

The economics of organised crime

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3 Gangs as primitive states

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1 Introduction

The term 'organised crime' consists of two words that to a certain extent contradict each other. On the one hand, a 'crime' is by definition an illegal act that usually, but by no means always, goes against society's norms and mores. Criminal acts and the persons committing them are relegated to the margins of the polity and the state and they are considered an aberration, an exception to the rule, something random. On the other hand, the adjective 'organised' means 'having a formal organization to coordinate and carry out activities'.¹ An organisation usually implies the presence of written and unwritten rules and norms of conduct together with sanctions against possible offenders. That is, even illegal organisations have a semblance of a legal framework and a culture. The contradiction in the term 'organised crime' lies, then, in the fact that criminal organisations cannot be considered aberrations and random individual phenomena, but rather they can represent a challenge to the existing legal framework and possibly to the state and the political system itself.

But the relationship between state authorities and gangs² or other elements of organised crime is seldom completely antagonistic. Often the relationship is symbiotic, a 'live-and-let-live' arrangement. For the police, the justice system, the politicians all have to come to terms with the fact that the state does not have complete control and frequently in the duopoly of violence that exists in the gang's territory the gang has the largest market share. Hence, despite the occasional mobilisations of the state and the official proclamations, tacit arrangements of division of turf and self-restraint on the part of both gangs and state authorities represents the more normal state of affairs.³ Of course, there are also cases of bribery and material participation of state authorities in gang activities, but there is no need to invoke these to say that the relationship is symbiotic.

The implicit or explicit delineation of boundaries between the gang and the state and, occasionally, the melding of the two means that there is space within which the gang has a near-monopoly in violence. This space could be a large rural district in western Sicily at the turn of the century, the territory of a powerful, well-organised New York gang, or just the club-house and its immediate surroundings of a small East Los Angeles gang. Since monopoly in violence is arguably the most important characteristic of the concept of the state, we believe it could be useful to think of organisations like gangs as states.

In Sicily the mafia used to regulate most important aspects of economic activity, and created and enforced its own version of justice.⁴ Most US urban gangs examined by Jankowski (1991) have a hierarchical structure with a president, vice-president, war-lord and treasurer. Moreover, within their territories these gangs perform similar functions to those of the Sicilian rural mafia. Gangs also develop organisational cultures and ideologies that contribute to their cohesion and expansion. These are characteristics shared with ordinary states and researchers on organised crime and gangs have explicitly recognised the similarities. Thus, Bequai (1979) states that '[organised crime] is in essence a *de facto* government with its own private army and system of laws' (p. xi), while Jankowski shows 'how gangs behave as private governments' (p. 89).

Gangs, as we generically use the term here for long-lived organisations with primarily illegal economic activity, should be distinguished from short-lived groups of ordinary bandits and brigands. Although there have been historical examples of long-lived bands of brigands (they could even be called armies), which had symbiotic relationships with state authorities that allowed some permanence in membership, geographical location and economic activity, in most rural societies that was the exception.⁵ A gang should also be distinguished from an urban 'crew', a group of individuals who get together to accomplish a specific task requiring team action which disbands after the task is accomplished. A long life and the tacit recognition of economic or geographic borders on the part of state authorities and others are characteristics absent from these ephemeral teams, but present in our concept of the gang.

Whereas the near-monopoly in violence, long-life, organisation, and *de facto* boundaries provide gangs with key attributes of the state, the absence of a permanent bureaucracy differentiates them from empires and modern states. Rather, gangs are more akin to tribal, feudal and other small states with little, if any, codification of their norms and sanctions and with minimal differentiation of leadership and other governing duties; this is the sense we try to convey with the term 'primitive state' in our title.

Our knowledge of the emergence of states⁶ and, more generally, the emergence of institutions, is rather limited. The view we advance in this paper is that primitive states and gangs emerge out of anarchy primarily through coercion. We first examine a formal model of anarchy. We find that those who have the comparative advantage in the use of force and are thus less productive in useful activities tend to prevail. Moreover, in addition to the resources wasted on violence, the redistribution of income discourages productive innovation and thus may constrain economic growth. We then discuss the evolution of gangs (and primitive states), emphasising the effect of coercion in their establishment and the role of ideology in keeping them in power. Although the discussion is partly based on insights gained from the model, we freely venture beyond the model, offering ideas that could be formalised and developed more fully in the future.

