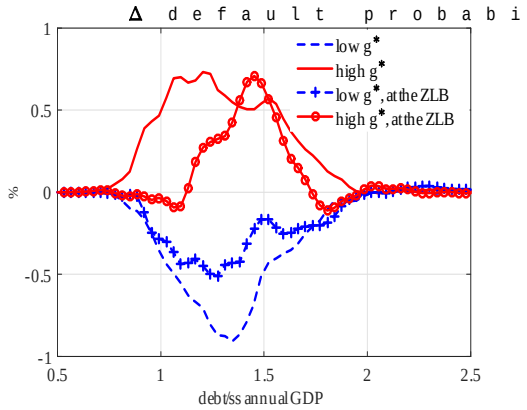
  - Trade channel: ⇑ M^*=X $\longrightarrow$ ⇑ FL
  - Net negative effect $\longrightarrow$ ⇓FL, ⇑default prob (0.75% B/Y=125%)
- Spillover is 40% of own effect (2% vs 0.75%).

Periphery's FL under ZLB.

Δ Periphery's g



Δ Core's g*



- No MP channel under ZLB $\Longrightarrow$ SMALLER effect of Δg, g* on FL.

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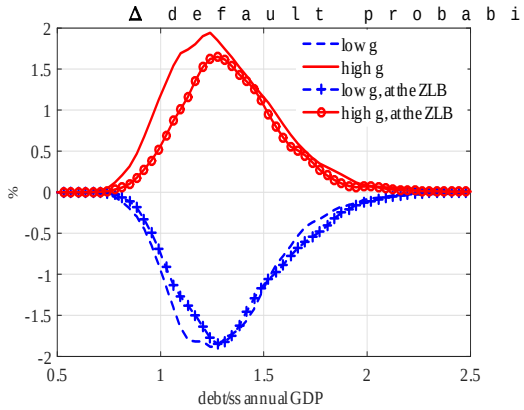

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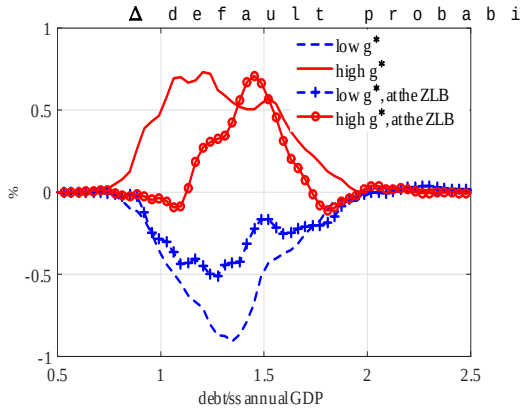
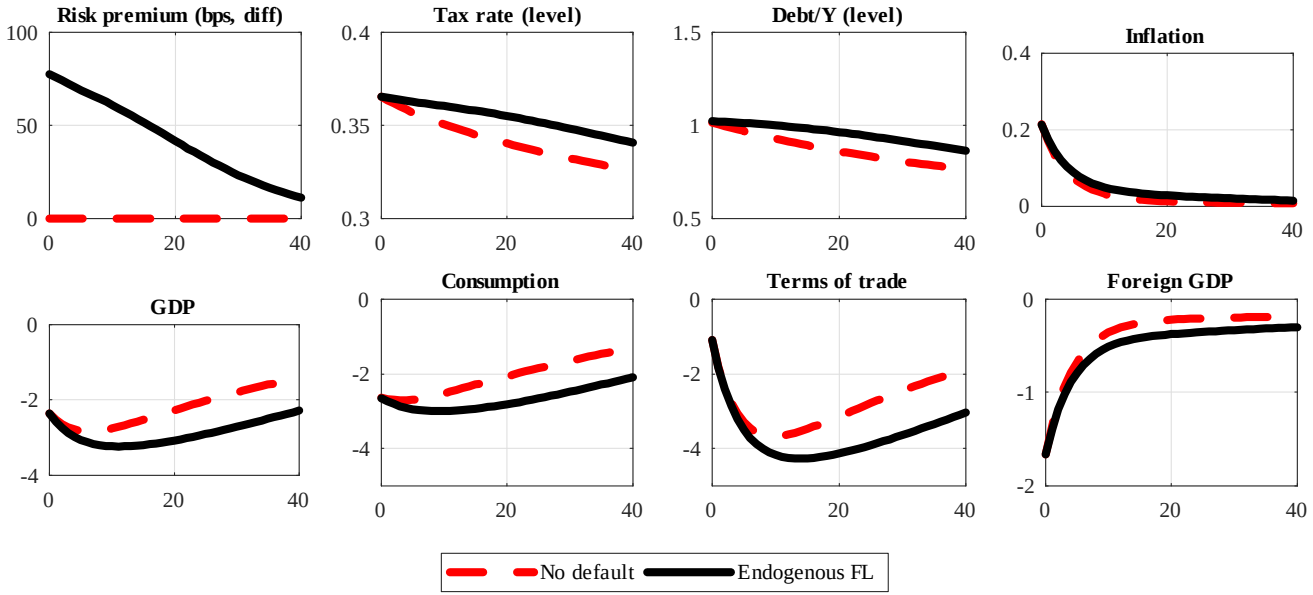


- No MP channel under ZLB $\Longrightarrow$ SMALLER effect of Δg, g* on FL.
- Smallest effect of Δg* due to NO (strong) MP channel.

Policy scenario 1:

