

The Perils of Bilateral Sovereign Debt

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RIDGE Forum
Montevideo, November 2025

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- A large share of sovereign borrowing takes the form of **official** debt
 - ... Multilaterals, development banks, other governments
- Emergence of new bilateral creditors **outside** the Paris Club
 - ... with claims to **seniority** and sometimes **opaque** terms

▶ IDS data

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- How does the presence of a large senior lender affect sovereign debt markets?
- What are its welfare implications for borrowing governments?

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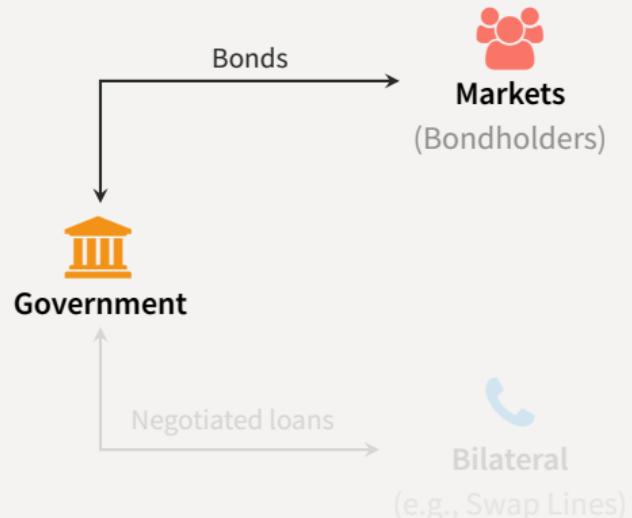
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Evaluating Senior Official Creditors

Quantitative sovereign debt model with

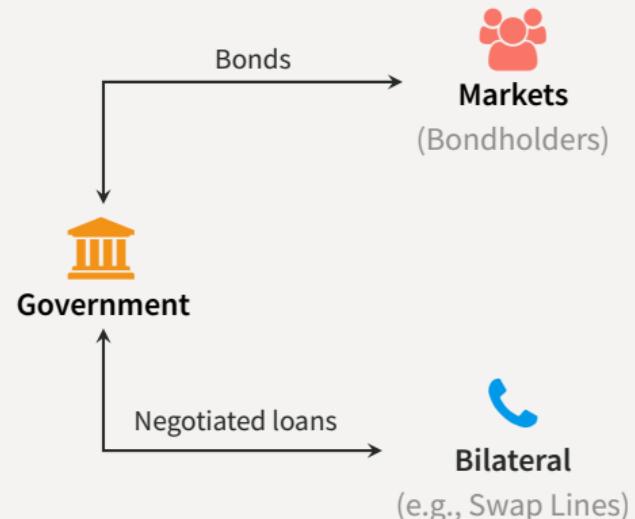
- Competitive creditors in private **markets**
- Large **bilateral** lender
 - 1. Superior enforcement
[de-facto seniority]
 - 2. Bargained terms
[price and quantity]
 - 3. Short-maturity loans
- Prime example: Central Bank **swap** lines
(Horn et al., 2021)
- Focus on the **interaction** between both funding sources



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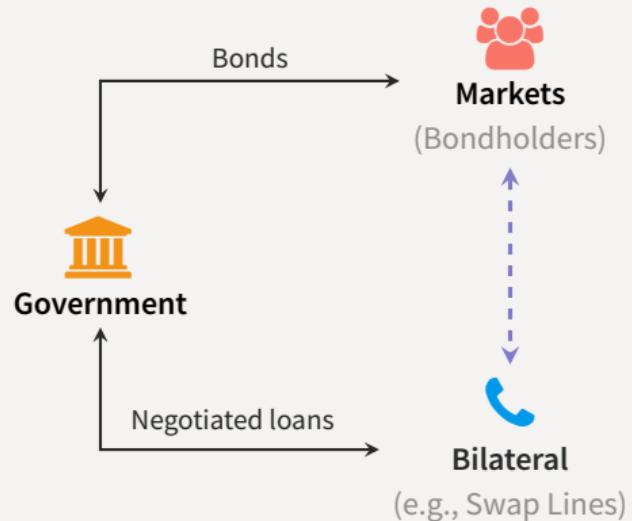
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Relational Overborrowing

Main findings

- Bilateral loans have significant effects on equilibrium outcomes
 - ... provide funding when other sources dry up (e.g. because of default risk) ▲
 - ... can also incentivize more **risk-taking** ▼
- If the rate on bilateral loans is decreasing in *market debt* [cross-elasticity]
 - ... government issues market debt more quickly, delevers more slowly
 - ... spends longer in the risky region
 - ... defaults more frequently
- Cross-elasticity can emerge endogenously from **bargaining** ☎
 - ... at plausible values for bargaining weights
 - ... increased frequency of defaults dominates extra liquidity
 - ... **welfare losses** for the government

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- Sovereign debt/default with interactions from ‘official’ debt
 - ... senior debt (Hatchondo, Martinez & Önder 2017), senior debt with conditionality (Boz 2011, Fink & Scholl 2016), bailout agencies (Corsetti, Guimarães & Roubini 2006, Kirsch & Rühmkorf 2017, Roch & Uhlig 2018), official debt (Arellano & Barreto 2024, Liu, Liu & Yue 2025)
- Data on new official creditors
 - ... Horn, Reinhart & Trebesch 2021a, 2021b, Gelpern et al. 2021, Horn, Parks, Reinhart & Trebesch 2023
- Central Bank swap lines
 - ... among advanced economies (Bahaj & Reis 2021, Cesa-Bianchi, Eguren-Martin & Ferrero 2022), data for emerging-market borrowers (Perks, Rao, Shin & Tokuoka 2021)

Model

The government of a small open economy borrows from a monopolist and from markets

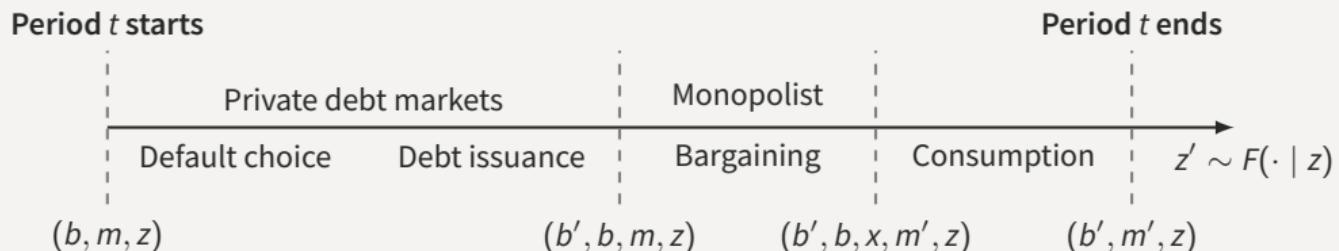
- Income $y(z_t)$ follows an AR(1) process in logs
 - ... Only one good, representative risk-averse household, expected utility
- **Renegotiate** the loan m each period
 - ... Involves a current transfer x and a new size m'
 - ... Loan is non-defaultable \Rightarrow Repaying m is the natural threat point
- Should expect
$$x = \frac{1}{1+r}m' - m$$
 - ... Implicit interest rate r to vary over time
 - ... Interest rate to reflect **market power**
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Timeline of Events



