

Political Economy of Sovereign Debt: A Theory of Cycles of Populism and Austerity

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Motivation

- Populist policy cycles (Dornbusch and Edwards (1991), Sachs (1989))
 - Latin American economies in the 20th century
 - Typical dynamics:
 - Large redistributive programs, accumulation of foreign debt
 - Eventually country got into trouble
 - Drastic reduction in foreign debt and reversal of redistributive policies
 - The cycle repeats
- Similar to recent experience in Southern European countries

What we do

- Explore debt dynamics in a textbook model of international borrowing
- Impatient government borrows internationally without commitment
- Introduce
 - **Intergenerational conflict**
 - **Heterogeneous agents**
- Show populist cycles emerge in best SPE

Why cycles emerge

- Incentives to default on international debt affected by domestic inequality
 - High inequality \implies high incentives to re-optimize
- High debt \implies need to cut transfers
 - Increases inequality among the young
 - Increases tomorrow's inequality among the old
 - That higher inequality is sustainable only if tomorrow's debt is low and government increases transfers to next period's young
- This gives rise to cycles
 - Austerity: Sharp transfer cuts and debt reduction
 - Populism: High transfers and debt accumulations periods

Related Literature

- Optimal Fiscal Policy: Barro (1979), Lucas and Stokey(1983), Werning (2007), Bhandari, Evans, Golosov, and Sargent (2013)
- Optimal Fiscal Policy without Commitment:
 - Open economy: Amador, Aguiar and Gopinath(2009), Aguiar and Amador (2014), Tran-Xuan (2023a and 2023b)
 - Closed economy: Farhi, Sleet, Werning and Yeltekin (2012), D'Erasmus and Mendoza (2014), Scheuer and Wolitzky (2014), Lancia, Russo and Worrall (2023)
- Political economy of populism: Acemoglu, Egorov and Sonin (2014)

Outline

- Illustrate result with
 - Simple log-log economy with affine taxes
 - Policy chosen by benevolent government
- Generalization
 - Different preferences and tax instruments
 - Different model of politics

Environment

- Infinite horizon OLG economy
- μ_i is fraction of agents with productivity θ_i , wlog $\sum_i \mu_i \theta_i = 1$
- Preferences of type i agent born in period t

$$\begin{aligned} U_{i,t} &= u(c_{it}) - v(y_{i,t}/\theta_i) + \beta u(x_{i,t+1}) \\ &= \log(c_{it}) + \log\left(1 - \frac{y_{it}}{\theta_i}\right) + \beta \log x_{i,t+1} \end{aligned}$$

- Small open economy: Borrow at international rate R

$$\sum_i \mu_i (c_{i,t} + x_{i,t}) + B_t^* = \sum_i \mu_i y_i + \frac{B_{t+1}^*}{R}$$

Government's preferences

- Uses Pareto weights $\{\alpha_i\}_i$ to aggregate preferences within generation

$$U_t = \sum_i \alpha_i \mu_i U_{i,t},$$

- $\{\hat{\beta}^t\}_t$ across generations

$$W_t = \frac{1}{\hat{\beta}} U_{o,t-1} + \sum_{k=0}^{\infty} \hat{\beta}^k U_{t+k}$$

- Impatient, $\hat{\beta}R < 1$

Affine taxes \Rightarrow implementability conditions

- Instruments:
 - Linear taxes on labor income and savings (domestic)
 - Transfers to young and old
- $\{c_{i,t}, y_{i,t}, x_{i,t}\}_i$ must satisfy the implementability conditions

$$c_i = \varphi_i C, \quad x_i = \varphi_i X$$

$$\theta_i - y_i = \varphi_i (1 - Y)$$

$$\varphi_i = 1 + \frac{1}{2 + \beta} \frac{\theta_i - 1}{1 - Y}$$

- Trade-off redistribution-efficiency
 - Consumption shares φ_i more dispersed if aggregate output Y high

Lack of commitment

- Government can re-optimize in any period
 - Default on debt, choose new tax policies
 - Let \underline{W} be the value of such re-optimization
- Subgame perfect equilibrium imposes **sustainability constraint**

$$\frac{1}{\hat{\beta}} U_{o,t-1} + \sum_{k=0}^{\infty} \hat{\beta}^k U_{t+k} \geq \underline{W}$$

- Two sources of time inconsistency:
 - Foreign: Don't want to repay debt
 - Domestic: Inequality among the old is undesirable; always desirable 100% tax on assets for the current old and redistribute via pension

