

**Lecture Notes for Political Economy of  
Institutions and Development, 14.773**

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## **Part 1**

# **Issues and Evidence**



## CHAPTER 1

### General Issues

#### 1. What Are Institutions?

##### 1.1. Different views of institutions.

- There is an increasing sense among economists and social scientists that the way that societies are organized, or briefly their “institutions”, are a first-order determinant of their economic performance.
- However, most often these institutions are treated as a black box, and there is little effort to understand why these institutions vary across countries.
- What are institutions?

There is no correct answer to this question, and the appropriate answer most probably depends primarily on the use that we want to put the notion of institutions to. Douglass North, for example, emphasizes the role of institutions as “to reduce uncertainty by establishing a stable (but not necessarily efficient) structure to human interaction.” This is a useful, but perhaps somewhat too loose, definition.

An alternative, but related, definition is that institutions refer to “the rules of the game” or more specifically to the extensive form of the exact game that the agents are playing (e.g., as suggested by Kreps). This definition is also useful, but may be too encompassing.

- Probably the first question we should address is whether, and how well, institutions adapt to the economic requirements of the society. For example, the classical

Marxist approach views the “superstructure,” which roughly corresponds to the notion of institutions here, as simply determined by the underlying economic forces.

- More pertinent to the discussion here, we may want to distinguish between the following different views of institutions:

(1) Efficient institutions view: According to this view, societies will choose the institutions that maximize their total surplus. How this surplus will be distributed among different groups or agents does not affect the choice of institutions. The underlying reasoning of this view comes from the Coase Theorem. Ronald Coase (1960) argued that when different economic parties could negotiate costlessly, they will be able to bargain to internalize potential externalities. The farmer, who suffers from the pollution created by the nearby factory, can pay the factory owner to reduce pollution. The same reasoning can be applied to political situations. If the current laws or institutions benefit a certain group while creating a disproportionate cost for another, these two groups can negotiate to change the institutions. By doing so they will increase the size of the total surplus (“the pie” that they have to divide between themselves), and they can then bargain over the distribution of this additional surplus.

(2) Incidental institutions view: While the efficient institutions view is explicitly based on economic reasoning, a different approach, which downplays choices and emphasizes the development of institutions as a byproduct of other social interactions, is more popular among many political scientists and sociologists. According to this view, the set of political and economic institutions emerge not as a choice of economic actors, but is an incidental consequence of other actions. An interesting example of this is the work by



Tilly (1990). Building on the Weberian tradition, Tilly proposed a theory of the formation of modern states, which argues that modern state institutions such as fiscal systems, bureaucracy and parliaments are closely related to the need to raise resources to fight wars and thus arose in places with incessant inter-state competition.

- (3) Rent-seeking institutions view: An alternative is that institutions emerge as a result of economic agents' choices, but are not necessarily efficient. But why isn't a set of institutions that maximize output chosen?

Because according to this view, institutions are not always chosen by the whole society (and not for the benefit of the whole society), but by the groups that control political power at the time (perhaps as a result of conflict with other groups demanding more rights). These groups will choose the institutions that maximize their own rents, and the institutions that result may not coincide with those that maximize total surplus. North, in the same vein, argues that in all societies there is a: "persistent tension between the ownership structure which maximizes the rents to the ruler (and his group) and an efficient system that reduces transaction costs and encourages economic growth".

For example, institutions that enforce property rights by restricting state predation will not be in the interest of a ruler who wants to appropriate assets in the future. By establishing property rights, this ruler would be reducing his own future rents, so may well prefer institutions that do not enforce property rights, and therefore do not constrain him from appropriating assets in the future to those that do. Therefore, equilibrium institutions will not be those that maximize the size of the overall pie, but the slice of the pie taken by the powerful groups.

Why doesn't a Coase theorem type reasoning apply? The main reason for the non-applicability of the Coase theorem in politics is commitment problems. If a ruler has political power concentrated in his hands, he cannot commit not to expropriate assets or revenues in the future. The enforcement of property rights, which would encourage investment by the agents, requires that he credibly relinquishes political power to some extent. But according to the Coasian bargain, he has to be compensated for what he could have received using this power. Herein lies the problem. When he relinquishes his power, then he has no guarantees that he will receive the promised payments in the future. Therefore, by their very nature, institutions that regulate political and social power create commitment problems, and prevent Coasian bargains that are necessary to reach efficient outcomes.

- (4) Costly institutions view: this approach combines elements of the first and the third approaches. Institutions are constructed in order to solve economic problems, such as reducing transaction costs, enforcing contracts etc., and there is a tendency towards efficient institutions. However, this approach, differently from the efficient institutions view, recognizes that it might be costly to design institutions, so depending on these costs, the right set of institutions may not emerge in a society.

An example of this view would be Demsetz's theory of property rights, which is also very similar to the theory of property rights that is advanced in North and Thomas. According to Demsetz, enforcing property rights has some costs, but also is beneficial economically. When the benefits exceed the costs, property rights will be enforced. As an example, he offers variations in property rights in land among American Indians. In many Indian societies, there were no property rights in land because land was abundant,

and the inefficiencies from overhunting were relatively small. However, property rights developed following commercialization of fur trade, because the possibility of selling fur, the overhunting problem became more serious, so the benefits from establishing property in over land increased. This caused the emergence of property rights in land among the tribes engaged in fur trading.

The general implications of this view are very similar to the efficient institutions view, but it allows for the presence of differences in institutions across societies that might have important economic consequences. Such differences would emerge because the costs of designing the right set of institutions may vary across societies.

A final possibility is a view that emphasizes how institutions that were appropriate for a given economic structure may outlive that economic structure, and create distortions. I will return to such theories below.

- What distinguishes the efficient institutions view from the other three is that according to the efficient institutions view, there should not be meaningful institutional differences translating into different economic outcomes— institutional differences should simply reflect differences in economic environments, rather than cause such differences. Therefore, empirical evidence that shows “exogenous” institutional differences leading to differences in economic outcomes will support one of the other three views. I will discuss this type of empirical evidence below.
- What distinguishes the last two approaches from the second view (the incidental institutions view) is that according to the incidental institutions view, we cannot try to understand institutional differences as emerging from different economic calculations. As a result, we cannot ask questions of the following form: “why

aren't the existing set of institutions being replaced by a new set of institutions that are more beneficial for the whole society or for certain groups?". These types of counterfactual questions are essential in economics. The last two approaches are therefore more in line with economic research in general, and will be in the starting point of the approach in this class.

- But there are important differences between these two views as well. In the rent-seeking view, conflict between social groups is an essential element of institutions and differences in the nature of this conflict will lead to different sets of institutions. In contrast, in the costly institutions view, conflict between different groups or agents is not important, and institutional differences will mostly emerge from differences in the economic environment or the costs of designing institutions.

## 1.2. Types of institutions.

- Let us start with an approach similar to the rent-seeking institutions view. But now, we need to understand what institutions are.
- For this purpose, I would like to distinguish between the following types of institutions (or different roles of institutions):
  - (1) Economic institutions: I take economic institutions to determine the “economic rules of the game”—in particular, the degree of property rights enforcement, the set of contracts that can be written and enforced, and some of the rules and regulations that determine the economic opportunities open to agents. Common examples of economic institutions would therefore include individual property rights, commercial law, contract law, patent law, the type of credit arrangements, etc.

- (2) Political power: this is the ability to change economic institutions or undertake redistribution of income and assets.
- (3) Political institutions: I take political institutions to be what regulates the limits of political power and determines how political power changes hands. Common examples of political institutions would include the constitution, electoral rules, constraints imposed on the power of the executive by other branches of the government, etc.

This distinction is useful, but it should not give the impression that we know exactly what these different “institutions” do in practice. There is considerable uncertainty about the role of these different objects for economic outcomes (more on this below).

- The difference between political power and political institutions needs to be clarified. Why is there a need for political institutions at all? Why is there anything more than current political power?

As an example, consider the Glorious Revolution in England. During the Glorious Revolution, the parliament had the power to kick James II out of power, and then they also used this power to undertake sweeping institutional changes (strengthen the role of the parliament and common law, weaken taxation powers of the Crown etc.). But if they had the power to make these institutional changes and to kick kings out of power, why did they need institutional changes? Why not simply threaten the next king?

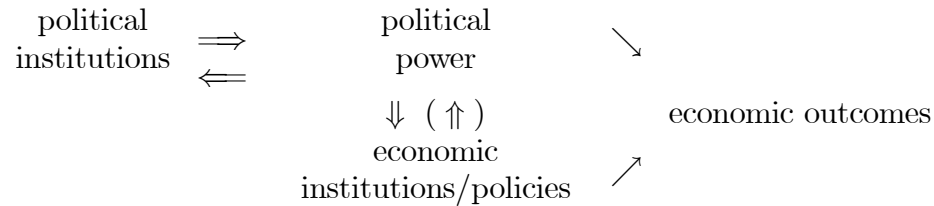
- I believe the answer to these questions lies in the fact that in these types of social interactions that are important *commitment problems*. In particular, there are two types of commitment problems that political institutions might be useful in mitigating:

- (1) A ruler today cannot commit not to expropriate assets or returns from investments tomorrow. In this case, political institutions that take away the ruler's power of expropriation future may be socially useful. Moreover, introducing such institutions might even be in the interests of the ruler in order to encourage investment. Therefore political institutions might emerge as a credible commitment by the ruler not to expropriate the citizens in the future.
- (2) The party who is in power today may not be in power tomorrow, and they may be afraid of the redistribution that those who come to power in the future may undertake. In this case, those in power today may introduce political institutions in order to constrain others who will come to power in the future.

Therefore one way of thinking of political institutions as a way of restricting the future use or allocation of political power, hence providing some commitment value. We will see examples of this below.

- At this point, it is also useful to note that in some situations we might want to distinguish economic policies from economic institutions. For example, a tax on capital by the government is a policy not an institution. For many of the applications, economic policies will be very similar to economic institutions, but one might want to bear in mind that they may be easier to change than economic institutions.

Therefore, in a schematic form, I am thinking of the situation as follows:



Therefore, we need to understand:

- (1) What type of economic institutions are important for economic outcomes.
- (2) The interaction between political power and economic institutions.
- (3) How political institutions affect and allocate political power.
- (4) The “origins” of political institutions, political power and economic institutions—that is, why do societies choose or end up with the institutions that they have.
- In addition, political institutions can also be subdivided into:
  - (1) Formal institutions, for example, whether the country in question has a Supreme Court, separation of power, parliamentary system etc.
  - (2) Informal institutions, which determine how a given set of formal rules and informal institutions function in practice. For example, many Latin American countries have a presidential system similar to the U.S., but in practice, they have very different “political institutions”.
- [...Currently, we have very little understanding of how informal institutions work, and this might be an interesting area for future research...]
- I will sometimes refer to the cluster of institutions, consisting of economic institutions, political power and formal and informal political institutions, simply as “institutions”.

- It is also useful to think of a very simple classification of these institutions into two groups (with the implicit understanding that most real world institutions will fall somewhere in between):
  - (1) Predatory (“bad”) institutions: as institutions that do not encourage investment and economic development.
  - (2) Developmental (“good”) institutions: institutions that permit or encourage investment and growth.

We’ll see below that different theories categorize different types of institutional structures in these two broad groups.

### **1.3. Conceptions of the State.**

- At the center of this whole picture is political power. For example, in 17th and 18th century Europe, it is commonly accepted that the landed aristocracy had the political power. But what does this mean? There were clearly barriers against the exercise of this power, as exemplified by peasant revolts, beheadings of kings, and bourgeois revolutions.
- Perhaps it is first useful to think of “the state” as the locus of political power. Probably the most common and useful definition of the state is as a monopoly (or near-monopoly) of violence, or of coercion power. That is, the state has the means to coerce other agents to perform certain tasks and abstain from certain behavior.

For example, Marx Weber puts this as follows:

“the modern state is a compulsory association which organizes domination. It has been successful in seeking to monopolize the legitimate use of physical force as a means of domination within a territory.... The right to use physical force is



ascribed to other institutions or individuals only to the extent to which the state permits it”.

- But then, who controls the state? And who and what constrains the state?
- There are a number of different ways of thinking of the state:
  - (1) *The state as a non-actor*: the simplest view of the state, common in many economics textbooks, treats the state without agency—that is, the state does not have its own objective function, nor does it represent the interests of some groups in the society. It is there to enforce property rights and contracts, and provide public goods. There is also little discussion of incentives, or what is sometimes called “opportunistic” behavior, and little sense in which the state needs to have the monopoly of violence in society. This view of the state very naturally leads to calls for the state/the government to intervene when there are market failures. The driving force of the new political economy of institutions is the recognition that this is not a satisfactory view, and I will not dwell on it in the rest of this class.
  - (2) *The state as a nexus of cooperation*. This view recognizes the presence of “opportunistic” behavior on the part of the agents, but does not emphasize conflict between groups of agents (such as workers vs. capitalists). The state, by virtue of its coercive power, encourages cooperation among agents. This view is related to Hobbes’ conception of the Leviathan with the monopoly on coercion serving the interest of all the citizens. According to Hobbes, without the Leviathan individuals live in “fear and danger of violence death” and their lives are “solitary, poor, nasty, brutish and short,” because every man is fighting for itself and not cooperating with others. The state encourages cooperation and orderly behavior. This view is also very close to the so-called “populist” political philosophy originating from Rousseau. Rousseau argued

that the state should be a reflection of the “general will” of the people—“obedience to a law we have prescribed for ourselves.” When all citizens obey this general will or law, welfare in this society will be higher.

- (3) *The state as the agent of a social group.* In these theories, the state represents the interests of a social group, such as the landowners, the capitalists or the political elite, and uses its monopoly over violence in order to further the interests of this group. Marxist theories of the state generally fall in this category, since they view the state as controlled by the capitalists or more generally by the ruling class. However, many non-Marxist theories, perhaps going as far back as Aristotle, are also in this category. For example, it seems plausible that before the 18th-century the state in Europe looked after the interests of the landed aristocracy and the King.
- (4) *The state as the grabbing hand:* in this view, the state is controlled by the bureaucrats or the politicians, who use their power to look after their own interests. This view goes back to Buchanan and Tullock, and recently has been popularized by Shleifer. In this case, the crucial question is how to control bureaucrats while ensuring that they perform the functions they are supposed to.
- (5) *The state as the autonomous bureaucracy. Weberian theories of the state.* In this view, like the previous one, the state is controlled by the bureaucrats or the politicians in the sense that they can take actions that agents themselves may not have taken. However, in this view, somehow the state could represent interests other than the narrow interests of its members. For example, in some modern Marxist theories of the state, such as Poulantzas’ theory, the state looks after the interest of the capitalist class better than individual capitalists themselves would be able to. In the Weberian theories, such as

Evans's embedded autonomy approach, or in Tilly's theory, the bureaucracy could be developmental and defend the interests of the whole society. For example, Evans attributes failures of many societies to state that are "weak because diffused fragments of society have stayed strong, retaining at the local level the ability to frustrate state actions". Therefore, in these theories, states need to be able to "dominate" the society in order to enact useful change.

- All of these views are obviously simple, and they can be combined with each other, or extended. For example, we can imagine a situation in which the state represents the interests of a social group, but which social group this is varies over time. Alternatively, one can be much more specific on the reasons why the state emerges as the monopoly supplier of coercion, and link this to the grabbing hand view of the state. We will see examples of models of this sort below.
- It is also useful at this point to mention an important ingredient of models that view social groups (such as classes) as the key actors. At the end of the day, decisions are taken by individuals, so if we are going to treat social groups as the key actors, all individuals within the social groups must find a profitable to take the same actions, and often, take actions that are in the interest of the group as a whole. This leads to what Olson has termed the "free rider" problem: individuals may free ride and not undertake actions that are costly for themselves but beneficial for the group. Therefore, any model that uses social groups as the actor must implicitly use a way of solving the free-rider problem. The usual solutions are
  - (1) Ideology: groups may develop an ideology that makes individuals derive utility from following the group's interests.

- (2) Repeated interactions: if individuals within groups interact more often with each other, certain punishment mechanisms may be available to groups to coerce members to follow the group's interests.
- (3) Exclusion: certain groups might arrange the benefits from group action such that those who free ride do not receive the benefits of group action.

[...Currently, there is little systematic work in economics on how social groups solve the free-rider problem, and this may be an important area for future work...]

We will return to discuss some of these issues later in the class.

- Next, I will give some simple examples to illustrate how some of these views can be operationalized.

## 2. Some Simple Models

### 2.1. A Model of the State Supporting Cooperation.

- Consider the following economy consisting of a large number of agents. Each agent lives for two periods, is born with one unit of the consumption good, and consumes only in the second period of his life. During the first period, agents are matched in pairs, and have a decision to invest their one unit of consumption good in the productive relationship or not. If both invest, the project produces an output of  $2a$ . If only one of them invest, the output is  $2b$ .
- The output gets realized at the end of the period, and is split between the two agents (for example, due to bargaining).
- The payoffs take the straightforward prisoner's dilemma structure

	invest	don't invest
invest	$a - 1, a - 1$	$b - 1, b$
don't invest	$b, b - 1$	$1, 1$

where

$$b > a - 1 > 1 > b - 1.$$

- Assume that whether an agent has invested or not is observed publicly. But there is no outside enforcement conditional on this public information.
- It is immediate that without outside enforcement, each agent will choose not to invest, and the inefficient outcome will be realized.
- Now imagine that the society gives the monopoly of violence/coercion to a set of agents, and empowers them to punish those who do not invest in the productive relationship (while still sharing the return). In particular, the state can come and take the output of  $b$  away from these agents. This changes the private payoffs to

	invest	don't invest
invest	$a - 1, a - 1$	$b - 1, 0$
don't invest	$0, b - 1$	$1, 1$

and now (invest, invest) is an equilibrium.

- This is an extremely simple example of how the coercion power of the state can be useful in supporting cooperation by modifying the payoffs to agents.
- In this example, we can think of the two different payoff matrices as representing the different “economic institutions”—in the first, the investor does not receive his contribution to the total output of the project, whereas with the second matrix, he does. Political power is in the hands of a set of agents who have been chosen to exercise this power for a specific set of objectives and who are assumed never to abuse this power. We can think of political institutions as redundant, or as the formal and informal arrangements that make sure that the political power of the state never gets misused.
- The model I outlined is extremely simplistic for a number of reasons:
  - (1) The microstructure of why cooperation is economically beneficial is not spelled out.
  - (2) Agents are finitely lived, so decentralized mechanisms to support cooperation are not possible.

- Finally, notice that this model falls in the category of costly institutions view. In particular, there is no disagreement among the agents (before they take their actions) about what set of institutions is optimal, so there will be little conflict or disagreement in the process of institutions building. Differences in institutions in societies will emerge from either differences in the costs of designing these institutions, or perhaps because some societies may not be able to coordinate their actions to design the appropriate institutions.

## 2.2. A Model of Class Conflict.

- Next consider an economy that consists of two groups: capitalists and workers.
- Capitalists start with some endowment of capital,  $e$ , and decide whether to invest this to be used with the workers. Normalize the number of capitalists to 1.
- All consumption is at the end of the period, and the total consumption of a capitalist is his returns from investment plus what he has not invested ( $e - k$ ).
- Aggregate production is

$$F(k, l) \equiv f(k)$$

where we can normalize the number of workers  $l$  to 1, and assume for now that labor is supplied inelastically.

- Workers are more numerous, and can grab a fraction  $\mu$  of the output.
- Assume that

$$f''(\cdot) < 0, f'(e) > 1, \text{ and } (1 - \mu)f'(0) < 1$$

so it is socially beneficial to invest all of the endowment in production, but if workers are expropriating the returns from these investments, capitalists will prefer not to invest at all.

- Now consider a situation without the state (or a state that does not protect the capitalists). Then the workers will grab as much of the output as they can. In this case, the capitalists will not invest.
- Alternatively, imagine a situation in which there is a state controlled by the capitalists, which prevents workers from grabbing output, and ensures that labor is transacted in a competitive labor market (why not use the state power to force workers to work at zero wage?). In this case, capitalists will invest all of their endowment.
- In this situation, economic institutions again correspond to whether property rights (of capitalists) are enforced. Political power is in the hands of the capitalists, and political institutions can be thought of as those that prevent the state from forcing workers to work below the competitive wage.
- In this case, the monopoly of violence is in the hands of the state (which is in turn in the hands of the capitalists), and this improves economic efficiency. But there is no general presumption that this should be the case. To see this, consider the alternative scenario where

$$f'(e) > 1, \text{ and } f'(e) > 1 - \mu$$

so even without strong property rights enforcement, capitalists will make investments. Moreover, suppose that with the state in the hands of the capitalists, they can force workers to work at 0 wage if workers are in the urban center. Workers also have an outside opportunity of staying in the countryside, where they receive a small outside wage of  $\varepsilon > 0$ . Finally, assume that  $F(k, l = 0) = 0$ . That is, if workers do not take part in the production process, there is no output.

- The timing of events is therefore:
- (1) Workers decide whether to move to the urban center.

- (2) Capitalists decide how much to invest.
  - (3) Production takes place and is distributed between capitalists and workers.
- Now, it is clear that without the state in the hands of the capitalists, workers will move to the urban center, all the endowment of the capitalists will be invested.
  - But if the state is in the hands of the capitalists, they cannot commit not to hold down workers to 0 wage once the workers have moved to the urban center. So all workers remain in the countryside, and there is 0 production.
  - Therefore in this case, the control of the state is giving excessive power to one of the social groups, leading to inefficiency. Weakening the state in this case will improve economic performance.
  - More generally, in the first version of the model, efficient institutions are those that give the coercive power of the state to the capitalists, and are therefore in the interests of the capitalists. In contrast, in the second version, giving the control of the state to the capitalists leads to inefficiencies.
  - Notice also that the model discussed in this section introduces the possibility of disagreement about the set of institutions. To see this, ignore the migration decision of workers, but continue to assume that  $f'(e) > 1$ , and  $f'(e) > 1 - \mu$ . This assumption ensures that there is going to be enough investment by capitalists even without strong property rights enforcement. Nevertheless, capitalists prefer institutions that give them the control of the state, while workers would like to control the state themselves in order to obtain a larger fraction of the output.
  - This model therefore highlights both the disagreement between the different social groups over the set of institutions, and the possibility that depending on the types of investments that need to be encouraged: different types of institutions may be efficient from a social point of view.



### 2.3. A Model of Class Conflict and Cooperation.

- Next consider a dynamic model similar to the previous one, where cooperation between social groups is also possible. In particular, suppose that the above game is repeated indefinitely, and both parties have a discount factor  $\beta$ .
- Consider the following trigger strategy configuration: capitalists invest  $k \leq e$  and give a fraction  $\delta$  of output to workers. If workers expropriate, there is no investment again in the future.
- Then, by standard arguments, the value to workers of not expropriating this period, and never expropriating in the future, is

$$V^C = \frac{\delta f(k)}{1 - \beta}$$

In contrast, the value of expropriating is

$$V^E = \mu f(k)$$

Therefore, if

$$\delta \geq \delta^* \equiv (1 - \beta) \mu$$

then workers will prefer not to expropriate, irrespective of the value of  $k$ .

- Capitalists are happy to invest as long as

$$f'(k) \geq 1 - \delta.$$

Suppose that

$$f'(e) < 1 - \delta^*,$$

so maximum investment is not sustainable.

- Then there exists a trigger strategy of the following form: in every period, firms invest  $k^*$  such that  $f'(k^*) = 1 - \delta^*$ , workers receive  $\delta^* f(k^*)$ , and firms stop investing if workers ever expropriate more than this amount. Workers always expropriate everything if there has been any expropriation beyond  $\delta^*$  in the past.

- In this equilibrium, in contrast to the previous one, there is clearly some cooperation between the different social groups. Moreover, we can think of this cooperation as one supported by relatively high wages for workers as seems to be the case in many contemporary societies.
- This model also gives us a way to think about institutions in a more nuanced form. The state no longer needs to be totally controlled by the capitalists, but simply can correspond to an entity that enforces a given level of  $\mu$ . A greater  $\mu$  will lead to a lower value of  $\delta^*$ , and hence to greater investment.
- There is also a sense in which the the power of the state and “voluntary” cooperation are complementary: better enforcement by the state encourages better cooperation—if  $\mu = 0$ , we have  $\delta^* = 0$ , and no investment by capitalists.

#### 2.4. A Model of Political Institutions.

- So far political institutions did not play the role of regulating how political power changes hands. Now I give a simple example of how we can think of this.
- Again consider an economy that consists of two groups, or simply two agents. Only one of the agents (agent A) has an investment, again modeled as before. In contrast to before, now suppose that who has political power is stochastic. In every period, with probability  $p$ , agent A is in power, and with probability  $1 - p$ , the other agent, agent B, will be in power. When agent B is in power, he can expropriate a fraction  $1 - \mu$  of agent A’s output.
- For simplicity, consider the Markov Perfect Equilibrium of this game in which there will be no trigger strategies. Then, agent A knows that his expected returns are

$$[p + (1 - p)\mu] f(k),$$

so he will choose a level of investment equal to  $k'$  such that

$$(2.1) \quad [p + (1 - p)\mu] f'(k') = 1$$

as long as this is interior.

- Now to make the discussion stark, suppose that  $[p + (1 - p)\mu] f'(0) < 1$ , so there will be no investment.
- Next, consider two different types of changes in political institutions:
  - (1) Constraints on expropriation: enforcement by the state can increase  $\mu$ .
  - (2) Changes in the allocation of political power: for example, instead of agent A coming to power with probability  $p$ , he can come to power with probability  $p' > p$ .
- Both of these institutional changes will increase output—to see this simply inspect (2.1).
- Moreover, since in the original allocation there is zero investment, both agents would prefer such institutional changes. The reasoning for this is similar to the famous (infamous) Laffer curve. With the original set of institutions, agent B is “taxing” agent A so much that the latter does not undertake any investment. Credibly reducing the tax rate (i.e., changing institutions) will increase both output and the tax revenue of agent B.
- Therefore, this model illustrates, in a very rudimentary way, how political institutions can play the role of constraining future actions. In this economy agent B wants a credible way of committing not to tax agent A too much. Designing political institutions such that there is a sufficient probability that agent A will come to power, or if he does not come to power, that he will not be taxed too heavily, provide the necessary commitment.

- However, notice that it is not generally the case that all agents will agree on institutional change. For example, suppose that starting from a different allocation such that  $[p + (1 - p)\mu] f'(0) > 1$ , and also suppose that there is a possible institutional change that will increase  $p$  to  $p' = 1$ . This will clearly increase total surplus (total output in the society), since it will increase investment by agent A. Moreover, agent A will be in favor of such institutional change. However, after the institutional change agent B will receive zero returns, whereas with the status quo, he receives positive returns.
- Therefore, agent B will oppose such institutional change. As a result, in this case whether institutional change will happen or not depends on which one of the two agents has the power to enact such institutional change.

## 2.5. Controlling Politicians.

- Next consider a model where the society tries to control politicians. This model is based on work by Barro and Ferejohn.
- In particular, suppose that all agents have utility given by

$$\sum_{t=0}^{\infty} \beta^t c_t$$

- Consumption of the citizens is given by

$$c_t = 1 - x_t$$

where  $x_t$  is what the politician in power steals, and is also equal to his consumption. In addition, the politician gets utility of  $\bar{v} < 1 - \beta$  from being in office. Assume that once he leaves power, the politician consumes nothing, and also there is a large number of politicians with the same utility function..

- Assume that voters coordinate on the decision for kicking out the politician. Also restrict attention only to policies that use information on the current realization of the variables.
- It is clear that the optimal policy of the citizens will take the form of “replace the politician if  $x_t \geq \bar{x}$ ” (or “replace the politician if  $c_t \leq \bar{c}$ ”).
- Consider the decision rule with  $\bar{x} = 0$ . Is this optimal for the citizens?
- The answer is no: faced with this replacement rule, the politician will steal everything, since if he didn’t, he would get a lifetime utility of  $\bar{v}/(1 - \beta)$ , whereas if he steals he would obtain  $1 > \bar{v}/(1 - \beta)$ . Therefore, the optimal policy has to give sufficient rents to the politician so that he prefers to remain in office rather than steal everything. In other words, the value of remaining in office for the politician,  $v_t$ , has to satisfy

$$v_t \geq 1$$

(here the value of remaining in office is defined to include what the politician gets this period as well as the continuation value).

- In a stationary equilibrium, this value is

$$v_t = \frac{\bar{x} + \bar{v}}{1 - \beta},$$

hence we need

$$\bar{x} \geq 1 - \beta - \bar{v}$$

And the voters will clearly choose

$$\bar{x} = 1 - \beta - \bar{v}.$$

- So there has to be enough rent for the politician not to misbehave.
- Clearly, greater value of being in office,  $\bar{v}$ , enables voters to control politicians better, reducing the amount they steal. Also, higher discount factor,  $\beta$ , also

makes politicians easier to control. [...Why is that? What is the effect of more frequent elections here?...]

- Next consider an extension of this economy to the situation where the consumption of the citizens is

$$c_t = \theta_t (1 - x_t)$$

where  $\theta_t$  is a state of nature. It is an iid draw from a distribution  $F$  with mean equal to  $E(\theta)$ . The consumption of the politician, in turn, is

$$c_t^p = \theta_t x_t$$

- Assume that this state of nature is observed by the politician, but not by citizens.
- Then, again assuming that voters only use current information and adopt a stationary decision rule, the citizens will have a decision rule of the following form: “replace the politician if  $c_t \leq \bar{c}$ ”.
- Now for the politician not to steal everything in the state with  $\theta_t$ , we need the value of remaining in office (including what he obtains this period) to satisfy:

$$v_t(\theta_t) \geq \theta_t$$

It is clear that the politician will have to be kicked out of power in some state of nature (in particular if  $\theta_t$  is very low, even if  $x = 0$ , we will have  $c_t < \bar{c}$ ). Therefore, the politician will be kicked out of power, or will steal so that he's kicked out of power, if

$$\theta_t < \bar{\theta},$$

in which case he will steal everything.

- Therefore, the value to the politician in state  $\theta_t$ , when he steals no more than what will keep him in office, is

$$v_t(\theta_t) = \theta_t - \bar{c} + \bar{v} + \beta v_t$$

where  $v_t$  is the continuation value, given by

$$v_t = \int_{\bar{\theta}}^{\infty} [\theta - \bar{c} + \bar{v} + \beta v_t] dF(\theta) + \int_{-\infty}^{\bar{\theta}} \theta dF(\theta)$$

The first term is the expected return when  $\theta_t > \bar{\theta}$  and the politician remains in office. In this case, he will consume exactly the amount that will give the citizens  $\bar{c}$ , that is,  $\theta - \bar{c}$ . The second term is what he obtains when  $\theta_t < \bar{\theta}$ , and therefore he steals everything. Evaluating the terms and combining them together

$$v_t = \frac{E(\theta) - [1 - F(\bar{\theta})] [\bar{c} - \bar{v}]}{1 - \beta [1 - F(\bar{\theta})]}$$

Thus, the value to the politician in state  $\theta_t$  is

$$v_t(\theta_t) = \theta_t - \bar{c} + \bar{v} + \beta \frac{E(\theta) - [1 - F(\bar{\theta})] \bar{c}}{1 - \beta [1 - F(\bar{\theta})]}$$

Now recall that  $\bar{\theta}$  is defined such that  $v_t(\bar{\theta}) = \bar{\theta}$ , or

$$\bar{v} = \bar{c} - \beta \frac{E(\theta) - [1 - F(\bar{\theta})] \bar{c}}{1 - \beta [1 - F(\bar{\theta})]}$$

or

$$(2.2) \quad 1 - \beta [1 - F(\bar{\theta})] = \frac{\bar{c} - \beta E(\theta)}{\bar{v}}$$

Thus a higher  $\bar{c}$  translates into a higher  $\bar{\theta}$ , meaning that if there are fewer rents that the politician can obtain, he will have to be replaced more often (of course, this also imply that we can think of voters as directly choosing  $\bar{\theta}$ . Thus voters face a trade-off between being more strict and updating more in most periods, but also paying the cost of replacing politicians (in terms of greater corruption). The expected return of voters is:

$$\frac{[1 - F(\bar{\theta})] \bar{c}}{1 - \beta}$$

since they obtain  $\bar{c}$  as long as  $\theta_t \geq \bar{\theta}$ . Substituting from (2.2) we have

$$\frac{\beta [\bar{v} - \bar{c} + \beta E(\theta)] \bar{c}}{[1 - \beta] \bar{v}},$$

which gives the optimal replacement rule as

$$\bar{c} = 1/2.$$

- Is the politician is now making greater rents? Why is this? [...Check this for yourself using the model with  $\theta_t$  but assuming that voters observe this...]
- In this model, institutions can be thought of as the mechanisms that the voters have for kicking politicians that misbehave out of power—here, this is the voting procedure. As in the model with cooperation above, citizens agree about the “right” set of institutions, though a better set of institutions for controlling politicians will reduce the rents to politicians.

### 3. Developmental Vs. Predatory Institutions

- It is now useful to return to a discussion of how we should think of developmental vs. predatory institutions according to the different theories.
- Before doing this, it might be useful to introduce two other notions of institutions (admittedly again extreme prototypes).
  - (1) Extractive institutions: which are a set of institutions that do not provide effective property rights protection to the large majority of the population. Typically, political power will be concentrated in the hands of a small economic or political elite that can *hold up* the citizens after they undertake their investments. The anticipation of such hold-up will discourage investment and lead to inefficiencies.
  - (2) Institutions of private property: these are a set of institutions ensuring that a broad cross-section of society have effective property rights, and also perhaps encouraging an equitable and efficient distribution of economic opportunities. Structures that put the power of the state in the hands of a small



economic or political elite will not satisfy these requirements, even if they protect the property rights of the members of this elite.

- What follows is a very schematic representation:

	Hobbesian Theories	Class-Conflict Theories	Grabbing Hand View	Weberian Theories
Strong states?	Good	Ambiguous	Bad	Good
Institutional differences?	Accidental/ costs of inst. design	Due to economic incentives of various groups	Accidental/ strength of bureaucracy	Accidental
Developmental institutions?	Institutions of private property	Institutions of private property	Institutions of private property	Autonomous bureaucracy
Agreement on institutions?	Yes	Generally no	Generally yes	Generally yes
Which view of institutions?	Costly institutions view	Rent-seeking institutions view	Costly institutions view	Incidental institutions view

- Whether strong states are useful for economic development is a first-order question both for economic policy and economic research. It is clear that strong states are good in the Hobbesian and the Weberian theories, and bad in the grabbing hand view. As the above models illustrate, they can be good or bad in the class-conflict theories, depending on whether the state is being controlled by the group that has the investments that are more important at the margin.
- Another major question that we will discuss further in the class is why there are institutional differences across countries. The Weberian theories fall in the incidental-institutions view of the world, and institutional differences reflect historical accidents. For example, Tilly argues that in Europe there was a lot of

inter-state competition, leading to strong states which played an important developmental role. Building on this theory, Jeffrey Herbst argues that there wasn't enough inter-state competition in Africa and this underlies the problems of economic development in that continent.

- Also in the Hobbesian theories, institutional differences must have accidental causes, or simply reflect differences in the costs of designing the appropriate institutions. In these theories, everybody agrees what the right set of institutions should be (at least behind the veil of ignorance). But because of some “accidents”, they may be unable to develop these institutions. Greif's theory of why Maghribi merchants did not develop modern institutions is that they had better informal ways of detecting cheating, so they did not need to develop these institutions. Ultimately, this lack of institutional development was costly for the Maghribi traders.
- In the grabbing hand view, everybody, other than the politicians, agree what the “correct” set of institutions are. Therefore, institutional differences either reflect accidents, or the strength of these politicians/bureaucrats.
- In contrast, in the class-conflict theories, institutions serve the interests of different classes, so there will be a conflict over what type of institutions should emerge, and economic incentives will determine equilibrium institutions.
- Notice also that I put institutions of private property as the prototypical institutional structure encouraging development in the class-conflict theories. This may be simplistic, since there are Marxist class-conflict theories that emphasize other important aspects of institutions that could encourage economic development. It is true that Marxist theories generally emphasize the emergence of private property as an important ingredient for capitalist growth, but early Marxist theories also argued that capitalist growth will come to an end quickly, because private

ownership of capital would not lead to rising living standards of workers. According to these views, some other form of developmental institutions would need to emerge. I will not dwell on these theories in this class.

#### **4. Institutional Origins in the Class-Conflict Theories**

- At this point, it is useful to push the class-conflict views somewhat further, and ask more systematically what set of factors would determine differences in institutions.
- Here is a possible list:

(1) Economic Interests:

A first determinant of whether institutions of private property (developmental institutions) will emerge is whether they will lead to outcomes that are in the interests of the politically powerful agents. For example, institutions that restrict state predation will not be in the interest of a ruler who wants to appropriate assets in the future. Yet this strategy may be in the interest of a ruler who recognizes that only such guarantees will encourage citizens to undertake substantial investments or lend him money, or will protect his own rents. They will also be in the interest of the major groups that can undertake investment in production activities in the future.

An application of this idea would be, for example, the question of why extractive institutions emerged in the Caribbean but not in North America. In the Caribbean, the factor endowments made extractive institutions more profitable for the elite. In particular, sugar production, which could exploit economies of scale and profitably employ slave labor, was conducive to a society where a small elite would control both political and economic power.

Another example of the effect of economic interests on institutions might be the “resource curse,” the fact that the presence of natural resources sometimes appears to make the development of institutions of private property more difficult. This could simply reflect the fact that with abundant natural resources, it may be more profitable for the elites to choose a set of institutions that will not interfere with their exploitation of these resources.

Therefore, “economic interests” generally suggest that we should expect extractive institutions to develop when the powerful agents have little to gain from enforcing property rights because they have few investment opportunities themselves and are not linked to other productive agents in the society, and when there are resources, such as crops or abundant labor, that can be effectively exploited by extractive institutions.

(2) Constraints:

When institutions or other social factors limit the powers of rulers and the range of distortionary policies that they can pursue, institutions of private property are more likely to arise or endure. Constraints on political elites may also be useful through two distinct channels:

- (a) they can reduce the political stakes, and contribute to political stability, since, with such constraints in place, it becomes less attractive to fight to take control of the state apparatus;
- (b) they may imply that if some of the worst policies are pursued, there will be a revolution, or an invasion of the country, or at the very least an intervention by some other institution, thus discouraging rulers from the worst policies.

The general idea here is quite straightforward: when there are effective constraints on elites, perhaps inherited from the pre-existing social organization,

that can prevent them from exploiting their power, extractive institutions will generally be less profitable for the elites.

(3) “Political Losers”:

Another important factor is whether institutional development will destabilize the system, making it less likely that elites will remain in power after reforms. An institutional setup encouraging investment and adoption of new technologies may be blocked by elites when they fear that this process of growth and social change will make it more likely that they will be replaced by other interests—that they will be “political losers”. Elites that are relatively secure in their position will be less afraid of change, and may therefore be less likely to block such change. Similarly, a stable political system where the elites are not threatened is less likely to encourage inefficient methods of redistribution as a way of maintaining power.

This discussion suggests that extractive institutions are more likely to arise when political elites are afraid that economic and social change brought about by the development of institutions of private property will displace them. I will discuss this issue further in the next section.

## 5. A Model of Institutional Origins

- It is also useful to briefly illustrate the idea of how concerns about future political power might lead to inefficient institutions, since this notion will arise again in the rest of the class. I will use a simple model to illustrate this point as well as how other factors determining institutional origins will play out.
- Consider the following simple model: at date  $t=0$  agent 1 is in power.
- In the status quo, agent 1 will obtain a payoff of  $a_1$  and agent 2 will obtain  $a_2$ .

- If agent 1 undertakes a reform, these payoffs will be  $b_1$  and  $b_2$ . Assume that

$$b_1 + b_2 > a_1 + a_2$$

so reform is socially beneficial (there are no other costs of reform).

- The setup so far does not specify who gains from reform. We can have a situation in which

$$b_1 < a_1 \text{ and } b_2 > a_2$$

In this situation, agent 1 will not want to undertake reform, since he will be an “economic loser” from this process—his economic interests are hurt by the reform. In contrast if we had  $b_1 > a_1$ , his economic interests would be in line with the reform and he would be more likely to undertake the reforms.

- Underlying the above reasoning is the notion that there are no easy ways of redistributing the gains from reform.
- Alternatively, suppose that after the reform, agent 1 who is in power can tax agent 2 the gains resulting from reform, i.e.,  $\Delta = b_2 - a_2$ . In this case, agent 1 will always be in favor of implementing reform, since the assumption  $b_1 + b_2 > a_1 + a_2$  ensures that there are enough gains to be redistributed from the reform to make it preferable for agent 1.
- But next suppose that in the reform process also creates political instability and turbulence, or erodes the powerbase of agent 1. So following reform, there is a probability  $1 - p$  that agent 1 will lose power, whereas without reform he always remains in power.
- Now, he will undertake the reform only if

$$b_1 + p(b_2 - a_2) > a_1$$

This illustrates the notion of “political losers”—the more likely is agent 1 to lose power, i.e., the lower is  $p$ , the less likely he is to undertake reform.

- This conclusion is strengthened if there are other sources of rents from being in power. For example suppose that when in power, agent 1 receives rents equal to  $R$ , but he will lose these rents if he loses power. Then the condition for undertaking reform changes to

$$b_1 + p(b_2 - a_2) + pR > a_1 + R$$

A greater value of the rents makes reform less likely, because these rents increase the value of remaining in power. More generally, anything that increases the risks of losing power makes reform less attractive.

- Next let us turn to constraints. To illustrate the first role of the constraints, imagine that when there are constraints on rulers, rents are smaller (i.e., the ruler cannot steal as much, and as a result  $R$  is lower). Then the above reasoning will suggest that constraints will make reform more likely.
- To illustrate the second role of constraints, suppose the opposite situation to the one analyzed above. In particular, suppose that there is an outside threat (revolution or invasion from another country), and reform makes it more likely that the country will be able to withstand this threat. In particular suppose that without reform the probability of invasion is  $q$ , and with reform it is 0. Also suppose that there is no redistribution of the gains from reform. Then the condition for reform becomes

$$b_1 + R > a_1 + (1 - q) R$$

Now a higher  $q$ , that is a greater threat of invasion, makes reform more likely. This can be thought of as the constraints placed on the ruler by the threat of outside invasion (or revolution) making him act more developmental.

- Also interestingly, now greater rents may make it more valuable for the incumbents to remain in power. This highlights that in some situations rents from being

in political power may have an ambiguous effect on whether beneficial economic reforms will be undertaken.

- We will return to a discussion of these issues at the end of the class where we will analyze institutional origins in more detail in a historical context.



## CHAPTER 2

### Evidence

#### 1. Aggregate Correlations

- There is now a large literature documenting a positive correlation between measures of institutions and good governance on the one hand, and economic performance on the other. One of the earliest is the paper by Knack and Keefer. They use measures of property rights, and find them to be strongly correlated with investment and growth (even after controlling for other potential determinants of growth).
- The enclosed tables give some of the results from their paper.
- Other authors have found similar relationships using political instability, corruption, and measures of rule of law.
- The problem is that these correlations do not establish that institutions have a causal effect on economic performance. We could simply be observing the fact that countries with different economic environments are choosing different institutions.
- Perhaps more important than this reverse causality problem, there is an omitted-variables problem. Economies that are different for a variety of reasons will differ both in their institutions and in their income per capita, and since it is impossible to control for these differences in practice, we may be assigning the effect of these omitted variables to institutional differences, greatly exaggerating the effect of institutions on economic performance.

TABLE 2 GROWTH, INSTITUTIONS AND POLITICAL VIOLENCE: ICRG

	(1)	(2)	(3)	(4)
Intercept	1.980	3.028	0.254	1.345
<i>ICRG82</i>	<i>1.980</i>	<i>2.851</i>	<i>0.237</i>	<i>1.091</i>
			0.092	0.072
			<i>3.420</i>	<i>2.499</i>
<i>REVC7489</i>		-1.630		-1.115
		-1.904		-1.302
<i>ASSN7489</i>		-3.486		-2.278
		-1.695		-1.108
<i>GDP70</i>	-0.401	-0.482	-0.692	-0.683
	-2.564	-3.141	-4.055	-4.030
<i>SEC70</i>	6.083	6.284	5.051	5.411
	3.819	4.083	3.286	3.524
<i>PRIM70</i>	-0.690	-0.959	-0.532	-0.752
	-0.758	-1.072	-0.617	-0.862
<i>GCON7489</i>	-5.222	-6.388	-4.289	-5.286
	-1.213	-1.527	-1.051	-1.293
<i>PPI74DEV</i>	-0.920	-0.985	-0.892	-0.941
	-2.243	-2.482	-2.3	-2.439
R-Square	0.198	0.270	0.291	0.318
N	97	97	97	97

Dependent variable: Average annual per capita GDP growth, 1974-1989.

Numbers in italics are t-statistics.

TABLE 3 GROWTH, INSTITUTIONS AND POLITICAL VIOLENCE: BERI

	(1)	(2)	(3)	(4)
Intercept	1.022	0.356	-0.977	-0.627
	<i>0.644</i>	<i>0.205</i>	-0.545	-0.336
<i>BERI72</i>			0.376	0.263
			<i>2.111</i>	<i>1.357</i>
<i>REVC7489</i>		-1.653		-1.630
		-1.304		-1.300
<i>ASSN7489</i>		-23.015		-14.695
		-1.710		-1.003
<i>GDP0</i>	-0.501	-0.594	-0.694	-0.721
	-2.751	-3.277	-3.520	-3.566
<i>SEC70</i>	5.376	4.624	4.047	4.026
	2.805	2.411	2.083	2.067
<i>PRIM70</i>	0.653	2.793	0.580	2.018
	0.377	1.389	0.349	0.976
<i>GCON7489</i>	-1.145	-1.508	-2.968	-3.052
	-0.183	-0.249	-0.489	-0.500
<i>PPI74DEV</i>	-0.929	-0.894	-0.711	-0.748
	-1.921	-1.938	-1.495	-1.595
R-Square	0.276	0.375	0.350	0.405
N	46	46	46	46

Dependent variable: Average annual per capita GDP growth, 1974-1989.  
Numbers in italics are t-statistics.

