

# A Model of a Predatory State

Boaz Moselle  
The Brattle Group

Benjamin Polak  
Yale University

We provide a model of a primitive state whose rulers extort taxes for their own ends. This “predatory” state can result in lower levels of both output and popular welfare than either organized banditry or anarchy. The predatory state may provide public goods, such as protection, and hence may superficially resemble a contractual state. But the ability to provide such goods can actually reduce popular welfare after allowing for tax changes. Moreover, the kinds of public goods that predatory states provide are those that increase revenue, not necessarily welfare. We consider when primitive states are likely to emerge from organized banditry, and argue that poverty may result in statelessness rather than vice versa. We show that even a weak state (in transition from banditry) can be bad for output and welfare, and that a “corrupt” state that makes side deals with bandits is especially bad.

## 1. Introduction

Archeologists and historians, regardless of the millennium or the continent they study or of their political or methodological persuasion, have tended to see the primitive state as a good thing. A visit to the Mesopotamian collection in the British Museum leaves the impression that the states of Ur or Babylon marked high points of mankind’s achievement, while the periods between such empires were temporary setbacks.<sup>1</sup> Similarly, for many historians of medieval Europe, “[t]he end of Antiquity was an unimaginable disaster,

---

An earlier version of this article called “A Cynical Theory of the State” formed part of Boaz’s (unpublished) 1995 Harvard Ph.D. dissertation, “Essays in the Analysis of Property Rights and Institutions.” We thank three anonymous referees, the editor (Mathew McCubbins), and Sandeep Baliga, Dirk Bergemann, Bill Brainard, Jeremy Edwards, Jonathan Feinstein, Jason Furman, Avner Greif, Herschel Grossman, Jack Hirshleifer, Janos Kornai, Paul Klemperer, John Lonsdale, Andreu Mas-Colell, Stephen Morris, Joel Mokyr, Roger Myerson, David Pearce, Susan Rose-Ackerman, Emma Rothschild, Ilya Segal, Stergios Skaperdas, Chris Sims, Tomas Sjöström, Knut Sydsæter, Aaron Tornell, Dan Usher, Jaume Ventura, Martin Weitzman, and Richard Zeckhauser for their comments. Both authors thank Gail and Jay Furman for their support. Boaz also thanks the University of Southampton.

1. At the time of writing, these collections are displayed in rooms 55 and 56, best reached from the north entrance.

the holocaust of civilization itself.”<sup>2</sup> The founder of the French Annales school, Marc Bloch (1961, vol. 1, pt. 1) argued that the evolution of western Europe could not recommence before order had been restored by the state. The noted Marxist historian, Perry Anderson (1974b:137, 183), describes the period between the Roman and Frankish empires as “chaotic and primitive centuries,” whereas feudal authority in the high Middle Ages “produced a unified and developed civilization that registered a tremendous advance on the rudimentary, patchwork communities of the Dark Ages.”<sup>3</sup> Nineteenth-century Europeans attributed what they saw as disorder in Africa, in part, to statelessness, thus justifying the imposition of external authority. In response, until recently, African historiography has been dominated by searches for and studies of precolonial states.<sup>4</sup> This history has been the object of some pride, with several modern African nations adopting the names of precolonial states.<sup>5</sup>

Great civilizations leave great relics. Thus we know of the splendor at the courts of Hammurabi, Charlemagne, or Osei Bonsu.<sup>6</sup> We know far less, however, about the welfare of ordinary people under great states. Moreover, we do not know much at all about stateless societies. Records tend to be kept by states, and these typically claim that conditions were harsher in the less complex societies they replaced. Since it is always in the interest of state regimes to foster that impression, however, there are grounds for skepticism.

In this article we argue that the primitive state may have been a bad thing. To do so, we provide simple models of anarchy, of organized banditry, and of a state. We can think of the former as a “state of nature” and of the second as a society in which groups of raiders are relatively organized (the Vikings might be an example) but in which the settled population lack the kind of hierarchies or structures we associate with a state. By contrast, our state will have some minimal organization, notably a “king.” The model allows us explicitly to compare the state with stateless societies in terms of both the quantity of output and its distribution between the rulers and the populace. Loosely speaking, in the model, the primitive state tends to result in lower levels of popular welfare than exist under organized banditry or anarchy. In some cases, our state can even increase disorder and decrease total output.

---

2. The quotation is Anderson’s (1974b:129) summary of the view of Ferdinand Lot, a leading interwar authority of the early Middle Ages. For a more modern and much more optimistic view of the “Dark Ages” see, for example, Gies and Gies (1994).

3. Consistent with the line of this article, however, Anderson sees the main advance as agricultural output, not necessarily popular welfare. He even suggests (1974b:160–161) that the welfare of the peasantry may have been worse where and when state power was more developed.

4. See, for example, the focus on states in the precolonial sub-Saharan chapters of Fage’s (1995) textbook. Pages 322–323 offer a typically pro-state view. Works such as these have shattered the old view that Africans had no history, but in doing so they implicitly accept the notion that a history is a history of states.

5. Examples include Ghana, Mali, and Zimbabwe. Benin did not even lie within the modern boundaries.

6. For descriptions of the latter’s palace in Kumasi, see Wilks (1975:376–378).

In part, historians' optimistic views of the state come, in the absence of evidence, from the theories of the state they have in the back of their minds. Theories of the state might address three issues. They might seek to explain the existence of the state, perhaps by some quasihistorical account of its origin. They might give a normative account of the state; that is, seek to legitimize the authority of the state. Finally, they might discuss the consequences of the state; that is, provide a model of the state. By far the most influential theory of the state, the contractual theory, does all three of the above.

In the typical contractual account, individuals live initially in a state of anarchy, and club together for protection. Economies of specialization lead to the hiring of agents to carry out this task, while economies of scale lead to the formation of (local) monopoly defense organizations. These "protective associations" can be identified as (minimal) states [see, e.g., Nozick (1974:16–17)]. For Hobbes (1962) and Locke (1967) [and, more recently, for Nozick (1974)], the main purposes of such an account are to justify and (perhaps) to limit the obligation of citizens to obey the state.<sup>7</sup> Contained in these accounts, however, is also an implicit model of what the state does. Typically the state provides certain services to its citizens, especially protection and the preservation of order. In return, citizens provide payments to their king or lord, perhaps in the form of taxes or feudal dues. Different contractual theories differ in the obligations both of the state and of its citizens. How good a contractual state is for the populace depends on the terms of this contract but, even in Hobbes's least restricted of contractual states, life is preferable to that in his picture of anarchy. Indeed, if the supposed contract is agreed to by the populace as a whole, then they cannot be worse off under the state than under anarchy: their well-being were they to reject the contract places a lower bound on their well-being were they to accept.<sup>8</sup>

As an explanation of the state, contractualism has suffered historical criticism. As early as the 1740s, Hume (1994:189–90) wrote: "[a]lmost all governments, which exist at present or of which there remains any record in story have been founded either originally on usurpation or conquest, or both, without any pretence of a fair consent, or voluntary subjection of the people." As a justification for obeying the state, contractualism has suffered the criticism that people cannot be bound by a contract to which they did not consent.<sup>9</sup> As a model of the state, however, contractualism has refused to die. In particular, it continues to underlie historians' optimistic descriptions and assessments both of the state and of statelike institutions. For example, North

---

7. For recent discussions of contractualism in Hobbes, see Ryan (1996), and Tuck (1996); and, in Locke, see Lloyd Thomas (1995).

8. This does not apply, however, to contractual theories where each contract is individual. There, everyone could be better off if no one agreed to the contract. See, for example, Gambetta (1993).

9. But, see Nozick's (1974:chap. 1) defense of explanations based on the fiction of consent in a state of nature.

and Thomas (1971:778) write that “[s]erfdom in Western Europe was essentially a contractual arrangement where labor services were exchanged for the public good of protection and justice.”<sup>10</sup> North’s later “neoclassical” model of the state is still contractual at heart. He writes (1981:23): “the state trades a group of services, which we shall call protection and justice, for revenue.” More recently, Gambetta (1993) has constructed a contractual model of the mafia, seen as an organization providing protection in return for payments, in competition with or in place of the state.

Unlike contractual accounts, in this article we do not either claim to explain the existence or seek to legitimize the power of the state or its rulers. We have no theory, only a model of the state. Like contractual accounts, however, we compare the state with stateless societies. But, in our model, the state is predatory. By this, we mean that the goal of the state’s rulers is only to maximize their own take. Whereas the contractual state derives from a “protective agency,” the predatory state is more like a “protection racket.” There is no contract with the populace, only extortion using the threat of violence.<sup>11</sup> As we shall see, the predatory state can superficially resemble a contractual state. This resemblance, however, is misleading. The two models lead to fundamentally different conclusions about the merits of the state.

At first glance, it is perhaps not surprising that if we model the state as predatory, it can be a bad thing. Most other recent writers, however, have come to the opposite conclusion. For example, Olson (1993) and McGuire and Olson (1996) argue that even in the absence of a contract or of other constraints to its power, the state will vastly increase both output and popular welfare. The reason is that rulers of the state will find it in their interest to provide the public goods we associate with good government.

The gigantic increase in output that normally arises from the provision of public goods gives the stationary bandit [or king] a far larger take than he could obtain without providing government. Thus government ... normally arises, not because of social contracts or voluntary transactions of any kind, but rather because of rational self-interest among those who can organize the greatest capacity for violence (Olson, 1993:568).

10. They note: “[a] contract is a mutual agreement between parties involved in governing a transaction—usually in the form of a payment for a specified consideration.”

11. The idea of a predatory state is not new. Tilly (1985:169), for example, warns against the contractual model: “[i]f protection rackets represent organized crime at its smoothest, then war making and state making—quintessential protection rackets with the advantage of legitimacy—qualify as our largest example of organized crime.” Lane (1958), Levi (1988), Tilly (1990), Kiser and Barzel (1991), Barzel (1992), and Wintrobe (1998) each show that predatory accounts of the state can be usefully applied to problems from European history and elsewhere. Both Olson (1993:569) and Barzel (1992:15) dislike the term “predatory,” arguing that it either suggests opportunism or “is superfluous in an already maximizing framework.” We use the term to refer only to the aims of the state (one could imagine less cynical objectives), not the consequence of those aims.

We agree that a predatory king, seeking to increase his revenue, will sometimes provide protection and other public goods. It does not follow, however, that the populace will therefore necessarily be better off under the state than under anarchy. Indeed, we show that the kings' ability to provide such public goods can actually reduce popular welfare.

Since such claims may be surprising, let us be clear about what we are and what we are not claiming in this article. First, we do not claim that contractual states are bad. In fact, we have nothing to say about contractualism (except that we are skeptical about the applicability of the contractual model to many primitive states). Second, we do not deny that, even within a predatory state, popular welfare might be improved by noncontractual constraints on the power of rulers over their subjects; for example, the collective threat of rebellion, or the individual threat of migration. Indeed, we explicitly abstract from such constraints in our model in order to make our main claim. That claim is that in the absence of such constraints (contrary to the views of Olson and others), the unbridled predatory state is likely to reduce the welfare of the populace relative to anarchy and organized banditry. Two conclusions follow. First, if it is possible that primitive states were relatively unconstrained (either by contract or otherwise), then it is possible that such states were bad. This, in turn, suggests a change in the way we often view the early state. Second, if primitive states were in fact welfare improving, then it was probably because of the constraints (contractual or otherwise) on those states.