Borrowing from Markets

- Debt is a geometrically-decaying coupon
 - ... for each unit, get q , pay $\kappa, (1 - \delta)\kappa, \dots (1 - \delta)^{s-1}\kappa$
- Government enters first stage owing b in debt, m in loans, income state z

$$v(b, m, z) = \max \{ v_R(b, m, z) + \epsilon_R, v_D(m, z) + \epsilon_D \}$$
$$v_R(b, m, z) = \max_{b'} w_R(b', b, m, z)$$

- Lenders in competitive markets need to anticipate interactions with the monopolist

$$q(b', b, m, z) = \beta_L \mathbb{E} [(1 - \mathbb{1}_D(b', m', z')) (\kappa + (1 - \delta)q(b'', b', m', z')) \mid z]$$

$$m' = m'(b', b, m, z)$$

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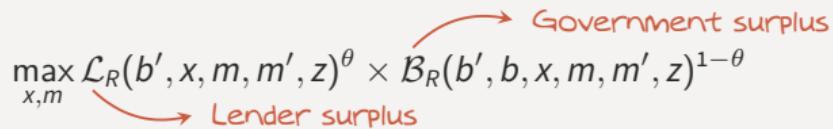
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Bargaining Stage with Monopolist

- At state z , owing debt b bonds and m on the loan and having issued b'

$$\max_{x,m} \mathcal{L}_R(b', x, m, m', z)^\theta \times \mathcal{B}_R(b', b, x, m, m', z)^{1-\theta}$$



- Lender's surplus

$$\mathcal{L}_R(b', x, m, m', z) = \underbrace{(a - x + \beta_L \mathbb{E}[h(b', m', z') | z])}_{\text{agreement}} - \underbrace{(a + m + \beta_L \mathbb{E}[h(b', 0, z') | z])}_{\text{threat point}}$$

- Government's surplus

$$\begin{aligned} \mathcal{B}_R(b', b, x, m, m', z) = & \underbrace{u(y(z) + B(b', b, m, z) + x)}_{\text{agreement}} + \beta \mathbb{E}[v(b', m', z') | z] \\ & - \underbrace{(u(y(z) + B(b', b, m, z) - m))}_{\text{threat point}} + \beta \mathbb{E}[v(b', 0, z') | z] \end{aligned}$$

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 - ... When $m - B(b', b, m, z)$ is large: government willing to borrow at high rates

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Quantitative Effects of Bilateral Loans

Calibration

- Calibrate to Argentina with only market (as in Roch & Roldán, 2023)

	Parameter	Value
Sovereign's discount factor	β	0.9504
Sovereign's risk aversion	γ	2
Preference shock scale parameter	χ	0.02
Lender's bargaining power	θ	0.5
Risk-free interest rate	r	0.01
Duration of debt	δ	0.05
Income autocorrelation coefficient	ρ_z	0.9484
Standard deviation of y_t	σ_z	0.02
Reentry probability	ψ	0.0385
Default cost: linear	d_0	-0.24
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Limiting Loans in Default

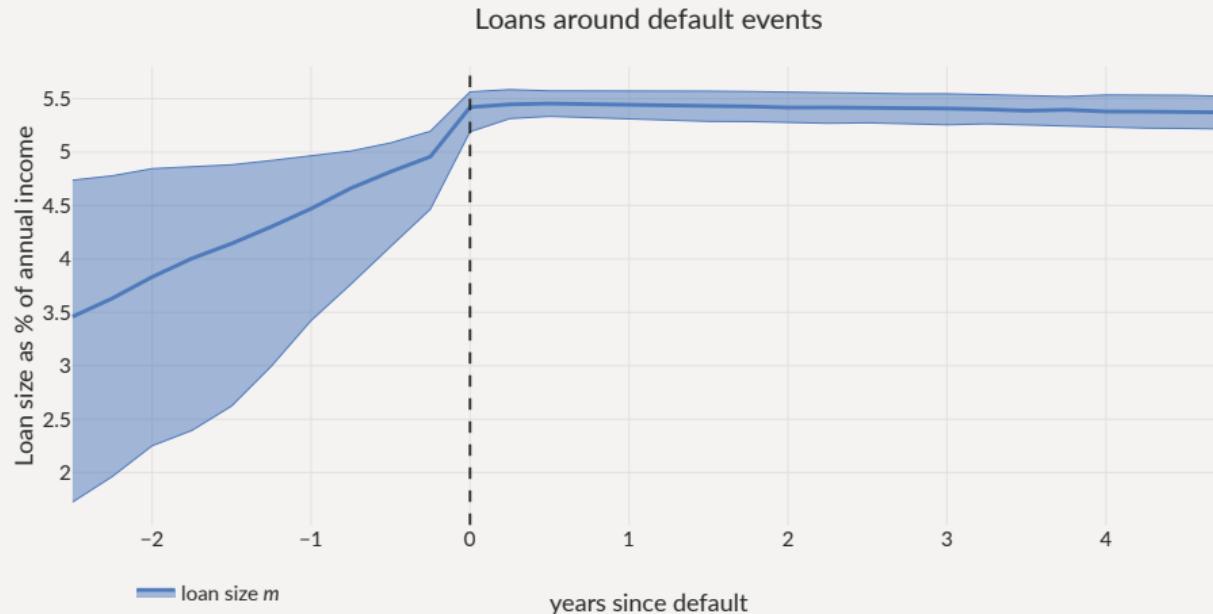
- Limited: entire loan must be repaid while in default $\Gamma(m) = 0$

	Only market	Unrestricted, $\theta = 0.5$	Limited, $\theta = 0.5$
Avg spread (bps)	714	2,105	1,038
Std spread (bps)	399	1,331	612
$\sigma(c)/\sigma(y)$ (%)	113	109	113
Debt to GDP (%)	22.5	21.2	22.5
Loan to GDP (%)	0	3.02	1.06
Loan spread (bps)	–	-429	536
Corr. loan & spreads (%)	–	67.5	71.1
Default frequency (%)	5.72	13	7.72
Welfare gains (rep)	–	-0.43%	-0.2%

When Is the Loan Used?