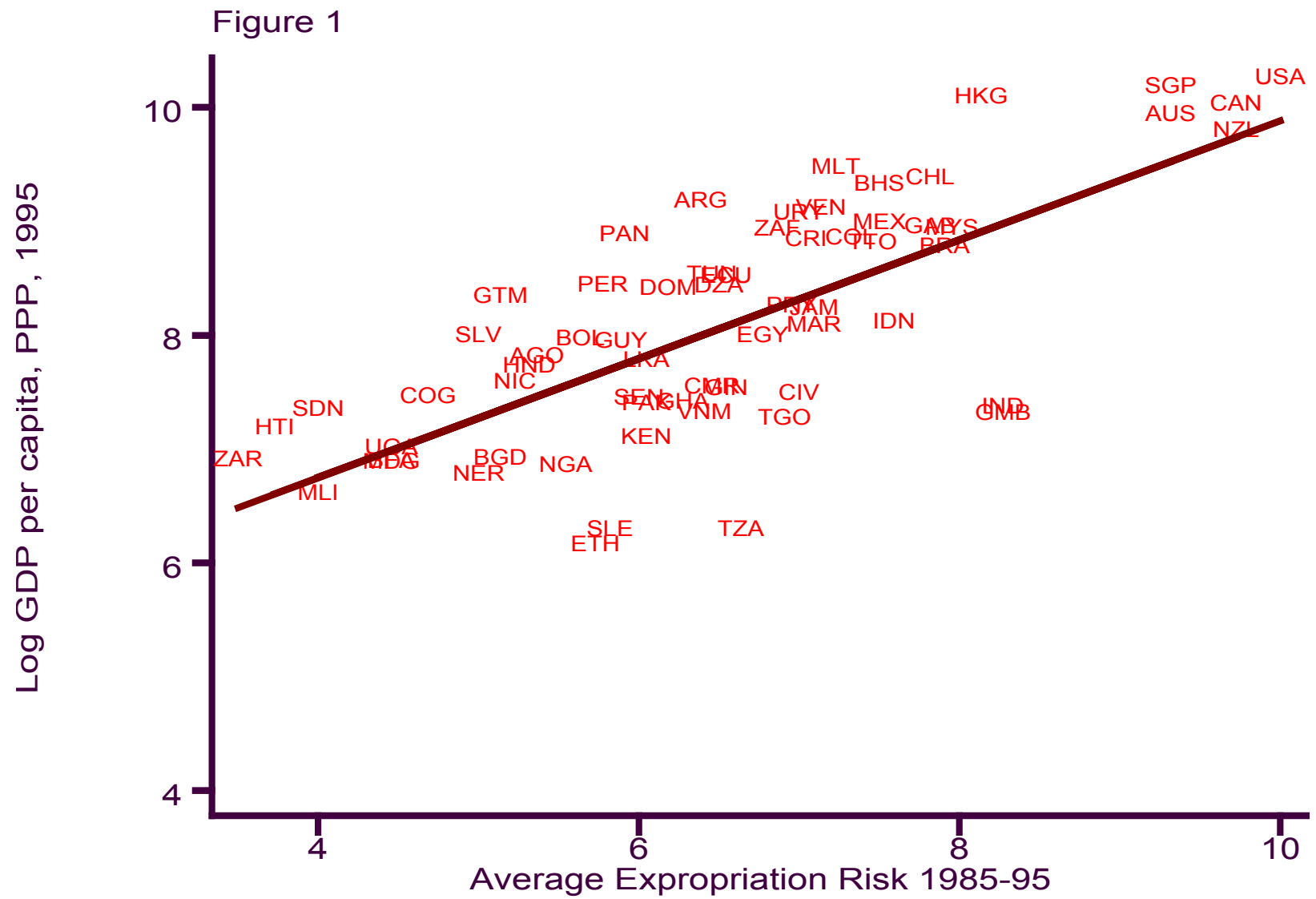
## 2. “Exogenous” Differences in Institutions

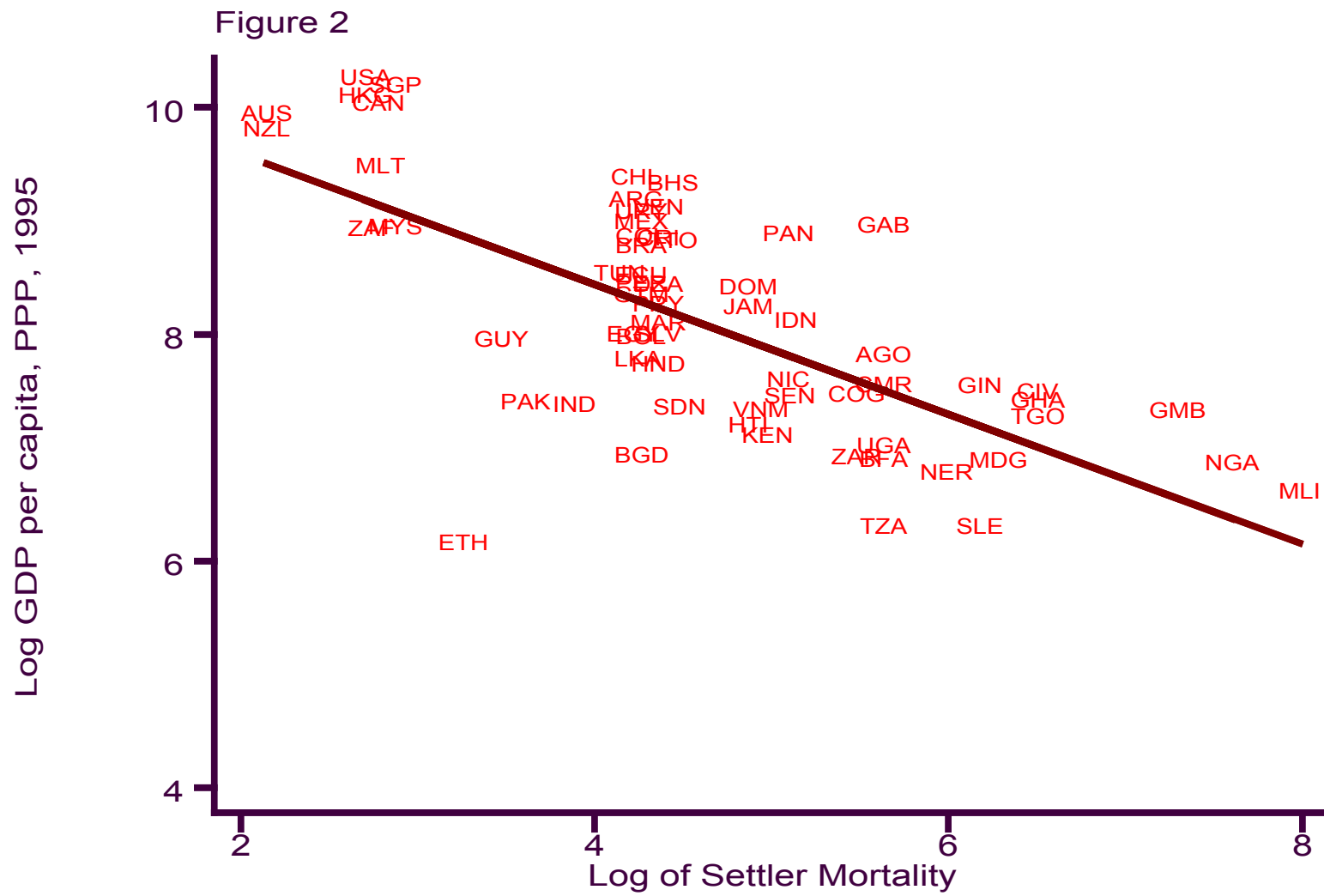
- To solve this identification problem, we need to find exogenous differences in institutions. In practice, of course, truly exogenous variation does not exist, so we have to find the source of variation that is plausibly orthogonal to other determinants of current economic performance.
- I am aware of three attempts to find such exogenous differences in institutions (or to use an IV strategy) in the literature:
  - (1) Mauro’s work on corruption, where he uses ethnolinguistic fragmentation as an instrument for corruption. The reasoning here is that ethnolinguistic fragmentation will make it harder for principals to control agents, hence facilitate corruption.
  - (2) Hall and Jones’ work which uses distance from the equator and the fraction of the population speaking English as instruments for a measure of institutions (which they call social infrastructure). The reasoning is that these variables proxy for the strength of the “good” European/British influence on a country’s culture and institutions.
  - (3) Acemoglu, Johnson and Robinson, who use mortality rates faced by potential settlers at the time of colonization as an instrument for institutional development. The argument is that in places where the Europeans did not settle because of high mortality, they introduced worse institutions than in places where they settled.
- The econometric argument underlying Mauro’s and Hall and Jones’ instruments is not entirely convincing. In both cases, the instrument can have a direct affect. For example, ethnolinguistic fragmentation can arguably affect economic performance by creating political instability, while many authors think that there is a

direct effect of climate and geography on performance. Moreover, the theoretical reasoning for the instrument of Hall and Jones is not strong. It is not easy to argue that the Belgian influence in the Congo, or Western influence in the Gold Coast during the era of slavery promoted good institutions or governance.

- Not surprisingly, I find the reasoning for the Acemoglu, Johnson Robinson paper more compelling. Here, the theory goes as follows:
  - (1) There were different types of colonization policies which created different sets of institutions. At one extreme, as in the Belgian colonization of the Congo, European powers set up “extractive states”. These institutions did not introduce much protection for private property, nor did they provide checks and balances against government expropriation. In fact, the main purpose of the extractive state was to transfer as much of the resources of the colony to the colonizer. At the other extreme, many Europeans went and settled in a number of colonies, and tried to replicate European institutions, with great emphasis on private property, and checks against government power. Primary examples of this include Australia, New Zealand, Canada, and the United States.
  - (2) The colonization strategy was influenced by the feasibility of settlements. In places where the disease environment was not favorable to European settlement, the formation of the extractive state was more likely.
  - (3) The colonial state and institutions persisted even after independence.

These premises suggest that exogenous variation in whether Europeans could settle or not would be a good instrument for institutional development in the colonies, and hence a good instrument for current institutions. Acemoglu, Johnson and Robinson use mortality rates faced by potential settlers at the time of colonizations as an instrument





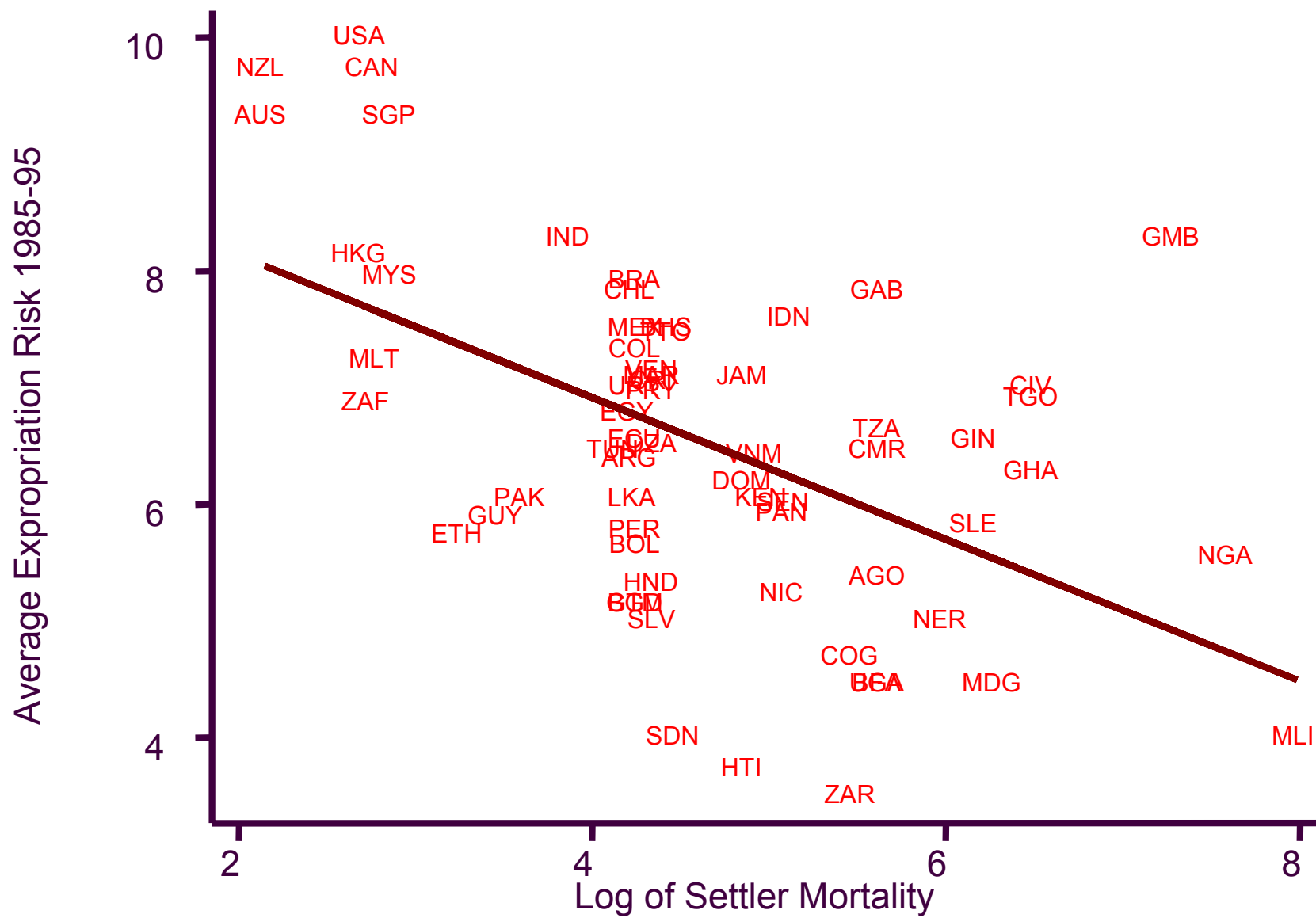




Table 2  
OLS Regressions

	Whole World (1)	Base Sample (2)	Whole World (3)	Whole World (4)	Base Sample (5)	Base Sample (6)	Whole World (7)	Base Sample (8)
	Dependent Variable is log GDP per capita in 1995						Dep. Var. is log output per worker in 1988	
Average Protection Against Expropriation Risk, 1985-1995	0.54 (0.04)	0.52 (0.06)	0.47 (0.06)	0.43 (0.05)	0.47 (0.06)	0.41 (0.06)	0.45 (0.04)	0.46 (0.06)
Latitude			0.89 (0.49)	0.37 (0.51)	1.60 (0.70)	0.92 (0.63)		
Asia Dummy				-0.62 (0.19)		-0.60 (0.23)		
Africa Dummy				-1.00 (0.15)		-0.90 (0.17)		
"Other" Continent Dummy				-0.25 (0.20)		-0.04 (0.32)		
R-Squared	0.62	0.54	0.63	0.73	0.56	0.69	0.55	0.49
N	110	64	110	110	64	64	108	61

Dependent Variable: columns 1-8, log GDP per capita (PPP basis) in 1995, current prices, (from the World Bank's World Development Indicators 1999); columns 9-10, log output per worker in 1988 from Hall and Jones (1999). Average protection against expropriation risk is measured on a scale from 0 to 10, where a higher score means more protection against expropriation, averaged over 1985 to 1995, from Political Risk Services. Standard errors are in parentheses. In regressions including dummies for the anti-expropriation index, the dummy for the first quartile --i.e., with highest risk of expropriation-- is the omitted category. In regressions with continent dummies, the dummy for America is omitted. See Appendix Table A1 for more detailed variable definitions and sources.

Of the countries in our base sample, Hall and Jones do not report output per worker in the Bahamas, Ethiopia, and Vietnam.

Table 3  
Determinants of Institutions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<i>Panel A</i>	<i>Dependent Variable is Average Protection against Expropriation Risk in 1985-95</i>									
Constraint on Executive in 1900	0.32 (0.08)	0.26 (0.09)								
Democracy in 1900			0.24 (0.06)	0.21 (0.07)						
Constraint on Executive in First Year of Independence					0.25 (0.08)	0.22 (0.08)				
European Settlements in 1900							3.20 (0.61)	3.00 (0.78)		
Log European Settler Mortality									-0.61 (0.13)	-0.51 (0.14)
Latitude		2.20 (1.40)		1.60 (1.50)		2.70 (1.40)		0.58 (1.51)		2.00 (1.34)
R-Squared	0.2	0.23	0.24	0.25	0.19	0.24	0.3	0.3	0.27	0.3
Number of Observations	63	63	62	62	63	63	66	66	64	64
<i>Panel B</i>	<i>Dependent variable is Constraint on Executive in 1900</i>				<i>Dependent variable is Democracy in 1900</i>			<i>Dependent variable is European Settlements in 1900</i>		
European Settlements in 1900	5.50 (0.73)	5.40 (0.93)			8.60 (0.90)	8.10 (1.20)				
Log European Settler Mortality			-0.82 (0.17)	-0.65 (0.18)			-1.22 (0.24)	-0.88 (0.25)	-0.11 (0.02)	-0.07 (0.02)
Latitude		0.33 (1.80)		3.60 (1.70)		1.60 (2.30)		7.60 (2.40)		0.87 (0.19)
R-Squared	0.46	0.46	0.25	0.29	0.57	0.57	0.28	0.37	0.31	0.47
Number of Observations	70	70	75	75	67	67	68	68	73	73

All regressions are OLS, using our base sample. Standard errors are in parentheses. Regressions with constraint on executive in first year of independence also include years since independence as a regressor. Average protection against expropriation risk is on a scale from 0 to 10, where a higher score means more protection against expropriation of private investment by government, averaged over 1985 to 1995. Constraint on Executive in 1900 is on a scale, from 1 to 7, with a higher score indicating more constraints. Democracy in 1900 is on a scale from 0 to 10, with a higher score indicating more democracy. European settlements is percent of population that was European or of European descent in 1900.

See Appendix Table A1 for more detailed variable definitions and sources.

Table 4  
IV Regressions of log GDP per capita

	Base Sample (1)	Base Sample (2)	Base Sample without neo- Europes (3)	Base Sample without neo- Europes (4)	Base Sample without Africa (5)	Base Sample without Africa (6)	Base Sample with Continent Dummies (7)	Base Sample with Continent Dummies (8)	Base Sample, dep. var. is log output per worker (9)
<i>Panel A: Two Stage Least Squares</i>									
Average Protection Against Expropriation Risk 1985-1995	0.94 (0.16)	1.00 (0.22)	1.28 (0.36)	1.21 (0.35)	0.58 (0.10)	0.58 (0.12)	0.98 (0.30)	1.10 (0.46)	0.98 (0.17)
Latitude		-0.65 (1.34)		0.94 (1.46)		0.04 (0.84)		-1.20 (1.8)	
Asia Dummy							-0.92 (0.40)	-1.10 (0.52)	
Africa Dummy							-0.46 (0.36)	-0.44 (0.42)	
"Other" Continent Dummy							-0.94 (0.85)	-0.99 (1.0)	
<i>Panel B: First-Stage for Average Protection against Expropriation Risk in 1985-95</i>									
Log European Settler Mortality	-0.61 (0.13)	-0.51 (0.14)	-0.39 (0.13)	-0.39 (0.14)	-1.20 (0.22)	-1.10 (0.24)	-0.43 (0.17)	-0.34 (0.18)	-0.63 (0.13)
Latitude		2.00 (1.34)		-0.11 (1.50)		0.99 (1.43)		2.00 (1.40)	
Asia Dummy							0.33 (0.49)	0.47 (0.50)	
Africa Dummy							-0.27 (0.41)	-0.26 (0.41)	
"Other" Continent Dummy							1.24 (0.84)	1.1 (0.84)	
R-Squared	0.27	0.30	0.13	0.13	0.47	0.47	0.30	0.33	0.28
<i>Panel C: Ordinary Least Squares</i>									
Average Protection Against Expropriation Risk 1985-1995	0.52 (0.06)	0.47 (0.06)	0.49 (0.08)	0.47 (0.07)	0.48 (0.07)	0.47 (0.07)	0.42 (0.06)	0.40 (0.06)	0.46 (0.06)
Number of Observations	64	64	60	60	37	37	64	64	61

The dependent variable in columns 1-8 is log GDP per capita in 1995, PPP basis. The dependent variable in column 9 is log output per worker, from Hall and Jones (1999). "Average Protection Against Expropriation Risk 1985-95" is measured on a scale from 0 to 10, where a higher score means more protection against risk of expropriation of investment by the government, from Political Risk Services. Panel A reports the two stage least squares estimates, instrumenting for protection against expropriation risk using log settler mortality; Panel B reports the corresponding first stage. Panel C reports the coefficient from an OLS regression of the dependent variable against average protection against expropriation risk. Standard errors are in parentheses. In regressions with continent dummies, the dummy for America is omitted. See Appendix Table A1 for more detailed variable descriptions and sources.

Table 5  
IV Regressions of log GDP per capita with Additional Controls

	Base Sample (1)	Base Sample (2)	British colonies only (3)	British colonies only (4)	Base Sample (5)	Base Sample (6)	Base Sample (7)	Base Sample (8)	Base Sample (9)
<i>Panel A: Two Stage Least Squares</i>									
Average Protection Against Expropriation Risk, 1985-1995	1.10 (0.22)	1.16 (0.34)	1.07 (0.24)	1.00 (0.22)	1.10 (0.19)	1.20 (0.29)	0.92 (0.15)	1.00 (0.25)	1.10 (0.29)
Latitude		-0.75 (1.70)				-1.10 (1.56)		-0.94 (1.50)	-1.70 (1.6)
British Colonial Dummy	-0.78 (0.35)	-0.80 (0.39)							
French Colonial Dummy	-0.12 (0.35)	-0.06 (0.42)							0.02 (0.69)
French legal origin dummy					0.89 (0.32)	0.96 (0.39)			0.51 (0.69)
p-value for Religion Variables							[0.001]	[0.004]	[0.42]
<i>Panel B: First-Stage for Average Protection against Expropriation Risk in 1985-95</i>									
Log European Settler Mortality	-0.53 (0.14)	-0.43 (0.16)	-0.59 (0.19)	-0.51 (0.14)	-0.54 (0.13)	-0.44 (0.14)	-0.58 (0.13)	-0.44 (0.15)	-0.48 (0.18)
Latitude		1.97 (1.40)				2.10 (1.30)		2.50 (1.50)	2.30 (1.60)
British Colonial Dummy	0.63 (0.37)	0.55 (0.37)							
French Colonial Dummy	0.05 (0.43)	-0.12 (0.44)							-0.25 (0.89)
French legal origin					-0.67 (0.33)	-0.7 (0.32)			-0.05 (0.91)
R-Squared	0.31	0.33	0.30	0.30	0.32	0.35	0.32	0.35	0.45
<i>Panel C: Ordinary Least Squares</i>									
Average Protection Against Expropriation Risk, 1985-1995	0.53 (0.19)	0.47 (0.07)	0.61 (0.09)	0.47 (0.06)	0.56 (0.06)	0.56 (0.06)	0.53 (0.06)	0.47 (0.06)	0.47 (0.06)
Number of Observations	64	64	25	25	64	64	64	64	64

Panel A reports the two stage least squares estimates with log GDP per capita (PPP basis) in 1995 as dependent variable, and Panel B reports the corresponding first stage. The base case in columns 1 and 2 is all colonies that were neither French nor British. The religion variables are included in the first stage of columns 7 and 8 but not reported here (to save space). Panel C reports the OLS coefficient from regressing log GDP per capita on average protection against expropriation risk, with the other control variables indicated in that column (full results not reported to save space). Standard errors are in parentheses. The religion variables are percentage of population that are Catholics, Muslims, and "other" religions; Protestant is the base case. Our sample is all either French or British legal origin (as defined by La Porta et al 1999.)

Table 6  
Robustness Checks for IV Regressions of Log GDP per capita

	Base Sample (1)	Base Sample (2)	Base Sample (3)	Base Sample (4)	Base Sample (5)	Base Sample (6)	Base Sample (7)	Base Sample (8)	Base Sample (9)
<i>Panel A: Two Stage Least Squares</i>									
Average Protection Against Expropriation Risk, 1985-1995	0.84 (0.19)	0.83 (0.21)	0.96 (0.28)	0.99 (0.30)	1.10 (0.33)	1.30 (0.51)	0.74 (0.13)	0.79 (0.17)	0.71 (0.20)
Latitude		0.07 (1.60)		-0.67 (1.30)		-1.30 (2.30)		-0.89 (1.00)	-2.5 (1.60)
p-value for Temperature Variables	[0.96]	[0.97]							[0.77]
p-value for Humidity Variables	[0.54]	[0.54]							[0.62]
Percent of European descent in 1975			-0.08 (0.82)	0.03 (0.84)					0.3 (0.7)
P-Value for Soil Quality					[0.79]	[0.85]			[0.46]
P-Value for Natural Resources					[0.82]	[0.87]			[0.82]
Dummy for being landlocked					0.64 (0.63)	0.79 (0.83)			0.75 (0.47)
Ethnolinguistic fragmentation							-1.00 (0.32)	-1.10 (0.34)	-1.60 (0.47)
<i>Panel B: First-Stage for Average Protection against Expropriation Risk in 1985-95</i>									
Log European Settler Mortality	-0.64 (0.17)	-0.59 (0.17)	-0.41 (0.14)	-0.4 (0.15)	-0.44 (0.16)	-0.34 (0.17)	-0.64 (0.15)	-0.56 (0.15)	-0.59 (0.21)
Latitude		2.70 (2.00)		0.48 (1.50)		2.20 (1.50)		2.30 (1.40)	4.20 (2.60)
R-Squared	0.39	0.41	0.34	0.34	0.41	0.43	0.27	0.30	0.59
<i>Panel C: Ordinary Least Squares</i>									
Average Protection Against Expropriation Risk, 1985-1995	0.41 (0.06)	0.38 (0.06)	0.39 (0.06)	0.38 (0.06)	0.46 (0.07)	0.42 (0.07)	0.46 (0.05)	0.45 (0.06)	0.38 (0.06)

Panel A reports the two stage least squares estimates with log GDP per capita (PPP basis) in 1995, and Panel B reports the corresponding first stages. Panel C reports the OLS coefficient from regressing log GDP per capita on average protection against expropriation risk, with the other control variables indicated in that column (full results not reported to save space). Standard errors are in parentheses. All regressions have 64 observations, except those including natural resources, which have 63 observations. The temperature and humidity variables are: average, minimum and maximum monthly high temperatures, and minimum and maximum monthly low temperatures, and morning minimum and maximum humidity, and afternoon minimum and maximum humidity. In the table we report joint significance levels for these variables (from Philip Parker, 1997).

Measures of natural resources are: percent of world gold reserves today, percent of world iron reserves today, percent of world zinc reserves today, number of minerals present in country, and oil resources (thousands of barrels per capita.) Measures of soil quality/climate are steppe (low latitude), desert (low latitude), steppe (middle latitude), desert (middle latitude), dry steppe wasteland, desert dry winter, and highland. See Appendix Table A1 for more detailed variable definitions and sources.

Table 7  
Geography and Health Variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Instrumenting only for Average Protection Against Expropriation Risk						Instrumenting for all Right-Hand Side Variables			Instrument only Average Protect. Against Exprop. Risk	
<i>Panel A: Two Stage Least Squares</i>											
Average Protection Against Expropriation Risk, 1985-1995	0.69 (0.25)	0.72 (0.30)	0.63 (0.28)	0.68 (0.34)	0.55 (0.24)	0.56 (0.31)	0.69 (0.26)	0.74 (0.24)	0.68 (0.23)	0.91 (0.24)	0.90 (0.32)
Latitude		-0.57 (1.04)		-0.53 (0.97)		-0.1 (0.95)					
Malaria in 1994	-0.57 (0.47)	-0.60 (0.47)					-0.62 (0.68)				
Life Expectancy			0.03 (0.02)	0.03 (0.02)				0.02 (0.02)			
Infant Mortality					-0.01 (0.005)	-0.01 (0.006)			-0.01 (0.01)		
<i>Panel B: First-Stage for Average Protection against Expropriation Risk in 1985-95</i>											
Log European Settler Mortality	-0.42 (0.19)	-0.38 (0.19)	-0.34 (0.17)	-0.30 (0.18)	-0.36 (0.18)	-0.29 (0.19)	-0.41 (0.17)	-0.40 (0.17)	-0.40 (0.17)		
Latitude		1.70 (1.40)		1.10 (1.40)		1.60 (1.40)	-0.81 (1.80)	-0.84 (1.80)	-0.84 (1.80)		
Malaria in 1994	-0.79 (0.54)	-0.65 (0.55)									
Life Expectancy			0.05 (0.02)	0.04 (0.02)							
Infant Mortality					-0.01 (0.01)	-0.01 (0.01)					
Mean Temperature							-0.12 (0.05)	-0.12 (0.05)	-0.12 (0.05)		
Distance from Coast							0.57 (0.51)	0.55 (0.52)	0.55 (0.52)		
Yellow Fever Dummy										-1.10 (0.41)	-0.81 (0.38)
R-Squared	0.3	0.31	0.34	0.35	0.32	0.34	0.37	0.36	0.36	0.10	0.32
<i>Panel C: Ordinary Least Squares</i>											
Average Protection Against Expropriation Risk, 1985-1995	0.35 (0.06)	0.35 (0.06)	0.28 (0.05)	0.28 (0.05)	0.29 (0.05)	0.28 (0.05)	0.35 (0.06)	0.29 (0.05)	0.29 (0.05)	0.48 (0.06)	0.39 (0.06)
Number of Observations	62	62	60	60	60	60	60	59	59	64	64

Panel A reports the two stage least squares estimates with log GDP per capita (PPP basis) in 1995, and Panel B reports the corresponding first stages. Panel C reports the coefficient from an OLS regression with log GDP per capita as the dependent variable and average protection against expropriation risk and the other control variables indicated in each column as independent variables (full results not reported to save space). Standard errors are in parentheses. Columns 1-6 instrument for average protection against expropriation risk using log mortality and assume that the other regressors are exogenous. Columns 7, 8 and 9 include as instruments average temperature, amount of territory within 100 km of the coast, and latitude (from McArthur and Sachs 2001.) Columns 10 and 11 use a dummy variable for whether or not a country was subject to yellow fever epidemics before 1900 as an instrument for average protection against expropriation. See Appendix Table A1 for more detailed variable definitions and sources.

for settlements and institutional development. Schematically:

(potential) settler mortality  $\Rightarrow$  settlements  $\Rightarrow$  early institutions  $\Rightarrow$  current institutions  $\Rightarrow$  current performance

- The enclosed tables and figures give the details of the estimates from Acemoglu, Johnson and Robinson.

### 3. Institutions and Industrialization

- Other work by Acemoglu, Johnson and Robinson establishes a number of related results. I now briefly review some of them here:
  - (1) Countries that are rich today, especially among the former colonies, are those that, for one reason or another, ended up with good institutions. Somewhat surprisingly, among the former colonies, these are countries that were relatively poor in 1500, before the colonization process started.
  - (2) These countries became rich, mostly by taking advantage of industrialization opportunities.
  - (3) There is a strong interaction between relatively good institutions and the capacity of an economy to take advantage of industrialization opportunities.

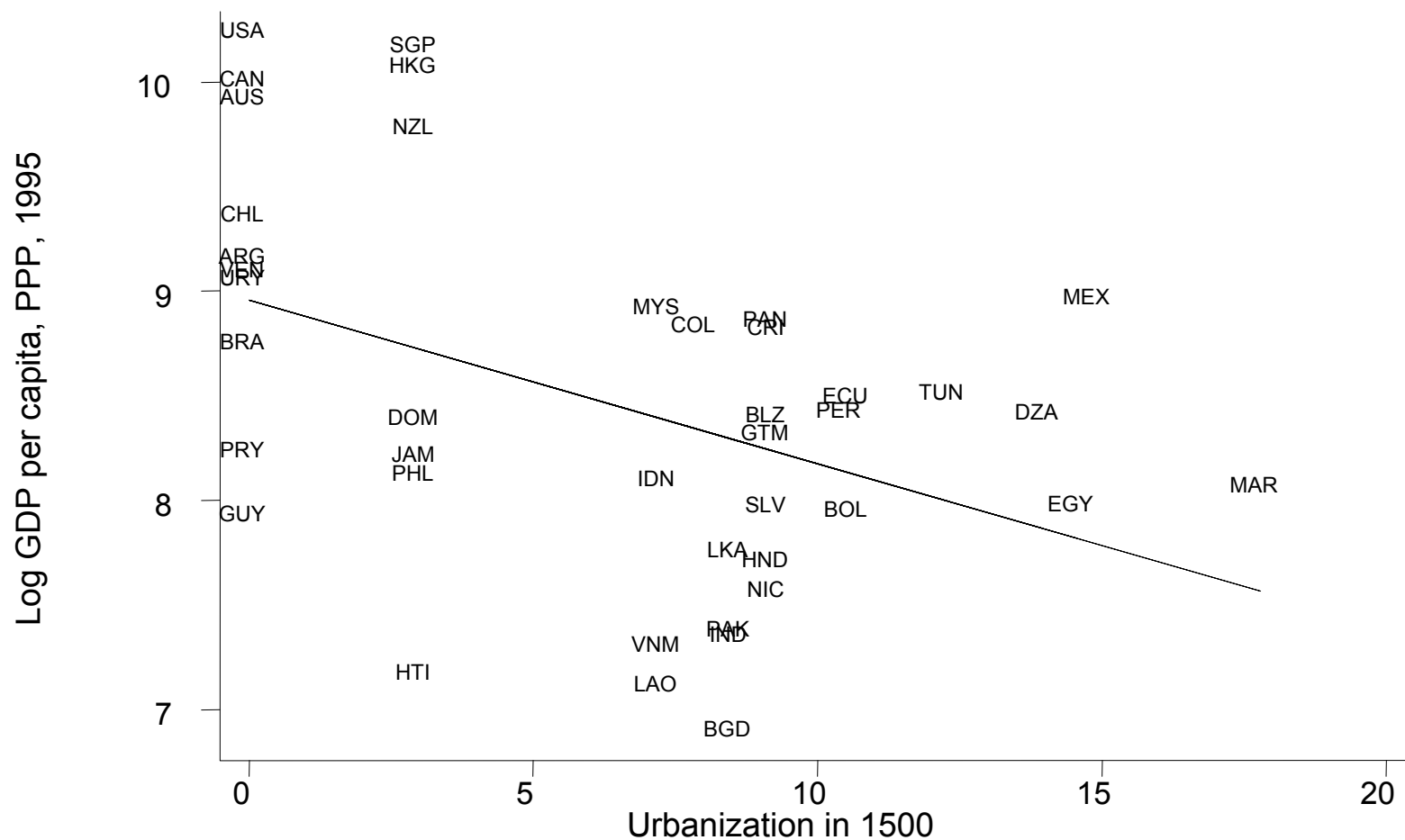


Figure I. Log GDP per capita (PPP) in 1995 against Urbanization rate in 1500

*Note:* GDP per capita is from the World Bank (1999); urbanization in 1500 is people living in towns with more than 5,000 inhabitants divided by total population, from Bairoch (1988) and Eggimann (1999). Details are in Appendix A and Appendix Table A1.



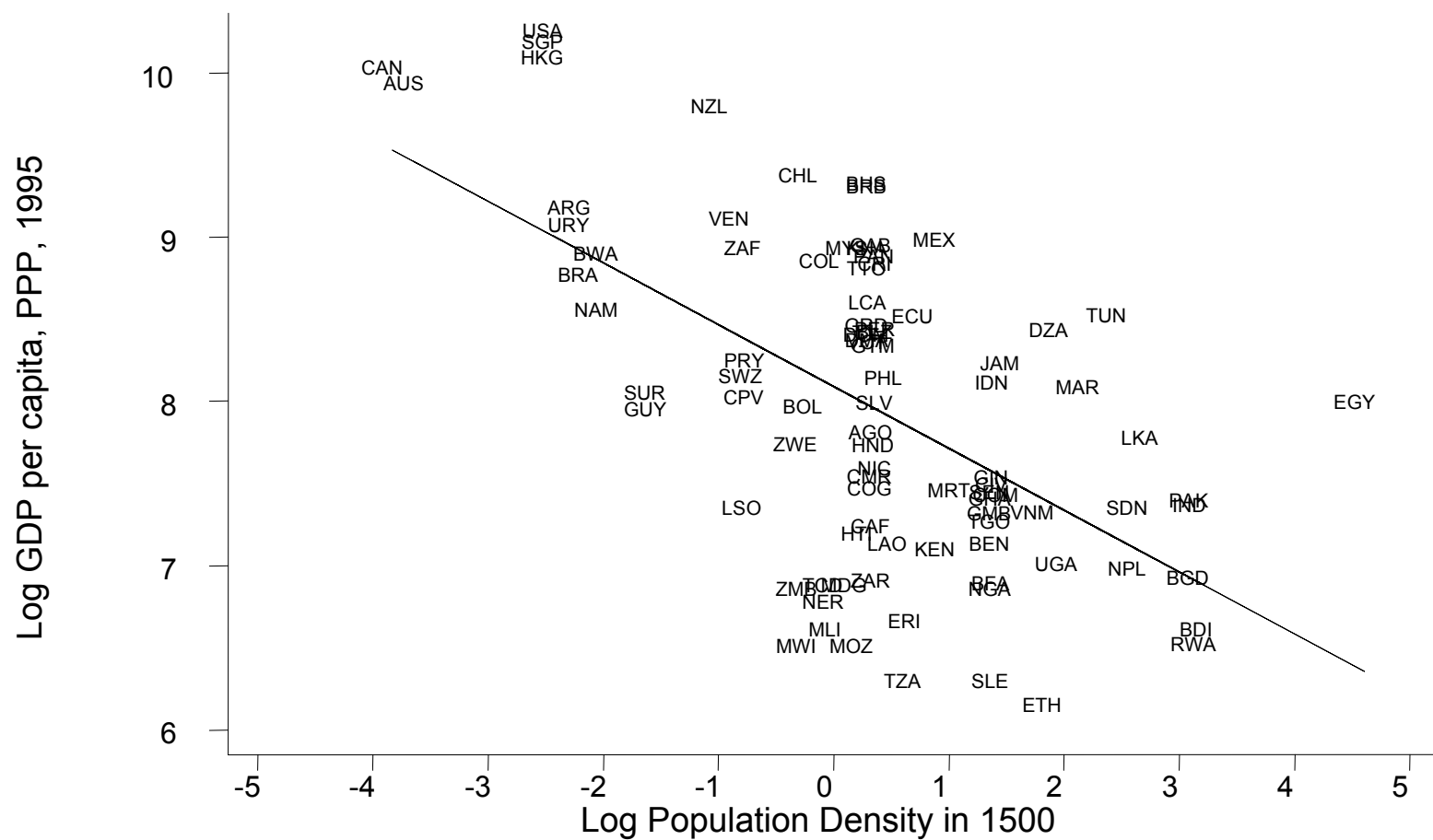


Figure II. Log GDP per capita (PPP) against log population density in 1500.

*Note:* GDP per capita from the World Bank (1999); log population density in 1500 from McEvedy and Jones (1978). Details are in Appendix Table A1.

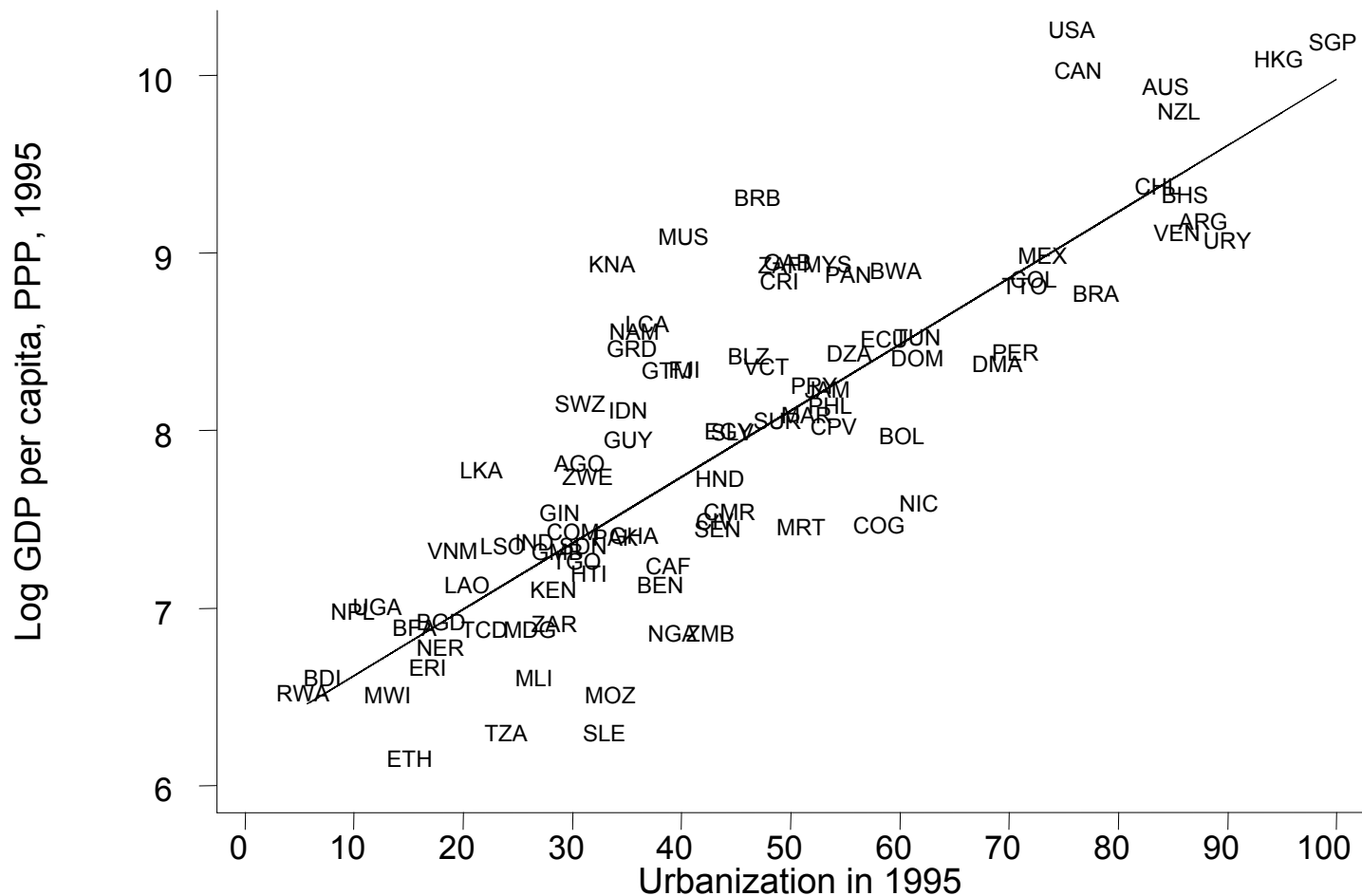


Figure III. Log GDP per capita (PPP) in 1995 against the Urbanization Rate in 1995

*Note:* GDP per capita and urbanization are from the World Bank (1999). Urbanization is percent of population living in urban areas. The definition of urban areas differs between countries, but the usual minimum size is 2000-5000 inhabitants. For details of definitions and sources for urban population in 1995, see the United Nations (1998)

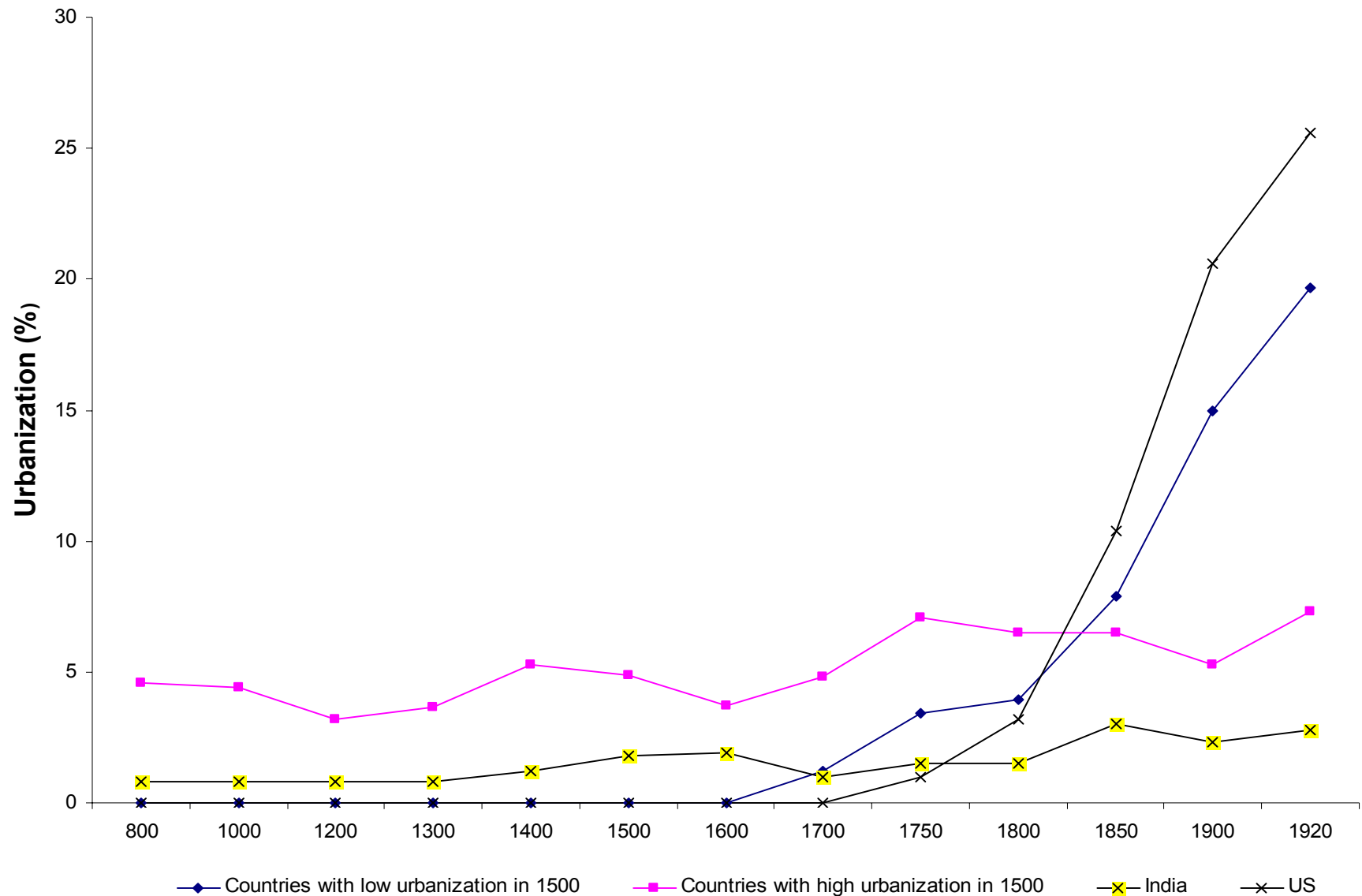


Figure IVA. Urbanization rate in India, the USA and New World countries with low and high urbanization, 800-1920

*Note:* Urbanization is population living in urban areas divided by total population. Urban areas have a minimum threshold of 20,000 inhabitants, from Chandler (1987), and Mitchell (1993 and 1995). Low urbanization in 1500 countries are Argentina, Brazil, Canada, Chile, and the US. High urbanization in 1500 countries are Bolivia, Ecuador, Mexico, Peru, and all of Central America. For details see Appendix A.

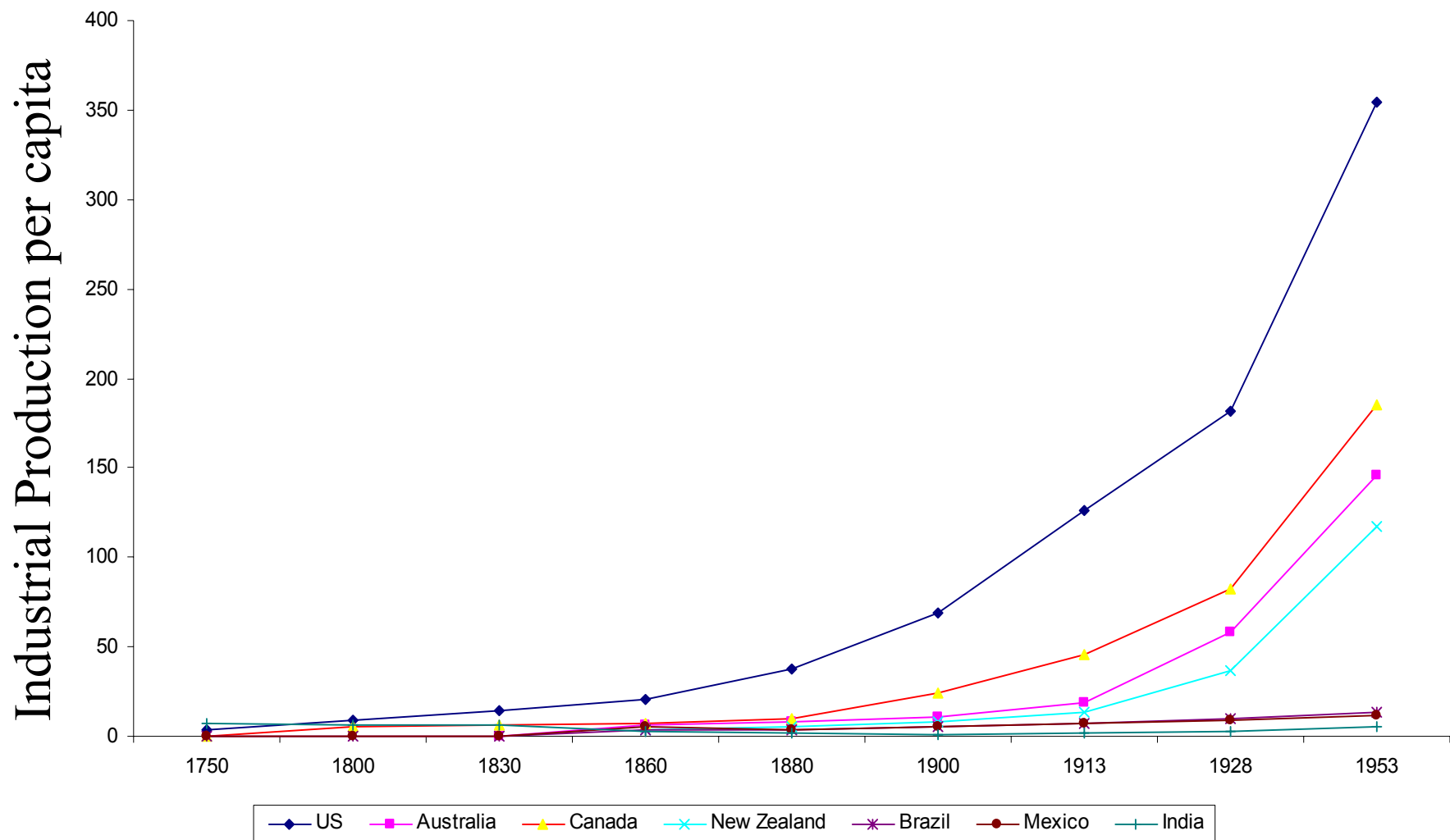


Figure IVB. Industrial Production per capita, 1750-1953

*Note:* Index of industrial production with UK per capita industrialization in 1900 equal to 100. From Bairoch (1982).

