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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

- **t=0**
  1. Existing foreign debt $D_0$ and corporate endowment $E_0$.

- **t=1**
  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.

### Period 2

- **t=1**
  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 $D_1^{Dom}$.

- **t=2**
  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

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

- Constrained by willingness to pay

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

- 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:

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

- 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)!