Sovereign Default and Coalition Formation

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Introduction

- Strong empirical evidence: likelihood of a sovereign debt event (default, rescheduling, restructuring) in developing countries is **smaller** when the government is composed by more than one political party, controlling for economic and political factors. The **coalition effect** is shown to be large (Saiegh 2005a, 2009);

- Coalition government theory: cabinet coalitions will be as small as possible, just the necessary to guarantee majority support in the parliament: **minimal winning coalition** (Riker, 1962). The theory is **contradicted** by the high frequency of surplus coalitions, and minority governments in both developing countries, and industrialized parliamentary democracies (Laver & Schofield 1990, Saiegh 2009, and my calculations).

Introduction

This paper is based on models of sovereign debt:

- Eaton & Gersovitz (1981): reputation;
- Cuadra & Sapriza (2008): political turnover, political polarization;
- Arellano (2008): GDP cost

Introduction

- Extension of the political economy sovereign debt model: government type choice: single-party or coalition.
- Governments cannot commit to debt repayment, but **can commit to keeping the coalition**. This includes a "junior" party that suffers a **specific cost** of default/autarky.
- The main trade-off for big political parties: gains from lower interest rates versus redistributive cost for the big party of having another party in the government. Coalitions are formed when the former more than compensates the latter.

Introduction

- **Small or junior party**: the members of a society that are more interested in debt repayment have better chances to influence government decisions if they are part of the cabinet.

- Tomz & Wright (2013): austerity is especially damaging to government employees, the unemployed and the poor: support for default is stronger among those groups. Note: a large share of people belong to these groups.

- People with low discount rates; people with large investment assets; people enjoying a high level of job security: they tend to prefer debt repayment (Tomz 2004, Curtis et al. 2012).

Model

General Setup

- Small open economy, parliamentary or mixed democracy (political risk every quarter).
- Two bigger parties, A and B, rotate in power. One smaller party, J.
- Endowment economy, y follows Markov process $Q(y'|y)$.
- $u(C) = \frac{C^{1-\eta}-1}{1-\eta}$; $\beta \in (0,1)$.

Model

General Setup

- Single-party A one-period social preferences:
- $\overline{\theta}u(C_A) + \underline{\theta}u(C_B) + \theta_J u(C_J)$
- Coalition $A + J$ one-period social preferences:
- $\left(\overline{\theta} - \xi_1\right) u(C_A) + \left(\underline{\theta} - \xi_2\right) u(C_B) + \left(\theta_J + \xi_1 + \xi_2\right) u(C_J)$
- $\overline{\theta} > \underline{\theta} > \theta_J > 0$, $\overline{\theta} \in (0.5, 1]$, and $\overline{\theta} + \underline{\theta} + \theta_J = 1$.
- $\xi_1 \in [0, \overline{\theta})$, and $\xi_2 \in [0, \underline{\theta})$

- Budget constraint, access to international borrowing markets:
- $C_A + C_B + C_J = y + B - q^i(B'; y, M)B'$
- $q^i(B'; y, M) = \frac{1-\lambda^i(B';y,M)}{1+r_f}$
- $i = A, B, A + J, B + J$
- $M = maj, min$

Model

General Setup

- Budget constraint, if default, and during financial autarky:
- $C_A + C_B + C_J = y^{aut}$
- General default penalty (Arellano):
- $y^{aut} = h(y) = \begin{cases} \widehat{y} \ if \ y > \widehat{y} \\ y \ if \ y \leq \widehat{y} \end{cases}$
- Specific default penalty: γC_J, with $\gamma \in (0, 1)$.
- Regain access to international credit markets: $\mu \in (0, 1)$.

- The specific default penalty has a direct effect on the junior party, *but also on the other parties:*
- whether the government is single-party, or coalition, the optimal redistribution policy must partially compensate the small party for its specific cost;
- these compensation means less consumption for the bigger parties.

Model

General Setup

- Four possible government compositions, or **agents**: A, $A+J$, B, $B+J$. Optimal policies must be found for each.

