Lecture 12: Political Economy

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Why is International Trade Not Free?

- **Optimal Tariff Argument:** Even when free trade is Pareto optimal, a large enough country will have a unilateral incentive to use trade taxes to tilt the terms of trade in its favor.
- **Second-Best Argument:** In the presence of domestic distortions (non-economic objectives, learning-by-doing, price or wage rigidity, commitment problems), and when direct correction of these distortions is not possible, trade taxes might improve welfare.
- **Political Economy:** Trade taxes are a way to redistribute income across different groups in society. They are used when more effcient means are not available or prove to be too costly.

Today's lecture

- Political Economy Models
  - Grossman and Helpman (1994): Protection for Sale
- Empirical Implementation

Political Economy: Alternative Approaches

- We consider a small economy with $n+1$ goods: one outside good produced with labor and n goods produced with labor and a sector-specific input. Preferences are quasi-linear. The wage rate equals one.
- For given tariffs $t_i = p_i - \pi_i$, the indirect utility is

$$v(\mathbf{p}) = I + \sum_{i=1}^{n} \Pi_i(p_i) + \sum_{i=1}^{n} S_i(p_i) + \sum_{i=1}^{n} (p_i - \pi) m_i(p_i)$$

- **Direct democracy:** Mayer (1984). Here the tariff is determined by direct voting.
    - Since there is no good result on voting in multidimensional policy spaces, he used a two-sector HO model in which there is one import tariff on which people vote.
    - The distribution of capital per person in the population determines every individual' optimal tariff.
    - The equilibrium tariff is the median voter's optimal tariff (note the special conditions under which the median voter theorem applies).

Alternative Approaches

In a quasi-linear economy they can vote on each tariff separately.

- A voter with the ownership share γ of the sector-specific input in sector i most prefers the price p_i :

$$p_i(\gamma) = argmax_p \ \gamma \Pi_i(p) + S_i(p) + (p - \pi_i) m_i(p).$$

- Then the equilibrium tariff is:

$$p_i - \pi_i = (\gamma_i^m - 1) \frac{X_i(p_i)}{[-m'_i(p_i)]},$$

where γ_i^m is the share of ownership of the sector i specific factor by median voter.

- This has the counterfactual implication that in industries with high concentration of ownership imports are subsidized.

Alternative Approaches

Political support function: Hillman (1982). Here the tariff is determined by a political support function that tradeoffs economic distortions and industry profits.

- In the quasi-linear economy the political support function can be expressed as

$$\sum_{i}^{n} b_i[\Pi_i(p_i) - \Pi_i(\pi_i)] + v(\mathbf{p}) - v(\boldsymbol{\pi})$$

- In this event the equilibrium tariff is:

$$p_i - \pi_i = \frac{b_i X_i(p_i)}{-m'_i(p_i)}$$

  i.e., there is protection, and it is higher the higher the weight of the industry in the political support function, the larger the industry, and the less elastic the import demand function is.

Alternative Approaches

- **Tariff formation function:** Findley and Wellisz (1982). Here the tariff level depends directly on the levels of contributions of supporting and opposing groups, i.e., $t_i = T_i(C_i^S, C_i^O)$. For general tariff formation functions this theory has no clear predictions. The question is where do these functions come from and who is represented in the two groups?

- **Electoral competition in reduced form:** Magee, Brock and Young (1989). Here the tariff is determined in electoral competition between two parties, each one committed to a policy.
    - The parties receive contributions that influence the probability of winning the election, and trade policies also influence these probabilities.

Alternative Approaches

The objective function of SIG j is to maximize

$$max_{C_j^A \geq 0, C_j^B \geq 0} \; q(\sum_{i=1}^{2} C_i^A, \sum_{i=1}^{2} C_i^B, \boldsymbol{t}^A, \boldsymbol{t}^B) W_j(\boldsymbol{t}^A)$$

$$+ [1 - q(\sum_{i=1}^{2} C_i^A, \sum_{i=1}^{2} C_i^B, \boldsymbol{t}^A, \boldsymbol{t}^B)] W_j(\boldsymbol{t}^B) - C_j^A - C_j^B,$$

where $q(.)$ is the probability that A wins the elections.