2 Origins in anarchy

Our starting-point is anarchy, a condition without enforceable property rights or behavioural norms to prevent the use of coercion. We first briefly review the reasons that the territories in which gangs emerge can be considered anarchic and then examine a formal model. A main feature of the model is that agents allocate their resources between productive and appropriative, or more generally, unproductive activities, with the former generating useful output and the latter influencing its distribution. Two questions we explore are: (i) Which agent is more likely to prevail in anarchy and eventually impose its own rule? (ii) What are the main determinants of welfare and the degree of inefficiency?

2.1 *The absence of control by the state*

Gangs emerge out of situations in which there is a power vacuum that the state is unable to fill. Jankowski (1991) describes one particular environment as follows.

Low income areas in American cities ... are organized around an intense competition for, and conflict over, the scarce resources that exist in these areas. They comprise an alternative social order. In this Hobbesian world, the gang emerges as one organizational response – but not the only one – seeking to improve the competitive advantage of its members in obtaining an increase in material resources. (Jankowski, 1991, p. 22)

There are several related reasons why it is difficult for the state to enforce its rule in areas in which gangs emerge. Some mafia-type groups

developed in isolated mountainous regions or islands of the Mediterranean (Albania, Calabria, Corsica, Montenegro) where central authority was, for all practical purposes, absent. Indicative of this absence of authority is the administration of private justice in these regions through the *vendetta*, *besa*,⁷ and other norms, as well as through the equivalent of the *mafiosi*.

Isolation, by reducing both access and the transmission of information, also weakens the responsiveness of the (usually distant) centralised authority to local concerns. In turn, this reinforces any pre-existing distrust and further undermines the ability of the state to enforce its rule.⁸ Although this type of isolation, which can be characterised as political and social isolation, can be induced by geography, it can also arise independently of it. Thus, the state's ineffectiveness in enforcing its rule in poor urban areas is bred primarily by economic distance which in turn induces social and political distance from the centres of power.

Laws prohibiting the production and distribution of certain commodities (drugs, alcohol, prostitution, gambling) also imply that the state effectively abrogates the enforcement of its other laws in the affected illegal market; private parties can no longer use the ordinary channels for the adjudication of disputes and the enforcement of contracts. In a sense with prohibition the state voluntarily, although sometimes unwittingly, creates conditions that facilitate the emergence of anarchy in the affected area of economic activity.

2.2 A model of anarchy

We now turn to the model of anarchy. It is a variation of the model in Skaperdas and Syropoulos (1992), which is itself an extension of models examined by Hirschleifer (1988, 1991) and Skaperdas (1992a). There are two agents, labelled 1 and 2. Introducing a greater number of agents does not change the essential results as long as alliances do not form.⁹ The agents can be either individuals or groups who have solved the collective action problem (for example, these groups could be clans) and behave as if they were individuals. Each agent has an endowment R_i of an inalienable resource which can be converted into 'guns', G_i , or a consumption good B_i ('bread' or 'butter') in the following manner ($i = 1, 2$):

$$R_i = \beta_i B_i + \gamma_i G_i \tag{1}$$

The positive parameters β_i and γ_i are coefficients measuring the technical efficiency with which each agent's resource can be transformed into the

consumption good and guns, respectively. A lower value for either parameter indicates greater efficiency in production.

The consumption goods could be identical but, in general, we allow them to be different from each other. We can identify B_1 as 'bread' and B_2 as 'butter' with agent 1 being a peasant cultivating grains and agent 2 being an animal herder. The agents have identical preferences over bread and butter. In particular, they both have a linearly homogeneous utility function $U(B_1, B_2)$.¹⁰

Once the agents have converted their respective resources into guns and the consumption goods, the latter can be subject to capture by either party or be peacefully exchanged. Specifically, the two agents may either use their guns in conflict whose outcome is uncertain or trade their consumption goods under the threat of conflict. For a given choice of guns (G_1, G_2), the winning probability of agent 1 in case of conflict is denoted by $p(G_1, G_2)$, with the winning probability of agent 2 represented by $1 - p(G_1, G_2)$. This function $p(\cdot, \cdot)$ is symmetric so that when the agents have equal quantities of guns, they also have equal probabilities of winning. In addition, each agent's winning probability is increasing in her own quantity of guns and decreasing in that of her opponent. These properties are formally written as follows.

$$p \equiv p(G_1, G_2) \in (0, 1); \quad p(G_1, G_2) = 1 - p(G_2, G_1) \\ \forall (G_1, G_2); \\ p_1 \equiv \partial p / \partial G_1 > 0 \text{ and } p_2 \equiv \partial p / \partial G_2 < 0 \tag{2}$$