Table IX  
The Interaction of UK Industrialization and Institutions

	Former Colonies, using only pre-1950 data	Former Colonies, using data through 1980 (all data)	Former Colonies, using only pre-1950 data	Former Colonies, using only data pre- 1950 and for independent countries	Former Colonies, with average institutions for each country, using only pre-1950 data	Former Colonies, with average institutions for each country, using only pre-1950 data	Former Colonies, with average institutions for each country, instrumenting using settler mortality, only pre-1950 data	Former Colonies, with average institutions for each country, instrumenting using settler mortality, only pre-1950 data	Former Colonies, with average institutions for each country, instrumenting using settler mortality, only pre-1950 data	Former Colonies, with average institutions for each country, instrumenting using settler mortality, only pre-1950 data
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<i>Panel A: Dependent Variable is Industrial Production Per Capita</i>										
UK Industrialization*Institutions	0.132 (0.026)	0.132 (0.027)	0.145 (0.035)	0.160 (0.048)	0.202 (0.019)	0.206 (0.022)	0.168 (0.030)	0.169 (0.032)	0.156 (0.065)	0.158 (0.065)
Institutions	8.97 (2.30)	-3.36 (4.46)	10.51 (3.50)	7.48 (9.51)						
Independence			-14.3 (22.9)			-6.4 (11.4)		1.1 (12.6)		2.0 (14.2)
UK Industrialization*Independence			-0.12 (0.21)			-0.042 (0.12)		0.046 (0.13)		0.06 (0.17)
UK Industrialization*Latitude									0.13 (0.50)	0.12 (0.48)
R-Squared	0.75	0.74	0.75	0.84	0.89	0.89	0.88	0.88	0.87	0.87
Number of Observations	59	75	59	32	59	59	59	59	59	59
<i>Panel B: Dependent Variable is Log GDP Per Capita</i>										
Log UK Industrialization*Institutions	0.078 (0.022)	0.060 (0.017)	0.073 (0.027)	0.079 (0.025)	0.135 (0.021)	0.130 (0.026)	0.159 (0.032)	0.150 (0.038)	0.116 (0.067)	0.111 (0.073)
Institutions	-0.027 (0.025)	-0.084 (0.028)	-0.10 (0.04)	-0.11 (0.04)						
Independence			0.67 (0.27)			0.12 (0.13)		0.10 (0.13)		0.019 (0.16)
Log UK Industrialization*Independence			0.035 (0.12)			-0.008 (0.093)		-0.042 (0.11)		0.016 (0.14)
Log UK Industrialization*Latitude									0.42 (0.49)	0.42 (0.54)
R-Squared	0.95	0.92	0.95	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Number of Observations	79	131	79	46	79	79	79	79	79	79

Standard errors are in parentheses. All columns report panel regressions with country and period dummies included. Dependent variable in Panel A is industrial output per capita 1750-1980 from Bairoch (1982). Dependent variable in Panel B is log GDP per capita 1830-1980 from Maddison (1995). The institutions variable is "Constraints on the Executive," which is an assessment of the constitutional limitations on executive power. The independent variable of interest is total UK industrial output interacted with constraints on the executive in each country from the Polity III dataset. The main effect of institutions is evaluated at the mean value of UK industrialization. Polity III provides information only for independent countries; if a country was a colony at a particular date, we assign the lowest value of constraints on the executive, which is 1. Average institutions are calculated over the values in Polity III for 1750, 1800, 1830, 1860, 1880, 1913, and 1928.

We have an unbalanced panel with the following observations. For industrial output, we have data on Australia, Brazil, Canada, India, Mexico, New Zealand, South Africa, and the US. In the panel regressions for GDP per capita before 1950 we have data on these countries (except South Africa) plus Argentina, Bangladesh, Burma/Myanmar, Chile, Colombia, Egypt, Ghana, India, Indonesia, Pakistan, Peru, and Venezuela. In addition, for the regression using GDP per capita data through 1980 we are also able to include Ethiopia, Ivory Coast, Kenya, Morocco, Nigeria, South Africa, Tanzania, and Zaire. We have data for the following dates: 1750, 1800, 1830, 1860, 1880, 1913, 1928, 1953 and 1980, although not for all countries for all dates. For detailed sources and descriptions see Appendix Table A1.

#### 4. Micro Evidence

- There is also micro evidence, such as that from Besley or Banerjee et al., showing that greater property rights increase investment and output.
- For example, Besley investigates the effect of property rights over land in Ghana on investment. In particular, he looks at whether households with the right to sell, rent, mortgage and pledge the land invest more (he proxies investments by planting new trees, or drainage, land excavation, irrigation or manuring). He typically finds that households that report to have property rights over their land (the right to sell, mortgage etc.) undertake more investments.
- A possible concern with these results, as with the aggregate correlations is that of omitted variable bias. Fields with good characteristics may have induced their owners to obtain property rights over them, and will also be naturally more productive, and therefore perhaps induce greater investments. Alternatively, differences in property rights and productivity may reflect heterogeneity among households. In these cases, the association between property rights and investment would not reflect the causal effect of better property rights enforcement on investment.
- Besley tries to deal with this problem using an instrumental-variables approach, using the method of land acquisition as an instrument for whether there are property rights over the land. These IV estimates give similar results, but one might be concerned that these instruments do not really solve the endogeneity problem, since it may be different types of lands or households with different characteristics that engage in different types of land transactions.
- Another point worth noting is that if the question of interest is whether institutional differences have aggregate consequences, this question is very difficult

to answer with microdata. The fact that households that have property rights over their land in a given institutional structure behave differently does not imply that all households will start behaving differently once the aggregate extent of property rights enforcement changes. There will be composition, selection, and substitution effects. Therefore, micro evidence is not a perfect substitute for macro evidence, though issues of causality are often better addressed at the micro level.

- Taken together, these results, nevertheless, weigh in favor of a view in which institutions are not simply adapting to differences in economic environments, but also cause an important part of these differences in economic environments and economic outcomes.

## 5. Which Institutions Matter?

- The empirical discussion so far emphasized the importance of “institutions”.
- But these institutions are still highly “black box”.
- For example, in Acemoglu, Johnson and Robinson the proxy for institutions is a measure of security of property rights. But there are two problems:
  - (1) many other dimensions of institutions are highly correlated with security of property rights, so it is difficult to know which of many institutional features matters more: the security of property rights, democracy, and independent judiciary etc.? For this reason, Acemoglu, Johnson and Robinson often refer to “a cluster of institutions”. But this feeds into the second problem.
  - (2) suppose that we are convinced of the importance of institutions. Then what do we do? What features of institutions do we try to change? Do political institutions matter? If so which? Is it the formal or the informal institutions?

- Empirical work on this topic would be very useful, but the problem is going to be one of identification: it is virtually impossible to find exogenous (simultaneous/independent) sources of variation in different components of institutions.
- So existing work has focused on OLS estimates.
- A first set of papers looked whether democracy matters for economic performance. Although democratic countries are typically richer than nondemocratic/dictatorial countries, this is often interpreted as the effect of income on political regime, rather than vice versa. For this reason, empirical work in this area has focused on the effect of democracy on subsequent economic growth. The typical finding here is that there is no correlation between democracy and growth (e.g., Barro). This finding might mean that there is no true effect of democracy on economic performance, or it may reflect some type of omitted variable bias.
- Recent work by Persson and Tabellini instead looks at whether the type of democratic institutions matter. They investigate the effect of electoral rules and types of political regimes on policy outcomes in a panel of 61 democracies.
- They find that in presidential regimes, the size of government is smaller and less sensitive to changes in income than in parliamentary regimes.
- They also find that majoritarian elections lead to smaller transfers, which are again less responsive to income shocks than proportional representation systems.
- Finally, they find that in proportional representation and parliamentary systems social transfers tend to expand around elections.
- The enclosed tables give some of their results.
- These results are very suggestive, but leave the question of whether it is the political system, or underlying conditions that lead to the establishment and maintenance of these political systems, that are causing these results.





## **Part 2**

# **Modeling Policies**



## CHAPTER 3

### Lobbying Models

- In lobbying models, agents can form organizations and “bribe” politicians/parties in order to induce policies that they prefer.
- Here I will outline a version of the lobbying model by Grossman and Helpman.

#### 1. Basic model

- Consider an economy in which there are  $n$  groups of agents. For simplicity, normalize the size of each group to 1.
- All agents within a group have identical preferences.
- Let the policy vector in this economy be denoted by  $q$ .
- Policy will be chosen by a politician.
- Lobbies will make transfers (bribes, campaign contributions) to the politician in order to influence policy. In some sense, the policies are for “sale”.
- The utility of an agent in group  $j$  is linear in its consumption

$$W_j(q) - C_j(q)$$

where  $W_j(q)$  is the income of the lobby and  $C_j$  is transfers away from this group, for example to the politician. It is written as a function of  $q$  to emphasize the fact that a group may make transfers conditional on a certain policy being adopted.

- Assume that the politician has a utility function of the form

$$G(q) \equiv \sum_{i=1}^n C_i(q) + a \sum_{i=1}^n W_i(q)$$

The first term is the monetary receipts of the politician, and the second term is aggregate welfare. Therefore, the parameter  $a$  determines how much the politician cares about aggregate welfare. When  $a = 0$ , he only cares about money, and when  $a \rightarrow \infty$ , he acts as a utilitarian social planner.

- Out of the  $n$  groups of agents,  $m$  of those are organized as lobbies, and can collect money among their members in order to further the interests of the group. The remaining  $n - m$  are unorganized, and will make no contributions.
- Without loss of any generality, I take groups  $i = 1, \dots, m$  to be the organized ones.
- The lobbying game takes the following form: all organized lobbies simultaneously offer a schedule  $C_j(q) \geq 0$  which denotes the payments they would make to the politician when policy  $q$  is adopted. After observing the schedules, the politician chooses  $q$ .
- Grossman and Helpman note that this game has exactly the same structure as a menu auction (a situation in which multiple bidders bid for a certain set of goods), and use the theorems developed by Bernheim and Winston for menu auctions.
- In particular, we can see that an equilibrium of this lobbying game will have the following structure:

**PROPOSITION:** The contribution functions  $\{C_j^*(\cdot)\}_{j=1, \dots, m}$  and policy  $q^*$  constitute a subgame perfect Nash equilibrium of this lobbying game if and only if

- : (1)  $C_j^*(\cdot)$  is feasible in the sense that  $0 \leq C_j^*(q) \leq W_j(q)$ .
- (2) The politician chooses the policy that maximizes its welfare, i.e.,

$$q^* \in \arg \max_q \left( \sum_{j=1}^m C_j^*(q) + a \sum_{j=1}^n W_j(q) \right)$$

(3) There are no profitable deviations for any lobby,  $i = 1, 2, \dots, m$ , i.e.,

$$(1.1) \quad q^* \in \arg \max_q \left( W_i(q) - C_i^*(q) + \sum_{j=1}^m C_j^*(q) + a \sum_{j=1}^n W_j(q) \right) \text{ for all } i = 1, 2, \dots, m$$

(4) There exists a policy  $q^j$  for every lobby  $j = 1, 2, \dots, m$  such that

$$q^j \in \arg \max_q \left( \sum_{j=1}^m C_j^*(q) + a \sum_{j=1}^n W_j(q) \right)$$

and satisfies  $C_j^*(q^j) = 0$ . That is, the contribution function of each lobby is such that there exists a policy that makes no contributions to the politician, and gives him the same utility.

- Conditions 2 and 3 are easy to understand. Condition 2 as to hold, since the politician chooses the policy.
- If Condition 3 did not hold, then the lobby could change its contribution schedule slightly and improve its welfare. In particular suppose that this condition does not hold for lobby  $i = 1$ , and instead of  $q^*$ , some  $\hat{q}$  maximizes (1.1). Denote the difference in the values of (1.1) evaluated at these two vectors by  $\Delta > 0$ .

Then consider the following contribution schedule for this lobby

$$\hat{C}_1(q) = \sum_{j=1}^m C_j^*(q^*) + a \sum_{j=1}^n W_j(q^*) - \sum_{j=2}^m C_j^*(q) - a \sum_{j=1}^n W_j(q) + \varepsilon c_1(q)$$

where  $c_1(q)$  reaches its maximum at  $q = \hat{q}$ .

Following this contribution offer by lobby 1, the politician would choose  $q = \hat{q}$  for any  $\varepsilon > 0$ . To see this note that by construction

$$\begin{aligned} & W_i(\hat{q}) - C_i^*(\hat{q}) + \sum_{j=1}^m C_j^*(\hat{q}) + a \sum_{j=1}^n W_j(\hat{q}) \\ & > W_i(q^*) - C_i^*(q^*) + \sum_{j=1}^m C_j^*(q^*) + a \sum_{j=1}^n W_j(q^*) \end{aligned}$$

Therefore, with this new contribution function, the politician is comparing the utility of sticking with the old policy of  $q^*$ , which is  $\sum_{j=1}^m C_j^*(q^*) + a \sum_{j=1}^n W_j(q^*)$

to deviating to  $\hat{q}$ , which is  $\sum_{j=1}^m C_j^*(q^*) + a \sum_{j=1}^n W_j(q^*) + \varepsilon c_1(q)$ . The latter utility is greater for any  $\varepsilon > 0$ .

The change in the welfare of lobby 1 as a result of changing its strategy is then

$$\Delta - \varepsilon c_1(q)$$

Since  $\Delta > 0$ , for small enough  $\varepsilon$ , the lobby gains from this change, showing that the original allocation could not have been an equilibrium.

- Next, consider condition 4. Basically, this condition is ensuring that the lobby is not making a payment to the politician above the minimum that is required. If this condition were not true, the lobby could reduce all its contributions, and still induce the same behavior.
- So far we know little about the contribution schedules. Bernheim and Winston, and following them Grossman and Helpman, argue that the schedule should be differentiable, for example so that small mistakes (trembles) do not lead to large changes in contributions (is this compelling?). Moreover, Bernheim and Winston show that such differentiable equilibria are coalition proof (but there may be others which also are).
- If this is the case, we can write down first-order conditions for the equilibrium policy. In particular, let  $q = (q_1, \dots, q_K)$ , then, by the definition of a maximum, we must have that

$$\sum_{j=1}^m \frac{\partial C_j^*(q)}{\partial q_k} + a \sum_{j=1}^n \frac{\partial W_j(q)}{\partial q_k} = 0 \text{ for all } k = 1, 2, \dots, K$$

and

$$\frac{\partial W_i(q)}{\partial q_k} - \frac{\partial C_i^*(q)}{\partial q_k} + \sum_{j=1}^m \frac{\partial C_j^*(q)}{\partial q_k} + a \sum_{j=1}^n \frac{\partial W_j(q)}{\partial q_k} = 0$$

for all  $k = 1, 2, \dots, K$  and  $i = 1, 2, \dots, m$

Combining these two first-order conditions, we obtain

$$\frac{\partial W_i(q)}{\partial q_k} = \frac{\partial C_i^*(q)}{\partial q_k}$$

for all  $k = 1, 2, \dots, K$  and  $i = 1, 2, \dots, m$

That is, contribution schedules will be *locally truthful*, in the sense that the marginal change in the contribution for a policy is equal to the effect of that policy on the lobby's welfare. Thus, the contribution schedule reflects the lobby's true preferences in the neighborhood of the equilibrium.

- This equilibrium therefore justifies a number of informal arguments made in the literature, for example by Becker, that that the margin lobbies will pay politicians according to their marginal benefits.
- Moreover, if we assume that contribution functions are not only locally truthful, but globally truthful (which are still best response for all lobbies), we obtain the major result of the Grossman-Helpman paper: that Truthful Nash Equilibria can be characterized as

$$q^* = \arg \max_q \left( \sum_{j=1}^m W_j(q) + a \sum_{j=1}^n W_j(q) \right)$$

That is, the society is maximizing the weighted social welfare function, where groups that are not organized receive weight equal to  $a$ , whereas organized groups get a weight of  $1 + a$ .

## 2. Application

- Next consider an application of this tax policy.
- Imagine there are two groups, the rich and poor. A fraction  $\lambda$  of the agents is rich with income  $h^r$ , and the remaining agents are poor with income  $h^p < h^r$ .
- Average income in the economy is

$$h = \lambda h^r + (1 - \lambda) h^p$$



- There is a linear tax rate  $\tau$  imposed on all incomes, and the proceeds are distributed lump sum to all agents.
- Taxation creates a dead weight loss of

$$c(\tau) h$$

where  $c(\tau)$  is strictly increasing and convex, and assume that  $c'(0) > 0$  and  $c'(0) < \varepsilon$

- The overall amount of lump sum subsidy is therefore

$$T = [\tau - c(\tau)] h$$

- First recall that with majority voting, the preferred tax rate for the poor (who are more numerous) will result. In particular, we will have

$$\tau^m = \arg \max_{\tau} (1 - \tau) h^p + [\tau - c(\tau)] h$$

or

$$h - h^p = c'(\tau^m) h$$

So as long as  $h - h^p > \varepsilon$ , we will have  $\tau^m > 0$ , and there will be redistributive taxation.

- Next consider the lobbying model, and assume that only the rich are organized.

Then, the equilibrium tax rate will be given by

$$\tau^l = \arg \max_{\tau} \left( \begin{array}{l} (1 + a) \lambda [(1 - \tau) h^r + [\tau - c(\tau)] h] \\ + a (1 - \lambda) [(1 - \tau) h^p + [\tau - c(\tau)] h] \end{array} \right)$$

The first-order condition to this problem (taking into account the possibility of a corner solution) gives

$$(1 + a) \lambda [h - h^r - c'(\tau^l) h] + a (1 - \lambda) [h - h^r - c'(\tau^l) h] \leq 0$$

(2.1)

or

$$\lambda [h - h^r - c'(\tau^l) h] - a c'(\tau^l) h \leq 0,$$

and clearly since  $h - h^r < 0$ , we will have  $\tau^l = 0$ .

- Therefore, with lobbying there will be no redistributive taxation.
- Interestingly, this conclusion also extends to the case in which the poor are also organized. In this case, we will have

$$\tau' = \arg \max_{\tau} \left( \begin{array}{c} \lambda [(1 - \tau) h^r + [\tau - c(\tau)] h] \\ + (1 - \lambda) [(1 - \tau) h^p + [\tau - c(\tau)] h] \end{array} \right)$$

The first-order condition to this problem gives

$$(2.2) \quad \begin{aligned} \lambda [h - h^r - c'(\tau^l) h] + (1 - \lambda) [h - h^r - c'(\tau^l) h] &\leq 0 \\ -c'(\tau^l) h &\leq 0. \end{aligned}$$

- This basically reflects the fact that with costly taxation, the utilitarian social welfare maximizing policy is zero taxes.
- In contrast, imagine a situation in which redistribution is socially beneficial. This might be because taxes are for distributed to the poor agents who are then able to invest in human capital which they were unable to do before because of credit constraints. Let us capture this in a very simple way by assuming that  $c'(\tau) < 0$  for  $\tau \leq \bar{\tau}$  and  $c'(\bar{\tau}) = 0$ . This implies that the utilitarian social welfare maximizing policy is to set  $\tau = \bar{\tau}$ .
- In this case there would be equilibrium redistribution at the rate  $\tau = \bar{\tau}$  when both the poor and the rich have organized to form lobbies. To see this note that with both the poor and the rich organized, the same condition as in (2.2) applies, so we need  $c'(\tau^l) h = 0$ , or in other words  $\tau^l = \bar{\tau}$ .
- But with only the rich organized, the relevant condition is given by (2.1), or

$$\lambda [h - h^r - c'(\tau^l) h] - ac'(\tau^l) h = 0 \text{ or } \leq 0,$$

and if  $|c'(\tau)|$  is not very large, there will not be redistribution.

- This illustrates the fact that with the rich organized, public policy will cater more to their preferences, so policies that redistributive away from the rich to the poor will not be adopted even if they are socially beneficial.

## CHAPTER 4

### Voting Models

I will not discuss how preferences of citizens translate into policies in societies with democratic institutions. The emphasis will be on the limitations of voting as a method of aggregating preferences, and the inefficiencies that arise because of these limitations as well as because of conflict between different interests.

#### 1. Median Voter Models

##### 1.1. Basics.

- Let me define a basic political economy model, using the notation adopted in Persson and Tabellini for simplicity.
- Consider an economy in which there is a large number of agents that differ according to some vector denoted by  $\alpha^i$ . Denote the utility function of agent  $i$  by

$$u(x^i, P(x, q), q | \alpha^i)$$

where  $x^i$  is his action,  $q$  denotes the vector of political choices (institutions, policies, etc.), and  $P(x, q)$  is a vector of general equilibrium variables, such as prices or externalities that result from all agents' actions as well as policy, and  $x$  is the vector of the  $x^i$ 's.

- We assume that individual maximization problems are well behaved and we ignore multiple equilibria, so each agent will choose an optimal action  $x^i(q, \alpha^i)$ .

Substituting this into the individual's utility function, we obtained an indirect utility function defined over policy as

$$W(q; \alpha^i).$$

- Next define the *preferred policy*, or the bliss point, of voter  $i$  as

$$q(\alpha^i) = \arg \max_q W(q; \alpha^i)$$

- In addition, we can think of a more primitive concept of individual preference orderings, which captures the same information as utility function  $W(q; \alpha^i)$ . Let us denote this by  $q \succeq_i q'$  for individual  $i$  weakly preferring  $q$  to  $q'$  and  $q \succ_i q'$  for  $i$  strictly preferring  $q$  to  $q'$ .
- Also think of a “political system” as a way of aggregating the set of utility functions,  $W(q; \alpha^i)$ 's, to a social welfare function  $W^S(q)$  that ranks policies for the society.
- Alternatively, a political system is a mapping from individual preference orderings to a social preference ordering.
- The celebrated Arrow (im)possibility theorem is that if this mapping satisfies some relatively weak conditions, then social preferences have to be “dictatorial” in the sense that they will reflect simply the preferences of one of the agents.
- To explain this theorem, let us introduce some more notation.
- First, any ordering  $\succeq$  is set to be *transitive* if  $[q_1 \succeq q_2 \text{ and } q_2 \succeq q_3] \implies q_1 \succeq q_3$ .
- Throughout, we assume that individual preferences are transitive.
- Next, define  $Q$  as a finite set of alternative economic allocations or policies that induce these economic allocations. Here we limit ourselves to  $Q \subseteq \mathbb{R}$ . Let  $\mathfrak{R}$  be the set of all weak orders on  $Q$ , that is,  $\mathfrak{R}$  contains information of the form

$q_1 \succeq_i q_2 \succeq_i q_3$  etc, and imposes the requirement of transitivity. An individual ordering  $R_i$  is an element of  $\mathfrak{R}$ , i.e.,  $R_i \in \mathfrak{R}$ .

- In a society consisting of  $n$  individuals, we define  $\rho = (R_1, \dots, R_n)$  as the society's preference profile. That is,  $\rho$  gives the preference ordering of each individual  $i \in N$  where  $N$  is the set of individuals in the society. Also  $\rho|_X = (R_{1|X}, \dots, R_{n|X})$  is the society's preference profile when alternatives are restricted to some subset  $X$  of  $Q$ .
- A social ordering, denoted by  $R^S$ , is an element of  $\mathfrak{S}$ , the set of all reflexive and complete binary relations on  $Q$  (and may or may not be an element of  $\mathfrak{R}$ ).
- Put differently, a social ordering in a society consisting of  $n$  individuals is a mapping  $f : \mathfrak{R}^n \rightarrow \mathfrak{S}$ . That is,  $f(\rho)$  gives the social ordering for the preference profiles in  $\rho$ . We can alternatively think of  $f$  as a political system mapping individual preferences into a social choice.
- This way of writing already imposes one condition, that of “*unrestricted domain*,” which says that in constructing a social ordering we should consider all possible individual orderings (i.e., not restrict ourselves to some special class of individual orderings, such as those with “single-peaked” preferences as we will do later when applying some voting theorems).
- We say that a social ordering is *weakly Paretian* if  $[q \succ_i q' \text{ for all } i \in N] \implies q \succ^S q'$ , that is, if all individuals in the society prefer an alternative that has to be chosen.
- To define the concept of *dictatorial* social ordering (political system), first let us introduce another concept. We say that a subset  $D$  of  $N$  is *decisive* if and only if  $[q \succ_i q' \text{ for all } i \in D] \implies q \succ^S q'$ . Obviously, in this case, the unique element of  $D$  is the dictator.
- A social ordering is *dictatorial* if there exists a singleton decisive set  $D$ .

- We say that a social ordering satisfies *independence from irrelevant alternatives* if for any  $\rho$  and  $\rho' \in \mathfrak{R}^n$  and any  $q, q' \in Q$ , we have that  $\rho_{|\{q, q'\}} = \rho'_{|\{q, q'\}} \implies f(\rho)_{|\{q, q'\}} = f(\rho')_{|\{q, q'\}}$ . That is, if two preference profiles have the same choice over two policy alternatives, the social orderings derive from these two preference profiles must also have identical choices over these two policy alternatives, irrespective of how these two preference profiles differ for “irrelevant” alternatives. This condition is a reasonably strong one, in that it rules out any kind of interpersonal “cardinal” comparisons—i.e., it excludes information on how strongly an individual prefers one outcome versus another.
- Now our theorem is:

**PROPOSITION (Arrow’s (Im)Possibility Theorem):** If a social ordering is transitive, weakly Paretian and satisfies independence from irrelevant alternatives, then it is dictatorial.

- An important implication of this theorem is that there is no way of avoiding the issue of conflict in preferences of individuals. When there are different preferences over economic allocations or policies (which is guaranteed by the unrestricted domain assumption above), there is no way of aggregating these conflicting preferences into a coherent choice for society. A corollary of this is that for social choices (or for public policy) it is going to matter who has *political power*. Since there is no choice that makes everybody happy, some individuals will be made happy and others unhappy by every public choice, and we can think of those whose preferences are represented as the individuals with “political power”.
- From a modeling point of view, the theorem means that, if we are interested in non-dictatorial outcomes, we have to look at political systems that either restrict choices or focus on more concrete and simpler situations.

- Often, economic models restrict the policy space and/or preferences of citizens in order to ensure that this impossibility theorem does not apply. Unfortunately, such restrictions on the policy space have more than technical implications. For example, often they force the modeler to restrict agents to use inefficient methods of redistribution. As a result, some of the inefficiencies that are found in political economy models are not a consequence of the logic of these models, but a consequence of the technical assumptions that the modelers make.
- The same problems that arise in thinking about general political mechanisms will also arise when we consider more specific mechanisms, such as voting.
- Let us now give a sketch of the proof of this proposition. Let us suppose that there exists a non-dictatorial and weakly Paretian social ordering,  $f$ , satisfying independence from irrelevant alternatives. We will see that this will lead to a contradiction. Let  $D$  be the minimal decisive set. Such a set always exists, since by the restriction of weakly Paretian  $N$  itself is a decisive set. Since  $f$  is non-dictatorial,  $D$  is not a singleton. Then by unrestricted domain, consider the following preference profile

$$\begin{array}{ll} \text{for } i \in D & q_1 \succ_i q_2 \succ_i q_3 \\ \text{for } j \in D \setminus \{i\} & q_3 \succ_i q_1 \succ_i q_2 \\ \text{for } k \notin D & q_2 \succ_i q_3 \succ_i q_1 \end{array}$$

Then by the fact that  $D$  is decisive, and all members of  $D$  prefer  $q_1$  to  $q_2$ , we have  $q_1 \succ^S q_2$ . By the fact that  $D$  is not a singleton, so must include not simply  $i$ , and all other members of the society prefer  $q_3$  to  $q_1$ , we cannot have  $q_1 \succ^S q_3$ , so  $q_3 \succeq^S q_1$ . Then by transitivity, we must also have  $q_3 \succ^S q_2$ . But this can only be the case if  $D \setminus \{i\}$  is decisive, which contradicts the presumption that  $D$  is decisive, proving the theorem.

- The implication is that either  $D$  has to be a singleton,  $D = \{i\}$ , so that  $D \setminus \{i\} = \emptyset$ , or we have to live with intransitivities.



### 1.2. Voting and the Condorcet paradox.

- What about voting? Could we use voting or voting-related mechanisms to aggregate preferences? The answer is no. We can see this from the Arrow's theorem, since voting is an example of the political system that's covered by the theorem.
- Let us here illustrate the problem with voting using a well-known example, which is often referred to as the Condorcet paradox. The underlying reason for this paradox is related both to the Arrow's theorem and to the reason why median voter theorems that we will see below have to rely on strong conditions.
- There are three individuals, 1, 2, and 3 and three choices. The individuals' preferences are as follows:

$$\begin{array}{ll} 1 & a \succ c \succ b \\ 2 & b \succ a \succ c \\ 3 & c \succ b \succ a \end{array}$$

- Moreover, let us make the political mechanism somewhat more specific, and assume that it satisfies the following three requirements, which we may refer to as open agenda majority rule.

A1. *Direct democracy.* The citizens themselves make the policy choices. This requirement means that we will in fact look at the preferences of the three agents, 1, 2 and 3.

A2. *Sincere voting.* In every vote, each citizen votes for the alternative that gives him the highest utility according to his policy preferences (indirect function)  $W(q; \alpha^i)$ . This requirement is now adopted for simplicity. In many situations, individuals may vote for the outcome that they do not prefer, anticipating the later repercussions of this choice (we refer to this type of behavior as “*strategic voting*”). Whether they do so or not is important in certain situations, but not for the discussion at the moment.

A3. *Open agenda.* Citizens vote over pairs of policy alternatives, such that the winning policy in one round is posed against a new alternative in the next round and the

set of alternatives includes all feasible policies. Later, we will replace the open agenda assumption with parties offering policy alternatives. For now it is a good starting point.

- Now, using the three assumptions, consider a contest between:
  - (1) Policy  $a$  and  $b$ . Agents 2 and 3 will vote for  $b$  over  $a$ , so  $b$  is the majority winner.
  - (2) Next, by the open agenda assumption, the other policy alternative  $c$  will run against  $b$ . Now agents 1 and 3 prefer  $c$  to  $b$ , which is the new majority winner.
  - (3) Next,  $c$  will run against  $a$ , but now agents 1 and 2 prefer  $a$ , so  $a$  is the majority winner.
- Therefore, in this case we have “cycling” over the various alternatives, or put differently there is “equilibrium” of the voting process that selects a unique policy outcome.
- For future reference, let us now define a Condorcet winner as a policy choice that does not lead to such cycling. In particular,

**DEFINITION:** A Condorcet winner is a policy  $q^*$  that beats any other feasible policy in a pairwise vote.

- Suppose now that the policy space is unidimensional, so that  $q$  is a scalar. In this case, a simple way to rule out the Condorcet paradox is to assume that preferences are *single peaked* for all voters.
- We say that voter  $i$  has single-peaked preferences if his preference ordering for alternative policies is dictated by their relative distance from his bliss point,  $q(\alpha^i)$ : a policy closer to  $q(\alpha^i)$  is preferred over more distant alternatives. Specifically:

**DEFINITION:** Policy preferences of voter  $i$  are single peaked iff:

$$\begin{aligned} &\text{If } q'' \leq q' \leq q(\alpha^i) \text{ or, if } q'' \geq q' \geq q(\alpha^i), \text{ then} \\ &W(q''; \alpha^i) \leq W(q'; \alpha^i). \end{aligned}$$

- Note that the strict concavity of  $W(q'; \alpha^i)$  is sufficient for it to be single peaked.
- We can see that in the above Condorcet paradox, not all agents had single-peaked preferences. For example, taking the ordering to be  $a, b, c$ , agent 1 which has preferences  $a \succ c \succ b$  does not have single-peak preferences (if we took a different ordering of the alternatives, then the preferences of one of the other two agents would violate the single-peakedness assumption).
- The next proposition in fact shows that with single-peaked preferences there always exists a Condorcet winner.

**PROPOSITION (The Median Voter Theorem):** If all voters have single-peaked policy preferences over a given ordering of policy alternatives, a Condorcet winner always exists and coincides with the median-ranked bliss point,  $q^m$ . Moreover,  $q^m$  is the unique equilibrium policy (stable point) under the open agenda majoritarian rule, that is, under A1-A3.

- To prove this theorem, all we need is a simple “separation argument.” Order the individuals according to their bliss points  $q(\alpha^i)$ , and label the median-ranked bliss point by  $q^m$ . Suppose that there is a vote over  $q^m$  and some other policy  $q'' < q^m$ . Every individual with  $q^m \leq q(\alpha^i)$  prefers  $q^m$  to  $q''$ , since it is closer to his bliss point. By A2, the sincere voting assumption, these individuals also vote for  $q^m$ . The coalition voting for supporting  $q^m$  thus constitutes a majority. The argument for the case where  $q'' > q^m$  is identical and this proves the proposition.

- Would the theorem generalize to the case in which individuals do not vote sincerely? The answer is yes. In a vote over two alternatives,  $q'$  and  $q''$ , an individual is either non-pivotal, in which case his vote does not matter, and we can, without loss of any generality, assume that he's voting for his most preferred outcome. Or he's pivotal, in which case, if he votes for the outcome that he prefers less, that outcome will be realized, giving him lower utility (this argument establishes that it is a weakly dominant strategy for a voter to vote sincerely in a one-off election, it is quite a bit more complicated to prove that the same is true in a potentially infinite sequence of elections, but the logic immediately translates to any sequence of finite votes over a set of alternatives).
- Notice that this argument does not generalize to the case in which the single-peakedness assumption is not satisfied [...it also does not necessarily apply when references are single peaked but there is no open agenda. Can you find an example of this?...]. Because in that case, there is no Condorcet winner, and inducing a choice that is not preferred now may lead to a more preferred social choice later.
- As an example, consider the following political mechanism. First, all individuals vote between  $a$  and  $b$ , and then they vote over the winner of this contest and  $c$ . With sincere voting,  $b$  will win the first round, and then  $c$  wins the second round against  $b$ . Now consider agent 2. If he changes his vote in the first round to  $a$  (thus does not vote sincerely), the first-round winner will be  $a$ , which will also win against  $c$ , and player 2 prefers this outcome to the outcome of sincere voting, which was  $c$ . This shows that without a Condorcet winner, "strategic" voting may emerge.

- This example also illustrates the role of “agenda setting”. Suppose that in the above game, agent 1 decides the exact orderings of voting. In particular, he has to choose between three options ( $a$  vs.  $b$  first,  $a$  vs.  $c$  first, and  $b$  vs.  $c$ , first). Anticipating strategic voting by player 2, he will choose the first option, and ensure that his most preferred alternative will be the political choice of the society. In contrast, if agent 3 chose the ordering, he would go for  $a$  vs.  $c$  first, which would induce agent 1 to vote strategically for  $c$ , and lead to  $c$  as the ultimate outcome.

[...This type of agenda setting with strategic voters is the underlying idea of the notion of structure-induced equilibrium developed by Shepsle...]

### 1.3. Party competition.

- Now suppose that we have a situation in which there is a Condorcet winner, and there are two parties,  $A$  and  $B$ , competing to come to power. Assume that the parties do not have an ideological bias, and would like to come to power (for example, they receive some utility from being in power). In particular, they both maximize the probability of coming to power, for example, they receive a rent of  $R$  when they are in power.
- Assume also that parties simultaneously announce their policy, and are committed to this policy. If an individual is indifferent between the two parties (i.e., their policies), he randomizes.
- This implies that we can capture the behavior of the two parties as follows

$$\begin{aligned}
 (1.1) \quad \text{Party } A &: \max_{q_A} P(q_A, q_B) R \\
 \text{Party } B &: \max_{q_B} (1 - P(q_A, q_B)) R
 \end{aligned}$$

where  $R$  denotes the rents all being in power and  $P(q_A, q_B)$  is the probability that party  $A$  comes to power when the two parties' platforms are  $q_A$  and  $q_B$  respectively. When the median voter theorem applies, this is clearly given by

$$(1.2) \quad P(q_A, q_B) = \begin{cases} 1 & \text{if } V^M(q_A) > V^M(q_B) \\ \frac{1}{2} & \text{if } V^M(q_A) = V^M(q_B) \\ 0 & \text{if } V^M(q_A) < V^M(q_B) \end{cases}$$

where  $V^M$  denotes the utility of the median voter.

- Then, we have the following result:

**PROPOSITION (Downsian policy convergence) :** Suppose that there are two parties that first announce a policy platform and commit to it and a set of voters that vote for one of the two parties. Assume that all voters have single-peaked policy preferences over a given ordering of policy alternatives, and denote the median-ranked bliss point by  $q^m$ . Then both parties will choose  $q^m$  as their policy.

- This proposition therefore shows that there will be policy convergence between the two parties, and party competition will implement the Condorcet winner among the voters.
- What happens if there is no Condorcet winner? The above proposition does not generalize to this case. In particular, if we take a situation in which there is cycling, like the above example, it is straightforward to verify that there is no pure strategy equilibrium in the political competition game (though there does exist a mixed strategy equilibrium. Can you characterize it?).
- Question: what happens if there are three parties?

## 2. Beyond Single-Peaked Preferences

### 2.1. Relaxing “single-peakedness”.

- It is possible to relax the assumption of single-peaked preferences, and also think of preferences there are close to single-peaked in multidimensional spaces.
- The following definition and proposition are useful in this regard.

**DEFINITION.** The preferences of voters satisfy the *single-crossing property* when the following statement is true:

$$\begin{aligned} &\text{If } q > q' \text{ and } \alpha^{i'} > \alpha^i, \text{ or if } q < q' \text{ and } \alpha^{i'} < \alpha^i, \text{ then} \\ &W(q; \alpha^i) \geq W(q'; \alpha^i) \implies W(q; \alpha^{i'}) \geq W(q'; \alpha^{i'}). \end{aligned}$$

- It is clear that the single-crossing property is weaker than the single-peakedness property. But it plays the same role, using exactly the same type of separation argument as before.

**PROPOSITION (Extended median-voter theorem).** If the preferences of voters satisfy the single-crossing property, a Condorcet winner always exists and coincides with the bliss point of the voter with the median value  $\alpha^i$ .

- It is clear that we can use this proposition to apply the median voter theorem again. [...a simple example of a situation where preferences are not single peaked, but satisfy the single-crossing property?..]

### 2.2. An application of the median-voter theorem: the Roberts-Meltzer-Richard model.

- Consider situation with two parties, competing to come to power.

- Suppose that agents have the following preferences

$$w^i = c^i + V(x^i)$$

where  $c^i$  and  $x^i$  denote individual consumption and leisure, and  $V(\cdot)$  is a well-behaved concave utility function.

- The budget constraint of each agent is

$$c^i \leq (1 - \tau)l^i + f,$$

where  $\tau$  denotes the income tax rate, and corresponds to the policy variable  $q$  in this application. In addition  $l^i$  is individual labor supply, and  $f$  is a lump sum transfer.

- The real wage is exogenous and normalized to 1. Individual productivity differs, such that the individuals have different amounts of “effective time” available. That is, individuals are subject to the “time constraint”

$$\alpha \geq x^i + l^i,$$

- Therefore,  $\alpha^i$  is a measure of “individual productivity”. We assume that  $\alpha^i$  is distributed in the population with mean  $\alpha$  and medial  $\alpha^m$ .
- Since individual preferences are linear in consumption, optimal labor supply satisfies

$$l^i = L(\tau) + (\alpha^i - \alpha),$$

where  $L(\tau) \equiv \alpha - V_x^{-1}(1 - \tau)$  is decreasing in  $\tau$  by the concavity of  $V(\cdot)$ . A higher tax rate on labor income distorts the labor-leisure choice and induces the consumer to work less. This will be the cost of redistributive taxation this model.



- Let  $l$  denote average labor supply. Since the average of  $\alpha^i$  is  $\alpha$ , we have  $l = L(\tau)$ . The government budget constraint can therefore be written:

$$f \leq \tau l \equiv \tau L(\tau).$$

Let  $W^i(\tau; \alpha^i)$  be the policy variable with  $f$  determined as residual. By straightforward substitution into the individual utility function, we can express the policy preferences of individual  $i$  as

$$(2.1) \quad W^i(\tau; \alpha^i) \equiv L(\tau) + V(L(\tau) + \alpha) + (1 - \tau)(\alpha^i - \alpha).$$

- Are the preferences represented by (2.1) single-peaked?
- The answer depends on the shape of the average labor supply function  $L(\tau)$ . If this function were convex,  $W^i(\tau; \alpha^i)$  would be everywhere strictly concave, and therefore satisfy the single-peakedness assumption. However, this function could be sufficiently convex that  $W^i(\tau; \alpha^i)$  could have multiple peaks (multiple local maxima). As a result, preferences may not be single peaked.
- But it is straightforward to verify that (2.1) satisfies the single-crossing property. Therefore, we can apply the median-voter theorem, and the outcome of party competition between the two parties will be  $\tau^m$  such that

$$\tau^m = \arg \max_{\tau} W^m(\tau; \alpha^m)$$

Hence, we have

$$(2.2) \quad L'(\tau^m) [1 - V'(L(\tau^m) + \alpha)] - (\alpha^m - \alpha) = 0$$

- If the mean is greater than the median, as we should have for a skewed distribution of income, it must be the case that  $\alpha^m - \alpha < 0$  (that is median productivity must be less than mean productivity). This implies that  $\tau^m > 0$ —otherwise, (2.2)

would be satisfied for a negative tax rate, and we would be at a corner solution with zero taxes (unless negative tax rates, i.e., subsidies, were allowed).

- Now imagine a change in the distribution of  $\alpha$  such that the difference between the mean and the median widens. From the above first-order condition, this'll imply that the equilibrium tax rate  $\tau^m$  increases.
- This is the foundation of the general presumption that greater inequality (which is generally, but not always, associated with a widening gap between the mean and the median) will lead to greater taxation to ensure greater redistribution away from the mean towards the median.
- Notice also that greater inequality in this model leads to greater “inefficiency” of policy. Why is this? The reason is only weakly related to the logic of redistribution, but more to the technical assumptions that have been made. In order to obtain single-peaked preferences, we had to restrict policy to a single dimensional object, the linear tax rate.
- Imagine, instead, that different taxes can be applied to different people. Then, redistribution does not necessitate distortionary taxation. But in this case, preferences will clearly be non-single-peaked—agent  $i$  particularly dislikes policies that tax him a lot, and likes policies that tax agents  $j$  and  $k$  a lot, where as agent  $j$  likes policies that tax  $i$  and  $k$  a lot, etc.

### 3. Multidimensional policies

- Next consider a situation in which preferences are defined over multidimensional policies. However, maintain the assumption that individuals are heterogeneous only in one dimension. Under certain special circumstances we can still use a

median-voter theorem. This requires all citizens to have “intermediate preferences”.

**DEFINITION.** Voters have intermediate preferences, if their indirect utility function  $W(q; \alpha^i)$  can be written as

$$W(q; \alpha^i) = J(q) + K(\alpha^i)H(q),$$

where  $K(\alpha^i)$  is monotonic in  $\alpha^i$ , for any  $H(q)$  and  $J(q)$  common to all voters.

**PROPOSITION.** If voters have intermediate preferences a Condorcet winner exists and is given by  $q(\alpha^m)$ .

- The proof is analogous to the proof of the above median-voter theorem. Since  $q(\alpha^m)$  is the maximum for agent  $\alpha^m$ , we have that

$$K(\alpha^m) \begin{matrix} \leq \\ \geq \end{matrix} \frac{J(q(\alpha^m)) - J(q)}{H(q) - H(q(\alpha^m))} \text{ as } H(q) \begin{matrix} \geq \\ \leq \end{matrix} H(q(\alpha^m)),$$

for any  $q \neq q(\alpha^m)$ .

- Furthermore, voter  $i$  supports  $q(\alpha^m)$  against  $q$  if we have that

$$\begin{aligned} &\text{either } H(q) > H(q(\alpha^m)) \text{ and } K(\alpha^i) > \frac{J(q(\alpha^m)) - J(q)}{H(q) - H(q(\alpha^m))} \\ &\text{or } H(q) < H(q(\alpha^m)) \text{ and } K(\alpha^i) < \frac{J(q(\alpha^m)) - J(q)}{H(q) - H(q(\alpha^m))} \end{aligned}$$

Suppose that  $H(q) > H(q(\alpha^m))$  and  $K(\alpha^i)$  is monotonically increasing (the case of monotonically decreasing is analogous). Then  $K(\alpha^i) \geq K(\alpha^m)$  for all  $\alpha^i \geq \alpha^m$ , and these will all satisfy

$$K(\alpha^i) > \frac{J(q(\alpha^m)) - J(q)}{H(q) - H(q(\alpha^m))}$$

and support  $q(\alpha^m)$  against  $q$ . The other cases are analogous, showing that the policy  $q(\alpha^m)$  always collects at least half the votes against any alternative policy.

### 3.1. Application.

- Suppose all individuals have the same exogenous income  $y^i = y$  and are subject to the same income tax  $\tau$ . they are thus subject to the same budget constraint

$$c = y(1 - \tau).$$

- Government revenue per capita,  $\tau y$ , is spent on two types of public consumption, in per capita amounts  $q_1$  and  $q_2$ , to satisfy the government budget constraint

$$q_1 + q_2 \leq \tau y.$$

- Agents have heterogenous preferences for these publicly provided goods, however, summarized in the following utility function for voter  $i$ :

$$w^i = U(c) + \alpha^i G(q_1) + (1 - \alpha^i) F(q_2),$$

where the weight  $\alpha^i$  is distributed in the population on the interval  $[0, 1]$ .

- In this setting it is easy to derive the policy preferences of agent  $i$  over the two-dimensional policy  $q \equiv (q_1, q_2)$ , treating  $\tau$  as residual. These preferences are

$$W(q; \alpha^i) = U(y - q_1 - q_2) + F(q_2) + \alpha^i (G(q_1) - F(q_2)).$$

- Clearly, these preferences satisfy the “intermediate preferences” property, despite the fact that policies are two-dimensional. Then party competition will lead to the median voter’s choice, which is given by

$$\max_{q_1, q_2} W(q; \alpha^m) = U(y - q_1 - q_2) + F(q_2) + \alpha^m (G(q_1) - F(q_2)).$$

The first-order conditions are

$$\begin{aligned} -U'(y - q_1 - q_2) + \alpha^m G'(q_1) &= 0 \\ -U'(y - q_1 - q_2) + (1 - \alpha^m) F'(q_2) &= 0 \end{aligned}$$

These conditions determine a unique policy outcomes  $(q'_1, q'_2)$ , and it is straightforward to do comparative statics. For example, an increase in  $\alpha^m$ , which corresponds to a median voter that prefers the public good  $q_1$  more strongly, will increase  $q_1$  and reduce  $q_2$ .

#### 4. Redistribution and Growth in The Median Voter Models

##### 4.1. Taxation, Redistribution and Growth.

- Two papers (Alesina and Rodrik, Persson and Tabellini) applied the median voter model of voting over (linear) taxes to an economy with endogenous growth to analyze the relationship between redistribution and growth. Here's a simple version based on Alesina and Rodrik.

- Output is given by the aggregate production function

$$y = k^{1-\alpha} g^\alpha l^\alpha$$

where  $k$  is capital and  $g$  is government investment in infrastructure, and labor  $l$  is normalized 1. This is financed by linear capital taxation at the rate  $\tau$ . So

$$g = \tau k$$

Substituting this in the production function, then using factor market clearing, we obtain

$$r = (1 - \alpha) \tau^\alpha$$

$$w = \alpha \tau^\alpha k$$

there is no tax on labor, but the take-home pay per unit of capital is

$$r - \tau = (1 - \alpha) \tau^\alpha - \tau$$

- Agents are heterogeneous in their holdings of capital (and all have labor  $l = 1$ ). In particular, let  $\sigma_i$  be the inverse of the relative capital holding of individual  $i$ ,

$$\sigma_i = \frac{k}{k_i}$$

Then the earnings of individual  $i$  can be written as

$$y_i = \alpha \tau^\alpha k_i \sigma_i + [(1 - \alpha) \tau^\alpha - \tau] k_i$$

The first term is labor earnings, while the second term is the capital income of individual.

All individuals have the same logarithmic utility function, and maximize

$$\int \ln c_i \exp(-\rho t) dt$$

This problem has the standard solution where

$$\gamma_i = \gamma(\tau) \equiv [(1 - \alpha) \tau^\alpha - \tau] - \rho$$

where  $\gamma_i$  is the rate of growth of consumption for individual  $i$ . When taxes are constant overtime, this is also the rate of growth of the individuals asset holdings, and therefore of the whole economy. Then, the overall growth rate of the economy as a function of the tax rate is  $\gamma(\tau)$ .

- Notice that there exists a growth maximizing tax rate,  $\tau^*$ , such that

$$\tau^* = [\alpha(1 - \alpha)]^{1/(1-\alpha)}$$

This tax rate, however, is not the utility maximizing tax rate for any of the agents. Only an agent who has *all* his income from capital will choose this tax rate, because this tax rate maximizes the rate of growth of capital income.

- Now consider individuals voting decisions over taxes. Each individual is going to have a most preferred tax rate, and conveniently, their preferences will be single

peaked over this policy instrument. This then allows us to use the median voter theorem.

- First write the level of consumption of individual  $i$  along the equilibrium balanced growth path:

$$(4.1) \quad c_i = [\alpha \tau^\alpha k \sigma_i + \rho] k_i$$

- Suppose the individual will maximize

$$\int \ln c_i \exp(-\rho t) dt$$

as given by (4.1) and subject to constraint that  $k$  and  $k_i$  should grow at the rate  $\gamma(\tau)$ .

