Autocracy & Democracy

Political Economy

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Goals

1. Political Institutions in Comparative Perspective
2. Autocracy vs. Democracy
3. Democratic Transitions and Reversals
4. Model of Power Structures in Africa

General Overview

- I wish to make our first lecture an intellectually stimulating one - maybe a bit provocative
- We will begin by focusing on a broad subject (autocracies and democracies) which we cannot adequately treat in such a limited time, but that generates a series of deep questions about the role of political institutions in the economy. I will not offer satisfactory answers (we do not have them)
- Offer a simple and stylized model instead, that shows how economic thinking can help in bringing some clarity

General Overview

Suppose we wish to look at different characteristics of political systems and at what the are consequences of different political institutions (e.g. democracy vs. autocracy; etc.).

Note: In other parts of this course, we look at economic institutions (e.g. rule of law, expropriation risk, strength of the courts) and some of these issues will resurface.

Institutions and Economic Development

Why? Fundamental determinants of economic development:

- Economic & Political Institutions
- Geography
- Culture
- Luck

What do we mean by "Fundamental"?

Fundamental means "defining the boundaries within which all economic decisions are made".

It does *not* mean "Exogenous"! Institutions change over time for many different reasons. That is why identification strategies are important.

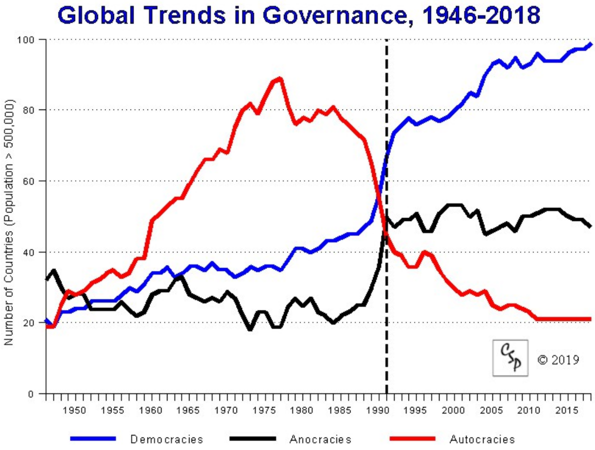
Example: investment/production. Think of $Y = AF(K, L)$. The choice of K and L in an economy are not fundamentals. A is not a fundamental. But the parameters that limit the evolution of K are.

Institutions and Economic Development (cont.)

Relates a literature on which dimension has the highest explanatory power in explaining the income levels of nations? This is the source of many debates in political economy and development economics.

- Economic & Political Institutions (Acemoglu and Robinson, 2012)
- Geography (Sachs, 2003)
- Culture (Tabellini, 2008)
- Human Capital (Shleifer, Barro, etc.)

Polity IV Democracy Time Series



Source: Polity Project. Monty G. Marshall and Keith Jaggers, Principal Investigators, George Mason University and Colorado State University; Ted Robert Gurr, Founder, University of Maryland.

Political Institutions: State Instability and Failure of Authority (cont.)

Source: Polity Project. Monty G. Marshall and Keith Jaggers, Principal Investigators, George Mason University and Colorado State University; Ted Robert Gurr, Founder, University of Maryland.

Democracy, Autocracy, and Economic Development

Once again, why does this matters?

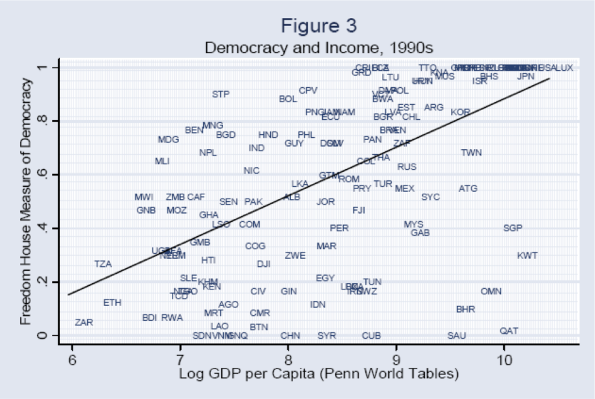
1. Political rights are valuable **per se** [*see Sen (1999)*]. Democratic regimes protect them.
2. As economists, we are also try to understand at the role of political institutions in the process of economic development.

Democracies tend to be richer than autocracies (All OECD countries are democracies).

But does democracy foster economic development? Does economic development cause political development [modernization hypothesis of *Lipset (1959)*; *Barro (JPE 1999)*]?

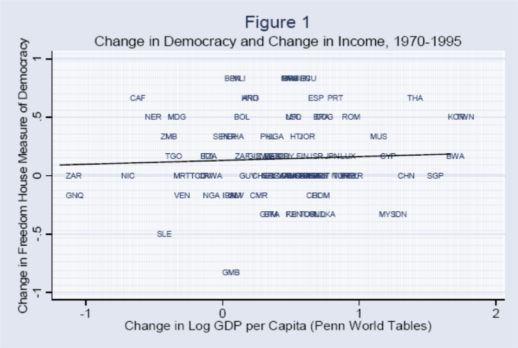
- The following slides present evidence from Acemoglu, Johnson, Robinson and Yared *(Income and Democracy? AER 2008;)*.

Democracies: Higher Income per Capita Levels



See Appendix Table A1 for data definitions and sources. Values are averaged by country from 1990 to 1999. GDP per Capita is in PPP terms. The regression represented by the fitted line yields a coefficient of 0.181 (standard error=0.019), N=147, R^2=0.35.

Changes in Democracy: no Correlation with Changes in Income



See Appendix Table A1 for data definitions and sources. Changes are total difference between 1970 and 1995. Countries are included if they were independent by 1970. Start and end dates are chosen to maximize the number of countries in the cross-section. The regression represented by the fitted line yields a coefficient of 0.032 (standard error=0.058), N=102, R^2=0.00.

Income does not grow with democracy!

Democracy, Autocracy, and Economic Development (cont.)

Existing work does not establish causal effects of income on democracy, nor vice versa. Acemoglu et al. (AER 2008) show that in different ways:

1. Within-country analysis (e.g. country-fixed effects analysis where unobserved country- specific characteristics that are constant over time are controlled for).
2. Instrumental Variable approaches (using past savings rates or predicted income constructs predicted income for each country using a trade share-weighted average income of other countries).

Both yield no strong result of a role of economic development in fostering political development.

- Evidence on the reverse channel of causation is equally scant.

Democracy, Autocracy, and Economic Development (cont.)

The best case so far: Daron Acemoglu, Suresh Naidu, Pascual Restrepo, James A. Robinson (*Democracy Does Cause Growth*, JPE 2019).

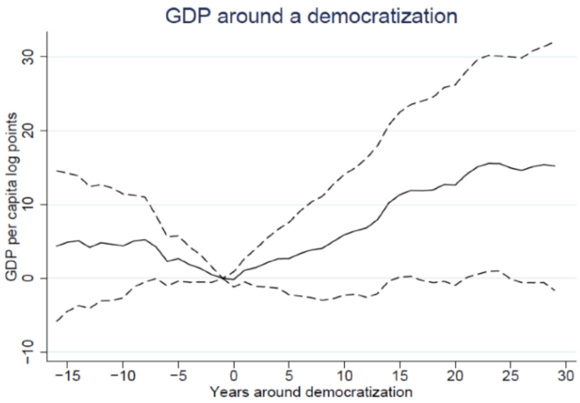
Standard empirical methodologies are flawed:

1. Democracy is hard to measure, and multiple sources have to be combined to reduce measurement error.
2. Strong persistence/sluggish dynamics in GDP (and democracy – I would add) are present in the data and should be accounted for.