- This yields a reduced form probability $\tilde{q}(\boldsymbol{t}^A, \boldsymbol{t}^B)$. In the first stage the two parties A and B play non-cooperatively to maximize their probabilities of winning the election.
- This implies that a SIG contributes to only one party, which is counterfactual.
- It also has no clear predictions about the sectoral structure of protection.

Protection for Sale

- Grossman and Helpman (1994) develop a lobbying model.
- They use the quasi-linear economic model and embody it in a framework of menu auctions.
    - In the first stage SIGs offer campaign contributions $C_i(\boldsymbol{p})$ for $i \in L$. The contributions are designed to buy policies.
    - In the second stage the policy maker chooses the policy vector.
    - The policy maker chooses $\boldsymbol{p}$ to maximize

    $$aW(\boldsymbol{p}) + \sum_{i \in L} C_i(\boldsymbol{p}),$$

    where $W(.)$ is aggregate welfare and a is the weight on welfare relative to contributions.
    - The formulation of the government's objective function can be justified by a model of probabilistic voting.

Electoral Competition

- Why do politicians care about contributions? Grossman and Helpman (1996) propose a model of electoral competition that yields this behavior.
  - There are two political parties that compete in an election, A and B. Each commits to a policy vector $\boldsymbol{p}^K, K = A, B$.
  - There is a continuum of voters. Voter i's utility is $v_i(\boldsymbol{p}^K) + \eta_i^K$ if K wins the election. Informed voters can asses this utility, where $v_i(.)$ is derived from the economic model and η_i^K is a preference of party K.
  - Voter i supports A if and only if $v_i(\boldsymbol{p}^A) - v_i(\boldsymbol{p}^B) > \eta_i^B - \eta_i^A \equiv \eta_i$.
  - η_i is uniformly distributed on $[(-1+2b)/2f, (1+2b)/2f]$, where f is the density and b is the bias in favor of B.
  - As a result, party A receives the fraction

$$s_I = \frac{1}{2} - b + f[v(\boldsymbol{p}^A) - v(\boldsymbol{p}^B)]$$

    of votes of the informed group, where v is the mean of v_i.
  - It is also possible to think about b as being random.

Electoral Competition

If there were only informed voters, party K would choose $\boldsymbol{p}^K$ to maximize $v(\boldsymbol{p}^K)$, which raises its probability of winning the elections when b is random, or which raises its expected plurality.

Electoral Competition

- Next assume that a fraction σ of the voters is informed and a fraction $1-\sigma$ is uninformed. The latter group's voting responds to electoral campaigns.
  - As a result, the fraction of votes received by party A is

$$\begin{aligned} s &= \sigma s_I + (1-\sigma)[\frac{1}{2} - b + h(C^A - C^B)] \\ &= \frac{1}{2} - b + \sigma f[v(\boldsymbol{p}^A) - v(\boldsymbol{p}^B)] + (1-\sigma)h(C^A - C^B). \end{aligned}$$

- In this case K maximizes $\sigma f v(\boldsymbol{p}^K) + (1-\sigma)hC^K$, and the relative weight on welfare is

$$a = \frac{\sigma f}{(1-\sigma)h}$$

  - Evidently, this relative weight is higher the larger the fraction of informed voters, the higher the density of η is, and the less effcient money is in buying votes of the impressionable voters

Protection for Sale: General Considerations

- The set L is the set of SIGs. SIG i's welfare is given by:

$$U_i = W_i(\boldsymbol{p}) - C_i(\boldsymbol{p}).$$

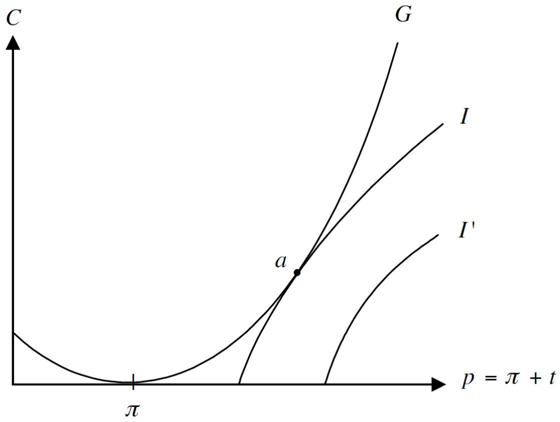
- The policy maker chooses $\boldsymbol{p}$ to maximize

$$aW(\boldsymbol{p}) + \sum_{i \in L} C_i(\boldsymbol{p}).$$

- First assume that there exists one policy instrument (p is a scalar) and one interest group.
- The model can be solved by considering a standard principal-agent setup, in which SIG is the principal and the policy maker is the agent, and (p, C) are the SIGs instruments to influence the agent.
- After finding the solution, we will show how to implement it with a contribution function $C(p)$.