(Note that this is not quite correct, since individuals should also take into account the welfare implications of the adjustment to steady state after a policy change and also anticipate future changes in policies as a function of the current voting behavior. In contrast, here they are simply maximizing utility in steady state. Typically, it is much much harder to solve these types of voting models when we take these dynamic elements into account—see, for example, Krusell and Rios-Rull, 1997, and we will see detailed example based on Hassler et al. later).

- Then the first order condition that gives the preferred tax rate for individual  $i$  is

$$\tau_i - \alpha(1 - \alpha)\tau_i^\alpha = \rho\alpha\theta_i(\tau_i)$$

where

$$\theta_i(\tau_i) = \frac{\alpha\tau_i^\alpha\sigma_i}{\alpha\tau_i^\alpha\sigma_i + \rho}$$

is the share of the labor income component in the consumption of individual  $i$ . This is increasing in  $\sigma_i$ , which means that individuals with *greater* labor income

Table 4. Reduced-Form Regressions

	(1)	(2)	(3)	(4)	(5)
Constant	-.018 (-1.37)	.003 (.21)	-.018 (-1.31)	-.007 (-.50)	-.049 (-3.43)
GDP	-.002 (-1.77)	-.003 (-2.21)	-.003 (-1.48)	-.006 (-3.25)	-.006 (-3.87)
MSE	.031 (4.05)	.016 (1.94)	.028 (3.44)	.031 (4.23)	.021 (2.94)
FSE	-.025 (-3.06)	-.011 (-1.32)	-.024 (-2.79)	-.024 (-3.00)	-.018 (-2.36)
PPPI	-.002 (-.30)	-.004 (-.48)	-.003 (-.32)	.004 (.45)	.0001 (.016)
MID	.118 (2.84)	.082 (1.81)	.111 (2.60)	.047 (1.02)	.083 (2.14)
LAAM		-.008 (-.171)			
ASIA		.011 (1.59)			
AFR		-.013 (-2.48)			
URB			.008 (.69)		
POP65				.241 (2.82)	
LIFEEX					.0009 (4.05)
nobs	67	67	64	67	65
R <sup>2</sup>	.30	.40	.26	.37	.45

Note: Dependent variable: *GR*. t-statistics in parentheses. See the Appendix for definition of variables.



Table 6. Reduced-Form, Democracy Effect

	(1)	(2)	(3)	(4)
Sample	All	Democracy	Nondemocracy	All
Constant	-.008 (-.50)	-.030 (-1.13)	-.016 (-.95)	-.007 (-.45)
<i>GDP</i>	-.004 (-2.35)	-.004 (-2.55)	-.0007 (.17)	-.004 (-2.63)
<i>MSE</i>	.032 (4.20)	.009 (.82)	.042 (3.37)	.040 (3.44)
<i>FSE</i>	-.027 (-3.24)	-.008 (-.73)	-.033 (-1.50)	-.026 (-1.31)
<i>PPPI</i>	.0002 (.02)	-.009 (-.81)	.015 (1.21)	.0004 (.05)
<i>MID</i>	1.78 (1.51)	.203 (2.76)	.050 (.93)	.064 (1.25)
<i>MID * DEM</i>	.080 (.88)			.139 (1.52)
<i>DEM</i>	-.020 (-.66)			-.029 (-.97)
<i>MSE * DEM</i>				-.029 (-1.76)
<i>FSE * DEM</i>				.015 (.68)
nobs	67	33	34	67
<i>R</i> <sup>2</sup>	.31	.27	.43	.35

Note: Dependent variable: GR. t-statistics in parentheses. *MID \* DEM*: *MID* interacted with the democracy dummy variable. Similarly for *MSE \* DEM* and *FSE \* DEM*. See the Appendix for definition of other variables.

Table 7. Reduced-Form, Income Effect

	(1)	(2)	(3)	(4)
Sample	All	Rich	Poor	All
Constant	-.0009 (-.05)	-.047 (-2.24)	-.019 (-.93)	-.018 (-.10)
<i>GDP</i>	-.005 (-2.33)	-.006 (-3.28)	.011 (1.23)	-.005 (-2.62)
<i>MSE</i>	.030 (4.01)	.019 (2.30)	.046 (3.01)	.042 (2.98)
<i>FSE</i>	-.026 (-3.16)	-.018 (-1.99)	-.052 (-1.90)	-.031 (-1.36)
<i>PPPI</i>	.001 (.13)	-.002 (-.25)	.009 (.77)	.003 (.36)
<i>MID</i>	.059 (1.12)	.243 (4.00)	.057 (.95)	.047 (.87)
<i>MID * RICH</i>	.148 (1.67)			.190 (2.08)
<i>RICH</i>	-.042 (-1.48)			-.048 (-1.65)
<i>MSE * RICH</i>				-.022 (-1.29)
<i>FSE * RICH</i>				.013 (.53)
nobs	67	32	35	67
$R^2$	.32	.50	.26	.33

Note: Dependent variable: *GR*. t-statistics in parentheses.  
*MID \* RICH*: *MID* interacted with the democracy dummy variable. Similarly for *MSE \* RICH* and *FSE \* RICH*. See the Appendix for definition of other variables.

Table 8. Economic and Political Mechanisms

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	<i>GR</i>	<i>MTAX</i>	<i>GR</i>	<i>MTAX</i>	<i>GR</i>	<i>MTAX</i>
Sample	All		All		Dem.	
Constant	.004 (.47)	.164 (1.13)	.005 (.65)	.185 (1.23)	.020 (2.30)	.715 (1.86)
<i>GDP</i>	-.004 (-2.39)	-.021 (-1.50)	-.002 (-1.26)	-.022 (-1.37)	-.002 (-1.02)	-.020 (-.98)
<i>MSE</i>	.004 (.38)		.040 (2.88)		-.020 (-1.52)	
<i>FSE</i>	.001 (.10)		-.046 (-2.38)		.020 (1.64)	
<i>PPPI</i>	-.0005 (-.07)		.008 (1.03)		-.016 (-1.64)	
<i>MTAX</i>	.090 (3.61)		.091 (3.73)		.068 (3.18)	
<i>MID</i>		-.096 (-.19)		-.222 (-.45)		-1.906 (-1.42)
<i>MID * DEM</i>				-.901 (-.88)		
<i>DEM</i>				.329 (.99)		
<i>POP65</i>		3.047 (3.78)		3.553 (3.61)		4.430 (3.28)
nobs	49	49	49	49	27	27
<i>R</i> <sup>2</sup>	.22	.30	.24	.29	.30	.29

Note: 2SLS. t-statistics in parentheses. See the Appendix for definition of variables.

Table 10. Sociopolitical Instability

Dependent Variable	(1) <i>GR</i>	(2) <i>SPI</i>	(3) <i>GR</i>	(4) <i>SPI</i>	(5) <i>GR</i>	(6) <i>SPI</i>	(7) <i>GR</i>	(8) <i>SPIG</i>
Constant	.034 (3.46)	.021 (3.26)	.034 (3.72)	.023 (1.70)	.035 (3.58)	.035 (3.54)	.143 (1.79)	.310 (8.14)
<i>GDP</i>	-.004 (-1.81)		-.004 (-1.99)		-.004 (-1.84)		-.007 (-1.55)	
<i>MSE</i>	.028 (2.63)	.006 (1.20)	.028 (2.32)	.009 (1.16)	.026 (1.97)	.005 (.63)	.013 (.72)	-.016 (-.55)
<i>FSE</i>	-.025 (-2.05)	-.009 (-1.20)	-.025 (-2.04)	-.012 (-1.62)	-.024 (-1.77)	-.007 (-.91)	-.012 (-.74)	-.008 (-.28)
<i>PPPI</i>	-.014 (-1.32)		-.014 (-1.36)		-.014 (-1.32)		-.015 (-1.04)	
<i>SPI</i>	-1.495 (-2.27)		-1.555 (-2.82)		-1.606 (-2.54)		.532 (-1.58)	
<i>MID</i>		-.090 (-2.11)		-.071 (-1.94)		-.093 (-2.94)		-.334 (-2.84)
<i>LAAM</i>				.004 (1.09)				
<i>ASIA</i>				-.006 (-.08)				
<i>AFR</i>				.003 (.78)				
<i>HOMOG</i>						-.006 (-1.09)		
nobs	64	64	64	64	60	60	63	63
<i>R</i> <sup>2</sup>	.15	.23	.21	.22	.19	.24	.14	.30

Note: 2SLS. t-statistics in parentheses. See the Appendix for definition of variables.

components will be in favor of *greater* capital taxation. This simply reflects the fact that taxes redistribute income from capital to labor.

- Under majority voting, the equilibrium will be the tax rate choice of the median voter. To find this, rank all individuals in ascending order according to their  $\theta_i$ 's (or  $\sigma_i$ 's), and if the total number of individual is 1, the median would be individual  $i = 1/2$ . Then equilibrium tax rate is

$$(4.2) \quad \tau^m - \alpha(1 - \alpha)(\tau^m)^\alpha = \rho\alpha\theta_{1/2}$$

- Now suppose everybody is equal. Then  $\sigma_i = 1$  for all, and  $\theta_{1/2} = \alpha\tau_i^\alpha / (\alpha\tau_i^\alpha + \rho)$ . The equilibrium tax rate will be that which maximizes utility of all. This tax rate,  $\bar{\tau} > \tau^*$ , since  $\tau^*$  was the tax rate that maximized utility of an agent who holds only capital. Similarly, with a symmetric distribution, the mean and the median will coincide and we will have the median  $\sigma_{1/2} = 1$ , and an equilibrium tax rate of  $\bar{\tau}$
- Next suppose that the distribution of capital ownership is skewed, so that average income is greater than the income of the median. This would correspond to the case where  $\sigma_{1/2} > 1$ —i.e., the median agent has less capital income than the mean. Then from (4.2), he will want to set a higher taxes in order to transfer resources from the richer agents to himself.
- A further increase in inequality, interpreted as an increase in  $\sigma_{1/2}$  (for a given mean) will increase taxes further and reduce growth. This is the source of the negative relationship between inequality and growth in these types of models.

- However, if we have  $\sigma_{1/2} < 1$ , then the median voter will choose a tax rate  $\tau < \bar{\tau}$ , since he is richer than the mean. Now an increase in  $\sigma_{1/2}$  will again increase taxes, but in this case, this corresponds to a reduction in inequality. Therefore, generally there is no unambiguous prediction between inequality and equilibrium tax rates.
- In practice, the distribution of income in most countries (except at the very top) resembles log normal, so the assumption that the median is less than the mean is reasonable. But the assumption that an increase inequality increases the gap between the mean and the median is not necessarily true even when the distribution is quite close to log normal.
- Finally, the case with  $\sigma_{1/2} < 1$  also shows that an increase inequality can increase the growth rate of the economy, since by reducing  $\sigma_{1/2}$  in this case, it reduces taxes. Interestingly, this reduction in the tax rate increases growth since  $\bar{\tau} > \tau^*$ . Yet, this tax reduction does not improve the allocation of resources. In this case, the tax rate was already too low relative to  $\bar{\tau}$ , and the majority of the agents do not want the tax rate to get closer to  $\tau^*$ .

#### 4.2. The Evidence.

- The median voter approach, combined with the specific assumptions here, suggests that greater inequality should lead to higher taxes and greater redistribution. Greater redistribution should in turn lead to lower growth.
  - What is the evidence?
- (1) over the post-war period, there seems to be a negative relationship between inequality and growth: more unequal societies are growing less (e.g., Alesina and Rodrik, Persson and Tabellini, Perotti).

- (2) this relationship is largely driven by differences between OECD economies and Latin American economies (e.g. Bourgninon).
- (3) it is not clear what the causality is. It is quite possible that both growth and inequality are affected by some omitted factors (for example, differences in institutions or social structure).
- (4) the relationship between inequality and growth becomes positive when we look at panel regressions (Forbes, 2000). This either means that the cross-country relationship was misspecified, or the panel regression is capturing short-run movements, while the cross-sectional relationship is capturing the effect of inequality in the long run. At the moment, there is no way to sort out these alternative explanations.

- What about the mechanisms?
- It is difficult to establish causality, but the cross-country evidence does not give great support to the chain of causation implied by the Meltzer-Richard approach.
- It turns out that there is no robust relationship between redistribution and growth. And if anything, societies redistributing more are the ones experiencing faster growth.
- More important, *higher* pre-tax inequality is often associated with *less* redistribution (Perotti). This evidence is not very supportive of the approaches based on this approach.
- One way out is to interpret “taxes” more generally, as any activity that reduces the private return to investment. One possibility would be political instability. There seems to be a robust negative correlation between inequality and political instability. Then higher inequality will lead to greater political instability, and

through this channel, it will reduce investment and growth. We would not necessarily see greater redistribution through the usual means resulting from higher inequality.

### 4.3. Redistribution and Growth When Inequality Is Harmful.

- Another possibility is to look for the relationship between inequality and growth through a different channel.
- In particular, with other imperfections in the economy, increased transfers from the “average” citizen to poorer agents may improve the allocation of resources. Examples of these types of economies would include models like Galor and Zeira or Benabou where inequality of income is costly for economic outcomes, for example because inequality reduces average human capital.
- Recall from above that greater inequality can sometimes lead to *less* redistribution.
- Therefore, one possible class of models includes those where an increase in pre-tax inequality reduces redistribution, creating further distortions. If redistribution has an effect on pre-tax inequality next period, multiple steady states are possible as in Benabou (2000).
- Here I give a very simple example: suppose the economy consists of three groups, upper class, middle class and lower class. All agents within a class have the same income level.
- A middle class agent is the median voter, and decides the linear tax rate on incomes. Tax revenues are redistributed lumpsum. Let  $y_m$  be the income of a middle-class agent,  $y_l$  be the income of the lower class agent, and  $\bar{y}$  be the average income. Assume that  $\bar{y} > y_m$ .



- Also assume that redistributive taxation at the rate  $\tau$  has a cost  $c(\tau)$  per unit of income. Then, the median voter will maximize

$$(1 - \tau) y_m + (\tau - c(\tau)) \bar{y}$$

The first-order condition is:

$$\frac{\bar{y} - y_m}{\bar{y}} = c'(\tau)$$

- The left-hand side of this expression,  $(\bar{y} - y_m) / \bar{y}$  corresponds to 1 minus the income share of the middle class, and some empirical work, e.g., Perotti, has looked explicitly at the relationship between policy and income share of the middle class.
- Now imagine a reduction in  $y_l$  and a corresponding increase in  $y_m$  such that average income,  $\bar{y}$ , remains unchanged. This increase in the income share of the middle class will reduce the desired tax rate of the median voter. But in this example, this change in the income distribution corresponds to *greater inequality*. So we have a situation in which greater inequality reduces taxes.
- Next, imagine that because of credit market problems, lower class agents are unable to invest in human capital. Then, a reduction in (post-tax) inequality will lead to greater human capital investments, and perhaps to higher growth.
- Although this type of model, for example, Benabou (2000), is more consistent with the cross-country correlations between redistribution, inequality and growth, we need micro evidence to determine which of these mechanisms is more relevant.
- Unfortunately, there is very little microlevel empirical work on this topic.

## 5. Probabilistic Voting Models

- The above analysis discussed situations in which we could apply median voters theorems without problems of cycling. As noted before, many situations do not fall into this category. In these situations, the payoff functions of parties are

discontinuous in their policy promises, and a Nash equilibrium often fails to exist in the party competition again.

- One way of dealing with the situations is to extend the standard voting models to “probabilistic” voting models, where there is enough individual heterogeneity that the payoff functions of different parties are “smooth” in policy choice, ensuring the existence of an equilibrium exists.

### 5.1. An example of cycling and nonexistence.

- Consider redistribution of a fixed amount among three (groups of) voters,  $i = 1, 2, 3$ , with each group of equal size.
- Assume that each group has preferences

$$W(q) = U(q^i),$$

$q^i$  is a nonnegative transfer out of a fixed budget normalized to unity:

$$\sum_{i=1}^3 q^i = 1.$$

Also assume that the common utility function  $U(\cdot)$  is strictly monotonic.

- There are two parties offering policies in order to maximize their probability of coming to power
- Now it is clear that there will be cycling and nonexistence here. To see this, note the following:
- A policy will be the winner if it gets votes from 2 agents.
- Now take a winning policy  $(q_1, q_2, q_3)$  where without any loss of generality supposed that  $q_1 > 0$ . Then the following policy will always be beat this winning policy  $(q_1 - 2\varepsilon, q_2 + \varepsilon, q_3 + \varepsilon)$ , proving that there will always be cycling.

### 5.2. Basic idea of probabilistic voting.

- Let  $\pi_P^i$  be the probability perceived by the candidates that voter  $i$  votes for party  $P$ ,  $P = A, B$ , and suppose that these probabilities refer to independent events for different voters. Then the expected vote share of party  $P$  is

$$\pi_P = \frac{1}{I} \sum_{i=1}^I \pi_P^i.$$

- Under Downsian electoral competition with two identical parties,  $\pi_P^i$  jumps discontinuously from 0 to 1 as voter  $i$  always votes with certainty for the party that promises the better policy. Because of these discontinuous jumps, a Nash equilibrium in the electoral competition game may fail to exist.
- Probabilistic voting models instead assume that

$$\pi_A^i = F^i(W(q_A; \alpha^i), W(q_B; \alpha^i)),$$

where  $F^i(\cdot)$  is a smooth and continuous function, increasing in the first argument and decreasing in the second, and now think of  $q$  as a vector, with the  $j$ th element denoted by  $q_j$ .

- This smoothness implies that a small unilateral deviation by one party does not lead to jumps in its expected vote share and thus gives rise to well-defined equilibria.
- An interesting special case would be one where

$$\pi_A^i = F^i(W(q_A; \alpha^i) - W(q_B; \alpha^i)),$$

where  $F^i(\cdot)$  is a continuous and well-behaved cumulative distribution function (c.d.f.), associated with a probability distribution. Moreover, it will sometimes be convenient to look at the special and tractable case where all  $F^i(\cdot)$ 's are uniform.

- Furthermore, suppose that parties maximize their expected vote share. In this case, party  $A$  sets  $q_A$  to maximize:

$$(5.1) \quad \pi_A = \frac{1}{I} \sum_{i=1}^I F^i(W(q_A; \alpha^i) - W(q_B; \alpha^i)).$$

Clearly, party B faces a symmetric problem, and in a Nash equilibrium with simultaneous policy announcements both candidates announce the same equilibrium policies:  $q_A = q_B$ .

- Moreover, the first-order conditions for a maximum of (5.1), evaluated at the equilibrium policy  $q_A$ , and taking  $q_B$  as given, can be written as

$$\sum_{i=1}^I f^i(0) \frac{\partial W(q_A; \alpha^i)}{\partial q_{jA}} = 0$$

for all  $j$ . In these expressions,  $f^i(0)$  denotes the density corresponding to the c.d.f.  $F^i(\cdot)$ , evaluated at 0 (that is, in equilibrium).

- Thus the equilibrium under this form of electoral competition implements the maximum of a particular weighted social welfare function, where voter  $i$  receives weight  $f^i(0)$ . In other words, we have that the equilibrium policies determined as

$$q^* \in \arg \max_q \sum_{i=1}^I f^i(0) W(q; \alpha^i)$$

- Voters with higher  $f^i(0)$  weigh more heavily, because in a neighborhood of the equilibrium they are more likely to reward policy favors with their vote. We can think of a group with high  $f^i(0)$  as a group of swing voters.
- In other words, more “responsive” voters, who have a higher density  $f^i(0)$ , receive a better treatment under electoral competition. Clearly, if all voters are equally responsive (if they all have the same value of  $f^i(0)$ ), this form of electoral competition implements the utilitarian optimum.

- Note the parallel of the implications of this model to that of the lobbying model. What is the intuition?

### 5.3. Application: the power of the middle class.

- I will now use the probabilistic voting model to show how a unique equilibrium will emerge in the redistribution problem with three groups discussed above, and also show how the “middle class” may get disproportionate redistribution if they are perceived as the “swing voters”.
- Again assume that the population consists of three distinct groups,  $J = R, M, P$ , representing the rich, the middle class, and the poor, respectively.
- Each group has preferences

$$W(q) = U(q^i),$$

$q^i$  is a nonnegative transfer out of a fixed budget normalized to unity:

$$\sum_{i=1}^3 q^i = 1.$$

and  $U(\cdot)$  is the strictly monotonic utility function common to all groups.

- The population share of group  $J$  is  $\alpha^J$ , with  $\sum_J \alpha^J = 1$ .
- The relevant policy vector is again a vector of redistributions  $q = (q_1, q_2, q_3)$
- At the time of the elections, voters base their voting decision both on the economic policy announcements and on the two parties' ideologies relative to the realization of their own ideology.
- As before, the two parties A and B simultaneously announce their policies, and voters vote between the two parties. At the time of policy announcement, the parties do not know the realization of the stochastic elements. At the time of voting, each individual knows the realization of its own preferences.

- In particular, voter  $i$  in group  $J$  prefers party  $A$  if

$$W^J(q^A) > W^J(q^B) + \sigma^{iJ} + \delta.$$

Here,  $q^A$  is a policy vector of party A, and  $q^B$  is the policy vector of party B.

- $\sigma^{iJ}$  is the individual-specific ideology parameter that can take on negative as well as positive values. This parameter measures voter  $i$ 's individual ideological bias toward candidate  $B$ . A positive value of  $\sigma^{iJ}$  implies that voter  $i$  has a bias in favor of party  $B$ , whereas voters with  $\sigma^{iJ} = 0$  are ideologically neutral, that is, they care only about the economic policy.
- Let us assume that this parameter for each group  $J$  has group-specific uniform distribution on

$$\left[ -\frac{1}{2\phi^J}, \frac{1}{2\phi^J} \right].$$

These distributions thus have density  $\phi^J$ , and neither of the three group has any bias towards one of the candidates/parties.

- Also assume, for simplicity, that

$$\sum_J \alpha^J \phi^J = 1$$

- The parameter  $\delta$  measures the average (relative) popularity of candidate  $B$  in the population as a whole, and also can be positive or negative. Assume that it has a uniform distribution on

$$\left[ -\frac{1}{2\psi}, \frac{1}{2\psi} \right].$$

- The “swing” voter in group  $J$  will be a voter whose ideological bias, given the candidates’ platforms, makes him indifferent between the two parties. This swing voter is defined as

$$\sigma^J = W^J(q^A) - W^J(q^B) - \delta.$$

All voters in group  $J$  with  $\sigma^{iJ} \leq \sigma^J$  prefer party  $A$ .

- Therefore, party  $A$ 's actual vote share is

$$\pi_A = \sum_J \alpha^J \phi^J \left( \sigma^J + \frac{1}{2\phi^J} \right).$$

- Notice that  $\sigma^J$  depends on the realized value of  $\delta$ , the vote share  $\pi_A$  is also a random variable.
- From the perspective of both parties, at the time of policy choice, the electoral outcome is thus a random event, related to the realization of  $\delta$ .
- Party  $A$ 's probability of winning is then

$$(5.2) \quad p_A = \text{Prob}_\delta \left[ \pi_A \geq \frac{1}{2} \right] = \frac{1}{2} + \psi \left[ \sum_{J=1}^3 \alpha^J \phi^J [W^J(q^A) - W^J(q^B)] \right],$$

Party  $B$  wins with probability  $1 - p_A$ .

- The two parties will choose  $q^A$  and  $q^B$  to maximize their probabilities of coming to power.
- It should be clear that the unique equilibrium will involve both parties converging to the same platform,  $q^* = (q_1^*, q_2^*, q_3^*)$  (since the two parties are facing exactly the same concave optimization problem—concavity follows from the concavity of the  $W^J$  functions).
- To characterize this equilibrium policy vector, let us write (5.2) more explicitly, also assuming that party  $B$  has announced the equilibrium policy  $q_B = q^*$ :

$$(5.3) \quad p_A = \text{Prob}_\delta \left[ \pi_A \geq \frac{1}{2} \right] = \frac{1}{2} + \psi \left[ \begin{array}{l} \alpha_1 \phi_1 (U(q_1^A) - U(q_1^*)) \\ + \alpha_2 \phi_2 (U(q_2^A) - U(q_2^*)) \\ + \alpha_3 \phi_3 (U(q_3^A) - U(q_3^*)) \end{array} \right],$$

Party  $A$  will maximize (5.3) subject to the constraint that

$$(5.4) \quad q_1^A + q_2^A + q_3^A = 1.$$

- This maximization problem has the following three first-order conditions

$$(5.5) \quad \begin{array}{l} \alpha_1 \phi_1 U'(q_1^A) = \lambda \\ \alpha_2 \phi_2 U'(q_2^A) = \lambda \\ \alpha_3 \phi_3 U'(q_3^A) = \lambda \end{array}$$

where  $\lambda$  is the Lagrangean multiplier on (5.4).

- There are two important implications that follow from (5.5):
  - (1) There now exists a unique equilibrium policy vector that both parties converge to, despite the fact that preferences are not single-peaked.
  - (2) Groups that have high  $\phi$ , that is groups that are more sensitive to policy and have weaker ideological bias, act as swing voters, and obtain more redistribution. This could be a possible explanation for why middle classes often obtain more redistribution in democracies [...why should middle class voters be more sensitive to economic policies? Perhaps less party ideology in a world where many parties (used to) represent capital or labor?....]

## 6. Models with Party/Candidate Ideology

- Finally, let us discuss models with “partisan politics”.
- So far the parties did not have a preference over policies, or at least they could commit to their policy platform.
- Another possibility is to have parties that represent existing constituencies, and unable to comments to particular policies, so that their “preferences” will determine post-election policies. Such an approach may be more in line with theories of political economy based on class conflict for example.
- Moreover, a situation with partisan parties helps us in dealing with situations of nonexistence and cycling as well.

### 6.1. Basic ideas.

- Imagine a situation in which party A prefers policy  $q_A$  to all other policies, and party B prefers  $q_B$  to all other policies, and there is no ex ante commitment to policies that will be chosen after the election.



- Then, whatever announcement a party makes ex ante is not informative, and each party will choose its most preferred policy once it comes to power.
- The immediate implication of this observation is that an equilibrium policy may exist (typically will exist) even when preferences are not single peaked.
- For example, consider the problem of redistribution to the three groups discussed above, where preferences were not single peaked, and political competition without party ideology led to cycling and nonexistence.
- For simplicity, assume that the three groups are of equal size.
- Now suppose that there are two parties, and party A prefers the policy  $q_A = (q_1^A, q_2^A, q_3^A)$  to all other policies, and party B prefers  $q_B = (q_1^B, q_2^B, q_3^B)$ .
- Irrespective of what their announcement are before the election, the two parties will implement their preferred policies.
- This implies that voters, anticipating this outcome, will vote simply comparing these two policy vectors. Without loss of any generality assume that  $q_1^A > q_1^B$ . So in this case, we will have the equilibrium policy be  $q_A = (q_1^A, q_2^A, q_3^A)$  if either  $q_2^A > q_2^B$  or  $q_3^A > q_3^B$ , and  $q_B = (q_1^B, q_2^B, q_3^B)$  when  $q_2^A < q_2^B$  and  $q_3^A < q_3^B$  (with obvious randomization when some of these inequalities are weak).

## 6.2. Electoral competition with partisan politics.

- To analyze the variations of electoral competition now, imagine that there is a single dimension of policy, again denoted  $q$  from a convex and compact set  $Q$ , and let there be two parties  $A$  and  $B$ .
- The two parties have the following objective functions

$$\begin{aligned}
 (6.1) \quad \text{Party } A & : \max_{q_A} P(q_A, q_B) (R + W_A(q_A)) + (1 - P(q_A, q_B)) W_A(q_B) \\
 \text{Party } B & : \max_{q_B} (1 - P(q_A, q_B)) (R + W_B(q_B)) + P(q_A, q_B) W_B(q_A),
 \end{aligned}$$

where  $W_A(q)$  and  $W_B(q)$  denote the ‘utility functions’ of parties  $A$  and  $B$ , and  $R$  is a rent from being in office, which is assumed to be weakly positive. So parties are now maximizing their ‘expected utility’ taking into account the voting behavior of the citizens as summarized by the function  $P(q_A, q_B)$ , which denotes the probability that party  $A$  will come to power when the two parties adopt policies  $q_A, q_B$ . This expected utility consists of their ideological preferences over policies that are implemented, and the rent from coming to office.

- To start with, we consider the case where  $P(q_A, q_B)$  is given by (1.2) above, i.e.,

$$(6.2) \quad P(q_A, q_B) = \begin{cases} 1 & \text{if } V^M(q_A) > V^M(q_B) \\ \frac{1}{2} & \text{if } V^M(q_A) = V^M(q_B) \\ 0 & \text{if } V^M(q_A) < V^M(q_B) \end{cases}$$

where  $V^M$  is the utility of the median voter. This would be the case for example, when preferences are single peaked and there are no ideological considerations on the side of the voters.

- Moreover, suppose that the utility functions of the parties are smooth and strictly quasi-concave (i.e., single peaked), with ideal policies  $q_A^*$  and  $q_B^*$ , i.e.,

$$q_A^* = \arg \max_{q_A} W_A(q_A) \quad \text{and} \quad q_B^* = \arg \max_{q_B} W_B(q_B).$$

In other words,  $W'_A(q_A^*) = 0$  and  $W'_B(q_B^*) = 0$ .

- Finally, as before assume that both parties choose their policies (policy platforms) simultaneously. Therefore, the predictions of this model can be summarized by the corresponding *Nash Equilibrium*, where each party chooses the policy which maximizes its utility given the policy of the other party. Nash Equilibrium policy platforms,  $(q_A^N, q_B^N)$ , will satisfy the following conditions:

$$q_A^N = \arg \max_{q_A} P(q_A, q_B^N) [R + W_A(q_A)] + [1 - P(q_A, q_B^N)] W_A(q_B^N),$$

and, simultaneously,

$$q_B^N = \arg \max_{q_B} [1 - P(q_A^N, q_B)] [R + W_B(q_B)] + P(q_A^N, q_B) W_B(q_A^N).$$

Intuitively these conditions state that in a Nash Equilibrium, taking  $q_B^N$  as given,  $q_A^N$  should maximize party  $A$ 's expected utility. At the same time it must be true that, taking  $q_A^N$  as given,  $q_B^N$  should maximize  $B$ 's expected utility.

- The problem in characterizing this Nash equilibrium is that the function  $P(q_A, q_B)$ , as shown by (6.2), is not differentiable. Nevertheless, it is possible to establish the following proposition, which was first established by Calvert (1985), and shows that even with partisan politics, there will be policy convergence, and this convergence will typically be to the most preferred point of the median voter.

**PROPOSITION (Policy Convergence with Partisan Politics):** Consider the partisan politics model described above, with ideal points of the two parties  $q_A^*$  and  $q_B^*$ , and the ideal point of the median voter corresponding to  $q^M$ . Suppose also that the probability of party  $A$  winning the election is given by  $P(q_A, q_B)$ , as in (6.2). We have that:

- If  $q_A^* \geq q^M \geq q_B^*$  or if  $q_B^* \geq q^M \geq q_A^*$ , then the unique equilibrium involves  $q_A = q_B = q^M$  and each party wins the election with probability one half.
- Otherwise, the unique equilibrium involves  $q_A = q_B = q^M$  if  $R > 0$ , and if  $R = 0$ , then  $q_A = q_B = q_A^*$  when  $V^M(q_A^*) > V^M(q_B^*)$  and  $q_A = q_B = q_B^*$  when  $V^M(q_A^*) < V^M(q_B^*)$ .
- Therefore, the basic result is that although there can be exceptions when there are no rents from coming to office and both parties have the same type of ideological bias, there are very strong forces towards policy convergence. As the discussion will illustrate, the source of these powerful forces is equation (6.2),

which implies that the policy that comes closer to the median voter's preferences will win relative to another policy.

- To see the proof of this for proposition, start with the first case where the preferences of the median voter are intermediate with respect to the ideal points of the two parties. Consider first the situation in which  $q_A = q^M \neq q_B$ . Then, we have that  $P(q_A, q_B) = 1$ , and party  $A$  is winning for sure. The utility of party  $B$  is given by:  $W_B(q^M)$ . Now imagine a deviation by party  $B$  to  $q_B = q^M$ . Now we will have that  $P(q_A, q_B) = 1/2$ , so the utility of party  $B$  changes to  $R/2 + W_B(q^M) > W_B(q^M)$ , hence the deviation is profitable, and  $q_A = q^M \neq q_B$  cannot be an equilibrium (in the case where  $R = 0$ , the argument is a little different, and now party  $A$  can change its policy to something slightly away from  $q^M$  towards its ideal point  $q_A^*$  and still win the election and now implement a policy closer to its preferences.)
- Similarly, consider now a situation where  $q_A \neq q^M \neq q_B$ , and suppose without loss of any generality that  $q_A^* > q^M > q_B^*$  and  $V^M(q_A) > V^M(q_B)$ , so that we again have  $P(q_A, q_B) = 1$ . It is clear that we must have  $q_A \geq q^M$ , otherwise, party  $A$  could find a policy  $q'_A$  such that  $V^M(q'_A) > V^M(q_B)$  and  $q'_A \geq q^M$  preferable to any  $q_A \in (q^M, q_B)$ . But then party  $B$  is obtaining utility  $W_B(q_A)$ , and by changing its policy to  $q_B = q^M$  it will obtain utility  $R + W_B(q^M)$  if  $q_A > q^M$  and  $R/2 + W_B(q^M)$  if  $q_A = q^M$ . By the fact that  $q_A \geq q^M$  both of these are greater than its initial utility,  $W_B(q_A)$ , hence, no policy announcements with  $q_A \neq q^M \neq q_B$  can be an equilibrium. Therefore, the equilibrium must have  $q_A = q_B = q^M$ , i.e., convergence to the median. Intuitively, the median voter's ideal point is preferable to each party relative to the other party's ideal point, and moreover increases their likelihood of coming to power. Therefore, no policy other than the median voter's ideal point can ever be implemented in equilibrium.

- Next let us consider the case where  $q_B^* > q_A^* > q^M$  (other configurations give analogous results) Now, suppose that we have  $q_A = q_A^*$ . What should party  $B$  do? Clearly, any policy  $q_B > q_A^*$  will lose the election.  $q_B = q_A^*$  will win the election with probability  $1/2$  and is preferable. But in fact party  $B$  can do better. It can set  $q_B = q_A^* - \varepsilon$  which is closer to the median voter's preferences, and by the fact that voters' preferences are single peaked, this is preferable to  $q_A^*$ , and therefore will win the election for party  $B$ . Although this policy is worse for party  $B$  than  $q_A^*$  (since  $q_B^* > q_A^*$ ), for  $\varepsilon$  small enough, the difference is minuscule, whereas the gain in terms of the rent from coming to power is first-order. This argument only breaks down when  $R = 0$ , and in this case, the best thing that party  $B$  can do is to offer  $q_B = q_A^*$  (or any other policy  $q_B > q_A^*$  for that matter, since it does not care about coming to power, and in either case,  $q_A^*$  will be the equilibrium policy).
- We therefore see that policy convergence to the median is a rather strong force, but they can be exceptions especially when rents from coming to power are nonexistent.
- Nevertheless, the above results depend crucially on the form of the  $P(q_A, q_B)$  function, which created very strong returns to being close to the most preferred point of the median voter. We saw in the last section how in the presence of ideological considerations on the side of the voters,  $P(q_A, q_B)$  can become a continuous function. If that's the case, then policy convergence will break down. To see this, suppose that  $P(q_A, q_B)$  is a continuous and differentiable function, and suppose that it reaches its maximum for each party at  $q^M$  (i.e., being closer to the median voter's preferences is still beneficial in terms of the probability of being elected—that we make this point which maximizes winning probabilities the median voter's ideal point is simply a normalization without any consequences).

In that case, the Nash equilibrium of the policy competition game between the two parties will be a pair of policies  $q_A^N, q_B^N$  such that the following first-order conditions hold:

$$(6.3) \quad \begin{aligned} \frac{\partial P(q_A^N, q_B^N)}{\partial q_A} (W_A(q_A^N) + R - W_A(q_B^N)) + P(q_A^N, q_B^N) W'_A(q_A^N) &= 0, \\ -\frac{\partial P(q_A^N, q_B^N)}{\partial q_B} (W_B(q_B^N) + R - W_B(q_A^N)) - P(q_A^N, q_B^N) W'_B(q_B^N) &= 0. \end{aligned}$$

- The first term on both lines is the gain in terms of the utility of winning times the change in the probability of winning in response to a policy change, and the second term is the product of the current probability of winning times the gain in terms of improvements in the party's utility because of the policy change. When these two marginal effects are equal to each other, each party is playing its best response. When both parties are playing their best responses, we have the Nash equilibrium.
- Inspection of these first-order conditions will reveal that both parties offering the ideal point of the median voter, i.e.,  $q_A = q_B = q^M$ , is typically not an equilibrium, despite the fact that the probability of winning is higher for both parties at this point. The reason is that now parties are trading off ideological benefits coming from their partisan views against the probability of winning. To see this, suppose that  $q_A = q_B = q^M$ , and party  $A$  deviates and offers a policy slightly away from  $q^M$  and closer to its ideal point,  $q_A^*$ . The first effect of this on party  $A$ 's utility is a loss  $\frac{\partial P(q^M, q^M)}{\partial q_A} R < 0$ , where the negative sign follows from the fact that any move away from  $q^M$  necessarily reduces the probability of winning by definition. But nevertheless, as long as  $P(q^M, q^M) W'_A(q^M)$  is large, i.e., party  $A$  is sufficiently ideological, the deviation can be profitable, i.e., we can have  $P(q^M, q^M) W'_A(q^M) > -\frac{\partial P(q^M, q^M)}{\partial q_A} R$ . In this case, we will get non-convergence in the two parties' platforms, and equilibrium policy will be different from the

preferences of the median voter, and will depend on the preferences of the parties' ideologies.

- Moreover, suppose that both parties are ideologically biased in one direction relative to the populace. In particular, suppose that  $q_B^* > q_A^* > q^M$ . Now it is easy to see that  $q_A = q_B = q_A^*$  can be an equilibrium because by shifting its platform to  $q_B = q_A^* - \varepsilon$ , party will only increase its chance of winning the election continuously, since  $P(q_A, q_B)$  is a continuous and smooth function.
- Then we have:

**PROPOSITION (Policy Non-Convergence with Partisan Politics and Probabilistic Voting):** Suppose that  $P(q_A, q_B)$  is a continuous and smooth function because of probabilistic voting (or other reasons). Then there can exist in equilibrium where  $q_A \neq q_B \neq q^M$  even if  $R > 0$ .

- The reason why this proposition is important for us is that it suggests that certain groups can be quite powerful in democratic politics if they can manage to control the ideological leanings of the parties.

### 6.3. Commitment and Convergence.

- An important assumption so far is that parties announce policy platforms and then they can commit to the policies that they have announced in those platforms. This way, parties could basically compete by varying the policies that they will implement when in office. However, as emphasized by Alesina (1988), the assumption of commitment is not necessarily plausible. In these one-shot models, what is there to stop the politicians from changing policies to their ideal point once they come the power? Nothing. There is no potential punishment (there would have been some punishment if we were in the world with repeated elections, but this is beyond the scope of our treatment here).

- Therefore, it is important to see what happens when we remove this commitment assumption. So consider the model of the last section, but assume that parties can choose whichever policy they like when they come to office. Suppose also that  $P(q_A, q_B)$  is given by (1.2). This means that announcements before the election are nothing other than cheap talk, and in the subgame perfect equilibrium, voters will realize that once they come to power, parties will implement their ideal points. Therefore, they will simply compare  $V^i(q_A^*)$  and  $V^i(q_B^*)$ , and vote for whichever party has an ideal point closer to their ideal point. The result will be that the party with an ideal point closer to that of the median voter will win.

We therefore have that

**PROPOSITION (Policy Non-Convergence With Partisan Politics and No Commitment):** Suppose that there is no commitment to policy platforms in the above model of partisan politics. Then in the unique equilibrium, we have that: if  $V^M(q_A^*) > V^M(q_B^*)$  party  $A$  comes to power with probability 1 and the equilibrium policy is  $q_A^*$ ; if  $V^M(q_B^*) > V^M(q_A^*)$  party  $B$  comes to power with probability 1 and the equilibrium policy is  $q_B^*$ ; and if  $V^M(q_A^*) = V^M(q_B^*)$  each party comes the power with probability 1/2 and the equilibrium policy is  $q_A^* = q_B^*$ .

- In this model of partisan politics without commitment, we see that parties' policy preferences matter more. This implies that control of the political agenda and parties internal structures may now be much more important in determining equilibrium policies.
- Even though the analysis in this section shows that the way that some groups, in particular, richer segments of the society, may influence equilibrium policies through political capture is quite different from their effects in the probabilistic voting model and lobbying model, the overall result is the same: certain groups can be more powerful in democratic politics than suggested by the basic model



of Downsian political competition. This result is important for our analysis of the emergence and consolidation of democracy below, but what matters is this general qualitative tendency. Therefore, in the rest of the book, we will use the formalization of the probabilistic voting and lobbying models, which can be summarized by saying that equilibrium policies will be such that they maximize a weighted utilitarian social welfare function

$$\sum_{i=1}^I \chi^i V^i(q),$$

and in this formulation, the parameters  $\chi^i$ 's denotes the political power of the groups. Given the analysis in this section, however, we will think of these parameters more generally as resulting from political capture as well as lobbying and probabilistic voting.

#### 6.4. Entry of parties.

- Besley and Coate study an extended form of these partisan politics models with entry decisions of parties endogenized.
- For example, imagine that in the above game each of the three groups can organize their own party at some (small) cost  $\varepsilon$ . What is the equilibrium of the game?
- Besley and Coate show that this class of games always has an equilibrium (though the equilibria may be a mixed strategy one). Typically, however, there are many equilibria.
- For example, suppose that if there is a tie in votes, there will be randomization over all the parties with equal votes.
- Then, in the above model, there is a unique equilibrium in which all three groups organize their own parties, and each agent votes for its own party.
- Alternatively, consider a situation in which group 1 is larger than the other two groups, which are of equal size, and group 1 is less than half of the population.

- Now there exists an equilibrium in which only group 1 organizes as a party, and group 1 agents obtain all the redistribution. If group 2 deviates and organizes a party, in the continuation game (in the subgame following group 2's entry) group 3 members randomize between the two parties with equal probability (this is optimal for them, since both parties will give them zero redistribution). Therefore, since there are many agents within each group, the party representing group 1 will obtain half of the votes from group 3 and win the election. Therefore, it is a best response for group 2 not to enter.
- However, there is also another equilibrium in which groups 2 and 3 organize, and group 1 does not enter. Members of group 2 and 3 vote for their own party, and members of group 1 randomize between the two parties. A deviation by group 1 is not profitable because in the continuation game following group 1's entry, all group 2 agents vote for the party of group 3. This is optimal for them since in either case they're getting zero redistribution.

### 6.5. Repeated interactions.

- Another possible set of issues arises when parties have ideologies, and are competing dynamically.
- To discuss the set of issues here suppose that two parties A and B are competing for election every period, and these parties have utilities given by

$$-\sum_{t=0}^{\infty} \beta^t (q_t - q^A)^2 \quad \text{and} \quad -\sum_{t=0}^{\infty} \beta^t (q_t + q^B)^2$$

where  $q_t$  is the policy choice at time  $t$ .

- Suppose that  $q = 0$  is the Condorcet winner in every period, and assume that

$$q^A > q^B > 0$$

Can we design some type of trigger strategies such that party A is convinced to choose  $q = 0$  all the time?

- Consider the following voters strategies:

All voters vote for party A now at time  $t = 0$ , and keep on voting for party A at time  $t = k$  as long as  $q_{k-j} = 0$  for all  $j \leq k$ . If  $q_{k-j} \neq 0$  for some  $j \leq k$ , all voters with bliss point  $q < \varepsilon$  for some small  $\varepsilon$  vote for party B in all future elections.

- First note that once it comes to power, party B will always choose its most preferred policy,  $q = -q^B$ , since it's behaving under no constraints.
- Moreover, since  $q^A > q^B > 0$ , more than half of the voters will support party B against party A when both of them are playing their most preferred policy.
- Then, if party A adopts the policy of  $q = 0$  in all periods, its utility is

$$V_C^A = - \sum_{t=0}^{\infty} \beta^t (q^A)^2 = \frac{-(q^A)^2}{1 - \beta}$$

If it deviates to its most preferred policy, its utility this period is 0, but from the next period onwards, the equilibrium policy will be  $q = -q^B$ , so the utility to deviating is

$$V_D^A = - \sum_{t=1}^{\infty} \beta^t (q^B + q^A)^2 = \frac{-\beta (q^B + q^A)^2}{1 - \beta}$$

Therefore, despite party ideologies, the Condorcet winner will be implemented as long as

$$V_C^A \geq V_D^A,$$

that is, as long as

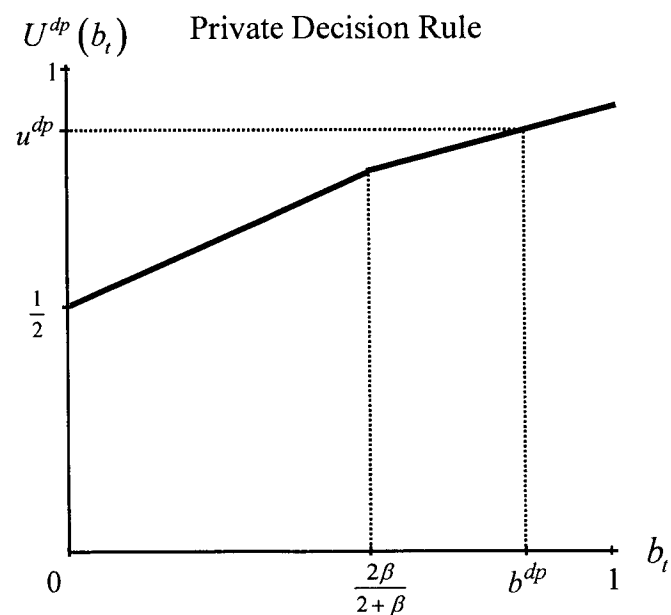
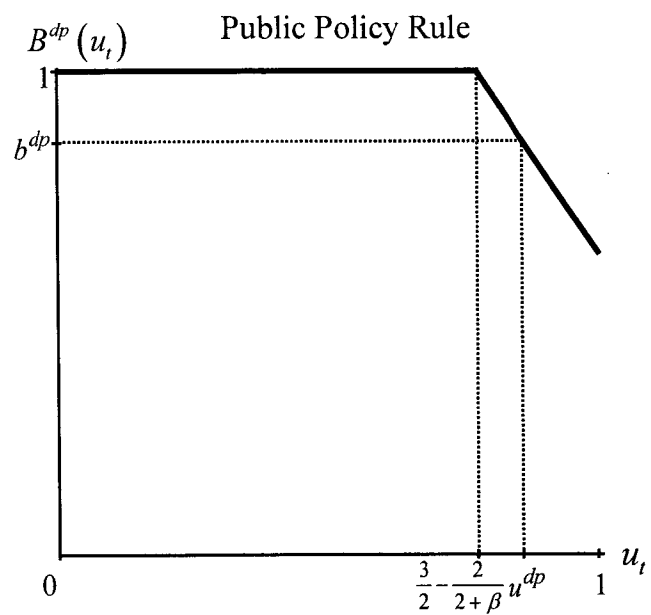
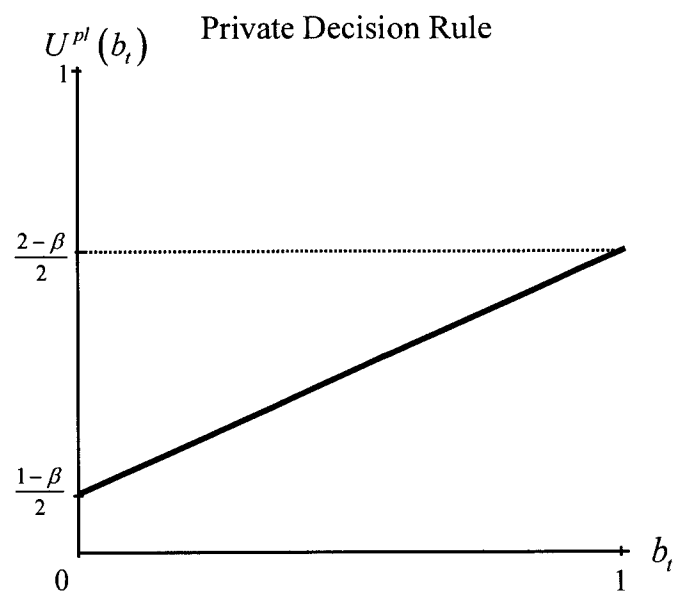
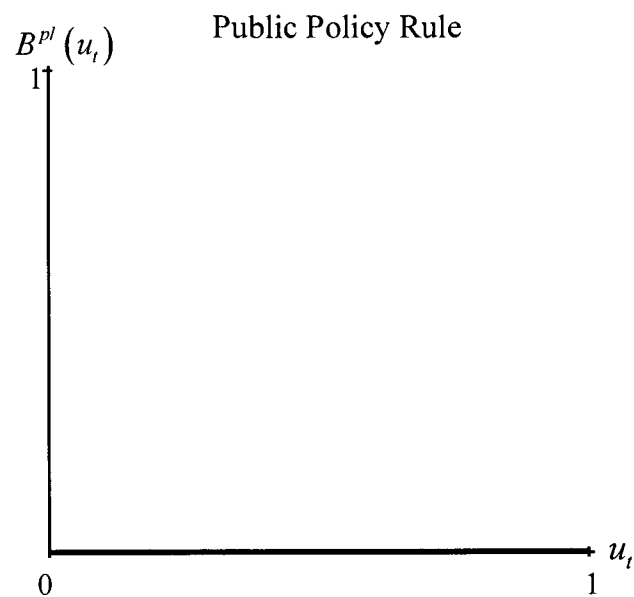
$$\beta (q^B + q^A)^2 \geq (q^A)^2$$

- This condition will be satisfied if  $\beta$  is high enough, that is, if political parties are patient, or if  $q^B$  is sufficiently large.