In our model, the power of the state plays a central role. There are several theories that try to explain where this power may have come from.<sup>12</sup> Some (like Olson) see the power of rulers over the populace as coming from a greater capacity for violence. For example, rulers of the state might invest in weapons or other potential tools of repression. Others see the state's power as an equilibrium phenomenon derived simply from a coordination of expectations among the populace. In this view, if everyone simultaneously defied the ruler, then the ruler would no longer be powerful. As Hume (1994:190) put it: "all ... might gain with [a ruler's] fall, but their ignorance of each other's intention keeps them in awe, and is the sole cause of his security." For people who hold this view, stocks of weaponry and a large police force are evidence of the rulers' weakness, rather than of their power. This article is deliberately silent on this controversy. The reason is that, for our purposes, it makes no difference where the power of the state comes from. We are interested in the consequences, not the cause, of that power.

The work most closely related to this article is by Usher (1989, 1992). Usher is relatively optimistic about the effect of the state on output and popular welfare. But this optimism is more by way of a "working assumption"

---

12. For an interesting recent discussion, see Zambrano (1999).

than a conclusion of his model; it is not his main concern.<sup>13</sup> In a recent article, Konrad and Skaperdas (1999) contrast anarchy directly with the state. They are less optimistic than Olson and Usher, but still more optimistic than us. Unlike us, they allow for competition between rulers. They show that this tends to be welfare reducing. There is also a large but somewhat less related literature in which investments by states or individuals in aggressive and defensive capabilities determine equilibrium allocations of power. Examples include Garfinkel (1990), Grossman (1991, 1994, 1995a,b), Grossman and Kim (1995, 1996, 1998), Grossman and Noh (1990), Hirshleifer (1988, 1991, 1995a,b), Skaperdas (1992), and Skaperdas and Syropoulos (1995, 1996, 1997). Historical applications of this approach include Dudley (1991) and Greif (1997).

Section 2 sets up the model of anarchy and compares this with organized banditry. Section 3 introduces the predatory state and considers both its welfare consequences and when such a state is likely to emerge. We pay special attention to the provision of public goods by the state. Section 4 considers two variants on the basic model: a weak state still in “transition” from organized banditry; and an established but “corrupt” state that colludes with bandits. Section 5 discusses and concludes. We eschew formal propositions in this article, but instead summarize some of the results, especially those concerning output and popular welfare, as informal observations. Intuition for most results can be seen graphically, and all formal proofs are relegated to an appendix.

## 2. Benchmarks: Anarchy and Organized Crime

Our first benchmark against which to compare the state is a society without any form of political organization or authority. Section 2.2 then considers organized banditry.

### 2.1 Anarchy

We use a model of anarchy similar to Usher’s (1989, 1992). The model has the potential to be quite rich in itself but, since our main concern here is comparison with more organized societies, we assume away much complexity.

Consider an economy consisting of a continuum of identical agents, each of whom can choose whether to be a “peasant” or a “bandit.” Peasants are producers while bandits live by “stealing” produce (though the term stealing here is rather loose since there are no formal property rights to violate). The names peasant and bandit are primarily metaphorical, but in the context of technologically primitive societies they possibly describe the main productive and predatory activities reasonably accurately. Individual well-being in each profession depends on the ratio of bandits to peasants. In addition, well-being might also depend on luck: whether the peasant happens to run into a

---

13. See Usher (1989:1040–1041) and (1992:119–120). Usher (1992) solves for the welfare effect of the threat of rebellion within a state, but not for the welfare effect of the state itself as compared to anarchy.

bandit, the outcome of any fight that might ensue, and so on. To keep things simple, however, assume that welfare is deterministic. For much of what follows, this is equivalent to saying we are only concerned with expected welfare.

Let  $\beta$  denote the proportion of the population who choose to be bandits. By normalizing the population size to 1, we can also let  $\beta$  be the number of bandits. Let  $R(\beta)$  denote the total product of this society when there are  $\beta$  bandits. That is,  $R(\beta)$  is the amount produced by peasants when there are  $\beta$  bandits, net of any destruction resulting from conflict.<sup>14</sup> We normalize  $R(0) = 1$ . Part of  $R(\beta)$  is kept and consumed by peasants, and part is taken and consumed by bandits. Let  $W_p(\beta)$  be the quantity consumed by each peasant and let  $W_b(\beta)$  be the quantity consumed by each bandit. In later sections, peasants and bandits will be subject to “taxation” by bandit chiefs or by the state. Anticipating these transfers, we refer to  $W_p$  and  $W_b$  as gross welfare functions. For simplicity, assume there is no storage or investment.<sup>15</sup> Society’s resource constraint is then

$$\beta W_b(\beta) + (1 - \beta) W_p(\beta) \equiv R(\beta), \quad (1)$$

where the right side shows total product and the left side divides this into an amount accruing to bandits and an amount accruing to peasants. Given this resource identity, an anarchic economy can be described by fixing any two of the three functions  $W_b$ ,  $W_p$ , and  $R$ . Underlying these functions are the technologies of production, of theft and of defense, available in this economy.

Most of the analysis in this and later sections will be illustrated graphically. The following three assumptions make it easy to draw such pictures. As with all numbered assumptions in this section, they will be maintained throughout.

*Assumption 1.* The gross welfare functions  $W_b$  and  $W_p$  (and hence also the total product function  $R$ ) are thrice differentiable.

*Assumption 2.* When there are no peasants, nothing is produced ( $R(1) = 0$ ).

*Assumption 3.* For all  $\beta$  in  $[0, 1)$ ,  $W'_p(\beta) < 0$ ,  $W'_b(\beta) < 0$  and  $R'(\beta) < 0$ ; that is, both gross welfare functions and the total product function are strictly decreasing.

Assumption 1 is technically convenient, but not entirely innocuous. For example, one could imagine a defensive technology that is wasteful of

---

14. More generally, we can think of  $R$  as net of any disutility resulting from violence—or the threat of violence—due to banditry.

15. Including investment would allow us to address richer dynamic incentive issues but at the cost of adding complexity to the basic model. For example, it would introduce switching costs between the two occupations. See the remarks in Section 5.

resources but very effective against theft. Peasants might only find this technology worth adopting above a certain level of banditry. In this case, both bandit gross welfare,  $W_b$ , and total product,  $R$ , might jump down at the critical proportion of bandits. Among other things, our assumption rules out such discontinuities.

Assumptions 2 and 3 are natural. Total product decreases in the number of bandits since there are fewer producers and more produce is likely to be destroyed. Moreover, as banditry increases, peasants might switch resources from production to protection. They might do this directly, say, by building walls, or indirectly, by farming lower-yield products that are easier to move or by cultivating in less fertile areas that are easier to defend. Iron-Age settlements in Europe, for example, appear to have sacrificed access to water for the protection of high ground. Similarly, in precolonial East Africa, the Kamba and Kikuyu farmed hill slopes and forests rather than the more fertile steppes more vulnerable to Masai raids. The functions  $R$ ,  $W_p$ , and  $W_b$  reflect such decisions. Peasant welfare decreases in  $\beta$  since more bandits means more people trying to steal your output. For bandits, more bandits means fewer, poorer, and possibly better protected peasants from whom to steal. The intuition here is similar to that in a predator-prey model (such as our contact-technology example below): more sharks means fewer seals, and fewer seals means thinner sharks.

Loosely speaking, we say that an economy is in equilibrium if no peasant wishes to become a bandit and no bandit wishes to become a peasant. More formally, we say that the proportion of bandits  $\beta_A^*$  is an anarchic equilibrium if

$$W_p(\beta_A^*) = W_b(\beta_A^*) \quad (2)$$

(or if  $\beta_A^* = 0$  and  $W_p(0) > W_b(0)$ ; or if  $\beta_A^* = 1$  and  $W_p(1) < W_b(1)$ ). The above assumptions are enough to ensure that such an equilibrium exists. Figure 1(a) [which is roughly analogous to Usher's (1989) Figure 2(c)] shows a simple example of an anarchic equilibrium. This picture is going to be the base for much of what follows: subsequent sections compare anarchic equilibria like Figure 1(a) with those under other institutional settings.

Contrary to Hobbes (1962:143), life in this anarchic economy is not necessarily "nasty, brutish and short." In Figure 1(a), the anarchy equilibrium welfare level,  $w_A^*$ , is  $\frac{1}{2}$ , where given our normalization, the best possible average popular welfare level is 1 and the worst is 0. More generally, the welfare consequences of anarchy depend on the functions  $R$ ,  $W_b$ , and  $W_p$ . These in turn depend on the underlying technologies of production, theft, and defense. To get some intuition, consider an increase in the return to banditry that leaves the total product function,  $R$ , unaffected. For example, suppose there is a change in military technology that benefits attack more than defense. Figure 1(b) illustrates the effect. The equilibrium number of bandits is increased, and (hence) the equilibrium welfare level of both peasants and bandits is decreased. Conversely, all other things being equal, if the



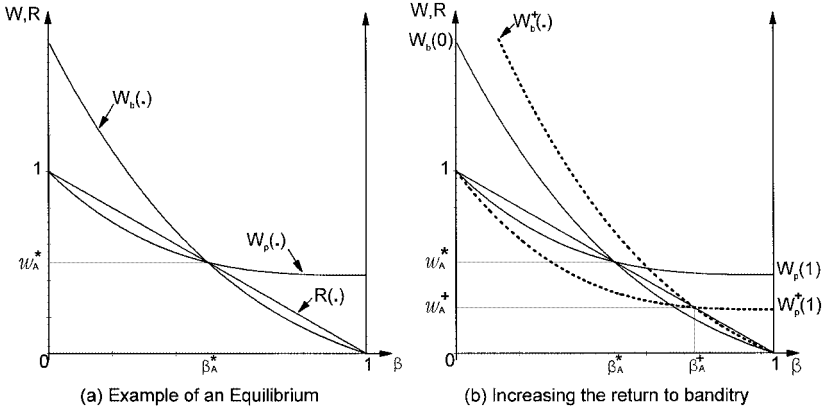


Figure 1. Anarchy.

return from being a bandit is low relative to that from being a peasant—perhaps because the terrain makes it very easy to defend a homestead—then life in the anarchic economy can be nice, gentle, and long.

Let  $V$  be the difference in the returns to the two professions; that is,

$$V(\beta) = W_b(\beta) - W_p(\beta).$$

In the extreme case, if banditry is very ineffective, then the only equilibrium will have no bandits and high welfare. At the other extreme, if banditry is too easy, then the only equilibrium will have no producers and welfare low enough to cause depopulation. The next assumption rules out these extreme cases.