Best SPE

$$\max_{\hat{\beta}} \frac{1}{\hat{\beta}} \sum_i \mu_i \alpha_i U_{o,-1}(x_{i,-1}) + \sum_{t \geq 0} \hat{\beta}^t \sum_i \mu_i \alpha_i U_t(c_{i,t}, y_{i,t}, x_{i,t})$$

subject to

- consolidated budget constraint

$$\sum_i \mu_i (c_{i,t} + x_{i,t-1}) + B_t = \sum_i \mu_i y_{i,t} + \frac{B_{t+1}}{R}$$

- implementability conditions
- sustainability constraint

$$\frac{1}{\hat{\beta}} U_{o,t-1} + \sum_{k=0}^{\infty} \hat{\beta}^k U_{t+k} \geq \underline{W}$$

Simplify the problem

Let $P(w_y, w_o)$ be tax revenue the government raises from a generation that gets value w_y when young and w_o when old

$$P(w_y, w_o) \equiv \max_{\{c_i, y_i, x_i\}_i} \sum_i \mu_i \left[y_i - \left(c_i + \frac{1}{R} x_i \right) \right]$$

subject to

$$\sum_i \mu_i \alpha_i [\log c_i + \log (1 - y_i/\theta_i)] = w_y$$

$$\sum_i \mu_i \alpha_i \log x_i = w_o$$

and the implementability conditions.

Recursive formulation

- Best SPE solves

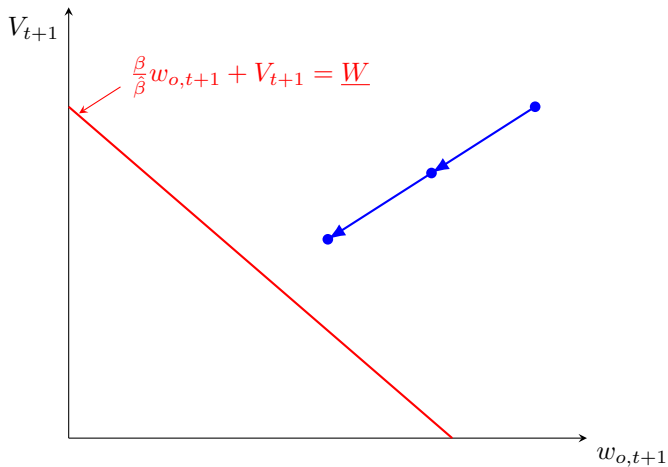
$$B(V) = \max_{w_y, w_o, V'} P(w_y, w_o) + \frac{1}{R} B(V')$$

subject to

$$\begin{aligned}w_y + \beta w_o + \hat{\beta} V' &= V, \\ \frac{\beta}{\hat{\beta}} w_o + V' &\geq \underline{W}.\end{aligned}$$

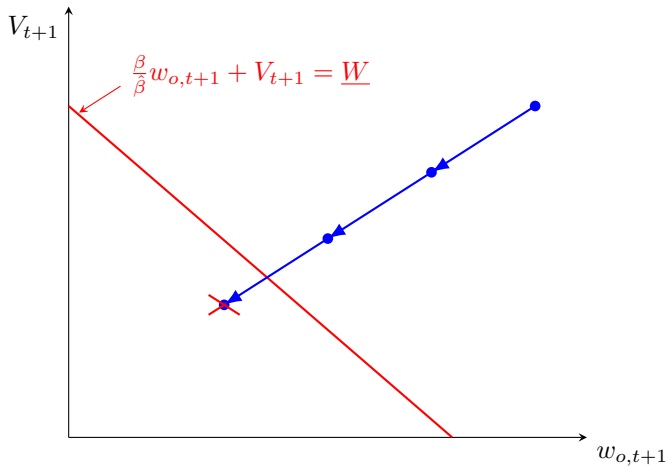
- $B(V)$ is strictly decreasing so high $V \iff$ low external debt

Dynamics for high V (low debt) \Rightarrow slack sustainability



$$B'(V) = \hat{\beta} R B'(V') > B'(V')$$

Eventually sustainability constraint binds



Dynamics when sustainability constraint binds

- When V is low (high debt) \Rightarrow binding sustainability constraint

$$\frac{\beta}{\hat{\beta}} w_o + V' = \underline{W}$$

- From PKC $w_y + \beta w_o + \hat{\beta} V' = V \rightarrow w_y = V - \hat{\beta} \underline{W}$
- Problem simplifies to

$$B(V) = \max_{w_o} P(V - \hat{\beta} \underline{W}, w_o) + \frac{1}{R} B\left(\underline{W} - \frac{\beta}{\hat{\beta}} w_o\right)$$