Acemoglu, Naidu, Restrepo, Robinson (2019) find that:

> *"[...] Our baseline results use a linear model for GDP dynamics estimated using either a standard within estimator or various different Generalized Method of Moments estimators, and show that democratizations increase GDP per capita by about 20% in the long run."*

FIGURE 3: SEMI-PARAMETRIC ESTIMATES OF THE EFFECT OF A DEMOCRATIZATION ON GDP PER CAPITA.



How Do We Explain All This?

China & many economically successful autocracies (above 80th percentile of average growth rates - All world, pooled):

Table 2: Economically Successful Autocracies

Regime	Years of Observations	Annual Growth	Robustness 1	2	3
Equatorial Guinea(1996-2004)	1996-2003	28.04%	Y	Y	Y
Rwanda(1994-2000)	1994-1999	12.56%	Y	Y	N
Gabon(1960-1968)	1960-1967	8.59%	Y	Y	-
Belarus(1996-2004)	1996-2003	8.15%	N	Y	-
Liberia(1997-2003)	1997-2002	7.94%	Y	Y	Y
China(1976-2004)	1976-2004	7.87%	Y	Y	-
Greece(1967-1974)	1967-1973	7.85%	Y	Y	Y
Ecuador(1972-1979)	1972-1978	7.73%	Y	Y	Y
Romania(1948-1977)	1960-1976	7.63%	Y	Y	-
South Korea(1981-1987)	1981-1986	7.23%	Y	Y	Y
Azerbaijan(1998-2004)	1998-2003	7.15%	Y	Y	Y
Taiwan(1975-1987)	1975-1986	6.81%	N	Y	-
Niger(1974-1981)	1974-1981	6.27%	Y	Y	N
Iraq(1968-1979)	1970-1978	6.17%	Y	Y	-
Taiwan(1949-1975)	1951-1974	5.98%	N	Y	-
Brazil(1965-1974)	1965-1973	5.89%	Y	Y	Y
Spain(1939-1975)	1950-1974	5.77%	Y	Y	-
Poland(1947-1980)	1970-1979	5.76%	Y	Y	-
Portugal(1930-1974)	1950-1973	5.75%	Y	Y	-
Togo(1960-1967)	1960-1966	5.68%	Y	Y	-
South Korea(1973-1981)	1973-1980	5.50%	N	Y	Y
Thailand(1958-1968)	1958-1967	5.34%	Y	Y	Y
Venezuela(1941-1958)	1950-1957	4.93%	Y	Y	-
Singapore(1965-2004)	1965-2004	4.80%	N	Y	-
Indonesia(1967-1998)	1967-1997	4.56%	Y	Y	-
Vietnam(1976-2004)	1989-2003	4.47%	N	Y	-
Bhutan(1953-2004)	1970-2003	4.28%	N	Y	-
China(1969-1976)	1969-1975	4.04%	N	Y	N
Iran(1955-1979)	1955-1978	4.01%	Y	Y	-
Tunisia(1971-1981)	1971-1980	3.86%	N	N	Y
Syria(1963-1970)	1963-1969	3.82%	Y	Y	Y
North Korea(1966-2004)	1970-2003	3.75%	N	Y	-
Peru(1950-1956)	1950-1955	3.73%	Y	N	-
Pakistan(1977-1985)	1977-1984	3.70%	Y	Y	Y
UAE(1971-2004)	1971-2003	3.70%	N	N	-

Public Policy in Democracies vs. Autocracies

Important question: Do autocracies and democracies differ in what they do?

Numerous scholars point at democratic political institutions as more efficient (*Persson and Tabellini 2003, Rodrik and Wacziarg 2005*), while others deny any difference.

Mulligan, and Sala-i-Martin, Gil (JEP 2004) emphasize how autocracies only differ from democracies through policies that restrict political competition and the monopoly of force (military and police spending for instance or censorship and freedom of the press regulation), but not in terms of economic and social policies - once we control for the level of income.

Olson (1993) emphasizes that policy is different even within autocracies: Stationary Bandits vs. Roving Bandits.

Also: see *Glaeser et al.* (JOEG 2004)

Democracies and Autocracies do not seem to differ in spending policy:

Table 1

Democracy and Spending Policy across Countries

Dependent variable: (each is a percentage of GDP)	*Government consumption, 1960–1990*		*Education spending, 1980–1990*	*Social spending*	
				Pension	*Nonpension*
Independent variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*
Democracy index, 1960–1990	**−1.27**	**1.57**	**0.42**	**−0.08**	**0.72**
	(2.14)	(1.99)	(0.52)	(0.44)	(0.63)
Communist dummy	−0.87	−0.45	1.09	0.82	1.62
	(1.75)	(1.66)	(0.45)	(0.40)	(0.60)
British legal origin	2.80	2.91	0.53	−0.35	−0.86
	(1.28)	(1.17)	(0.31)	(0.28)	(0.40)
Percentage of population aged 65+, 1960–1990	0.01	0.25	0.07	0.58	0.49
	(0.25)	(0.23)	(0.06)	(0.05)	(0.07)
Log(population)/10, 1960–1990	−9.77	−8.16	−2.28	−0.24	0.02
	(2.54)	(3.36)	(0.86)	(0.76)	(1.08)
Real GDP per capita, 1960–1989 average, log	−2.96	−4.58	−0.06		
	(0.75)	(0.76)	(0.29)		
Share of value added from agriculture, 1960–1990			−3.38	−1.95	−2.01
			(1.60)	(0.93)	(1.35)
Military spending, percentage of GDP		0.60			
		(0.14)			
Adj-R-squared	.27	.38	.25	.78	.65
Countries	131	125	110	110	102

Notes: Ordinary least squares standard errors in parenthesis. All regressions include a constant term (not shown).

Source: Mulligan, Sala-i-Martin, Gil (2004).

Policies in Democracies vs. Autocracies

Democracies and Autocracies do not seem to differ in tax policy. [Tax revenues are higher in autocracies just to make up for the higher military spending in the next table].

Table 2

Democracy and Tax Policy across Countries

Dependent variable:	*Corporate tax rate 1987–1990, percentage*		*Personal income tax flatness, 1973–1990*		*Payroll tax capped, 1958–1995*		*Total revenue as percentage of GDP, 1973–1990*	
Independent variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
Democracy index, 1960–1990	**2.65**		**0.08**	**0.08**	**0.10**	**0.14**	**−3.85**	**−6.94**
	(4.20)		(0.03)	(0.03)	(0.21)	(0.22)	(3.30)	(3.23)
Democracy index, 1975–1990		**−0.39**						
		(4.03)						
Communist dummy	3.91	2.74	0.03	0.03	−0.33	−0.32	9.03	
	(5.71)	(5.76)	(0.03)	(0.03)	(0.19)	(0.19)	(3.09)	
British legal origin	−1.12	1.79	0.02	0.01	−0.02	−0.10	1.69	1.81
	(2.66)	(2.58)	(0.02)	(0.02)	(0.12)	(0.13)	(1.94)	2.00)
Percentage of population aged 65+, 1960–1990	0.32	0.48	0.01	(0.01)	−0.85	−0.01	1.76	2.03
	(0.47)	(0.48)	(0.00)	(0.00)	(2.41)	(0.02)	(0.38)	(0.39)
Log(population)/10, 1960–1990	4.92	5.22	−0.02	−0.02	0.10	0.26	−12.42	−12.10
	(7.40)	(7.42)	(0.05)	(0.05)	(0.33)	(0.33)	(5.56)	(5.70)
Real GDP per capita, 1960–1989 average, log	−0.51	−0.22	0.02	0.03	0.09	0.15	5.21	5.17
	(1.80)	(1.79)	(0.02)	(0.02)	(0.09)	(0.11)	(1.24)	(1.28)
Ethnolinguistic fractionalization				0.06		0.36		
				(0.03)		(0.23)		
Adj-R-squared	.00	.00	.63	.65	.04	.07	.55	.52
Countries	80	80	60	59	71	69	115	115

Notes: Ordinary least squares standard errors in parenthesis. All regressions include a constant term (not shown).