*Assumption 4.* When there are no bandits, the relative return to banditry is positive and finite; when there are no peasants, it is negative and finite:  $\infty > V(0) > 0 > V(1) > -\infty$ .

Loosely speaking the first statement in Assumption 4 says that if everyone else is a peasant, you would do better as a bandit. With lots of potential targets and no competition, it would be “easy pickings.” The second statement says that if everyone else is a bandit, you would do better as a peasant. With no one to steal from, bandits would starve, whereas if you produce, you keep a small part of your crop.

In subsequent sections we will see that the shapes of the functions  $R$ ,  $W_b$ , and  $W_p$  affect which institutional regime is likely to exist, and also the welfare consequences of those regimes. As above, these shapes depend on the underlying technologies of production, theft, and defense. For example, it is natural to assume that bandits take the easiest pickings first, and that more banditry leads peasants to relocate to safer ground or to choose harder-to-steal crops. Thus the marginal effect on peasant welfare of adding one bandit is diminishing in the number of bandits. That is, the function  $W_p$  is convex. The

more there is an easiest-pickings-first effect or the more peasants are induced to take protective measures as banditry increases, the more convex is  $W_p$ . The total production function,  $R$ , is probably also convex in the number of bandits. Some of the measures taken by peasants to reduce the take of bandits, however, do so at a cost to total production. Thus they diminish the effect of the marginal bandit on peasant welfare more than they diminish the effect of the marginal bandit on total output. We assume, therefore, that total production is less convex than gross peasant welfare. It is also natural to assume that gross bandit welfare,  $W_b$ , is convex. For example, the easiest-pickings-first effect is likely to be large at low levels of banditry but to fall off as banditry increases. The more the easiest-pickings-first effect falls off the more convex is  $W_b$ . To keep things simple, we will assume that gross bandit welfare is more convex than gross peasant welfare.<sup>16</sup> To summarize:

*Assumption 5.* For all  $\beta$  in  $[0, 1)$ ,  $W_b''(\beta) > W_p''(\beta) > R''(\beta) \geq 0$ .

Assumption 5 greatly simplifies our analysis. For example, in the appendix we show that Assumption 5 implies that the marginal effect of adding one bandit is always worse for bandits than for peasants; that is, the function  $V$  is decreasing. This is enough to rule out multiple anarchic equilibria. In fact, Assumption 5 is enough to ensure that equilibria in all subsequent sections of the article are unique, and it saves us from having continually to check second-order conditions. In its absence, many of the results below would be qualitatively similar but would apply only to local rather than global comparative statics.

Hereafter, when we say “all technologies,” we mean all functions  $R$ ,  $W_p$ , and  $W_b$  satisfying Assumptions 1–5. There are many simple explicit functional forms (or structural models) that satisfy all the assumptions we have imposed on these reduced forms.

*Example 1* (contact technology).  $R(\beta) = 1 - \beta$ ;  $W_p(\beta) = \pi^r \beta$ ; and  $W_b(\beta) = ((1 - \beta)/\beta)(1 - \pi^r \beta)$ , where  $\pi$  is a parameter in  $(0, 1)$ ,  $r$  is a positive real number, and  $-r \ln \pi > 1$ .<sup>17</sup>

This can be thought of as a “contact technology” similar to predator-prey models like Furlong (1987). We can think of  $r\beta$  as the number of bandits met by each peasant—and of  $\pi$  as the probability that he will escape each encounter with his product intact. Thus  $\pi^r \beta$  represents (approximately) each peasant’s expected final consumption. When  $\pi$  is low and  $r$  is high, loosely speaking, the equilibrium level of banditry,  $\beta_A^*$ , is high and the equilibrium popular welfare level,  $w_A^*$ , is low.

We can also use polynomial technologies such as the following.

*Example 2* (quadratic).  $R(\beta) = 1 - \beta$ ;  $W_p(\beta) = (k\beta - 1)^2$ ; and  $W_b(\beta) = k(1 - \beta)(2 - \beta k)$ , where  $k$  is a parameter in  $(\frac{1}{2}, 1)$ .

16. This is implied if  $W_p''' \leq R'''$ .

17. Where  $W_b(0)$  is defined as  $\lim_{\beta \rightarrow 0} W_b(\beta) = -r \log \pi$ .

*Example 3 (cubic).*  $R(\beta) = 1 - \beta$ ;  $W_p(\beta) = 1 - m(\beta - \beta^2 + \frac{\beta^3}{3})$ ; and  $W_b(\beta) = m(1 - 2\beta + \frac{4\beta^2}{3} - \frac{\beta^3}{3})$ , where  $m$  is a parameter in  $(1, 3)$ .

In these examples,  $k$  or  $m$  parameterize the effectiveness of banditry versus production. Thus  $k$  or  $m$  might be higher in the steppes or the plains, where it is harder for peasants to defend themselves from bandits, than in the hill country. The anarchy level of banditry is increasing (and welfare is decreasing) in this effectiveness. All the figures in this article are computed examples using Example 3. For example, Figure 1(a) sets  $m = \frac{12}{7}$  so that  $\beta_A^* = \frac{1}{2}$ . For our purposes, however, these explicit functional forms (and all the pictures) are just examples. All the results and all the intuitions below are stated for the general case.

## 2.2 Organized Banditry

We now compare anarchy with organized banditry. It is almost a “folk theorem” in this area that organization reduces the level of crime.<sup>18</sup> Our model confirms this result, and provides some intuition.

The simplest version of organized crime is monopoly banditry. Consider the basic economy of the previous section, but now suppose that a bandit chief can make the life of other bandits uncomfortable if they do not join his band. For the purpose of this article we are not concerned where the power of the bandit chief comes from, and, for simplicity, we assume that no resources are used to maintain this power. We do not assume, however, that the bandit chief’s power is unlimited.

Organizing bandits might have two effects. The first is that, at each level of banditry  $\beta$ , gangs might be better at theft than are individual bandits. This would shift up the relative return to banditry, as in Figure 1(b), increasing the equilibrium number of bandits and decreasing welfare. To abstract from this effect, suppose that there are no internal economies of scale in theft. That is, assume that (holding the overall level of banditry  $\beta$  fixed) the optimal gang size is small enough to be operated without need of a bandit chief.

This leaves the second effect of organizing bandits: the bandit chief may restrict the number of bandits to increase his private return. Recall that increasing banditry reduces the return to all bandits. A monopolist bandit chief partially internalizes this externality, just as a product monopolist internalizes the effect of increasing output on industry prices. The product monopolist reduces output to drive up the gap between prices and average costs. The bandit monopolist reduces banditry to drive up the gap between the gross returns per bandit and the cost of hiring a bandit.<sup>19</sup>

18. We do not know who first pointed this out. It may have been Schelling (1967). Buchanan’s (1973) reasoning is very close to ours: “[i]f monopoly in the supply of ‘goods’ is socially undesirable, monopoly in the supply of ‘bads’ should be socially desirable, precisely because of the output restriction.”

19. Strictly speaking, the correct analogy is to a firm who is both a monopolist in the product market and a monopsonist in the input market, but the idea is the same.

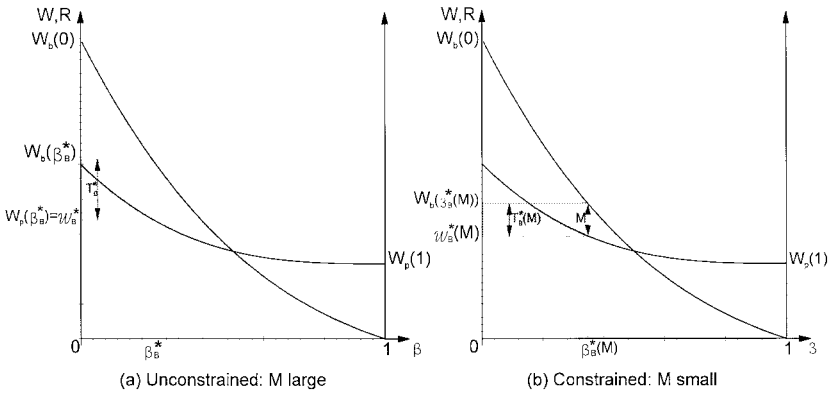


Figure 2. Organized banditry.

We can think of the bandit chief fixing the tribute,  $T_b$ , to be paid by bandits to join his gang, and letting the number of peasants and bandits adjust so that individuals are indifferent. Equivalently, we can think of him hiring a number of bandits, collecting the gross take from their banditry, and paying them just enough so that they prefer to work for him than to be peasants or freelance bandits. Let  $W_b(\beta) - M$  be the welfare of a freelance bandit who does not join the bandit chief's gang. We can think of  $M$  as the expected cost of hiding from the chief's wrath or of being caught by his agents. That is,  $M$  measures the power of the chief to inflict harm. If the bandit chief were to set  $T_b > M$ , he would collect no tribute. Conversely, if he sets  $T_b < M$  all would-be bandits will pay the tribute to join his gang. Thus, provided  $M > 0$ , in equilibrium there will be no bandits outside the monopoly gang.

The outcome of monopoly banditry is best seen in a picture. Figure 2(a) shows the case where the constraint on the chief's power over other bandits does not bind. Figure 2(b) shows the case where it does. Both are computed for the same technology used in Figure 1(a), though the results they suggest are general. Start with the case in Figure 2(a); that is, the power of the bandit chief,  $M$ , is large. For every level of banditry  $\beta$ , the total revenue from banditry is  $\beta W_b(\beta)$ . In equilibrium, ordinary individuals are indifferent between being bandits or peasants, so each ordinary bandit obtains welfare level  $W_p(\beta)$ . The tribute level corresponding to  $\beta$  is then  $W_b(\beta) - W_p(\beta) \equiv V(\beta)$ . Thus the bandit chief makes profits shown in the figure by a rectangle of length  $\beta$  and height  $T_b = V(\beta)$ . He chooses the level of banditry (or equivalently, the tribute level) to maximize the area of this rectangle. Let  $\beta_B^*$  and  $T_B^*$  be the optimum values of  $\beta$  and  $T_b$  in the case where the power of the chief to inflict harm,  $M$ , is large. The equilibrium welfare of the populace under banditry,  $w_B^*$ , is given by  $W_p(\beta_B^*)$ .

The case where the constraint binds (that is, where  $M$  is small) is similar, except now the height of the equilibrium profit rectangle will be  $M$ . Let the optimum values in this case be  $\beta_B^*(M)$  and  $T_B^*(M)$  to indicate their dependence on  $M$ . Since, the constraint binds,  $T_B^*(M) = M$  and  $\beta_B^*(M) =$

$V^{-1}(M)$  as shown in Figure 2(b). Similar to before, the equilibrium welfare of the populace under banditry,  $w_B^*(M)$ , is given by  $W_p(\beta_B^*(M))$ .