Limited More

- Loans shoot up before *and during* defaults

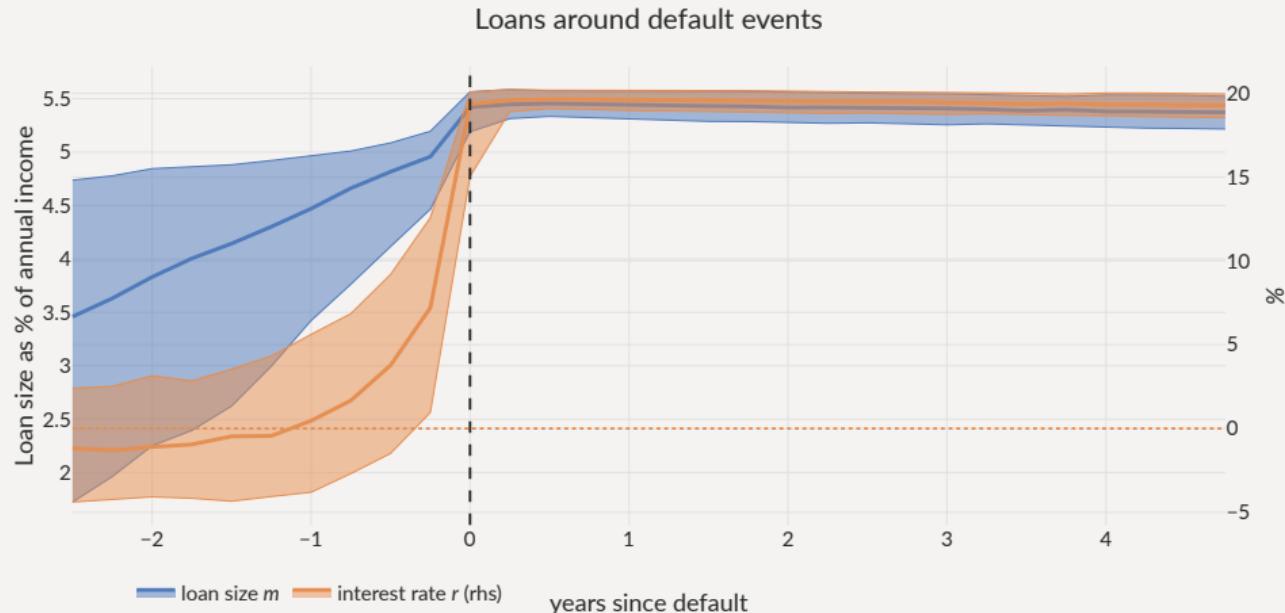


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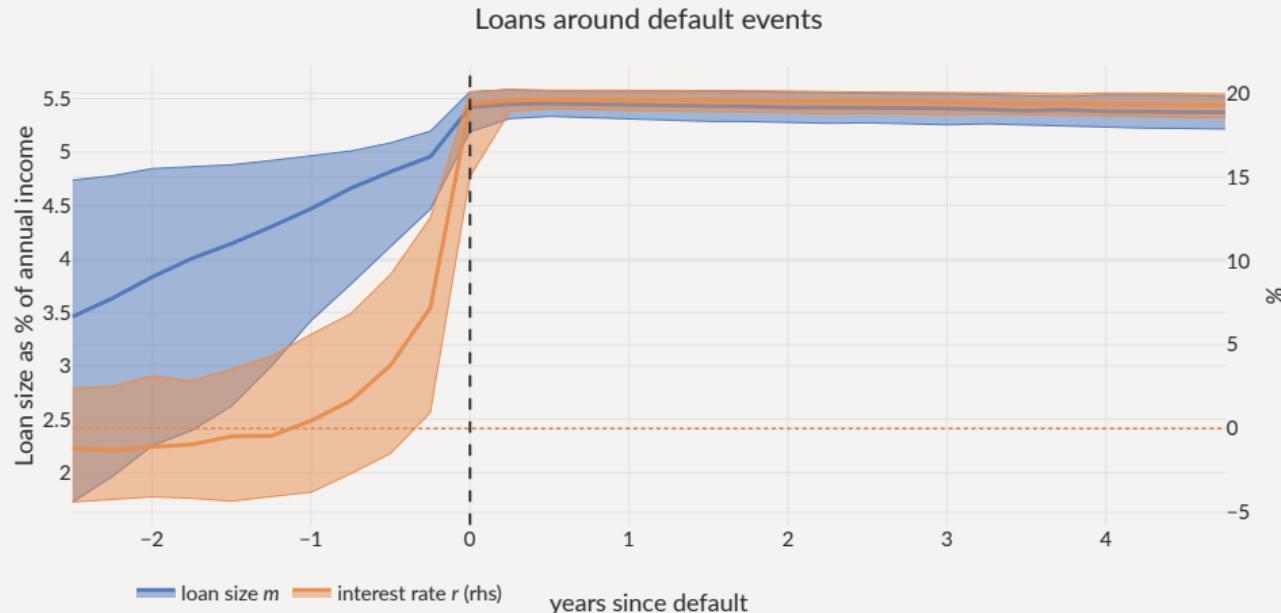