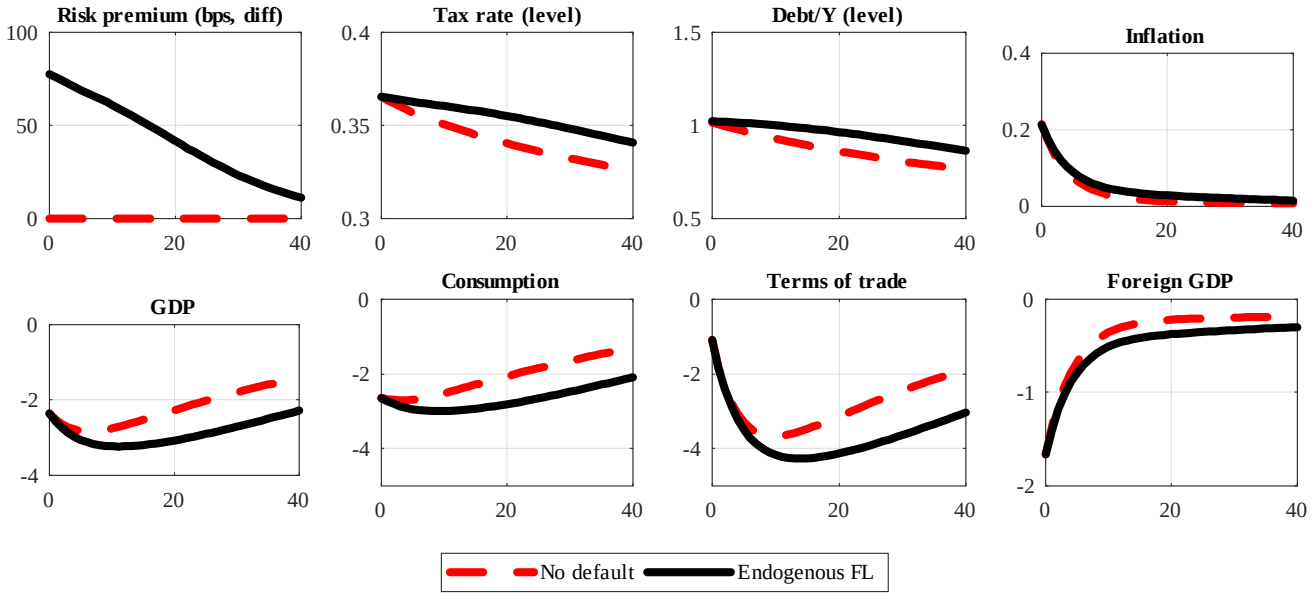
Peripherys' Long-run consolidation from B/Y=100 to 60%

Periphery's Consolidation: B/Y 100-60%



- High debt requires significant $\Uparrow$ tax, $\Downarrow B/Y$ slowly, with high risk premium

Periphery's Consolidation: B/Y 100-60%



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- Long and costly process ($\Downarrow$Y, C & L), spillover to Core ($\Downarrow$Y*).

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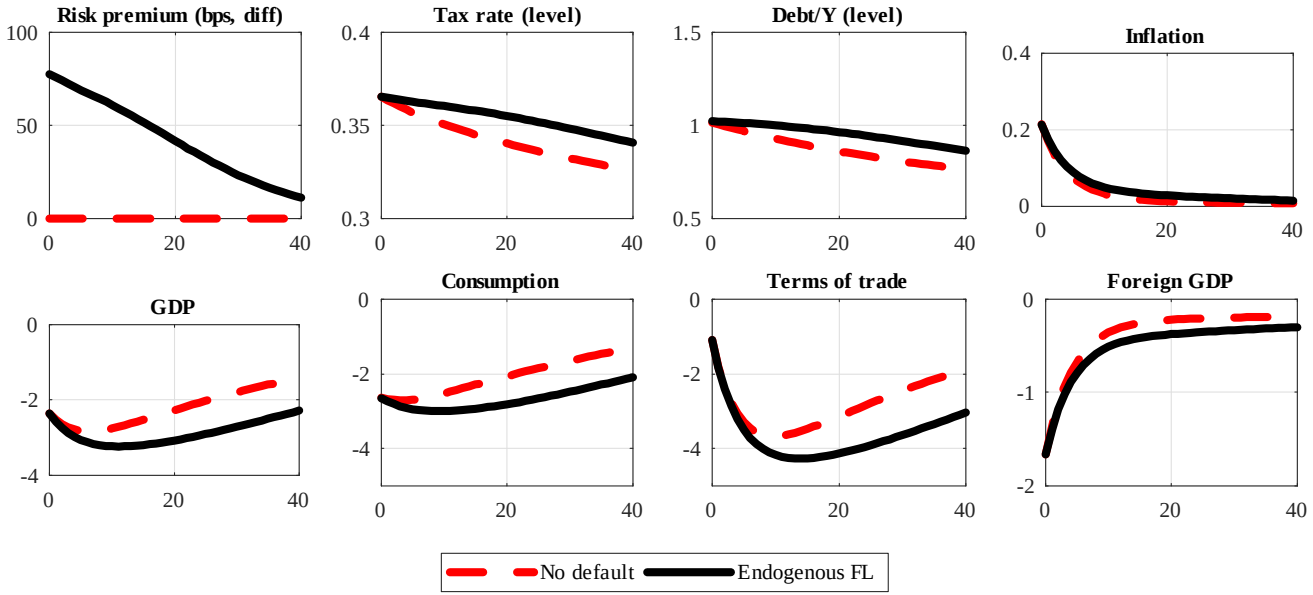
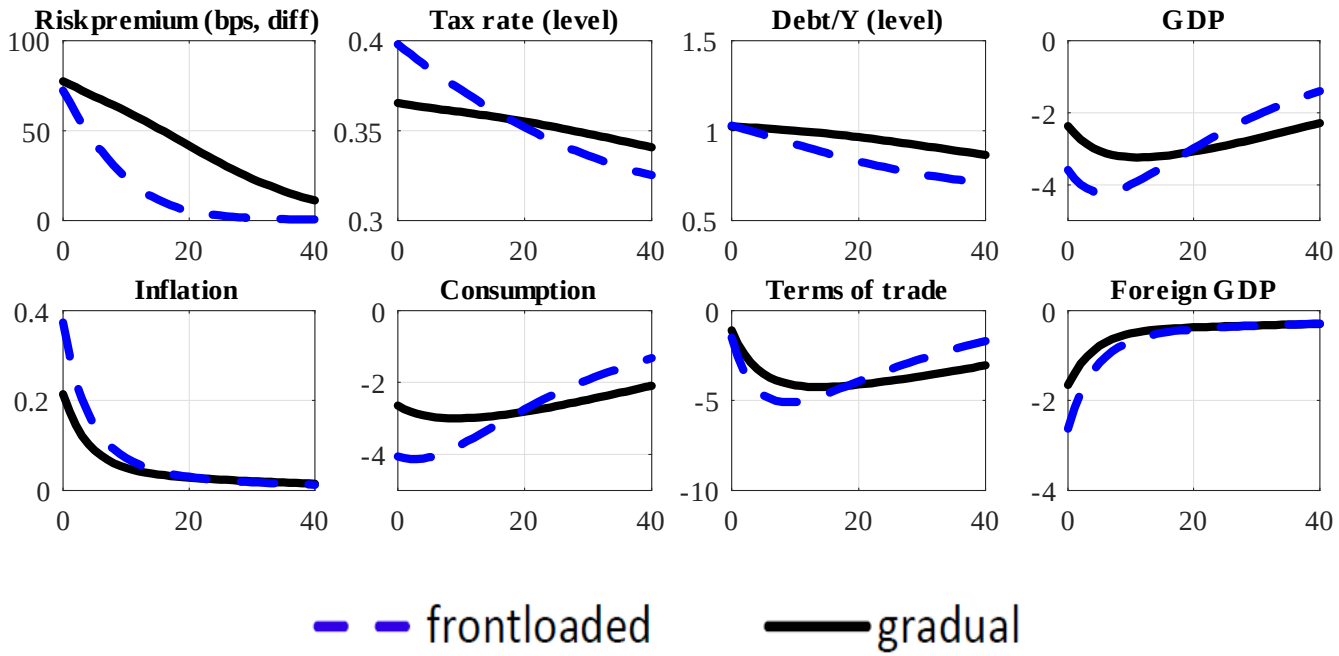