In the appendix, we show that the first-order condition for the bandit chief's problem is sufficient, and (for the unconstrained case) can be written as follows:<sup>20</sup>

$$W'_p(\beta_B^*) = R'(\beta_B^*). \quad (3)$$

Equation (3) shows the trade-off facing the bandit chief if he were to increase the number of bandits at the margin. On the right,  $R'$  is the reduction in total production of society as banditry is increased. For the left, recall that in equilibrium all ordinary people have welfare level  $W_p$  and that we have normalized total population to one. Therefore the left side,  $W'_p$ , is the reduction in total consumption by the populace (leaving more for the chief) as banditry is increased.

The effect of monopolizing banditry on welfare is simple. Provided the bandit chief has some power ( $M > 0$ ), monopolized crime Pareto dominates disorganized crime or anarchy. The reason is that the welfare of the populace (in this case  $W_p$ ) is decreasing in banditry, and monopoly reduces the quantity of bandits. This result does not depend on strict profit maximization by the bandit chief. Again an analogy may be useful. The tribute level is like a tax on bandits. The functions  $W_b$  and  $W_p$  are like demand and supply curves, respectively (albeit both are downward sloping). Just as any tax (not just a revenue-maximizing tax) reduces equilibrium quantity, so any positive tribute level reduces banditry. Reducing the quantity of a “bad” increases welfare.

We summarize all this in the following observation:

*Observation 1.* Compared to anarchic equilibrium, monopolized crime leads to fewer bandits, higher output, and higher popular welfare. Moreover, these effects are (weakly) larger, the greater is the power,  $M$ , of the bandit chief to harm other bandits.

It is possible to say more about organized banditry. For example, suppose that there are several bandit chiefs. For simplicity, suppose that each chief is unconstrained by his power to harm freelance bandits but is unable to inflict any welfare losses on members of rival gangs. Suppose that each chief simultaneously chooses the number of bandits in his gang. This is a model of Cournot oligopoly banditry. By analogy, we know that the equilibrium total level of banditry and the corresponding populace welfare will lie between

---

20. An equivalent way to write this condition is  $(\beta_B^* V'(\beta_B^*)) / (V(\beta_B^*)) = -1$ . This is analogous to the product-monopolist's elasticity condition, where  $\beta$  corresponds to quantity and  $V$  corresponds to profit per unit (price minus average cost).

that under monopoly,  $\beta_B^*$ , and “perfect competition,”  $\beta_A^*$ . Similar analogies could be made for Bertrand or Stackelberg, but let us move on.

### 3. The Predatory State

Return to the monopolist bandit chief. Recall that we can think of him as hiring the (possibly constrained) optimal number of bandits to steal from peasants. Suppose instead that he can cut out the middlemen. That is, suppose that the bandit chief can go directly to the peasants and say “provided you pay me tribute, I will not steal from you.”<sup>21</sup> We call this extortion. If we call the chief who has made the transition from banditry to extortion, a “king,” and if we call the tribute paid by the peasants to the king, “taxes,” then we have here a primitive state. It may still be in the interest of the former bandit chief, now king, to exert his power, if he has any, to deter other bandits. Now consider some historians, prearmed with a contractual model, who, while searching in the archives or traveling in a time machine, come across this society. They would think they were observing a contractual state, with taxes paid by peasants to a king in return for some protection from banditry. The resemblance to a contractual state is, however, only superficial. In fact, the state is predatory: the king’s only goal is to maximize his revenue. Moreover, the misidentification matters. Despite its outward appearance, the predatory state has very different welfare consequences from a contractual state.

At first glance, one might think that “monopoly extortion” by a king, albeit a predatory king, would be socially preferable to the “monopoly banditry” of the previous section. After all, provided the king does not need many thug employees to threaten peasants, he need no longer keep all those bandits unproductively employed stealing for him. Indeed, for Olson (1993), it is precisely this transition from raiding bandits to taxing kings (“stationary bandits”) that results in higher output and higher popular welfare. Therefore, in Section 3.1, we first compare the extortion of a predatory state with organized banditry and anarchy in terms of output and popular welfare. We then look for clues as to when such predatory states will form, by considering the conditions under which extortion generates more revenue than banditry. Section 3.2 then considers the state provision of public goods.

#### 3.1 Extortion

Again, the outcome of extortion is best seen in a picture. For purposes of comparison, Figure 3 is computed using the same technologies as the previous figures. For simplicity, assume that, even without any employees, the king can inflict unlimited harm on any peasant who refuses to pay tax and who remains as a peasant. We can think of this as the king’s needing only

---

21. We need it to be credible that the chief will punish a peasant who refuses to pay, and also that, if peasants pay, the chief will not take all their crops anyway. Since these issues are just artifacts of our using a one-shot setting, we ignore them here. In our working paper, Moselle and Polak (1999:Section 5), we provide a fully dynamic treatment.

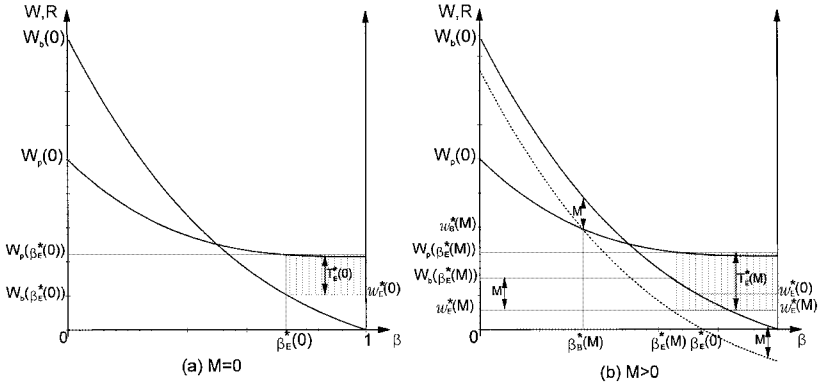


Figure 3. Extortion.

very few thugs to destroy the house and crops of an individual recalcitrant peasant.<sup>22</sup> Bandits other than the king's personal thugs, however, are harder to find and hence harder to harm. Figure 3(a) shows the case where the king has no power to harm such "freelance" bandits; that is,  $M = 0$ .

Much as before, we can think of the extortionist king fixing the tax paid by peasants,  $T_p$ , and letting the number of peasants and bandits adjust so that individuals are indifferent; or fixing the number of bandits  $\beta$ , and letting the tribute adjust. For every level of banditry  $\beta$ , the total revenue of peasantry is  $(1 - \beta)W_p(\beta)$ . In equilibrium, ordinary individuals are indifferent between being bandits or peasants, so (as  $M = 0$ ) each peasant obtains welfare level  $W_b(\beta)$ . The tax level corresponding to  $\beta$  is then  $W_p(\beta) - W_b(\beta) \equiv -V(\beta)$ . Thus the king makes profits shown in the figure by a rectangle of length  $(1 - \beta)$  and height  $T_p = -V(\beta)$ . He chooses the level of banditry, or equivalently, the tax level, to maximize the area of this rectangle. Let  $\beta_E^*(0)$  and  $T_E^*(0)$  be the optimal levels of  $\beta$  and  $T_p$  when  $M = 0$ . In this case, the equilibrium welfare of the populace under extortion,  $w_E^*(0)$ , is given by  $W_p(\beta_E^*(0))$ .

Figure 3(b) shows a case where the king has some power to harm freelance bandits (that is,  $M > 0$ ). The equilibrium condition that individuals are indifferent between being bandits or peasants now leaves each ordinary person with welfare level  $W_b(\beta) - M$ . This is represented in the picture by the downward-shifted dotted line parallel to  $W_b$ . The height of the relevant extortionist profit rectangle is now  $T_p = M - V(\beta)$ . Let  $\beta_E^*(M)$  and  $T_E^*(M)$  be the optimum values in this case. The equilibrium welfare of the populace,  $w_E^*(M)$ , is given by  $W_p(\beta_E^*(M)) - M$ . For comparison, Figure 3(b) also shows the corresponding equilibrium levels of banditry and welfare under monopolized banditry at the same  $M$  (the case in Figure 2(b)), and those under extortion with  $M = 0$  (the case in Figure 3(a)).

22. In Section 4, we consider a "weaker" chief who still needs to keep his army of bandits intact in order to threaten peasants.

In the appendix, we show the first-order condition for the king's problem is sufficient, and (for an interior equilibrium) can be written as follows:<sup>23</sup>

$$W'_b(\beta_E^*(M)) + M = R'(\beta_E^*(M)), \quad (4)$$

where  $\beta_E^*(M)$  is the level of banditry set by the king as a function of his power to harm bandits. Equation (4) again shows the trade-off facing the king were he to increase the number of bandits at the margin. On the right, as before,  $R'$  is the reduction in total production of society as banditry is increased. For the left, recall that in equilibrium all ordinary people have the same welfare level,  $W_b - M$ . Each bandit consumes  $W_b$  worth of resources and suffers a welfare loss of  $M$  imposed on him by the king. Each peasant consumes  $W_b - M$  of resources. Thus total consumption by the populace is  $W_b - (1 - \beta)M$ . Therefore the left side,  $W'_b + M$ , is the reduction in total consumption by the populace (leaving more for the king) as banditry is increased. At an interior equilibrium, the equilibrium popular welfare level,  $w_E^*(M)$ , is given by  $W_b(\beta_E^*(0)) - M$ .

It is already clear from Figure 3 that extortion can be worse than monopoly banditry in terms of both output and popular welfare. Indeed, when the king cannot harm bandits much ( $M$  is small), extortion results in lower output and lower popular welfare even than anarchy. For intuition, recall the analogy in the monopoly banditry case to a tax on bandits. This reduced the number of bandits. The tribute set by the extortionist king is a tax on peasants. The result is fewer peasants, more bandits, hence less output and lower welfare.

More generally, the comparison of both output and popular welfare levels under extortion with those under monopoly banditry depend on the power,  $M$ , that the king or bandit chief has to harm freelance bandits. We already saw in Figure 3 that, at small  $M$ , the predatory state results in more banditry and lower welfare than monopoly banditry. More formally, we show in the appendix that a sufficient (but not necessary) condition for both popular welfare and output to be lower under extortion than under monopoly banditry is that  $M$  is small enough to constrain monopoly banditry (so  $V(\beta_B^*) = M$ , like the case shown in Figure 2(b)).

At the other extreme, when the power to harm bandits is large, output is higher under extortion than monopoly banditry. The reason is that the bandit chief makes his living employing or collecting tribute from bandits, so he always wants there to be some bandits about. As  $M$  increases, therefore, the equilibrium level of banditry under monopolized banditry never falls below the unconstrained level illustrated in Figure 2(a). By contrast, the extortionist king makes his living taxing peasants. The fewer bandits, the better it is for

23. An equivalent way to write this condition is  $((1 - \beta_E^*(M))V'(\beta_E^*(M)))/(M - V(\beta_E^*(M))) = -1$ . Similar to before, this condition is analogous to the product-monopolist's elasticity condition, where  $(1 - \beta)$  corresponds to quantity and  $M - V$  corresponds to profit per unit.



him. From the first-order condition of Equation (4), we see that, if  $M \geq R'(0) - W'_b(0)$ , there will be no bandits under extortion.<sup>24</sup>

Such a society is extremely productive and has no crime, but it does not follow that popular welfare is high. This depends on the division of output between the king and the peasants. Recall that welfare of each peasant is equal to that which he could achieve were he a bandit. Loosely speaking, when there are no other bandits, this is given by  $W_b(0) - M$ . Thus if  $M$  is very high, peasant welfare is driven to zero. The equilibrium will eventually be in the lower left corner of our pictures, with the entire product of society accruing to the king.