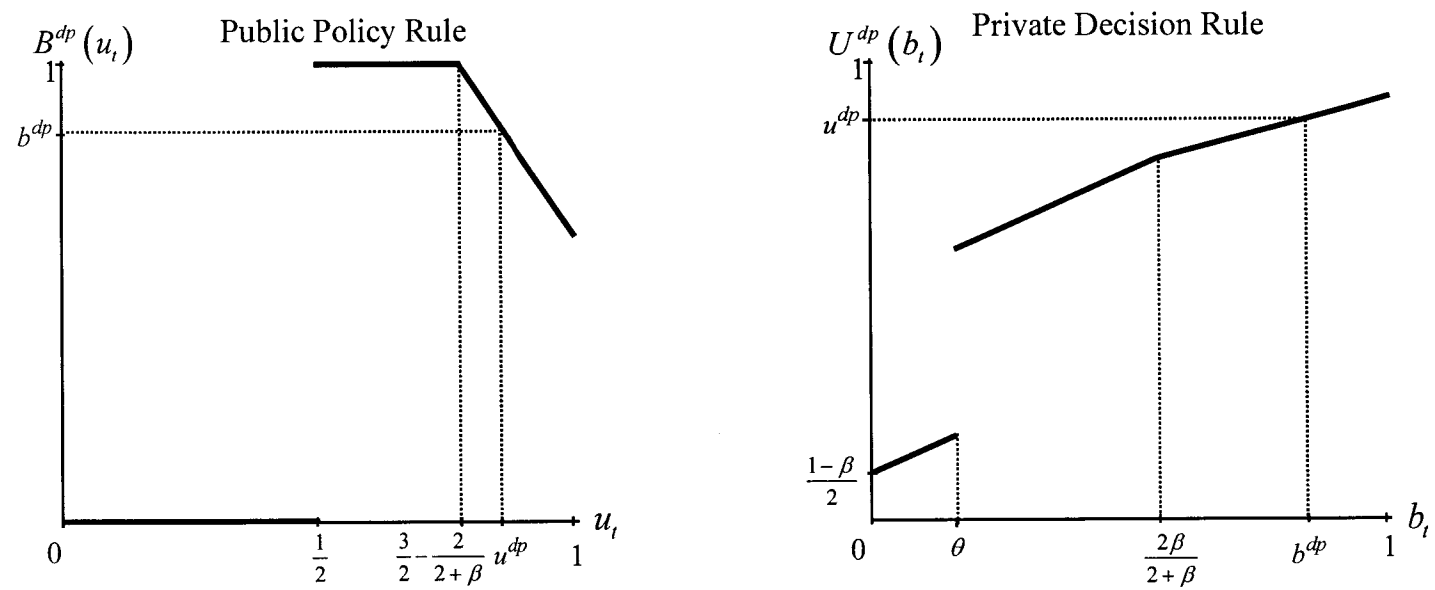
- This last condition is interesting, since it emphasizes that greater disagreement among the parties may be useful in forcing one of the parties to adopt the policies desired by the voters.
- Question: why did I choose party A as the one to be in power and implement the Condorcet winner policy of voters?
- Question: how would you support an equilibrium in which party B is induced to choose the Condorcet winner policy?

## 7. Dynamic Voting

- Model of dynamic voting by Hassler, Rodriguez Mora, Storesletten and Zilibotti—where agents take into account the implications of current policies on future policies (The models we’ve seen so far take that future sequence of policies is given, e.g. Alesina and Rodrik)
- Provide analytical solutions.
- Context: welfare state (WS) was initiated in many countries after the 1929 crisis, and survived the end of the crisis.
- Why are redistributive institutions so persistent? Is the political support for the welfare state robust?
- The central question: Will the support for an “inefficient redistribution” driven by ex-post interests (not insurance) be sustained over time, when voters are rational and forward-looking?
- Findings:
  - Yes, the welfare state can regenerate its own political constituency (persistence).
  - But... the welfare state can breakdown as an equilibrium phenomenon (fragility)



**Figure 1.** Public policy rule and private decision rule under Plutocracy (upper panels) and Dictatorship of Proletariat (lower panels)



**Figure 2.** Public policy rule and private decision rule under majority voting:  
 Pro-Welfare Equilibrium.  $\beta = 0.75$ .

- DP;  $b_t$  is chosen so as to maximize

$$V^{ou}(b_t, b_{t+1}, u_t) = b_t - \frac{(1 - \beta) + (b_t + \beta B(U(b_t))) + 2u_t}{4} b_t$$

Equilibrium FOC

$$2 - \left( u_t + \left( \frac{1 - \beta}{2} \right) + b_t + \frac{\beta}{2} B(U(b_t)) + \frac{\beta}{2} b_t B'(U(b_t)) \right) = 0$$

- The last term from the non-myopic political behavior.
- Guess the form of the value function  $\rightarrow B(u_t) = a_1 + a_2 u_t$ , implying  $B' = a_2$ .

$$U(b_t) = (1 - \beta + b_t + \beta B(U(b_t))) / 2 \rightarrow$$

$$U(b_t) = \frac{1 - \beta(1 - a_1) + b_t}{2 - \beta a_2}, \quad U'(b_t) = \frac{1}{2 - \beta a_2}$$

- Substitute back  $B$  and  $U$  into the FOC, and solve for  $b_t$ :

$$b_t = \left( \frac{3}{2} - \beta a_2 + \frac{1}{2} \beta (1 - a_1) \right) - \left( 1 - \frac{1}{2} \beta a_2 \right) u_t$$

- Verify

$$b_t = \left( \frac{3}{2} - \beta a_2 + \frac{1}{2} \beta (1 - a_1) \right) - \left( 1 - \frac{1}{2} \beta a_2 \right) u_t = B(u_t) = a_1 + a_2 u_t$$

This is in fact the solution as long as  $a_1 = \frac{3(2+\beta)-\beta^2}{4-\beta^2}$ ,  $a_2 = -\frac{2}{2-\beta}$ .

- Thus the solution (including the constraint  $b \in [0, 1]$  and up to some qualifications for some effimeral states):

$$B(u_t) = \max \left[ \frac{3(2+\beta)-\beta^2}{4-\beta^2} - \frac{2}{2-\beta} u_t, 1 \right]$$

$$U(b_t) = \frac{\beta(1+\beta)+2}{2(2+\beta)} + \frac{2-\beta}{4} b_t$$

**Majority voting**

- Optimal choice of investment gives

$$e_t = 1 - \frac{1 - \beta + (b_t + \beta b_{t+1})}{2}$$

- Let  $u_t$  denote the proportion of old  $U$  at  $t$ . Then,

$$u_{t+1} = (1 - e_t),$$

since all young are identical. Budget balance imposed each period requires

$$2\tau_t = (u_{t+1} + u_t) b_t$$

which implies

$$\tau_t = \frac{(1 - \beta) + (b_t + \beta b_{t+1}) + 2u_t b_t}{4}.$$

- Politically decisive (median) voter chooses  $b$  to maximize her indirect utility. In this presentation, assume that only those who know their type (old) participate.
- Agents are rational and forward-looking. In particular:
  - The old at  $t$  care about  $b_{t+1}$  since this affects the incentives of the young to invest (and the taxbase of current redistribution).
  - The old realize that their political choice affect future distribution of types, and, hence,  $b_{t+1}$  and their utility.

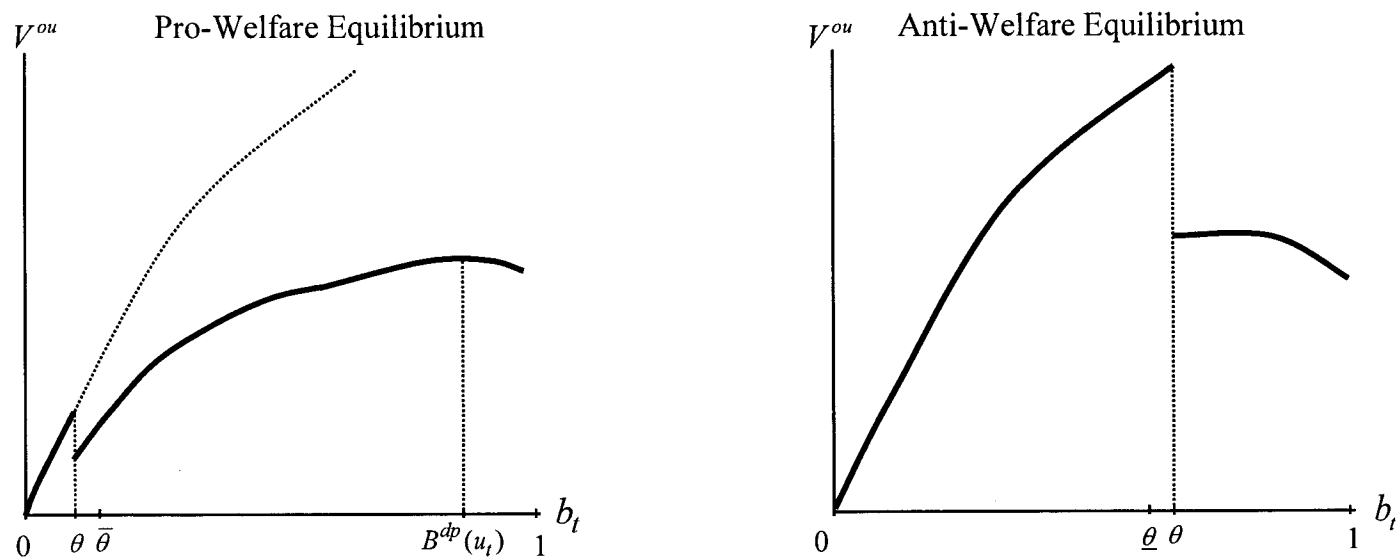
$$V^{os}(b_t, b_{t+1}, u_t) = 1 - \tau_t = 1 - \frac{(1 - \beta) + (b_t + \beta b_{t+1}) + 2u_t b_t}{4},$$

$$V^{ou}(b_t, b_{t+1}, u_t) = b_t - \tau_t = b_t - \frac{(1 - \beta) + (b_t + \beta b_{t+1}) + 2u_t b_t}{4}.$$

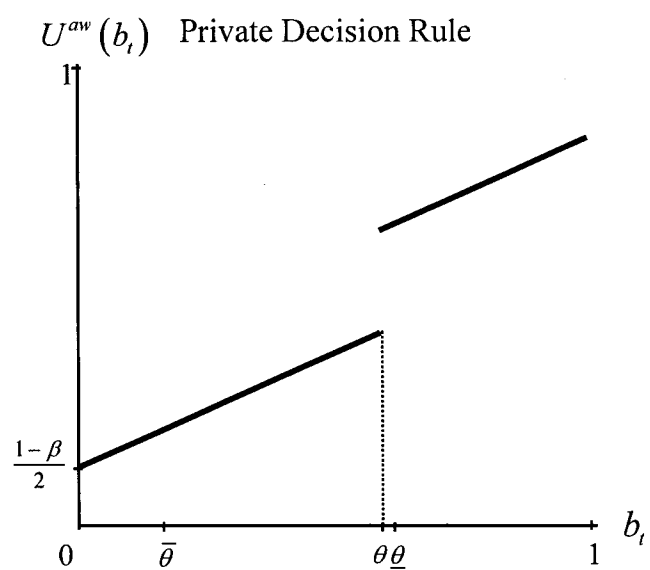
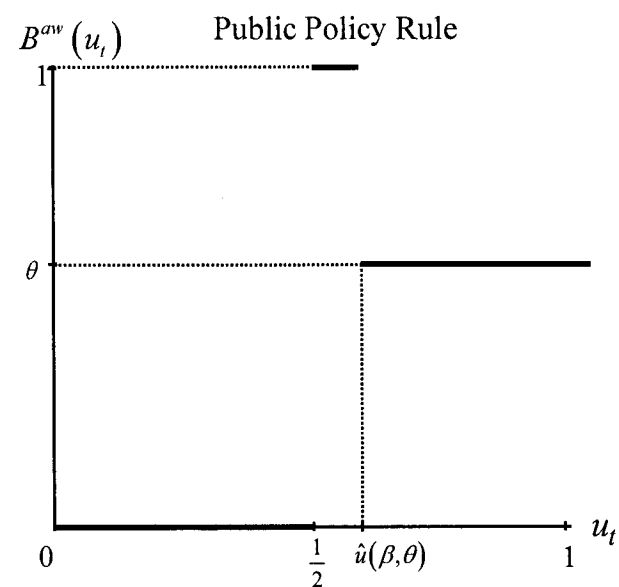
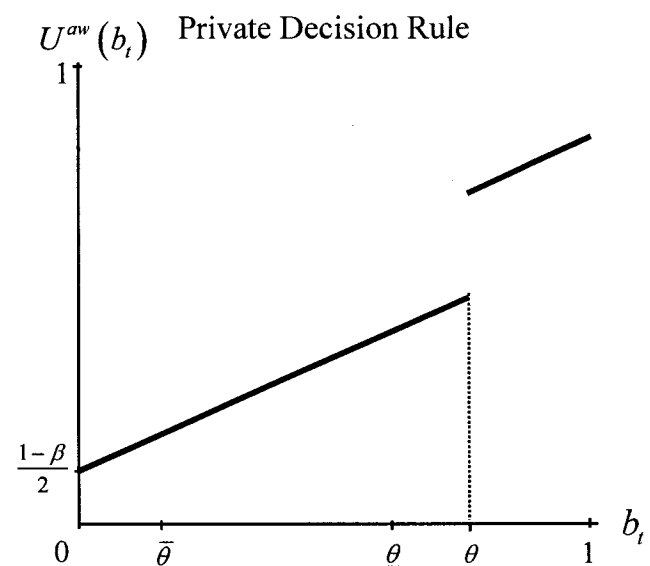
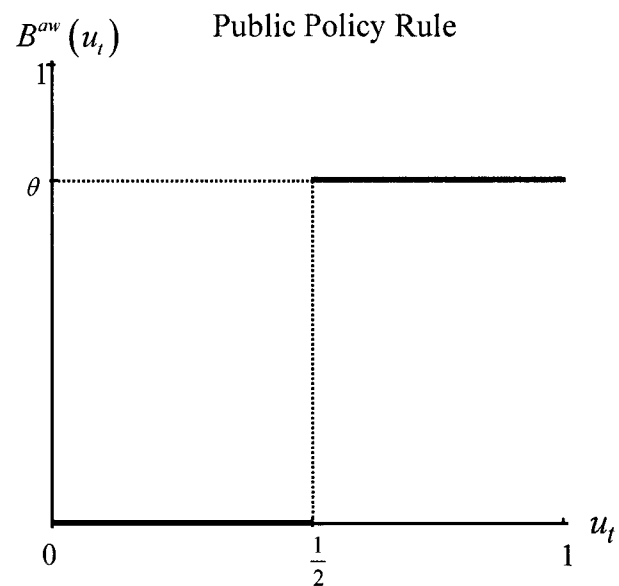
### Definition of equilibrium

- Markov equilibria: take strategies conditional only on the current state of the world. Then, a fixed point in the mapping from expectations about future redistribution.
- A (Markov perfect) political equilibrium is defined as a pair of functions  $\langle B, U \rangle$ , where  $B : [0, 1] \rightarrow [0, 1]$  is a public policy rule,  $b_t = B(u_t)$ , and  $U : [0, 1] \rightarrow [0, 1]$





**Figure 3.** Indirect utility of the old unsuccessful,  $V^{ou} = V^{ou}(b_t, B(U(b_t)), u_t)$  under PWE and AWE.  $\beta = 0.75$  and  $u_t = u^{dp}$ .



**Figure 4.** Public policy rule and private decision rule under majority voting:  
 Anti-Welfare Equilibrium with switch in one period (upper panels,  $\theta = 0.75$ ) and with  
 switch in two periods (lower panels,  $\theta = 0.58$ ).  $\beta = 0.75$ .

is a private decision rule,  $u_{t+1} = 1 - e_t = U(b_t)$ , such that the following functional equations hold:

- (1)  $B(u_t) = \arg \max_{b_t} V(b_t, b_{t+1}, u_t)$  subject to  $b_{t+1} = B(U(b_t))$ , and  $b_t \in [0, 1]$ ,  
and  $V(b_t, b_{t+1}, u_t)$  is defined as the indirect utility of the current decisive voter.
- (2)  $U(b_t) = (1 - \beta + b_t + \beta b_{t+1}) / 2$ , with  $b_{t+1} = B(U(b_t))$ .

### Dictatorship

- All power to one of the two types of old:
  - (1) Dictatorship of proletariat (DP)
  - (2) Plutocracy (PL)
- PL is straightforward; no redistribution ever;

$$u_t = u^{pl} = (1 - \beta) / 2.$$

- DP;  $b_t$  is chosen so as to maximize

$$V^{ou}(b_t, b_{t+1}, u_t) = b_t - \frac{(1 - \beta) + (b_t + \beta B(U(b_t))) + 2u_t}{4} b_t$$

Equilibrium FOC

$$2 - \left( u_t + \left( \frac{1 - \beta}{2} \right) + b_t + \frac{\beta}{2} B(U(b_t)) + \frac{\beta}{2} b_t B'(U'(b_t)) \right) = 0$$

- The last term from the non-myopic political behavior.
- Guess the form of the value function  $\rightarrow B(u_t) = a_1 + a_2 u_t$ , implying  $B' = a_2$ .

$$U(b_t) = (1 - \beta + b_t + \beta B(U(b_t))) / 2 \rightarrow$$

$$U(b_t) = \frac{1 - \beta(1 - a_1) + b_t}{2 - \beta a_2}, \quad U'(b_t) = \frac{1}{2 - \beta a_2}$$

- Substitute back  $B$  and  $U$  into the FOC, and solve for  $b_t$ :

$$b_t = \left( \frac{3}{2} - \beta a_2 + \frac{1}{2} \beta (1 - a_1) \right) - \left( 1 - \frac{1}{2} \beta a_2 \right) u_t$$

- Verify

$$b_t = \left( \frac{3}{2} - \beta a_2 + \frac{1}{2} \beta (1 - a_1) \right) - \left( 1 - \frac{1}{2} \beta a_2 \right) u_t = B(u_t) = a_1 + a_2 u_t$$

This is in fact the solution as long as  $a_1 = \frac{3(2+\beta)-\beta^2}{4-\beta^2}$ ,  $a_2 = -\frac{2}{2-\beta}$ .

- Thus the solution (including the constraint  $b \in [0, 1]$  and up to some qualifications for some effimeral states):

$$B(u_t) = \max \left[ \frac{3(2+\beta)-\beta^2}{4-\beta^2} - \frac{2}{2-\beta} u_t, 1 \right]$$

$$U(b_t) = \frac{\beta(1+\beta)+2}{2(2+\beta)} + \frac{2-\beta}{4} b_t$$

### Majority voting

- If  $u_t \leq 1/2$ , the successful agents decide. If  $u_t > 1/2$ , the unsuccessful agents decide.
- Summary of the results:
  - (1) If  $u_0 \leq 1/2$ , no welfare state ever arises.
  - (2) If  $u_0 > 1/2$ , two possible equilibria depending on expectations;
    - (a) Perpetual survival of the welfare state (“pro-welfare” expectations),  
and
    - (b) The welfare state is (strategically) terminated in, at most, two periods  
 (“anti-welfare” expectations).
- (a) is sustained for any parameter; (b) only sustained if agents are sufficiently forward-looking.

### Equilibrium with survival of the welfare state

- Intuition: an existing welfare state can regenerate its political support, at least as long if the young have faith in its survival.
- In particular:
  - Welfare state implies low investment and a large future constituency for the welfare state.
  - No welfare state implies high investment and a small future constituency for the welfare state.
- A big shock, (depression, democratization, rise of labor movement) could start the welfare state, then it regenerates its support.

• **Equilibrium with break-down of the welfare state**

- The old unsuccessful agents want to be the last generation living in a welfare state, since their tax burden depends positively on  $b_{t+1}$ .
- Thus, if the young believe the welfare state to be fragile, the old can induce its breakdown by voting for sufficiently low  $b_t$ .
- The young work (invest) hard and  $u_{t+1} \leq 0.5$
- The termination of the welfare state in finite time is an equilibrium if  $\beta > \beta_M \approx 0.555$ .
- Intuitively, to induce young to rationally believe that the welfare state is about to breakdown, the old unsuccessful must set  $b$  sufficiently low.
- How low is low depends on the young's expectations.
- Expectations must be consistent with

$$U(b_t) = (1 - \beta + b_t + \beta B(U(b_t))) / 2.$$

- $B(U(b_t)) = 0$  requires that  $U(b_t) \leq 0.5$

- To believe this is rational as long as  $b_t \leq \beta$  (“anti-welfare” expectations).
- But the believe that  $B(U(b_t)) > 0$  is also self-fulfilling under any  $b_t$  except  $b_t = 0$ .
- Break-down requires forward looking behavior, cannot happen if  $\beta$  is low.

### **Wage inequality and political equilibrium.**

- Parameterize inequality by assuming that the successful agents earn  $w \neq 1$ .

$$u_{t+1} = 1 - e_t^* = \frac{2 - (1 + \beta)w + b_t w + \beta b_{t+1} w}{2}.$$

- If  $w < 1/(1 + \beta)$ , the welfare state is the unique outcome ( $u_{t+1} > 1/2$ , for any non-negative sequence of  $b$ 's).
- Intermediate  $w$ : multiple equilibria (as before)
- Large  $w$ 's: no welfare state.

### **• The effect of increasing wage premia**

- Assume a technology-driven increase in wage inequality
- Skill-biased technical change  $\rightarrow$  Thatcherite's revolution.
  - Policy changes magnify the effect of technology on inequality.
- When some agents behind the veil of ignorance vote.
- Assume limited representation of ex-ante interest (a share  $\varepsilon < 1$  of young vote on current benefits).
- “Easier” to induce a break-down since, now,  $u_{t+1} \leq 1/2 + \varepsilon$  is sufficient for a majority against redistribution next period.
- Exists a threshold  $\bar{\varepsilon}(\beta) \in [0.174, 0.5]$  where the pro-welfare equilibrium remain sustained.
- Alternatively,  $\varepsilon = 1$  but some young prefer redistribution because they are born unsuccessful.

## CHAPTER 5

### Models of Group Conflict

[...This material will not be covered in spring 2003]

In this chapter, we will discuss a number of models where policies are determined by various types of conflict between different groups. These groups could be “economic classes”, interest groups or even ethnic groups.

#### 1. Common Pool Models

- First, consider a model in which there are  $n$  interest groups, and suppose that these interest groups are competing for the resources of the government/society. In particular, suppose that each group can take away resources from the common budget all the government/society without paying an adequate price, creating a common pool problem.
- Differently from the lobbying model, therefore, here interest groups can simply take resources away from a common pool (if you want, you can think of this situation as one where these groups have already lobbied successfully to gain the right to share from the common pool).
- For example, this model can correspond to the situation in many resource-rich countries where the revenues from the resource can be spent for many competing projects/groups.
- More specifically, consider the following model adopted from Lane and Tornell.

- The capital stock (or the stock of resource) in the economy accumulates or decumulates according to the differential equation:

$$(1.1) \quad \dot{K}(t) = \alpha K(t) - \sum_{j=1}^n c_j(t)$$

where  $c_j(t)$  is the consumption of group  $j$ .

- Each group has the same utility function given by the familiar constant relative risk aversion form

$$(1.2) \quad J(c_j) = \int_t^\infty \frac{\sigma}{\sigma-1} c_j(s)^{\frac{\sigma-1}{\sigma}} e^{\delta(s-t)} ds$$

with intertemporal elasticity of substitution equal to  $\sigma$ .

Assume that

$$\sigma > 0, \quad n > 1, \quad \alpha > 0, \quad \delta > 0, \quad \frac{\alpha[1-\sigma] + \delta\sigma}{n - \sigma[n-1]} \geq 0$$

- Moreover, the capital stock always has to remain positive.

$$K(t) \geq 0, \quad t \geq 0$$

In addition, we assume that no group can steal all of the capital stock in one period, and in particular there is a limit on how much can be taken away:

$$c_i(t) \leq \bar{x}K(t), \quad \text{and} \quad \frac{\alpha[1-\sigma] + \delta\sigma}{n - \sigma[n-1]} < \bar{x} < \infty$$

- We will look for a Markov perfect equilibrium where the various groups' strategies only depend on the current state of the system summarized by  $K(t)$ .

[... Notice that the Markov perfect equilibrium here places very strong restrictions. In particular, punishment strategies as a function of past behavior are not allowed, despite the fact that the game has a prisoner's dilemma structure..]

- More formally, a Markov strategy for group  $i$  is a consumption policy  $c_i(t)$  which is a function only of the payoff-relevant state variable:  $K(t)$ . An  $n$ -tuple of Markov strategies  $\{c_j^*(k(t))\}_{j=1}^n$  forms a MPE if it is a subgame-perfect equilibrium for



every realization of  $K(t)$ . That is, if no group can change its strategy and improve its payoff

$$J(c_i^*(t), c_{-i}^*(t); K(t)) \geq J(c_i(t), c_{-i}^*(t); K(t)), \text{ for all } i, t,$$

where  $c_{-i}^* = (c_1, \dots, c_{i-1}, c_{i+1}, \dots, c_n)$  and  $J(., .)$  is the value taken by payoff function (1.2).

- The attractive property of an MPE is that it can be characterized as a solution to a set of  $n$  Hamiltonian problems (one for each group). This is because each group is maximizing its utility taking as given the consumption functions of the other groups, which are given by  $c_j^*(K)$  in equilibrium. These functions simply map the residual capital in the future to a level of consumption for these groups.
- Namely, the Hamiltonian for group  $i$  is

$$H_i = \frac{\sigma - 1}{\sigma} c_i^{\frac{\sigma-1}{\sigma}} + \lambda_i \left[ \alpha K - c_i - \sum_{j \neq i} c_j^*(K) \right] + \bar{\mu}_i [\bar{x}K - c_i]$$

with  $\lambda_i$  as the Lagrangean on the capital accumulation equation (1.1), and the  $\mu$ 's as the Lagrangeans on the restriction that consumption should not exceed a certain fraction of the capital stock. The unique control variable here is the consumption of the group,  $c_i$ , while the unique state variable is the capital stock.

- Let us use the guess and verify method for characterizing the solution, and in particular postulate that consumption is linear in the capital stock.

We will take this form for the consumption function of the other groups, and find the optimal consumption path of group  $i$ , and then verify that this “best response” consumption function is actually linear.

- So postulate

$$(1.3) \quad c_j^*(t) = x_j K(t), j = 1, \dots, n,$$

with  $x_j$ 's as undetermined coefficients.

- Moreover, let us focus on interior equilibria, where  $c_i(t) \leq \bar{x}K(t)$  and hence  $\bar{\mu}_i(t) = 0$  (nevertheless, this restriction is important, otherwise they could be deviations from equilibrium that would consume all the capital stock and give higher utility to a group than following the solution of the Hamiltonian. The fact that in equilibrium the boundary condition is not hit is not sufficient to conclude that the restriction was not useful!).
- Under these assumptions, the first-order conditions to the problem of maximizing the Hamiltonian are given by

$$(1.4) \quad c_i(t)^* = [\lambda_i(t)]^\sigma,$$

$$(1.5) \quad \dot{\lambda}_i(t) = \lambda_i(t) \left[ \delta - \alpha + \sum_{j \neq i} x_j^*(t) \right],$$

$$(1.6) \quad \lim_{t \rightarrow \infty} K(t)^* \lambda_i(t) e^{-\delta t} = 0,$$

Combining these equations, we find that the optimal consumption policy of each group  $i$  must satisfy

$$\frac{\dot{K}(t)}{K(t)} = \frac{\dot{c}_i^*(t)}{c_i^*(t)} = -\sigma \frac{\dot{\lambda}_i(t)}{\lambda_i(t)}, \quad i = 1, \dots, n.$$

Now using the accumulation equation (1.1) and (1.5) with the candidate solution (1.3), we obtain

$$x_i^* = \alpha[1 - \sigma] + \delta\sigma - \sum_{j \neq i} x_j^*[1 - \sigma], \quad i, j = 1, \dots, n,$$

which gives  $n$  linear equations in  $n$  unknowns. These equations solve for a Markov perfect equilibrium

$$x_i^* = \frac{\alpha[1 - \sigma] + \delta\sigma}{n - \sigma[n - 1]}, \quad i = 1, \dots, n$$

[...Note there could be many other equilibria...]

- Then (1.3) gives the behavior of consumption in this equilibrium as

$$(1.7) \quad c_i^*(t) = \frac{\alpha[1 - \sigma] + \delta\sigma}{n - \sigma[n - 1]} K(t), \quad i = 1, \dots, n.$$

[...Finally, to verify that this is an equilibrium, we have to check the transversality condition, once we substitute these optimal consumptions into the value functions. I skip this step...]

- Now for comparison, consider the choice of a utilitarian social planner maximizing the some of the pale functions given by (1.2) subject to the accumulation equation (1.1). This clearly corresponds to the standard Ramsey neoclassical growth model with the standard solution:

$$\begin{aligned} c_i^{fb}(t) &= \frac{\alpha(1-\alpha) + \delta\sigma}{n} K(t) \\ K^{fb}(t) &= K(s) e^{\sigma[\alpha-\delta][t-s]}, \end{aligned}$$

- Comparing these to the (1.7) immediately shows that there is excessive consumption in the equilibrium because of the common pool problem. That is,

$$\frac{\alpha[1-\sigma] + \delta\sigma}{n - \sigma[n-1]} > \frac{\alpha(1-\sigma) + \delta\sigma}{n}$$

as long as  $n > 1$ .

- Lane and Tornell emphasize the comparative statics of the growth and consumption is economy as a function of “the aggregate productivity level” as captured by  $\alpha$ . In particular, they dub the term “vorocity effect” for the possibility that an increase in productivity may actually *reduce* growth.
- To do this, define the growth rate of the econom as  $g \equiv \dot{K}/K$ . Now substitute the equilibrium consumption rule (1.7) into the accumulation equation, (1.1), to obtain the equilibrium law of motion of capital stock more explicitly as

$$K^*(t) = K(s) \exp \left( \frac{\sigma[\alpha - \delta\sigma]}{n - \sigma[n-1]} (t-s) \right)$$

Directly differentiating this equation, we obtain that

$$\frac{\partial g^*}{\partial \alpha} = \frac{\sigma}{n - (n-1)\sigma} = \begin{cases} - & \text{if } \sigma > \frac{n}{n-1} \\ + & \text{if } \sigma < \frac{n}{n-1} \end{cases}$$

- In other words, an increase in aggregate productivity may actually reduce growth. In particular, if  $\sigma > 1$ , as the number of groups increases, to eventually be the case that a higher aggregate productivity will lead to lower growth. This is the vorocity effect. [...Note that when  $n = 1$ , the vorocity effect never operates, since there are no more common pool problems...]
- In contrast, in the neoclassical model, greater aggregate productivity would always increase growth. In particular:

$$\frac{\partial g^{fb}}{\partial \alpha} = \sigma > 0$$

- Lane and Tornell suggest that this effect can explain why a number of resource rich countries to perform very badly over the postwar period. As examples, they offer Venezuela, Nigeria and Trinidad and Tobago (but what about Botswana? Botswana is the fastest growing country in the world during the postwar period and diamonds have been a big contributor to growth in Botswana).
- It is also useful to illustrate the intuition behind that vorocity effect more carefully. For this, take the number of groups as 2.
- Notice that increase in aggregate productivity has two effects: a direct effect that increases the growth rate one to one, and an indirect appropriation effect because both parties start consuming more as a fraction of the capital stock. More specifically

$$\frac{\partial g}{\partial \alpha} = 1 - \frac{\partial x_1}{\partial \alpha} - \frac{\partial x_2}{\partial \alpha}.$$

The indirect appropriation effect ( $\frac{\partial x_1}{\partial \alpha} + \frac{\partial x_2}{\partial \alpha}$ ) in turn is composed of two components: the traditional income-substitution effect and the rate-of-return effect

$$\frac{\partial x_1}{\partial \alpha} = \frac{\partial R_1}{\partial \alpha} [1 - \sigma] = \left[ 1 - \frac{\partial x_2}{\partial \alpha} \right] [1 - \sigma].$$

If  $\sigma < 1$ , there will not be enough appropriation by group 1 to actually reduce growth. In fact, greater appropriation by group 2 reduces appropriation by group

1. So in this region, appropriation by the two groups are strategic substitutes, and this does not generate enough appropriation to reduce growth when aggregate productivity increases.
- But as  $\sigma$  increases above 1, appropriations by the two groups become strategic complements, and now the voracity effect can operate.
- In particular when  $\sigma > 2$ , we will have the strategic complementarity strong enough that  $\sigma > \frac{n}{n-1}$ , and greater aggregate productivity reduces growth.

## 2. Political Economy of Reform: General Issues

- The decision of whether to undertake a particular economic (or sometimes political) reform often generates conflict between different groups. Now I will discuss some general issues that arise in thinking about the political economy of reform, and then outline some models of reform.
- Suppose there is a change in policy that will benefit the society as a whole. Let us refer to this as “policy reform”.
- There is a sense among many economists and political scientists that this type of beneficial reform is often not undertaken, undertaken against significant opposition, or delayed.
- Why would this be so?
- There are a number of reasons for beneficial reform not to be undertaken or delayed. Here I will discuss some of these informally, and then analyze some of them in greater detail.

(1) myopia: voters may simply be myopic and not see the benefits of reform.

This is one of the most common views among the practitioners. It is often suggested as a reason for why inflation is difficult to control in LDCs. The control of inflation requires a cut in the budget deficit, and in particular,

the removal of many subsidies. Even though this would be beneficial for everybody in the medium run (it is always correct?), voters may not see the connection between the removal of the subsidies and the control of inflation, and oppose the reform. This view has also led to the belief that “benevolent” dictatorships (if such things exist!) may be preferable to democracy in less-developed countries, since they can undertake beneficial reforms that democracies cannot. (This is in fact the interpretation that Barro gives for his empirical result that democracies do not grow more rapidly than dictatorships. Dictatorships can be costly, but they also implement useful reforms). Of course, there may be other theories for why dictatorships may be more effective at undertaking reform. In any case, the evidence on this point is not strong.

- (2) the role of future generations: reform may be socially beneficial not because it benefits the current generation, but because the main beneficiaries will be future generations. In this case, the current generation may not want to undertake the reform, since future generations cannot compensate them (or cannot commit to compensating them in the future). Although this is probably an important consideration in practice, it does not appear to be the main issue: there are plenty of examples of reforms that benefit the current generation which are still resisted.
- (3) veto players: there could be a number of veto players (individuals or social groups) who can block reform. This obviously includes the individuals or social groups that are in power, but there could be parties in the opposition, or other social organizations such as trade unions that also act as veto players. When we say that reform is socially beneficial, we mean that it is a potential Pareto improvement. This implies that there should be enough

gains generated by the reform to compensate the veto players. The problem may be that:

- (a) either the fiscal instruments for such a redistribution are not present.
- (b) or the parties that gain from reform cannot commit to making such redistribution in the future.

We will discuss both of these issues below.

- (4) uncertainty: uncertainty about the costs and benefits of reform can also create resistance to reform. Two versions of this idea have been suggested by two different important papers: Fernandez-Rodrik and Alesina-Drazen. Fernandez-Rodrik construct a model in which beneficial reform may not be undertaken because the majority of the agents expect to lose from reform (though the gains far outweigh the losses). Because the political system cannot commit to compensating the losers, the agents will oppose it *ex ante*. We will discuss this explanation below.

Alesina-Drazen construct a model in which there are negotiations between two groups on who will bear the costs of reform. Each group is uncertain about the other group's gain from reform, and does not want to be the first one to give up. This leads to a war of attrition between the two groups, delaying reform.

- (5) political losers: politically powerful groups that anticipate a loss of power following reform will oppose it for the reasons we have already discussed. This view also provides an explanation for why veto players may be difficult to buy out. The main problem may not be making payments to veto players, but the fact that these veto players derive their political power from the current status quo, and reform will erode their political power.

### 3. The Fernandez-Rodrik Model

- Consider a simple version of this model.
- Suppose there are two groups, 1 and 2, with fractions  $\lambda$  and  $1 - \lambda$  in the population. Assume that  $\lambda > 1/2$ .
- All agents in group 2 will gain an amount  $a$  from reform.
- A fraction  $\pi$  of the agents in group 1 will gain an amount  $b$ , where  $b$  can be negative, corresponding to a loss.
- The remaining fraction  $1 - \pi$  of the agents in group 1 gain an amount  $c$ , which can also be negative.
- Assume that

$$(1 - \lambda) a + \lambda [\pi b + (1 - \pi) c] > 0$$

so the reform is socially beneficial (it is a potential Pareto improvement).

- Assume also that whether the reform will be undertaken or not is decided by majority voting.
- So if there are ex post redistribution to compensate the losers, the reform will always pass.
- Focus on the case in which such redistribution is not possible (the winners, for example, cannot commit to undertaking the necessary redistribution after the reform).
- Then, we have the following simple result:
  - If  $\pi b + (1 - \pi) c \geq 0$ , the reform will pass.
  - If  $\pi b + (1 - \pi) c < 0$ , the reform will not pass.
- This result simply follows from the fact that  $\lambda > 1/2$ , and all agents in group 1 will vote the same way, since ex ante they do not know whether they will receive  $b$  or  $c$ .



- Now contrast this situation to one in which group 1 agents do not know whether they will receive  $b$  or  $c$ . Suppose also without loss of generality that  $b \geq c$ . Also assume that  $c < 0$ , so that there are losers from reform (otherwise, the problem is trivial). Then, we have:

The reform will pass if  $b > 0$  and  $(1 - \lambda) + \lambda\pi > 1/2$ .

- This is a (substantially) weaker condition than the one above, so the fact that agents do not know whether they will be the winners from reform makes reform harder to enact.
- Another implication of this observation is that if  $\pi b + (1 - \pi)c < 0$  and also  $b > 0$  and  $(1 - \lambda) + \lambda\pi > 1/2$ , we can have a situation in which the reform will not pass. But if somehow it was enacted, and there was a vote over whether it should be reversed, it would not be reversed. This is because now the winners know their identity, and a fraction  $(1 - \lambda) + \lambda\pi > 1/2$  of the agents will vote to keep the reform.
- How realistic is a situation like this? Quite realistic, it seems. Many reforms benefit a given sector, and some of the agents from the other sector who can make the switch, or adapt to the changing environment. It may be quite plausible that the identity of these agents is not known in advance, even by themselves (though if these are getting rents by switching, i.e.,  $b > 0$ , why didn't they switch before the reform?).

#### 4. The Alesina-Drazen Model

- Next consider the possibility of delay in reform.
- Imagine an economy with two groups, and an inefficient policy in place.
- Time is continuous, and both groups discount the future at the rate  $r$ .
- Both groups agree that there needs to be reform.

- But there is a distributional conflict in that there is disagreement about who should bear the costs of reform.
- In particular, assume that the cost of reform is  $C$ , which needs to be raised by taxation, and one of the two parties can give in, and bear a fraction  $\alpha \geq 1/2$  of this cost, while the other party bears the remaining  $1 - \alpha$  fraction.
- In addition, the cost of inefficient policies for the two parties are their own private information.
- Specifically, assume that until there is reform, group  $i$  receives a payoff of  $-\theta_i$ .
- Both  $\theta$ 's are drawn from the same distribution  $F(\cdot)$  with support  $[\underline{\theta}, \bar{\theta}]$ , and assume that  $f(\bar{\theta}) > 0$ .
- After reform, payoffs are normalized to 0.
- Assume that

$$(4.1) \quad \underline{\theta} > r\alpha C,$$

which ensures that even when inefficient policies are least costly, reform is still beneficial, even when the party in question is paying the greater fraction of the cost of reform.

- Nevertheless, we will see that there will be delay in the adoption of the policy because of private information.
- First, however, note that if  $\alpha = 1/2$ , there will be no delay. In this case, there is no cost to any party of giving in at the first instant, which is beneficial by assumption (4.1). Delay will arise when there is distributional conflict, i.e.,  $\alpha > 1/2$ .
- To analyze this case, first note that without loss of any generality we can restrict attention to a policy of giving in at some time  $T(\theta)$  for each type  $\theta$ , unless the other party has already given in before this time.

- Suppose that the other player will give and at time  $t$  with density (probability)  $h(t)$ , or it will have given up by time  $t$  with probability  $H(t)$ . Then the expected utility at time 0 for type  $\theta$  as a function of its “strategy” can be written as

$$\begin{aligned}
 U(T | \theta) = & - \int_0^T \left\{ \int_0^\tau \theta e^{-rs} ds + (1 - \alpha) C e^{-r\tau} \right\} h(\tau) d\tau \\
 & - \int_T^\infty \left\{ \int_0^T \theta e^{-rs} ds + \alpha C e^{-r\tau} \right\} h(\tau) d\tau
 \end{aligned}$$

The first line is the expected payoff when the other party gives in before  $T$ . This consists of two terms: the costs incurred until the time the other party gives in, and the cost of reform at the time the other party gives in. Of course the time that the other party gives in,  $\tau$ , is a random variable, and expectation is being taken over this.

The second line is the expected payoff when the other party does not concede before  $T$ , and again consists of two terms.

- The first observation is that

$$\frac{\partial^2 U(T | \theta)}{\partial T \partial \theta} = -e^{-rT} [1 - H(T)] < 0$$

as can be verified directly by differentiating and simplifying.

- This implies that the equilibrium relationship between  $T$  and  $\theta$  will be decreasing, i.e.,  $T'(\theta) < 0$ .
- Next, suppose that the other party is using the strategy  $T(\theta)$ , and consider the payoff of the group when their type is  $\theta$ .
- We can now do a simple change of variables, and integrate over  $\theta$  instead of time (and replace  $dt$  with  $T'(\theta) d\theta$ ) to write the payoff function when type  $\theta$  stops at

time  $T = T(\hat{\theta})$  as

$$U(\hat{\theta} | \theta) = - \int_{\underline{\theta}}^{\hat{\theta}} \left\{ \int_x^{\hat{\theta}} \theta e^{-rT(x)} T'(x) dx + (1 - \alpha) C e^{-rT(z)} \right\} T'(z) f(z) dz \\ - \int_{\hat{\theta}}^{\bar{\theta}} \left\{ \int_0^{\hat{\theta}} \theta e^{-rT(x)} T'(x) dx + \alpha C e^{-rT(z)} \right\} T'(z) f(z) dz$$

where note that the other party stopping before  $T(\hat{\theta})$ , corresponds to that party having a type  $\theta' \geq \hat{\theta}$ .

- The best response of type  $\theta$  must satisfy the condition

$$\frac{\partial U(\hat{\theta} | \theta)}{\partial \hat{\theta}} = 0$$

So looking at the first-order condition and simplifying, we obtain

$$f(\hat{\theta}) [(1 - 2\alpha) C] + F(\hat{\theta}) [\theta - r\alpha C] T'(\hat{\theta}) = 0$$

A symmetric equilibrium must have the feature that  $\hat{\theta} = \theta$ . Solving this first-order condition under this assumption, we obtain, the following differential equation determining the symmetric equilibrium

$$(4.2) \quad \left[ -\frac{f(\theta)}{F(\theta)} \frac{1}{T'(\theta)} \right] (2\alpha - 1) C = [\theta - r\alpha C]$$

In addition, we have the boundary condition that

$$T(\bar{\theta}) = 0$$

That is, the highest type will immediately concede.

- Equation (4.2) is intuitive: the left-hand side is the expected gain from waiting one more instant, given by the conditional probability of the other group conceding times the cost differential between conceding oneself and the other party giving in. The right-hand side is the cost of waiting one more instant, which is the cost of inefficient policy,  $\theta$ , minus the benefit that the cost of reform will be incurred next period.

- Notice that an increase in  $\alpha$  increases the left-hand side and reduces the right-hand side, and hence causes an increase in  $T'(\hat{\theta})$ , that is, there will be greater delay when  $\alpha$  increases. This reflects the fact that a greater  $\alpha$  corresponds to greater distributional conflict over who will pay the costs of reform.
- Moreover, as  $\alpha \rightarrow 1/2$ , we need to have  $T'(\hat{\theta}) \rightarrow 0$ , so all types will immediately give in. That is, there will be no delay when there is no distributional conflict.
- It is useful to look at a specific case of this solution. Suppose that  $\theta$  is uniform over  $[k, k+1]$  with  $r\alpha C < k$ . Then, we have  $f(\theta)/F(\theta) = 1/(\theta - k)$ , and the differential equation (4.2) becomes

$$T'(\theta) = -\frac{2\alpha - 1}{k - r\alpha C} \cdot \frac{1}{(\theta - k)(\theta - r\alpha C)},$$

which solves for

$$T(\theta) = \frac{2\alpha - 1}{k - r\alpha C} \cdot \ln \left[ \frac{k - \theta}{\theta - r\alpha C} \right] + \bar{T}.$$

Using the boundary condition that  $T(\bar{\theta}) = 0$ , we obtain the full solution as

$$T(\theta) = \frac{2\alpha - 1}{k - r\alpha C} \cdot \left( \ln \left[ \frac{k - \theta}{\theta - r\alpha C} \right] - \ln \left[ \frac{1}{k + 1 - r\alpha C} \right] \right)$$

Now it can be verified directly that when  $\alpha = 1/2$ , all types immediately concede, and that concession times become more delayed as  $\alpha$  increases.

- Finally, notice a common (but perhaps somewhat loose) interpretation of this result: reform is only undertaken after the situation gets really worse (this is more true in the original Alesina-Drazen model, where costs are increasing every instance where there is no reform). Hence, this model is seen as a justification for the presumption that reform takes place when the situation hits rock bottom. Although this interpretation is suggestive, it's not totally rigorous, since the reason why reform eventually occurs is not because the situation has become sufficiently bad, but more because one side has lost the war of attrition.

- More generally, many of the models that we have seen predict that as the status quo payoff gets worse, reform becomes more likely (since the comparison is always the status quo payoff vs. the payoff from reform). Hence, the result that a really bad situation makes reform possible is probably a more general result than this model.

### **5. Inefficient Redistribution: General Issues**

- An interesting application of models of group conflict is to the question of why redistribution is often made using inefficient means.
- Most redistribution in practice takes an inefficient form, that is, redistribution hardly ever takes the form of lump sum transfers away from some groups towards others.
- Part of this is because of informational problems. Lump sum transfers are often not possible (e.g., consider a situation in which agents differ according to their productivity, and these productivities are unobserved by the taxation authority. This will lead to a Mirrlees type optimal income taxation, and a greater level of taxation will increase distortions).
- Nevertheless, there are many examples of redistribution that takes a clearly more inefficient form than some of the available alternatives.
- A prominent example is farm subsidies in the form of price supports or input subsidies. These policies distort relative prices and discourage the reallocation of productive resources to other sectors, and the general perception among economists and political scientists is that these policies are mainly designed for transferring income to farmers.
- Another example is trade policy which provides protection to domestic industries via tariffs and quotas, even when free trade is socially beneficial.

- Why does redistributive policy take an inefficient form?
- There are four different types of answers in the literature:
  - (1) A commitment to inefficient methods of redistribution may be a way of constraining the overall amount of redistribution.
  - (2) Voters are myopic, and are fooled by inefficient redistribution methods, whereas they would not be fooled by lump sum transfers.
  - (3) Voters are rational, and we are in an equilibrium in which political parties exploit their imperfect information to make transfers to their favorite groups under the disguise of “Pigovian” subsidies.
  - (4) Inefficient redistribution as a method of maintaining future power.
- Most of these explanations have some degree of group conflict embedded in them.
- Now I will outline some simple models to give the basic ideas.

## 6. Inefficient Redistribution to Constrain the Amount of Redistribution

- Consider an economy that consists of two groups, the rich and the poor.
- The poor form the majority, and will decide the amount of redistribution in society. But the rich design the institutions. In particular, suppose that a fraction  $\lambda$  of the agents is rich with income  $h^r$ , and the remaining agents are poor with income  $h^p < h^r$ .
- Average income in the economy is

$$h = \lambda h^r + (1 - \lambda) h^p$$

- There is a linear tax rate  $\tau$  imposed on all incomes, and the proceeds are distributed lump sum to all agents.
- Taxation creates a dead weight loss of

$$\mu c(\tau) h$$

where  $c(\tau)$  is strictly increasing and convex, and  $\mu$  parameterizes the degree of inefficiency of redistributive of taxation.