- High debt requires significant $\Uparrow$ tax, $\Downarrow B/Y$ slowly, with high risk premium
- Long and costly process ($\Downarrow$Y, C & L), spillover to Core ($\Downarrow$Y*).
- Lower cost with NO default.

Periphery's Consolidation: Frontloaded?



- Frontloaded $\Downarrow$ risk premium & long-run cost.

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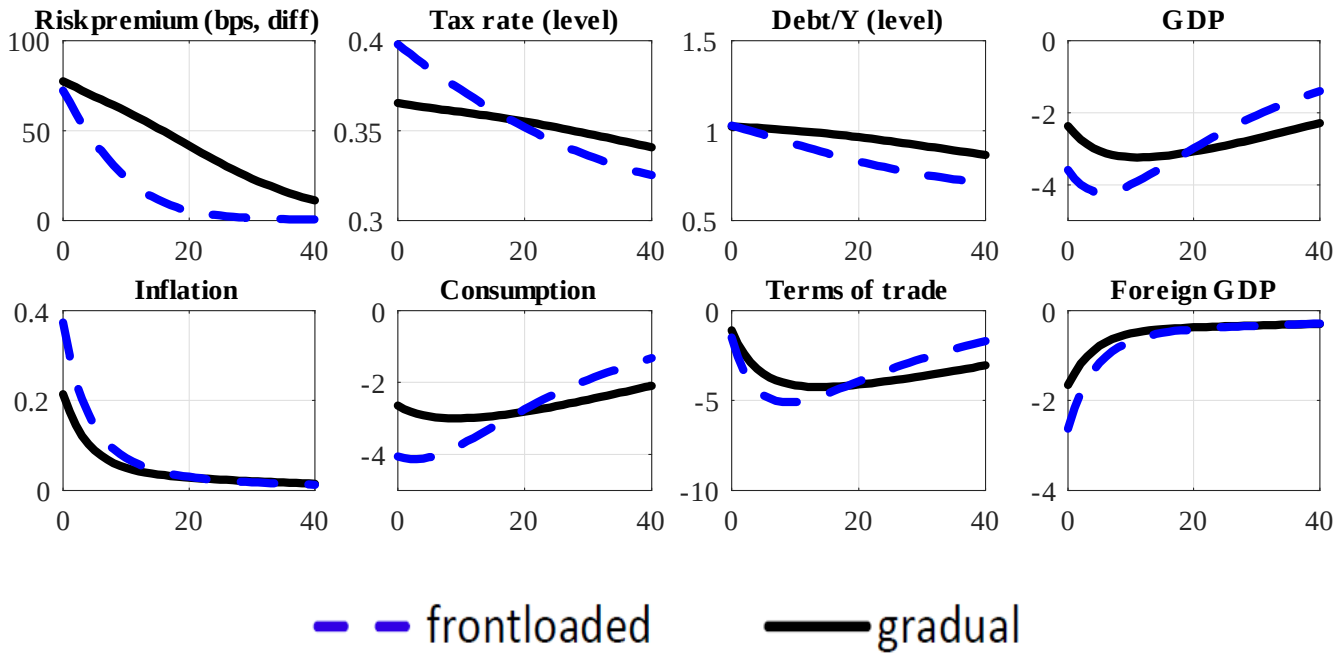

- Frontloaded $\Downarrow$ risk premium & long-run cost.
- Initial greater $\Downarrow$Y due to flex wages: stronger $\Uparrow$tax$\rightarrow\Uparrow$W$\rightarrow\Uparrow$ R^{ECB}

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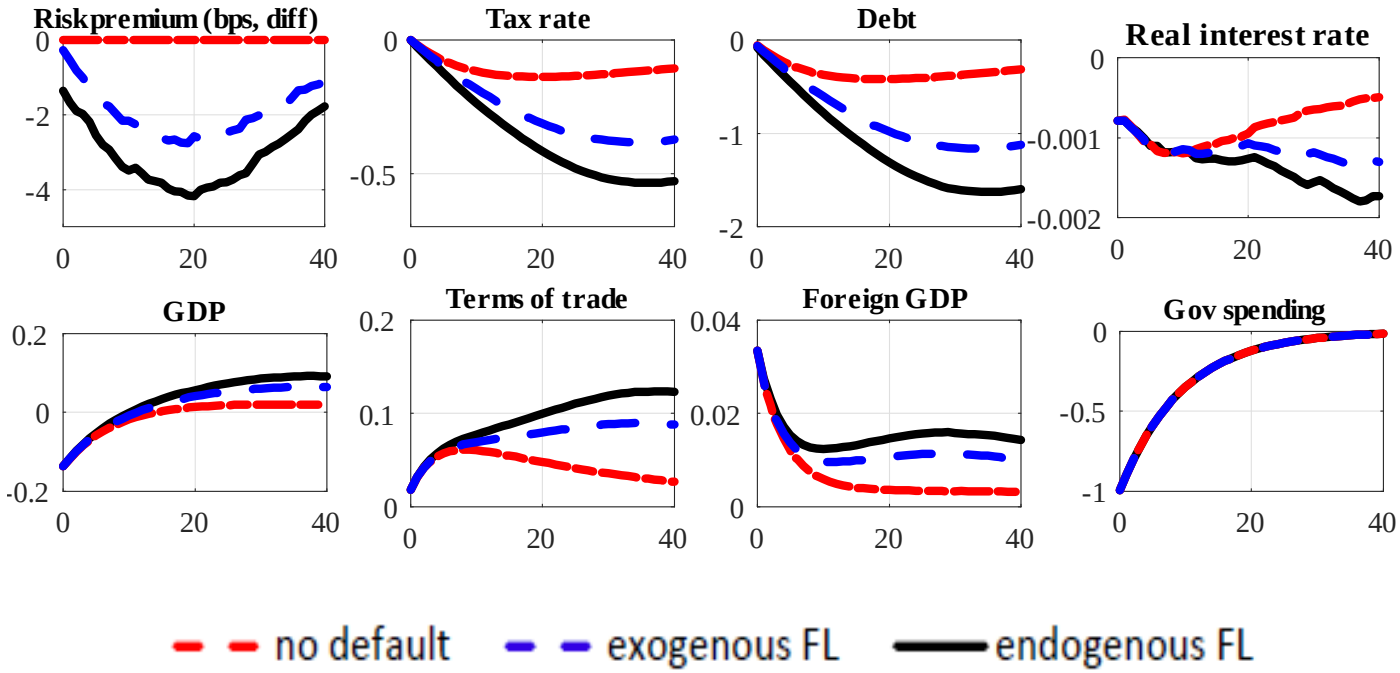
Policy scenario 2:

Discretionary short-run fiscal policy (transitory Δg, g^*)

Discretionary fiscal policy: 1% fall in g



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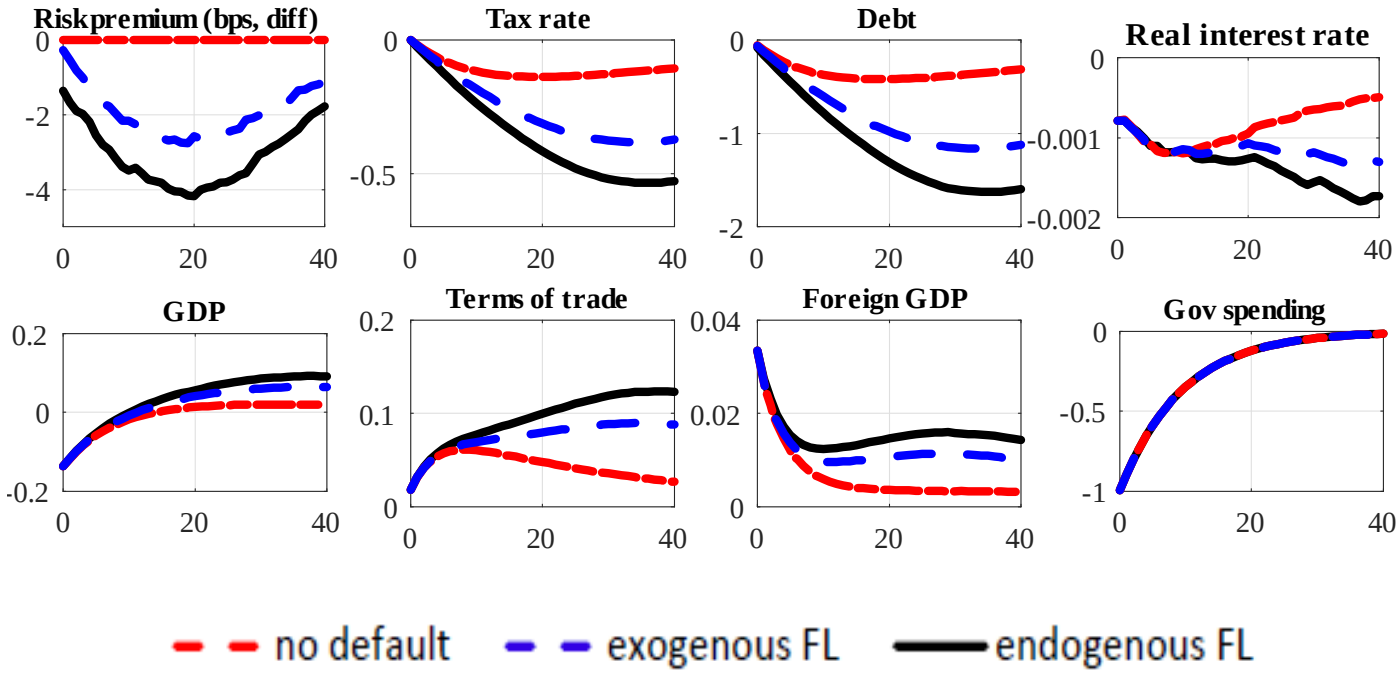

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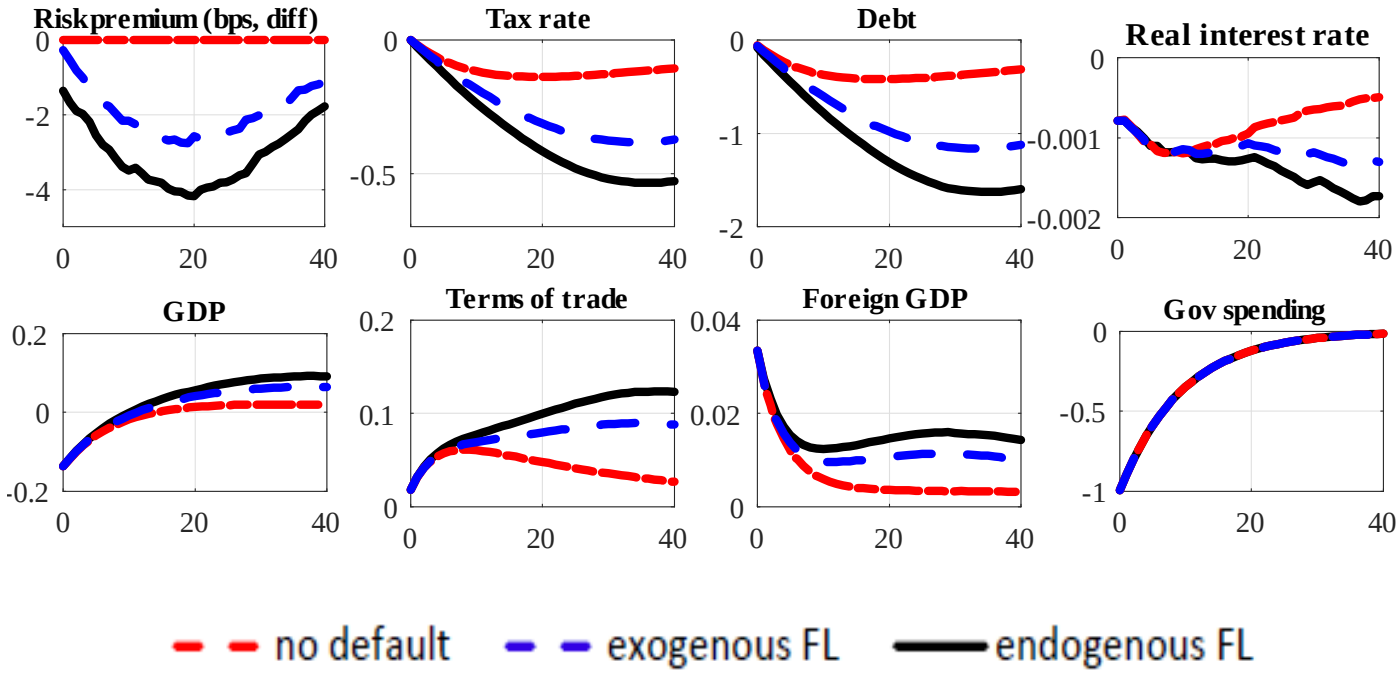

