I. Some Quotes on Anarchy, Leviathan, and State

On the nature of anarchy: from Thomas Hobbes, *Leviathan* (1651)

"Whatsoever therefore is consequent to time of Warre, where every man is Enemy to every man; the same is consequent to the time wherein men live without other security than what their own strength, and invention shall furnish them withal. In such condition .. the live of man [will be] solitary, poor, nasty, brutish and short."

On the Interests of Authoritarians, from Mancur Olson, "Anarchy, Autocracy and Democracy" (American Political Science Review, 1991)

"The conqueror of a well-defined territory has an encompassing interest in that domain given by the share of any increase in the territorial income that he collects in taxes. This encompassing interest gives him an incentive to maintain law and order and to encourage creativity and production in his domain. Much of the economic progress since the discovery of settled agriculture is explained by this "incentive."

Risks associated with governance from James Buchanan, *Limits to Liberty* (1975).

"The state serves a double role, that of enforcing constitutional order and that of providing "public goods." This duality generates its own confusions and misunderstandings. "Law," in itself, is a "public good," with all the familiar problems in securing voluntary compliance. Enforcement is essential, but the unwillingness of those who abide by law to punish those who violate it, and to do so effectively, must portend erosion and ultimate destruction of the order that we observe. These problems emerge in modern society even when government is ideally responsive to the demands of citizens. When government takes on an independent live of its own, when Leviathan lives and breathes, a whole set of additional control issues cone into being. "Ordered anarchy" remains the objective, but ordered by whom? Neither the state nor the savage is noble, and this reality must be squarely faced.

II. Theories of the Origin of the State

There are two fundamental accounts of the origin of the state. One that postulates a coercive or extractive state that imposes its will on its citizens in order to maximize the rewards of positions of power. The other postulates a productive state that individuals agree to empower as a means of advancing the individual interests of all members of society. The origin of a state has implications for the aims of government decisionmakers and thereby on the kinds of tax systems that tend to be adopted and the pattern of expenditures associated with their tax revenues. These theories have a long history, but were reinvigorated by two important twentieth century public economists, James Buchanan and Mancur Olson.

James Buchanan (1975) refined the social contract account of the origin of the state worked out by Thomas Hobbes and John Locke during a period termed the Enlightenment by scholars of intellectual history. Buchanan drew on contemporary economic analysis and game theory characterize the original Hobbesian setting. He suggests that a Nash Equilibrium somewhat resembling the Hobbesian anarchy would emerge among organized groups or tribes. Each could potentially benefit by partially disarming and those gains might be realized through a series of formal agreements or social contracts. His concept of social contracts is more optimistic than that of Hobbes in that he believes that a state can be limited by a constitution, although he shares Hobbes' pessimistic conception of anarchy as a setting that is nasty enough that essentially every individual benefits from agreeing to create a rule-making and enforcing organization. Such an organization—a government—can at least potentially secure peace and solve other public goods and externality problems.

Mancur Olson (1993) developed a theory of the origin of extractive states that might have emerged from anarchy because one or more group was better organized and thus more powerful than others within a region. Olson argues that a forward-looking extractive state does more than extract wealth from its subjects. It provides a subset of possible public services, namely ones that tend to increase the long run revenues of the state. Olson implicitly assumes that enslavement is not economically very productive, and thus an extractive government relies upon taxes and fees to extract income and services from the population ruled. As a consequence, every secure dictator has an "encompassing interest" in the welfare of its subjects, at least to the extent that increasing their welfare increases the revenues for the extractive regime.

There is doubtless some truth to both theories of the origin of the state. Different states may have different historical origins. For example, to resist the invading army of an extractive state, those under attack or expecting to be attacked may to join forces under a social compact to resist conquest. Alliances are often voluntary agreements to repel a dictatorial invader and, insofar as the threat of attack are long term ones, may generate new governments as in the Netherlands, the United States, and Switzerland.

However, both theories should be considered "ideal types" that simplify real historic settings in order to isolate reasons why new governments may be formed or preexisting governments reformed. It is unlikely that either form of territorial government emerged in one great leap from anarchy to dictatorship or social contract. It is more likely that both forms of territorial governments emerged gradually through a long series of refinements to preexisting informal forms of governance, and that some governments took a more consensual courses than others and so resembled those imagined by social contract theory. However, both are very useful models in that the identify incentives to form and support governments (spoils and shares of the spoils, and social dilemmas and potential solutions that require rules and rule enforcement).