- The overall amount of lump sum subsidy is

$$T = [\tau - \mu c(\tau)] h$$

- Imagine the following timing of events:

- (1) The rich choose  $\mu$  from a set  $[\underline{\mu}, \bar{\mu}]$ .
- (2) The poor decide  $\tau$ .

- Let us solve this game backwards:
- For given  $\mu$ , the utility of the poor agent is

$$(1 - \tau) h^p + [\tau - \mu c(\tau)] h,$$

hence, their preferred tax rate will satisfy the first-order condition

$$h^p = [1 - \mu c'(\tau^*(\mu))] h$$

where I wrote the preferred tax rate as  $\tau^*(\mu)$  to emphasize that it is a function of the degree of inefficiency of the tax system.

- Straightforward differentiation gives that

$$\frac{d\tau^*(\mu)}{d\mu} = -\frac{c'(\tau^*(\mu))}{\mu c''(\tau^*(\mu))} < 0,$$

that is, a greater inefficiency in the tax system reduces the optimal tax rate for the poor. Intuitively, as taxes become more inefficient, a given level of tax rate creates less redistribution towards the poor, and become less desirable.

- Let us now look at the utility of a rich agent, anticipating the tax rate that will be chosen by the poor agents. This is

$$(1 - \tau^*(\mu)) h^r + [\tau^*(\mu) - \mu c(\tau^*(\mu))] h,$$

The rich agent will choose  $\mu$  to maximize this utility.



- The derivative of this utility evaluated at  $\mu = \underline{\mu}$  is

$$[-h^r + [1 - \mu c'(\tau^*(\underline{\mu}))] h] \frac{d\tau^*(\underline{\mu})}{d\mu} - c(\tau^*(\underline{\mu}))$$

If this derivative is positive, it means that the rich prefer a more inefficient tax system than the most efficient available alternative characterized by  $\underline{\mu}$ .

- The first term is positive by virtue of the fact that there is redistribution away from the rich: a higher  $\mu$  reduces the tax rate, and hence benefits rich agents
- So if  $c(\tau^*(\underline{\mu}))$  is small, the rich would like to create some inefficiency in the tax system in order to reduce redistribution away from themselves towards the poor.
- Intuitively, more inefficiency in the tax system reduces the desired tax rate of the poor, and may help the rich.
- Is this story plausible as an explanation for why there are inefficient methods of redistribution in practice?
- I believe not: the argument requires that it is easy to commit to the form of redistribution, but not to the level of redistribution. It seems far-fetched to believe that the political system can commit to the form of redistribution, which is much harder to specify, but cannot commit to the level of redistribution.

## 7. Inefficient Redistribution to Fool Voters

- Perhaps the most common argument for why farmers receive price subsidies is that this is a “hidden” transfer to them, and the voters tolerate such hidden transfers.
- If instead there were direct transfers to farmers, voters would object to it.
- A simple form of this argument would build on myopia: voters do not understand that price subsidies are transfers, but would immediately understand when they see direct transfers.

- But perhaps this argument views voters as too “irrational”.
- Can a similar argument be developed where voters are not irrational, but simply misinformed?
- Coate and Morris develop such a model. Here is a simple version of their model.
- Suppose there are two groups 1 and 2. There are three different policies possible:
  - (1) Do nothing, in which case the two groups receive their status quo payoffs  $a_1$  and  $a_2$ .
  - (2) A price subsidy to group 1. In this case, the two groups receive  $b_1 + \varepsilon$  and  $b_2 + \varepsilon$ , where  $\varepsilon$  takes the value 0 with probability  $1 - p$ , and the value  $\varepsilon = e$  with probability  $p$ . Voters do not know the value of  $\varepsilon$ , but we will assume that politicians do. In addition, we have

$$b_1 > a_1, b_2 < a_2 < b_2 + e$$

and

$$b_1 + b_2 < a_1 + a_2 < b_1 + b_2 + 2e$$

That is group 1 always gains as a result of this policy, and the society may gain or lose depending on the value of  $\varepsilon$ . In other words, with probability  $p$ , we can think of this price subsidy as a Pigovian subsidy correcting some market failure.

- (3) Direct transfer to group 1, so that the payoffs are  $a_1 + \tau$  and  $a_2 - \tau$ .
- In addition, suppose that there are two different types of parties in power. With probability  $q$ , we can have a party that wants to maximize efficiency, and with probability  $1 - q$ , we have a “partisan” party that wants to transfer resources to group 1. All parties receive some additional (small) utility from being in power.
  - Voters do not observe the identity of the party in power.

- Finally, assume that group 2 is the majority, and they can vote the party out of power once they see its policy.
- The timing of events is:
  - (1) Nature determines the identity of partying power and the value of  $\varepsilon$ .
  - (2) The party chooses its policy.
  - (3) Group 2 agents decide whether to kick this party out of power. If they do so, the status quo payoffs are realized.
  - (4) If the party is not kicked out of power, its policy gets implemented, and payoffs are realized.
- Suppose the party turns out to be the one that favors group 1. Can it directly transfer resources to group 1? The answer is clearly no. If it did so, group 2 agents would immediately removed this party from power.
- However, they can undertake hidden transfers by choosing the price subsidy policy.
- Will this hidden transfer “fool” the voters? It depends on parameters.
- The price subsidy policy could be observed in two different eventualities:
  - (1) Either the party in power is the social welfare maximizer, and in fact the policy is welfare improving. This has probability  $pq$ .
  - (2) Or it is the partisan party, wanting to transfer resources to group 1. This has probability  $(1 - q)$ .
- The expected return to group 2 voters from the price subsidy policy is therefore:

$$\frac{pq(b_2 + e) + (1 - q)}{pq + (1 - q)}$$

So they will prefer to accept this policy only if

$$(7.1) \quad \frac{pq(b_2 + e) + (1 - q)b_2}{pq + (1 - q)} > a_2$$

Therefore, when (7.1) is satisfied, an equilibrium in which the partisan party fools the rational voters is possible.

- Is this a plausible explanation for inefficient redistribution?
- I believe the answer is no. There are two problems:
  - (1) Only policies that have a sufficiently high ex ante probability of being efficient can be used for inefficient transfers. Subsidies to farmers do not seem to satisfy this requirement.
  - (2) If any value of  $\tau$  is allowed in combination with price subsidies, a forward induction argument (e.g. The Intuitive Criterion of Cho and Kreps) would rule out inefficient redistribution. Intuitively, the party that cares about social welfare would combine the price subsidy with a negative value of  $\tau$  to reveal its type, and this policy would of course not be desirable for the partisan party. Thus we would end up with a separating equilibrium, in which the voters would be able to tell apart the social-welfare-maximizing and partisan parties, and there would be no inefficient redistribution.

## 8. Inefficient Redistribution to Maintain Power

- Another possibility is that inefficient redistribution arises as a method of ensuring future redistribution.
- Imagine that efficient redistribution for the sector, say farming, would encourage some agents to leave farming, or at least young agents not to enter farming.
- Suppose also that future redistribution depends positively on the number of farmers (in general, we can have situations in which a greater number of agents in a given sector may be an advantage or a disadvantage for political power, because of free rider problems).

- In this case, current farmers may prefer inefficient redistribution in order to guarantee future redistribution.
- The following model illustrates this point.
- Consider the following two-period economy (periods 0 and 1) with a single consumption good produced by one of two sectors, farming and manufacturing.
- In the first period there are  $1 - \delta$  agents with a fraction  $n_0$  in farming and  $1 - n_0$  in manufacturing.
- These agents cannot change sector.
- All agents are risk neutral and discount the second period by a factor  $\beta \in (0, 1)$ .
- In each period, a farmer produces an output of  $B$  and a manufacturer produces output  $A$ , with  $A > B$ .
- Farmers cannot be taxed (e.g. they can hide their output costlessly), while manufacturers can be taxed a maximum of  $T$  (e.g. they can hide their output at a cost of  $T$ ) where  $T < A$ .
- At the beginning of period 0,  $\delta$  new agents arrive and choose which sector to enter. This decision is irreversible. There are no new agents in period 1.
- Let  $\tau_0$  and  $\tau_1$  denote the tax on manufacturers in periods 0 and 1 respectively, where  $\tau_t \in [0, T]$ , for  $t = 0, 1$ .
- The tax revenue can be redistributed to farmers in two distinct forms.
  - (1) a transfer to agents who are in farming at the beginning of the period, denoted by  $\theta_t \geq 0$ , for  $t = 0, 1$ .
  - (2) a general price subsidy which all farmers receive, denoted by  $\mu_t \geq 0$ .

The difference between  $\mu_0$  and  $\theta_0$  is that only those who were initially farmers at  $t = 0$  receive  $\theta_0$ , whereas  $\mu_0$  is also paid out to young agents who enter farming at time  $t = 0$ .  $\theta_0$  therefore approximates an efficient transfer as it is conditioned on characteristics outside the agents control. In contrast,  $\mu_0$  subsidizes farm

output and encourages new agents to enter farming, and so, is an inefficient method of redistribution.

- Ignoring political economy considerations, existing farmers prefer  $\theta$ -transfers to  $\mu$ -transfers, because they do not have to share the former with newly arriving farmers. However, it will turn out that political economy considerations may nonetheless encourage existing farmers to choose  $\mu$ -transfers.
- Consider the following reduced form political process which determines the current tax rate on manufacturers as a function of the number of farmers. More explicitly, the tax rates in the two periods are

$$(8.1) \quad \begin{aligned} \tau_0 &= \tau(n_0) \in [0, T] \\ \tau_1 &= \tau(n_1) \in [0, T]. \end{aligned}$$

The assumption  $\tau \geq 0$  incorporates the fact that farmers cannot be taxed. Notice that the tax rate in period  $t$  is only a function of the fraction of the population in farming at the time.

- Assume that the function  $\tau$  satisfies the following two conditions.

- (1) if  $n \leq n^-$  then  $\tau(n) = 0$
- (2) if  $n \geq n^+$  then  $\tau(n) = T$

- Assume also that the division of the tax revenue between  $\theta$ - and  $\mu$ - subsidies is decided only by farmers.
- The timing of political and economic events is as follows.
  - (1) In period 0, the political economy process determines  $\tau_0$ , then the farmers decide  $\theta_0$  and  $\mu_0$ .
  - (2) Young agents are born, they observe the policy vector, and decide which sector to enter.
  - (3) Then production takes place and the policy is implemented.

(4) At the beginning of period 1, the political process determines  $\tau_1$  and  $\theta_1$ .

(5) The model ends following production and implementation of the chosen policy.

- Define  $x$  as the fraction of new agents going into farming at time  $t = 0$ . The government budget constraints in the two periods are

$$(8.2) \quad (1 - \delta)(1 - n_0)\tau_0 = (1 - \delta)n_0(\theta_0 + \mu_0) + \delta\mu_0x$$

$$(8.3) \quad (1 - n_1)\tau_1 = n_1\theta_1.$$

In equation (8.2),  $(1 - \delta)(1 - n_0)\tau_0$  is total tax revenue,  $(\theta_0 + \mu_0)$  is the total per capita transfer to the  $(1 - \delta)n_0$  existing farmers, and  $\mu_0$  is the inefficient transfer that the  $\delta x$  newcomers who enter farming receive. In equation (8.3),  $(1 - n_1)\tau_1$  is total tax revenue, and is distributed among  $n_1$  farmers. [...Note that young agents who go into manufacturing do not get taxed in period 0, and they may also not receive any transfers when they go into farming (that is, if  $\mu_0 = 0$ )...]

- Notice that although the political process can discriminate between young and old farmers in period 0, this is not possible in period 1.
- Let  $V^f$  and  $V^m$  be the expected utilities (at time 0) of old farmers and manufacturers. Let  $W^f$  and  $W^m$  be the expected utilities (at time 0) of new agents who choose farming and manufacturing. Then,

$$(8.4) \quad V^f(\theta_0, \mu_0, \theta_1) = B + \theta_0 + \mu_0 + \beta[B + \theta_1],$$

$$(8.5) \quad V^m(\tau_0, \tau_1) = A - \tau_0 + \beta[A - \tau_1],$$

and

$$(8.6) \quad W^m(\tau_1) = (1 + \beta)A - \beta\tau_1,$$

$$(8.7) \quad W^f(\mu_0, \theta_1) = (1 + \beta)B + \mu_0 + \beta\theta_1.$$

- Newcomers make their occupational choices after observing  $\mu_0$ . Their strategy is therefore conditioned on  $\mu_0$ , and we write the fraction of new agents who go into farming when the subsidy is  $\mu$  as  $x(\mu)$ . Then the optimal sectoral choice of new agents in period 0 is:

$$(8.8) \quad \begin{aligned} x(\mu) &= 0 && \text{if } W^m(\tau_1) > W^f(\mu, \theta_1) \\ x(\mu) &= 1 && \text{if } W^m(\tau_1) < W^f(\mu, \theta_1) \\ x(\mu) &\in [0, 1] && \text{if } W^m(\tau_1) = W^f(\mu, \theta_1). \end{aligned}$$

- $x(\mu)$  defines the best response function (correspondence) of newcomers for all possible levels of subsidies.
- The fraction of farmers in the population at time  $t = 1$  is then

$$(8.9) \quad n_1 = (1 - \delta)n_0 + \delta x,$$

- A pure strategy subgame perfect Nash equilibrium is a tuple,  $\{x(\mu), n_1, \tau_0, \theta_0, \mu_0, \tau_1, \theta_1\}$  such that equations (8.2), (8.3), (8.9) hold,  $\tau_0 = \tau(n_0)$ ,  $\tau_1 = \tau(n_1)$ , and the function  $x(\mu)$  is defined by (8.8),  $\{\theta_0, \mu_0\}$  maximizes  $V^f$ .
- Notice that  $\tau_1 = \tau(n_1)$  at time 1, which implies that the political system cannot commit to future redistribution. This is a crucial ingredient in this theory for inefficient redistribution because it provides a reason for the farmers to wish to increase their numbers in period 1 to achieve greater political power.
- For simplicity, assume;

**Assumption 1:**  $(1 + \beta)(A - B) > 2\beta T$ ,

- which implies that the maximum tax rate is small relative to the productivity differential between the two sectors, and ensures that it is not worthwhile to go into farming only to receive future transfers.



- First consider the case in which  $n_0 \leq n^-$ , so that  $\tau_0 = 0$ , hence  $\theta_0 = \mu_0 = 0$ . In this case, there are too few farmers at date  $t = 0$  for them to have any power, so there is no redistribution. As a result, there exists a unique equilibrium in which all young agents go into manufacturing. Specifically, with  $\tau_0 = 0$ ,  $\mu_0 = 0$ , so Assumption 1 ensures that

$$W^f(\mu_0 = 0) \leq (1 + \beta)B + \beta T < (1 + \beta)A - \beta T \leq W^m(\tau_0 = 0).$$

Therefore:

**PROPOSITION:** *Suppose Assumption 1 holds and  $n_0 < n^-$ , then there exists a unique equilibrium with  $n_1 = (1 - \delta)n_0$ ,  $\tau_0 = \tau_1 = \theta_0 = \theta_1 = \mu_0 = 0$ , and  $x(\mu_0 = 0) = 0$ .*

- Next, consider the case where  $n_0 > \frac{n^+}{1-\delta}$ . Farmers have large enough numbers so that even when  $x = 0$ , they retain maximal power. Therefore, they choose  $\tau_0, \tau_1, \theta_0, \theta_1$ , and  $\mu_0$  to maximize  $V^f$ , which gives  $\tau_0 = \tau_1 = T$ ,  $\mu_0 = 0$ ,  $\theta_t = \frac{(1-n_t)T}{n_t}$ , for  $t = 0, 1$ .
- Notice that in this case

$$W^f = (1 + \beta)B + \beta \left[ \frac{(1 - n_1)T}{n_1} \right], \text{ and}$$

$$W^m = (1 + \beta)A - \beta T,$$

Assumption 1 implies that  $W^m > W^f$ , and  $x(\mu = 0) = 0$ .

**PROPOSITION:** *Suppose Assumption 1 holds and  $n_0 > \frac{n^+}{1-\delta}$ , then there exists a unique equilibrium such that  $\tau_0 = \tau_1 = T$ ,  $\mu_0 = 0$ ,  $\theta_0 = \frac{(1-n_0)T}{n_0}$ ,  $x(\mu_0 = 0) = 0$ ,  $n_1 = (1 - \delta)n_0$  and  $\theta_1 = \frac{(1-(1-\delta)n_0)T}{(1-\delta)n_0}$ .*

- In both cases discussed so far, the equilibrium maximizes output and the form of redistribution is efficient.

- Although there is redistribution, no production or occupational decisions are distorted. The reason for this efficient form of redistribution is that political power is not contested. When  $n_0 < n^-$ , manufacturers have total political power and this can never be transferred to farmers. Similarly, when  $n_0 > \frac{n^+}{1-\delta}$ , farmers have maximal political power and always retain it, even if all newcomers were to go into manufacturing. This highlights the main conclusion of this model that inefficient redistribution will arise in order to control political power.
- Now consider the case where

$$n^- < n_0 < \frac{n^+}{1-\delta}.$$

Farmers have some political power in period 0, and the extent of their political power at date 1 depends on the actions of newcomers. It is straightforward from the analysis in the above proposition that if  $\mu_0 = 0$ , newcomers will prefer to go into manufacturing. Therefore, farmers may want to use  $\mu_0 > 0$ , i.e. inefficient redistribution, in order to attract newcomers into farming, and increase their political power.

- The utility of old farmers can be written as

$$(8.10) \quad V^f = (1 + \beta)B + \theta_0 + \mu_0 + \beta\phi(n_1)$$

where

$$(8.11) \quad \phi(n_1) \equiv \frac{\tau(n_1)(1 - n_1)}{n_1} \equiv \frac{\tau((1 - \delta)n_0 + \delta x)(1 - (1 - \delta)n_0 - \delta x)}{(1 - \delta)n_0 + \delta x}$$

is per capita redistribution at  $t = 1$ .

- For the farmers to attract newcomers, they need to provide them with at least as much utility in farming as in manufacturing, hence

$$W^f \geq W^m,$$

where  $W^m$  and  $W^f$  are given by (8.6) and (8.7).

- Define

$$U^f(x) = (1 + \beta)B + \beta\phi(n_1) = W^f - \mu_0$$

as the utility of a new agent entering farming when a fraction  $x$  of newcomers enter farming and there is no inefficient redistribution (i.e.,  $\mu_0 = 0$ ).

- Also define  $U^m(x) = W^m$  as the utility of a new agent entering manufacturing when a fraction  $x$  of newcomers enter farming. Now  $x > 0$  requires that  $\mu_0 \geq U^m(x) - U^f(x)$  so as to convince newcomers to enter farming. Moreover, existing farmers would never want to pay more than necessary to newcomers, so focus on the case where

$$\mu_0 = U^m(x) - U^f(x) = (1 + \beta)(A - B) - \beta(\phi(n_1) + \tau(n_1)).$$

Solving (8.2) for  $\theta_0 + \mu_0$ , the return to old farmers when they ensure that a fraction  $x$  of new farmers enter farming, the utility of all farmers,  $\widehat{V}^f(x)$ , is

$$(8.12) \quad \widehat{V}^f(x) = (1 + \beta)B + \beta\phi(n_1) + \frac{(1 - \delta)(1 - n_0)\tau_0 - \delta x [U^m(x) - U^f(x)]}{(1 - \delta)n_0}.$$

- Let  $\overline{V}^f$  be their utility when  $\mu_0 = 0$ . Notice that  $\widehat{V}^f(x = 0) = \overline{V}^f$  because when  $\mu_0 = 0$  and no new born agents are entering farming,  $x = 0$ , so the fact that  $\mu_0 = U^m(x) - U^f(x)$  does not matter.
- Whether farmers prefer to use inefficient methods of redistribution, and so attract newcomers, depends on

$$(8.13) \quad \frac{d\widehat{V}^f(x = 0)}{dx} = \delta \left( \beta\phi'((1 - \delta)n_0) - \frac{U^m(x = 0) - U^f(x = 0)}{(1 - \delta)n_0} \right).$$

The first term in parenthesis is the benefit of attracting some of the newcomers, while the second term is the cost of doing so per existing farmer.

- If this expression, (8.13), is positive, then the utility of old farmers can be increased by attracting some of the young agents into farming.

- In this case farmers will design the redistribution system to be inefficient specifically to increase their numbers.
- Notice that farmers will only want to use inefficient redistribution when increasing their numbers leads to greater per capita transfers,  $\phi(n_1)$ . This implies that taxes imposed on manufacturers should increase sufficiently in  $n_1$  to ensure greater transfers to farmers.

**PROPOSITION:** *If*

$$(8.14) \quad \phi'((1-\delta)n_0) > \frac{1}{\beta(1-\delta)n_0} [U^m(x=0) - U^f(x=0)]$$

*then there will be inefficient redistribution, i.e.  $\mu_0 > 0$ . In equilibrium,*

$$\mu_0 = U^m(x^*) - U^f(x^*),$$

*and a fraction  $x^*$  of newcomers enter farming such that*

$$(8.15) \quad \beta((1-\delta)n_0 + \delta x^*) \phi'((1-\delta)n_0 + \delta x^*) - \mu_0 + \beta \delta x^* \tau'((1-\delta)n_0 + \delta x^*) = 0,$$

*or  $x^* = 1$  if (8.15) > 0 when evaluated at  $x^* = 1$ .*

- The second part follows by noting that  $(\mu_0, x^*)$  are chosen to maximize (8.12). Substituting for  $\mu_0 = U^m(x^*) - U^f(x^*)$ ,  $dU^m(x^*)/dx = -\beta\tau'(n_1)$ , and  $dU^f(x^*)/dx = \beta\phi'(n_1)$ , and simplifying gives (8.15).
- Inefficient redistribution arises because it keeps power in the hands of the farmers. It achieves this because it rewards potential farmers, not only those who are already locked into farming. Expressed differently, because  $\theta_0$  is a “lump-sum” transfer, it does not distort the decisions of marginal agents. Precisely for this reason, however, the political process may choose to redistribute via  $\mu_0$  not  $\theta_0$ .
- Finally, consider a comparative static implication of this model regarding specificity of factors.

- To do this, consider the analogous situation where, rather than young agents that can potentially enter farming, there are existing farmers that can leave. The same logic as before suggests that inefficient redistribution may be useful to keep these farmers in farming, and hence maintain the power of the farming lobby.
- Now consider a situation which these agents have very specific skills that are useful for farming. In this case, they are unlikely to leave, and there is little need for inefficient redistribution.
- Alternatively, imagine the situation in which they have no specific skills. Now inefficient redistribution is necessary to keep them in farming.
- Therefore, the prediction of this approach is that there should be more inefficient redistribution when factors are less specific.
- This comparative static seems to be in line with the evidence, where sectors that receive a lot of subsidies do not appear to have very specific skills (e.g., textiles, farming etc.). Interestingly, it is the opposite of the predictions other approaches, which suggest that there should be more redistribution (and hence perhaps more inefficient redistribution), when there are more specific skills.



## **Part 3**

# **Understanding Institutions**





## CHAPTER 6

### The Emergence of Democratic Institutions

- Democratic institutions emerged in most countries during the 19th or early 20th centuries with extensions of the franchise to portions of the population that had previously no votes.
- Existing evidence suggests that, as may have been expected, this change in voting rights led to important policy changes. For example, greater redistribution, better organization for labor, more investment in the education of the masses.
- The emergence of democracies therefore offers an example of major institutional change, and gives us an opportunity to understand the process of how institutions get determined.

#### 1. Different Theories of Democratization

- Here are a number of different theories of democratization:
  - (1) *The Enlightenment*: This theory is that the elite extended the franchise because their social values changed. In particular, the Enlightenment movement may have made it harder for the elites to view a society in which a large fraction of the population had no representation as fair and just.
  - (2) *Political Party Competition*: This theory is inspired in part by the British experience, where the competition between Disraeli and Gladstone was a major factor in political reform. According to this theory, politicians have a strong preference

to stay in power, and may extend the franchise with the expectation that the newly enfranchised will return the favor by voting for their party.

- (3) *Middle-Class Drive*: Since the seminal work of Barrington Moore, many social scientists view the middle class, or the bourgeoisie as the driving force of democratization. Many of these theories are not explicit on what the reason for this may be. I will return to discussion of the role of middle class below.
- (4) *Conflict Between Ins and Outs*: According to this view, which is the one I will dwell on more, democratization occurs because of competition between those who do not have the vote and those who do. In this view, democratization is a change in political institutions that affects how political power is allocated in the future.
  - I will now discuss a model formalizing the view that democratization emerges as a result of the conflict between ins and outs. Clearly, this falls in the broad category of rent-seeking views of institutions and/or class-conflict theories of the state.
  - This is partly motivated by the historical evidence. Most historical evidence suggests an important role for conflict between those who controlled political power and those without political power. For example, in Britain all major extensions of the franchise happened amidst social unrest or even in the face of a severe threat of revolution by the disenfranchised (the workers, the poor or the lower middle-class).
  - There are also a number of conceptual issues that this discussion brings out. In particular:
    - (1) Why would groups that have political power now transfer to others? The answer to this is related to the notion that the outs can threaten the system, or cause a revolution.

- (2) But then why not simply give them redistribution or adopt the policies that they want rather than change the whole political system? The answer to this question will relate to the issue of political institutions as a “commitment device”—democratization not only changes policies today, but also regulates political power in the future. Recall that this is the key role of political institutions, so we have an example here where this role of political institutions is essential.

## 2. A Model

- Consider an infinite horizon economy with a continuum 1 of agents. A proportion  $\lambda$  of these agents are “poor”, while the remaining  $1 - \lambda$  form a rich “elite”.
- Initially, political power is concentrated in the hands of the elite, but  $\lambda > 1/2$ , so if there is full democracy, the median voter will be a poor agent.
- There is a unique consumption good  $y$  with price normalized to unity, and a unique asset,  $h$  (which should be thought as a combination of human and physical capital and land).
- There are two methods of producing the final good, both linear in capital. The first is a market technology,  $Y_t^m = AH_t^m$ , where  $H_t^m$  is the amount of capital devoted to market production. The second is an “informal”, or home production technology,  $Y_t^h = BH_t^h$ , where  $H_t^h$  is the amount of capital used in home production. The role of home production is to ensure an equilibrium tax rate less than 100 percent, because while taxes can be imposed on the market sector, home production is not taxable. A high value of  $B$  implies that only limited taxes can be levied on income.
- All agents have identical preferences represented by a linear indirect utility function over net income, and a discount factor  $\beta \in (0, 1)$ . Post-tax income is given

by

$$\hat{y}_t^i \equiv (1 - \tau_t)Ah^i + T_t,$$

for  $i = p, r$ , where  $\tau_t$  is the tax rate on income, and  $T_t \geq 0$  is the transfer that the agent receives from the state.

- Assume that taxes and transfers cannot be person specific, hence  $T_t$  and  $\tau_t$  are not indexed by  $i$ . The government budget constraint therefore implies

$$T_t = \tau_t AH^m.$$

- The  $\lambda$  poor agents, though initially excluded from the political process, can overthrow the existing government and take over the capital stock in any period  $t \geq 0$ . If a revolution is attempted, it always succeeds.
- Revolution provides a window of opportunity for a large-scale redistribution of assets away from the rich to the poor, so the poor takeover control of the capital stock of the economy, but a fraction  $1 - \mu_t$  of the capital stock gets destroyed in the process. Therefore, if there is a revolution at time  $t$ , each poor agent receives a per period return of  $\mu_t AH / \lambda$  in all future periods: total income in the economy is

$$\mu_t AH$$

and is shared between  $\lambda$  agents.

- The revolution opportunity  $\mu$  is stochastic and changes between two values:  $\mu^h$  and  $\mu^l = 0$ , with  $\Pr(\mu_t = \mu^h) = q$  irrespective of whether  $\mu_{t-1} = \mu^h$  or  $\mu^l$ . The fact that  $\mu$  fluctuates captures the notion that some periods may be more conducive to social unrest than others. It will underlie results related to the idea that a promise to redistribute today may not materialize due to changes in circumstances tomorrow. A low value of  $\mu$  means that a revolution is very costly, while

a low value of  $q$  implies that the threat of revolution is rare, perhaps because the poor are unorganized.

- Finally, in each period the elite have to decide whether or not to extend the franchise. If it is extended, the economy becomes a democracy, and the median voter, a poor agent, sets the tax rate. We assume that if voting rights are extended, they cannot be rescinded, so the economy always remains a democracy.

The timing of events within a period is.

1. the state  $\mu$  is revealed.
2. the elite decide whether or not to extend the franchise. If they decide not to extend the franchise, they set the tax rate.
3. the poor decide whether or not to initiate a revolution. If there is a revolution, they share the remaining output. If there is no revolution and the franchise has been extended, the tax rate is set by the median voter (a poor agent).
4. the capital stock is allocated between market and home production, and incomes are realized.

- The analysis can be simplified by exploiting two features of the model. First, the capital allocation decision takes a simple form: if  $\tau_t > \hat{\tau} \equiv (A - B)/A$ , then all agents allocate their capital to home use, thus  $H_t^m = 0$ . If, on the other hand,  $\tau_t \leq \hat{\tau}$ , then  $H_t^m = H_t$  is a best-response. No voter would ever choose  $\tau_t > \hat{\tau}$ , so we can restrict attention to  $\tau_t \leq \hat{\tau}$  and  $H_t^m = H_t$ , which reduces the number of actions to be considered.
- Second, all members of the elite have identical preferences, so we can treat them as one player. Also, all poor agents have the same preferences, and when it comes to whether or not to participate in a revolution, there is no “free-rider problem” because if an agent does not take part in the revolution, he can be excluded

from the resulting redistribution. This economy can therefore be represented as a dynamic game between two players, the elite and the poor.

- Let us focus on Markovian equilibria, where strategies are only a function of the current state of the system.
- The state of the system consists of the current opportunity for revolution, represented by either  $\mu^l$  or  $\mu^h$ , and the political state (democracy or elite control).
- More formally, let  $\sigma^r(\mu, P)$  be the actions taken by the elite when the state is  $\mu = \mu^h$  or  $\mu^l$ , and  $P = E$  (elite in power) or  $D$  (democracy). This consists of a decision to extend the franchise  $\phi$  when  $P = E$ , and a tax rate  $\tau^r$  when  $\phi = 0$  (i.e. when franchise is not extended). Clearly, if  $\phi = 0$ ,  $P$  remains at  $E$ , and if  $\phi = 1$ ,  $P$  switches to  $D$  forever. Similarly,  $\sigma^p(\mu, P|\phi, \tau^r)$  are the actions of the poor which consist of a decision to initiate a revolution,  $\rho$  ( $\rho = 1$  representing a revolution), and possibly a tax rate  $\tau^p$  when the political state is  $P = D$ . These actions are conditioned on the current actions of the elite who move before the poor agents according to the timing of events above.
- Then, a (pure strategy Markov Perfect) equilibrium is a strategy combination,  $\{\sigma^r(\mu, P), \sigma^p(\mu, P|\phi, \tau^r)\}$  such that  $\sigma^p$  and  $\sigma^r$  are best-responses to each other for all  $\mu$  and  $P$ .
- Define  $V^p(R)$  as the return to poor agents if there is a revolution starting in state  $\mu = \mu^h$ . Since only the value of  $\mu^h$  at the time of the revolution matters,

$$V^p(R) = \frac{\mu^h AH}{\lambda(1 - \beta)},$$

which is the per-period return from revolution for the infinite future discounted to the present. Also, because the rich lose everything,  $V^r(R) = 0$ . Finally, since  $\mu^l = 0$ , the poor would never attempt a revolution when  $\mu = \mu^l$ .

- In the state  $(\mu^l, E)$  the elite are in power and there is no threat of revolution, so in any Markov Perfect Equilibrium,  $\phi = 0$  and  $\tau^r = 0$ . Therefore, the values of poor and rich agents,  $j = p$  or  $r$ , are given by:

$$(2.1) \quad V^j(\mu^l, E) = Ah^j + \beta [(1 - q)V^j(\mu^l, E) + qV^j(\mu^h, E)].$$

- Next, consider the state  $(\mu^h, E)$ , and suppose that the elite play  $\phi = 0$  and  $\tau^r = 0$ , that is, they neither extend the franchise nor redistribute to the poor. Then, we would have

$$\tilde{V}^p(\mu^h, E) = Ah^p / (1 - \beta).$$

The revolution constraint is equivalent to:

$$V^p(R) > \tilde{V}^p(\mu^h, E),$$

so that without any redistribution or franchise extension, the poor prefer to initiate a revolution when  $\mu = \mu^h$ .

- Assume

$$\frac{h^r}{h^p} > \frac{\lambda(1 - \mu^h)}{(1 - \lambda)(\mu^h - (1 - \beta)\frac{A-B}{A})}.$$

which is a condition slightly stronger than the revolution constraint,  $V^p(R) > \tilde{V}^p(\mu^h, E)$ . It ensures not only that the revolution constraint binds, but also that redistribution only for one period is not sufficient to prevent a revolution.

- Since the revolution is the worst outcome for the elite, they will attempt to prevent it. They can do this in two different ways. First, the elite can choose to maintain political power,  $\phi = 0$ , but redistribute through taxation. In this case, the poor obtain  $V^p(\mu^h, E, \tau^r)$  where  $\tau^r$  is the tax rate chosen by the rich. With either action by the elite, the poor may still prefer a revolution, thus:

$$V^p(\mu^h, E) = \max \{V^p(R); \phi V^p(D) + (1 - \phi)V^p(\mu^h, E, \tau^r)\},$$

where  $V^p(D)$  is the return to the poor in democracy. Instead, the return to the poor when the elite choose the redistribution strategy is:

$$(2.2) \quad \begin{aligned} V^p(\mu^h, E, \tau^r) &= (1 - \tau^r)Ah^p + \tau^r AH \\ &+ \beta [qV^p(\mu^h, E, \tau^r) + (1 - q)V^p(\mu^l, E)]. \end{aligned}$$

The rich redistribute to the poor, taxing all income at the rate  $\tau^r$ . The poor therefore receive net income  $(1 - \tau^r)Ah^p$  from their own capital and a transfer of  $T = \tau^r AH$ .

- If in the next period we are still in state  $\mu = \mu^h$ , redistribution continues. But, if the state switches to  $\mu = \mu^l$ , redistribution stops and the poor receive  $V^p(\mu^l, E)$ . This captures the notion that the elite cannot commit to future redistribution, unless the future also poses an effective revolution threat.
- Notice that  $\tau^r \leq \hat{\tau}$ , that is the elite cannot tax themselves at a rate higher than  $\hat{\tau} \equiv (A - B)/A$  [...if  $\tau > \hat{\tau}$ , then each (rich) agent would privately prefer to use all their assets in the home sector, reducing aggregate tax revenues to zero...]
- The second strategy to prevent the revolution is to extend the franchise,  $\phi = 1$ . Since  $\lambda > 1/2$ , in a democracy the median voter is a poor agent and wants as much redistribution as possible. Redistribution has no allocative cost as long as  $\tau \leq \hat{\tau}$ , so the equilibrium tax rate is  $\tau_t = \hat{\tau} \equiv (A - B)/A$ , and  $T_t = (A - B)H$ . The returns to poor and rich agents in democracy are therefore:

$$V^p(D) = \frac{Bh^p + (A - B)H}{1 - \beta} \text{ and } V^r(D) = \frac{Bh^r + (A - B)H}{1 - \beta}.$$

- Let us restrict attention to the area of the parameter space where democratization prevents a revolution, i.e.,  $V^p(D) > V^p(R)$ . Thus, assume:

$$Bh^p + (A - B)H > \frac{\mu^h AH}{\lambda}.$$



- To determine whether the elite can prevent the revolution with the redistribution strategy, let  $\hat{V}^p(\mu^h, E|q)$  be the maximum utility (as a function of the parameter  $q$ ) that can be given to the poor without extending the franchise. This maximum utility is achieved by setting  $\tau^r = \hat{\tau}$  in (2.2). Therefore, combining (2.1) and (2.2), we obtain:

$$\begin{aligned}
 (2.3) \quad \hat{V}^p(\mu^h, E|q) &= V^p(\mu^h, E, \hat{\tau}) \\
 &= \frac{Bh^p + (A - B)H - \beta(1 - q)(A - B)(H - h^p)}{(1 - \beta)}.
 \end{aligned}$$

If  $\hat{V}^p(\mu^h, E|q) < V^p(R)$ , then the maximum transfer that can be made when  $\mu = \mu^h$  is not sufficient to prevent a revolution. Notice that thanks to the above assumptions, we have  $\hat{V}^p(\mu^h, E|q = 1) = V^p(D) > V^p(R)$  and  $\hat{V}^p(\mu^h, E|q = 0) = Ah^p/(1 - \beta) + (A - B)(H - h^p) < V^p(R)$ .

- Moreover,  $\hat{V}^p(\mu^h, E|q)$  is monotonically and continuously increasing in  $q$ . Therefore, there exists a unique  $q^* \in (0, 1)$  such that  $\hat{V}^p(\mu^h, E|q^*) = V^p(R)$ . Finally, note that  $V^r(\mu^h, E, \tau^r)$  is decreasing in  $\tau^r$ , and for all  $\tau^r$ , it is greater than  $V^r(D)$ . The latter fact follows because when there is a democracy,  $\tau = \hat{\tau}$  in all periods, whereas with the power in the hand of the elites,  $\tau \in (0, \hat{\tau}]$  whenever  $\mu = \mu^h$ , but  $\tau = 0$  when  $\mu = \mu^l$ .

**PROPOSITION:** Suppose the above assumptions hold. Then, for all  $q \neq q^*$ , there exists a unique pure strategy Markov Perfect Equilibrium such that:

1. If  $q < q^*$ , then the revolution threat will be met by franchise extension. More formally, the equilibrium is  $\sigma^r(\mu^l, E) = (\phi = 0, \tau = 0)$ ,  $\sigma^r(\mu^h, E) = (\phi = 1, .)$ .  $\sigma^p(\mu^h, E|\phi = 0, \tau) = (\rho = 1)$ ,  $\sigma^p(\mu^h, E|\phi = 1, .) = (\rho = 0, \tau = \hat{\tau})$  and  $\sigma^p(\mu^h, D) = (\tau = \hat{\tau})$ .

2. If  $q > q^*$ , then the revolution threat will be met by temporary redistribution. More formally,  $\sigma^r(\mu^l, E) = (\phi = 0, \tau = 0)$ ,  $\sigma^r(\mu^h, E) = (\phi = 0, \bar{\tau}^r)$  where  $\bar{\tau}^r \in (0, \hat{\tau})$  is defined by  $V^p(R) = V^p(\mu^h, E, \bar{\tau}^r)$ , and  $\sigma^p(\mu^h, E | \phi = 0, \tau) = (\rho = 0)$  for all  $\tau \geq \bar{\tau}^r$ . Also, off the equilibrium path,  $\sigma^p(\mu^h, E | \phi = 0, \tau) = (\rho = 1)$  for all  $\tau < \bar{\tau}^r$ ,  $\sigma^p(\mu^h, E | \phi = 1, \cdot) = (\rho = 0, \tau = \hat{\tau})$  and  $\sigma^p(\mu^h, D) = (\tau = \hat{\tau})$ .

- Starting with the elite in power, if  $q < q^*$ , then the rich set a zero tax rate when  $\mu = \mu^l$ , and extend the franchise when the state switches to  $\mu = \mu^h$ . The poor play the optimal strategy of initiating a revolution if the state is  $\mu = \mu^h$  and the franchise has not been extended. After the franchise extension, the median voter is a poor agent and sets the tax rate  $\tau = \hat{\tau}$ . In contrast, when  $q > q^*$ , the rich can prevent a revolution by redistributing. So in the state  $\mu = \mu^l$ , they set  $\tau = 0$ , and when  $\mu = \mu^h$ , they set a tax rate,  $\bar{\tau}^r$ , just high enough to prevent the revolution. This strategy combination is the unique pure strategy (Markov Perfect) equilibrium of the game.

There are three main conclusions to be drawn from this analysis:

- (1) Even though the elite face a lower future tax burden with redistribution than under democracy, they may prefer to extend the franchise. This is because when  $q < q^*$ , redistribution is not sufficient to prevent a revolution. With  $q$  low, the revolution threat is transitory, so the poor realize that they will only receive transfers for a short while. Redistribution when  $\mu = \mu^h$  can therefore be viewed as a noncredible promise of future redistribution by the elite. Unconvinced by this promise, the poor would attempt a revolution. The revolution is only prevented by franchise extension. This highlights that the role of political institutions is to provide commitment by allocating future political power.

- (2) Perhaps paradoxically, a high  $q$  makes franchise extension less likely. A high  $q$  corresponds to an economy in which the poor are well organized, so they frequently pose a revolutionary threat. A naive intuition may have been that in this case franchise extension would be more likely. This is not the case, however, because with a frequent revolutionary threat, future redistribution becomes *credible*.
- (3) Greater inequality makes the revolution constraint more binding, and makes it more likely that there will be democratization. With very low inequality, the revolution constraint will never bind. With higher, but still low inequality, when the revolution constraint binds, the elite can prevent the revolution by temporary redistribution.

### 3. Repression

- The above analysis did not allow the elite to use repression as a method of preventing social unrest and revolution.
- Given the widespread use of repression in many non-democratic societies, it is important to analyze this question.
- Moreover, it will turn out that we can understand the role of the middle class in the democratization process better when the elite have a repression strategy.
- For the purpose of this discussion, let us focus on the case where without repression there will be democratization.
- Assume also that the elite can hire an army with the sole purpose of suppressing revolutionary threats, at per period cost  $M$  for each member of the elite, and that this strategy completely avoids the threat of revolution [...how is the free rider problem among the elite solved here?].

- With this repression strategy in the state the rich will have a return of

$$\overline{V}^r(\text{Repression}) = \frac{Ah^r - M}{1 - \beta}.$$

whereas recall that with democratization they have a return of

$$V^r(D) = \frac{Bh^r + (A - B)H}{1 - \beta}$$

- Therefore, the elite will prefer repression if

$$M < (A - B)(h^r - H).$$

- This condition shows that the anticipation of higher taxes after democratization will encourage the elite to prefer repression. Higher taxes may result from
  - (1) a high level of  $A - B$ , that is a poor alternative technology.
  - (2) the high level of  $h^r - H$ , that is a high level of inequality.
- Therefore, now high inequality will make democratization less likely.
- Therefore, the relationship between inequality and democratization is ambiguous.

#### 4. The Role of the Middle Class in Democratization

- Barrington Moore emphasized the role of the middle class and the bourgeoisie in democratization.
- He suggested that in societies where the bourgeoisie is strong, there will be democratization.
- In societies where the bourgeoisie is weak and enters into a coalition with the landed aristocracy, fascism will result.
- How can we make sense of the role of the middle class in democratization?
- In the framework developed here, there can be three distinct roles of the middle class/bourgeoisie:
  - (1) The middle class could be part of the outs and fight for democracy. This seems to have been the case in the 1832 reforms in Britain.

- (2) The middle class could be part of the outs, and after democratization, we might expect the median voter to be from the middle class. If this is the case, the tax preferences of the middle class will determine whether repression is profitable for the non-middle-class elites (e.g., the landed aristocracy). In particular, the poorer is the middle class, the higher may be their preferred tax rate, and the more likely is repression.
- (3) The middle class/bourgeoisie may already be part of the ins. In this case, it is plausible that, relative to the landed aristocracy for the military (especially in Latin America), the middle class finds repression less attractive and democratization more attractive (e.g., after democratization there could be land reform, or heavy taxation of land, and repression may be more damaging to economic relations that are based on commerce). In this case, the middle class could be important in the process of democratization in a different manner: as it gains power within the coalition among the elite, the elite may shift from repression to appeasement (e.g. democratization).



## CHAPTER 7

### Political Instability and Coups

- Now I will analyze an extension of the above model to also discuss coups and political instability.

#### 1. The Basic Model

- Consider an infinite horizon economy with a continuum 1 of agents. As before, a proportion  $\lambda$  of these agents are “poor”, while the remaining  $1 - \lambda$  form a rich “elite”.
- There is a unique consumption good  $y$ , and a unique asset with total stock,  $h$  (which can be thought of as physical or human capital or land).
- Each poor agent has capital  $h^p$  and each member of the elite has  $h^r > h^p$ .
- Let  $h^r = (1 - \theta)h/(1 - \lambda)$  and  $h^p = \theta h/\lambda$  where  $\lambda > \theta > 0$ , so that a low level of  $\theta$  corresponds to higher inequality.
- The final good is produced from capital, and total output of an agent is

$$y_t^i = A_t h^i$$

for  $i = p, r$ , where  $A_t$  captures aggregate productivity. In particular,  $A_t$  takes two values,

$$A_t = \begin{cases} A^h = 1 & \text{with probability } 1 - s \\ A^l = a & \text{with probability } s \end{cases}$$

where  $A^l = a < 1$  is a period of recession. We assume that  $s < 1/2$  so that recessions are relatively rare. We therefore refer to  $A_t = A^h$  as “normal times”.

- The role of recessions is to change the opportunity cost of coups to rich agents in a democracy and of revolution to poor agents in a nondemocracy.
- All agents have identical preferences represented by

$$E_t \sum_{j=0}^{\infty} \beta^{t+j} C_{t+j}^i$$

for  $i = p, r$ , where  $C_t^i$  is consumption of agent  $i$  at time  $t$ ,  $\beta$  is the discount factor and  $E_t$  is the expectations operator conditional on all information available at time  $t$ .

- Post-tax income is given by,

$$\hat{y}_t^i \equiv (1 - \tau_t) A_t h^i + T_t,$$

where  $\tau_t \geq 0$  is the tax rate on income, and  $T_t \geq 0$  is the lump-sum transfer all agents receive (transfers cannot be person specific).

- Also assume that it is costly to raise taxes: at tax rate  $\tau_t$ , there is a deadweight cost of

$$c(\tau_t) A_t h,$$

where  $c$  is twice continuously differentiable with  $c(0) = 0$ ,  $c'(0) = 0$ ,  $c'(\tau) > 0$  for all  $\tau > 0$ , and  $c'' \geq 0$ .

- For simplicity assume that  $c'(1) = \infty$ , which ensures an interior tax rate.
- The government budget constraint implies

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

- The society starts in nondemocracy and the  $\lambda$  poor agents are initially excluded from the political process, but they can attempt a revolution in any period  $t \geq 1$ .
- After a revolution, poor agents expropriate an additional fraction  $\pi - \theta$  of the asset stock of the economy. During the period of the revolution, a fraction  $1 - \mu > 0$  of the income of the economy is destroyed, so each agent obtains a per-period



return of  $\mu\pi A_t h/\lambda$ . After this initial period following revolution, each for agent receives a per-period return of  $\pi A_t h/\lambda$  forever.

- A low value of  $\mu$  implies that a revolution is relatively costly, and a low value of  $\pi$  implies that returns from revolution are limited.
- The rich can also decide to voluntarily extend the franchise and establish a democracy, and there are no costs in this process.
- If the franchise is extended, then the economy becomes a democracy, and the median voter, a poor agent, sets the tax rate.
- In a democracy, the elite have no special voting power (one-person-one-vote), but they can attempt a coup. After a coup, the political situation reverts back to the initial status quo with the elite controlling political power.
- A coup causes economic disruption and political turmoil, and destroys a fraction  $1 - \phi$  of all agents' income during the period in which it takes place. Agent  $i$ 's income if a coup occurs in period  $t$  is therefore  $\phi A_t h^i$ .
- The timing of events within a period is

- (1) The state  $A_t$  is revealed.
- (2) If there has been a revolution in the past, the poor receive their share of income, consumption takes place and the period ends.

If the society is in a democracy, the poor set the tax rate,  $\tau_t$ . If the society is in a nondemocratic regime, the rich set  $\tau_t$ .

- (3) In a nondemocratic regime, the rich decide whether or not to extend the franchise. In a democracy, they decide whether to mount a coup. If they extend the franchise or a coup takes place, the party that comes to power decides whether to keep the tax  $\tau_t$  set at stage 2 or set a new tax rate.