Source: Mulligan, Sala-i-Martin, Gil (2004).

Policies in Democracies vs. Autocracies

Democracies and Autocracies differ in policies affecting Public Office Competition:

Table 3
Democracy across Countries—Policies that Might Affect Public Office Competition

Dependent variable:	*Widespread torture c. 2000*		*Fraction of years 1976–1990 with death penalty*	*Military spending*	*Civil liberties, 1973–1990*	*Regulated religion, 1970–1990*	*Fraction of years 1985, 1990, 1995 drafting*	*Open trade policy*
Independent variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
Democracy index, 1960–1990 (but see notes)	**−0.28**	**−0.29**	**−0.56**	**−3.44**	**0.55**	**−0.30**	**−0.01**	**0.17**
	(0.14)	(0.13)	(0.13)	(1.20)	(0.04)	(0.15)	(0.14)	(0.11)
Communist dummy	−0.17	0.04	0.11	0.87	−0.18	0.41	0.12	−0.31
	(0.12)	(0.11)	(0.10)	(1.08)	(0.08)	(0.13)	(0.11)	(0.08)
British legal origin	0.06	0.08	0.31	0.17	−0.01	−0.08	−0.44	0.03
	(0.09)	(0.08)	(0.08)	(0.73)	(0.02)	(0.09)	(0.08)	(0.07)
Fraction of population aged 65+, 1960–1990	3.15	0.73	0.22	−21.	0.78	−0.57	1.57	4.39
	(2.07)	(1.87)	(1.49)	(14.)	(0.47)	(1.79)	(1.56)	(1.27)
Log(population)/10, 1960–1990	1.04	0.86	0.46	−1.82	−0.01	−0.07	0.71	0.01
	(0.25)	(0.23)	(0.21)	(2.26)	(0.07)	(0.25)	(0.25)	(0.19)
Real GDP per capita, 1960–1989 average, log	0.08	0.08	0.09	1.40	0.04	0.16	−0.06	0.08
	(0.06)	(0.05)	(0.04)	(0.46)	(0.01)	(0.05)	(0.06)	(0.05)
Years at war since 1950				0.58			−0.09	
				(0.13)			(0.16)	
Armed forces per male aged 15–24, 1985–1995							1.67	
							(0.58)	
Fraction of males aged 15–24, 1985–1995	2.92	3.98						
	(2.71)	(2.45)						
Adj-R-squared	.21	.15	.22	.23	.85	.17	.35	.53
Countries	121	121	131	125	130	131	127	113

Notes: Ordinary least squares standard errors in parenthesis. All regressions include a constant term (not shown). Democracy index is 1998–1999 average in specifications (1) and (2). Torture from State Department and REDRESS in specifications (1) and (2), respectively. Military spending (specification 5) measured as percentage of GDP.

Source: Mulligan, Sala-i-Martin, Gil (2004).

Models of democratic transitions.

Many interesting theories and models of political transitions (*Lipset* (1959); *Przeworski* (1991); *Linz and Stepan* (1996); *Myerson* (2007, 2008); *Mulligan and Tsui* (2007), etc.)

We will focus on *Acemoglu and Robinson (AER 2001): A Theory of Political Transitions.*

In many respects, this is the workhorse model of their 2006 book. It encompasses the *Acemoglu and Robinson (QJE 2000)* model on the extension of the democratic franchise in Western Europe used in many subsequent papers.

The Model

- Two groups of agents: The Poor and the Rich (the *Elite*).
- Two political states: Democracy (median voter is *Poor*, and controls policy) and Autocracy (the *Rich* controls policy).
- During an Autocracy, the *Poor* can mount a revolution (storming the Bastille). Furthermore, the *Rich* can establish a democracy.
- During a Democracy the *Rich* can mount a coup.
- Income is stochastic and the opportunity cost of coups and revolutions changes with income.
- No commitment to future level of taxation is possible.

Setup

Infinite horizon. Discrete time.

Measure 1 of agents. A fraction $\lambda > 1/2$ agents are Poor (p), the rest is Rich (r).

There is an unique consumption good y and a unique productive asset with total stock h.

At the beginning of time $t = 0$ the poor owns h^p and the rich $h^r > h^p$.

To parameterize income inequality in this economy we use the parameter $\theta < \lambda$ such that the share of capital owned by the poor is less than proportional to their size $h^p = h\theta/\lambda$ and $h^r = h * (1 - \theta)/(1 - \lambda)$.

Higher θ implies lower income inequality (and vice versa).

Setup (cont.)

Income accrues from production: $y_{i,t} = A_t h^i$ for $i = p, r$ where A_t indicates aggregate productivity, which follows a stochastic process

- $A_t = A^{high} = 1$ with prob. $1 - s$
- $A_t = A^{low} = a$ with prob. s

where $a < 1$ & it indicates a period of recession. $s < 1/2$ so recession is relatively rare.

All agents maximize expected discounted consumption:

$$\mathbb{E}_t \sum_{j=0}^{\infty} \beta_j C_{i,t+j} \text{ for } i = p, r$$

Setup (cont.)

Disposable income is given by after-tax income plus (not-group-specific) transfers:

$$(1 - \tau_t) * A_t h^i + f_t$$

Also assume that there is a cost in raising taxes equal to $c(\tau_t) * A_t h$ with $c'(0) = 0,\ c' > 0,\ c'' > 0,\ c'(1) = \infty$.

The government budget constraint is given by:

$$f_t = \lambda * \tau_t * A_t h^p + (1 - \lambda) * \tau_t * A_t h^r - c(\tau_t) * A_t h$$

$$= (\tau_t - c(\tau_t)) * A_t h$$

Revolution

A revolution can be attempted in any nondemocratic period after $t = 0$. If attempted, it **always** succeeds.

After a revolution, the share of capital owned by the poor becomes more proportional to their size $h\pi/\lambda$ with $\theta < \pi$.

- π tells us how high the returns to the revolution are.

The revolution destroys $(1 - m) > 0$ fraction of resources in the period in which happens.

- m tells us how **"cheap" the revolution is** (the higher m, the less the poor lose from revolution).

Revolution (cont.)

For the poor the return in the period of the revolution is $mA_t h\pi/\lambda$ and the per period return ever after is $A_t h\pi/\lambda$.

Note: the discounted net present value of a revolution is:
$W^p(R) = (1 - s + sa) * h\pi/\lambda * 1/(1 - \beta)$

For the rich the revolution is very costly - they lose everything forever:
$W^r(R) = 0$.

- The rich will always try to avoid revolution. This is the disciplining device through which the poor can obtain redistribution or democratization.

Coup d'état

A coup can be attempted in any democratic period after $t = 1$.

If attempted, the coup always succeeds.

The coup destroys $(1 - \phi) > 0$ fraction of resources in the period in which it happens. ϕ tells us **how "cheap" the coup is** (the higher ϕ, the less the rich loses from the coup).

For the poor & the rich the return in the period of the coup is $\phi A_t h^i$.