There is quite a bit of evidence that smaller governments in the period before recorded history were heavily involved in both warfare and the construction of defensive structures that gives Hobbes' imagined account some historical foundations. (See for example Pinker (2011) or Keeley (1997).) There is also quite a bit of evidence that territorial governments emerged at about the time that settled agricultural communities emerged and that many were extractive rather than formed by contract. (See for example Harari (2015).) Social contract or consensus-based societies may well have existed as well, but being smaller left fewer records and artifacts. For example, town and villages in the English North American colonies of 17th England century were often founded via contracts.

The contribution that these theories make to public economics is that they provide positive theories of how governments with taxation power might emerge and the purposes that might be advanced by their tax and spending policies. In Buchanan's case, taxation and spending are to advance shared interests. In Olson's governments, taxation and spending emerge to advance the interest of those holding positions of authority within governments. In between are governments that are partly productive in Buchanan's sense and partly extractive in Olson's sense.

III. Olson's Model of the Extractive State

The extractive theory of the state is the most straightforward to model, although it was initially the least studied of the two conceptualizations of governments to be studied by economists.[1] We start with

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[1] Both lines of study, arguably began with a seminar series organized by Gordon Tullock and Winston Bush at Virginia Polytechnic Institute during the early 1970s. That seminar series generated two small books on the rational-choice based theory of anarchy. At about the same time, Bush and Mayer (1974) a mathematical characterization of a Nash equilibrium of anarchy that was known to most of the participants in that seminar. See Skaperdas (1992) for a somewhat more recent game theoretic model of conflict in anarchy. Such models also have relevance for economic analysis of contemporary warfare and economic development. See Acemoglu, Robinson, and Robinson (2001) for a very influential analysis of the origins of contemporary extractive institutions. See Congleton (2011) for a rational-choice based theory of the

Olson's theory partly because it is relatively straightforward and partly because authoritarian forms of government have been the most commonplace in recorded history. Democracies have historically been a very small minority of the governments in the past. (Surprisingly little work has been done on dictatorship.

Mancur Olson's papers on the extractive state (which he termed a stationary bandit) is part of a richer theory that explains why such states are an improvement over anarchy and includes a possible explanation for transitions to democracy. Those other parts are of secondary interest for this lecture. What is most important is his idea that a tax-revenue maximizing state (what Brennan and Buchanan termed a Leviathan state in their 1977 *Journal of Public Economics* Paper) has interests that tend to favor prosperity in their kingdoms—whenever they are confident that they and their children will remain in control for the foreseeable future. In effect, Olson develops a "residual claimant" model of a long-lived stable dictatorial regime.

The Olsonian model assumes that anarchy was populated by roving bandits that kept all but the bandits in misery. He suggests that a relatively powerful roving bandit might settle down and become a stationary bandit, which turns out to make the persons subject to banditry better off (implicitly because of his or her longer time horizon and ability to exclude roving bandits from his or her territory. Given the the existence of a stationary bandit (dictator), Olson models the fiscal policies (both expenditures and taxes) that a long run profit maximizing stationary bandit or dictator would adopt.

The dictator's political power is analogous to that of a slave holder in the eighteenth century southeastern United States, except that the nation state cannot be sold and its residents cannot be economically enslaved. Instead of commanding labor to do his or her bidding and directly benefiting from the services provided or the sales of those services, a market economy is supported and taxed to produce revenue that can be used for the dictator's amusement. It turns out that a revenue maximizing dictator's interest in tax revenue leads him to provide services that increase national wealth (taxable wealth) and to tax at less than 100%. The latter implies that his subjects share in any prosperity induced by the dictator's policies. It also explains why the governments of all contemporary dictators provide some services to their subjects. It also explains why dictatorship might be preferred to anarchy—using a different line of argu-

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emergence of Western democracy. (Ronald Wintrobe, Gordon Tullock, and Mancur Olson initially accounted for most of the rational choice-based literature on dictatorship.)

ment that worked out by Hobbes. Since the dictator cannot fully capture the fruits of his subjects' labor, the "ruled" are made better off by the dictator relative to what they would have realized under Hobbesian anarchy. That is to say, the ruled realize greater net-of-tax income than required for their subsistence, because a dictator's long term interests limits his day-to-day extraction.

