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Dynamics of Growth, Debt and Taxation

by

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Extending our earlier work in

Sovereign Debt, Government Myopia and the Financial Sector

Review of Financial Studies, 2013

Why don't governments restructure debt even when long-term gains seem high?

What leads to the entanglement of financial sector with sovereign credit risk?

Proposed Explanations

- Fear of exclusion from debt markets
  - Need long-term exclusion, but defaulters return to international capital markets reasonably soon
  - At any rate, requires long-term governments!
- “Collateral damage” to own banks
  - Governments issuing debt in own currency face banking crises upon sovereign default
  - More suitable for rich, industrialized countries

Our Explanation

- Most governments care about short-term electoral popularity and like to “spend”
  - Hence, they care about *current cash flows*
- They dislike default as it lowers current cash
- They pass on the burden of repaying debt to future governments
  - Collateral damage channel, even if less relevant now, may be stronger then
- Current governments “stuff” their banks with bonds to build *future* commitment to repay
  - And knowing this, creditors continue to lend

Two-period Model

The Economy

- Country that is emerging from an endowment shock (or a “poor” country)
  - Commodity price shock, war, financial crisis, …
- Legacy debt held by external creditors
- Private sector (households and corporations)
  - Can invest endowment productively for long run
  - Save in government bonds via a financial sector
  - Financial sector has some “home bias”
- Short-term government
  - Maximize spending on populist schemes
  - Raise money through taxation and new debt
  - Taxes discourage investment; encourage savings

Model Timeline

Period 1 | Period 2

t=0 | t=1 | $t=1^{+}$ | t=2

(1) Existing foreign debt D_0 and corporate endowment E_0.

(2) Govt decides whether to announce "default" on legacy debt; It announces tax rate t_1; Corporate sector makes investment k_1 and saves the rest $(E_0 - k_1)$

(3) Short run corporate output $f_1(k_1)$ realized;

(4) Govt collects taxes $t_1 f_1(k_1)$; Govt repays debt of $D_0 (1+r)$ and raises new debt (if no default): Externally financed debt is D_1^{For}, domestically financed debt D_1^{Dom}.

(5) New govt comes in; Govt decides whether to announce "default" on legacy debt; announces tax rate t_2;

(6) Long run corporate output $f_2(k_1)$ realized; Govt collects taxes $t_2 f_2(k_1)$; Govt repays debt of $D_1 (1+r)$ (if no default)

Costs of Default (in period 2)

- Default disrupts domestic financial sector
- Costs of default equal $zD_1^{Dom}(1+r), z>1$, and

$$D_1 = D_1^{For} + D_1^{Dom}$$

- Several explanations
  - Government bonds may be in demand for “safety”
  - They may serve as collateral in inter-bank flows
  - *z* exogenous for now
- Period 1 government likes to boost savings, i.e., D_1^{Dom}, to build future willingness to pay

How much can the future government repay?

- Constrained by ability to pay

$$D_1(1+r) \leq t^{Max} f_2(k_1).$$

- Constrained by willingness to pay

$$D_1(1+r) \leq zD_1^{Dom}(1+r) = z(E_0 - k_1^*(t_1)).$$

- Which constraint binds?

