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
    - Repayment of foreign debt and reversal of redistributive policies
    - The cycle repeats
- Similar to recent experience in Southern Europe countries

What we do

- Explore debt dynamics in a textbook model of international borrowing
- Impatient social planner borrows internationally lack of commitment
- Introduce
  - Heterogeneous agents
  - Intergenerational conflict
- Show populist cycles emerge in best SPE

Why cycles emerge

- Incentives to default on international debt affected by inequality at home
  - High inequality $\Longrightarrow$ high incentives to re-optimize
- High debt $\Longrightarrow$ need to cut transfers
  - Increases inequality among the young
  - Increases tomorrow's inequality among the old
  - That higher inequality is sustainable only if tomorrow debt is low and government increases transfers to next period's young
- This gives rise to cycles
  - Periods of high transfers and debt accumulations followed by periods of sharp transfer cuts and debt repayments

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)
    - Closed economy: Farhi, Sleet, Werning and Yeltekin (2012), D'Erasmo 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
- Preferences of type i agent born in period t

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

- μ_i is fraction of agents with productivity θ_i, wlog $\sum_i \mu_i \theta_i = 1$
- Small open economy: Borrow at international rate R

Government's preferences

- Uses weights $\{\alpha_i\}_i$ to aggregate preferences within generation, $\hat{\beta}$ across generations

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

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

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

Affine taxes

- Instruments: linear taxes on labor income and savings, transfers to young and old
- Households can borrow and lend among themselves

$$U_{i,t} = \max \log c + \log\left(1 - \frac{y}{\theta_i}\right) + \log x$$

subject to

$$c + a \leq (1 - \tau_{l,t})y + T_{y,t}$$

$$x \leq (1 - \tau_{a,t+1})R^d_{t+1}a + T_{o,t+1}$$

- Interest rate R^d_{t+1} clears domestic borrowing and lending

Implementability conditions

- FOCs

$$\frac{x_{i,t+1}}{c_{i,t}} = \beta R^d_{t+1}\left(1-\tau_{at+1}\right) \rightarrow c_{it} = \varphi_{it} C_t, \quad x_{it} = \varphi_{it} X_{t+1}$$

$$\frac{1}{c_{i,t}}\left(1-\tau_{lt}\right) = \psi \frac{1}{\theta_i - y_{it}} \rightarrow \theta_i - y_{it} = \varphi_{it}\left(1 - Y_t\right)$$

- Plug into budget constraint to get

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

- Thus, $\{c_{i,t}, y_{i,t}, x_{i,t}\}_i$ must satisfy the implementability conditions:

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

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

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

Lack of commitment

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

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

- 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

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

subject to

- consolidated budget constraint

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

- 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 welfare w_y when young and w_o when old

$$P(w_y, w_o) = \max Y - C - \frac{X}{R}$$

subject to

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

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

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

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

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

Critical property: $P_{12} > 0$

- If w_y is high then must provide high consumption and leisure to the young
- Thus, inequality (dispersion of consumption shares) is low

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

- Cheaper to provide more utility to the old because of low inequality
- Thus, $P_{12} > 0$