The only way for popular welfare to be higher under extortion than under banditry is for there to be a level of  $M$  high enough so that, at this  $M$ , monopoly banditry would be unconstrained (in fact, high enough so that  $\beta_E^*(M) < \beta_B^*$ ), but not so high that the king gets everything. That is, we need the extortion equilibrium point in the pictures to be in the roughly triangular region (best seen in Figure 2(a)) below the  $W_p$  function, above  $W_p(\beta_B^*)$  and to the left of  $\beta_B^*$ . There exist some technologies of production and banditry for which the extortion equilibrium enters such a region for intermediate ranges of  $M$ .<sup>25</sup> For many technologies, however, including that shown in Figure 3 and also including our quadratic Example 2 for all  $k$ , this never occurs; that is, popular welfare is higher under monopoly banditry at all levels of  $M$ .

In Section 3.2, we will discuss further what aspects of technology affect these welfare comparisons, but, for now, let us summarize as follows:

*Observation 2.* For all technologies, when the power  $M$  to harm bandits is small, both output and popular welfare are higher under either monopolized banditry or anarchy than under the extortion of the predatory state. For all technologies, when  $M$  is very large, output is higher under extortion but popular welfare is higher under monopolized banditry and anarchy. And under many technologies, popular welfare is also higher under monopolized banditry than under extortion at intermediate (hence all) levels of power over bandits.

Consider the import of this result for historians and archeologists who have found “prosperous” ancient or medieval states. The signs of prosperity are often, on the one hand, evidence of high levels of production such as terraced fields, and, on the other, the remains of palaces and splendor. Perhaps there are also records confirming a high maintenance of order. Each finding—high output, rich rulers, and low crime—is consistent with a predatory state that had considerable power to harm bandits. In the model, however, these signs

24. If the king needs some thugs to run his predatory state then there will be some “hired bandits” even in this case. The result that extortion leads to high output when  $M$  is high requires that the king needs fewer than  $\beta_B^*$  such thugs.

25. An example is  $R(\beta) = 1 - \beta$ ,  $W_p(\beta) = 1 - 2k\beta + k^2\beta^2 - \frac{k^2x^3}{3}$ , and  $W_b(\beta)$  defined using the resource identity, with  $k = .61$  and  $M$  in a (small) neighborhood of .59.

do not necessarily indicate a prosperous populace. Indeed, the populace may well have been better off in the more chaotic environments against which ancient states are often favorably compared.

The pessimistic conclusion does not depend at all on our simplifying assumption that the power of the king to harm bandits,  $M$ , is costless. Suppose that  $M$  were produced at a cost by the state and is chosen to maximize state profits. Since Observation 2 applies to all levels of  $M$ , in particular it applies to these profit-maximizing levels.<sup>26</sup> To reiterate: for many technologies of production and banditry, regardless of  $M$  (and regardless of where  $M$  comes from), the predatory state generates popular welfare levels lower than organized banditry, and sometimes even lower than anarchy.

Next, consider state revenues. Although we have no such formal story here, suppose that primitive predatory states are more likely to emerge where extortion is more profitable than monopoly banditry. That is, suppose that the monopoly bandit chief is more likely to settle down and become a king, when the switch from marauding to taxing increases his take. Under what circumstances, then, are we likely to see state formation?

When there is very little power over bandits, not surprisingly, revenues are higher if directly extorted from peasants. At the other extreme, when power over bandits is very high, extortion again extracts more revenue than banditry. In the limit as  $M$  gets large, under extortion, everyone is a peasant and their entire product goes to the predatory king. In fact, for some technologies, extortion generates more revenue than banditry at all levels of power over bandits. For other technologies, however, there is an intermediate range of  $M$  in which banditry is more lucrative.<sup>27</sup> The technologies for which organized banditry raises more revenue than extortion (if only at intermediate power levels) are those in which banditry is effective relative to defense and production; that is, those technologies for which, under anarchy, banditry is high and popular welfare is low. An intuition is that, since there are many bandits and few peasants in such societies, it can be more lucrative to tax bandits than peasants.

In parts of early medieval Europe and parts of precolonial East Africa, especially in the plains, there appears to have been only minimal state formation. The model suggests two plausible reasons why this might have occurred. First, bandit leaders in these areas might have had only intermediate power over their fellow bandits, not sufficient to deter all banditry were the leader to abandon his profession and become an extortionist king. Second, these might have been environments that would have technologically favored banditry. A prediction of the model is that we are more likely to see state formation in

26. Indeed, for any  $M$ , we can find a convex cost function such that this level is chosen.

27. An example is our quadratic technology for  $k$  close to 1 and  $M = \frac{1}{2}$ . Recall that the quadratic technology never yields higher popular welfare under extortion than under monopoly banditry, regardless of  $k$  or  $M$ . Thus the technologies for which banditry can yield higher revenues are not those which banditry can generate higher popular welfares. Loosely speaking, it is harder to find examples of the latter.

hilly or marshy areas which are easy to defend; and we are more likely to see relative statelessness, just organized banditry, in the open plains or steppes where strategies of raid and flight are easy to undertake.

The model thus also warns against concluding too much if we were to find low welfare in economies with minimal states. Societies where banditry is relatively effective tend both to be poor and to be those in which organized banditry is favored over direct taxation of peasants. That is, limited state formation may be caused by, rather than the cause of, economies with high banditry and low welfare.

### 3.2 Public Goods

In both contractual and optimistic predatory accounts of the state, the main supposed benefit of the state comes from its provision of public goods. If there are goods or services that are privately costly to produce and whose social benefit exceeds their private benefit, such goods will be underprovided, or not provided at all, under anarchy. Consider, for example, protection from or hostilities against bandits. It may not be worthwhile for an individual peasant to pursue bandits into the forest, but all other things being equal, peasants as a whole would benefit from the reduction in banditry if one peasant did so.

In the contractual model, the state provides public goods in fulfillment of its side of the supposed bargain; in this case, chasing off bandits in return for tax payments. Predatory accounts of the state deny the existence of such a deal. But since the king is a large player, taxing peasantry as a whole, he may internalize at least part of the externalities involved in providing public goods. In this case, he will chase off bandits regardless of his lack of a contractual obligation to do so. This idea is central to Olson's analysis:

... a stationary bandit [or king] has an encompassing interest in the territory he controls and accordingly provides domestic order and other public goods. Thus he is not like the wolf that preys on the elk, but more like the rancher who makes sure that his cattle are protected and given water. ... No metaphor or model of even the autocratic state can therefore be correct unless it simultaneously takes account of the stationary bandit's incentive to provide public goods at the same time that he extracts the largest possible net surplus for himself (Olson, 1993:569).

In such predatory accounts, the king's purpose in providing such goods is not to increase popular welfare, but rather to increase the amount that can extorted as revenue from the populace. Nevertheless, in optimistic predatory accounts, popular welfare will be increased as an unintended consequence.

In fact, when an optimizing entity with coercive power has a sufficiently encompassing interest ... the invisible hand will lead it, remarkably, to treat those subject to its power as well as it treats itself (Mcguire and Olson, 1996:73–74).

By contrast, in our pessimistic predatory account of the state, if a ruler has the ability to provide public goods, the populace may actually be made worse off. In this section we try to identify what kind of public goods help the populace, what kinds hurt, and why; and we briefly discuss what kinds of public goods will be provided by the predatory state.

To see how the ability to provide public goods can reduce popular welfare, return to the example of chasing and punishing bandits. Suppose that some change in punitive technology enables the king to inflict harsher punishments on bandits. In our model, we can think of this as an increase in the degree  $M$  to which the king makes life unpleasant for bandits. Increasing  $M$  has two effects on popular welfare. On the one hand, making life more hazardous for bandits results in there being fewer bandits. Holding the tax level fixed, this “bandit effect” of increasing  $M$  increases the welfare of both peasants and bandits. On the other hand, however, since bandits are now worse off than before, the king can extract more tax from peasants without their exercising their option to become bandits. Holding the level of banditry fixed, this “tax effect” of increasing  $M$  reduces the welfare of both bandits and peasants.<sup>28</sup> Since the tax effect and the bandit effect work in opposite directions, the combined effect can go either way.

We can see both effects of increasing  $M$  in Figure 3(b). The tax effect is shown by the vertical drop from the old equilibrium point  $(\beta_E^*(0), w_E^*(0))$  on the  $W_b$  line to the dotted  $W_b - M$  line immediately below. The bandit effect is the slide up the dotted  $W_b - M$  line to the new equilibrium point  $(\beta_E^*(M), w_E^*(M))$ . More formally, at an interior equilibrium, the marginal net effect of increasing  $M$  on popular welfare is given by

$$\frac{d}{dM}(w_E^*(M)) = -1 + \frac{W_b'(\beta_E^*(M))}{R''(\beta_E^*(M)) - W_b''(\beta_E^*(M))}. \quad (5)$$

The first term,  $-1$ , is the tax effect, holding the level of banditry fixed. The second term,  $W_b'/(R'' - W_b'')$ , is the bandit effect: the change in welfare from the change in banditry induced by the change in  $M$ . Under our assumptions, both the numerator and the denominator are negative, so the bandit effect is positive.

More intuitively, to get a large bandit effect requires two things: each bandit who switches to become a peasant should have a large effect on popular welfare, and many bandits should switch. We get the former if there are large negative marginal externalities across bandits; that is,  $-W_b'$  is large. This helps because, in equilibrium, the welfare of bandits is also the welfare of peasants. If  $-W_b'$  is large, each bandit who abandons banditry has a big effect on the return of those who remain as bandits, and hence also on popular welfare. We get the latter, loosely speaking, if the size of the negative marginal externality across bandits does not change very much as we

28. Olson ignores this tax effect. For example, he writes (1993:570): “though the amount collected at any tax rate will vary with the level of public-good provision, the revenue maximizing tax rate for the autocrat should not.” In general, this is false.

change the number of bandits; more precisely, if  $(W_b'' - R_b'')$  is small. This helps because, in equilibrium, the king effectively sets the number of bandits such that their marginal effect on total output  $R'$  is equal to their marginal effect on total popular consumption,  $W_b' + M$ . If  $W_b'' - R''$  is small, it takes a large change in the number of bandits to restore this equality when  $M$  is increased.