- Big parties rotate in power, and win a **majority** with probability $\sigma \in (0,1)$.Then, $M = maj, min$.

- Effects of **majority**: probability of big party survival is higher $1 > \pi(maj) > \pi(min) > 0$; when there is a coalition, probability the coalition breaks is higher $1 > \delta(min) > \delta(maj) > 0$.

- Big party survival does not depend on the presence of the junior party in the government. Hence, if coalitions are formed, it must be because of some other reason.

Model

Timing and Policies

- Five state variables: income, y; stock of assets, B; access to markets or autarky; majority or minority; single-party or coalition.

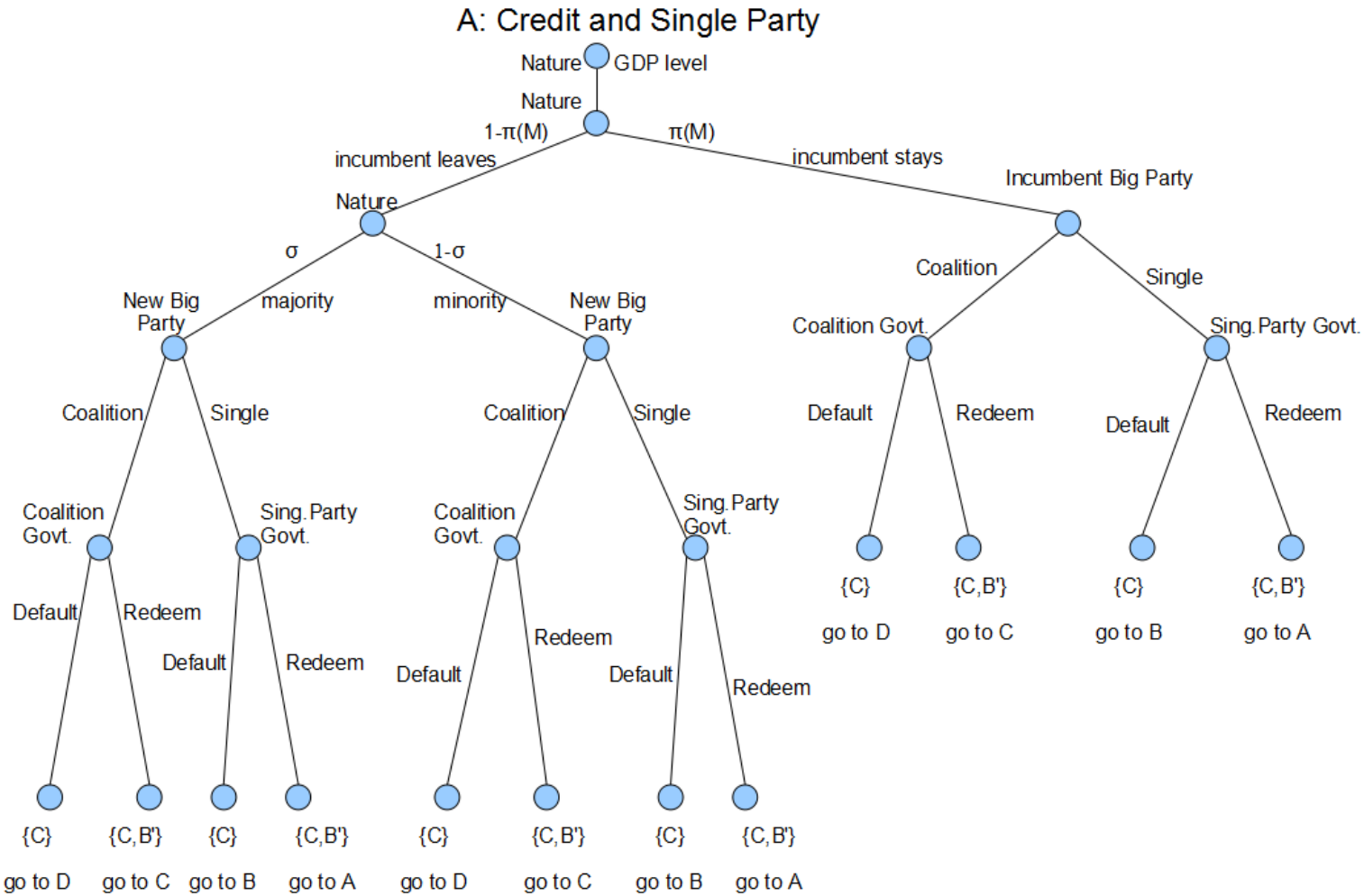
- Four scenarios: access to credit and single-party; access to credit and coalition; autarky and single-party; autarky and coalition.