- (4) In a nondemocratic regime, the poor decide whether or not to initiate a revolution. If there is a revolution, they share the remaining output of the economy. If there is no revolution, the tax rate decided at 2 or 3 gets implemented.
- (5) Consumption takes place and the period ends.
- Notice that coups are only possible starting in a democratic regime, and revolutions are only possible starting in a nondemocratic regime. This implies that the poor cannot undertake a revolution immediately following a coup against democracy.
  - Again focus on the pure strategy Markov Perfect Equilibria of this game in which strategies only depend on the current state of the world and the prior actions taken within the same period.
  - The state  $S$  is one of  $(A, D)$ ,  $(A, E)$ , or  $(A, R)$  where  $A = A^l$  or  $A = A^h$ . Here  $E$  denotes elite in power (nondemocratic regime),  $D$  denotes democracy, and  $R$  denotes “revolution”.
  - The strategy of the elite is denoted by  $\sigma^r(S|\tau^p)$  and is a function of the state  $S$  and the taxation decision by the poor when  $S = (A, D)$ .
  - This strategy determines the actions of the elite which are  $\{\gamma, \zeta, \tau^r\}$ .  $\gamma$  denotes the decision to extend the franchise, which only applies in the state  $(A, E)$ , and  $\gamma = 1$  corresponds to the extension of the franchise, while  $\gamma = 0$  means no franchise extension.  $\zeta$  is the decision to mount a coup, which only applies in the state  $(A, D)$ , and we adopt the convention that  $\zeta = 1$  corresponds to a coup, and  $\zeta = 0$  to no coup.
  - Finally,  $\tau^r$  is the tax rate set by the elite, and they get to set the tax rate either when  $S = (A, E)$  and  $\gamma = 0$ , or when  $S = (A, D)$  and  $\zeta = 1$ .
  - The optimal tax rate for a poor agent in the absence of a coup threat,  $\tau^m$ , simply maximizes his per period consumption, and is independent of the state of the

economy. Thus,

$$\tau^m = \arg \max_{\tau} \{ (1 - \tau) A_t h^p + (\tau - c(\tau)) A_t h \},$$

where  $(1 - \tau) A_t h^p$  is the after-tax earned income for a poor agent, and  $(\tau - c(\tau)) A_t h$  is the lump-sum transfer,  $T_t$ . The first-order condition of this problem gives

$$(1.1) \quad c'(\tau^m) = \frac{\lambda - \theta}{\lambda},$$

- (1.1) implies that  $\tau^m$  is uniquely defined and decreasing in  $\theta$ . When  $\theta = \lambda$ , so that  $h^r = h^p$ , we have  $\tau^m = 0$ .
- Since  $\tau^m$  does not directly depend on the shock  $A_t$ , the tax rate would always remain constant in the absence of the threat of political change. In practice, the tax rate will vary over time because of the political constraints imposed by changes in  $A_t$ .
- Define  $\delta^i(\theta) A_t$  to be the net amount of redistribution that a person of type  $i$  receives in state  $A_t$  when the tax rate is  $\tau^m$ , i.e.

$$\delta^i(\theta) A_t \equiv T_t^m - \tau^m A_t h^i.$$

The assumption that the budget is balanced then implies,

$$T_t^m = (\tau^m - c(\tau^m)) A_t h.$$

Note that

$$\delta^r(\theta) < 0 < \delta^p(\theta),$$

so that there are net transfers to the poor. Furthermore, higher inequality raises the tax rate on the rich, while simultaneously increasing the net transfer to the poor.

- Assume that coups and revolutions are not beneficial when  $A_t = A^h$ . That is,

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

- The cost of a coup for a rich agent during normal times is  $(1 - \phi)h^r + \delta^r(\theta)$ , which is the direct loss due to turbulence minus the taxes that they would have paid in a democracy (recall  $\delta^r(\theta) < 0$ ). Whereas the maximum benefit of a coup is to avoid taxation in all future periods. The net present value of taxation at the rate  $\tau^m$  in the future is  $-\beta((1 - s) + sa)\delta^r(\theta)/(1 - \beta)$ , and comparing this to the cost  $(1 - \phi)h^r + \delta^r(\theta)$  gives Assumption 1. This assumption guarantees that there is no threat of a coup in normal times.
- Next, define the continuation value (the discounted expected net present value) of a poor agent after a revolution but before the state  $A_t$  is revealed as:

$$(1.2) \quad W^p(R) = \frac{(sa + 1 - s)\pi h}{(1 - \beta)\lambda},$$

This expression follows because a revolution is permanent, and after a revolution, the poor obtain a fraction  $\pi$  of the total assets of the economy,  $h$ , and share it among themselves forever (and  $\lambda$  is the fraction of the poor in the economy). A fraction of  $1 - s$  of the time, we are in state  $A_t = A^h$ , so these assets have return 1, and the remaining fraction  $s$  of the time,  $A_t = A^l$  and the return is  $a < 1$ .

- If, starting in the state  $(A_t, E)$ , the poor undertake a revolution, they would obtain

$$(1.3) \quad V^p(A_t, R) = \frac{\pi\mu A_t h}{\lambda} + \beta W^p(R),$$

where  $A_t = A^l = 1$  or  $A_t = A^h = 1$ . This expression follows because during the period of revolution the poor only receive a fraction  $\pi\mu$  of the assets of the economy,  $h$ , and obtain  $W^p(R)$  thereafter.

- In contrast, if, starting from the state  $(A_t, E)$ , they never undertake a revolution, and there is no redistributive taxation, they would obtain a utility of

$$\widehat{V}^p(A_t, E) = A_t h^p + \beta \frac{((1 - s) + sa)h^p}{1 - \beta}.$$

This expression follows because without taxation the poor receive  $h^p$  this period,  $h^p$  in all future normal periods, and  $ah^p$  in all future recession periods.

- $\widehat{V}^p(A^h, E)$  is clearly a lower bound on the utility that the poor would obtain in nondemocracy, since in equilibrium there may be redistributive taxation. Therefore, a sufficient condition for the poor not to undertake a revolution in the state  $(A^h, E)$  is that  $\widehat{V}^p(A^h, E)$  is greater than  $V^p(A^h, R)$  as given by equation (1.3) evaluated at  $A_t = A^h$ . This is guaranteed by the following condition on parameters:

**Assumption 2::**

$$\mu < \frac{(\pi - \theta)\beta s(1 - a) + \theta - \beta\pi}{(1 - \beta)\pi}.$$

This assumption implies that in normal times, i.e. when  $A_t = A^h$ , the elite will choose no redistribution when in power.

- Since  $\lambda > 1/2$ , in a democracy, the median voter is a poor agent. By Assumption 1, there is no threat of a coup in normal times, so in a Markov Perfect Equilibrium he will choose the tax rate  $\tau^m$ . The expected discounted value of an agent of type  $i = p, r$  in this state, denoted by  $V^i(A^h, D)$ , is:

$$(1.4) \quad V^i(A^h, D) = h^i + \delta^i(\theta) + \beta W^i(D).$$

The agent receives  $h^i$  from his own capital and  $\delta^i(\theta)$  as net transfer from the government. The expected return in the next period is the continuation value under democracy,

$$(1.5) \quad W^i(D) = (1 - s)V^i(A^h, D) + sV^i(A^l, D),$$

where  $V^i(A^l, D)$  is the value to agent  $i$  in state  $(A^l, D)$ . With probability  $1 - s$ , the state  $(A^h, D)$  recurs next period, while with probability  $s$  there is a recession, and in this state the continuation value is  $V^i(A^l, D)$ .

- The continuation value  $V^i(A^l, D)$  depends on the actions of the rich, who might want to undertake a coup in the state  $A_t = A^l$ . The poor may therefore reduce the tax rate to  $\tau^d$  in this state in an attempt to prevent the coup—recall that the coup decision follows the taxation decision of the poor. Suppose that this reduced taxation prevents the coup. Then, the value of agent  $i$  in state  $(A^l, D)$  would be  $V^i(A^l, D) = v^i(A^l, D \mid \tau^d)$ . This continuation value  $v^i(A^l, D \mid \tau^d)$  satisfies the Bellman equation;

$$(1.6) \quad v^i(A^l, D \mid \tau^d) = a(h^i + \Delta^i(\theta, \tau^d)) + \beta W^i(D),$$

where

$$\Delta^i(\theta, \tau^d)A_t \equiv T^d - \tau^d A_t h^i$$

is the net amount of redistribution for a person of type  $i$  in state  $A_t$  with a tax rate of  $\tau^d$ . Notice that in the current period, taxes are lower,  $\tau^d$  instead of  $\tau^m$ , giving higher utility to the rich—i.e.,  $\Delta^p(\theta, \tau^d) \leq \delta^p(\theta)$ , and  $\Delta^r(\theta, \tau^d) \geq \delta^r(\theta)$ . However, the continuation value is still  $W^i(D)$ . This captures the notion that next period if the state switches to  $A^h$ , taxes will increase back to  $\tau^m$ : it is impossible for the poor to commit to future taxes, unless the future also poses an effective coup threat.

- Reducing the tax rate to  $\tau^d$  may not be enough to prevent a coup, however. After observing the tax rate  $\tau^d$ , the elite decide whether to mount a coup,  $\zeta = 1$ , or not,  $\zeta = 0$ , so

$$(1.7) \quad V^r(A^l, D) = \max_{\zeta \in \{0,1\}} \left\{ \zeta \tilde{V}^r(A^l, E) + (1 - \zeta)v^r(A^l, D \mid \tau^d) \right\},$$

where  $\tilde{V}^r(A^l, E)$  is the continuation value to the elite after a coup in the state  $(A^l, E)$  given by

$$(1.8) \quad \tilde{V}^i(A^l, E) = \phi a h^i + \beta W^i(E),$$

and

$$(1.9) \quad W^i(E) = (1 - s)V^i(A^h, E) + sV^i(A^l, E),$$

is the expected continuation value with the elite in control of the political system. This continuation value depends on the strategies that the players will pursue in a nondemocratic regime. Assumption 2 above ensures that in the state  $(A^h, E)$ , the rich will set zero taxes, so agent  $i$  obtains income  $h^i$ , and his continuation value is  $W^i(E)$ . Hence,  $V^i(A^h, E) = h^i + \beta W^i(E)$ .

- In contrast, if there is a recession,  $(A^l, E)$ , there are three possibilities: (i) democratization,  $\gamma = 1$ ; or (ii) they may choose not to democratize, i.e.,  $\gamma = 0$  and set a tax rate of  $\tau^e$ ; and the poor could choose  $\rho = 0$  (no revolution) in response; or (iii) the poor may undertake a revolution,  $\rho = 0$ . The continuation values depend on which of these cases applies.
- Let us focus on  $\gamma = 1$ , i.e., franchise extension, which is the case that applies along the equilibrium path. Then,

$$(1.10) \quad V^i(A^l, E) = a(h^i + \delta^i(\theta)) + \beta W^i(D).$$

This expression follows because in this first period of democracy, there is no threat of a coup, and the poor set the unconstrained tax rate  $\tau^m$ , which gives a current consumption of  $a(h^i + \delta^i(\theta))$  to group  $i$ . The continuation value is  $W^i(D)$ .

- The elite prefer not to carry out a coup in state  $(A^l, D)$ , i.e.,  $\zeta = 0$ , if  $\tilde{V}^r(A^l, E)$  given by (1.8) is less than  $v^i(A^l, D \mid \tau^d)$  in (1.6). Hence, there will be no coup as long as

$$(1.11) \quad W^r(E) - W^r(D) \leq \frac{a((1 - \phi)h^r + \Delta^r(\theta, \tau^d))}{\beta}.$$

Equation (1.11) is the *coup constraint*: a coup occurs if the gain to the rich of capturing political power and reducing taxation,  $\beta(W^r(E) - W^r(D)) - a\Delta^r(\theta, \tau^d)$ , is greater than the cost of the coup,  $a(1 - \phi)h^r$ . A coup is less likely to be beneficial for the elite when the level of income in a recession,  $a$ , is high since this determines the opportunity cost of political turmoil caused by the coup. Therefore, coups are only attractive when a recession causes a severe drop in output, reducing the opportunity cost of political turmoil.

- First determine a critical value of the cost of coup,  $\hat{\phi}(\theta, a, s)$ , such that as long as  $\phi < \hat{\phi}(\theta, a, s)$ , a coup is never beneficial for the rich, even if the poor continue to tax at the rate  $\tau = \tau^m$  in state  $(A^l, D)$ . This critical value is found by solving (1.11) for  $\phi$  with  $\tau^d = \tau^m$  (i.e., with  $\Delta^r(\theta, \tau^d) = \delta^r(\theta)$ ):

$$(1.12) \quad \hat{\phi}(\theta, a, s) = \frac{(1 - \beta(1 - s))a(h^r + \delta^r(\theta)) + \beta(1 - s)\delta^r(\theta)}{(1 - \beta(1 - s))ah^r}.$$

When  $\phi < \hat{\phi}(\theta, a, s)$ , the coup threat does not play a role, and democracy is *fully consolidated*. Moreover, it can be shown that

$$\partial \hat{\phi}(\theta, a, s) / \partial \theta > 0,$$

so a less unequal society is more likely to achieve a fully consolidated democracy. Intuitively, a greater level of inequality makes democracy less attractive for the rich as it implies higher taxes. Note also that

$$\partial \hat{\phi}(\theta, a, s) / \partial a > 0,$$

so an increase in  $a$ , which makes recessions less severe, increases the opportunity cost of mounting a coup and makes it easier to consolidate democracy. Finally,

$$\partial \hat{\phi}(\theta, a, s) / \partial s > 0.$$

An increase in the frequency of recessions implies that the coup constraint binds regularly, and because in this state the rich pay relatively low taxes, this makes



low taxes more “credible”. Democracy is therefore less costly to the elite. Therefore, a coup must be less costly ( $\phi$  higher) to be worthwhile.

- Next determine the value of the cost of coup,  $\bar{\phi}(\theta, a, s) > \hat{\phi}(\theta, a, s)$ , such that as long as  $\phi < \bar{\phi}(\theta, a, s)$ , the poor can stop a coup by setting a low enough tax rate in the state  $(A^l, D)$ . Conversely, when  $\phi > \bar{\phi}(\theta, a, s)$ , their incomes fall by a sufficiently small amount as a result of political turmoil that even a policy of setting  $\tau^d = 0$  does not stop a coup.
- The threshold  $\bar{\phi}(\theta, a, s)$  is derived by solving (1.11) for  $\phi$  with  $\tau^d = 0$  (i.e.,  $\Delta^r(\theta, \tau^d) = 0$ ):

$$(1.13) \quad \bar{\phi}(\theta, a, s) = \frac{(1 - \beta(1 - s))ah^r + \beta(1 - s(1 + a))\delta^r(\theta)}{(1 - \beta(1 - s))ah^r}.$$

The comparative statics are identical to those of  $\hat{\phi}(\theta, a, s)$ .

- If  $\hat{\phi}(\theta, a, s) < \phi < \bar{\phi}(\theta, a, s)$ , then democracy is *semi-consolidated*: the poor can avoid a coup by reducing the tax rate below  $\tau^m$  in state  $(A^l, D)$ . In particular, they would set  $\tau = \tau^d$  such that

$$\beta(W^r(E) - W^r(D)) = a((1 - \phi)h^r + \Delta^r(\theta, \tau^d)),$$

satisfying the coup constraint (1.11) as an equality. Although the society always remains democratic, the threat of a coup is still important and influences taxes: the tax rate  $\tau^d$  is less than  $\tau^m$ , which the poor would have set in the absence of this threat.

- Differentiation shows that  $\tau^d$  is increasing in  $\theta$  so that higher inequality reduces the tax rate necessary to prevent a coup. Intuitively, higher inequality makes democracy more costly for the rich, and the poor have to give them a bigger tax concession to prevent a coup.
- Finally, if  $\phi > \bar{\phi}(\theta, a, s)$ , a coup is not very costly to the rich, so even a strategy of setting  $\tau = 0$  by the poor will not prevent it. In this case, the society will

revert back to a nondemocratic regime when  $A_t = A^l$ , despite the social costs involved in this process.

- Next, consider the incentives to undertake a revolution in a non-democratic society. If the poor attempt a revolution in the state  $(A^l, E)$ , they would obtain  $V^p(A^l, R)$  as given by equation (1.3) above evaluated at  $A_t = A^l$ . Although Assumption 2 ensures that the revolution constraint is not binding in state  $A^h$ , it may bind in state  $A^l$ . The elite may then choose to redistribute income to the poor in order to prevent a revolution, imposing a tax rate  $\tau^e$  and giving the poor a return

$$V^p(A^l, E) = v^p(A^l, E \mid \tau^e).$$

The value  $v^i(A^l, E \mid \tau^e)$ , satisfies the Bellman equation,

$$(1.14) \quad v^i(A^l, E \mid \tau^e) = a(h^i + \eta^i(\theta, \tau^e)) + \beta W^i(E).$$

where

$$\eta^i(\theta, \tau^e)a \equiv T_t^e - \tau^e a h^i$$

is the net redistribution for agent  $i$  at the tax rate  $\tau^e$  in the state  $A^l$ . In this case, the poor receive net income  $(1 - \tau^e)ah^p$  from their own earnings and transfer  $T_t^e = (\tau^e - c(\tau^e))ah$ , giving them a total income of  $a(h^p + \eta^p(\theta, \tau^e))$ . Notice that the continuation value is  $W^i(E)$ : if in the next period we are still in state  $A_t = A^l$ , then redistribution continues. But, if in contrast the economy switches to  $A_t = A^h$ , redistribution stops.

This captures the notion that *the elite cannot commit to future redistribution*, unless the future also poses an effective revolution threat. Also note that  $\tau^e \leq \tau^m$ , that is, the elite will not tax themselves at a rate higher than  $\tau^m$ , since this is the rate that maximizes redistribution to a poor agent. If this tax rate is not sufficient to stop a revolution, then no other tax rate  $\tau^e \in [0, 1]$  will do so.

- Combining (1.3) and (1.14) gives the *revolution constraint* in the state  $A^l$  as

$$(1.15) \quad W^p(R) - W^p(E) \leq \frac{a(h^p + \eta^p(\theta, \tau^e) - \mu\pi h)}{\beta}.$$

This constraint requires that the utility from a revolution for the poor is not very large relative to their utility of living in a nondemocratic regime; so a tax concession can convince them not to undertake the revolution.

- Since the elite would like to prevent a revolution at all cost, they will set  $\tau^e$  as high as necessary to prevent a revolution. However, (1.15) may be violated even when the elite give maximum transfers to the poor in state  $A^l$ , i.e. when they tax themselves at the rate  $\tau^m$ . In this case, the elite will have to extend the franchise in order to prevent a revolution. Substituting  $\tau^e = \tau^m$  into equation (1.15), we can solve for a critical value of  $\mu$ , denoted by  $\bar{\mu}(\theta, a, s)$ , such that for  $\mu > \bar{\mu}(\theta, a, s)$ , a revolution is so attractive for the poor in state  $A^l$  that even the maximum amount of redistribution by the rich cannot stop it. This critical value is

$$(1.16) \quad \bar{\mu}(\theta, a, s) = \frac{(1 - \beta + s\beta) a (h^p + \delta^p(\theta)) - (as + 1 - s) \beta \pi h + \beta(1 - s) h^p}{(1 - \beta) a \pi h}.$$

When  $\mu < \bar{\mu}(\theta, a, s)$ , democratization can be avoided by redistributing to the poor in state  $(A^l, E)$ . In this case, the tax rate that the elite have to set in order to avoid revolution is  $\tau = \tau^e$ , such that  $v^p(A^l, E \mid \tau^e) = V^p(A^l, R)$ , where  $v^p$  is given by (1.14) above.

- In contrast to the case with  $\mu < \bar{\mu}(\theta, a, s)$ , when  $\mu > \bar{\mu}(\theta, a, s)$ , democratization is the only option left to the elite. Notice that

$$\partial \bar{\mu}(\theta, a, s) / \partial \theta > 0,$$

so higher inequality reduces the revolution threshold because the poor are worse off in a nondemocratic regime. Furthermore,

$$\partial \bar{\mu}(\theta, a, s) / \partial a > 0$$

so that if  $a$  increases, making recessions less severe, a revolution must be less costly to be attractive for the poor, and so becomes less likely. Finally,

$$\partial \bar{\mu}(\theta, a, s) / \partial s > 0,$$

which implies that when recessions are more frequent, it becomes easier to prevent a revolution without democratization.

- The reason for this result is similar to the comparative statics of  $\hat{\phi}(\theta, a, s)$  and  $\bar{\phi}(\theta, a, s)$  with respect to  $s$ ; an increase in the frequency of recessions makes future redistribution by the elite more credible because it is in their interest to redistribute during recessions.

Finally, assume that democratization does prevent a revolution. That is,

**Assumption 3::**  $V_1^p(A^l, D)$  is greater than  $V^p(A^l, R)$ .

This is simply a parameter restriction.

PROPOSITION 1. :

**PROPOSITION:** Suppose Assumptions 1, 2 and 3 hold and the society starts in a nondemocratic regime. Then:

- (1) *If  $\mu < \bar{\mu}(\theta, a, s)$ , then the society remains nondemocratic.*
- (1) If  $\mu > \bar{\mu}(\theta, a, s)$  and  $\phi < \hat{\phi}(\theta, a, s)$ , then the society democratizes the first time the state is  $(A^l, E)$ , and then remains a fully consolidated democracy.
- (2) If  $\mu > \bar{\mu}(\theta, a, s)$  and  $\hat{\phi}(\theta, a, s) < \phi < \bar{\phi}(\theta, a, s)$ , then the society democratizes the first time the state is  $(A^l, E)$ , and then remains a semi-consolidated democracy.

- (3) If  $\mu > \bar{\mu}(\theta, a, s)$  and  $\phi > \bar{\phi}(\theta, a, s)$ , then the society is an unconsolidated democracy, and continuously switches regimes.
- In the first type of equilibrium where  $\mu < \bar{\mu}(\theta, a, s)$ , a revolution is sufficiently costly that given the amount of inequality and the value of  $s$ , the elite can avoid it by redistributing. Therefore, in state  $A^h$ , the elite set  $\tau = 0$ , while in state  $A^l$ , they redistribute by setting the tax rate  $\tau^e$ , which is just enough to stop a revolution. In this equilibrium, there is never democratization and the amount of redistribution is relatively limited. More inequality nonetheless increases the level of redistribution in this regime because the rich are forced to choose higher taxes to prevent a revolution in the state  $(A^l, E)$ .
  - Now consider the case with  $\mu > \bar{\mu}(\theta, a, s)$ . When the economy transits into state  $A^l$ , the rich can no longer maintain their political power via redistribution, and must extend the franchise. There are three types of equilibria depending on the value of  $\phi$ .
- (1) If  $\phi < \hat{\phi}(\theta, a, s)$ , democracy, once created, is fully consolidated. When the state first moves from  $A^h$  to  $A^l$ , the elite are forced to extend the franchise. After this, the poor always set  $\tau = \tau^m$ . In this type of society, the amount of redistribution is at its highest level, there is very little or no fiscal volatility, and the threat of a coup plays no role once the society becomes democratic. This case can be thought to be similar to the situation in most OECD countries. It is more likely to arise when  $\theta$  is high, that is when the society is fairly equal.
- (2) The second possibility is that  $\phi > \hat{\phi}(\theta, a, s)$ , but  $\phi < \bar{\phi}(\theta, a, s)$ . In this case, democracy is not fully consolidated; if the poor were to set a tax rate  $\tau^m$  in the state  $(A^l, D)$ , a coup would occur. However, the poor can avoid a coup by setting a lower tax  $\tau = \tau^d$  in state  $(A^l, D)$ , which is just sufficient to dissuade the elite

from mounting a coup. Although the society always remains democratic, it is in some sense “under the shadow of a coup”, as the coup threat limits overall redistribution.

- (3) The final type of equilibrium involves  $\mu > \bar{\mu}(\theta, a, s)$  and  $\phi > \bar{\phi}(\theta, a, s)$ . In this case, democracy is unstable: when the state moves to  $A^l$ , a coup is relatively attractive for the elite, and cannot be halted by reducing taxes. As a result, the economy will stochastically fluctuate between democracy and elite control. More specifically, the economy starts with the elite in power and they set  $\tau = 0$ . Whenever the state moves to  $A^l$ , the elite extend the franchise. But as soon as the state goes from  $(A^h, D)$  to  $(A^l, D)$ , they mount a coup, regain political power, and set  $\tau = 0$ . The variability of fiscal policy is therefore highest in this equilibrium, and the amount of redistribution is less than in cases 2 and 3, but more than in case 1. Higher inequality increases redistribution in this regime because it increases the tax rate when there is democracy, while there is never any redistribution during nondemocracies.
- The reason why there is an inefficient equilibrium in this case, in contrast to an intuition based on the *Coase Theorem*, is that the political system is unable to commit to future taxes. If the poor and the rich could bargain and commit to a path of future taxes, there would be no coups along the equilibrium path. Yet, in practice, future taxes are determined in future political equilibria, and promises of lower taxes in the future are not credible—once the coup threat disappears, the tax rate will rise back to  $\tau^m$ . Forward-looking elites, realizing this, prefer a coup, even though this is a costly outcome for society.
  - Notice that when democracy is unconsolidated and the poor are in power, they set the maximum tax rate, fully anticipating that redistribution will eventually come to an end as a result of a coup. This result may help to explain the

existence of highly redistributive, but relatively short-lived, populist regimes of Latin America.

- There are four major conclusions to be drawn from this analysis.
  - (1) The first links inequality to regime changes. A decrease in  $\theta$  reduces  $\bar{\mu}(\theta, a, s)$ ,  $\bar{\phi}(\theta, a, s)$  and  $\hat{\phi}(\theta, a, s)$ . This implies that at higher levels of inequality, both revolutions and coups are more attractive. Therefore, societies with more initial inequality are more likely to switch between democracy and non-democracy, and less likely to have a fully consolidated democracy. So the results are in line with the empirical findings of a positive association between inequality and political instability.
  - (2) The second conclusion pertains to the link between inequality and redistribution. To see this, fix the cost of coup  $\phi$ , and define  $\theta^H > \theta^L$  such that  $\phi = \hat{\phi}(\theta^H, a, s)$  and  $\phi = \bar{\phi}(\theta^L, a, s)$ . Moreover, suppose that  $\mu > \bar{\mu}(\theta, a, s)$ . When  $\theta > \theta^H$ ,  $\phi < \hat{\phi}(\theta, a, s)$ , so inequality is sufficiently low that democracy is fully consolidated. Now consider an increase in inequality (a reduction in  $\theta$ ). This will increase redistribution at first as in the standard models of voting over redistribution, since  $\frac{\partial \tau^m}{\partial \theta} < 0$ . When  $\theta$  falls below  $\theta^H$ , we have  $\phi \in (\hat{\phi}(\theta, a, s), \bar{\phi}(\theta, a, s))$  and democracy is only semi-consolidated. The poor are then forced to reduce taxes from  $\tau^m$  to  $\tau^d$  in the state  $(A^l, D)$ . Nevertheless, overall redistribution increases. As inequality increases further, it will eventually fall below  $\theta^L$ . When  $\theta < \theta^L$ , we have  $\phi > \bar{\phi}(\theta, a, s)$ , and democracy is now unconsolidated. So in the state  $(A^l, D)$ , there is a coup followed by a period of nondemocracy and no taxation. The increase in inequality in the neighborhood of  $\theta^L$  therefore reduces overall redistribution. As a result, there is a nonmonotonic relationship between inequality

and redistribution, with societies at intermediate levels of inequality redistributing more than both very equal and very unequal societies.

- (3) The third implication is related to fiscal volatility. The relationship between fiscal volatility and inequality is likely to be increasing. Within each regime, higher inequality leads to more variability. Moreover, higher inequality makes Case 4, which has the highest amount of fiscal variability, more likely. This may explain why fiscal policy has been much more volatile in Latin America than in the OECD.
- (4) The fourth implication is that the costs of redistribution will also have an impact on the equilibrium political system. Suppose that the cost of taxation becomes less convex, so that  $c(\tau^m)$  is unchanged, but  $c'(\tau^m)$  decreases. Since deadweight losses from taxation are now lower, the median voter will choose a higher level of taxation. However, as  $\tau^m$  increases, so will  $-\delta^r(\theta)$ , so democracy becomes more costly to the elite, and hence less likely to be consolidated. This implies that in societies where taxation creates less economic distortions, for example in societies where a large fraction of the GDP is generated from natural resources, democracies may be harder to consolidate.

## 2. Political Development

- An important empirical regularity is that richer economies are more likely to be democratic than poorer ones. Why?
- This can be because richer economies are more likely to democratize, or because richer economies are less likely to experience coups.
- It seems that in the data the second channel is very important.
- Why would this be so in the above model?



- (1) Richer economies are more stable (smaller shocks).
- (2) Richer economies have more equal distributions of income.
- (3) Richer economies have better institutions, increasing the costs of coups.
- (4) Richer economies have better institutions, placing restrictions on high taxes, making democracy less costly for the elites.
- Currently, we have little information about which one of these channels is more important.

### 3. Political Instability and Investment

- Empirical evidence suggests that political instability leads to low investment and growth (e.g., Alesina et al). This is very intuitive, since political instability often corresponds to weak enforcement of property rights.
- The framework here is useful because of political instability is endogenous. So it is useful to look at the relationship between political instability and investment in this context.
- Suppose now that an agent of type  $i$  can undertake an investment of value  $k^i$  at cost  $h^i\Gamma(k^i)$  where  $\Gamma$  is increasing and convex, with  $\Gamma(0) = 0$ . The cost is incurred only once, and this investment raises the return in democracy forever by a factor of  $1 + k^i$ , but has no effect on income in a nondemocratic regime.
- The desirability of the investment therefore depends on the expected duration of democracy.
- The important feature is that the return to a range of investments is higher in democracies than in nondemocracies.
- Key insight: the duration of democracy will be affected by the amount of investment, as well as affecting the profitability of investment. As a result, if agents

believe that democracy will persist, they will invest more, and this will in turn increase the durability of democracy. Thus there may be multiple equilibria.

- Notice first that since all agents face the same marginal tax rate and since both returns and costs are multiplied by  $h^i$ , they will all choose the same level of investment,  $k^i = k$ .
- Define  $v_1^i(A^l, D \mid k)$  as the value to an agent in an unconsolidated democracy starting in state  $A^l$  and with investment  $k$ . Let us define  $\bar{k}$  as the investment level when democracy is expected to be unconsolidated. This investment level is given by

$$\bar{k} = \arg \max_k v_1^i(A^l, D \mid k).$$

- In contrast, in a semi-consolidated democracy, investment is productive also during periods of recession.
- Define

$$v_2^i(A^l, D \mid k)$$

to be the value to an agent in a semi-consolidated democracy starting in state  $A^l$  and with investment  $k$ . The investment level that will be chosen by the agents in this case,  $k^*$ , will be different, and in particular, will satisfy

$$k^* = \arg \max_k v_2^i(A^l, D \mid k).$$

Notice that when democracy is consolidated, the investment is productive in all future periods. Therefore,  $k^* > \bar{k}$ , because the cost of investment is independent of the political regime, but when democracy is consolidated, the expected return is higher.

- Now consider the coup constraint conditional on the level of investment,  $k$ . In particular, define  $\bar{\phi}(k)$  as the critical value of  $\phi$  such that when  $\phi < \bar{\phi}(k)$ , and

the level of investment is  $k$ , a coup can be prevented in the state  $A^l$ . The usual arguments imply that the critical value is  $\bar{\phi}(k)$  given by

•

$$w^r(E | k) - w_2^r(D | k) = \frac{a(1 - \bar{\phi}(k))h^r}{\beta},$$

where  $w_2^r(D | k)$  is the expected continuation value, conditional on  $k$ , when democracy is consolidated, and  $w_2^r(D | k)$  is the expected continuation value in nondemocracy. The reason why the value function  $w_2^r(D | k)$  features in the coup constraint is because the elite compare  $\beta w_2^r(D | k)$ , which is the value of remaining in a democracy forever, with that of mounting a coup which is  $\beta w^r(E | k) - a(1 - \bar{\phi}(k))h^r$ . Notice that  $k^*$  is the maximizer of  $w_2^r(D | k)$ , so

$$w_2^r(D | k^*) > w_2^r(D | \bar{k}),$$

and hence  $\bar{\phi}(k^*) > \bar{\phi}(\bar{k})$ . Intuitively, a greater level of investment makes a coup less attractive because the political turmoil associated with the coup creates a greater output loss.

- This analysis implies that there exist values of  $\phi$  such that  $\phi \in (\bar{\phi}(\bar{k}), \bar{\phi}(k^*))$ . When  $\phi \in (\bar{\phi}(\bar{k}), \bar{\phi}(k^*))$ , democracy will be consolidated when all agents invest up to  $k^*$ , and when democracy is consolidated, they will indeed prefer to invest  $k^*$ . There is another equilibrium, however, where all agents expect democracy not to be consolidated, so invest only up to  $\bar{k}$ . This level investment, in turn, is not high enough to consolidate democracy. The general implication is that when there exist investments whose payoffs are higher in democracies, expectations about how durable these democracies are can be self-reinforcing, leading to multiple equilibria with different political regimes, output levels, and economic welfare.

#### 4. Asset Redistribution

- In this framework, asset inequality determines the level of taxation and the costs and benefits of coups. When there is greater asset inequality, there will be greater redistribution in the future, making democracy more costly for the elites, hence encourage them to undertake a coup.
- If asset inequality can be reduced permanently, the benefits of a future coup to the elite would be lower because democracy would be less redistributive.
- This may be somewhat paradoxical, since it is redistribution that makes democracy unstable, how can asset redistribution consolidate democracy?
- The answer lies in the distinction between current and future redistribution. It is the anticipation of future redistribution that makes democracy unstable. Asset redistribution today reduces future “equilibrium” redistribution.
- Then, why do we often observe a lot of fiscal redistribution by populist governments rather than asset redistributions, such as education, land reform etc.?
- Possible answers are:
  - (1) Asset redistribution may be impossible, difficult or unattractive for other reasons. For example, if much of the population, especially the constituency of the parties, are urban, land redistribution is not very useful.
  - (2) Education as a way of redistributing human capital takes effect very slowly, so will not help parties that need to redistribute in order to remain in power.
  - (3) Anticipation of asset redistribution may actually destabilize the system even more—the reasoning is exactly the same as before; anticipated asset redistribution is in the future, and a coup will prevent it. So the elite that will lose as a result of the asset redistribution would prefer to undertake a coup to prevent it.

## CHAPTER 8

### Persistence of Inefficient Institutions

#### 1. General Issues

- Why do societies choose inefficient institutions and maintain these inefficient institutions for very long periods?
- This question is also related to the question of why societies cannot always switch to the best available technologies.
- Three different types of answers:
  - (1) Those who can change institutions will lose economically from institutional reform.
  - (2) Those who can change institutions are afraid of losing their political power.
  - (3) Inefficient institutions persist because different social groups cannot agree on who should bear the costs of change (Alesina-Drazen).
- We have already seen a model along the lines of the third answer.
- The first type of answer presumes that there are serious constraints on how much of the gains from institutional change can be redistributed to those with political power. Yet, such constraints appear artificial, especially when we are trying to endogenize political economy decisions.
- Or, it might be those who will lose economically will also lose their political power. In that case, we are back to the second (political loser) explanation.
- Let us look in more detail to a political-loser type explanation now.

## 2. Persistence of Nondemocratic Institutions

- The models in the previous two chapters illustrated how democratic institutions may or may not emerge because of distributional conflicts.
- The emphasis was on the distributional effects of democracy, with little focus on its efficiency implications.
- Now I will briefly discuss how nondemocratic institutions may persist even when democratic institutions are more efficient.
- The basic idea is very similar to those discussed in the first part of these notes.

### 2.1. Blocking democratization.

- Imagine an economy dominated by the landed aristocracy and the monarchy. Let me think of these groups as one agent. For simplicity, assume that these groups do not engage in production.
- The economy also includes a group of merchants, with mass normalized to 1.
- Each merchant has access to a production technology

$$Ai$$

where  $i$  is investment.

- The cost of investment is incurred ex ante and is denoted by

$$c(i)$$

with  $c'(\cdot) > 0$ ,  $c''(\cdot) > 0$  and  $c'(0) = 0$ .

- When institutions are monarchic, the monarchy can expropriate a fraction  $\tau \in (0, 1)$  of these returns.
- Therefore, each merchant would choose an investment level equal to

$$(1 - \tau) A = c'(i^*)$$

which is strictly positive by the assumption that  $c'(0) = 0$ . But, this investment level  $i^*$  less than the first-best investment level given by

$$A = c'(i^{fb})$$

- Now imagine that democratic institutions (e.g., parliamentary control over the monarchy) can take away the power of the monarchy to expropriate returns from merchants' investment.
- Therefore, such institutional change would clearly improve efficiency and output.
- But as a result of institutional change the return to the monarchy and landed aristocracy would go down from  $\tau A i^* > 0$  to 0.
- Therefore, the landed aristocracy and the monarchy will oppose institutional change that will introduce democracy, and to the extent that they have the power to do so, nondemocratic institutions will persist.

## 2.2. Reducing human capital investments to prevent democratization.

- A more extreme case of persistence of nondemocratic institutions is the model by Bourguignon and Verdier.
- In their model, the elite refrain from investing in the human capital of the poor because with greater human capital, the poor would take part in the political process, and demand transfers.
- Here is a simple version of their model:
- Suppose that political power is in the hands of a rich elite, and production is carried out by workers, whose measure is normalized 1.
- Total output is

$$A(1 + h)$$

where  $h$  is the human capital of the workers.

- Workers do not participate in the political process unless their human capital is

$$h > \bar{h}$$

This could be because of regulations (e.g., franchise restrictions), or because low human capital individuals cannot organize.

- As long as they control political power, the rich elite obtain a fraction  $\tau$  of output (either through taxation, or they own the land or the capital that are necessary for production).
- If the workers participate in the political process, they take over the control of political power, and now the rich elite obtains a smaller fraction of output,  $\tau'$ , which I will normalize to zero for simplicity.
- Workers start with human capital  $h_0 = 0$ , and the society can invest in the human capital of the workers at the cost  $c(h)$ .
- Moreover assume that the efficient level of human capital investment is  $h^*$  given by

$$c'(h^*) = A$$

such that

$$h^* > \bar{h}.$$

- The timing of events is as follows:
  - (1) The rich elite decide the level of human capital investment  $h$ .
  - (2) Production takes place.
  - (3) Depending on the human capital of workers, who has control of political power is determined.
  - (4) The distribution of output is determined as a function of who has political power.
- Now it is straightforward to solve this game backwards.



- When  $h > \bar{h}$ , workers control political power and they obtain the return of  $A(1+h)$ , and the rich obtain 0 ( $\tau' A(1+h) = 0$  since  $\tau' = 0$ ).
- When  $h \leq \bar{h}$ , the rich elite has control of political power, and they obtain the return of  $\tau A(1+h) > 0$ .
- Anticipating this outcome, at the first stage, the rich elite choose  $h = \bar{h} < h^*$  in order to maintain political power.
- Therefore, this model illustrates how that could be under investment by the politically powerful groups in some assets in order to maintain their political power.
- The situation could of course be more extreme, for example, if workers themselves could invest in human capital, and their desired investment level of human capital  $h'$  were greater than  $\bar{h}$ . In this case, the rich would try to prevent the poor from investing in human capital in order to cling to political power.
- The difference of this scenario from the one discussed just before is that there the elite prevented institutional change because this would cause loss of political power. Here, the elite is preventing economic investments because this will cause institutional change.

### 3. Political Losers and Institutional Change

- Let me now discuss a more abstract model of resistance to beneficial institutional change.
- Consider an infinite horizon economy in discrete time consisting of a group of citizens, with mass normalized to 1, an incumbent ruler, and an infinite stream of potential new rulers. All agents are infinitely lived, maximize the net present discounted value of their income and discount the future with discount factor,  $\beta$ .

While citizens are infinitely lived, an incumbent ruler may be replaced by a new ruler, and from then on receives no utility.

- There is only one good in this economy, and each agent produces:

$$y_t = A_t,$$

where  $A_t$  is the state of “technology” or institutional structure that will enable citizens to produce output at time  $t$ .

- I will often refer to  $A_t$  as institutions, though it can also be thought of as technology broadly construed.
- For example, a change in the enforcement of property rights such as the creation of new legal institutions, or the removal of regulations that prevent productive activities, or any kind of political and economic *reform* that encourages investment would correspond to an increase in  $A_t$ .
- When there is beneficial institutional change,  $A$  increases to  $\alpha A$ , where  $\alpha > 1$ . The cost of such change in is normalized to 0. In addition, if there is political change and the incumbent ruler is replaced, this also affects the output potential of the economy as captured by  $A$ . In particular, when the incumbent does not adopt a new technology, the “cost of political change”—that is, the cost of replacing the incumbent—is  $zA$ , while this cost is  $z'A$  when there is institutional/technological innovation.
- Therefore, more formally

$$(3.1) \quad A_t = A_{t-1} (1 + x_t (\alpha - 1) - p_t \hat{x}_t z' - p_t (1 - \hat{x}_t) z),$$

where  $x_t = 1$  or 0 denotes whether the new technology is introduced ( $x_t = 1$ ) or not ( $x_t = 0$ ) at time  $t$  by the incumbent ruler, while  $\hat{x}_t = 1$  or 0 refers to the innovation decision of a new ruler. Also,  $p_t = 1$  denotes that the incumbent is replaced, while  $p_t = 0$  applies when the incumbent is kept in place.

- The important assumption is that the extent of these costs of political change depend on whether there is institutional change. When there is institutional innovation, the position of the incumbent is relatively secure, and it will be more costly to replace him. With innovation, there is political uncertainty and *turbulence*, and part of the advantages of the incumbent are eroded. As a result, the cost of replacing the incumbent may be lower.
- More explicitly, assume that  $z$  and  $z'$  are random variables, enabling stochastic changes in rulers along the equilibrium path.  $z$  is drawn from the distribution  $F^N$  and  $z'$  is drawn from  $F^I$ , which is first-order stochastically dominated by  $F^N$ , capturing the notion that institutional change erodes part of the incumbency advantage of the initial ruler.
- To simplify the algebra, assume that  $F^I$  is uniform over  $[\mu - \frac{1}{2}, \mu + \frac{1}{2}]$ , while  $F^N$  is uniform over  $[\gamma\mu - \frac{1}{2}, \gamma\mu + \frac{1}{2}]$ , where  $\gamma \geq 1$ . In this formulation,  $\mu$  is an inverse measure of the degree of political competition: when  $\mu$  is low, incumbents have little advantage, and when  $\mu$  is high, it is costly to replace the incumbent.
- Note that  $\mu$  can be less than  $\frac{1}{2}$ , and in fact, we will focus much of the discussion on the case in which  $\mu < \frac{1}{2}$ . This implies that sometimes it may be less costly to replace the incumbent ruler than keeping him in place (i.e., the “cost” of replacing the incumbent may be negative). The case of  $\mu = 0$  is of particular interest, since it implies that there is no incumbency advantage, and  $z$  is symmetric around zero.
- On the other hand,  $\gamma$  is a measure of how much the incumbency advantage is eroded by the introduction of a new technology: when  $\gamma = 1$ , the costs of replacing the ruler are identical irrespective of whether there is institutional change or not. A new entrant becomes the incumbent ruler in the following period after he takes control, and it will, in turn, be costly to replace him.
- Citizens replace the ruler if a new ruler provides them with higher utility.

- Finally, rulers levy a tax  $T$  on citizens. We assume that when the technology is  $A$ , citizens have access to a non-taxable informal technology that produces  $(1 - \tau)A$ . This implies that it will never be optimal for rulers to impose a tax greater than  $\tau$ .

The timing of events within the period is

- (1) The period starts with  $A_t$ .
  - (2) The incumbent decides whether to undertake institutional change,  $x_t = 0$  or  $1$ .
  - (3) The stochastic costs of replacement,  $z_t$  or  $z'_t$ , are revealed.
  - (4) Citizens decide whether to replace the ruler,  $p_t$ .
  - (5) If they replace the ruler, a new ruler comes the power and decides whether to initiate institutional change  $\hat{x}_t = 0$  or  $1$ .
  - (6) The ruler in power decides the level of the tax rate,  $T_t$ .
- First consider the institutional innovation decisions that would be taken by an output-maximizing social planner.
  - This can be done by writing the end-of-period Bellman equation for the social planner,  $S(A)$ . (evaluated in after step 6 in the timing of events above). By standard arguments, this value function can be written as:

(3.2)

$$\begin{aligned}
 S(A) = A + & \\
 & \beta \left[ x^S \int \left[ +p_I^S(z') \left( \hat{x}^S S((\alpha - z') A) + (1 - \hat{x}^S) S((1 - z') A) \right) \right] dF^I + \right. \\
 & \left. (1 - x^S) \int \left[ +p_N^S(z) \left( \hat{x}^S S((\alpha - z) A) + (1 - \hat{x}^S) S((1 - z) A) \right) \right] dF^N \right]
 \end{aligned}$$

where  $x^S$  denotes whether the social planner dictates that the incumbent innovates while  $\hat{x}^S$  denotes the social planner's decision of whether to undertake the institutional innovation with a new ruler (after replacing the incumbent).  $p_I^S(z') \in \{0, 1\}$  denotes whether the planner decides to replace an incumbent who has innovated when the realization of the cost of replacement is  $z'$ , while  $p_N^S(z) \in \{0, 1\}$  is the decision to keep an incumbent who has not innovated as a function of the realization  $z$ .

- Intuitively, when technology is given by  $A$ , the total output of the economy is  $A$ , and the continuation value depends on the innovation and the replacement decisions. If  $x^S = 1$ , the social planner induces the incumbent to innovate, and the social value when he is not replaced is  $S(\alpha A)$ . When the planner decides to replace the incumbent, then there is a new ruler and the social planner decides if he will change institutions,  $\hat{x}^S$ . In this case, conditional on the cost realization,  $z'$ , the social value is  $S((\alpha - z') A)$  or  $S((1 - z') A)$  depending on whether the new technology is adopted. Notice that if  $\hat{x}^S = 1$  and the newcomer innovates, this affects the output potential of the economy immediately, hence the term  $(\alpha - z') A$ . The second line of (3.2) is explained similarly following a decision by the planner not to innovate. The important point in this case is that the cost of replacement is drawn from the distribution  $F^N$  not from  $F^I$ .
- By standard arguments,  $S(A)$  is strictly increasing in  $A$ . This immediately implies that  $S((\alpha - z') A) > S((1 - z') A)$  since  $\alpha > 1$ , so the planner will always choose  $\hat{x}^S = 1$ .
- The same reasoning implies that the social planner would like to replace an incumbent who has innovated when  $S((\alpha - z') A) > S(\alpha A)$ , i.e., when  $z' < 0$ . Similarly, she would like to replace an incumbent who has not innovated when  $S((\alpha - z) A) > S(A)$ , i.e., when  $z < \alpha - 1$ . Substituting for these decision rules

in (3.2), the decision to innovate or not boils down to a comparison of

$$\text{Value from innovating} = \left( \int_0^{\mu+\frac{1}{2}} S(\alpha A) dz' \right) + \left( \int_{\mu-\frac{1}{2}}^0 S((\alpha - z') A) dz' \right)$$

and

$$\text{Value from not innovating} = \left( \int_{\alpha-1}^{\gamma\mu+\frac{1}{2}} S(A) dz \right) + \left( \int_{\gamma\mu-\frac{1}{2}}^{\alpha-1} S((\alpha - z) A) dz \right)$$

Inspection shows that that the first expression is always greater. Therefore, the social planner will always adopt the new technology or initiate the necessary institutional change. Intuitively, the society receives two benefits from innovating: first, output is higher, and second the expected cost of replacing the incumbent, if necessary, is lower. Both of these benefits imply that the social planner always strictly prefers to undertake institutional change.

- Next considered the Markov Perfect Equilibria (MPE) of this repeated game.
- The strategy of the incumbent in each stage game is simply a technology adoption decision,  $x \in [0, 1]$ , and a tax rate  $T \in [0, 1]$  when in power, the strategy of a new entrant is also similarly, an action,  $\hat{x} \in [0, 1]$  and a tax rate  $\hat{T}$ .
- The strategy of the citizens consists of a replacement rule,  $p(x, z, z') \in [0, 1]$ , with  $p = 1$  corresponding to replacing the incumbent. The action of citizens is conditioned on  $x$ , because they move following institutional change by the incumbent. At this point, they observe  $z$ , which is relevant to their payoff, if  $x = 0$ , and  $z'$ , if  $x = 1$ .
- An MPE of this game consists of a strategy combination  $\{x, T, \hat{x}, \hat{T}, p(x, z, z')\}$ , such that all these actions are best responses to each other for all values of the state  $A$ .
- Denote the end-of-period value function of citizens by  $V(A)$  (once again this is evaluated after the innovation decisions, i.e., after step 6 in the timing of events),

so  $A$  includes the improvement due to institutional change or the losses due to turbulence and political change during this period. With a similar reasoning to the social planner's problem:

(3.3)

$$V(A) = A(1 - T) +$$

$$\beta \left[ x \int \left[ \begin{array}{c} (1 - p_I(z')) V(\alpha A) \\ + p_I(z') (\hat{x} V((\alpha - z') A) + (1 - \hat{x}) V((1 - z') A)) \end{array} \right] dF^I + \right. \\ \left. (1 - x) \int \left[ \begin{array}{c} (1 - p_N(z)) V(A) \\ + p_N(z) (\hat{x} V((\alpha - z) A) + (1 - \hat{x}) V((1 - z) A)) \end{array} \right] dF^N \right]$$

where  $p_I(z')$  and  $p_N(z)$  denote the decisions of the citizens to replace the incumbent as a function of his innovation decision and the cost realization.