Timing of the Game

Sequential structure:

1. Nature determines aggregate productivity A_t .
2. If there has been a revolution in the past, the Poor receive their income, consume, and the period ends. If the state is a democracy the Poor pick a tax rate τ_t. If the state is an autocracy the Rich pick a tax rate τ_t.
3. *In a nondemocratic regime the Rich decide whether to extend the electoral franchise to the Poor*. In a *democratic regime the Rich decide whether to stage a coup*.
    - Whoever is in power now can fix a new tax rate τ_t for the current period.
4. *In a nondemocratic regime the Poor decide whether to initiate a revolution*.
    - If there is a revolution, the Poor share the remaining income in the economy.
    - If there is no revolution, the tax rate τ_t gets implemented.
5. All receive their income, consume, and the period ends.

Note: the Poor cannot undertake a revolution immediately after a coup (you need to start in a nondemocratic regime).

Equilibrium

Two players: Poor and Rich representative agents.

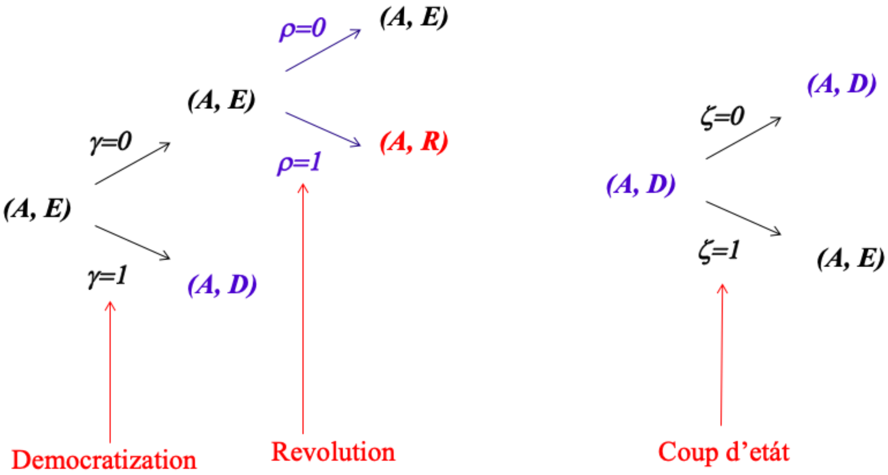
Focus on (pure strategy) Markov Perfect Equilibria: Strategies depend only on the current state & the prior actions taken within the same period.

- It's a standard way to exclude history-dependence of strategies and other complications.

For a given level of productivity A, there are three possible states S:

- (A, D) = Poor in power (Democracy)
- (A, E) = Rich (Elite) in power (Autocracy)
- (A, R) = Revolution (an absorbing state)

Transitions



Strategies - For the Rich

For the Rich:

$\sigma^r(S|\tau^p) = \{\gamma, \zeta, \tau^r\}$

- γ , in state (A, E) extend the franchise $(\gamma = 1)$ or not $(\gamma = 0)$
- ζ, in state (A, D), given τ^p, stage a coup $(\zeta = 1)$ or not $(\zeta = 0)$
- τ^r in state (A, E), or in state (A, D) after a coup $(\zeta = 1)$, fix the tax rate

Strategies - For the Poor

For the Poor:

$\sigma^p(S|\gamma, \tau^r) = \{\rho, \tau^p\}$

- ρ, in state (A, E) initiate the revolution $(\rho = 1)$ or not $(\rho = 0)$
- τ^p in state (A, D) fix the tax rate

Equilibrium

A pure strategy Markov Perfect Equilibrium is a strategy combination

$$\sigma^{r*}(S|\tau^{p}),\ \sigma^{p*}(S|\gamma,\tau^{r})$$

such that these strategies σ^{r*}, σ^{p*} are best-responses to each other for all possible states.

See paper for a more formal definition.

Analysis: Preliminaries

Some preliminaries first:

What is the optimal tax rate τ^m the poor would set, absent the risk of a coup?

Simply maximize the per-period consumption of the poor wrt τ:

$$max\left\{(1-\tau_t) * A_t h^p + (\tau_t - c(\tau_t)) * A_t h\right\}$$

which implies

$$c'(\tau^m) = (\lambda - \theta)/\lambda$$

using the fact that $h^p = h\theta/\lambda$.

So, the higher the inequality (the lower θ), the higher the taxes. Also: Notice that in the absence of political change, taxes would be constant.

Define $\delta^i(\theta)A_t$, the net amount of redistribution that a person of group i receives in state A_t when the tax rate is τ^m.

$$\text{So: } \delta^i(\theta)A_t = f^m - \tau^m * A_t h^i$$

And from the budget constraint transfers are $f^m = (\tau^m - c(\tau^m)) * A_t h$

This implies net transfers to the poor: $\delta^r(\theta) < 0 < \delta^p(\theta)$

Assumptions (1)

Assume revolutions & coups are not worthwhile in periods of economic expansion (i.e. $A_t = A^h = 1$).

Assumption 1: *Sufficient condition for which coups are not profitable in good times.*

The cost of a coup for the Rich in normal times (the direct loss from the coup minus taxes paid $(1-\phi)h^r + \delta^r(\theta)$) is always larger than the taxes τ^m avoided forever ($-(1-s+sa) * \delta^r(\theta) * \beta/(1-\beta)$)

That is:

$$(1-\beta)(1-\phi)h^r > -(1-\beta s(1-a))\delta^r(\theta).$$

Assumptions (2)

Assumption 2: *Sufficient condition for which revolutions are not profitable in good times.*

In state (A_t, E) the value of a revolution is

$$V^p(A_t, R) = m * A_t h\pi/\lambda + \beta W^p(R)$$

The value of never undertaking a revolution, and hence of never receiving transfers from the rich from then on is:

$$\underline{V^p}(A_t, E) = A_t h^p + \beta(1 - s + sa) * h^p/(1-\beta)$$

Of course, this value is a lower bound of the Poor's utility under autocracy (because occasionally there could be redistributive taxation – the Rich could tax themselves and give to the Poor).

So we assume that for $A_t = 1, \underline{V}^p(1, E) > V^p(A_t, R)$

With this assumption we know there will never be a revolution in good times. This also implies that the Rich will never redistribute to the Poor in good times.

Analysis

We need to derive some intuitive value functions in the different states of the world.

What is the value of being in a democracy during good times $(A_t = 1)$ for agents $i = p, r$?

$$V^i(1, D) = h^i + \delta^i(\theta) + \beta W^i(D)$$

Where we make use of the fact that there is never going to be a coup in good times (hence the net transfers are $\delta^i(\theta) * 1)$ and the continuation value from next period on of being in state D is:

$$W^i(D) = (1 - s) * V^i(1, D) + s * V^i(a, D)$$

This depends on the state of the economy next period (could be a boom or a recession).

Analysis

What is the value of being in a democracy during bad times for agents $i = p, r, V^i(a, D)$?

Now, here the situation gets tricky for the Poor.

- If they redistribute too much, they can trigger a coup.
- So, they may decide to keep taxes low and reduce transfers to themselves in bad times just to avoid a coup by the elite.

Call this tax rate (if feasible) $\tau^d < \tau^m$.

Analysis

Suppose τ^d prevents the coup, then

$$V^i(a, D) = v^i(a, D|\tau^d) = a(h^i + \Delta^i(\theta, \tau^d)) + \beta W^i(D)$$

where net transfers under the threat of a coup are:

$$\Delta^i(\theta, \tau^d)A_t = f^d - \tau^d * A_t h^i$$

Notice that the continuation value is still $W^i(D)$ which tells us the following:

- If in the next period the Poor have good times, they will increase taxes back up to τ^m (this can't trigger a coup at that point because times are good).
- The Poor cannot commit to keep taxes low.