- Four policies:
- if single-party government, to form a coalition or not;
- if there is any debt, to repay or to default;
- if there is access to credit, how much to borrow;
- distribution of income among the three constituencies.

- When in power, each **agent** must evaluate its own options, and also take into account the optimal policies of the other agents. Find **symmetric equilibrium**.

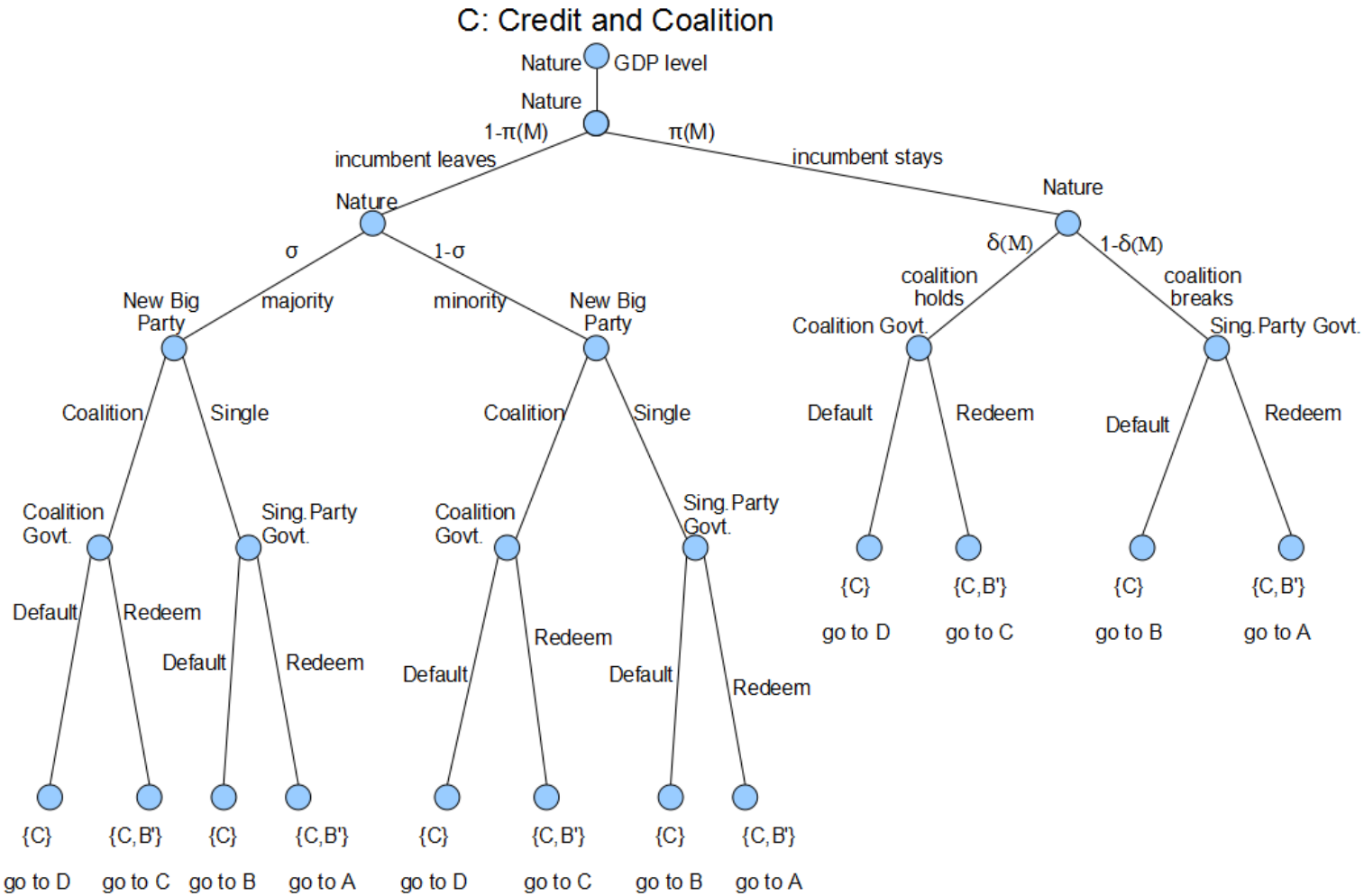
Model

Timing and Policies



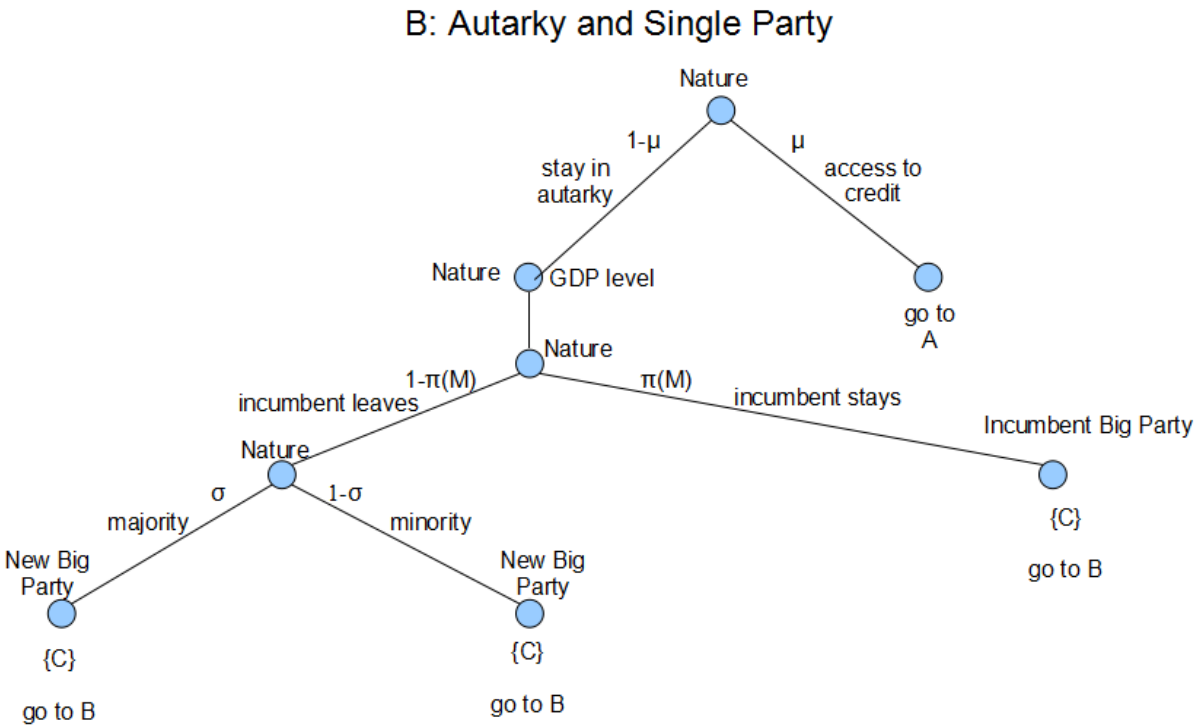
Model

Timing and Policies



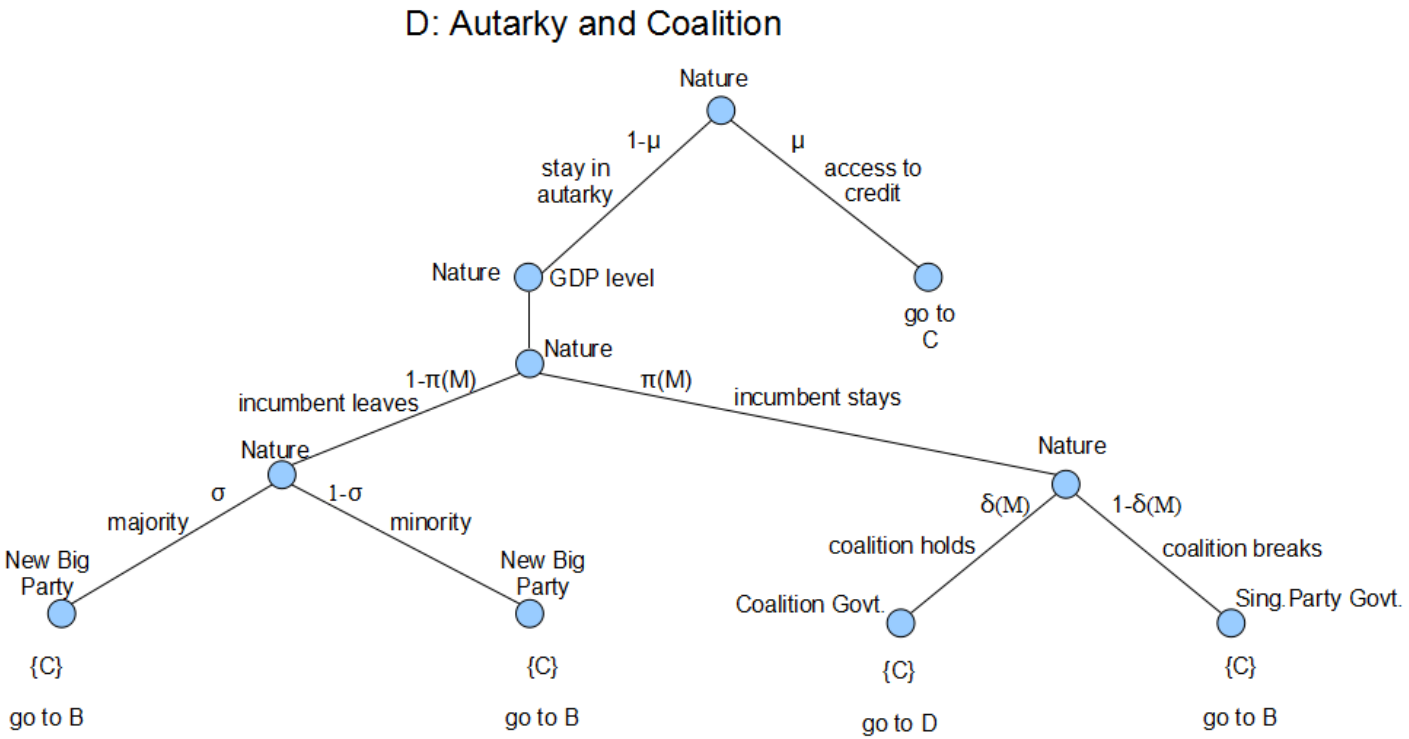
Model

Timing and Policies



Model

Timing and Policies



- Example:

$$VR_A^A(y, B, M) =$$

$$\max_{C_A, C_J, C_B, B'} \overline{\theta} u(C_A) + \underline{\theta} u(C_B) + \theta_J u(C_J) + \beta \sum_{y'} Q(y'|y) \times ...$$

$$... \times \left[\begin{array}{c} \pi(M) V_A^A(y', B', M) + ... \\ ... + (1 - \pi(M)) \left(\begin{array}{c} \sigma V_B^A(y', B', maj) + ... \\ ... + (1 - \sigma) V_B^A(y', B', min) \end{array} \right) \end{array} \right]$$

$$s.to. \; C_A + C_B + C_J = y + B - q^A(B'; y, M) B'..$$

Calibration

- Parameters as close as possible to those in Cuadra and Sapriza (2008); Arellano (2008); and Cuadra et alea (2010).