Dynamics when sustainability constraint binds

- When V is low (high debt) \Rightarrow binding sustainability constraint

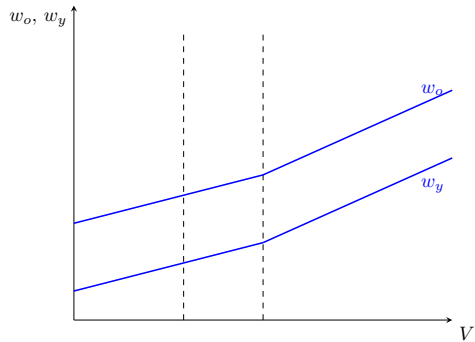
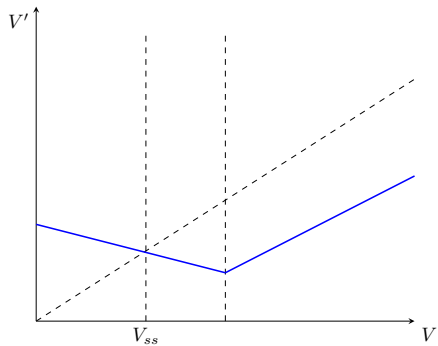
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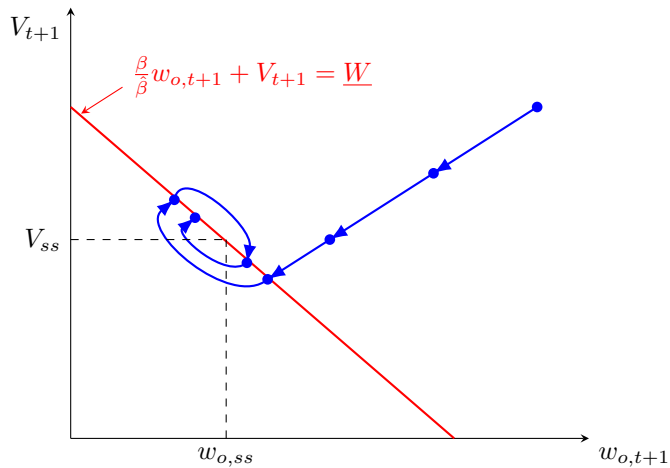
$$B(V) = \max_{w_o} P(V - \hat{\beta} \underline{W}, w_o) + \frac{1}{R} B\left(\underline{W} - \frac{\beta}{\hat{\beta}} w_o\right)$$

- **Dynamics depends on cross-partial P_{12} :**
- $P_{12} > 0 \rightarrow$ objective is supermodular $\rightarrow w_o$ **is increasing in V**
- $\frac{\beta}{\hat{\beta}} w_o + V' = \underline{W} \rightarrow V'$ **is decreasing in V**

Policy functions



Dynamics



Economics behind it

- Suppose B_t is high \Rightarrow need to cut transfers to the young in t
 - Inequality (dispersion of MU) among the young in period t increases
 - Inequality among the old in period $t + 1$ increases
 - Higher inequality makes it costly to increase $w_{o,t+1}$ ($P_{12} > 0$)
- To make debt sustainable in $t + 1$
 - Cheaper to increase value of future generations than to increase $w_{o,t+1}$
 - This can only be done by *decreasing* borrowing in $t + 1$
- **Cyclical dynamics: periods of austerity, low transfers, and debt repayments are followed by periods of largesse and borrowing**

Generalization

How robust is the presence of cycles to

- Different preferences and tax instruments
- Different ways of choosing policies

General problem

- For any preferences and tax system can write

$$P(w_y, w_o) \equiv \max_{\{c_i, y_i, x_i\}_i} \sum_i \mu_i \left[y_i - \left(c_i + \frac{1}{R} x_i \right) \right]$$

s.t.

$$\sum_i \mu_i \alpha_i [u(c_i) - v(y_i/\theta_i)] = w_y$$

$$\sum_i \mu_i \alpha_i u(x_i) = w_o$$

$$\{c_i, y_i, x_i\}_i \in \mathcal{F}$$

- \mathcal{F} captures
 - Implementability constraints with linear/affine taxes
 - Incentive constraints with non-linear taxes