Nonetheless, reducing taxes in a democracy may not be enough to prevent a coup. Let's see what the Rich decide about this:

$$V^r(a,D) = max_{\zeta}\{\zeta \underline{V^r}(a,E) + (1-\zeta)v^r(a,D|\tau^d)\}$$

Where the continuation value of a coup $(\zeta = 1)$ in state (a,D) is:

$$\underline{V^i}(a,E) = \phi a h^i + \beta W^i(E)$$

This depends on the fact that the rich will be able to set taxes to zero right after the coup (recall there cannot be revolution immediately after a coup - it can only occur in the following period).

The continuation value from next period on of being in state E is:

$$W^i(E) = (1-s) * V^i(1,E) + s * V^i(a,E)$$

Analysis

What happens when the Elite is in power?

In a boom: the Rich will set taxes to zero, since there cannot be a revolution by *Assumption 2*. So, for agents $i = p, r$:

$$V^i(1, E) = h^i + \beta W^i(E)$$

In a recession, the Rich have several options:

- They can democratize $(\gamma = 1)$
- They can decide not to democratize $(\gamma = 0)$ but they can raise taxes from 0 to τ^e to appease the Poor and avoid a revolution $(\rho = 0)$
- A revolution may occur $(\rho = 1)$

Since we start from autocracy, if either $\gamma = 0$ or $\rho = 1$, then we would never observe a democracy.

Since we use $V^i(a, E)$, let us focus on case 1 $(\gamma = 1)$ when calculating a deviation from democracy (in what follows along the equilibrium path).

Analysis

So if $\gamma = 1$, then for agents $i = p, r$:

$$V^i(a, E) = a(h^i + \delta^i(\theta)) + \beta W^i(D)$$

which depends on the fact that the poor will set τ^m taxes (recall there cannot be a coup immediately after a democratization, only the following period - so, the poor will pick the best tax rate for them, τ^m).

The continuation value from next period on of being in state D is what we derived earlier.

Assumption 3: *Assume revolutions are worse than democracies, so democratizations can help preventing revolutions.*

$$V^p(a, R) < V^p(a, D)$$

(Excludes case 3 in previous slide) This completes the derivation of the value functions. Let's now look at the properties of the MP equilibrium.

Coup Constraint

In state (a, D) the elite would prefer not to stage a coup if it is too costly, or:

$$\underline{V^r}(a, E) < v^r(a, D|\tau^d)$$

That is, by replacing the expressions in the previous slides:

$$\phi ah^r + \beta W^r(E) < a(h^r + \Delta^r(\theta, \tau^d)) + \beta W^r(D)$$

Or, more intuitively:

$$\beta(W^r(E) - W^r(D)) - a\Delta^r(\theta, \tau^d) < ah^r(1-\phi) \tag{18}$$

Capturing power & reducing taxes from τ^d to 0 < Cost of the coup

Note: If a is large (recession is not too deep), the coup is more expensive and less likely.

Consolidated Democracy

In state (a, D) the Rich will never stage a coup for levels of ϕ low enough, such that:

$$\beta(W^r(E) - W^r(D)) - a\Delta^r(\theta, \tau^d) < ah^r(1 - \phi) \qquad (18)$$

or, more clearly:

$$\beta(W^r(E) - W^r(D)) - a\delta^r(\theta) < ah^r(1 - \phi)$$

Capturing power & reducing taxes *even when taxes at the maximum*
$<$ *Cost of the coup*

Substituting the value functions, you get a threshold $\underline{\phi}(\theta, a, s)$:

$$\underline{\phi}(\theta, a, s) = ((1 - \beta(1 - s))a(h^r + \delta^r(\theta)) + \beta(1 - s)\delta^r(\theta))/((1 - \beta(1 - s))ah^r)$$

For $\phi < \underline{\phi}$, coups never occur.

Consolidated Democracy (cont.)

For $\phi < \underline{\phi}$, coups never occur, so increasing $\underline{\phi}$ decreases the range in which coups might occur:

1. $\partial\underline{\phi}(\theta, a, s)/\partial\theta > 0$ more equal societies are easier to consolidate (**lower need to tax the rich**).
2. $\partial\underline{\phi}(\theta, a, s)/\partial a > 0$ less severe recession make consolidation easier (by **increasing the opportunity cost of a coup**).
3. $\partial\underline{\phi}(\theta, a, s)/\partial s > 0$ more frequent recessions make consolidation easier (**increasing the frequency at which the Rich pay lower taxes makes democracy less costly to the Rich**).

Semi-Consolidated Democracy

In state (a, D) the Rich always stage a coup for levels of ϕ high enough (cheap coups), such that:

$$\beta(W^r(E) - W^r(D)) - a\Delta^r(\theta, \tau^d) < ah^r(1-\phi) \qquad (18)$$

or, more clearly:

$$\beta(W^r(E) - W^r(D)) - 0 > ah^r(1-\phi)$$

Capturing power & reducing taxes <u>even when taxes are at the minimum</u>
<u>$\tau^d = 0$</u> $>$ Cost of the coup

Substituting the value functions you get a threshold $\phi(\theta, a, s)$.

For $\phi > \phi$ coups always occur during recessions:

$$\phi(\theta, a, s) = ((1 - \beta(1 - s))ah^r + \beta(1 - s)\delta^r(\theta))/((1 - \beta(1 - s))ah^r)$$

For $\underline{\phi} < \phi < \phi$, the democracy is *semi-consolidated*.

- That is, in order to prevent a coup, during recessions the Poor lowers taxes to a level $0 < \tau^d < \tau^m$

Note: During booms taxes go back up to τ^m. *Even if the country remains a democracy, the off-equilibrium threat of a coup influences tax policy!*

Revolution Constraint

In state (a, E) the Poor would prefer not to start a revolution if it isn't worth it:

$$V^p(a, R) < v^p(a, E|\tau^e)$$

The Rich may wish to avoid revolution by conceding some redistribution τ^e, that is:

$$m * ah\pi/\lambda + \beta W^p(R) < a(h^p + d^p(\theta, \tau^e)) + \beta W^p(E) \tag{19}$$

where $d^i(\theta, \tau^e)a = f^e - \tau^e * ah^i$ and it means:

Capturing power through the Revolution < Value of living in an autocracy for the Poor

Note: The Rich may have the opportunity of avoiding revolutions by just increasing taxes and redistributing during recessions. However, even giving $\tau^e = \tau^m$ *may not be enough to satisfy (19). In that case they will need to democratize.*

Democratizations

In state (a, E) the poor would always start a revolution if:

$$V^p(a, R) > v^p(a, E|\tau^m)$$

Where the rich tries to avoid revolution by conceding maximum redistribution τ^m. That is:

$$m * ah\pi/\lambda + \beta W^p(R) > a(h^p + \delta^p(\theta)) + \beta W^p(E) \tag{20}$$

Substituting the value functions you get a threshold $m(\theta, a, s)$.

For $m > m$ a revolution is always attractive during a recession, even at maximum redistribution τ^m:

$$m(\theta, a, s) = ((1-\beta(1-s))a(h^p+\delta^p(\theta))+\beta(1-s)h^p-(1-s+as)\beta\pi h/((1-\beta)a\pi h)$$

In this case, the Rich must democratize to avoid a revolution.

Democratizations (cont.)

For $m < m$ the Rich can prevent the revolution by redistributing resources during recessions.

- That is, in order to prevent a revolution during recessions the Rich increases taxes (on themselves) to a level $0 < \tau^e < \tau^m$.

Taxes go back down to 0 during booms.

Note: **The threat of a revolution influences tax policy even if the country remains autocratic.**

Democratizations (cont.)

For $m > m$ a revolution is always attractive during recessions (even at maximum redistribution). So, the Rich democratize during the recession to avoid a revolution (by *Assumption 3*).