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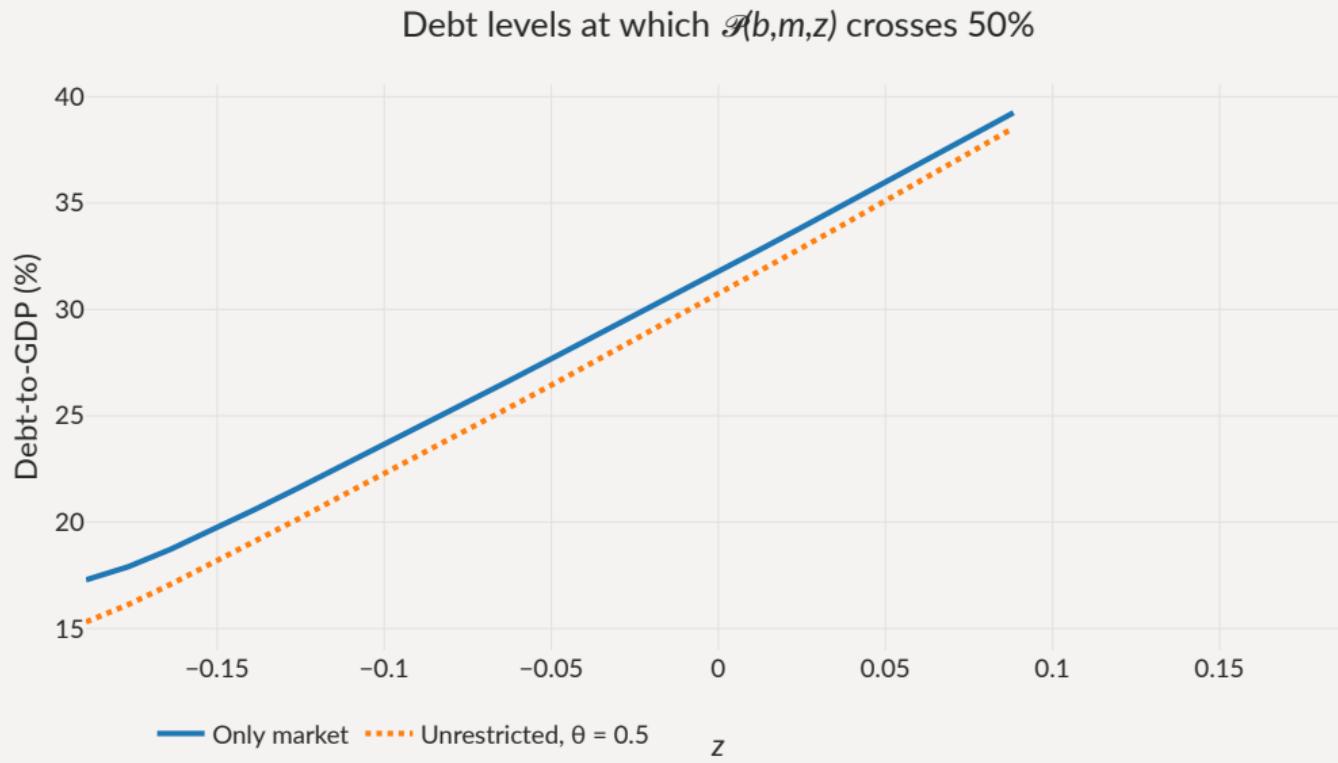
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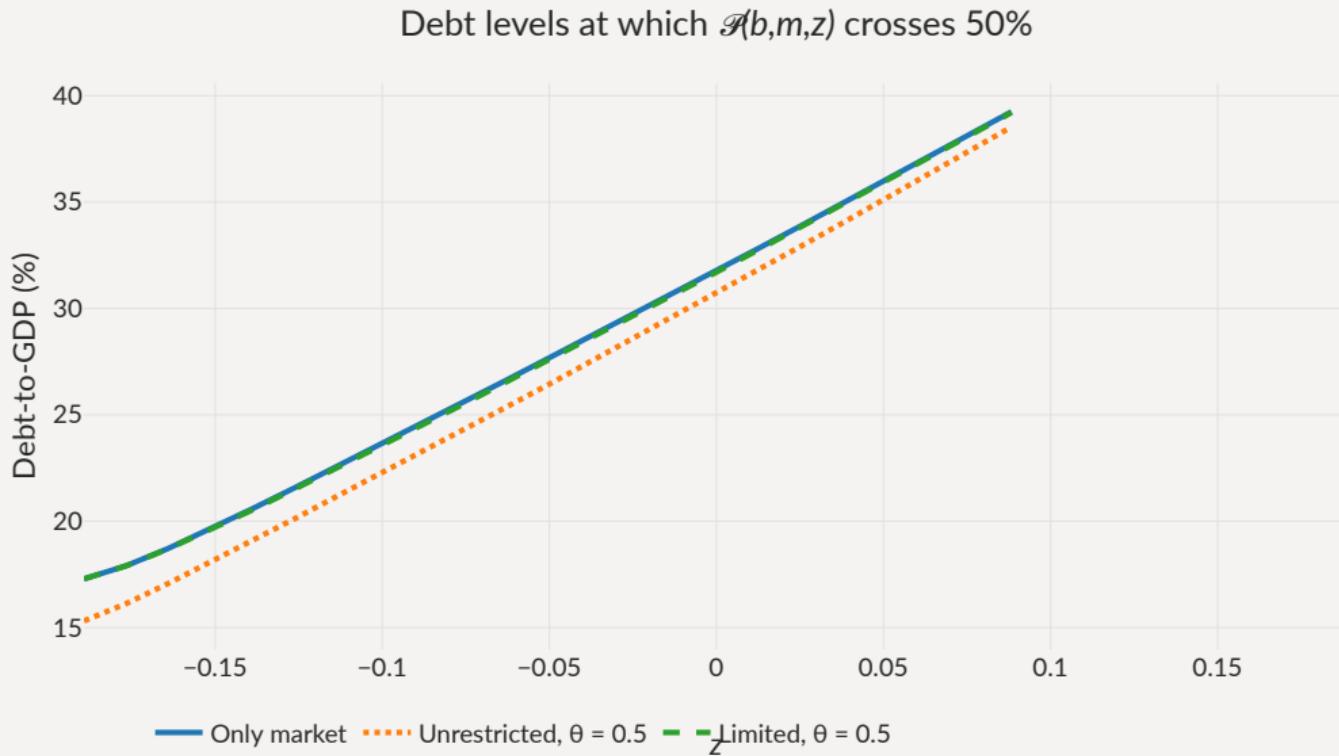
Default Barriers with Loans