The model abstracts from many issues associated with authoritarian rule including the nature of the ruling organization, how the dictator holds onto power, and differences in the importance of support (or nonresistance) from various subsets of those in his or her territory. (Some of these are dealt with in Tullock (1974 and 1987) and Wintrobe 2000.) Olson's analysis also largely ignores the effects of uncertain terms of office or ignorance on a ruler's economic policies. Both these problems tend to reduce a ruler's interest in long run growth and efficient taxation. Olson's initial analysis (and several follow up pieces) demonstrate why taxing authority (especially when limited to general taxes such as a VAT or income tax) tend to partly align the interests of rulers with those of their subjects. And as noted in the quote from Olson at the beginning of this lecture, it thus can account for the services and relative prosperity of stable authoritarian regimes throughout history.

Olson's core arguments can be easily summarized with a mathematical model. A secure dictator, whose rule is unchallenged by potential rivals or invaders, will select tax and expenditure policies to maximize his net income:

$$Y = t\,Ny(G,t) - c(G)$$

where *y* a function representing *average* or per capita national income and N is the number of subjects within the kingdom. Average income rises as government service *G* increases and falls as tax rate *t* increases. *t* is the tax rate and *G* is a government service that increases private output such as a court system, high way system, or an education system. Those services cost c(G) to provide. Note that government services that do not do so (or do not increase the ruler's security) will not be provided. Note also that this model can be easily generalized by considering *G* to be a vector of services and *t* a vector of tax schedules. However, little is lost by focus on a one service, one tax, fiscal system with a residual claimant.

Two first order conditions of characterize the ideal tax rate, t*, and service level, G*, for a net revenue maximizing (pragmatic) dictator.

$$Y_t = Ny(G,t) + tN\,y_t = 0$$

$$Y_G = tNy_G - c_G = 0$$

Subscripts denote partial derivatives. Both first order conditions hold simultaneously at the ideal public service level. Services are set so that the marginal increase in tax revenues equals their marginal costs and the tax rate is set so that the direct marginal increase in tax revenue equals the indirect marginal reduction in tax revenue generated by weaker incentives to work and invest.[2]

Because the tax base can be increased by services, the ruler has an interest in the tax base. The ruler can be said to have an encompassing interest in the wealth of his subjects insofar as his interests are aligned with theirs. After all, their wealth or income is where the government's taxes come from. On the other hand, this is not a completely encompassing interest. National income is not maximized, which would have a different first order condition. (Students can easily work these out.) For example, government service *G tends to be underprovided* by the dictator because he receives less than the complete marginal benefit from the service. (The national income maximizing level of government services requires $Ny_G - c_G = 0$ rather than $\mathbf{t}Ny_G - c_G = 0$.)

Still the result of a flat tax on all personal income tends to align the interest of leviathan with those of his or her subjects more than one might have expected. It is doubtless for reasons similar to this that stable authoritarian regimes in medieval Europe, for example, were often fairly popular even though their rulers, as the expression goes, "lived like kings."

IV. A Model of a Social Contract

Social contract theory differs from the extractive theory of governance in that it considers the case in which a group of individuals decides to create a government to solve or reduce various problems associated with living together in communities. Such a state is intended to be "productive" rather than "extractive" in that it is supposed to make essentially everyone in the community better off than they would have been without a central government. In effect, such governments are voluntary clubs established to address particular problems. The pre-governmental setting can be imagined in a variety of ways, but the most common is to imagine a state of anarchy analogous to that outlined by Hobbes (1651) in his pioneering work on the origins of legitimate state authority.

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[2] Only if there is no incentive effect would the revenue maxizing tax rate be 100%. The kingdom is normally assumed to have what has been termed a "Laffer curve," which has a revenue maximizing tax rate well under 100%. Economist Art Laffer is supposed to have drawn a curve showing tax rates on the horizontal axis and revenue on the vertical axis on napkin while at lunch and somehow managed to have the curve named after him.

The Hobbesian setting can be illustrated with a four by four game in normal form. Suppose that Al and Bob each initially have control over 3 units of a final good (apples) and 3 units of a productive input (time). Suppose that one's time can be used either to attempt to take units of the good from the other or invested in a manner that will increase the quantity of their own holdings of the final good. (Time might be used for stealing one's neighbors apples or for planting apple treas and subsequently harvesting apples from one's orchard). Efforts to steal an apple requires one unit of the input (time) but reduces the value of the good taken by one half. (Theivery either consumes a half unit of the final good, damages the unit taken, or some combination of the two). If one use all one's time productively, one more unit of the final good would be available.