The pursuit and punishment of bandits reduces popular welfare unless the bandit effect is bigger than the tax effect. In the case illustrated in Figure 3(b), the tax effect is bigger: increasing  $M$  shifts the equilibrium to the lower left. From Section 3.1, we know that in the limit as  $M$  becomes large, regardless of the underlying technology, popular welfare is reduced to zero. In this limit there are no bandits, so there is no bandit effect. More generally, from Equation (5), we see that increasing  $M$  increases popular welfare if and only if  $-W_b'(\beta_E^*(M)) > W_b''(\beta_E^*(M)) - R_b''(\beta_E^*(M))$ . In our figures, the left side of this inequality corresponds to the slope of the bandit gross welfare function. Loosely speaking, the right side corresponds to the curvature of that function.<sup>29</sup> As Figure 3 illustrates, unless  $W_b$  is very steep, it does not require much curvature for the total effect on popular welfare to be negative. Put another way, we just argued that to get large bandit effects, there must be large but relatively unchanging (marginal) externalities across bandits. That is, not only do we need a large easy-pickings-first effect, but the pickings must continue to diminish at a similar rate regardless of the number of bandits. It is not hard to think of economies where one of these two conditions fail, and thus increasing the provision of the public good accompanies a reduction in popular welfare.

This analysis also allows us to refine Observation 2. We already argued that there are only some technologies at which popular welfare in the predatory state can ever exceed that under monopoly banditry, and even then only at intermediate levels of  $M$ . We can now add that, for this to occur, there must be large bandit effects.<sup>30</sup> Moreover, we now know what kind of technologies can generate such effects.

The reader might object that the pursuit and punishment of bandits is a one-sided example of a public good, in that it reduced bandit welfare without positive direct effects on peasant welfare or on output. Less one-sided public goods, however, can also have negative net welfare effects. Consider, for example, a public good that simply increases total output, making more available regardless of whether it is eventually taxed by the king, stolen by bandits, or kept by peasants. The king might fund an irrigation project

29. The tax and bandit effects are a little like income and substitution effects, respectively. Similar to here, to get large substitution effects, we need indifference curves to have low curvature.

30. More precisely, a necessary (but still not sufficient) condition is that the bandit effect of increasing  $M$  must outweigh the tax effect at some  $\beta < \beta_b^*$ . To verify that this is not sufficient: in our quadratic technology with  $k = 1/\sqrt{2}$ , the bandit effect can dominate the tax effect, but popular welfare levels are always lower under extortion than under monopoly banditry.

or encourage technical innovation in production, or he might provide contract dispute adjudication or otherwise encourage trade. A simple way to model this is to multiply the output and gross welfare functions through by a constant,  $\gamma > 0$ . The resource constraint then becomes

$$\gamma R(\beta) = \beta \gamma W_b(\beta) + (1 - \beta) \gamma W_p(\beta).$$

Increasing  $\gamma$  is interpreted as the effect of the irrigation project or of increased trade.

In the absence of a state, increasing  $\gamma$  has no effect on the anarchy level of banditry, but increases the equilibrium welfare level of all bandits and peasants. The outcome is like that shown in Figure 1(a) except that the vertical axis has been rescaled. In the presence of a predatory state, however, there are again two effects: a tax and a bandit effect. Formally, at an interior equilibrium, the marginal net effect of increasing  $\gamma$  is given by

$$\frac{d}{d\gamma}(w_E^*) = W_b + \frac{-M}{\gamma^2} \frac{\gamma W'_b}{(R'' - W''_b)}, \quad (6)$$

where the arguments of all functions have been suppressed. The first term ( $W_b$ ) is the tax effect. Unlike in the case of punishing bandits, the tax effect here is positive. Irrigation projects or encouragements to trade have a positive direct effect on bandit welfare—there is more for bandits to steal—and this, in turn, limits the amount that the state can extort from peasants. The other term is the bandit effect. It is negative (except when  $M = 0$ ): that is, the irrigation project increases the level of banditry. The reason is that the ability of the king to harm bandits,  $M$ , is not affected by the irrigation project. Since everything else is increased, this is like a proportional reduction in  $M$  (hence the term  $-M/\gamma^2$ ). But as we already saw from the first example of a public good, decreasing  $M$  raises the level of banditry. Thus, once again, the net effect of the public good on the welfare of the populace under extortion can go either way.<sup>31</sup>

Although only two specific examples of public goods were considered here, the idea is quite general. We can always break the net welfare effect of a public good into two parts: a tax effect and a bandit effect. Since peasants will be taxed to the point at which they are indifferent between remaining peasants and becoming bandits, public goods whose direct effect is to hurt bandits will have negative tax effects. Since more bandits means lower welfare, public goods that result in more bandits will have negative bandit effects. Often, as in the above examples, we can sign each effect of an increase in a particular public good regardless of the specific technologies underlying  $R$ ,  $W_p$ , and  $W_b$ . The problem is that the two effects are often in opposite directions, and their respective strengths depend on the specific technologies.

31. For an example where increasing  $\gamma$  decreases welfare, take our quadratic technology with  $k = M = \frac{1}{\sqrt{2}}$ , and  $\gamma$  between 1 and 1.5.

The pursuit and punishment of bandits only increases popular welfare if the (positive) bandit effect is large. Irrigation and the encouragement of trade only decreases popular welfare if the (negative) bandit effect is large. In both cases the size of the bandit effect depends on the same term  $-W'_b/(W''_b - R'')$ . Loosely speaking, therefore, the kinds of technologies of production and of theft for which pursuing bandits can be good are similar to the technologies for which irrigation can be bad.

Again, we collect these results in the form of an observation:

*Observation 3.* Increasing the provision of public goods by a predatory state can increase but can also decrease popular welfare. This result holds not only for those one-sided public goods such as pursuing and punishing bandits that have no direct welfare benefits. It also applies to public goods like irrigation projects or contract adjudication which only have positive direct effects on popular welfare. In each case we can break the welfare effects into two: a bandit effect (the effect via a change in the equilibrium number of bandits) and a tax effect (the effect via a change in the predatory state's equilibrium tax rate).

The idea that the provision of public goods can make the populace worse off has implications for historians and others who analyze predatory organizations. Recall that if a state taxes peasants and provides public goods out of the revenues collected, it appears superficially a lot like a contractual state. To some extent, Gambetta's ground breaking contractual analysis of the Sicilian mafia falls into this trap. Gambetta (1993:28–33, chaps. 7–10) gives many examples to show that protection offered by the mafia is “genuine” in that the service is actually provided. He uses this to argue that the mafia is not practicing extortion. Our model, however, draws the interpretation of this evidence into question. First, a predatory, noncontractual organization practicing extortion would also provide services if by doing so it increased revenue. More importantly, some of the “public goods” provided by the mafia might actually reduce popular welfare. That is, ordinary Sicilians might be better off under “pure extortion” with no services “in return.”<sup>32</sup> Similarly, historians point to the benefits of having the state secure passage through the forest but they ignore the cost to the populace that their option of living as bandits in the forest is now less attractive. Outlaws in the Middle Ages were not only outside the law but also outside the grasp of feudal dues and taxes.

Next, consider which public goods will actually be provided by the predatory state. The king's revenues are clearly increased as we increase  $M$ : fewer bandits increases his tax base, and worse-off bandits means he can tax more from each peasant. Thus we should expect the predatory state to try to deter banditry by pursuit and punishment. What about our second example: irrigation or encouraging trade? In our model with the public good represented

---

32. Gambetta also allows that protection can hurt the protected, but his reasons are different. He points out that if some “buy” more protection, there may be a negative externality as crime is diverted to the less unprotected.

by  $\gamma$ , if  $M > 0$  and the equilibrium is interior, then the king's revenues are given by

$$(1 - \beta_E^*(M))(M - \gamma V(\beta_E^*(M))).$$

Thus (by the envelope theorem) state revenues are decreasing in  $\gamma$  whenever the relative return to banditry,  $V$ , is positive. This will occur at any technology and parameter  $M$  such that extortion results in fewer bandits than anarchy,  $\beta_E^*(M) < \beta_A^*$ . If we interpret  $\gamma$  as a productivity parameter, the same example also shows that the state will sometimes oppose technical progress.

Besley and Coate (1997) show that even a democratic state may fail to fix market failures in a Pareto-improving manner. The case of the predatory state is, not surprisingly, more extreme. It sometimes provides public goods in such a way as to make everyone except the ruler worse off, and it sometimes fails to provide them when they could make everyone, except the ruler, better off. In short, maximizing revenue is not the same thing as maximizing output or popular welfare. To expect a predatory state to do the latter out of enlightened self-interest is wishful thinking.

There are public goods, however, that increase both revenue and welfare. A simple case is a public good that increases peasant welfare but has no direct effect on bandit welfare. Examples might be an entertainment (a fair, fête, or circus) or a religious building or burial ground, funded from taxes, and from which bandits can be excluded. Such public goods allow state revenues to be increased. Since peasants (and only peasants) benefit from the circus, more can be extorted from them before they elect to become bandits. As usual, consider the two effects on popular welfare. The tax effect is zero. By definition, holding the number of bandits fixed, bandit welfare is unaffected and so peasants' outside option is unchanged. The bandit effect, however, is positive. Providing a circus increases the marginal welfare cost to society ( $-R'$ ) of an extra person becoming a bandit (since this person would then be excluded from the benefits of the circus). Thus the number of bandits needs to be reduced to restore the equality in Equation (4).

One prediction, then, of the model is that primitive predatory states are more likely to provide fairs and churches and to deter banditry than they are to provide irrigation or to encourage trade. The former types of public good always increase revenue, whereas the latter types, particularly for states of intermediate power, can reduce it. Fêtes, fairs, and public merriment fit our popular image of life in the feudal manor, while Bloch (1961:408) reports that internal order and maintaining religion were two of only three public goods expected of the early feudal state.<sup>33</sup> The model also predicts, however, that the state will provide public goods like irrigation in cases where it is so powerful that no bandits exist and all output accrues to the king. Smith, Mill, and Marx, and (much later) Wittfogel (1957) each believed that public

---

33. The third was defending from foreign foes.



hydraulic works were associated with the existence of despotism, especially in the ancient Far East.<sup>34</sup>

#### 4. Extensions to the Model

In this section we consider two extensions to the basic model. First, we consider a transitional state that still needs to employ bandits in order to threaten peasants. Second, we consider a corrupt state that makes side deals with bandits. In both extensions, it is the incentives of the king to increase or decrease the number of bandits that determine the welfare of the populace.

##### 4.1 A Transitional State

In Section 3 we considered a bandit chief who no longer relied on raiding, but rather settled among the peasants and extorted taxes. We assumed that no individual peasant would dare to stand up to such a ruler, so the king (as he had now become) would no longer need to maintain a large army of bandits. However, we can also consider the stage when the ruler is making the transition from a roving bandit chief to a settled king. In this transitional state, the king already raises revenue from peasants by extortion instead of raiding, but he still needs to retain an army of bandits to make good his threat. In this sense, the transitional king is weaker than the one studied in Section 3.