Current govt's "repression" policy

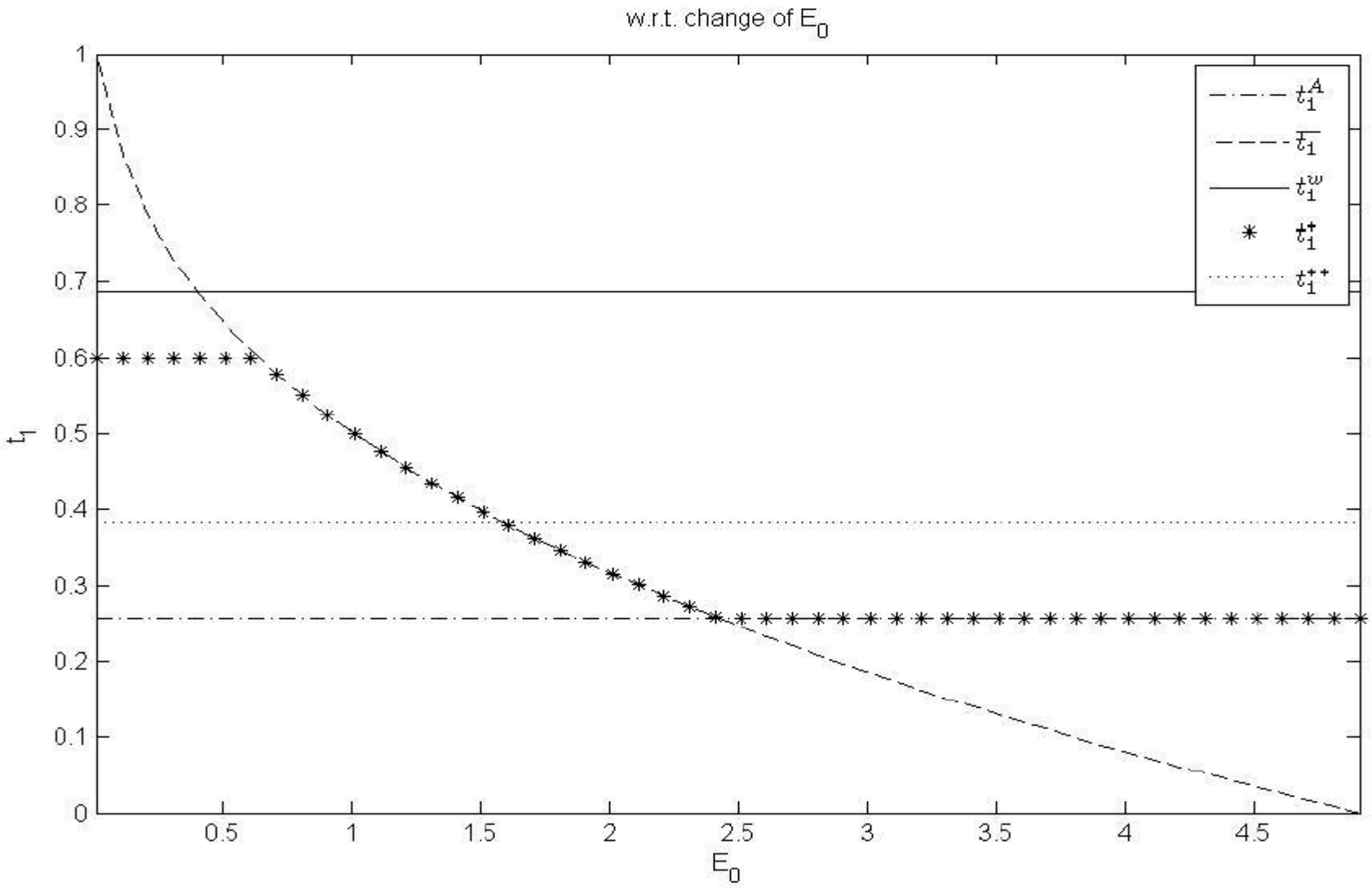
- High endowment or ability-to-pay:

$$\max_{t_1} \frac{1}{(1+r)} t_2 f_2(k_1^*(t_1)) + t_1 f_1(k_1^*(t_1)).$$

- Low endowment or willingness-to-pay:

$$\max_{t_1} z(E_0 - k_1^*(t_1)) + t_1 f_1(k_1^*(t_1))$$

Repression policy in endowment



Current govt's default decision

- Default if and only if

$$t_1^{**} f_1(k_1^*(t_1^{**}) \geq D_1^* - D_0(1+r) + t_1^* f_1(k_1^*(t_1^*)).$$

- Assumes that default leads to one-period exclusion from debt markets
- Default attractive only if economy is highly productive