The net payoffs are represented in the following game matrix. To make the setting more realistic, the payoffs should be regarded as present discounted values of a long series of repeated interactions in which the same strategies are played by each player. (Such repeated strategies are common in finite repeated games in which each subgame has a unique Nash equilibria.) Of course, it is the relative payoffs that generate this result rather than the absolute values, so the same results would obtain if one multiplied all of the payoffs in table 2.1 by 100, 1000, or any other positive number.

Table 2.1 The Hobbesian Dilemma

Al \ Bob	No units used in theft	1 unit used in theft	2 units used in theft	3 units used in theft
No units used in theft	4, 4	(3), (3.6+.5)	(2), (3.3+1)	(1), (3+1.5)
1 unit used in theft	(3.6+.5), (3)	(2.6+.5), (2.6 +.5)	(1.6 +.5), (2.3+1)	(.6 + .5), (2+1.5)
2 units used in theft	(3.3+1, (2)	(2.3+1), (1.6 +.5)	(1.3+1), (1.3 +1)	(0.3+1), (1+1.5)
3 units used in theft	(3+1.5), (1)	(2+1.5), (.6+.5)	(1+1.5), (0.3+1)	1.5, 1.5

Notice that each person has a dominant pure strategy in this game, namely to spend all of his or her inputs (time) stealing from the other. As a consequence. no production takes place, and because of the cost (damage) of thievery, both live relatively poor lives—possibly ones that are nasty, brutish, and short as posited by Hobbes.

The point of the game is to demonstrate that the result, although in a sense chosen by each, is not the best that is feasible for them, of they could coordinate their choices. Indeed, they could nearly triple their net benefits if each resisted stealing from the other. One potential solution is to create a government that enforces laws against thievery. They can afford to pay taxes or other fees to fund such an organization, because of the economic advantages associated with a society without thievery. Their claims over resources are protected and so their incentives to work and save are much stronger.

Hobbes believed that even Olson's stationary bandit would be better than anarchy and argued that persons living in anarchy would take even that form of government over anarchy. Locke and Buchanan disagree with this conclusion. Locke (1690) disagreed because he did not believe that anarchy was as bad as Hobbes had argued because he believed that all or most persons have internalized norms that help solve the Hobbesian dilemma. Buchanan (1975, 1980 w. Brennan) disagreed because he believed that constitutions could constrain leviathan and make government better than that provided by an extractive leviathan—e.g. a productive government would provide better or more services and lower taxes than leviathan.

Taxes are paid under a social contract, because the services of governments contracted for require real resources. If thievery could be eliminated, Al and Bob would be willing to pay up to 2.5 units of the final good each for that service. Of course, the lower the cost of governance, the better off each would be, other things being equal.

It bears noting that the creation of a government is not the only possible solution to the problem confronted by Al and Bob in the choice setting of table 2.1. One could imagine that anti-stealing norms might emerge and be enforced informally by the members of a community. A strongly internalized norm such as "one should not steal from one's neighbors" would be sufficient to generate peace in an isolated village, although it may allow for raiding parties to other nearby villages. A government might be adopted in such a setting, as argued by Locke, to "top up" the informal norms and support for norms within a village or region if they were not strongly enough internalized to solve important thievery problems. Such a government would at least initially have quite limited responsibilities and authority because village norms would provide most of the incentive to avoid thievery and also provide the customary laws to be enforced.

Note that the same game matrix can be used to illustrate both the Hobbesian and Lockean settings, although the interpretation of payoffs would differ in the two cases. In the Lockean setting the payoffs would be "net" of any guilt felt or public outrage for the person(s) engaging in theft. In either case, the "government" formed would punish persons for theft.

How to design an organization so that one gets a productive service producing government rather than an extractive government of the sort analyzed by Olson is the challenge of social contract design.