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

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

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

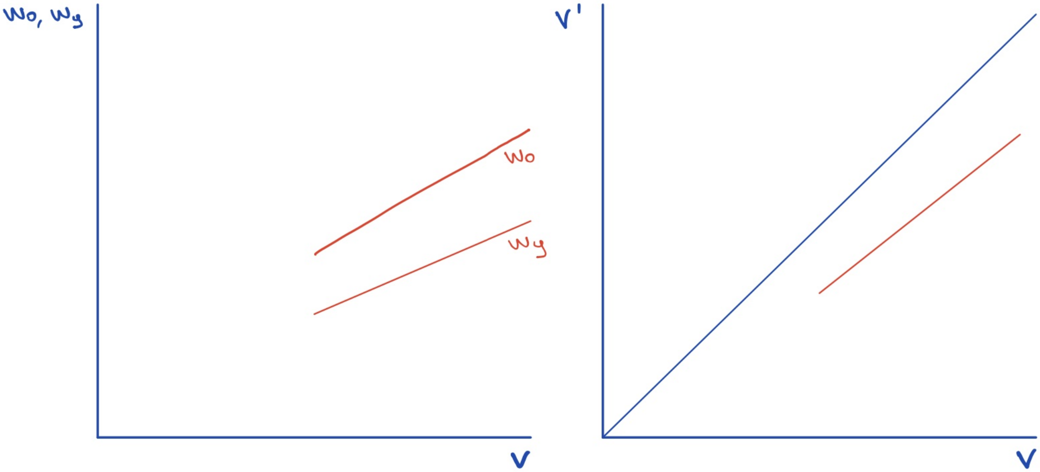
Dynamics for high V

- If V is high (low debt) $\Rightarrow$ sustainability constraint is slack

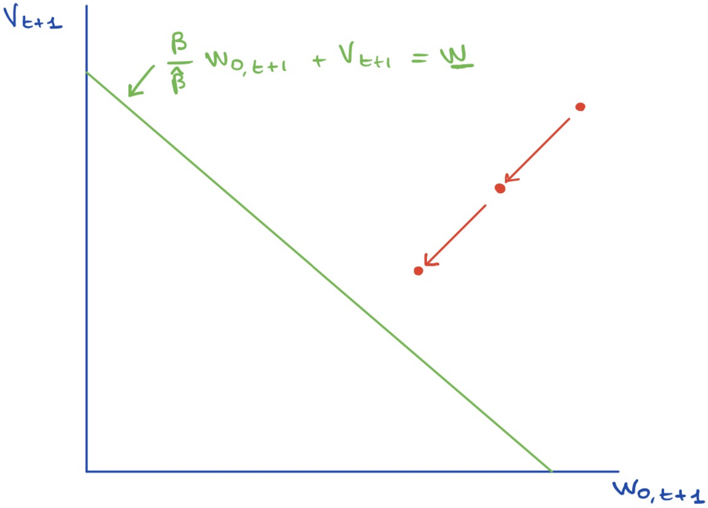
$$B'(V) = \hat{\beta} R B'(V') > B'(V')$$

- Since $\hat{\beta} R < 1$, over time
  - Welfare V_t decreases
  - Debt $B(V_t)$ increases
  - w_y, w_o decrease

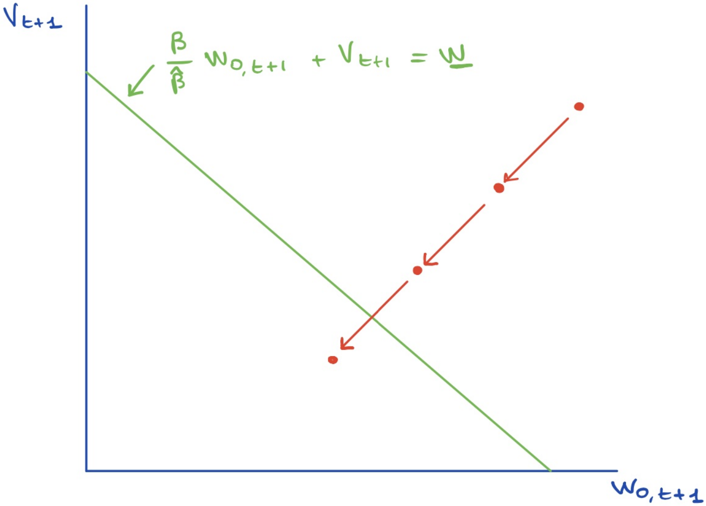
Policy functions for high V



Dynamics for high V



Dynamics for high V: Eventually sustainability constraint binds



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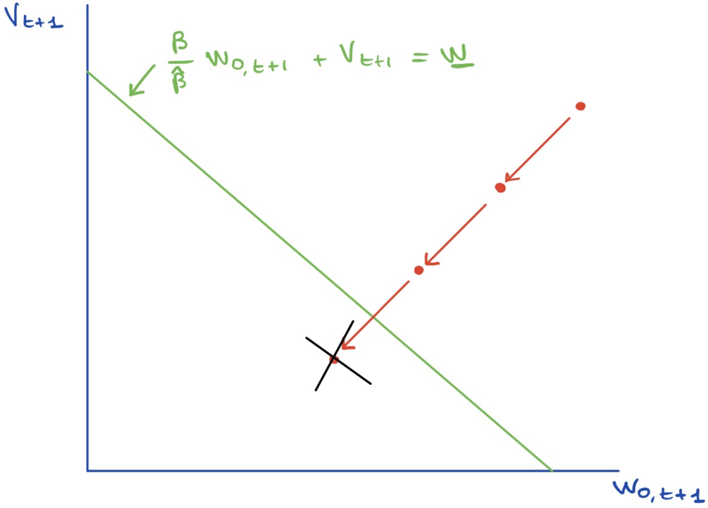