1. $\partial m(\theta, a, s)/\partial \theta > 0$ more equal societies are less likely democratize and the Poor are more likely to just be happy with redistribution (**autocracy is not that costly for the Poor**).

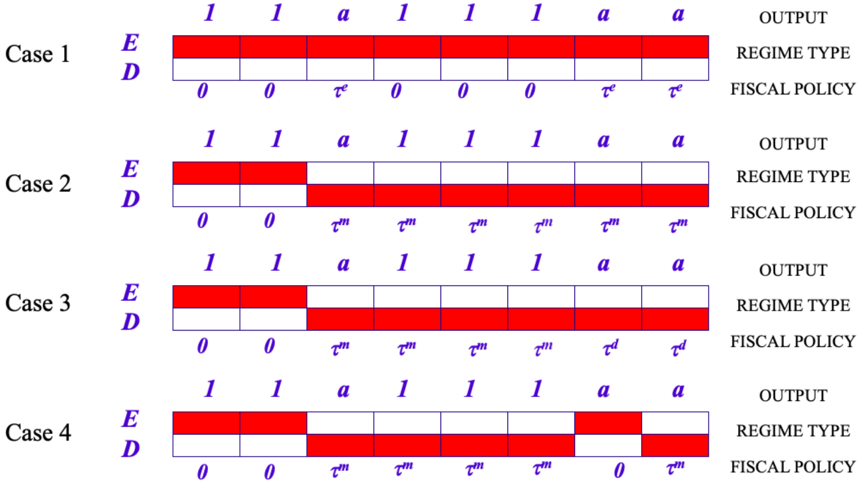
2. $\partial m(\theta, a, s)/\partial a > 0$ less severe recessions make societies less likely to democratize and the Poor are more likely to just be happy with redistribution (**by increasing the opportunity cost of a revolution**).

3. $\partial m(\theta, a, s)/\partial s > 0$ more frequent recessions make societies less likely to democratize. Furthermore, the Poor are more likely to just be happy with redistribution (**increasing the frequency at which the Rich pay higher taxes makes autocracy less costly for the Poor**). Frequency of recessions acts as a <u>commitment to redistribution</u>.

Equilibrium (under Assumptions 1-3): Proposition

1. If $m < m(\theta, a, s)$, then society remains nondemocratic forever.
   - *Intuition: a revolution can always be bought off by the elite and the system remains an autocracy.*
2. If $m > m(\theta, a, s)$ and if $\phi < \underline{\phi}(\theta, a, s)$, then society democratizes the first time the state is (a, E) (at the first recession) and it remains a consolidated democracy forever.
   - *Intuition: The revolution threat forces democratization and coups are too costly to stage even when taxes are at their maximum τ^m.*
3. If $m > m(\theta, a, s)$ and if $\underline{\phi}(\theta, a, s) < \phi < \bar{\phi}(\theta, a, s)$, then society democratizes the first time the state is (a, E) (at the first recession) and it remains a semi-consolidated democracy forever.
   - *Intuition: The revolution threat forces democratization and then coups are not too costly to stage, so taxes have to be lowered in bad times.*
4. If $m > m(\theta, a, s)$ and if $\phi > \bar{\phi}(\theta, a, s)$, then society becomes an unconsolidated democracy the first time the state is (a, E) (at the first recession) and then at every recession it continuously switches regimes.
   - *Intuition: Democratizations follow coups (cycles).*

Empirical Implications



Examples

1. Society remains nondemocratic forever. There are several examples of this where the Poor are "bought off", like Singapore, Saudi Arabia.
2. OECD countries. Extension of the democratic franchise to Western societies.
3. Countries for which the threat of coups still constraints redistribution even though they are formally democratic. (Brazil?)
4. In African and some Latin American countries that are continuously alternating between regime types, the changes in regime are often triggered by economic downturns (Chile, Argentina).

Notes

1. Societies with high asset inequality (low θ) are more likely to have both more coups and revolutions.
    - Hence they are more likely to be in case 4 and switch back and forth between democracy and autocracy.
2. In our model, the richer the country (the higher h), not necessarily the more democratic the country. Both coup and revolution constraints are unaffected by the level of h per se.
3. Higher inequality (low θ) increases fiscal policy variability within each case of equilibrium.
4. Societies where distortions $c(.)$ are lower (less convex) will have higher taxes. They are less likely to consolidate (the rich, fearing higher taxes, will have more incentives to stage coups).
    - In a sense, distortions are a good commitment device against expropriation of the elite.

Note: The paper has also a very interesting second section on consolidation (not covered in the final exam). ***Read it!***

How Is Power Shared in Africa?

- Francois, Rainer, Trebbi (2015).
- **Theory part**: A model of the allocation of patronage positions on the part of an autocratic leader.
- **Goal**: To open the black box of autocracies.

Model Setup

- Our explanation: the leader has to worry about two anti-regime threats: insider & outsider threats.
- These are balanced by patronage allocations.
    - **Outsider threats:** (not in ruling coalition) disgruntled & foment dissent;
    - **Insider threats:** (in coalition) but can eye the leader's prize.
- Include insiders to dissuade revolutions by outsiders, but insiders must be dissuaded against coups.
- Allocations to affect one threat also potentially affect the other, and vice versa.
    - Also, allocations depend on returns to leadership, and hence on nature of equilibrium play.
- We need a model to formalize this, to structure these interactions, to characterize stable outcomes.

Model Preliminaries

- An infinite horizon, discrete time economy
- Per period discount rate, δ.
- N ethnicities, the set of ethnicities denoted $N = \{1, \ldots, N\}$
- Each ethnicity comprises two types: elites, e, and non-elites, n.
- Ethnic group j has elite size e_j and non-elite size n_j with $e_j = \lambda n_j$ and $\lambda \in (0, 1)$
- The population of non-elites is of size P, $\sum_{i=1}^{N} n_i = P$. Let $N = \{1, ..., N\}$

- Order by size $e_1 > e_2 > \ldots > e_{N-1} > e_N$.
- Elites decide whether co-ethnic non-elites support government or not
  - Each elite 'controls' $1/\lambda$ non-elite
- At time 0 leader from group $j \in N$ selected with probability proportional to group size

$$p_j(N) = \frac{exp(\alpha e_j)}{\sum_{i=1}^{N} exp(\alpha e_i)} \tag{1}$$

Model Preliminaries (cont.)

- $l \in N$ indicates ethnic identity of leader
- ϑ denotes the set of subsets of N.
- The leader chooses how to allocate leadership posts (cabinet positions or ministries) across ethnic groups.
- Let Ω^l denote the set of groups in cabinet other than the leader's group
- Hence, country is ruled by an ethnic coalition $(\Omega^l \cup l \in \vartheta)$

Patronage

- Cabinet posts generate patronage to post holders. (Total cake value $= 1$)
  - Per-member patronage value allocated to elite group $j : x_j$
  - Total patronage accruing to elite j (if all e_j in govt.): $x_j e_j \in [0, 1]$
- In their offers of patronage, leaders are able to split ethnic groups.

Assumption: *Leaders can split ethnic groups in their offers of patronage.*

- *Specifically, a leader of ethnicity I can offer patronage to a subset $e_j'(I) \leq e_j$ of group j; and exclude the remaining $e_j - e_j'(I)$ from their governing coalition.*
- *A leader cannot exclude elites from his own ethnicity.*

Patronage (cont.)

Ethnic ties bind leaders.

Assumption: Leaders must share retained patronage equally with their co-ethnic elite. However, they are able to offer patronage to elites from other ethnicities as they wish.

- Denote these residual leader group shares:

$$\overline{x}_l = (1 - \textstyle\sum_{i \in \Omega^l} x_i e_i^l(l))/e_l$$

- Leader also obtains a nontransferable, personal premium, F, to holding office (captures the "personalistic" nature of autocratic rents).