Recursive formulation

- Best SPE solves

$$B(V) = \max_{w_y, w_o, V'} P(w_y, w_o) + \frac{1}{R} B(V')$$

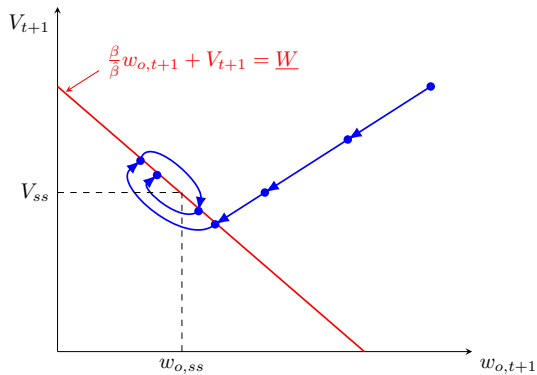
subject to

$$\begin{aligned}w_y + \beta w_o + \hat{\beta} V' &= V, \\ \frac{\beta}{\hat{\beta}} w_o + V' &\geq \underline{W}.\end{aligned}$$

Dynamics depend on P_{12}

$P_{12} > 0$:

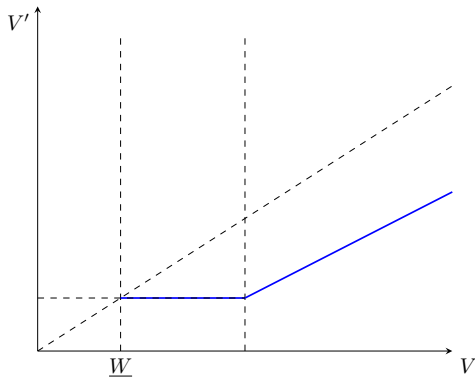
- Cycles between populism and austerity



Dynamics depend on P_{12}

$P_{12} = 0$ (rep agent economy or first best):

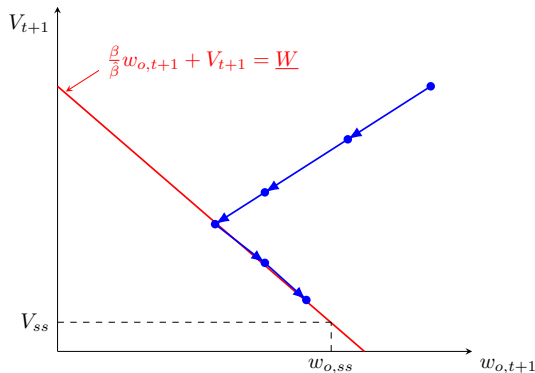
- Debt is monotonically accumulated until cannot borrow anymore
- Transfers to young and pensions to old decrease in indebtedness



Dynamics depend on P_{12}

$P_{12} < 0$:

- Debt is monotonically increasing
- Once sustainability constraint binds: transfers to young decrease, pensions increase as debt accumulated



Cycles are quite robust

- $P_{12} > 0$ is a common feature of many economies/tax systems
- Affine tax system under
 - Separable preferences w/ constant elasticity for reasonable IES [▶ Details](#)
 - GHH preferences
 - Balanced growth path preferences
- Fully non-linear Mirrleesian taxes
 - Break the link between inequality among young today and old tomorrow
 - $P_{12} > 0$ if
 - IES not too high [▶ Details](#)
 - Enough inequality
 - Pareto weights away from Rawlsian

Other models of politics

- Similar equilibrium dynamics arise in models of probabilistic voting (Lindbeck and Weibull, 1987)
 - Pareto weights $\{\mu_i\}$, $\hat{\beta}$ pinned down by idiosyncratic shocks
 - Government in period t does not take into account agents who are not born
- An allocation is SPE outcome if it satisfies
 - Implementability conditions
 - Political sustainability constraint

$$\frac{\beta}{\hat{\beta}} w_o + v' \geq \underline{w}$$

where v is promised utility to one generation

$$v = w_y + \beta w_o$$

Other models of politics, cont.