Dynamics when sustainabiity constraint binds

- 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

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

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

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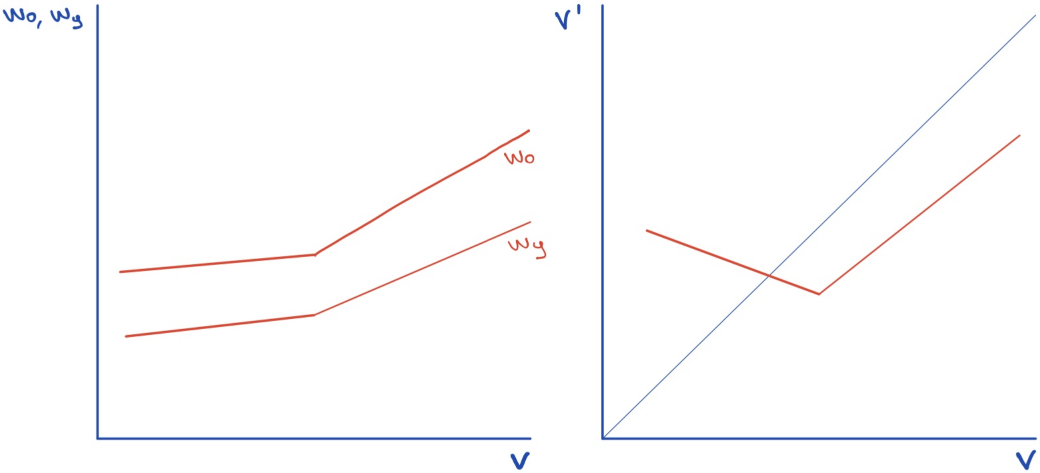
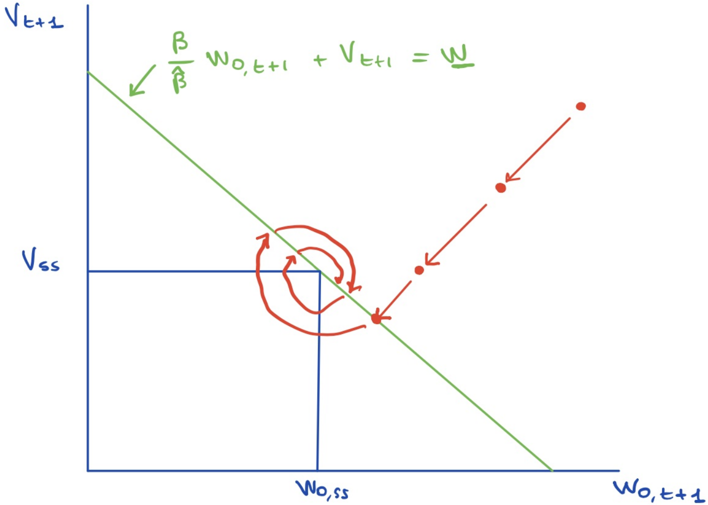
- **Cyclical debt dynamics: Periods of low debt and high transfers to young and old are followed by periods of high debt and low transfers**

Policy functions



Dynamics

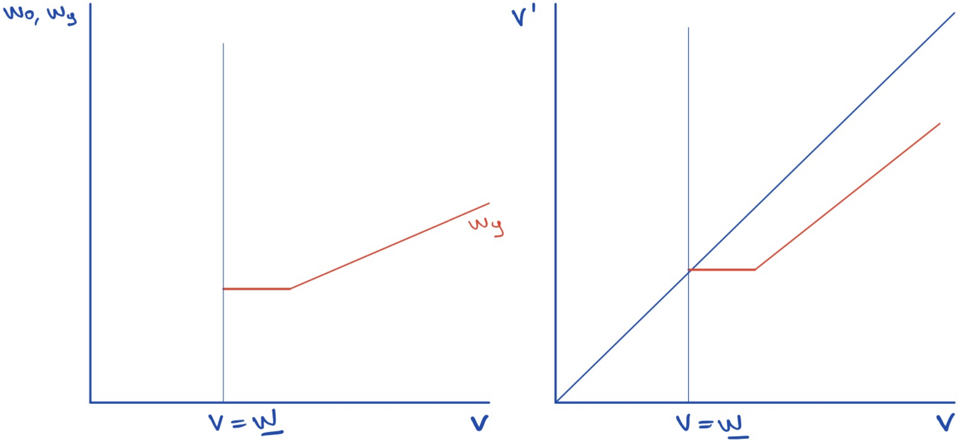


Economics behind it

- Suppose B_t is high $\Rightarrow$ need to cut transfers to the young in t
  - Inequality (dispersion of MRS) 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 $t+1$
  - Costly to increase $w_{o,t+1}$ so need to increase $w_{y,t+1}$
  - This can only be done by increasing borrowing in $t+1$
- This leads to cyclical dynamics: periods of austerity and debt repayments are followed by periods of largess and borrowing

Comparison with rep agent economy

$\beta = 0$ (or first best $\rightarrow P_{12} = 0$): $V' \geq \underline{W}$



Generalization

How robust is the presence of cycles to

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

General problem

- For any preferences and tax system can write

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

s.t.