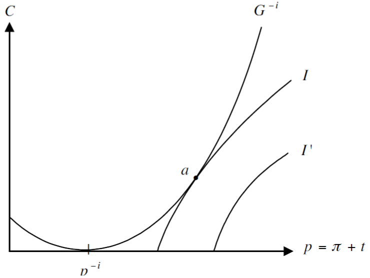
One Policy Instrument and One SIG

The following figure depicts the solution:



One Policy Instrument and Many SIGs

- In the presence of many SIGs define
$$G^{-i}(p) = aW(p) + \sum_{j \in L,\ j \neq i} C_j(p).$$
- If SIG i offers no contributions, the policy maker maximizes $G^{-i}(p)$. This results a policy p^{-i} and an indifference curve G^{-i} in the figure below, defined by
$$G^{-i}(p) + C = G^{-i}\left(p^{-i}\right).$$



Many Policy Instrument and Many SIGs

- Now there can be multiple equilibria. But if all SIGs play compensating contribution functions, then there is a unique equilibrium, the compensating equilibrium, in which the equilibrium policy is

$$p^o = argmax_p = aW(p) + \sum_{j \in L} W_j(p).$$

- The same applies when there is a policy vector $\boldsymbol{p}$, in which case a compensating contribution is given by

$$C_i(\boldsymbol{p}, k_i) = max\{W_i(\boldsymbol{p}) - k_i, 0\}$$

- The resulting equilibrium policy vector is

$$\boldsymbol{p}^o = argmax_{\boldsymbol{p}} = aW(\boldsymbol{p}) + \sum_{j \in L} W_j(\boldsymbol{p}),$$

  and the equilibrium contributions are

$$C_i^0 = max\{W_i(\boldsymbol{p}^o) - k_i^o, 0\}.$$

Many Policy Instrument and Many SIGs

- k_i^o is SIG i's best response to the other SIGs' choices. That is:

$$(\boldsymbol{p}^o, k_i^o) = argmax_{\boldsymbol{p}^o, k_i^o} W_i(\boldsymbol{p}) - C_i(\boldsymbol{p}, k_i)$$

subject to

$$aW(\boldsymbol{p}) + \sum_{j \in L, j \neq i} C_j(\boldsymbol{p}, k_j^o) + C_i(\boldsymbol{p}, k_i) \geq max_{\boldsymbol{q}}[aW(\boldsymbol{q}) + \sum_{j \in L, j \neq i} C_j(\boldsymbol{p}, k_j^o)]$$

- Bernheim and Whinston (1986) argue that "truthful Nash equilibria" are focal; they are coalition proof.
- A weaker requirement is "locally compensating (truthful) contributions," that is

$$\nabla C_i(\boldsymbol{p}) = \nabla W_i(\boldsymbol{p})$$

  - The FOC of the politician is

$$a\nabla W(\boldsymbol{p}) + \sum_{j \in L} \nabla C_j(\boldsymbol{p}) = 0$$

  - Therefore $\boldsymbol{p}^o$ satisfies

$$a\nabla W(\boldsymbol{p}^o) + \sum_{j \in L} \nabla W_j(\boldsymbol{p}^o) = 0$$

Protection for Sale: Quasi-Linear Model

- The politician maximizes a weighted sum of aggregate welfare and the welfare of the individual lobbies:

$$\boldsymbol{p}^o, = argmax_{\boldsymbol{p}} aW(\boldsymbol{p}) - \sum_{j \in L} W_j(\boldsymbol{p}).$$

- In the quasi-linear model:

$$W_i(\boldsymbol{p}) = l_i + \Pi_i(p_i) + \alpha_i \sum_{j=1}^{n} (p_n - \pi_j) m_j(p_j) + \alpha_i \sum_{j=1}^{n} S_j(p_j),$$

  where α_i is the fraction of the people who own sector i's specific input (there is specialization in ownership).
- The weight in the social welfare function is 1 for an individual who is not represented by an interest group and $1 + a$ for a represented individual.