- Unrestricted: default barrier moves inward, Limited: marginal impact



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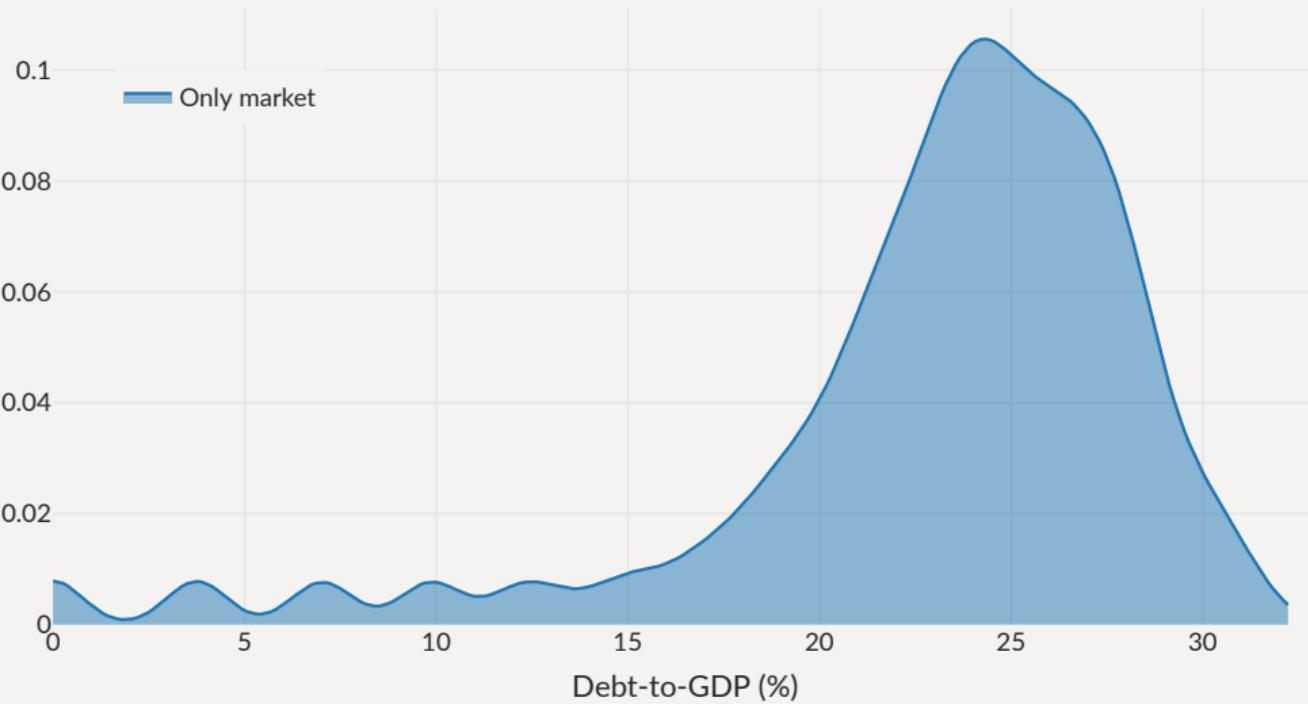


If Limited loans help repay the debt,

Why are there **more** defaults with loans?