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- Initial fall in Y, increase after 10q
- MP channel weak: $\Downarrow \pi^{EA} \rightarrow$small $\Downarrow R^{ECB} \rightarrow \Uparrow$ FL

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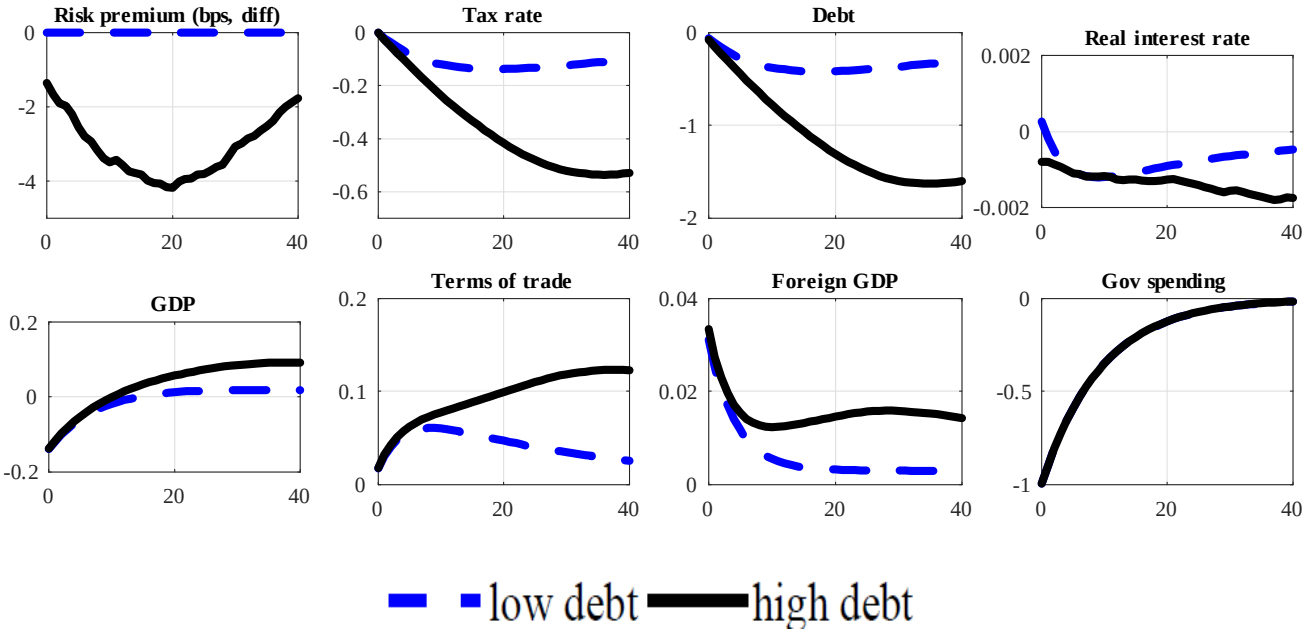
Eurosistema

