

Central Bank Swap Lines as Bilateral Sovereign Debt

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Symmetric and Asymmetric Swap Lines

- **Swap** line: two lines of credit involving two central banks
 - ... Each makes available an amount of its own currency to the other, for a fixed term
 - ... Short-term arrangements (typically one year, typically renewed)
- Used to mainly involve **AEs** Fed-ECB-BoE-BoJ-BoC
 - ... to support lender-of-last-resort functions with multinational firms
- Large increase in bilateral swaps and loans involving **EMs** since early 2000s
 - ... for EM, swap resources are hard currency
 - ... for EM, swap can be used for financing BoP (or as borrowed reserves)

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How do swap lines interact with sovereign debt?

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How do Central Bank Swap Lines affect the Market Structure of Sovereign Debt?

- We abstract from **currencies**, **collateral**, and focus on the **borrowing**
- Borrowing with bonds
 - ... interest rate reflects **default** risk
- Borrowing from the swap line
 - ... interest rate and drawings **negotiated**
- Defaulting on the debt does not mean defaulting on the swap

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The Dangers of Borrowing through Swap Lines

Main findings

- Swap drawings small relative to debt, but
 - Presence of swaps affects sovereign debt markets
 - ... can provide financing when other sources dry up
 - ... can increase risk-taking
- Lending around or in default maximizes surplus in swap negotiations
 - Availability of swaps in default:
 - ... raises the value of default
 - ... which increases the default frequency
 - ... and worsens borrowing terms in bond markets
 - Without restricting swaps in default, welfare losses for the government
- Swap lines create overborrowing incentives similar to the debt dilution problem
 - Surplus requires spreads — spreads require risk

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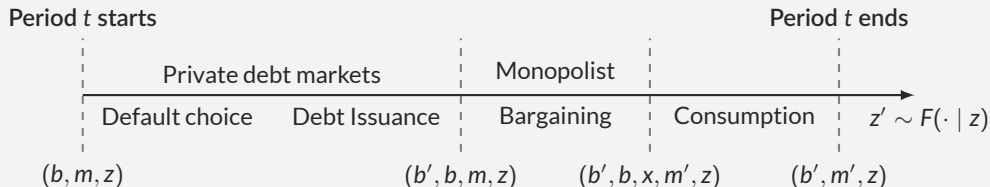
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Model

Timeline of events

Two markets

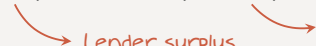
- Owe debt b in markets: long-term debt, geometrically-decaying coupons
- Owe drawn amount m to “monopolist” Central Bank [Total amount available = k]



Bargaining for swap line terms

- Nash bargaining over transfer x and amount owed/drawn m'

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



Lender surplus

- Interest rate: $x = \frac{1}{1+r} m' - m$
- Expected profits from m'

Government surplus

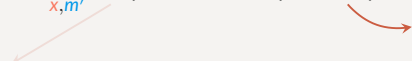
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Dynamics and Quantitative Results

When are gains from trade largest?

- Monopolist cannot offer **worse** terms than private creditors
... Implicit interest rate on the swap cannot exceed that on bonds
- When debt is low and default is **unlikely**, private markets lend at close to r
... Little value added from the monopolist's presence
- When debt is less safe, **spreads** open up $r^p > r$
... Monopolist can offer better terms and make a profit $r^p > r^m > r$
- **Twist:** monopolist can charge lower rates during debt accumulation episodes
... Conversely, charge higher rates during debt deleveraging
- Bilateral relationship creates incentives for risk-taking and **overborrowing**

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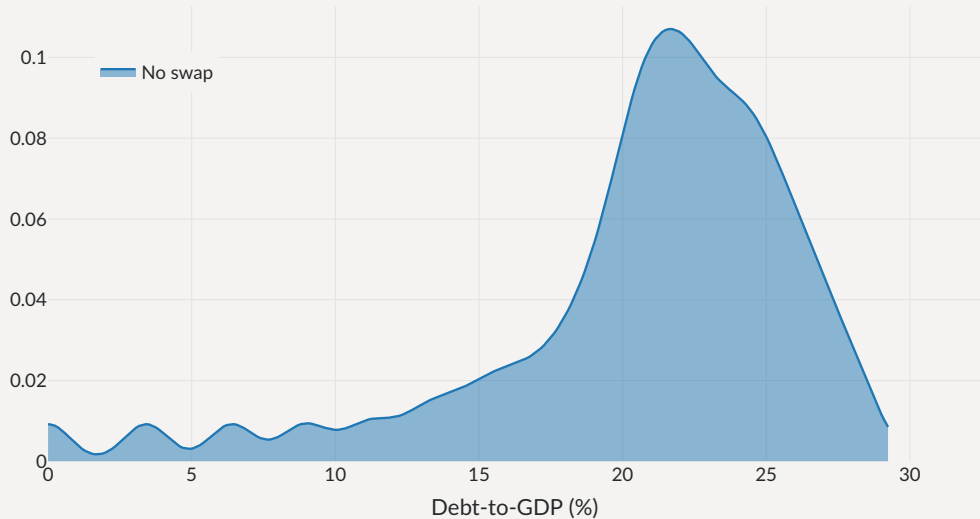
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Dynamics with swap lines