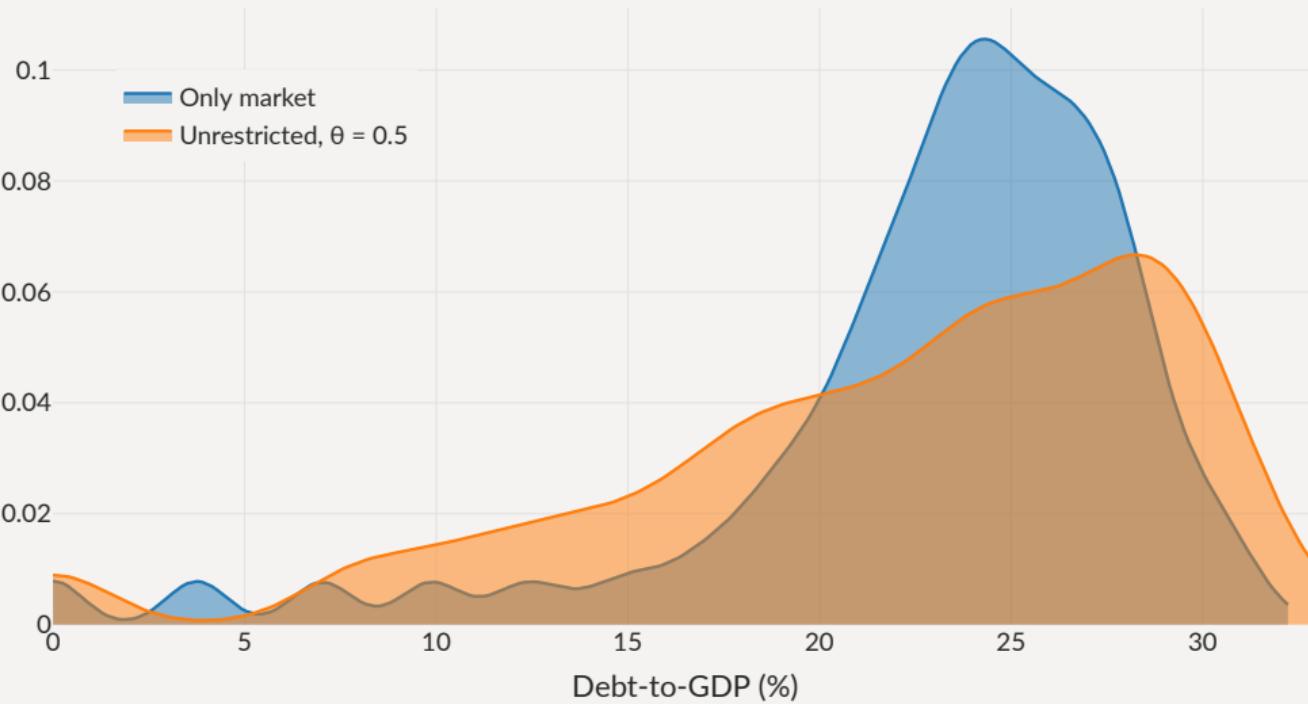
Debt Levels with Loans

Distribution of debt levels



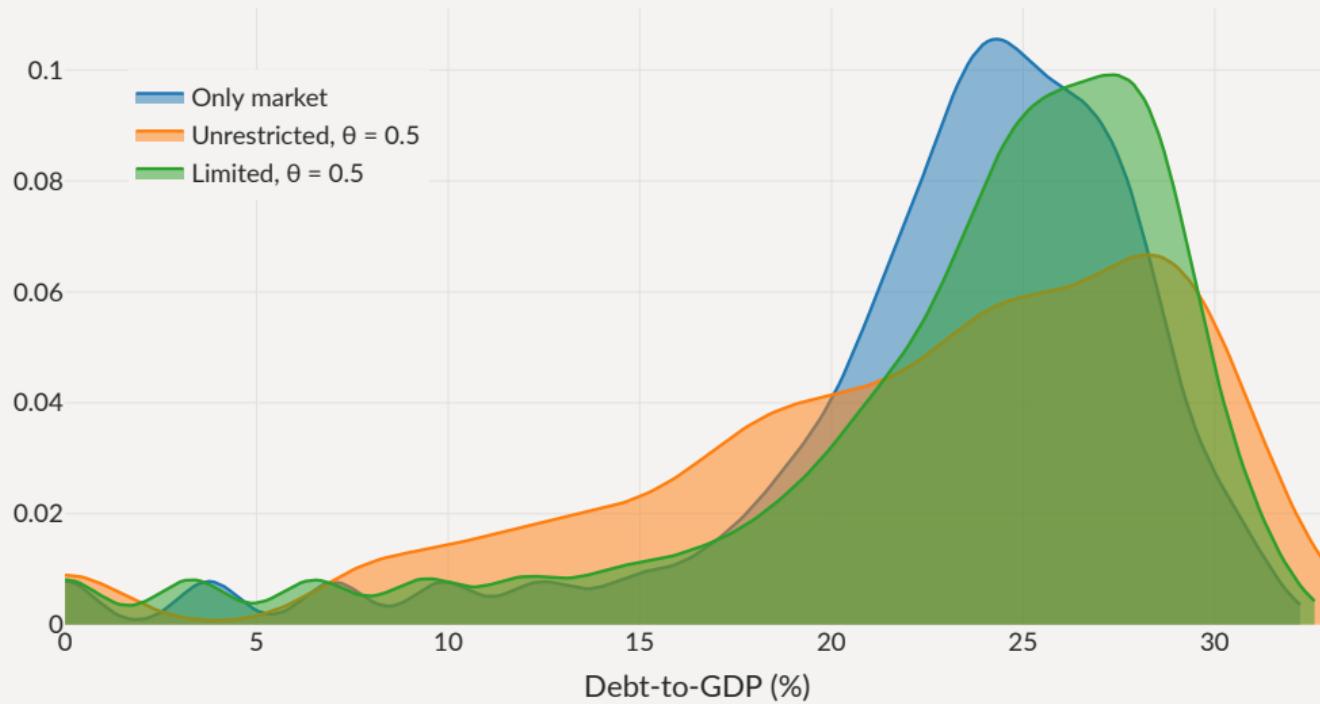
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Relational Overborrowing

Government's surplus

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- Revenues from debt issuance $B(b', b, m, z)$ modulate the value of the threat point
 - After large revenues (high q , high b'), gov't flush with cash, strong in bargaining
 - After bad issuance (low q or low b'), gov't **weak** in bargaining
- Strongly negative cross-elasticity of bilateral terms to market debt
→ goes against market discipline of spreads

$$u'(c) \left(q + \frac{\partial q}{\partial b'} i + \frac{1}{1+r_b} \frac{\partial m'}{\partial b'} + \frac{\partial \frac{1}{1+r_b}}{\partial b'} m' \right) = \beta \mathbb{E} [u'(c)(1 - \mathbb{1}_{\mathcal{D}})(\kappa + (1-\delta)q' + \dots)]$$

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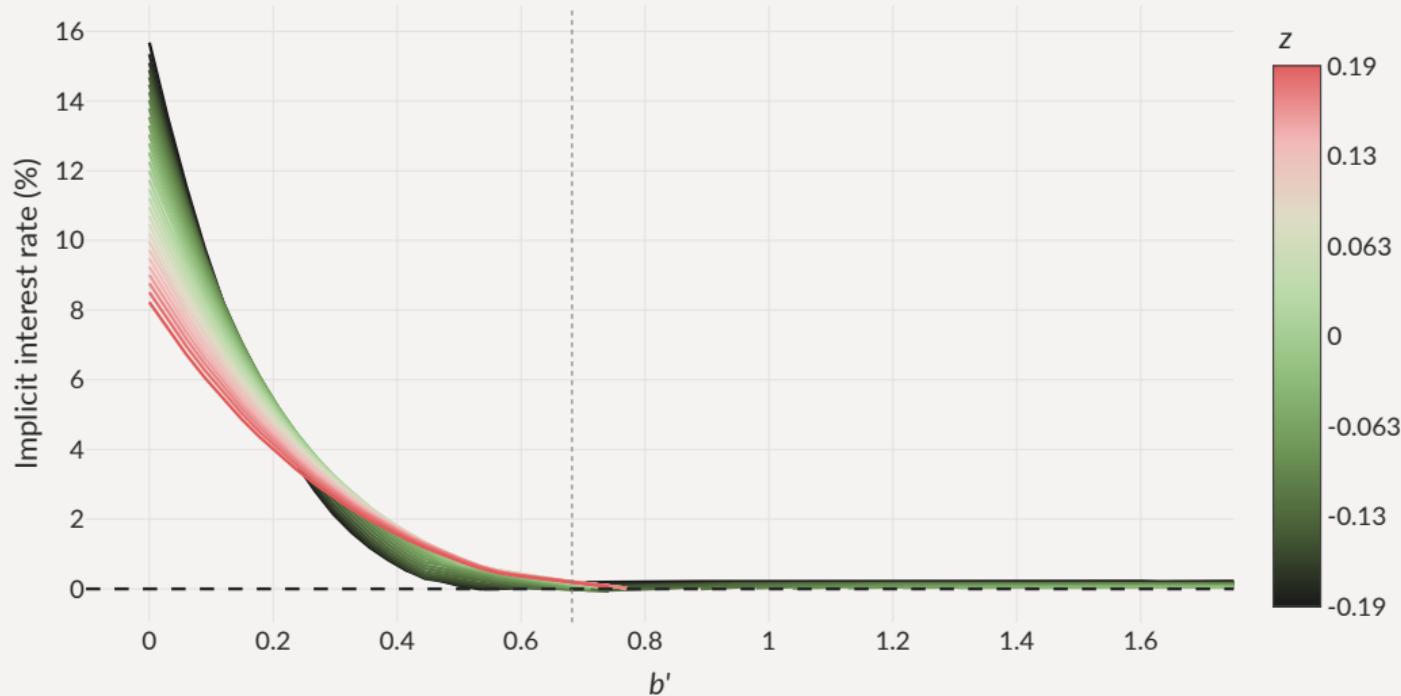
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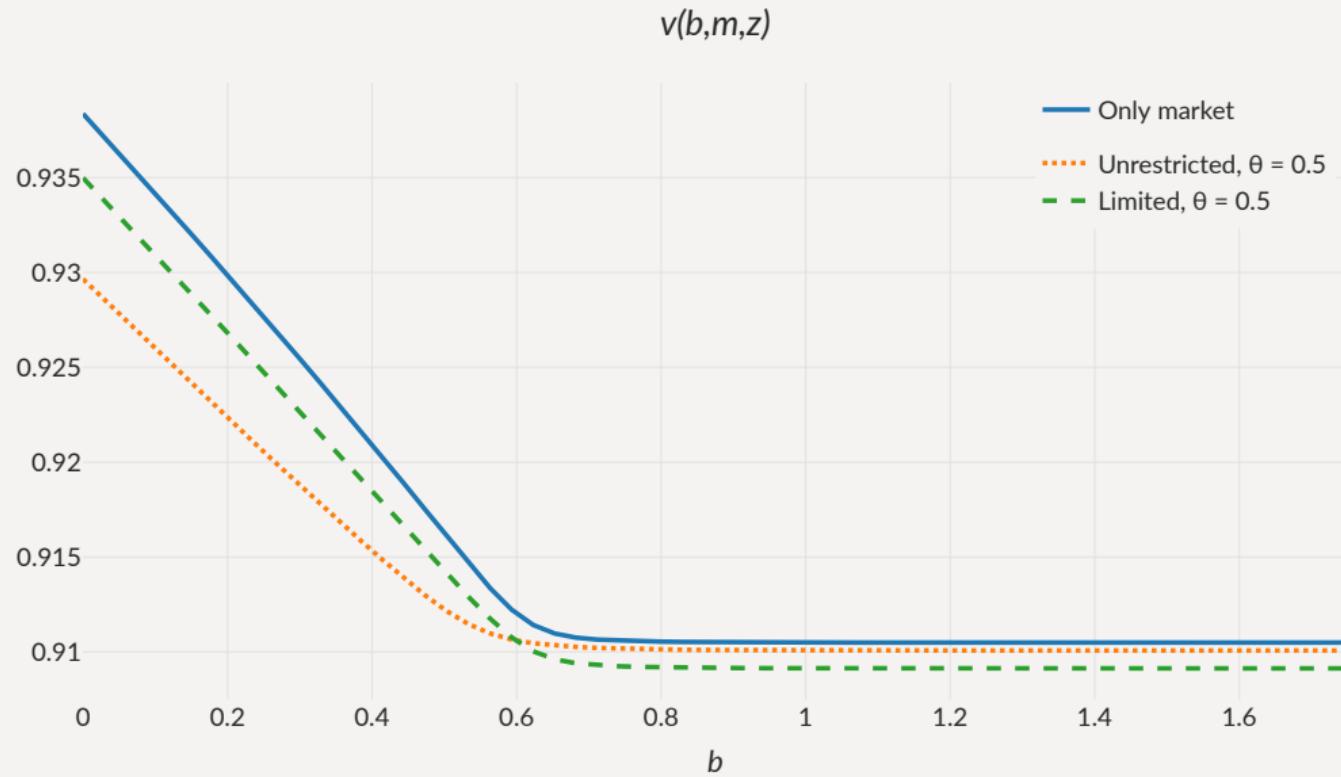
Surplus on loan requires spreads > 0 : monopolist provides **incentives** for risk taking