- From Saiegh's database, sample of parliamentary and mixed democracies: average spell durations (in years, my own calculations):
  - big party majority: 8.1
  - big party minority: 4.9
  - surplus coalition: 2.5
  - mw coalition: 4.0

Calibration

Risk aversion	η	2
Discount factor	β	0.94
Endowment process	ρ_y	0.945
	σ_y	0.025
Incumbent big party	$\overline{\theta}$	0.61
Other big party	$\underline{\theta}$	0.37
Junior party	θ_J	0.02
Power transfer	ξ_1, ξ_2	0.002,0.002
GDP loss	ϕ	0.9
Specific junior loss	γ	0.85
Re-entry probability	μ	0.282
Majority win	σ	0.5
Survival in power if majority	$\pi(maj)$	0.97
Survival in power if minority	$\pi(min)$	0.94
Coalition holding if majority	$\delta(maj)$	0.91
Coalition holding if minority	$\delta(min)$	0.94
Risk-free rate	r_f	0.017

Calibration

- Model is solved by value function iteration.
- Maximum borrowing: 25.
- Simulations: 10000, 400 periods each.

Results

Business Cycle Statistics

Mean interest rate	2.06%
Mean interest rate (annualized)	8.51%
σ(annual interest rate)	2.79%
ρ(annual interest rate, GDP)	-27.10%
ρ(consumption, GDP)	96.24%
σ(consumption)$/\sigma$(GDP)	1.09
ρ(consumption, annual int. rate)	-39.17%
ρ(trade balance, GDP)	-15.53%
ρ(trade balance, annual. int. rate)	52.67%
ρ(borrowing, GDP)	89.41%

Results

Business Cycle Statistics (cont'd)

Mean debt	16.70
Mean debt as % of GDP	16.28%
Mean default rate	1.34%
Mean coalition formation rate	4.21%
surplus	2.73%
minimum winning	1.48%