Determinants of Protection

- Solving for the equilibrium trade tax then delivers:

$$p_i - \pi_i = \frac{I_i - \alpha_0}{a + \alpha_0}\frac{X_i}{-m_i'}, \text{ or } \frac{p_i - \pi_i}{p_i} = \frac{I_i - \alpha_0}{a + \alpha_0}\frac{1}{\mu_i \varepsilon_i}$$

where I_i is an indicator variable that equals 1 when $i \in L$ and 0 otherwise, $\alpha_0 = \sum_{i \in L} \alpha_i$ is the fraction of people represented by SIGs, $\mu_i = m_i / X_i$ is the import penetration ratio and ε_i is the import demand elasticity.

  - Protection is positive if and only if a sector is organized.
  - Protected sectors are afforded larger protection when fewer people belong to SIGs and the policy maker places lower weight on welfare. When $\alpha_0 = 1$ there is no protection.
  - Among the protected sectors, sectors with a smaller import penetration ratio and smaller import demand elasticities are more heavily protected.

Protection for Sale: Empirical Implementation

- Goldberg and Maggi (1999) propose an empirical implementation of the protection-for-sale model, by exploiting cross-industry variation in trade protection.
  - There is little variation in tariffs, so Goldberg and Maggi use nontariff barriers (NTBs); coverage ratios.
- Because the demand elasticities ε_i are not measured accurately, they estimate

$$\varepsilon_i \rho_i = \frac{I_i - \alpha_0}{a + \alpha_0}\left(\frac{1}{\mu_i}\right).$$

  where ρ_i is the coverage ratio, and it replaces $(p_i - \pi_i)/p_i$.
- They define a sector as organized if its PAC contributions exceed a certain level (an identifying assumption).
- They regress $\varepsilon_i \rho_i$ on $1/\mu_i$ for organized sectors and for not organized sectors.
- The estimates are precise and the model has substantial explanatory power.
- The estimates imply $\alpha_0 \approx 85\,\%$ and $a \approx 50 - 70$ (very high!).

Empirical Implementation

- Gawande and Bandyopadhayay (2000) use a similar methodology, except for:
  - Account for tariffs on intermediates.
  - They too obtain a high *a*.
  - Organized groups are identified from an auxiliary regression that predicts PAC spending from trade variables.
- Mitra, Thomakos and Ulubasoglu (2002) estimate the model on Turkish data, during and after the military regime. They use tariffs and NTB coverage ratios. α and α_0 are higher in the post military regime period.
- McCalman (2004) estimates the mode for Australia, using tariffs.
  - Comparing estimates in the late sixties and early nineties, he argues that the model predicts well the policy of trade liberalization (an increase in α and α_0 and the role of sectoral characteristics).

Empirical Implementation

- Mitra, Thomakos and Ulubasoglu (2006) provide a sensitivity analysis for the U.S. tariffs and NTB coverage ratios.
  - They argue that all importing sectors should be treated as organized.
  - Estimating the equation

$$\varepsilon_i \mu_i \rho_i = \beta \equiv \frac{I_i - \alpha_0}{a + \alpha_0}.$$

- They argue that:
  - The data do not reject the hypothesis that β is the same for what in previous studies was taken to be organized and not organized sectors.
  - Kolmogorov-Smirnov tests of the distribution of the LHS variable do not reject the hypothesis that the distribution is the same in the two groups of sectors.