Discretionary fiscal policy: 1% fall in g



- Relevance of Risk Premium channel with high debt

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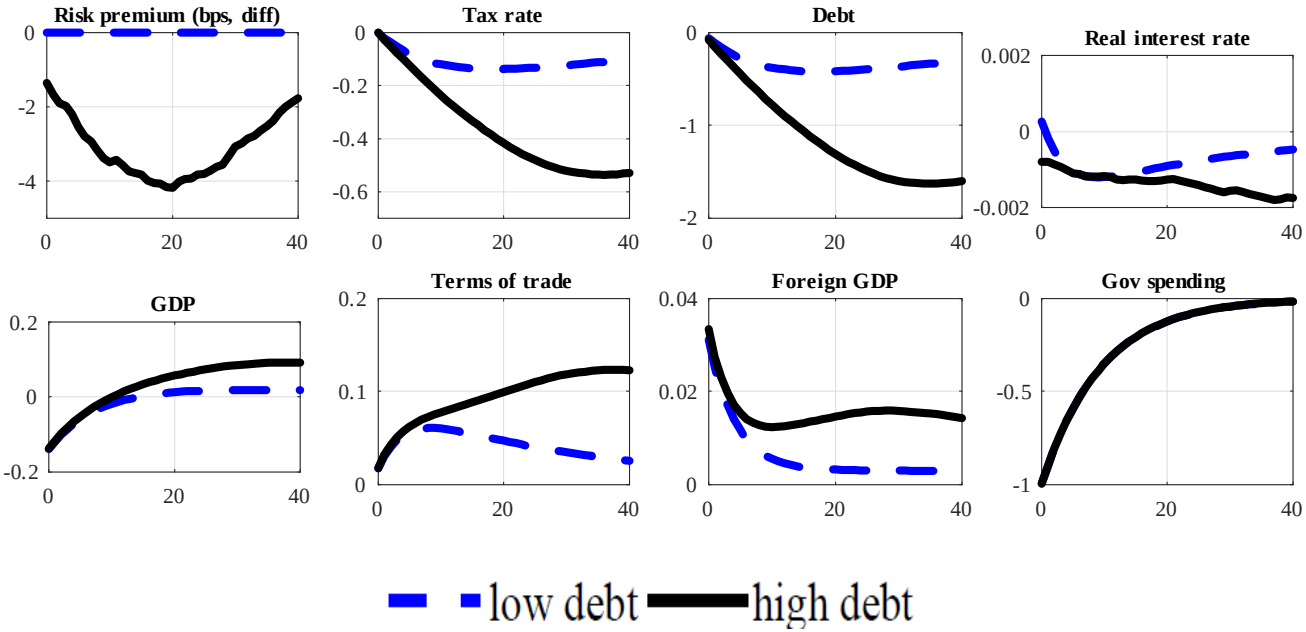
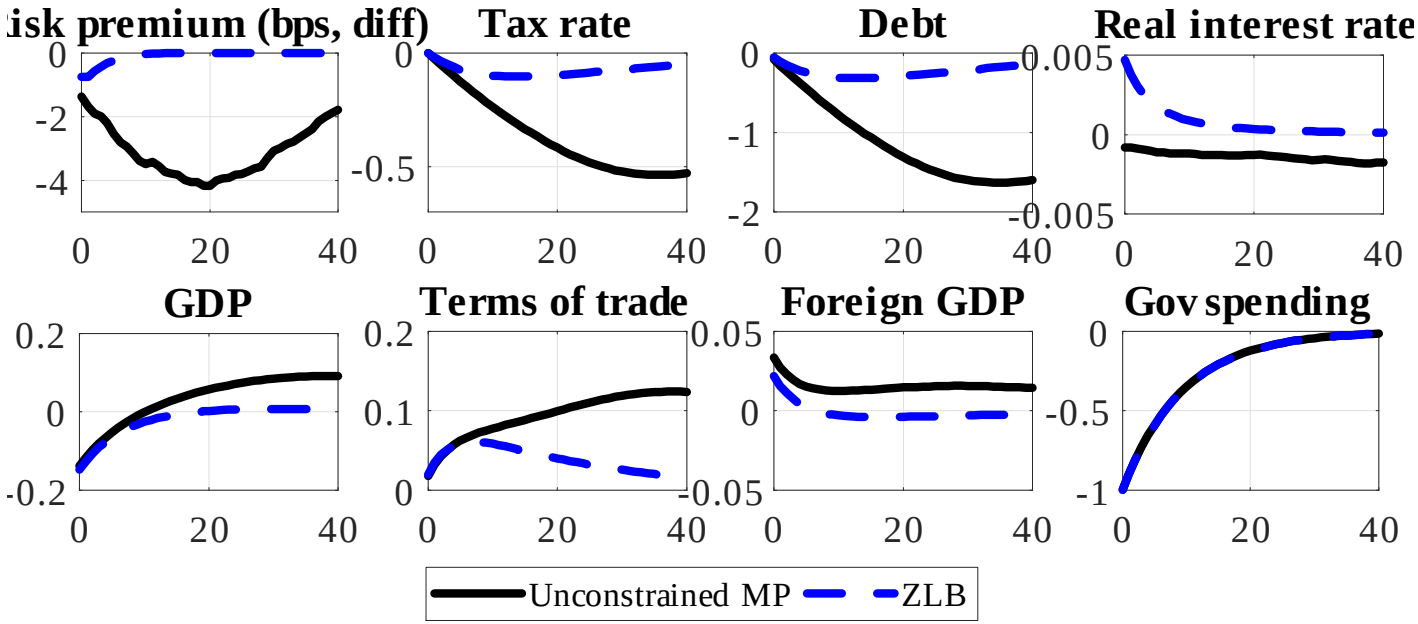


- Relevance of Risk Premium channel with high debt
- With high debt, ⇓g→⇑FL, ⇓default prob→ ⇑Y,C,TOT

Discretionary FP: 1% fall in g, ZLB



Under ZLB the RP channel is muted:

- Standard MP: $\Downarrow$g $\rightarrow\Downarrow$R & $\Downarrow$inf $\rightarrow$ constant $\frac{R}{P}$ $\rightarrow$ $\Uparrow$FL$\rightarrow\Downarrow$RP

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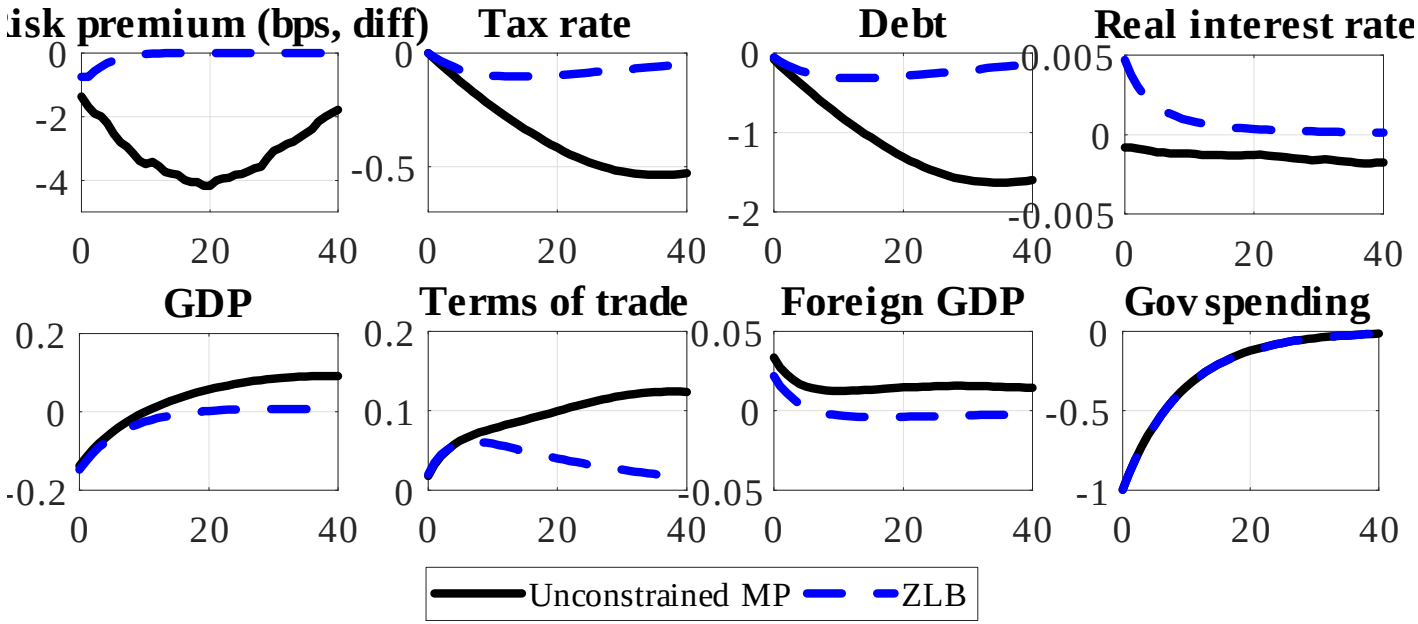