Since raids are no longer carried out in the transitional state, there is a savings in waste, death, and destruction relative to ordinary organized banditry. To keep the analysis clean, suppose that if the transitional king has  $\beta$  such bandits, then he can threaten each peasant with a raid which (as before) will push the peasants welfare down to  $W_p(\beta)$ .<sup>35</sup> Since there are no raids, however, the actual output of each peasant is  $W_p(0) = 1$ , rather than just  $W_p(\beta)$ . One might think that such a transitional state must be as good or better for the populace than is pretransition monopoly banditry, since it seems identical other than the saved deadweight losses of raiding. Unfortunately this is not necessarily true.

To see why, consider the case where the bandit chief is sufficiently powerful that he is not constrained by  $M$ , so the number of organized bandits is  $\beta_B^*$ . Given an army of  $\beta$  bandits, the transitional king can extract  $1 - W_p(\beta)$  from each of the  $(1 - \beta)$  peasants. Out of this, he must pay each of his  $\beta$  bandits what they could get as peasants, namely,  $W_p(\beta)$ . Thus the transitional king chooses  $\beta$  to maximize  $1 - \beta - W_p$ . The first-order condition (which is sufficient since  $W_p$  is convex) is just

$$W'_p(\beta_T^*) = -1. \quad (7)$$

34. For a (very critical) discussion of Smith, Mill, and Marx's views on the "Asiatic Mode of Production," see Anderson (1974a:462–549).

35. He might be able to push the peasant's welfare below this since the peasant would be unprepared for such raids, but we do not need this stronger assumption to make our point.

The intuition is similar to before. Each additional bandit reduces total output by  $-1$ , but also reduces the total consumption of that output by the populace (leaving more for the chief/king) by  $W'_p$ .

Contrast this with pretransition monopoly banditry where [from Equation (3)]  $W'_p(\beta_B^*) = R'(\beta_B^*)$ . If  $R$  is linear (as in each of our three examples), these first-order conditions are identical, and the number of bandits and hence the level of popular welfare is exactly the same under pretransition monopoly banditry as in the transitional state. All the savings from avoided raids accrue to the transitional king. If  $R$  is strictly convex, and if  $\beta_B^*$  is low enough such that  $R'(\beta_B^*) < -1$ , however, then  $\beta_T^* > \beta_B^*$ , and hence popular welfare under the transitional state is lower than under pretransition monopolized banditry.<sup>36</sup>

What goes wrong for the populace is that the incentives facing the transitional king are different than those facing the bandit chief. The marginal cost of an extra bandit to the bandit chief is  $R'(\beta_B^*)$ : not only is this person removed from production, but also, after the destruction of raiding and after any increase in protective measures, the effective productivity of the remaining peasants is also reduced. By contrast, the cost of the extra bandit to the transitional king is just that person's production. When  $\beta_B^*$  is low, the latter marginal cost is smaller, and the transitional king responds by hiring more bandits. From the point of view of the chief, however, if the transition to extortion can be achieved, then revenue is weakly increased. The intuition is that he could always choose to retain exactly  $\beta_B^*$  bandits, in which case his revenue is (at worst) the same as before. To summarize:

*Observation 4.* In a transitional state in which extortion replaces raiding as the method of collecting output, but the king still needs to retain an army of bandits in order to extort output from peasants, popular welfare can be lower than under ordinary monopoly banditry. But the king's revenues are increased.

#### 4.2 Corruption

Return to the model of Section 3.1 where the king had some fixed ability,  $M$ , to hurt bandits and extorted taxes from peasants without the need to retain an army. Suppose that instead of inflicting harm on the bandits, the king goes to them and says "provided you pay me a bribe, I will let you be." An historian who (wrongly) believed the state to be contractual might interpret such side payments from bandits as corruption. We will adopt this term even though it is perhaps redundant to call a predatory state corrupt.<sup>37</sup> In this section we ask how such corruption affects revenue, output, and welfare.

36. In general, if  $R$  is strictly convex, the welfare comparison can go either way. Formally, let  $\tilde{\beta}$  be given by  $R'(\tilde{\beta}) = -1$ . By our normalization, there always exists such a  $\tilde{\beta}$ . Then  $\beta_T^*$  always lies between  $\beta_B^*$  and  $\tilde{\beta}$ .

37. In fact, the model fits well with the first of Rose-Ackerman's (1998:42–44; 1999:chap. 7) categories of a corrupt state: an extortionary state with few rulers taking payments from multiple bribers.



finally consume the same amount of resources as peasants. The first-order condition is the same therefore as if the compensatory consumption term under extortion were zero.

Side deals between the rulers of states and bandits tend to attract the wrath of the press. In a contractual state, each such deal constitutes a breach of the contract. The model above suggests that hostility toward such deals makes sense even in the absence of a contract. The level of banditry under corruption (at an interior equilibrium) is equal to the highest that can occur under extortion, higher than under anarchy or monopolized banditry. That is, corruption can result in as low an output as any we have seen in this article. Similarly, if it is not zero, popular welfare under corruption,  $w_C^*$ , is only  $W_b(\beta_E^*(0)) - M$ .

On the other hand, corruption always increases the king's revenue. The reason is he is now playing both sides of the market. Given this, we might expect predatory states always to make side deals with bandits. Perhaps one reason we do not see more such deals is that actions by the state against bandits (such as raids into the forest) tend to hurt all bandits, so that deals with individual bandits are difficult. Alternatively, perhaps there were more side deals between kings and (at least, larger) individual bandits than it first appears. One could perhaps think of feudalism as the result of such deals between the king and barons who would otherwise be bandits. To summarize:

*Observation 5.* When the king has some potential to harm bandits, "corrupt" side deals between the king and bandits increase the king's revenue. Popular welfare is lower, sometimes decreased to the lowest feasible level. When it is not, the level of banditry is the same as would occur (without side deals) were the king to have no power to harm bandits.

## 5. Conclusions and Implications

There is a tendency to associate powerful states with words like progress and civilization. An aim of this article is to get readers at least to question that connection. Contractual states (if and when they exist) are likely to be better than anarchy. The concern of this article, however, is with states that are unconstrained by contract or by other means.

A predatory state is a state whose rulers' aim is to maximize their take, not the well-being of the populace. The main conclusion of this article is that an unbridled predatory state can result in lower output and lower welfare levels than would occur under either organized banditry or even anarchy. The short intuition is that, since it is easier for the state to extort income from peasants (who are tied to their farms) than it is from bandits (who can retreat to the forest), the state disproportionately taxes productive activity and thus tends to push people toward banditry.

The predatory state may provide public goods, especially those that promote order and deter banditry, and thus may resemble a contractual state. While the provision of such public goods increases total production, however, it can reduce the welfare of the populace. The short intuition is that by

making life harsher for bandits, the state can now extort more from peasants without the peasants electing to become bandits. More generally, given a predatory state, the effect on popular welfare of any public good depends not just on whether the good increases total output, but on whether it enables the state to take back more of that output in the form of taxation. Our model allows us to identify two welfare effects of any public good, and suggests how to assess their sign and size.

There are several secondary conclusions of the article. Here are just four.

1. A testable prediction on state formation. Settled states are more likely to form in easily defended hill or marsh country and less likely to form in the steppes or plains.
2. Interpreting historical evidence. Even if we find that stateless societies tend to be poor, it does not follow that the state is a good thing. Our model predicts the opposite causation: predatory states are less likely to form where banditry is easy and the populace is poor.
3. A testable prediction on public goods. The predatory state is more likely to provide public goods such as law and order (say, the pursuit and punishment of bandits) or organized celebration (say, circuses or religion), than it is to provide irrigation or the promotion of trade. The reason is that the former goods always increase tax revenue, while the latter can reduce revenues.
4. Corruption makes things worse. A predatory state that takes from both bandits and peasants (i.e., a corrupt state) is very bad for both output and welfare. The reason is that if a state can raise revenue from bandits, it has no incentive to keep down the number of bandits.

An implication of this article is that, if we believe that the early state was noncontractual but was nevertheless welfare improving, then we should look for factors missing from our model that may have constrained the state. Some things missing from our model, however, would actually make things worse for the populace. For example, we assumed that peasants can costlessly become bandits. In practice, there were probably considerable switching costs. The presence of such costs, however, since they make it harder for peasants to exercise their outside option, make it easier for the state to extort income from peasants.

Conversely, peasants would be better off if there was some alternate outside option other than banditry. For example, if other states were nearby and if such states allowed relatively free entry, then the implicit threat of migration would limit the amount each state could extort from their peasants. This corresponds to an old view of why citizens were relatively prosperous in the many small city-states of northern Italy in the later Middle Ages.

A second possible constraint on the predatory state may be concern for the future. Barzel (1992:11) argues that, in a dynamic setting, if a ruler were to seize a peasant's product, then others would learn to expect such confiscations and would be reluctant to produce in the future: "[a]s long as

the ruler's immediate gains from confiscation fall short of these future losses, subjects do not have to fear confiscation." This idea is correct in principle, but it should not be pressed too far. In Moselle and Polak (1999), we formalize Barzel's intuition in a dynamic adaptive-learning model and show that the (long-lived) predatory state can still result in very low levels of both output and popular welfare. An intuition is that the tax rate that maximizes long-term revenues (the top of the Laffer curve) is generally much greater than that which maximizes long-term output or welfare.

A third possible constraint on the predatory state may be the threat of revolt. One might argue, however, that a state constrained to act in certain ways or face rebellion is essentially a state constrained by an implicit contract. Indeed, North and Weingast (1989) view the glorious revolution in England as marking the transition from a predatory to a contractual state. A more cynical view is that, even then, the transition was only from a predatory monarchy to a predatory oligarchy. The picture of the eighteenth-century British state given by O'Brien (1988, 1994), for example, fits neatly with the predictions of our model. The state raised more tax (largely by regressive means) than its continental rivals and provided little else but law and order by way of public goods. It may take more than the odd popular revolution to produce a state whose existence improves popular welfare.

## Appendix

*Proofs for Section 2.1.* To show that  $V'(\beta) < 0$ , first rewrite the resource equation [Equation (1)] as  $\beta V(\beta) = R(\beta) - W_p(\beta)$ . Differentiating then multiplying through by  $\beta$  gives  $-\beta^2 V'(\beta) = -\beta R'(\beta) + \beta W_p'(\beta) + \beta V(\beta)$ . Substituting  $\beta V = R - W_p$  and rearranging gives

$$\begin{aligned} -\beta^2 V'(\beta) &= \beta[W_p'(\beta) - R'(\beta)] - [W_p(\beta) - R(\beta)] \\ &= \int_0^\beta [[W_p'(\beta) - R'(\beta)] - [W_p'(\beta') - R'(\beta')]] d\beta' > 0 \end{aligned}$$

since the integrand is strictly positive by Assumption 5.