- Best SPE for generations alive at 0 from $t \geq 1$ solves

$$B(v) = \max_{w_y, w_o, v'} P(w_y, w_o) + \frac{1}{R} B(v')$$

subject to

$$\begin{aligned}w_y + \beta w_o &= v, \\ \frac{\beta}{\hat{\beta}} w_o + v' &\geq \underline{w}.\end{aligned}$$

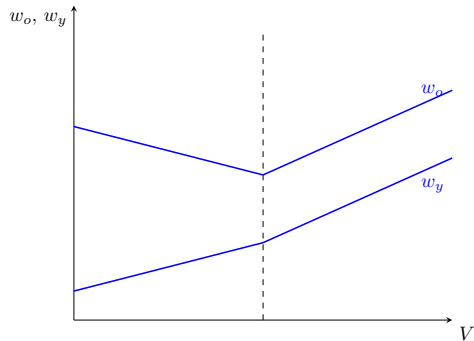
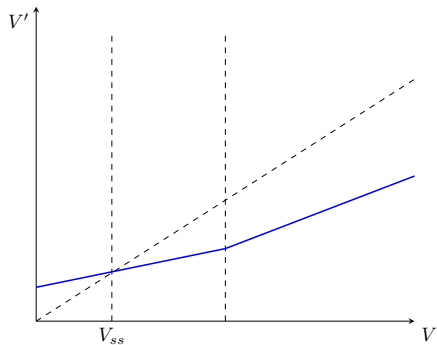
- Cross-partial $P_{12} > 0$ is sufficient for cycles but not necessary
 - For example, cycles under first best $P_{12} = 0$
- Thus, cycles more likely if government myopic

Conclusion

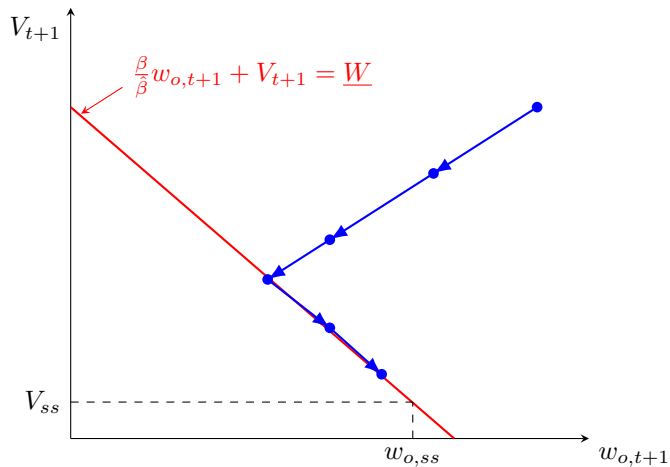
- Fiscal and redistributive policies when gov't lacks commitment
 - Interaction between domestic and foreign motive to default
- Under commonly met conditions, optimal fiscal consolidation involves cyclical behavior of external debt and austerity type adjustments
- More likely if government myopic

Extra Slides

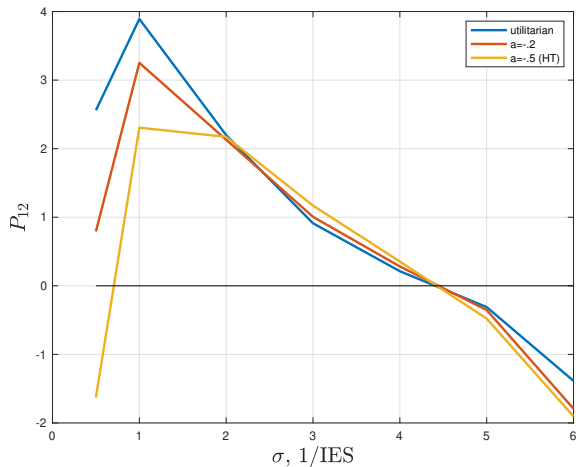
Policy functions, $P_{12} < 0$



Dynamics, $P_{12} < 0$

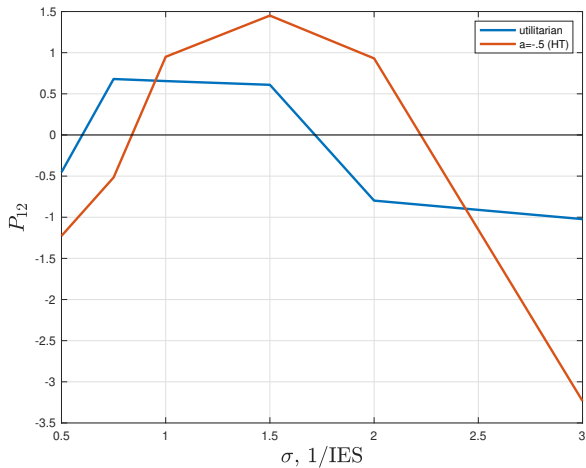


Calibrated example with affine taxes and separable preferences



► Back

Calibrated example with non-linear taxes



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