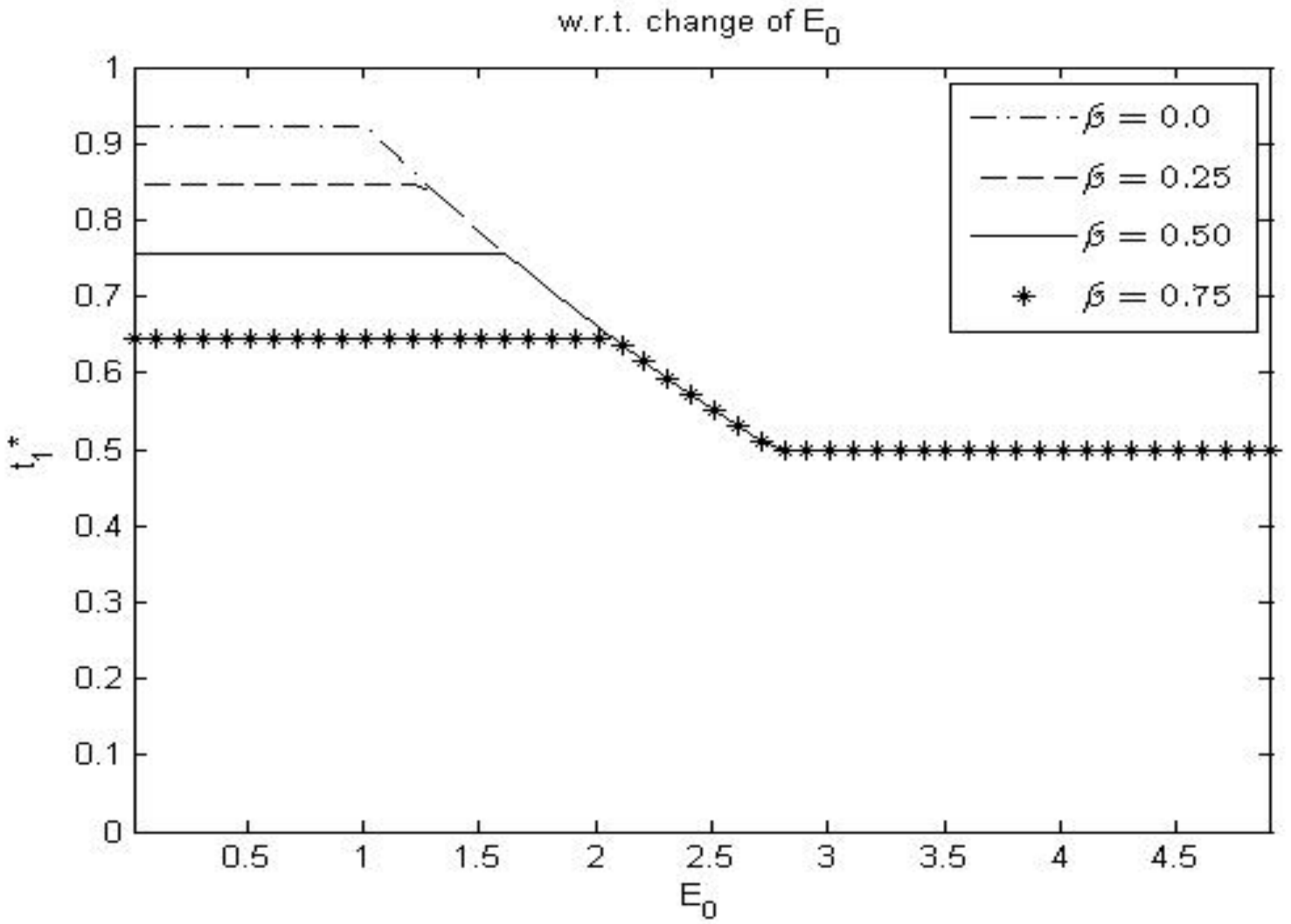
Long-term government

- Consider a government that discounts future spending at the rate $\beta \leq (1+r)^{-1}$
- Objective function:

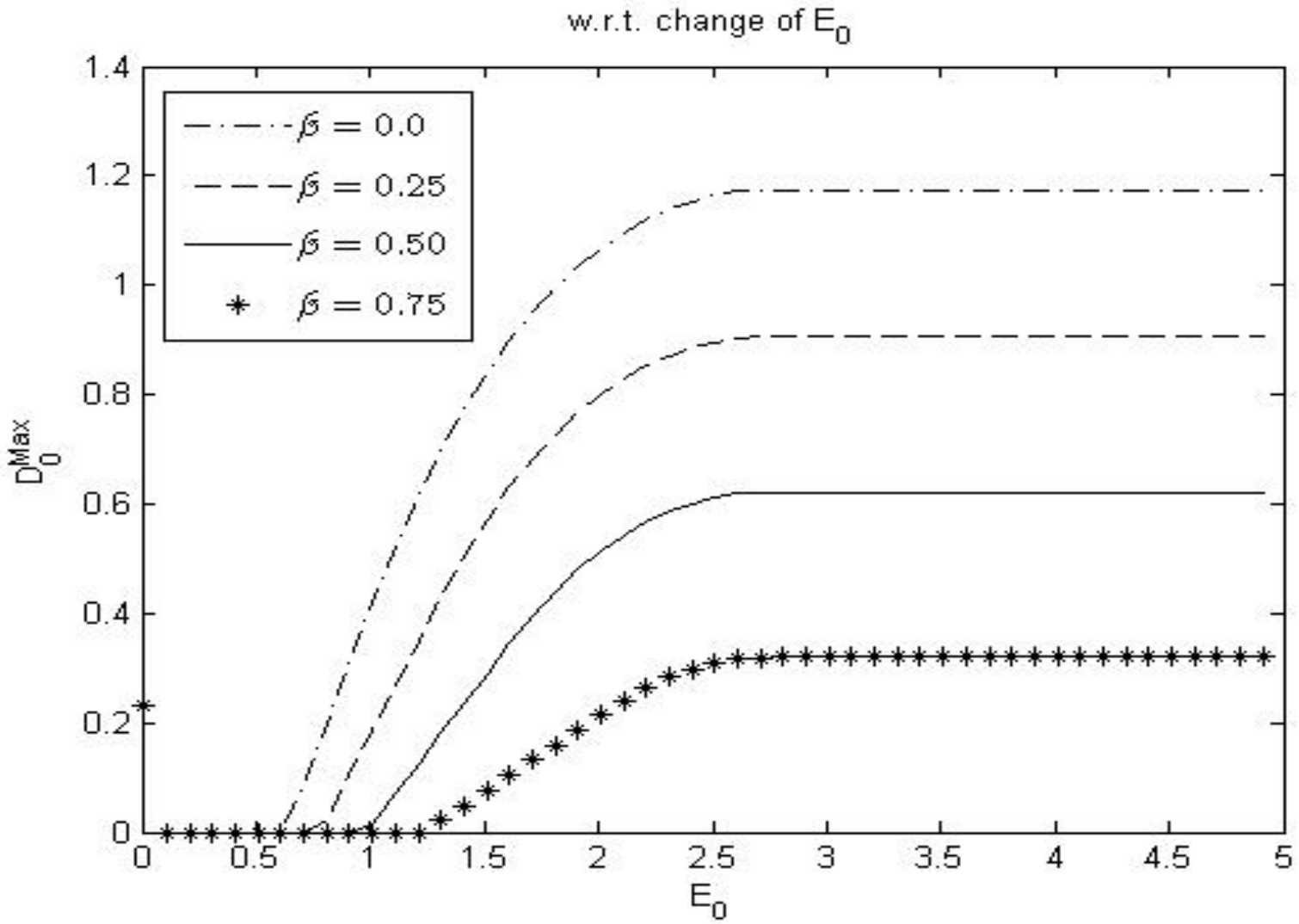
$$\left[D_1 - D_0(1+r)\right] + t_1 f_1\left(k_1(t_1)\right) + \beta\left[t_2 f_2\left(k_1(t_1)\right) - D_1(1+r)\right]$$

- If $\beta = (1+r)^{-1}$ then no value to bringing spending forward by borrowing, so it *always* defaults on legacy debt

Short-term governments engage more in repression



Short-term governments have greater debt capacity!



Implications

I. Debt is a double-edged sword

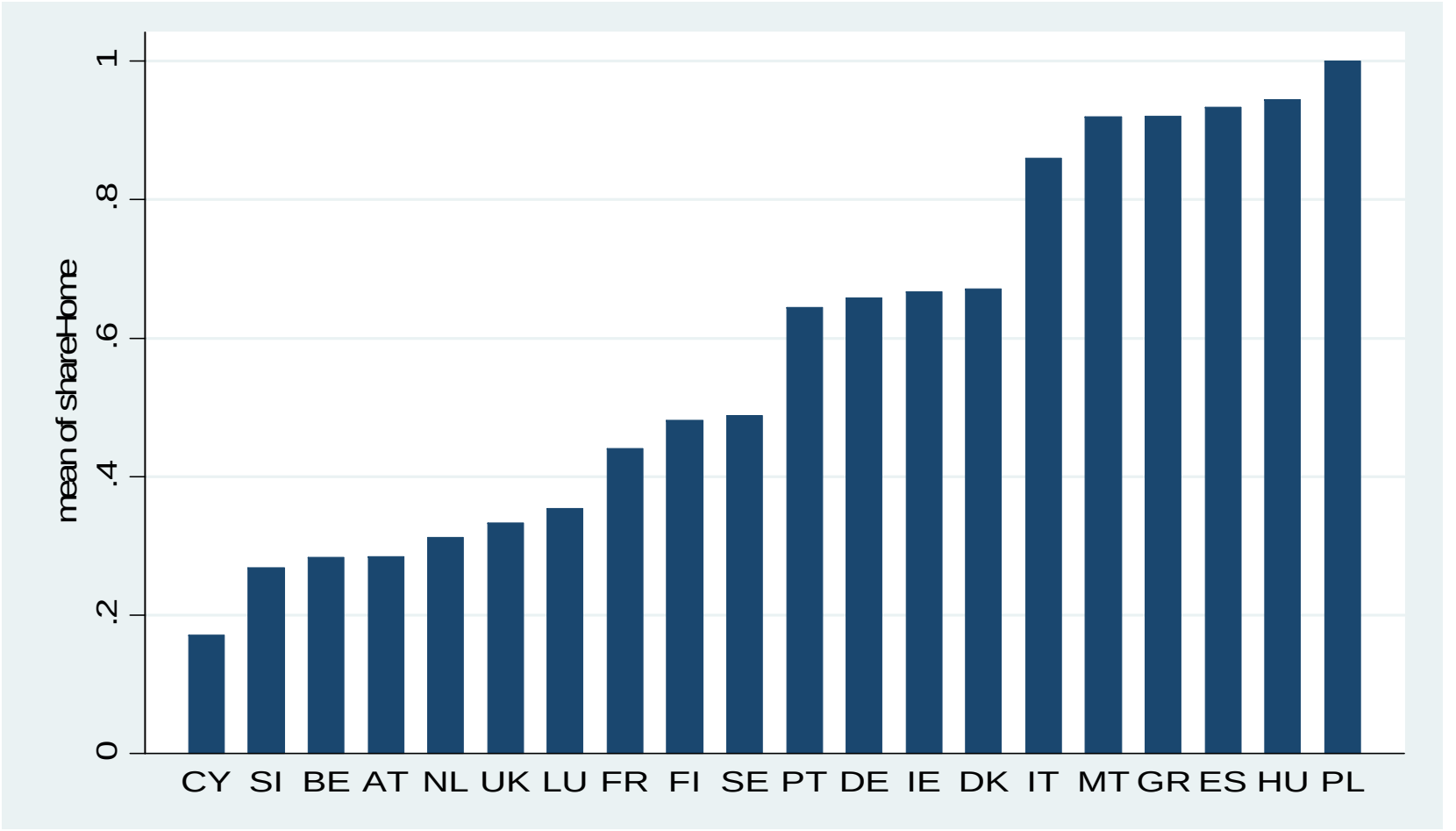
- Ability-to-pay region (high endowment): debt lengthens government's horizons even though it is myopic and populist
  - Debt monetizes future taxes
  - Leads to more growth and investment compared to autarky (no sovereign debt)
- Willingness-to-pay (low endowment):