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

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

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

- $\mathcal{F}$ captures
  - Implementability constraints with linear 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

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

- Dynamics depends on P_{12}

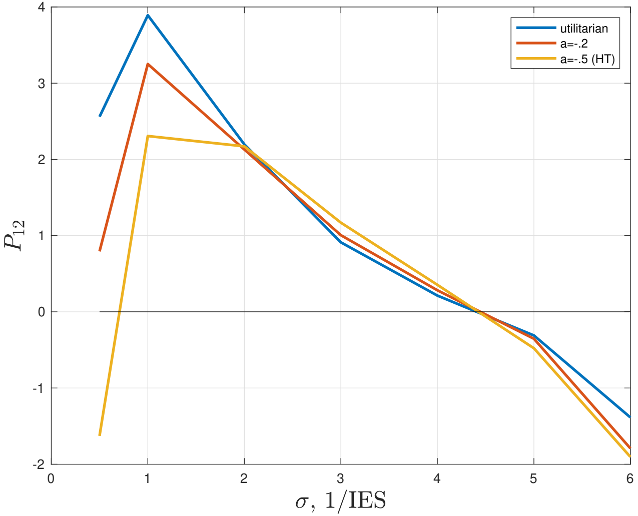
Three possibilities

- $P_{12} > 0$:
  - Debt cycles: periods of low debt and higher transfers/pensions are followed by high debt and "austerity"
- $P_{12} = 0$:
  - Debt is monotonically accumulated until cannot borrow anymore
  - Transfers to young and pensions to old decrease in indebtedness
- $P_{12} < 0$: ▸ Details
  - Debt is monotonically increasing
  - Once sustainability constraint binds: transfers to young decease, 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
  - GHH preferences
  - Balanced growth path preferences

Calibrated example with affine taxes and separable preferences



Cycles are quite robust, cont.

- $P_{12} > 0$ is a common feature of many economies/tax systems
- Affine tax system under
  - Separable preferences w/ constant elasticity for reasonable IES
  - GHH preferences
  - Balanced growth path preferences
- Fully non-linear Mirrleesian taxes provided that IES is not too high
  - With non-linear savings taxes, the planner can break the link between inequality among young today and among old tomorrow
  - But it is too costly to do if IES is low

Other models of politics

- Similar equilibrium dynamics arises in models of probabilistic voting (Lindbeck and Weibull, 1987)
  - Pareto weights $\{\mu_i\}$, $\hat{\beta}$ pinned down by idiosyncratic shocks
  - Welfare in period t does not take into account agents who are not born
- Best SPE for generations alive at 0 solves

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

subject to

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

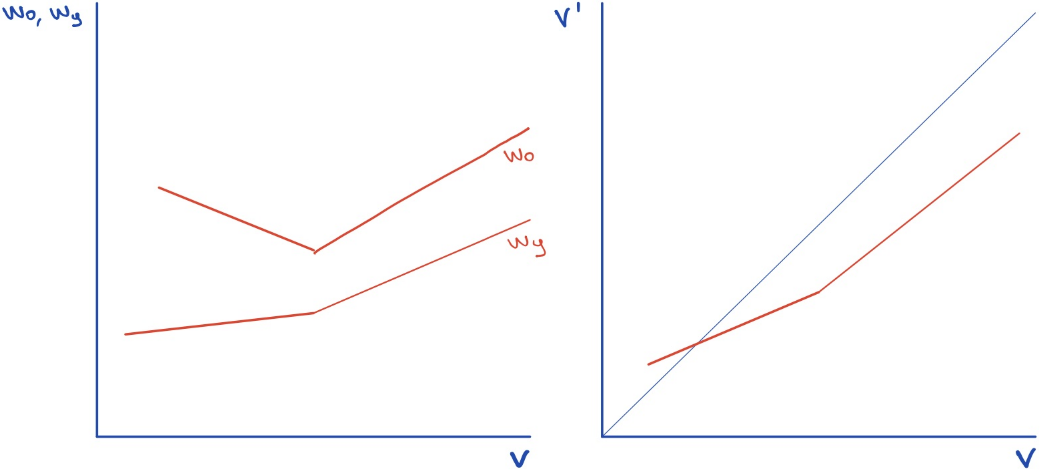
- Cross-partial $P_{12} > 0$ is sufficient (not necessary) for cycles

Conclusion

- Fiscal and redistributive policies when gov't lacks commitment
  - Interaction between domestic and foreign motive to default
- Optimal fiscal consolidation involves cyclical behavior of external debt and austerity type adjustments

Extra Slides

Policy functions, $P_{12} < 0$



Dynamics, $P_{12} < 0$