*Proofs for Section 2.2.* The bandit chief's problem is to choose a tribute level  $T_b$  to maximize revenue  $\max_{T_b} \beta T_b$  subject to the constraints  $W_b(\beta) - T_b(\beta) = W_p(\beta)$  and  $T_b \leq M$  (and  $\beta \in [0, 1]$ ). We can use the first constraint to eliminate  $T_b$  from the problem, giving  $\beta V(\beta)$  as the objective function. The resource equation [Equation (1)] gives

$$\beta V(\beta) = R(\beta) - W_p(\beta), \quad (\text{A1})$$

which is concave by Assumption 5. Since the remaining constraint,  $V(\beta) \leq M$ , is (trivially) quasi-concave, the chief's problem has a unique solution given by the first-order condition, as claimed in Section 2.1. Either the constraint does not bind and we obtain Equation (3) using Equation (A1), or it does bind and yields the outcome directly.

*Proofs for Section 3.* The king's problem is to choose a tax level  $T_p$  to maximize revenue  $\max_{T_p} (1 - \beta)T_p$  subject to the constraints that  $W_b(\beta) - M = W_p(\beta) - T_p$  and  $T_p \leq W_p(\beta)$  (and  $\beta \in [0, 1]$ ). Again, we can eliminate  $T_p$  from the problem, which becomes  $\max_{\beta} (1 - \beta)(M - V(\beta))$  subject to  $W_b(\beta) - M \geq 0$ . Using the resource equation [Equation (1)] again, we have

$$(1 - \beta)(M - V(\beta)) = (1 - \beta)M + R(\beta) - W_b(\beta), \quad (\text{A2})$$

which is concave by Assumption 5, while the remaining constraint  $W_b(\beta) \geq M$  is (trivially) quasi-concave. So again this problem has a unique solution, given by the first-order condition. Either the constraint does not bind and we obtain Equation (4) using Equation (A2), or it does bind and yields the outcome directly.

We next show that a sufficient (but not necessary) condition for output and popular welfare to be lower under extortion than under monopoly banditry is that  $M$  is small enough to constrain monopoly banditry. Recall that popular welfare under constrained monopolized banditry is given by  $W_p(\beta_B^*(M))$  and popular welfare under organized banditry is given by  $W_p(\beta_E^*(M)) - T_p$ , so it is enough to show that  $\beta_E^*(M) > \beta_B^*(M)$ . When organized banditry is constrained by  $M$ , we have  $V(\beta_B^*(M)) = M$ . Thus, for any  $\beta \leq \beta_B^*(M)$ , the highest feasible tax on peasants  $T_p = M - V(\beta)$  would be negative. Therefore  $\beta_E^*(M) > \beta_B^*(M)$ .

The comparative static equations [Equations (5) and (6)] are obtained using the first-order conditions, via the implicit function theorem and some algebraic manipulation.

*Proofs for Section 4.2.* Formally the king's problem is as in Section 3.1 with the same constraints, but an extra (linear) term in the objective function, which is now  $\max_{T_p} (1 - \beta)T_p + \beta M$ . The same analysis goes through, giving the equivalent problem  $\max_{\beta} M + R(\beta) - W_b(\beta)$ , which is concave by Assumption 5, while the remaining constraint  $W_b(\beta) \geq M$  is (trivially) quasi-concave. Equation (8) is the (interior) first-order condition.

## References

- Anderson, Perry. 1974a. *Lineages of the Absolutist State*. London: New Left Books.  
 ———, 1974b. *Passages from Antiquity to Feudalism*. London: New Left Books.  
 Barzel, Yoram. 1992. "Property Rights and the Evolution of the State," working paper, University of Washington.  
 Besley, Timothy, and Stephen Coate. 1997. "Analyzing the Case for Government Intervention in a Representative Democracy," working paper, London School of Economics.  
 Bloch, Marc. 1961. *Feudal Society*, translated by L. Manyon. Chicago: University of Chicago Press [first published 1939–1940. Paris: Michel.]  
 Buchanan, James. 1973. "A Defense of Organized Crime," in S. Rottenberg, ed., *The Economics of Crime and Punishment*. Washington, DC: American Enterprise Institute.  
 Dudley, Leonard. 1991. *The Word and the Sword: How Techniques of Information and Violence Have Shaped our World*. Oxford: Basil Blackwell.  
 Fage, John. 1995. *A History of Africa*. London: Routledge.  
 Furlong, William. 1987. "A General Equilibrium Model of Crime Commission and Prevention," 34 *Journal of Public Economics* 87–103.

- Gambetta, Diego. 1993. *The Sicilian Mafia, The Business of Private Protection*. Cambridge, MA: Harvard University Press.
- Garfinkel, Michele. 1990. "Arming as a Strategic Investment in a Cooperative Equilibrium," 80 *American Economic Review* 50–68.
- Gies, Frances, and Joseph Gies. 1994. *Cathedral, Forge and Waterwheel: Technology and Invention in the Middle Ages*. New York: Harper Collins.
- Greif, Avner. 1997. "The Institutional Foundations of Genoa's Economic Growth: Self-Enforcing Political Relations, Organizational Innovations, and Economic Growth during the Commercial Revolution," working paper, Stanford University.
- Grossman, Herschel. 1991. "A General Equilibrium Model of Insurrections," 81 *American Economic Review* 912–921.
- . 1994. "Production, Appropriation and Land Reform," 84 *American Economic Review* 705–712.
- . 1995a. "Rival Kleptocrats: The Mafia versus the State," in G. Fiorentini and S. Peltzman, eds., *The Economics of Organized Crime*. Cambridge: Cambridge University Press.
- . 1995b. "Robin Hood and the Redistribution of Property Income," 11 *European Journal of Political Economy* 399–410.
- , and Minseong Kim. 1995. "Swords into Ploughshares? A Theory of Security of Claims to Property," 103 *Journal of Political Economy* 1275–1288.
- . 1996. "Predation and Production," in M. Garfinkel and S. Skaperdas, eds., *The Political Economy of Conflict and Appropriation*. Cambridge: Cambridge University Press.
- . 1998. "Predation and Moral Decay," working paper, Brown University.
- Grossman, Herschel, and Suk Jae Noh. 1990. "A Theory of Kleptocracy with Probabilistic Survival," 2 *Economics and Politics* 157–171.
- Hirshleifer, Jack. 1988. "The Analytics of Continuing Conflict," 76 *Synthese* 201–233.
- . 1991. "The Paradox of Power," 3 *Economics and Politics* 177–200.
- . 1995a. "Anarchy and its Breakdown," 103 *Journal of Political Economy* 26–52.
- . 1995b. "Theorizing about Conflict," in K. Hartley and T. Sandler, eds., *Handbook of Defense Economics*, vol. 1. Amsterdam: Elsevier Science.
- Hobbes, Thomas. 1962. *Leviathan*. Glasgow: Collins/Fontana [first published: London, 1651].
- Hume, David. 1994. "On the Original Contract," in K. Haakonssen, ed., *Political Essays*. Cambridge: Cambridge University Press [first published: London, 1741].
- Kiser, Edgar, and Yoram Barzel. 1991. "The Origins of Democracy in England," 3 *Rationality and Society* 396–422.
- Konrad, Kai, and Stergios Skaperdas. 1999. "The Market for Protection and the Origin of the State," discussion paper, Center for Economic Policy Research, London.
- Lane, Frederic. 1958. "Economic Consequences of Organized Violence," 18 *Journal of Economic History* 401–417.
- Levi, Margaret. 1988. *Of Rule and Revenue*. Berkeley: University of California Press.
- Locke, John. 1967. *Two Treatises of Government*. London: Cambridge University Press [first published, 1689].
- Lloyd Thomas, David. 1995. *Locke on Government*. London: Routledge.
- McGuire, Martin, and Mancur Olson. 1996. "The Economics of Autocracy and Majority Rule," 34 *Journal of Economic Literature* 72–96.
- Moselle, Boaz, and Ben Polak. 1999. "A Model of a Predatory State," working paper, Yale University.
- North, Douglass. 1981. *Structure and Change in Economic History*. New York: Norton.
- , and Robert Thomas. 1971. "The Rise and Fall of the Manorial System: A Theoretical Model," 31 *Journal of Economic History* 777–803.
- , and Barry Weingast. 1989. "Constitutions and Commitment: The Evolution of Institutions Governing Public Choice in Seventeenth Century England," 49 *Journal of Economic History* 803–832.
- Nozick, Robert. 1974. *Anarchy, State and Utopia*. New York: Basic Books.
- O'Brien, Patrick. 1988. "The Political Economy of British Taxation," 41 *Economic History Review* 1–32.



- . 1994. "Central Government and the Economy," in R. Floud and D. McCloskey, eds., *The Economic History of Britain since 1700. Vol. 1, 1700–1860*. Cambridge: Cambridge University Press.
- Olson, Mancur. 1993. "Dictatorship, Democracy and Development," 87 *American Political Science Review* 567–576.
- Rose-Ackerman, Susan. 1998. "Corruption and Development," in B. Pleskovic and J. Stiglitz, eds., *Annual World Bank Conference on Development Economics*. Washington DC: World Bank.
- . 1999. *Corruption and Government: Causes, Consequences, and Reform*. New York: Cambridge University Press.
- Ryan, Alan. 1996. "Hobbes's Political Philosophy," in T. Sorell, ed., *The Cambridge Companion to Hobbes*. Cambridge: Cambridge University Press.
- Schelling, Thomas. 1967. "Economics and Criminal Enterprise," 7 *Public Interest* 61–78.
- Skaperdas, Stergios. 1992. "Cooperation, Conflict and Power in the Absence of Property Rights," 82 *American Economic Review* 720–739.
- , and Constantinos Syropoulos. 1995. "Gangs as Primitive States," in G. Fiorentini and S. Peltzman, *The Economics of Organized Crime*. Cambridge: Cambridge University Press.
- . 1996. "Competitive Trade with Conflict," in M. Garfinkel and S. Skaperdas, *The Political Economy of Conflict and Appropriation*. New York: Cambridge University Press.
- . 1997. "Insecure Property and the Stability of Exchange," working paper, University of California, Irving.
- Tilly, Charles. 1985. "War Making and State Making as Organized Crime," in P. Evans, D. Rueschemeyer, and T. Skocpol, eds., *Bringing the State Back In*. Cambridge: Cambridge University Press.
- . 1990. *Coercion, Capital and European States AD900–1900*. Oxford: Blackwell.
- Tuck, Richard. 1996. "Hobbes's Moral Philosophy," in T. Sorell, ed., *The Cambridge Companion to Hobbes*. Cambridge: Cambridge University Press.
- Usher, Dan. 1989. "The Dynastic Cycle and the Stationary State," 79 *American Economic Review* 1031–1044.
- . 1992. *The Welfare Economics of Markets, Voting and Predation*. Ann Arbor: University of Michigan Press.
- Wilks, Ivor. 1975. *Asante in the Nineteenth Century: The Structure and Evolution of a Political Order*. Cambridge: Cambridge University Press.
- Wintrobe, Ronald. 1998. *The Political Economy of Dictatorship*. Cambridge: Cambridge University Press.
- Wittfogel, Karl. 1957. *Oriental Despotism: A Case Study of Total Power*. New Haven, CT: Yale University Press.
- Zambrano, Eduardo. 1999. "Formal Models of Authority: Introduction and Political Economy Applications," 11 *Rationality and Society* 115–138.