debt with myopic, populist governments leads to economic and financial repression

II. (Over-)Developing of debt markets by governments

- Instead of direct taxation of investments, governments can favor banking sector investments in its own debt markets
  - High liquidity requirements for banks
  - Eligibility in central bank OMOs, LOLR, …
- Governments can also choose “z” to increase vulnerability of the banking sector
  - Leave banks under-capitalized
  - Such banks prefer to gamble on domestic debt inducing a “home bias” in bond holdings

“Home bias” in Europe



Source: Acharya, Drechsler and Schnabl (2011)

III. European sovereign crisis

- Failure to recapitalize banks
  - Linked to zero risk weights on sovereign debt
- Under-capitalized banks did “carry trades” moving out of (shorting) German bunds into periphery debt
- Need mechanisms to break the sovereign-financial sector nexus – Bruegel proposal:
  - “Blue” bonds held by domestic banks and guaranteed by Euro area (taxation of members)
  - “Red” bonds guaranteed by issuing country and domestic banks prohibited from holding
  - Lack of commitment to repay Red bonds?
  - Compensate government officials in Red bonds?

Dynamics

Steady state

I. The economy may reach the steady state when governments have the willingness to pay (high endowment)

- Borrowing constrained only by ability to pay
- Each government borrows fully against the entire future stream of tax proceeds
- However, the tax proceeds only pay off the legacy debt of the previous government
- Economies evolve to this state over time…

Transition to steady state

II. Along the path to steady state (at low endowments), the willingness to pay constraint binds

- Option 1: Increase willingness to pay by "repressing" the economy / financial sector
- Option 2: Increase future government's ability to pay (reach steady state sooner) and enhance today's debt capacity
- Both boost debt capacity, but only Option 2 boosts growth and Option 1 represses growth

Middle-income growth “trap”

- Poor economies choose Option 2 and stimulate growth to increase debt capacity
  - Indeed, it may be their only commitment to borrow
- As economies get richer, growth slows down *endogenously* due to government myopia and reliance on Option 1 (“repress growth”)
  - Government bond markets expand at the cost of the private sector investments

Great Moderation and Crises

- With uncertainty about growth, there can be default within the term of current governments (“sudden stop”)
  - Defaults are costly due to entanglement
  - Myopic governments partly internalize the cost of defaults due their debt policies
- If uncertainty about growth is primarily back-loaded (“Great Moderation”)
  - Myopic governments internalize less the cost of sovereign defaults if these are more in the long run
  - Leads to excessive build-up of sovereign debt and future sovereign defaults

Thank You (Raghu)!