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- ZLB: $\Downarrow$g $\rightarrow$constant R, $\Downarrow$inf $\rightarrow \Uparrow \frac{R}{P}$& $\Uparrow$FL$\rightarrow$constant RP

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Discretionary FP: Multipliers

Multiplier PV(DY)/PV(DG)	Periphery			Spillover to Core			Euro area		
models	**0**	**1 yr**	**10 yr**	**0**	**1 yr**	**10 yr**	**0**	**1 yr**	**10 yr**
No default	0.75	0.70	0.27	-0.14	-0.12	-0.11	0.18	0.17	0.02
Exogenous FL	0.75	0.70	-0.20	-0.14	-0.12	-0.19	0.18	0.17	-0.20
Endogenous FL	**0.75**	**0.69**	**-0.49**	**-0.14**	**-0.13**	**-0.24**	**0.18**	**0.17**	**-0.33**
Endogenous FL, ZLB	0.80	0.75	0.45	-0.09	-0.07	0.01	0.23	0.22	0.17

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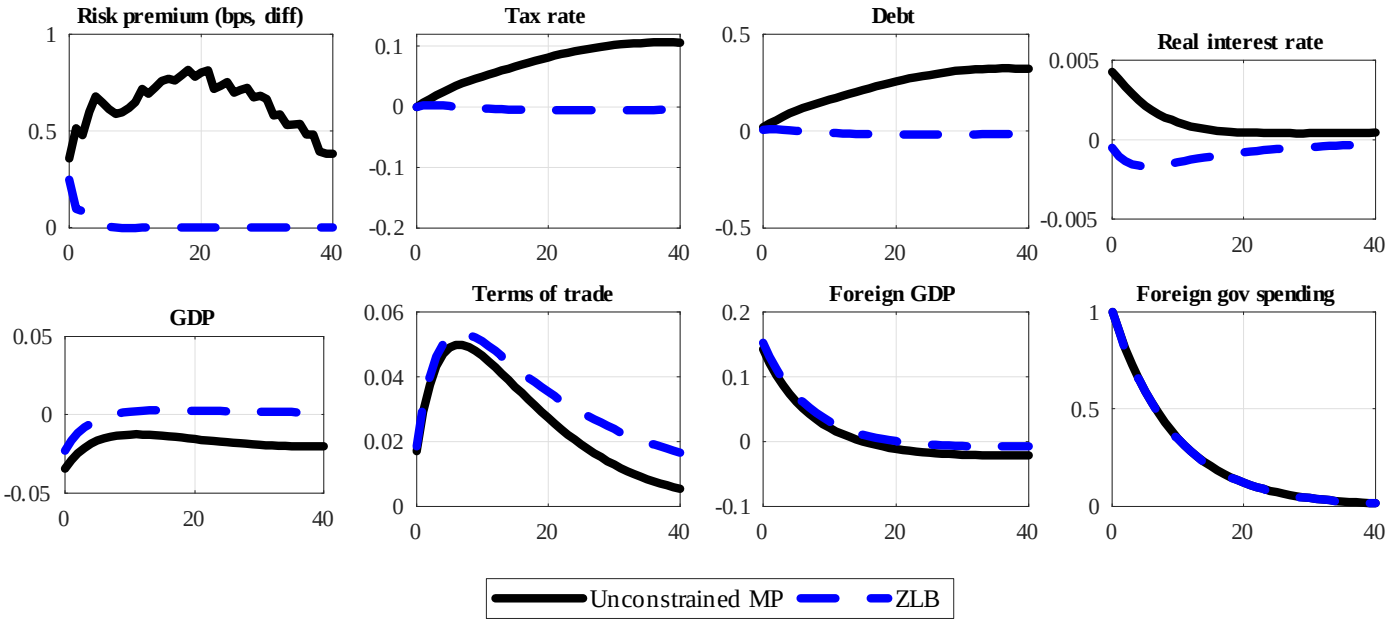
- Risk premium channel reduces long run multiplier by 76bp, of which 29bp are due to endogenous FL
- Spillover to EA reduces EA multiplier by 35bp, 13bp due to endo FL.
- ZLB kills RP channel$\longrightarrow$ multiplier like in NO default case.

Fiscal coordination: 1% rise in g*



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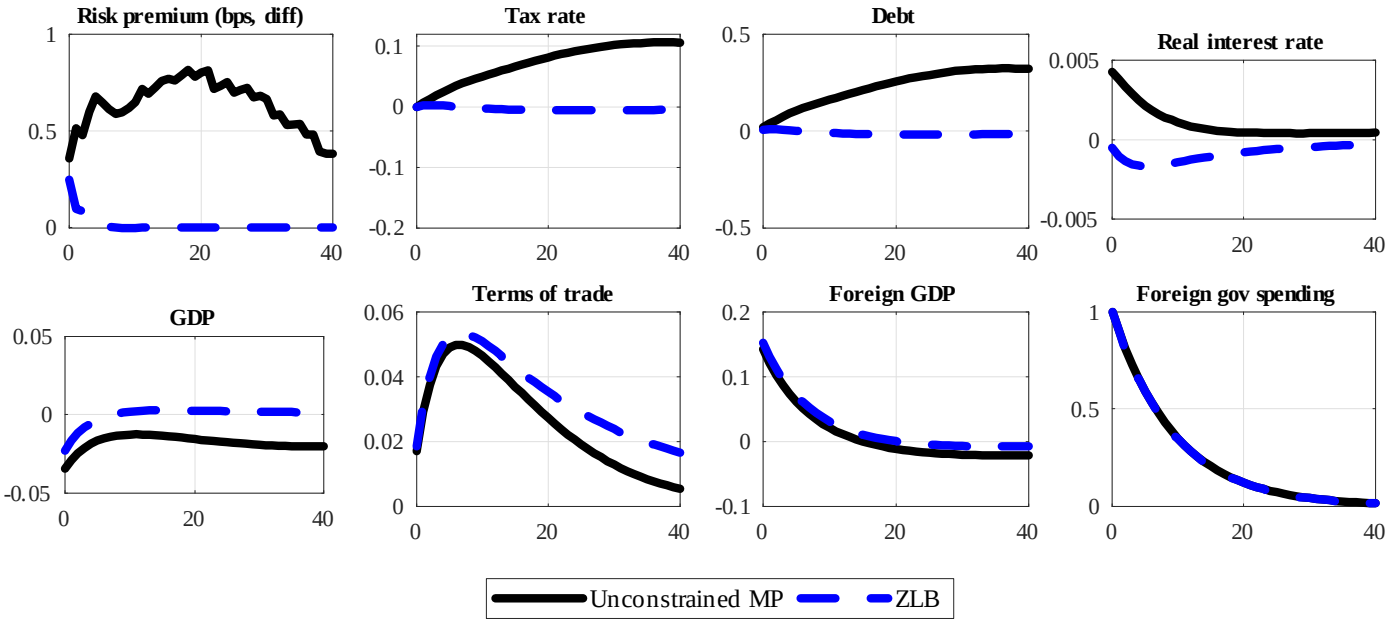