need to redo the graph with name Delevered

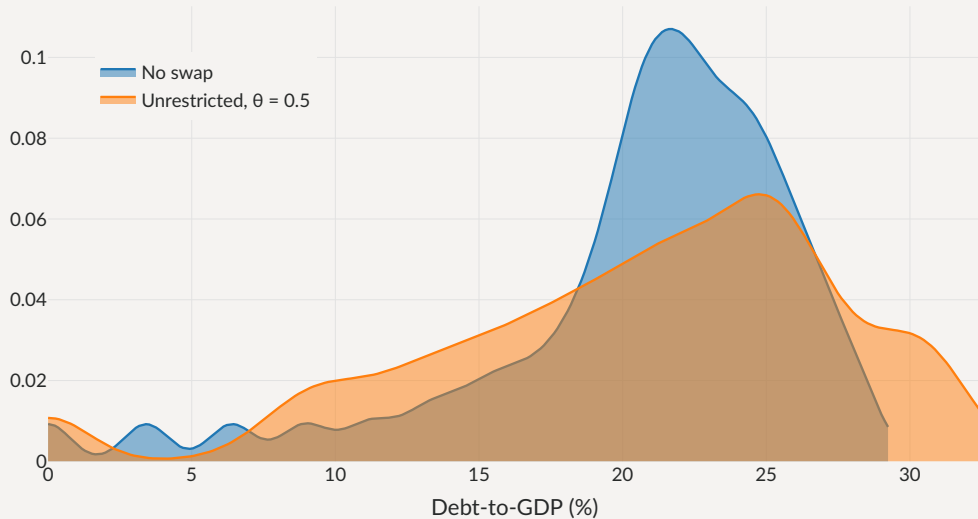
Distribution of debt levels



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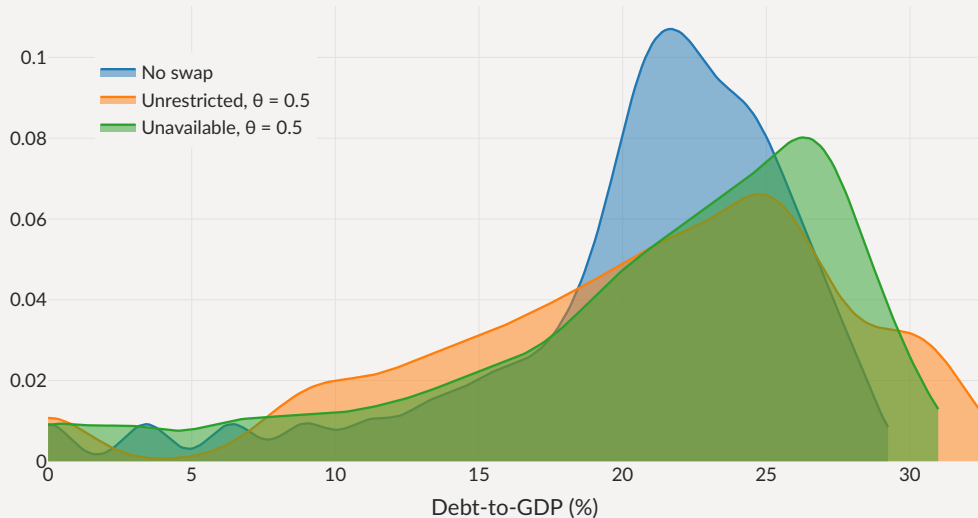
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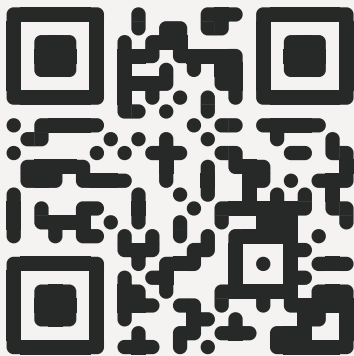
Welfare effects of swap lines

	No swap	Unrestricted, $\theta = 0.5$	Delevered, $\theta = 0.5$
Avg spread (bps)	901	2447	1406
Std spread (bps)	532	1578	960
$\sigma(c)/\sigma(y)$ (%)	110	110	114
Debt to GDP (%)	20.5	19.6	20.5
Swap to GDP (%)	0	3.25	1.27
Corr. swap & spreads (%)	-	62.6	70.1
Default frequency (%)	7.07	15.2	10.7
Welfare gains (rep)	-	-0.36%	-0.22%

Concluding Remarks

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- Simple model with monopolist/fringe structure
- Strong interaction between two markets for sovereign debt
 - ... even if swaps are not used intensely on the equilibrium path
- Market power crucial in model
 - ... how to discipline in model?
 - ... how to affect in reality?
- Large welfare effects, policy challenges
 - How to limit their use during defaults?
 - Strengthened debt dilution – more gains from fiscal rules, state-contingent debt?



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