A. Possible forms of government created by social contract: One-man Rule

It is possible that a group of individuals would agree to delegate authority to a single person who would establish a rule making and rule enforcing agency. This might be done, for example, in times of war (supreme commander) or on occasions when such a person could be removed from "office" very easily (as with a CEO or town manager). Hobbes suggests this delegating unrestrictive authority to a single individual might also be adopted as an escape from the endless war that he believes is associated with anarchy.

f a group decides to use one-man government, it is clear that they would prefer that the ruler him or her-self abide by a variety of laws—constitutional laws. For example: Some method of aligning the interests of the ruler and the ruled might be adopted. Buchanan and Brennan (1977), for example, suggest a number of rules on the tax authority of such a ruler. For example, only tax instruments with a relatively high deadweight loss might be permitted, to make over-taxing relatively unprofitable for government officials. Other possibilities include specifications of property rights, takings clauses, and due process in judicial proceedings. The domain of policy might also be constrained. Unfortunately, if the government has sufficient coercive power to impose laws on a territory's citizens, it can also ignore provisions of the contract that it does not like.

B. Possible forms of government created by social contract: Elected Leaders

One way to induce compliance with laws is through short terms of office and elections. The ruler may have to stand for reelection frequently—so frequently that he or she does not have time to create a powerful organization that they can use for extractive purposes—or leaders may be selected at rando for short terms, as was done for many posts in ancient Athens. Short terms of office allows mistakes be corrected in a relatively inexpensive manner—although frequent elections are not without their own costs in both time and attention by nonofficials.

Such processes for selecting the man or woman to rule may be buttressed by veto power of the rule making authority of the person(s) selected to be the chief executive officer of a community. Proposed laws might have to be approved by all or a super majority of members of the community through a referenda or town meeting. This would make the leader, in effect, only part of the government rather than all of it. His or her rule making authority would be shared with the electorate. Similarly, rule enforcing authority might be shared through the use of juries for all important judicial proceedings.

C. Possible forms of government created by social contract: the King and Council

Another possibility is to elect a council rather than a single leader, that itself makes policies via majority rule. This would reduce the likelihood of a dictatorship, because no single person holds all rule making and enforcement authority. However, it might not produce effective policies if council members free ride on their governmental duties. To avoid such problems, the council might elect a town manager to take care of day to day affairs, or a separate election for Mayor might take place. Such divided forms of government have a variety of advantages as noted by Congleton (2011, 2013).

Much of the monitoring of government performance would be undertaken by the different branches of government who might compete for favor in subsequent elections. Continuity in government would be improved over one-man rule, and more stable policies would be likely because of compromises required in divided governments and the stabilizing effects of majority rule within the council.

D. Evolution of government institutions created by social contract

Many of the features of modern states with elected governments are the result of a long series of institutional innovations that were adopted over the centuries to address the problems associated with delegating authority to "the crown" in the case of productive states and to address problems of overthrow in authoritarian states. Thus, governments tend to be more complex than the models suggest, although relatively simple models are still useful because they help one to identify the potential advantages of government, key problems that need to be addressed. and some of the core properties of alternative institutions.

The problems of constitutional design are ancient ones and thus the study of the effects of constitutions on public policies is also ancient. The first thorough such study being undertaken by Aristotle (330 B.C.) in his classic work called *the Politics* in English.

As noted in the introduction of this lecture, states whose governments are grounded in mass elections are rare historically. That European governance shifted away from authoritarian states in the sixteenth century is partly a product of the enlightenment, partly of the rise of liberalism (in what some call its classical form), and partly a matter of luck. The oldest democratic constitution in the world is presently the US constitution which is just over 200 years old. Historical records imply that large scale governments are at approximately 10,000 years old—and likely to have been older than that.

Constitutional history is, however, largely beyond the scope of this course. What is important for the purposes of this course is that the policies of productive and extractive states differ and that taxes are collected by each and that services are provided by each. [For more on the emergence of Western democracy see Congleton (2011).]

IV. Some Simple Exercises

A. Show and explain why using property rights and a property right enforcer can produce an escape from the dilemma of the thieves examined above. Use a game matrix similar to table 2.1 that includes the effects of punishments for theft. Explain why this illustrates the possibility of social contracts, that is to say, the mutual gains that can be realized by agreeing to be "coerced" by a third party--government or sheriff.

B. Explain why a revenue maximizing dictator's interest in tax receipts leads him to provide public goods that increase national wealth (taxable wealth) and to tax at less than 100%.

C. Explain why security interests may make a dictator less interested in long run growth and why this may cause his or her laws to favor some groups over others.

D. Explain why the power to tax is usually associated with governments, but not private clubs.