Assuming the winner receives the entire production of the two consumption goods and letting $U(0, 0) = 0$, the expected pay-offs of the two agents in the event of conflict can be written as follows:

$$\pi^1 = p(G_1, G_2) \cdot U(B_1, B_2) \tag{3a}$$

$$\pi^2 = [1 - p(G_1, G_2)] \cdot U(B_1, B_2) \tag{3b}$$

The linear homogeneity of $U(B_1, B_2)$ implies that $pU(B_1, B_2) = U(pB_1, pB_2)$ for any p . Consequently, the expected pay-offs in (3) can also be interpreted as deterministic pay-offs according to which each agent receives a share of each good equal to his winning probability. In other words, for any given choice of guns, bread and butter, the two agents are indifferent between engaging in conflict and

trading the two consumption goods in a way that results in the allocation just described.¹¹

Using (1), B_1 and B_2 can be eliminated from (3), thus making the pay-offs functions of the G_i , R_i , β_i and γ_i . Of these, G_1 is agent 1's choice variable or strategy, G_2 is agent 2's strategy, while the remaining variables are exogenous parameters. We focus our attention on Nash equilibrium strategy combinations, denoted by (G_1^*, G_2^*) .¹² At a Nash equilibrium in which both agents have chosen positive quantities of guns and of the consumption goods, each agent's derivative with respect to her own strategy, G_1 for 1 and G_2 for 2, vanishes. In particular, for agent 1 the following condition holds at a Nash equilibrium:

$$\partial \pi^1(G_1^*, G_2^*) / \partial G_1 = p_1^* U_1^* - p^* U_1^* \gamma_1 / \beta_1 = 0 \quad (4)$$

where $p^* \equiv p(G_1^*, G_2^*)$, $U^* \equiv U(B_1^*, B_2^*)$, and subscripts in functions denote partial derivatives. The first term of (4) represents the marginal benefit of a small increase in guns (and an implied small reduction in bread). It is the product of the change in the probability of winning due to a small increase in guns, p^* , times the total 'pie', U^* . The second term in (4) represents the marginal cost of a small increase in guns. An increase in guns reduces the consumption good produced by the agent and, therefore, this marginal cost must include terms reflecting the opportunity cost of reducing useful production. These terms are U_1^* and γ_1 , and $1/\beta_1$. U^* is the marginal utility of bread, γ_1 represents the (in)efficiency of producing guns (higher values reduce efficiency), and $1/\beta_1$ represents the efficiency of producing bread. Then, the higher is the marginal utility of bread, the lower is the efficiency of producing guns, and the higher is the efficiency of producing bread, the higher is the opportunity cost of producing guns. Since the agent who has the most guns has a higher probability of winning or, equivalently, receives a higher share of total utility, we could expect the agent who is contributing more to useful production and overall welfare but is less efficient in the production of guns to be less powerful.

This intuition, emanating from an inspection of (4), can be generally confirmed.¹³ For more specificity and for the presentation of some other effects, we consider the following CES form of the utility function:

$$U(B_1, B_2) = [\alpha B_1^{(\sigma-1)/\sigma} + (1-\alpha) B_2^{(\sigma-1)/\sigma}]^\sigma / (\sigma-1) \quad (5)$$

The parameter α measures the relative valuation of bread and butter. The higher α is, the more bread is valued relative to butter by every agent.

Table 3.1: Effects on equilibrium share of agent 1 of increases in α , β_1 , γ_1 and R_1

	$\sigma = 1$	$\sigma \in (1, \infty)$	$\sigma = \infty$
α	-	-	-
β_1	0	+	+
γ_1	-	-	-
R_1	+	+	0

The parameter σ represents the elasticity of substitution in consumption between bread and butter. The larger σ is, the more substitutable (or, the less complementary) the two consumption goods are and as σ approaches ∞ , $U(B_1, B_2)$ approaches $\alpha B_1 + (1-\alpha) B_2$, the case with perfect substitution.¹⁴

Table 3.1 reports the effect of changes in different variables on the equilibrium share of agent 1; the effect on the equilibrium share of agent 2 is opposite to that of agent 1.¹⁵

The effect on equilibrium p^* of an increase in α is the own marginal utility effect previously discussed in connection with (4). The second effect, due to changes in β_1 , has also been discussed: an improvement in agent 1's efficiency of producing bread (a decrease in β_1) increases her opportunity cost of investing in guns and reduces agent 1's equilibrium share. Thus, those who contribute more to total welfare, those who in a sense have a comparative advantage in useful production, receive smaller shares of the pie.