Value Functions

Characterize stationary outcomes:

- $V_j^{leader}(\Omega^j)$ denotes the value of being the leader.
- $V_j(\Omega^j)$ denotes the value of being in the government coalition to an elite member from ethnicity j, conditional on the leader being from ethnicity j (and the member not being the leader himself).
- $V_j(\Omega^l)$ denotes the value of being in government coalition to an elite from ethnicity j, conditional on the leader being from ethnicity l.
- V_j^0 denotes the value function for an elite of ethnicity j excluded from the current government.
- $V_j^{transition}$ denotes the net present value of being in a 'transition', i.e. before a new leader has been chosen (more below).

Transitions

Leaders lose power or are deposed for '**exogenous**' and '**endogenous**' reasons:

- Exogenous
  - Events outside their control: they may die or a friendly superpower may change its regional policy, for example.
- Endogenous
  - Leaders can be deposed by outsiders via revolution (i.e. civil war, large-scale political violence);
  - Leaders can be deposed by government insiders via coup d'état (i.e. internal power-struggles).

Revolutions

- A revolution – whether it succeeds or not – destroys value. The total value of all govm't posts is reduced to $r \leq 1$ after a revolution.
- Probability of success depends on **relative sizes of combatants**.
    - For example: with $N_I = n_I + \sum_{i \in \Omega^I} n_i$ insiders & N_0 revolutionaries, outsiders will succeed with probability $N_0/(N_I + N_0)$
- Winning a revolution leads to deposing the leader, and then drawing of a new one, i.e. a transition according to probability $p_j(N)$ defined in equation (1).
- Losing a revolution results in no change of the status of the government.

Revolutions (cont.)

A group of potential elite revolutionaries, N_0 , excluded from patronage of current government, has incentive to mount a revolution leading to a civil war if, for each one:

$$\frac{N_0}{N_0+N_I} rV_j^{transition} + \frac{N_I}{N_0+N_I} rV_j^0 \geq V_j^0$$

Nash Conjectures:

- In deciding whether to start a revolution, an elite uses Nash conjectures to determine the number of other elites that would join in.
- That is, once a revolution commences, all valuations are proportionately reduced by $1 - r$. Thus, **all outsiders will join a revolution once started**.

No revolutions from **outside**:

$$\boxed{\frac{N_0}{P} r V_j^{transition} \leq \left(1 - \left(1 - \frac{N_0}{P}\right) r\right) V_j^0} \quad \forall j \notin \Omega^l \qquad (2)$$

- Provided $V_j^{transition}/V_j^0 > 1$ & $V_j^{transition}/V_j^0$ unaffected by the size of the ruling coalition (proved).

No revolutions from **inside**:

$$\boxed{\frac{N_0 + n_j}{P} r V_j^{transition} + \left(1 - \frac{N_0 + n_j}{P}\right) r V_j^0 \leq V_j\left(\Omega^l\right)} \quad \forall j \in \Omega^l \qquad (3)$$

Revolutions (cont.)

The leader suffers $\Psi \leq 0$ if there is a revolution attempt.

- Assume throughout that Ψ is large enough to always make it optimal for leaders to dissuade revolutions.
- This assumption aims at capturing the extremely high cost of revolution for the rulers, in a similar fashion to *Acemoglu and Robinson (2001, 2005)*.
- Implication: No endogenous revolutions on the equilibrium path.

Avoiding a Revolution

Leaders utility from coalition Ω :

$$W_l(\Omega) = \Psi * R(\Omega) + V_l^{leader}(\Omega) * (1 - R(\Omega))$$

and the revolution indicator is defined as:

$$R(\Omega) = \begin{cases} 0 & if \;\; both \; (2) \; and \; (3) \; hold \\ 1 & otherwise \end{cases} \tag{4}$$

Optimal coalition selected by a leader ethnicity l is:

$$\Omega^l = arg \;\; max_{(\Omega \cup l) \in \vartheta} \{W_l(\Omega)\} \tag{5}$$

Exogenous Transitions

With probability ε, something exogenous to the model finishes off the leader:

- Negative health shock; an International Criminal Court arrest mandate; a drone strike, etc.

Define this state as a '**transition**' state:

- Probability of an the next leader being of a certain ethnicity differs by ethnicity
- Let this probability be again $p_j(N)$

Value of being in the transition state is :

$$\boxed{V_j^{transition} = p_j(N)\bar{V}_j(\Omega^j) + \sum_{i=1, i\neq j}^{N} p_i(N)\left[I(j \in \Omega^i)V_j(\Omega^i) + I(j \notin \Omega^i)V_j^0\right]}$$

- Here, ignore the small probability event that individual j *actually* becomes the leader after a transition.

Coups

Coups do not destroy patronage value.

In spirit of *Baron and Ferejohn's (1989)* proposer power - assume that in each period, one member of the ruling coalition has the opportunity to attempt a coup.

- The probabiiity of a coup's success is independent of the size of the group of insiders.
- Anyone can get the opportunity to slip cyanide in the leader's cup.

Assume that the attempt is costless, that it succeeds with probability γ, and that the coup leader becomes the new leader.

If challenger j loses, they move into exclusion state, is denoted V_j^0 and gets:

$$\boxed{V_j^0 = 0 + \delta((1-\varepsilon)V_j^0 + \varepsilon V_j^{transition})} \qquad (6)$$

Avoiding a Coup

We focus on the case in which leader l transfers sufficient patronage x_i to each included elite from group i to ensure they do not exercise a coup opportunity.

- No endogenous coups on the equilibrium path (uninsurable coups are still allowed).
- Leader only brings people who can be trusted into the cabinet (leader does everything to make sure this is the case).
- **Punchline**: Leaders take *no chances* on people who can kill them.

Avoiding a Coup (cont.)

- **Returns from coup are gains from future leadership**.
- Successful coup leader of ethnicity j knows they also must also dissuade each i elite they may choose to include.

Impose *sub-game perfection*.

- Conjectured alternative: leader i is also computing an optimal set of patronage transfers to an *optimally chosen coalition*.
- If i were to stage a coup, they would also have to dissuade their own coalition members from mounting coups against them, and so on.
- This is a recursive problem. It's simple because of *assumed stationarity*.

Avoiding a Coup (cont.)

To dissuade j:

$$\boxed{\begin{aligned}&x_j + \delta((1-\varepsilon)V_j(\Omega^l) + \varepsilon V_j^{transition}) \geq \\ &\gamma(\bar{x}_j + F + \delta((1-\varepsilon)V_j^{leader}(\Omega^j) + \varepsilon V_j^{transition})) \\ &+ (1-\gamma)(0 + \delta((1-\varepsilon)V_j^0 + \varepsilon V_j^{transition}))\end{aligned}} \tag{7}$$

To minimize payments this constraint binds and reduces to:

$$\boxed{x_j = \gamma(\bar{x}_j + F)} \tag{8}$$

- x_j is independent of Ω^l, independent of l;
- Current leader l's optimal transfers x_i is same as optimal transfers that a coup leader from j would also make to group i, were j to become leader;
- **Optimal allocation transfers** to any j come from (8).

The Optimal Coalition: Size

How big should a leader's group of insiders be?