- ⇑g* → ⇑deficit*, Y^*, π^*
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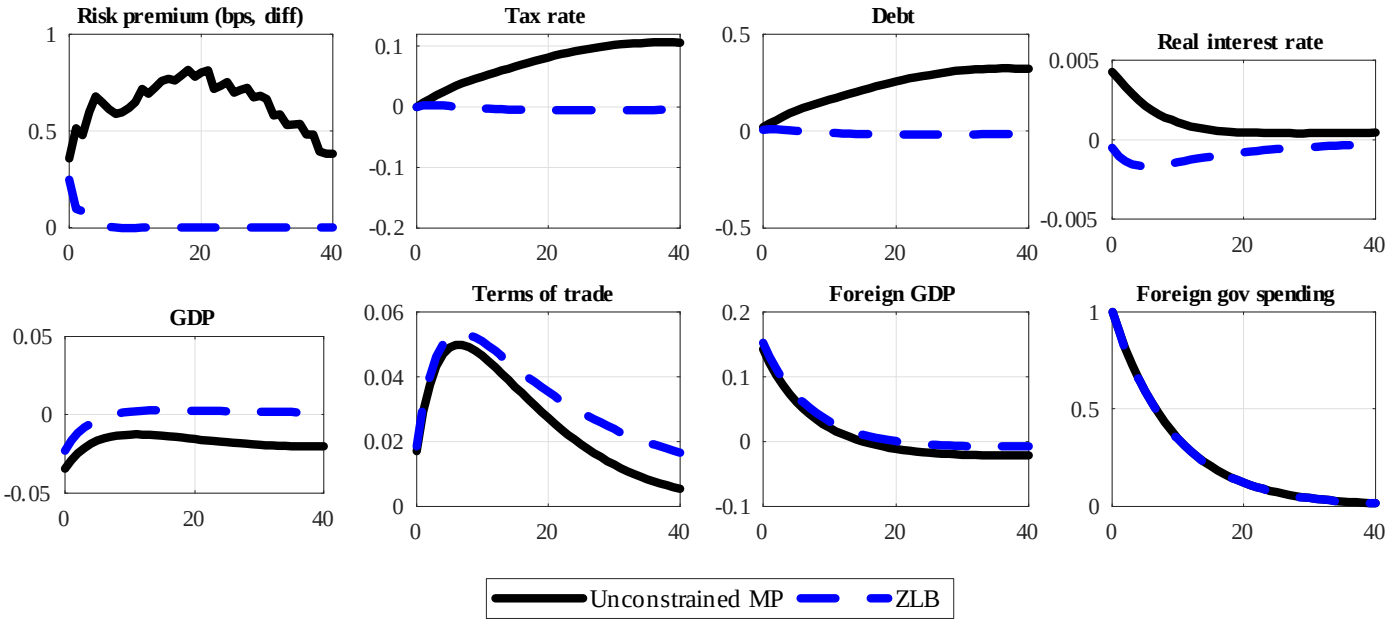

- ⇑g* $\longrightarrow$ ⇑deficit*, Y^*, π^*
  - MP channel: ⇑ R^{ECB} > Trade channel $\longrightarrow$ ⇓FL, ⇑RP $\longrightarrow$ ⇓Y
- Under ZLB, no MP channel $\longrightarrow$ RP constant $\longrightarrow$ ⇑Y.

Conclusions:

- Endogenous risk matters significally when debt is >90%.
- Makes long run consolidation to 60% costly, with spillovers to EA.
- Under high debt, risk premium channel reduces multiplier of discretionary fiscal policy.considerably.
- Endogenous risk premium explains 40% of that reduction.
- Policy coordination favors joint consolidation, but ZLB mitigates the gains.

THANK YOU FOR YOUR ATTENTION

Standard Fiscal Policy:

- Governments' Budget constraint:

$$\text{Periphery} \quad : \quad \frac{b_t}{R_t} + TOT_t^{\eta-1}\left(T - g_t - z\right) = \left(1-\delta_t\right)\frac{b_{t-1}}{\pi_t}$$

$$\text{Core} \quad : \quad \frac{b_t^*}{R_t^{ECB}} + TOT_t^{\eta^*}\left(T^* - g_t^* - z^*\right) = \frac{b_{t-1}^*}{\pi_t^*}$$

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- Fiscal policy rules:

$$\text{Periphery:} \quad \tau_t = \tau + \gamma_b(b_{t-1} - 0.6)$$

$$\text{Core:} \quad \tau_t^* = \tau^* + \gamma_b(b_{t-1}^* - 0.6)$$

Calibration:

Periphery = Spain, Core = Germany

parameters	values	
β	0.99	the discount factor
θ	11	elasticity of substitution
ψ	116.5	Rotemberg adjustment parameter
α_π	2.5	Taylor rule parameter to inflation
γ_b	0.3	tax response parameter to changes in debt
b/y	0.6	steady state debt to output ratio (home)
b^*/b^*	0.6	steady state debt to output ratio (foreign)
g/y	0.183	steady state gov spending to output ratio (home)
g^*/y^*	0.187	steady state gov spending to output ratio (foreign)
τ	0.3005	steady state income tax rate (home)
τ^*	0.3425	steady state income tax rate (foreign)
a, a^*	1	steady state technology
ρ^g, ρ^{g^*}	0.9	AR(1) coefficient in government spending rules
σ_g, σ_{g^*}	0.01	standard deviation of government spending shock
s	0.36	share of home country
η	0.63	home country bias in home goods
η^*	0.37	foreign country bias in home goods
δ	0.07	quarterly haircut on debt if default occurs