Empirical Implementation

- Mitra, Thomakos and Ulubaşoğlu propose to estimate β and to trace the combinations of a and α_0 implied by this estimate:

TABLE 1
Estimation results for tariffs

	Only organized sectors									
$\hat{\beta}$	0.0182									
s.e.	0.0036	$N = 165$								
α_L	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.90	0.98
a	49.26	43.67	38.09	32.51	26.92	21.34	15.75	10.17	4.58	0.00
s.e.	9.83	8.74	7.65	6.55	5.46	4.37	3.28	2.19	1.09	0.20
	All sectors treated as organized									
$\hat{\beta}$	0.0164									
s.e.	0.0026	$N = 242$								
α_L	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.90	0.98
a	54.65	48.47	42.28	36.11	29.92	23.73	17.55	11.37	5.18	0.00
s.e.	8.71	7.74	6.77	5.80	4.88	3.87	2.90	1.94	0.97	0.16
	Only import-competing organized sectors									
$\hat{\beta}$	0.0303									
s.e.	0.0066	$N = 87$								
α_L	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.90	0.97
a	29.57	26.17	22.77	19.38	15.98	12.58	9.19	5.79	2.40	0.00
s.e.	6.47	5.75	5.03	4.31	3.59	2.87	2.16	1.44	0.72	0.21
	All import-competing sectors treated as organized									
$\hat{\beta}$	0.0263									
s.e.	0.0046	$N = 133$								
α_L	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.90	0.97
a	34.09	30.19	26.29	22.39	18.49	14.59	10.70	6.80	2.90	0.00
s.e.	5.92	5.26	4.61	3.95	3.29	2.63	1.97	1.32	0.66	0.17

Empirical Implementation

TABLE 2
Estimation results for *NTBs*

	Only organized sectors									
$\hat{\beta}$	0.0169									
s.e.	0.0034	$N = 165$								
α_L	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.90	0.98
a	53.09	47.08	41.07	35.06	29.05	23.04	17.03	11.02	5.01	0.00
s.e.	10.82	9.62	8.42	7.22	6.01	4.81	3.61	2.41	1.20	0.20
	All sectors treated as organized									
$\hat{\beta}$	0.0188									
s.e.	0.0033	$N = 242$								
α_L	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.90	0.98
a	47.67	42.26	36.85	31.45	26.04	20.63	15.22	9.82	4.41	0.00
s.e.	8.34	7.42	6.49	5.56	4.64	3.71	2.78	1.85	0.93	0.18
	Only import-competing organized sectors									
$\hat{\beta}$	0.0272									
s.e.	0.0063	$N = 87$								
α_L	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.90	0.97
a	32.95	29.18	25.40	21.63	17.86	14.09	10.32	6.54	2.77	0.00
s.e.	7.60	6.76	5.91	5.07	4.22	3.38	2.53	1.69	0.84	0.23
	All import-competing sectors treated as organized									
$\hat{\beta}$	0.0304									
s.e.	0.0058	$N = 133$								
α_L	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.90	0.97
a	29.56	26.16	22.77	19.37	15.98	12.58	9.19	5.79	2.40	0.00
s.e.	5.63	5.01	4.38	3.75	3.13	2.50	1.88	1.25	0.63	0.19

Empirical Implementation

Gawande, Krishna and Olarreaga (2009) estimate *a*s for many countries, by assuming that all sectors are organized and $\alpha_i = 0$:

TABLE 1. *Estimates of* a

Country	*ccode*	*1/a*	*se(1/a)*	*a*	*Country*	*ccode*	*1/a*	*se(1/a)*	*a*
Argentina	ARG	0.19	0.02	5.25	Kenya	KEN	1.16	0.33	0.86
Austria	AUS	0.11	0.01	8.79	Korea	KOR	0.06	0.00	16.15
Bangladesh	BGD	6.34	2.27	0.16	Sri Lanka	LKA	1.08	0.18	0.93
Bolivia	BOL	1.47	0.20	0.68	Latvia	LVA	0.17	0.01	5.75
Brazil	BRA	0.04	0.00	24.91	Morocco	MAR	0.87	0.14	1.14
Chile	CHL	0.21	0.02	4.83	Mexico	MEX	0.77	0.07	1.29
China	CHN	0.12	0.01	8.33	Malawi	MWI	3.93	1.17	0.25
Cameroon	CMR	3.31	2.54	0.30	Malaysia	MYS	0.32	0.02	3.13
Colombia	COL	0.13	0.01	7.88	Netherlands	NLD	0.35	0.05	2.85
Costa Rica	CRI	0.50	0.07	1.98	Norway	NOR	0.24	0.05	4.22
Germany	DEU	0.09	0.01	11.55	Nepal	NPL	15.56	5.66	0.06
Denmark	DNK	0.12	0.01	8.10	Pakistan	PAK	1.35	0.31	0.74
Ecuador	ECU	0.81	0.14	1.23	Peru	PER	0.21	0.03	4.85
Egypt	EGY	0.80	0.18	1.24	Phillipines	PHL	0.35	0.03	2.84
Spain	ESP	0.07	0.00	15.16	Poland	POL	0.13	0.01	7.48
Ethiopia	ETH	5.92	2.26	0.17	Romania	ROM	0.11	0.01	9.25
Finland	FIN	0.09	0.01	10.57	Singapore	SGP	0.00	0.00	404.29
France	FRA	0.09	0.01	10.96	Sweden	SWE	0.08	0.03	12.28
U.K.	GBR	0.08	0.01	11.86	Thailand	THA	0.94	0.17	1.06
Greece	GRC	0.20	0.02	5.11	Trinidad and Tobago	TTO	0.90	0.16	1.11
Guatemala	GTM	0.65	0.08	1.53					
Hong Kong	HKG	0.00	0.00	∞	Turkey	TUR	0.07	0.00	14.53
Hungary	HUN	0.25	0.02	3.96	Taiwan	TWN	0.12	0.01	8.53
Indonesia	IDN	0.38	0.09	2.62	Uruguay	URY	0.28	0.02	3.62
India	IND	0.37	0.05	2.72	United States	USA	0.04	0.01	26.14
Ireland	IRL	0.29	0.04	3.50	Venezuela	VEN	0.18	0.01	5.41
Italy	ITA	0.07	0.01	13.42	South Africa	ZAF	0.19	0.02	5.13
Japan	JPN	0.03	0.00	37.81					

Notes: Hong Kong has zero tariffs. In the runs with fifty-four observations (full sample) Hong Kong's *a* is set to 10,000.

Empirical Implementation

TABLE 4. *Hypothesis tests about determinants of a OLS estimates: dependent variable ln(a)*

Hypothesis	*Variable*	*Model 1*	*Model 2*
EC: Proportional versus plurality (H1)	PROPORTIONAL	0.037 [0.11]	−0.102 [0.32]
EC: Proportional versus plurality (H1.2)	PROP+LEGCOHESION	1.46 [2.71]***	0.99 [1.90]*
EC: Proportional versus plurality (H1.2)	PLUR+LEGCOHESION	1.376 [2.55]**	0.338 [0.62]
EC: Uninformed voting (H2)	ILLITERACY	−2.759 [2.76]***	−3.665 [3.52]***
EC: Uninformed voting (H2)	URBANIZATION	3.821 [3.79]***	3.175 [3.89]***
EC: Ideological attachment to party (H3)	LRDIVIDE	−0.746 [2.20]**	−0.688 [2.19]**
EC: Productivity of media spending (H4)	TVADVERTISING_GDP	0.214 [1.65]	0.211 [1.75]*
LB: Executive checks on legislators (H5)	CHECKS	0.153 [3.24]***	
LB: Executive checks on legislators (H5)	BinaryCHECKS		1.809 [3.88]***
LB+EC: Executive electoral competition (H6)	EIEC	−0.368 [3.60]***	
LB+EC: Executive electoral competition (H6)	BEIEC		−1.576 [3.61]***
LB: Undivided government (H7)	ALLHOUSE	−0.296 [1.03]	−0.369 [1.31]
LB: Undivided government (H7)	ESIMILARITY	0.326 [0.99]	0.496 [1.65]
	Constant	0.537 [0.59]	0.68 [0.90]
	N	50	50
	Adjusted R^2	0.67	0.72
	Tests (p-values reported):		
	Hypothesis 1.2	0.368	0.901
	Normality of ln(a)	0.209	0.209
	Normality of errors	0.934	0.779

Notes: Absolute *t*-statistics (using White-corrected standard errors) in parentheses.
*denotes statistical significance at 10%, ** at 5% and *** at 1% "EC" = electoral competition theory, "LB" = legislative bargaining theory. Normality tests report p-values for the Shapiro–Wilk test.

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