Using (2) and (6), there exists a maximal size of excluded individuals such that these outsiders are just indifferent to undertaking a revolution, that is:

$$\boxed{N_0 = \frac{\delta\varepsilon(1-r)}{r(1-\delta)}P}$$

Denote n^*

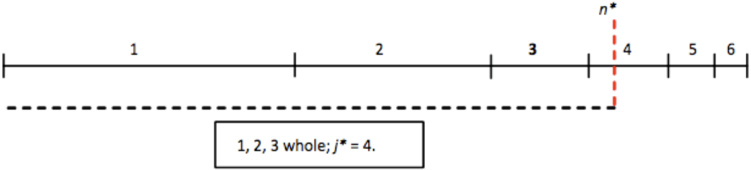
$$\boxed{\frac{n^*}{P} = \left(1 - \frac{\delta\varepsilon(1-r)}{r(1-\delta)}\right)}$$

- n^* is independent of I.

The Optimal Coalition: Size (cont.)

Suppose the larger groups included in leader's optimal are set ahead of smaller ones. Then, define j^* as:

$$\boxed{\sum_{i=1}^{j^*-1} \frac{n_i}{P} < \frac{n^*}{P} < \sum_{i=1}^{j^*} \frac{n_i}{P}}$$



The Optimal Coalition: Size (cont.)

- We show that large ethnic groups are always in.
- Why? In equilibrium, large groups are cheaper per member (leadership is less valuable so cheaper to have IC bind).
- Groups 1 to $j^* - 2$ are the "base set". Any leader will include them whole.
- The rounding off differs with the leader's ethnicity. It also depends on the size of e^l.

The Optimal Coalition: Size (cont.)

Result

The optimal governing coalition for leader of ethnicity l, Ω^l is as follows:

$$e \in \Omega^l \equiv \begin{cases} e_1 ... e_{j \neq l}, ... e_{j^*-1},\ e'_{j^*} & \text{for } l \leq j^* - 1 \\ e_1 ... e_{j^*-2},\ e'_{j*-1}(l) & \text{for } l \in [j^*, j^+] \\ e_1 ... e_{j^*-1}, e'_{j^*}(l) & \text{for } l > j^+. \end{cases}$$

where, $e^* \equiv \lambda n^*$ *and* $j^+ < N$ *if* $\exists j^+ : e^* < \sum_{i=1}^{j^*-1} e_i + e_{j^+}$ *and* $e^* > \sum_{i=1}^{j^*-1} e_i + e_{j^+ +1}$, *otherwise* $j^+ = N$, *and* $e'_{j^*} = e^* - \sum_{i=1}^{j^*-1} e_i$, *of group* j^*, $e'_{j*-1}(l) = e^* - \sum_{i=1}^{j^*-2} e_i - e_l$, *of group* $j^* - 1$, *and* $e'_{j^*}(l) = e^* - \sum_{i=1}^{j^*-1} e_i - e_l$, *of group* j^*.

The Optimal Coalition: Size (cont.)

Result

Provided the patronage value of government is sufficiently high, the patronage transfers just sufficient to dissuade members of each ethnic elite from mounting a coup; i.e. x_j *for* $j \in [1, j_* - 1]$ *are:*

$$x_j e_j = \frac{\gamma \left[1 - x_{j_*} e'_{j_*} - \frac{\gamma F}{1-\gamma} \Sigma_{i=1}^{j_*-1} e_i \right]}{1 + \gamma (j_* - 2)} + \frac{\gamma F}{1-\gamma} e_j,$$

where $x_{j_*} e'_{j_*}$ *can be explicitly computed (ref. paper).*

Result

The optimal governing coalitions defined in Proposition 1, and supporting transfers in Proposition 2 are the unique sub-game perfect stationary equilibrium of the model in which there are no endogenous coups or revolutions.

The Optimal Coalition: Size (cont.)

Result

1. Larger groups receive more patronage than smaller groups. That is, for $n_i > n_j$, $x_i e_i > x_j e_j$.
2. The leadership premium accruing to the elite of a leader's own ethnic group, if in the base set of ethnicities, is independent of that group's size.

- Shares of patronage are only partially observable due to a group-specific error v_{jt}.
- Every player in the game observes $\{x_i e_i'(l)\}_{i \in \Omega^l}$ exactly, but not us (the econometrician).
- Define:

$$\boxed{\hat{x}_{jt} = x_j \ if\, j \in \Omega^l,\ \hat{x}_{jt} = 0 \ if\, j \notin \Omega^l \ and\, j \neq l,\ \hat{x}_{jt} = \bar{x}_j \ if\, j = l}$$

- We specify:

$$\boxed{X_{jt} = \begin{cases} \hat{x}_{jt} e_i'(l) + v_{jt} & if\ \hat{x}_{jt} e_i'(l) + v_{jt} > 0 \\ 0 & if\ \hat{x}_{jt} e_i'(l) + v_{jt} \leq 0 \end{cases}}$$

Bonus Material: Specification and Estimation (cont.)

- We employ only $N-1$ independent equations for each observed cabinet (exclude the smallest group's equation, N).
- v has bounded support $[-1, 1]$. Assume $v \sim Beta(-1, 1, \xi, \xi)$ independently with identical shape parameters ξ.

Likelihood Function

- Conditional on model parameters $\theta = (\gamma, F, r, \xi, \alpha, \varepsilon)$, exogenous characteristics $Z = (N, \lambda, \delta)$, leader's identity l, coalition Ω^l can be computed.
- Partition the set of ethnic groups in 4 groups:
  1. Predicted coalition members receiving posts $G_1 = (j \in \Omega^l \cap X_j > 0)$
  2. Predicted members not receiving posts $G_2 = (j \in \Omega^l \cap X_j = 0)$
  3. Predicted outsiders receiving posts $G_3 = (j \notin \Omega^l \cap X_j > 0)$
  4. Predicted outsiders not receiving posts $G_4 = (j \notin \Omega^l \cap X_j = 0)$
- Call partition $\rho = \{G_1, G_2, G_3, G_4\}$

Likelihood Function (cont.)

Likelihood contribution of observed cabinet allocation X in regime ρ :

$$\boxed{L_\rho(X \mid Z, l; \theta) = \prod_{i=1}^{N-1} \beta(X_{it} - \hat{x}_{it} e'_i(l))^{I(i \in G_1, G_3)} B(-\hat{x}_{it} e'_i(l))^{I(i \in G_2, G_4)}}$$

$I(.)$ the indicator function

Likelihood Function (cont.)

- For time period τ, indicator $I_\tau(\rho) = 1$ if optimal coalition Ω falls in regime ρ and 0 otherwise.
- Leadership spell: country is ruled by a specific leader y of ethnicity l_y starting at year t_y & ending at T_y
- Given Z and the sequence of coalitions observed in a country $\{X_\tau\}$ the likelihood function under a leadership y with a spell of duration T_y is:

$$\boxed{L\left(\{X_\tau\}_{\tau=t_y}^{T_y} \mid Z, y; \theta\right) = \prod_{\tau=t_y}^{T} \prod_{\rho} \left[L_\rho\left(X_\tau \mid Z, l_y; \theta\right)\right]^{I_\tau(\rho)}}$$

- For each country a sequence:

$$Y = l_1, t_1, T_1; \ldots l_y, t_y, T_y; \ldots; l_Y, t_Y, T_Y$$

- The likelihood function for each country:

$$\boxed{L\left(Y, \{X_\tau\}_{\tau=t_y}^{T_y} \mid Z; \theta\right) = \prod_{y=1}^{Y} p_{l_y}(N)(1-\varepsilon)^{T_y - t_y}\, \varepsilon\left[L\left(\{X_\tau\}_{\tau=t_y}^{T_y} \mid Z, y; \theta\right)\right]}$$

Conclusions on Autocracy vs. Democracy

- Wide cross-country and within country variation in political institutions.
- Analysis of democracies vs. autocracies.
- Within democracies: Many Constitutional features of relevance.
- Electoral rules and Form of Government are particularly interesting for their impact on fiscal policy, among other things.