- Intuitively, the citizens produce  $A$  and pay a tax of  $TA$ . The next two lines of (3.3) give the continuation value of the citizens. This depends on whether the incumbent innovates or not,  $x = 1$  or  $x = 0$ , and on the realization of the cost of replacing the incumbent. For example, following  $x = 1$ , citizens observe  $z'$ , and decide whether to keep the incumbent. If they do not replace the incumbent,  $p_I(z') = 0$ , then there is no cost, and the value to the citizens is  $V(\alpha A)$ . In contrast, if they decide  $p_I(z') = 1$ , that is, they replace the incumbent, then the value is  $V((\alpha - z') A)$  when the newcomer innovates, and  $V((1 - z') A)$  when he doesn't. The third line is explained similarly as the expected continuation value following a decision not to innovate by the incumbent.
- The end-of-period value function for a ruler (again evaluated after step 6 in the timing of the game, so once he knows that he is in power) can be written as

$$(3.4) \quad W(A) = TA + \beta \left[ \begin{array}{c} x \int (1 - p_I(z')) W(\alpha A) dF^I \\ + (1 - x) \int (1 - p_N(z)) W(A) dF^N \end{array} \right].$$

The ruler receives tax revenue of  $TA$ , and receives a continuation value which depends on his innovation decisions  $x$ . This continuation value also depends on the draw  $z'$  or  $z$ , indirectly through the replacement decisions of the citizens,  $p_I(z')$  and  $p_N(z)$ .

- Standard arguments immediately imply that the value of the ruler is strictly increasing in  $T$  and  $A$ . Since, by construction, in an MPE the continuation value does not depend on  $T$ , the ruler will choose the maximum tax rate  $T = \tau$ .
- Next, consider the institutional innovation decision of a new ruler. Here, the decision boils down to the comparison of  $W((1 - z)A)$  and  $W((\alpha - z)A)$ . Now the strict monotonicity of (3.4) in  $A$  and the fact that  $\alpha > 1$  imply that  $\hat{x} = 1$  is a dominant strategy for the entrants.
- The citizens' decision of whether or not to replace the incumbent ruler is also simple. Again by standard arguments  $V(A)$  is strictly increasing in  $A$ . Therefore, citizens will replace the incumbent ruler whenever  $V(A) < V(A')$  where  $A$  is the output potential under the incumbent ruler and  $A'$  is the output potential under the newcomer.
- Now consider a ruler who has innovated and drawn a cost of replacement  $z'$ . If citizens keep him in power, they will receive  $V(\alpha A)$ . If they replace him, taking into account that the new ruler will innovate, they will receive  $V((\alpha - z')A)$ . Then, their best response is:

$$(3.5) \quad p_I(z') = 0 \text{ if } z' \geq 0 \text{ and } p_I(z') = 1 \text{ if } z' < 0.$$

Next, following a decision not to innovate by the incumbent, citizens compare the value  $V(A)$  from keeping the incumbent to the value of replacing the incumbent and having the new technology,  $V((\alpha - z)A)$ . So

$$(3.6) \quad p_N(z) = 0 \text{ if } z \geq \alpha - 1 \text{ and } p_N(z) = 1 \text{ if } z < \alpha - 1.$$



- Finally, the incumbent will decide whether to innovate by comparing the continuation values. Using the decision rules of the citizens, the return to innovating is

$$\int_{\mu-\frac{1}{2}}^{\mu+\frac{1}{2}} (1 - p_I(z')) \cdot W(\alpha A) dF^I,$$

and the value to not innovating is given by the expression

$$\int_{\gamma\mu-\frac{1}{2}}^{\gamma\mu+\frac{1}{2}} (1 - p_N(z)) \cdot W(A) dF^N.$$

Now incorporating the decision rules (3.5) and (3.6), and exploiting the uniformity of the distribution function  $F^I$  gives the value of innovating as

$$(3.7) \quad \text{Value from innovating} = [1 - F^I(0)] W(\alpha A) = P \left[ \frac{1}{2} + \mu \right] W(\alpha A)$$

where the function  $P$  is defined as follows:  $P[h] = 0$  if  $h < 0$ ,  $P[h] = h$  if  $h \in [0, 1]$ , and  $P[h] = 1$  if  $h > 1$ , making sure that the first term is a cumulative probability (i.e., it does not become negative or greater than 1). Similarly, the value to the ruler of not innovating is

$$(3.8) \quad \begin{aligned} \text{Value from not innovating} &= [1 - F^N(\alpha - 1)] W(A) \\ &= P \left[ \frac{1}{2} + \gamma\mu - (\alpha - 1) \right] W(A), \end{aligned}$$

which differs from (3.7) for two reasons: the probability of replacement is different, and the value conditional on no-replacement is lower.

- It is straightforward to see that if  $P \left[ \frac{1}{2} + \gamma\mu - (\alpha - 1) \right] < P \left[ \frac{1}{2} + \mu \right]$ , so that the probability of replacement is higher after no-innovation than innovation, the ruler will always innovate—by innovating, he is increasing both his chances of staying in power and his returns conditional on staying in power. Therefore, there will only be blocking of institutional change when

$$(3.9) \quad P \left[ \frac{1}{2} + \gamma\mu - (\alpha - 1) \right] > P \left[ \frac{1}{2} + \mu \right],$$

i.e., when by innovating, the ruler creates “turbulence,” which increases his chances of being replaced.

- For future reference, define  $\bar{\gamma}$  such that (3.9) holds only when  $\gamma > \bar{\gamma}$ . Therefore, as long as  $\gamma \leq \bar{\gamma}$ , there will be no blocking of institutional change.
- To fully characterize the equilibrium, conjecture that both value functions are linear,  $V(A) = v(x)A$  and  $W(A) = w(x)A$ . The parameters  $v(x)$  and  $w(x)$  are conditioned on  $x$ , since the exact form of the value function will depend on whether there is innovation or not. Note however that  $w(x)$  and  $r(x)$  are simply parameters, independent of the state variable,  $A$ .
- The condition for the incumbent to innovate, that is, for (3.7) to be greater than (3.8), is:

$$(3.10) \quad w(x) \alpha A P \left[ \frac{1}{2} + \mu \right] \geq w(x) A P \left[ \frac{1}{2} + \gamma \mu - (\alpha - 1) \right]$$

$$\iff$$

$$\alpha P \left[ \frac{1}{2} + \mu \right] \geq P \left[ \frac{1}{2} + \gamma \mu - (\alpha - 1) \right].$$

- When will the incumbent adopt institutional change? First, consider the case  $\mu = 0$ , where there is no incumbency advantage (i.e., the cost of replacing the incumbent is symmetric around 0). In this case, there is “fierce” competition between the incumbent and the rival. Condition (3.10) then becomes  $\alpha P \left[ \frac{1}{2} \right] > P \left[ \frac{1}{2} - (\alpha - 1) \right]$ , which is always satisfied since  $\alpha > 1$ . Therefore, when  $\mu = 0$ , the incumbent will always innovate, i.e.,  $x = 1$ . By continuity, for  $\mu$  low enough, the incumbent will always innovate.
- Intuitively, because the rival is as good as the incumbent, and citizens prefer better technology, they are quite likely to replace an incumbent who does not innovate. As a result, the incumbent innovates in order to increase his chances of staying in power. The more general implication of this result is that incumbents

facing fierce political competition, with little incumbency advantage, are likely to innovate because they realize that if they do not innovate they will be replaced.

- Next, consider the polar opposite case where  $\mu \geq 1/2$ , that is, there is a very high degree of incumbency advantage. In this situation  $P[\mu + \frac{1}{2}] = 1 \geq P[\frac{1}{2} + \gamma\mu - (\alpha - 1)]$ , so there is no advantage from not innovating because the incumbent is highly *entrenched* and cannot lose power. This establishes that highly entrenched incumbents will also adopt institutional change.
- The situation is different however when  $\mu \in (0, \frac{1}{2})$ . Inspection of condition (3.10) shows that for  $\mu$  small and  $\gamma$  large, incumbents will prefer not to innovate. This is because of the *political replacement effect* in the case where  $\gamma > \bar{\gamma}$ : institutional change increases the likelihood that the incumbent will be replaced, effectively eroding his political rents (notice that this is the opposite of the situation with  $\mu = 0$  when the incumbent innovated in order to increase his chances of staying in power).
- As a result the incumbent may prefer not to innovate in order to increase the probability that he maintains power. The reasoning is similar to the replacement effect in industrial organization emphasized by Arrow (1962): incumbents are less willing to innovate than entrants since they will be partly replacing their own rents. Here this replacement refers to the political rents that the incumbent is destroying by increasing the likelihood that he will be replaced.
- To determine the parameter region where blocking happens, note that there can only be blocking when both  $P[\frac{1}{2} + \mu]$  and  $P[\frac{1}{2} + \gamma\mu - (\alpha - 1)]$  are between 0 and 1, hence respectively equal to  $\frac{1}{2} + \mu$  and  $\frac{1}{2} + \gamma\mu - (\alpha - 1)$ . Then from (3.10), there will be blocking when

$$(3.11) \quad \gamma > \alpha + \frac{3}{2} \frac{\alpha - 1}{\mu}.$$

Hence as  $\alpha \rightarrow 1$ , provided that  $\gamma > 1$ , i.e., provided that there is a loss of incumbency advantage, there will always be blocking. More generally, a lower gain from innovation, i.e., a lower  $\alpha$ , makes blocking more likely.

- It is also clear that a higher level of  $\gamma$ , i.e., higher erosion of the incumbency advantage, encourages blocking of institutional change. This is intuitive: the only reason why incumbents resist institutional change is the fear of replacement. In addition, in (3.11) a higher  $\mu$  makes blocking more likely. However, note that, as discussed above, the effect of  $\mu$  on blocking is non-monotonic. As  $\mu$  increases further, we reach the point where  $P \left[ \frac{1}{2} + \gamma\mu - (\alpha - 1) \right] = 1$ , and then, further increases in  $\mu$  make blocking less likely—and eventually when  $P \left[ \frac{1}{2} + \mu \right] = 1$ , there will never be blocking.

**PROPOSITION:** *When  $\mu$  is sufficiently small or large (political competition very high or very low), the elites will always undertake institutional change. For intermediate values of  $\mu$ , institutional change may be blocked.*

- As emphasized above, blocking will happen because of the political replacement effect: in the region where blocking is beneficial for the incumbent ruler, the probability that he will be replaced increases when there is institutional change. This implies that the incumbent ruler fails to internalize future increases in output.

#### 4. Political Rents and Institutional Change

- It is straightforward to add rents from holding political power.
- With an argument very similar to the one in the first part of the notes, a greater value of these rents,  $R$ , makes institutional change less likely.
- The intuition is simply that institutional change is blocked when it leads a greater probability of losing power. Greater rents make losing power more costly.

### 5. External Threats and Institutional Change

- External threats, or the threat of revolution, may force institutional change.
- Here is a simple extension to illustrate this point.
- Suppose that at time  $t$ , rulers find out that there is a one-period external threat at  $t + 1$ , which was unanticipated before. In particular, another country (the perpetrator) with technology  $B_t$  may invade.
- Whether this invasion will take place or not depends on the level of output in two countries, and on a stochastic shock,  $q_t$ . If  $\phi B_t - q_t > A_t$ , the perpetrator will successfully invade and if  $\phi B_t - q_t \leq A_t$ , there will be no invasion, so  $\phi \geq 0$  parameterizes the extent of the external threat: when  $\phi$  is low, there will only be a limited threat. This formulation also captures the notion that a more productive economy, which produces more output, will have an advantage in a conflict with less productive economy.
- For simplicity, suppose that there will never be an invasion threat again the future, and assume that  $q_t$  is uniform between  $[0, 1]$ . Suppose also that  $B_t = \delta A_{t-1}$ . This implies that there will be an invasion if

$$q_t \leq \phi \delta - 1 - x_t (\alpha - 1),$$

were recall that  $x_t$  is the decision of the incumbent to innovate. Using the fact that  $q_t$  is uniform over  $[0, 1]$ , and the same definition of the function  $P[\cdot]$ , we have the probability that the ruler will not be invaded at time  $t$ , conditional on  $x_t$ , as

$$P[1 - \phi \delta + x_t (\alpha - 1)].$$

The important point here is that the probability of invasion is higher when  $x_t = 0$  because output is lower.

- The same reasoning as before immediately establishes that at time  $t$  the ruler will innovate if

$$(5.1) \quad \alpha P \left[ \frac{1}{2} + \mu \right] P [1 - \phi\delta + (\alpha - 1)] \geq P \left[ \frac{1}{2} + \gamma\mu - (\alpha - 1) \right] P [1 - \phi\delta].$$

- When  $P [1 - \phi\delta] \in (0, 1)$ , blocking institutional becomes less attractive in the presence of the external threat, because a relatively backward technology increases the probability of foreign invasion. Therefore, in this extended model, the emergence of an external threat might induce innovation in an economy that was other was going to block institutional change.
- An increase in  $\delta$  or  $\phi$  will typically make blocking less likely. For example, when  $\delta \rightarrow 0$  or  $\phi \rightarrow 0$ ,  $P [1 - \phi\delta] \rightarrow 1$ , threat of invasion disappears and we are back to condition (3.10). For future reference, we state this result as a proposition:

**PROPOSITION:** *Political elites are less likely to block institutional change when there is a severe external threat (high  $\phi$ ) and when the perpetrator is more developed (high  $\delta$ ).*

- The intuition for both comparative statics is straightforward. With a more powerful external threat or a more developed perpetrator, the ruler will be “forced” to allow innovation so as to reduce for an invasion. Therefore, this extension shows how an external threat can induce institutional change.

## CHAPTER 9

# Understanding Differences in Institutions

### 1. General Issues

- In this last lecture, I return to a discussion of “institutional origins”—that is, the question of why different societies end up with different institutional structures, leading to different economic institutions and policies, and therefore to widely different economic outcomes.
- Some of the basic determinants of differences in institutions have been discussed already.
- Just to repeat, I have already emphasized at the beginning:
  - (1) Economic interests of powerful social groups.
  - (2) Constraints on powerful social groups.
  - (3) The risks of losing political power for the already-powerful groups.
- In addition, the accounts in this chapter will highlight the importance of conflict. When institutions create winners and losers (as they often do), whether beneficial institutional change will take place or not will depend on whether the winners become more powerful over time and can force the change.
- Here I would also like to start a discussion of why inefficient institutions persist. Although the same three factors are probably important in this, an explicit discussion of persistence is useful.
- In particular, this discussion introduces the possibility of “inappropriate” institutions.

- More specifically, a set of institutions that were appropriate for a given economic environment (or more generally arose as the equilibrium in a given economic environment) will create a set of powerful groups. Against this background, consider a change in economic environment that requires a different set of institutions. To the extent that this change is not in the interests of the existing powerful social groups, the “inappropriate” institutions will remain in place.
- Now I would like to briefly go over a number of different cases of institutional development (or lack thereof), and then return to a discussion of these issues in the light of these cases.

## 2. Historical Context

- Consider the following contrasting experiences of institutional development:
  - (1) 17th-century Britain and the Netherlands vs. France and Spain.
  - (2) 19th-century Britain and Germany vs. Austria-Hungary and Russia
  - (3) The Caribbean vs. North America in the 18th and 19th centuries.
  - (4) Korea and Taiwan vs. Belgian Congo.
  - (5) Botswana vs. Ghana and Somalia.
- The following is a very incomplete and subjective account of history, with some very speculative attempts to link the historical experience to the factors emphasized above.

### 2.1. 17th-century Britain and the Netherlands vs. France and Spain.

- Why were Britain and the Netherlands much more successful starting in the 17th century and France and Spain?
- Basic pattern: the commercial interests gained considerable power in Britain and the Netherlands and developed institutional structures that protected the property rights of the rising commercial capitalists. In contrast, France and



Spain experienced the rise of absolutism, with little checks on the power of the monarchy.

- One possible general principle: institutions in Britain and the Netherlands improved relative to those in France and Spain because commercial interests there fought successfully against the existing system.
- This emphasizes three issues, already discussed already:
  - (1) There are often winners and losers from institutional change, even when such change will increase overall economic performance.
  - (2) Institutional change will often take place when the potential winners become more powerful and impose the requisite changes on the rest of the society.
  - (3) More rapid economic growth took place in Britain and the Netherlands, where the commercial interests became stronger, and not in France and Spain where the state became more powerful. This may shed doubt on models that emphasize “state building” and “state capacity”.
- The milestone in Britain was the Glorious Revolution of 1688, which by many accounts introduced considerable constraints on the Crown. Most notably, it provided parliamentary control over the Crown.
- North and Weingast, for example, interpret the Glorious Revolution as a turning point in British history because they argue it provided a credible commitment to secure property rights, protection of wealth and especially in the elimination of uncertainty over the repayment of the public debt.
- Without downplaying the role of the Glorious Revolution, it is also possible to argue that the commercial interests and Britain had been gaining power for much longer. According to this view, the Glorious Revolution represented the final step in a much longer process of evolution (Clark, 1996). For example, long before 1688, there was protection for members of the Parliament even when they

disagreed with the Crown(e.g., since 1575 members of Parliament could not be arrested).

- With either interpretation, commercial interests had become quite strong in Britain by the end of the 17th century (though of course landed aristocracy still had considerable power, both economically and politically, due to the role of the Crown and the House of Lords).
- From 1603 onwards, the Crown was under the control of the Stuarts, which continuously had revenue problems. To make up for the shortfalls of revenue, the Crown often sold lands and made grants of monopoly rights.
- The Crown also seized goods and assets for public purposes.
- Perhaps most important, the Crown often failed to honor its loans.
- Although there was a parliament at the time, it had little power. The Crown could dissolve the parliament, even when the parliament disagreed with it.
- During this period also, the supreme judicial power rested with the Star Chamber, which, in addition to judicial powers, had legislative and executive powers, and was supreme over common law. The Star Chamber basically represented the Crown's interests.
- The Civil War led to sweeping changes in institutions, strengthening the parliament, abolishing the Star Chamber, and placing restrictions against monopolies.
- Now all cases involving property had to be tried according to common law, and there had to be regular standings of the parliament.
- Much of this institutional change survived the Restoration.
- Consequently, Britain was transformed into a parliamentary monarchy, with significant checks on the Crown.

- The Parliament gained a central role in financial matters, with the exclusive power to raise taxes. This also ensured that property rights for all parties, especially for financial and commercial capital, were much more secure.
- How could commercial interests become so strong in England, but not in Spain and France? Two possible answers:
  - (1) One possible answer may be that in 14th and 15th century England the Lords were strong, and were able to induce the creation of the parliament early on as a way of restricting the Crown (but certainly not to protect commercial interests). Similarly, they forced the King to “live on his own”—that is, under strict restrictions on expanding his revenues. Possibly, these restrictions then enabled the commercial interests to become stronger, and demand even more rights.
  - (2) Another possible answer is that the Atlantic trade increased the wealth and therefore the political power of the commercial interests. This enabled them to demand and obtain even more rights (Acemoglu and Johnson).
- The rise of the commercial interests to power in the Netherlands was associated with the independence of the Dutch from Spain the late 16th century.
- The Netherlands was perhaps the most major commercial area of Europe. So the interests of the powerful groups within the Netherlands were in line with property rights enforcement and the encouragement of commercial/capitalist activity.
- However, the Netherlands was under Spanish control, and provided a large part of the revenue to the Spanish Crown.
- Moreover, the potential economic development, commercialization and industrialization in the towns and merchants in Burgundy threatened established the interests in older towns, and perhaps of those in Spain.

- So especially under the reign of Philip II, there was a clash between the interests of the Spanish monarchy and the towns in the Netherlands.
- These towns rebelled against Spain under the leadership of William of Orange, and gained independence.
- What followed was a much more “capitalist” regime, with strong property rights enforcement.
- Why did institutions in the Netherlands become capitalist so quickly?
- The answer appears to be related to the fact that the powerful groups were always from commercial interests, and as they became more powerful, perhaps mostly thanks to the Atlantic trade, they could demand and obtain more rights, and shape the institutions according to their interests.
- The situation in France and Spain contrasts with that of Britain and the Netherlands.
- In both France and Spain, relatively few checks on the power of the monarchy developed. In contrast, the monarchy may have become more absolutist over the relevant time period.
- North and Thomas write of Spain and France: “Both absolutist monarchies, caught up in a race for political dominance, failed to create a set of property rights that promoted economic efficiency”.
- In France, as in England, there was a constant need for revenues, and the Crown used many different methods, including additional taxes, forced loans, sales of public offices (expanding the bureaucracy) to raise revenues.
- To implement the taxes, the King separated the French regions artificially, isolating one from another using internal tariffs.
- The lack of development of institutions in France appears to be related to the strength of the monarchy.

- The French monarchy was strong enough to withstand demands from commercial interests, and did not need to enter into a pact with the commercial groups for revenue in return of providing institutional and constitutional guarantees to them.
- The situation in Spain appears very similar. In Spain, part of the story may also be that Ferdinand and Isabella re-established peace, and this enabled them to have absolute control of the state.
- In addition, sheepherding interests were very strong in Spain, and North and Thomas argue that these groups did not support development of property rights on land.
- North and Thomas also suggest that the silver revenue from the New World may have adversely affected institutional development in Spain because the Crown did not have to give concessions to the parliament in order to be able to raise additional revenue.
- Property rights became even less secure when the Crown decided to confiscate remittances of American silver to merchants in Seville.
- Overall, it appears that the most important factor explaining the divergent paths of institutions and Britain and the Netherlands on the one hand and France and Spain on the other is whether the social groups demanding institutional change, in this case commercial and industrial interests, were powerful or not. Interestingly, this is also the interpretation favored by most Marxist historians following Marx and Engels who wrote in *the Communist Manifesto*: “each step in the development of the bourgeoisie was accompanied by corresponding political advance of the class”.

## **2.2. 19th-century Britain and Germany vs. Austria-Hungary and Russia.**

- During the 19th century, there was rapid industrialization in Britain and Germany. In both countries, the state made the necessary institutional accommodations to support the process of industrialization.
- In contrast, there was very slow industrialization in Austria-Hungary and Russia, mostly because of resistance from the state and landed aristocracy against the process of industrialization and institutional change (such as protection of property rights, freeing of serfs, etc.).
- A comparison of these cases emphasizes the importance of a number of factors already discussed above:
  - (1) The economic interests of the elites: the elites in Britain had more to gain from industrialization than those in Austria-Hungary and Russia.
  - (2) Political losers: the landed aristocracy in Britain and Germany had more secure positions, and were less threatened by the process of industrialization.
  - (3) The importance of rents: there were greater rents that the landed aristocracy would lose if they lost political power in Austria-Hungary and Russia than in Britain and Germany
- Despite the important changes following the Glorious Revolution, landowning interests were still strong in Britain at the end of the 18th century.
- These British elites, nevertheless, faced an ongoing process of industrialization which, by creating new groups of wealthy businessmen and finally a powerful working class, forced the aristocracy to concede political power.
- Despite intense struggles between different interest groups, British land owners did not explicitly oppose industrialization.
- Mokyr writes “the landowning elite, which controlled political power before 1850, contributed little to the industrial revolution in terms of technology or entrepreneurship. It did not, however, resist it.”

- A couple of things are worthwhile noting:
  - (1) In large part because of the Glorious Revolution, the political powers of the monarchy and traditional aristocracy were relatively muted in Britain compared to other European countries.
  - (2) Feudalism and servile labor were almost completely gone and most of the landed elite had economic links to commercial farmers, or had become commercial farmers, so they themselves had much to gain from commercialization and industrialization.
  - (3) The landed aristocracy in Britain did not fear economic change as much as the landed aristocracy in some other countries because of the controlling role of the House of Lords.
- All these reasons contributed to the favorable attitude towards industrialization among the politically powerful social groups
- Industrialization occurred in Germany in the context of the rise of the Prussian state.
- The Prussian state also ensured the entrenchment of the elites, in particular the landed aristocracy, the Junkers. For example, the Junkers forged the coalition of ‘Iron and Rye’ with the rising industrial class to secure their economic interests.
- The Junker elite also had considerable control over the political system because of the power of the upper house of the parliament, which they dominated.
- Despite the important role of the Junker elite, the political stakes were relatively limited for the landed aristocracy. This was mostly because of the reforms induced by the Napoleonic wars.
- In the parts of Germany that they occupied, the French rule amounted to a “crash course in modernization that removed the institutions of the old regime,

separated church and state, rebuilt the administrative bureaucracy on a new basis, and made possible the relatively untrammelled accumulation and disposition of property that is one hallmark of a modern civil society.” (Blackbourn).

- Where the French did not rule, as in Prussia, their impact was to induce defensive reform and modernization. The serfs were freed in Prussia in 1807, and in general the Junkers were relatively commercialized compared to the landed elites of Russia or parts of the Habsburgh Empire.
- Therefore, the two important elements in the German case appear to be the relatively secure position of the landed aristocracy (because of their coalition with industrial groups and because of their control of the upper house of the parliament) and the fact that they had less to lose from the process of industrialization (because land relations were no longer feudal).
- Russia provides a stark contrast to the British and German cases. During the reign of Nikolai I between 1825 and 1855 (in the wake of the Decembrist putsch) only one railway line was built in Russia.

Generally, the landed interests and the Tzar were strongly opposed industrialization and the institutional changes necessary to bring about industrialization.

- It was only after the defeat in the Crimean War, Nikolai 's successor, Alexsandr II, initiated a large scale project of railway building and an attempt to modernize the economy (by, among other things, introducing a western legal system, decentralizing government, and freeing the serfs). The reason appears to be that Alexsandr II, most probably correctly, perceived that Russia's technological inferiority left it vulnerable to foreign threat.
- This period of industrialization also witnessed heightened political tensions, consistent with the view that previous elites were afraid of economic and institutional change because of their destabilizing effects.



- The state of land/labor relations in Tzarist Russia also contributed to resistance to change in that country. The feudal social structure in nineteenth-century Russia generated high rents for political elites, and implied that the landed aristocracy had few commercial interests, and was not associated with industrial groups. So the primary beneficiaries of industrialization would have been groups outside the landed aristocracy. Moreover, because land is relatively easy to expropriate, the elites had a lot to lose from political changes. These factors increased the political stakes for the elites, making them fear industrialization more than in Britain or Germany.
- The situation in Austria-Hungary appears to be similar to that in Russia.
- The consensus view amongst historians appears to be that the main explanation for the slow growth of Austria-Hungary in the nineteenth century is the opposition of the state.

“In domestic as well as foreign policy the *Vormärz* regime, from 1815 to 1848, was determined to prevent another French Revolution anywhere in Europe. From this principle Francis I derived not only his opposition to the growth of industry (and with it the Proletariat)...but his general reluctance to permit any change whatsoever.”

- Also as in Russia, Austria-Hungarian elites received relatively high rents from unreformed feudal land/labor relations.

### **2.3. South vs. North America in the 18th and 19th centuries.**

- The contrast between North America on the one hand and South America and the Caribbean on the other is interesting because in the 18th century a number of Caribbean and Latin American countries appear to have been considerably

richer (higher output per capita, though very unequally distributed) than North America.

- But these societies went through very different paths of institutional developments, and while North America industrialized rapidly, the Caribbean and much of South America stagnated during the 19th century.
- What explains the differences in the development of institutions in these two sets of societies?
- One possible answer is that while the groups that were more powerful in North America favored enforcement of property rights, and generally policies that encouraged commercial and industrial development, those in the Caribbean, Central and South America were opposed to industrialization and institutional changes necessary for industrialization.
- The important issue here may be that there was no powerful landed aristocracy in the United States, and the “middle class”, the group that would gain most from enforcement of property rights and encouragement to industry, had considerable political rights.
- Moreover, the low population density in North America implied that labor (especially European labor that migrated there) was more powerful, and had better outside options, and therefore could not be coerced by other (economically and politically more powerful) groups.
- This reflected in large part the fact that North America, especially the United States, was a settler colony.
- The settlers were opposed to political and economic institutions that gave power to landed interests.
- This can be seen from the fact that attempts to introduce semi-feudal land relations in the United States were defeated by the settlers.

- The attempt to systematically colonize the United States began with the founding of the Jamestown colony in 1607. Created by the Virginia Company as a commercial venture, in the absence of significant indigenous inhabitants to use as labor, they contracted indentured laborers at prevailing English wages to work for seven years. The Jamestown colony was never an economic success and the company tried various ‘incentive’ schemes, including a highly punitive almost penal regime in an effort to make money. However, as Galenson notes

“what the company failed to anticipate...was that its protection was not essential to the workers, would could consequently rebel against their harsh treatment by running away to live with the Indians or simply by starting their own small settlements. Faced with this effective competition for the workers’ labor, the company had to recognize that it did not have the monopsony position it had anticipated as the only employer in the region’s labor market and was forced to respond by offering higher wages and better living and working conditions...”

- In order to attract workers North America, the British Crown had to start giving more incentives and political power to the settlers. Therefore, this can be interpreted as low population density tipping the balance of political power in favor of the social groups that had more to gain from institutional change.
- A crucial institutional innovation designed to create incentives for the workers was the early creation in 1619 of the General Assembly with adult male suffrage.
- After this early period the colony grew rapidly, particularly after the spread of tobacco from the 1620’s onwards. Large land grants were made by Charles I to encourage settlers to move to the Colony, and in 1632 Maryland was given to the second Lord Baltimore. The charter also gave Baltimore “virtually complete legal authority over his territory, with the power to establish a government in whatever form he wished” (Galenson). His idea was to attract tenants from Britain and set

up a huge manorial system. This approach to colonization was not so different to the one employed by the Portuguese in Brazil.

- However, things were different in North America because

“the manorial organization of Baltimore’s colony failed to materialize, as Maryland’s history during the 17th century witnesses the gradual breaking down of rigid proprietary control...The extreme labor shortage...allowed many early settlers to gain their economic independence from the manorial lords, and establish separate farms...Thus just as in Virginia, in Maryland the colonial labor problem undermined the initial plans for a rigid social hierarchy, as Lord Baltimore’s blueprints for a manorial society were largely swept away and early Maryland became an open and fluid society, which offered considerable economic and social opportunity.” (Galenson).

- The low population density, and the fact that settlers were generally more powerful than the native populations of central and South America or the African slaves in the Caribbean or Brazil, made it impossible to profitably exploit such labor whose bargaining power forced elites to extend political rights and create equal access to land and the law. These early experiences formed the basis for the institutions that created limited government during the colonial period and ultimately resistance to British rule and taxation. They culminated in the Constitution 150 years later.
- Overall, therefore, the low population density in North America did not permit the emergence of a powerful and rich landed interest, similar to the feudal powers in Europe. Instead, economic and political power became to be distributed more equally, and to rest largely in the hands of the middle segments of the society.
- As argued originally by de Toqueville in 1835 in his “*Democracy in America*,” this relative lack of a landed elite and the relatively egalitarian distribution of

assets was also an important element in the development of institutions that were democratic and protected property rights.

- This situation is in stark contrast to other British colonies, for example in the West Indies (the Caribbean), and to most of the Spanish colonies.
- In Central America, much of the population were natives, and political and economic power were in the hands of European colonists.
- In the Caribbean, the majority of the population were African slaves, and the settlers were in a position similar to the landed aristocracy in Europe.
- In the case of the Caribbean, sugar plantations were very profitable, especially when using slaves employed at low wages (Engermann and Sokoloff).
- However, a system based on slave labor and low wages required the total concentration of political and coercive power of the state in the hands of the planters. Therefore, the economic interests of politically powerful groups encouraged the development of extractive institutions with power highly concentrated in the hands of the elite.
- The situation in Central America and Mexico was similar, except that it was the high population density of the native population that made extractive institutions profitable for the colonists.
- This population could again be coerced to work for low wages in plantations and in mines.
- In addition, this high population density made it profitable for the colonists to take over existing tax and tribute systems and maintain existing extractive institutions that generated high revenues for the elites.
- Notice that the plantation system in the Caribbean was quite effective in the heyday of sugar, and these colonies were richer than the North American colonies. This highlights issues of “appropriate” institutions. An institutional structure

that gave excessive powers to planters may not have been very costly when the main economic activity was sugar plantation, but could become much more costly (from a social point of view) when industrialization opportunities are present (since these slavery-based institutions did not encourage industrialization).

- Why did the political and economic elites in the Caribbean and South America oppose industrialization and institutional changes that would encourage industrialization? Two reasons appear important:
  - (1) The set of institutions that were already set up were designed to further the interests of the elites that specialized in agriculture. They would most probably not have been the primary beneficiaries of industrialization.
  - (2) Political power was important to the planters in the Caribbean and the elites in Central America because it enabled them to force large masses of natives or African slaves to work for low wages. Institutional change that would give more rights to lower strata of the society, even goes far as creating a middle class, would have necessarily weakened their political power. The fear of becoming “political losers” may have been quite important in turning the elites against industrialization.
- Therefore, this comparison emphasizes:
  - the importance of economic interests (whether settlers were to benefit from industrialization),
  - considerations of maintaining future political power (whether the elites were afraid of losing the political power as a result of the process of industrialization and institutional change),
  - and also constraints on the elites (the fact that labor in North America could move away and earn a good living thanks to the abundance of land, thus restricting the set of options open to the early elites in the colonies).

- It also highlights the importance of European settlers:
  - where European settlers were the majority, their economic interests were in line with industrialization.
  - where European settlers were the minority, they often found it more profitable to monopolize political power and use it to dominate the non-European elements in society.
- Finally, it stresses the role of population density in determining the constraints on, and the economic options available to, the elites.

#### **2.4. Korea and Taiwan vs. Congo (Zaire).**

- Comparison of Korea and Taiwan to Congo is interesting because in all three societies, the postwar leaders were very powerful dictators.
- But while in Korea and Taiwan, the leaders pursued developmental policies, in Congo Mobutu adopted perhaps the most kleptocratic policies that the world has ever witnessed.
- Most commentators agree that the success in Korea and Taiwan were very much due to the policies adopted by the state (though there is considerable disagreement on whether the interventions of the state, or the enforcement of property rights and free markets were more important).
- What explains the differences between the choices of the leaders?
- One possible answer is “constraints”: while Mobutu faced little constraints, either from its neighbors or from existing institutions, Korea and Taiwan faced very severe threats of communism, either because of a possible revolution or because of invasion.
- It may be that developmental policies were a necessity for these countries, because such policies were the best way to secure the continuation of the regime.

- Economic interest may have also played some role in encouraging developmental policies in Korea and Taiwan, since in both cases there were organic relations between political and economic elites.
- Developmental policies in Korea came to be adopted under Gen. Park Chung Hee who took control in a military coup in 1961. The previous regime under Syngman Rhee was highly corrupt and predatory.
- Gen. Park was very dictatorial in its approach, and made it known to businessmen that he would support them, but in return expected loyalty and obedience. He immediately formed the Economic Planning Board as a platform to coordinate and control development, and selected a small group of high-ranking businessmen with whom he met regularly.
- Via this channel, he formed close links with the important industrial groups, the chaebol. The chaebol needed Park and he needed them for the economic success.
- Throughout this period, there was a constant fear of revolution and unrest. In fact, a leading motivation of the investment in the education of the masses and land reform during the postwar period may have been to try to minimize unrest in Korea.
- South Korea was not only under the threat of communism from the outside, but also there were still very powerful communist elements within South Korea.
- The situation in Taiwan was very similar, as the country was under continuous threat of invasion from the mainland, and the leader, Chiang Kai-shek, harbored hopes of reconquering the mainland, and desired rapid industrialization to achieve this objective.
- The Taiwanese regime was the rule of the Kuomintang (the Nationalist Party) that were the rulers of China before the revolution, and arrived from there in 1949 after being defeated by the Communists.



- Before the arrival of the Kuomintang, Taiwan was a largely agricultural society that had been under Japanese occupation between 1895 and 1945. The Kuomintang and Chiang Kai-shek arrived on the island with approximately one million people from the mainland, equivalent to about half of the population of the island before 1945, and took control of the government.
- The Kuomintang regime in the mainland had been extremely predatory, corrupt, rent seeking and marred by political instability and infighting. Chiang Kai-shek brought with him some of his closest allies, and he quickly dissolved the groups that contained potential rivals to him.
- This highly unstable and rent-seeking rule of the Kuomintang in China before the revolution makes their developmental policies in Taiwan even more surprising.
- Throughout the postwar period, as well as now, the Taiwanese state has been under constant threat, mostly from the mainland, but also from the inside.
- These concerns not only motivated developmental policies, but also land reform in Taiwan. Chiang Kai-shek's close ally Gen. Ch'en Ch'eng, who was the governor of Taiwan at the time of the reforms, describes the motivation for the reforms as

“...the situation on the Chinese mainland was becoming critical and the villages on the island were showing marked signs of unrest and instability. It was feared that the Communists might take advantage of the rapidly deteriorating situation....”
- The Kuomintang also contained many of the economically powerful groups in Taiwan, who were among the mainlanders that came with Chiang Kai-shek, especially in banking and textiles. So the economic interests of the party that controlled the state were consistent with rapid development.
- The situation in Congo (Zaire) was very different.

- The Belgian Congo under Leopold was perhaps the most predatory colony of the late 19th and early 20th centuries. There was almost no institutional development during the period of colonial rule.
- After independence in 1960, Patrice Lumumba came to power, but was ousted by Mobutu, then the Army Chief of Staff, in September 1960.
- Mobutu immediately removed what were already weak institutional controls on the political elites (dismantling the judiciary system etc.).
- He then proceeded to run the state in order to increase his own wealth, while at the same time buying political support from groups around him, once again using the state's resources.
- There was effectively no property rights enforcement throughout the postwar period, and the GDP of Congo declined at the rate of 2 percent a year.
- Throughout this period, there was never any real threat to Mobutu's regime, in part because he was able to buy off all his political rivals (in no little part using money provided from the U.S., the IMF and the World Bank as developmental aid, but really these were payments to Mobutu to keep Zaire non-communist).
- It seems natural to presume that Mobutu would not have been able to pursue such predatory policies if there were any constraints on his behavior. There were almost none.
- An alternative explanation for difference between Congo on the one hand and Korea and Taiwan on the other hand is suggested by Evans. He argues that there was greater "state capacity" (embedded autonomy) supported by a meritocratic bureaucracy in Korea and Taiwan.
- This explanation does not appear appealing, since the regimes that were so developmental in Korea and Taiwan had been themselves predatory and extractive in

the past (in Korea under Rhee, and in Taiwan, the Kuomintang regime's history in mainland China before fleeing to the island).

## 2.5. Botswana vs. Ghana and Somalia.

- The final comparison here is between Botswana vs. Ghana and Somalia.
- While Botswana has been an economic success story since independence, Ghana and Somalia have experienced a very very poor economic performance.
- At independence, out of the three countries, Ghana appeared to have the most favorable conditions, while Botswana perhaps the least favorable ones (with very low GDP and very very low human capital).
- What explains the success of Botswana?
- The general consensus among macroeconomists is that Botswana's economic success is mostly due to the adoption of good economic policies, while Ghana and Somalia are examples of disastrous and chaotic economic and social policies.
- The bureaucracy in Botswana appears to have been on the whole meritocratic and non-corrupt. Despite the mineral wealth, the exchange rate has not become overvalued, while monetary and fiscal policy has been prudent, and the government invested heavily in public goods, such as infrastructure, health and education.
- It appears, however, that good economic policies in Botswana are an outcome of relatively good institutions.
- How did this poor country manage to have or to develop good institutions?
- One conjecture is that Botswana's institutions reflect a combination of factors. These include:

- (1) tribal institutions that encouraged broad based participation and constraints on political leaders during the pre-colonial period, combined with only limited effect of British colonization on these pre-colonial institutions because of the peripheral nature of Botswana to the British Empire;
  - (2) the fact that upon independence, the most important rural interests, chiefs and cattle owners, were politically powerful, and cattle was the main economic activity, making these politically powerful groups pro-development;
  - (3) the income from diamonds, which generated enough rents for the main political actors, increasing the opportunity cost of further rent seeking;
  - (4) perhaps a number of important and farsighted decisions by the post-independence political leaders, in particular Seretse Khama and Quett Masire.
- In the aftermath of independence, well-enforced property rights were, to a large extent, in the interests of Botswana's political elites, making the first factor, economic interests, stack the cards in favor of good institutions. After independence, cattle owners were the most important economic interest group, and they were politically influential. As many scholars have recognized "Botswana's government was largely a government of cattlemen."
  - At independence the only real prospect for a sector of the economy to develop was ranching and this was done successfully by exploiting the EEC market and a great deal of the infrastructure development had the effect of increasing ranching incomes. Moreover, the fact that the elite was invested in the main export sector explains why the marketing board gave the ranchers a good deal and also why the exchange rate was not overvalued, which contrasts with the experiences of many African countries. The political elites were therefore enriched by the developmental policies that were adopted from 1966. They benefited from membership

of the Custom Union with South Africa, and they also benefited from the heavy investment in infrastructure throughout the country.

- Some historians argue that “the primary beneficiaries of government policy in the areas of economic and rural development have been the organizational elites, bureaucratic, professional, and political, who dominate the system.” (Picard)
- The economic interest of the elites in development appears to be only part of the story, however. By the mid 1970’s the income from diamonds swamped the income from ranching, so one needs to account for why this did not induce the political elite to change its strategy and expropriate the revenues from diamonds.
- Two issues seem important:
  - (1) First, it was important that political elites did not oppose or feel threatened by the process of growth— they did not fear becoming political losers. The political security of the elites was to some degree an outcome of the relatively developed institutions that Botswana inherited from its pre-colonial period, which ensured some degree of political stability. It was also an outcome of Seretse Khama’s leadership, which resulted both from his position as the hereditary chief of the largest tribe, and from the relatively broad coalition he formed within the BDP (Botswana Democratic Party), including the tribal chiefs and cattle owners.
  - (2) Second, the underlying structure of institutions may have also been important in restricting the range of options, in particular distortionary policies, available to the political leadership— that is, political elites faced effective constraints. For example, political institutions such as the kgotla (the village council), which ensured a certain degree of accountability of political elites. The constraints placed by these institutions may help to explain why, while the cattle owners clearly preferred their own property rights to be enforced,

they did not use their political power in order to expropriate the revenue from diamonds starting in the 1970's.

The indirect benefits from the presence of these political constraints may have also been quite important: there was no political instability in Botswana, and Sertese Khama could build a relatively effective bureaucracy without the majority of economic groups fearing future expropriation.

- For both of these factors, the limited impact of colonial rule in Botswana, as compared to the experiences of many other nations in Africa, South America or the Caribbean, may have been quite important yet. Limited colonial rule allowed the continuity of the pre-colonial institutions, which provided the legitimacy to Sertese Khama and enabled him to form a broad-based coalition. The relative security of elites in Botswana contrasts with the situation in many post-independence African countries where developmental policies appear to undermine the power base of traditional political institutions such as chiefs, destabilizing the power of existing elites. The limited nature of colonial rule may have been important in ensuring the institutional checks on the economically and politically powerful groups. Contrary to many other countries in Africa, colonial rule did not strengthen Botswana's chiefs and did not destroy the kgotla and other related institutions, nor did it introduce indirect rule with substantial power delegated to the political elites representing the British Empire.
- Finally, it is important to recognize the contribution of diamonds to the consolidation of the institutions of private property in Botswana. Botswana got off onto the right track at independence and by the time the diamonds came on stream, the country had already started to build a relatively democratic polity and efficient institutions. The surge of wealth likely reinforced this. Because of the breadth of the BDP coalition, diamond rents were widely distributed and

the extent of this wealth increased the opportunity cost of undermining the good institutional path—no group wanted to fight to expand its rents at the expense of “rocking the boat”.

- In contrast, in post-independence Ghana, the leader Nkrumah and his Convention People’s Party (CPP) both lacked such a coalition and in the absence of institutional limits, posed a threat to other groups. The CPP therefore quickly became locked into an antagonistic relationship with other tribes.
- After independence had been secured from the British the anti-colonial coalition in Ghana crumbled.

“by 1951, with the British agreement in principle to grant independence to the colony, this stage of decolonization gave way to a period of domestic struggles for power on the eve of independence. At this junction, the internal tensions that had been somewhat in check erupted into an open clash over the control of the colonial state.”

- Nkrumah (who was from a minor Akan ethnic group – the Nzima) and his CPP were left with a very precarious political base. To compensate for this Nkrumah engaged in a “divide and rule” strategy with respect to the Ashanti (whose chiefs were one of his strongest opponents) by attempting to set different factions of commoners against the chiefs. The chiefs and their National Liberation Movement “met the nationalist appeal of the CPP with a rival nationalism of its own, through an impassionate demand for recognition of the traditional unity of the Ashanti nation,” (Austin).
- This political strategy ensured Nkrumah’s power at independence in 1958. After the departure of the British, he moved to suppress the opposition and ultimately to declare a one-party state. Despite the announced objectives of modernization,

the need to stabilize political power seems to have been the key determinant of the economic policies.

- Chazan and Pellar (1986) argue that by 1964 the CPP had “reduced the role of the state to that of a dispenser of patronage. By advocating the construction of a ramified bureaucracy, Nkrumah established a new social stratum directly dependent on the state. By curtailing the freedom of movement of these state functionaries through the diversion of administrative tasks to political ends, the regime contributed directly to undermining their effective performance.”
- Equally important, in order to maintain power, Nkrumah, and all Ghanaian leaders at least until Jerry Rawlings’ second coup, had to rely on urban support. This encourage them to pursue very inefficient policies transferring resources from the agricultural sector, which constituted the bulk of the economy. These policies included low prices for agricultural goods through marketing boards and overvalued exchange rates, and destroyed the cocoa industry, the most important sector in Ghana at independence (Bates).
- In contrast to Ghana, the ability of political elites in Botswana to build institutions and to refrain from politically motivated redistribution was important. This ability in turn appears to have stemmed from the fact that the BDP enjoyed a large and stable majority in the National Assembly, so did not fear losing its position as a result of social and economic change, and operated within a set of institutions which constrained the range of distortionary policies the leaders could pursue. This difference in institutions led to less underlying political instability and distortionary policies in Botswana than in Ghana.
- The comparison of Somalia to Botswana is interesting because of Somalia consists of a single people, sharing a common history, culture, religion, and language, and



like Botswana, British colonial rule had minimal effect on the structure of Somali society.

- As in Botswana, the motivation for the creation of a British colony in the Horn of Africa was strategic since Somalia commanded the sea-lanes between the Suez Canal and the Red Sea and India and the Far East. Nothing happened in the colonial period to the basic political institutions of the clans because the British “administration’s aims were extremely modest, and restricted in fact to little more than the maintenance of effective law and order...[since] there was no pervasive system of indigenous chiefs and consequently no basis for a true system of indirect rule.”
- Despite these similarities with Botswana, Somalia has had a dismal economic record, was unable to sustain democratic politics, and suffered a high degree of political instability. An investigation of the nature of post-independence politics in Somalia suggests that the pre-colonial institutions may have contributed to political instability rather than help the creation of institutions of private property.
- Clapham argues that

“these peculiarities [of the Somali case] reside in the structure of a nomadic society, in which shared identities of culture, language, and religion nevertheless coexist with intense factional conflict resulting from the perennial competition over very scarce resources. This dichotomy is symbolized in the Somali national genealogy, which, on the one hand, traces the descent of all Somalis from a common ancestor (Somal) and on the other, divides them into clans that provide a natural base for political factions.”
- One possible explanation for the difference between Botswana and Somalia is that this difference reflects the importance of the form of political institutions

that the Botswana tribes developed. These not only integrated disparate ethnic groups, thus creating the homogeneity we observe today, but they also allowed the the leading tribes to create a political culture of inter-tribe cooperation very different from the Somali experience.

- In contrast, despite ethnic, cultural and linguistic homogeneity, the political structure of the Somali clans was therefore highly divisive, and institutions in placing constraints on political elites were absent. This increased the stakes in controlling the state apparatus, and encouraged political elites to fight each other, forming coalitions along clan lines. In fact, after independence in 1960, and the unification of British Somaliland and (former) Italian Somaliland into the state of Somalia, clan loyalty dominated politics, even after the military takeover in October 1969. Parties formed along clan lines or were subject to complex internal battles along clan lines.
- Laitin and Samatar conclude that “one can scarcely think of a significant domestic or foreign development in Somali politics since independence that was not influenced to a large degree by an underlying clan consideration.”
- The Somali example therefore suggests that it is not the limited effect of colonialism itself that promotes the building of good institutions, but the interaction of this limited colonial rule with pre-colonial institutions placing effective constraints on political elites.
- Overall, this comparison suggests the importance of economic interests and constraints placed by existing institutions.
- It seems important that in Botswana there were relatively representative tribal institutions that survived colonial rule, and these institutions placed important restrictions on politicians and elites.

- The exceptional economic performance of Botswana also emphasizes to additional factors:
  - (1) Perhaps the presence of substantial wealth created by the resources (the diamonds) enabled the development of institutions without creating a major conflict between socially powerful groups. [...Note that this is the opposite of the prediction that follows from the common-pool models studied above...]
  - (2) Maybe even more important, leadership appears to have been very important in Botswana. If instead of Seretse Khama, the post-independence leader of Botswana was somebody like Mobutu wanting to get rich fast, the same economic policies would not have been adopted and the same institutional developments would not have occurred [...unless existing institutions managed to take somebody like this out of power. Would they have been able to do so?..]