Loan interest rate (Limited)



Welfare Effects of Bilateral Loans

Limited \succcurlyeq Unrestricted, but...



Programming the Large Lender

Possible rules

- Bargaining over bilateral terms endogenously leads to punishment for **deleveraging**
- Explore interest rate **rules** of the form

$$r(b', m') = \max\{r, \alpha_0 + \alpha_b b' + \alpha_m m'\}$$

- Two versions
 - Risk-inducing rule: $\alpha_0 > 0, \alpha_b < 0, \alpha_m = 0$
 - Size-dependent (similar to surcharges): $\alpha_0 > 0, \alpha_b = 0, \alpha_m > 0$

Equilibrium with Exogenous Rules

	Only market	Size dependent r	Risk inducing r	Limited, $\theta = 0.5$
Avg spread (bps)	714	623	921	1,038
Std spread (bps)	399	315	552	612
$\sigma(c)/\sigma(y)$ (%)	113	115	115	113
Debt to GDP (%)	22.5	23.5	22.8	22.5
Loan to GDP (%)	0	0.71	0.972	1.06
Loan spread (bps)	–	682	1,264	536
Corr. loan & spreads (%)	–	62.5	48.1	71.1
Default frequency (%)	5.72	5.13	6.92	7.72
Welfare gains (rep)	–	0.21%	-0.079%	-0.2%

Concluding remarks

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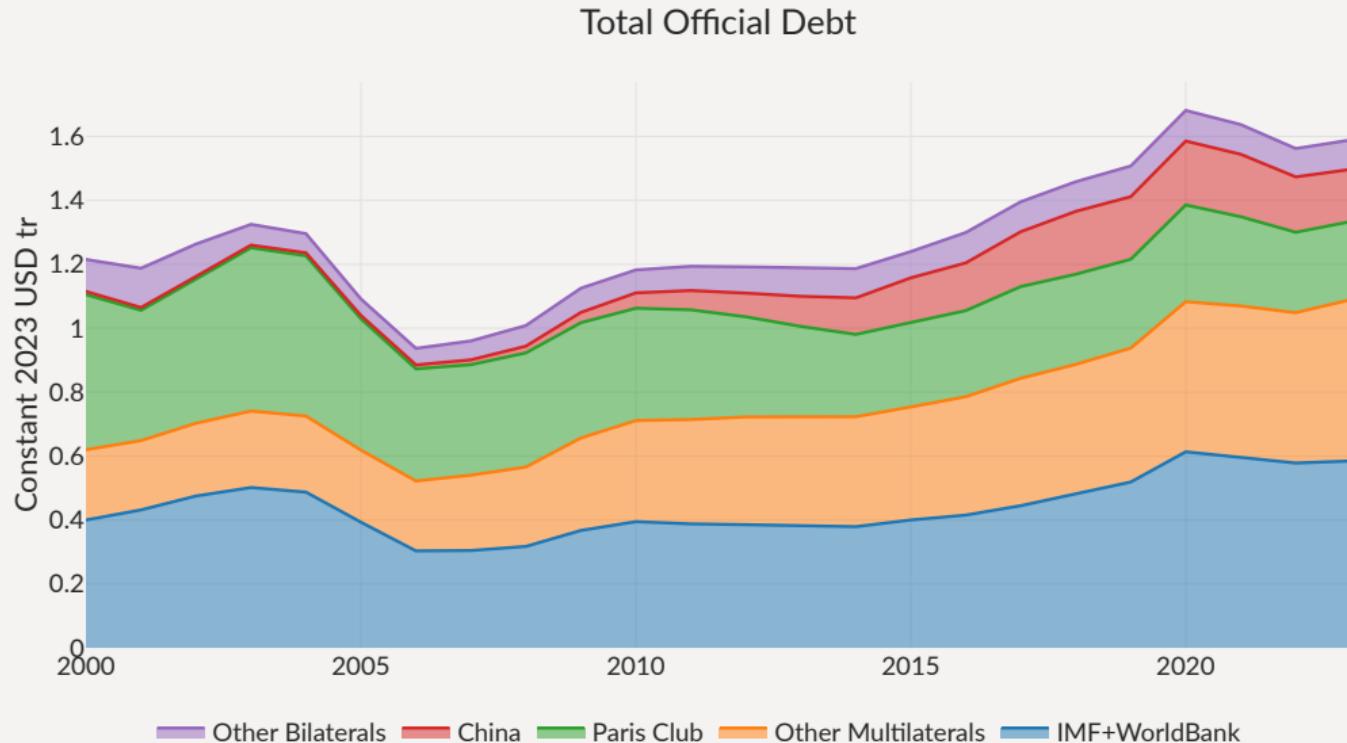
- Simple model of borrowing from **markets** and a **senior bilateral lender**
 - ... Dangerous when bilateral interest rate responds negatively to *market* debt
 - ... Bargaining as an example of situation where cross-elasticity emerges
- Strong interaction between two markets for sovereign debt
 - ... cross-elasticity induces risk-taking, more defaults, welfare losses
 - ... even if bilateral loans are **not** used intensely on the equilibrium path
- Cross-elasticity constitutes a simple test to assess welfare gains of **new** instruments
 - ... or a boost to the gains of fiscal rules, state-contingent debt...