Results

Business Cycle Statistics

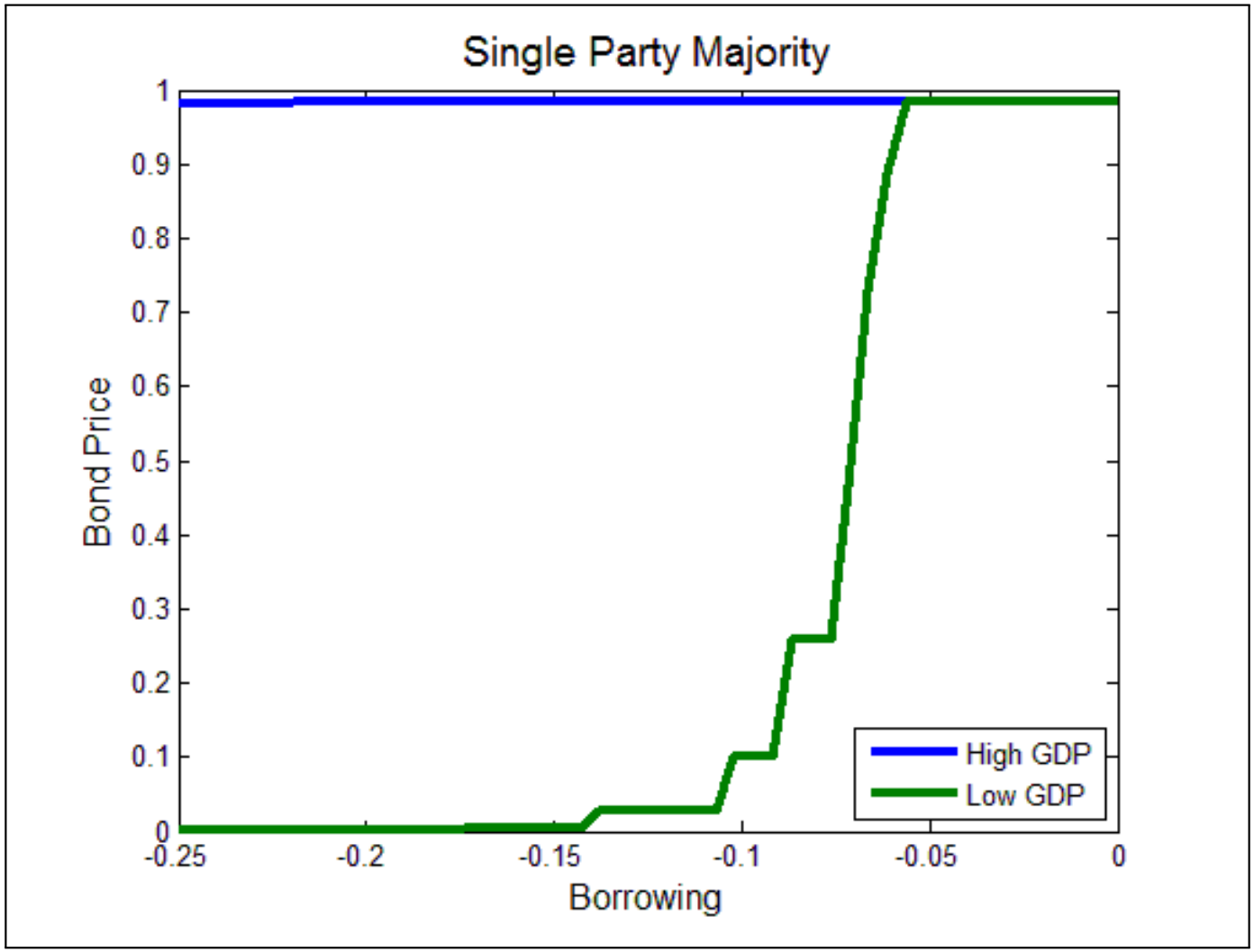


Figure: Bond Price, Single-Party Majority

Results

Government Type

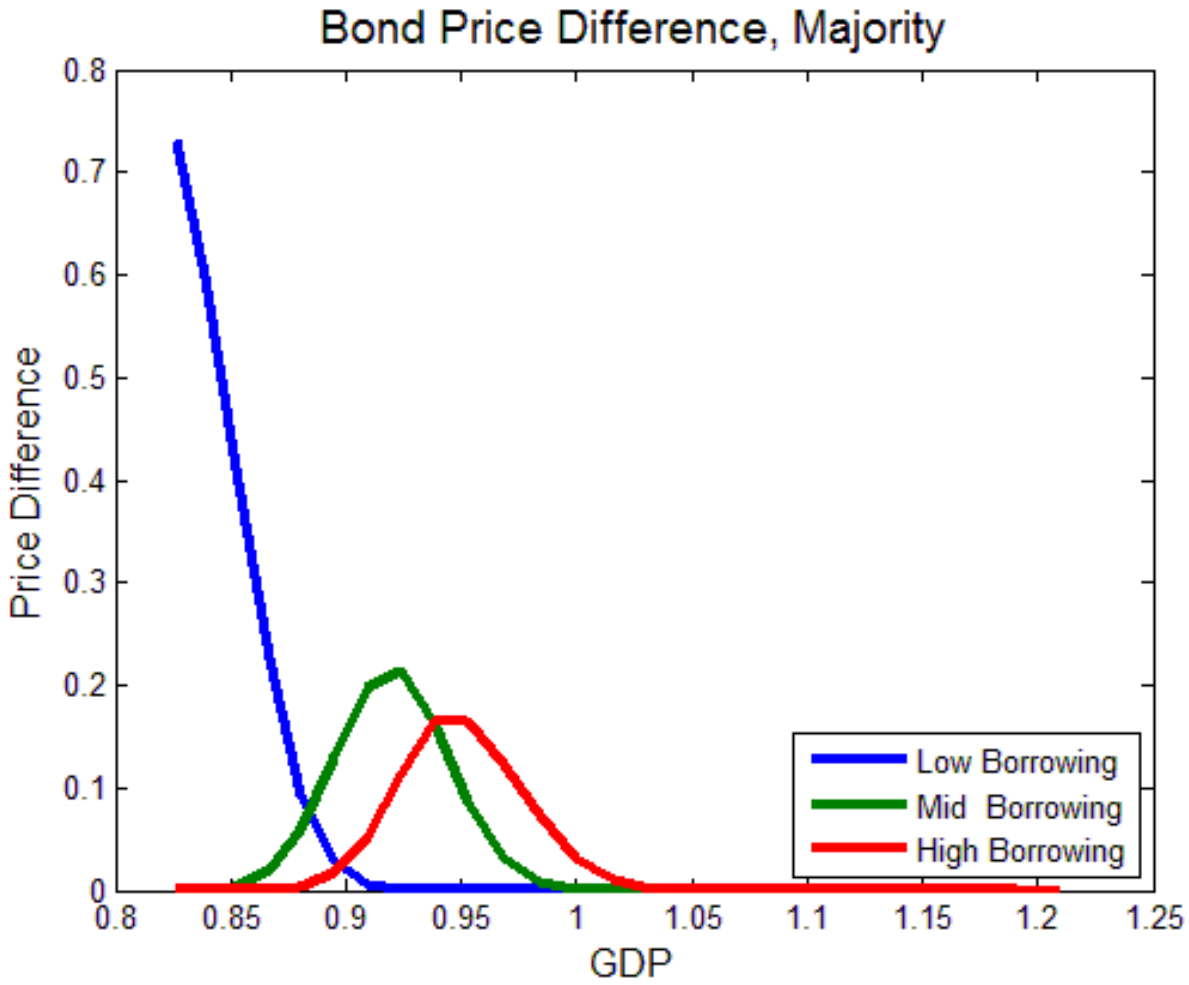
- Optimal policies in the space (B', y): default probability is never higher for coalition than it is for single-party government (true for both *maj* and *min*).
- Then, coalition bond prices are never lower than those for single-party:
- $q^{A+J}(B'; y, M) \geq q^{A}(B'; y, M)$, $M = maj, min$, and symmetrically for $B + J$ vs. B.
- Default risk is smaller for coalitions: **coalitions buy commitment**.

Bond Prices: Coalition vs. Single-Party

	Majority	Minority
Maximum difference	0.7320	0.7328
Average difference	0.0228	0.0229
Minimum difference	0.0000	0.0000

Results

Government Type



Type of Government Frequency

	Sing. Maj.	Sing. Min.	Coal. Maj.	Coal. Min.
Mean relative freq.	57.54%	33.72%	5.66%	3.09%

	Single Party	Coalition
Mean relative freq.		
during majority	91.15%	8.85%
during minority	91.92%	8.08%

Business Cycle and Type of Government

	Sing. Maj.	Sing. Min.	Coal. Maj.	Coal. Min.
Mean int. rate*	8.32%	8.27%	10.81%	10.52%
σ(int. rate*)	2.61%	2.43%	3.14%	2.41%
ρ(borrowing, GDP)	87.34%	85.50%	86.97%	87.17%
Mean borrowing	16.98	16.69	15.90	15.73
Mean debt % GDP	16.29%	16.27%	16.37%	16.25%

* annual

Results

Government Type

- When coalitions are formed: mean income 96.72%, mean debt 22. Large indebtedness, "mild" recession.
- The same numbers for the *maj* case, and for the *min* case.
- Coalitions are the most effective in bringing down borrowing costs for the combination of very low borrowing needs with a very deep recession (which is unlikely).

Conclusions

- In equilibrium, the model generates:
- more favorable borrowing conditions for coalition government;
- default;
- coalition formation, namely surplus coalitions;
- average debt levels closer to the data.

- Coalitions are formed even though they do not contribute to big party survivability, nor to governability, and even though they represent a cost for the formateur party.

Thank you!