Scan to find the paper

A New Landscape for Official Sovereign Debt

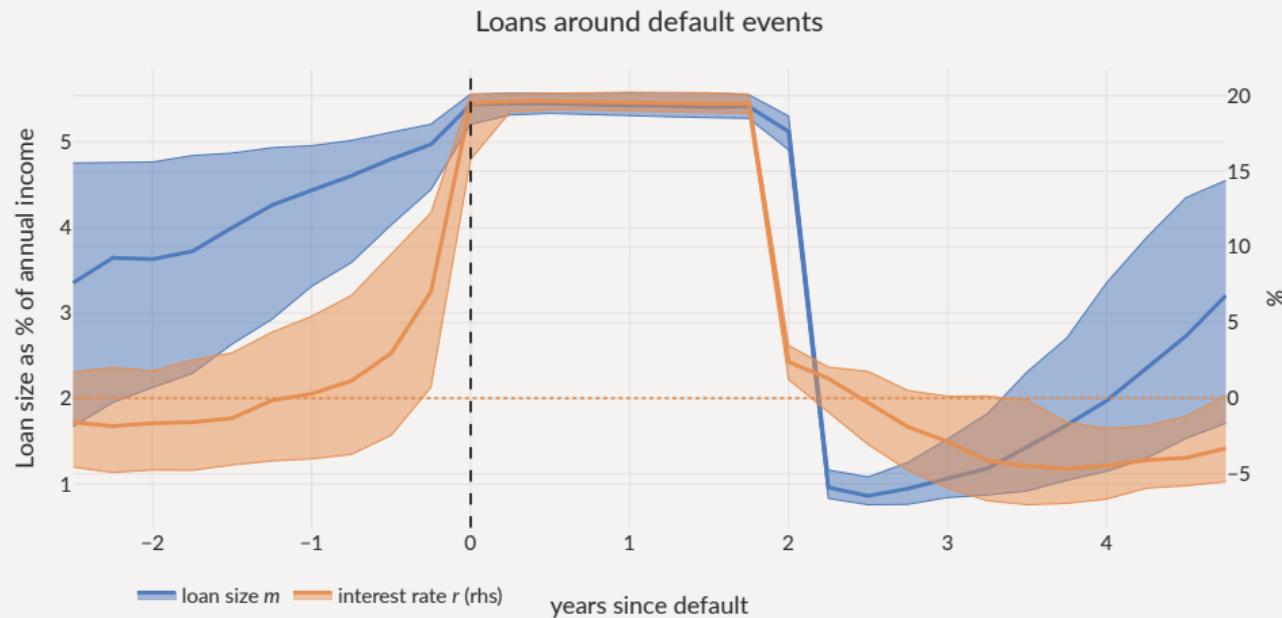
◀ Back



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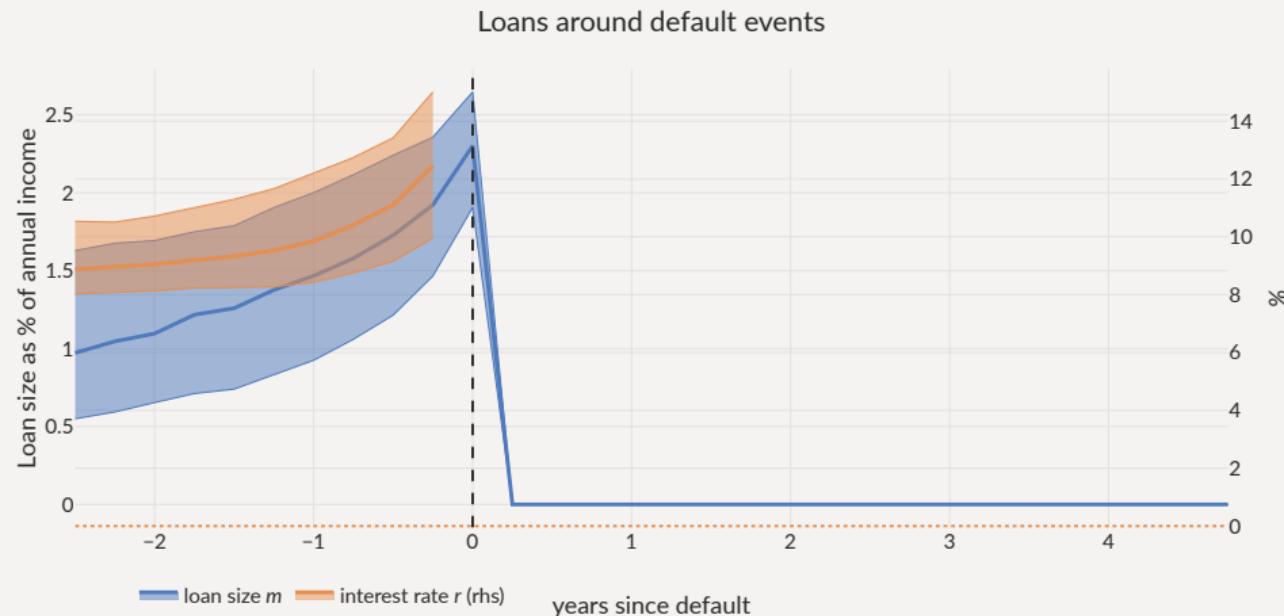
- Further conditioning on default events lasting exactly two years



When is the Loan Used?

◀ Back

- With Limited: $\Gamma(m) = m$



Loan drawings m' (Limited)