There are several implications of this effect for anarchic environments. First, the incentives for productive innovation (decreases in the β_i s) are few, if any, relative to ideal perfectly competitive economies where productive innovation is rewarded.¹⁶

Second, when emigration to another place which provides more rewards to useful productivity is possible, those who are more usefully productive will have a greater incentive to emigrate. In consequence, the average useful productivity in anarchic environments will tend to decline.¹⁷ This type of emigration may accentuate existing differences in the standards of living between regions, in contrast to tendencies for real income equalisation that are normally present in standard neoclassical worlds. Therefore, the persistence of average income inequality across regions could be explained on the basis of differences in institutions governing the distribution of income: guns under anarchy in one region, neoclassical competition elsewhere. This story is consistent with the patterns of emigration from southern Italy and American inner cities,

where the rule of the gun is much more prevalent than in the areas of immigration.¹⁸

Whereas being more usefully productive confers a relative disadvantage, being more efficient in the conversion of initial resources into guns (lower γ_i) is usually advantageous. This can be inferred from Table 3.1 where a decrease in the efficiency of producing guns (a rise in γ_i) reduces the equilibrium share of agent i . The last effect in Table 3.1 concerns changes in an agent's initial resource endowments. An increase in resources of an agent increases the equilibrium share of that agent, unless the elasticity of substitution is infinite.¹⁹ In short, for agents to increase their power in anarchy they can try to increase their efficiency of arms production or they can increase their resource endowments through, depending on the context, conquest of new territories, recruitment of new members in the gang, and (in the past) through enslavement.

We now briefly turn to the effects of some parameters of the model on the degree of inefficiency and equilibrium utility of the agents. As an indicator of inefficiency we adopt the ratio of actual (equilibrium) total utility to potential total utility,²⁰ where in the latter all initial resources are converted into consumption goods and none into guns. Improvements in an agent's useful productivity (reduction in β_i) increase that agent's utility, raise the utility of her competitor, and may increase inefficiency. An increase in an agent's resource endowment (R_i) increases her utility and reduces her opponent's utility and the greater is the asymmetry in the two endowments of the agents, the lower is the degree of inefficiency. Under conditions of near symmetry, increases in resource endowments intensify conflict and reduce efficiency.²¹

Consequently, when we identify the agents in the model as collectivities, an increase in resources coming from increased membership in the collectivity can reduce the average welfare of the members. Thus, beyond a certain point the original members of the group or their leadership will not wish to recruit new members unless their own welfare is enhanced. Naturally, this will only occur if the compensation awarded to new members is lower than average.

There is an additional variable affecting the degree of inefficiency to which we would like to draw attention. From (4) it can be seen that higher p_i^* implies higher marginal benefit and lower p^* a lower opportunity cost of producing guns. Therefore, the greater the ratio p_1/p (and, equivalently, $-p_2/(1-p)$) is,²² the greater is the incentive to produce guns and, consequently, the greater is the degree of inefficiency.

It would be reasonable to posit that more destructive weapons increase the effectiveness of conflict. Since, as argued above, improvements in the effectiveness of conflict raise inefficiency, we would expect the availability

of more destructive weapons to increase inefficiency with a greater proportion of total resources converted to guns. The reported recent dramatic increase in gang warfare in American cities is surely related to the increased availability of more destructive weapons. It would be interesting to know whether gangs have been allocating greater percentages of their resources to purchases of weapons over the time that these weapons have become more destructive and more available.

Overall, those with a comparative advantage in useful production tend to receive a smaller share of the pie whereas those with a comparative advantage in gun production or a greater quantity of resources tend to receive a larger share of the pie. Interpreting the model as a steady-state model with exactly the same structure – resources, other parameters, utility functions – repeated in every period, we could then say the agents with the comparative advantage in unproductive activities and a greater number of resources become the rulers of the anarchic territory or, in another interpretation, those agents have higher rank within the organisation emerging out of anarchy. Once we admit a time dimension, however, interactions among the interested agents could become more complicated and more interesting. In the next section we examine other aspects of the likely evolution of anarchic environments whose static counterpart we have just considered.

3 Evolution

Social norms, institutions and organisations have come to be seen by economists and other social scientists as primarily cooperative or efficient arrangements; firms are viewed as minimising transaction costs, with their most important component associated with durable, relationship-specific assets (Williamson, 1989); legal institutions economise on information in enforcing efficient trading arrangements (Milgrom *et al.*, 1990); norms of cooperation in general arise when the future is important in long-term relationships (Axelrod, 1984). We can call this a 'contractarian' view of the emergence of organisations and institutions, by the fact that the agents involved make a self-enforcing contract to cooperate.²³

While gangs usually promote the interests of their members (in part, because they eliminate much destructive conflict among them) and can thus be considered cooperative organisations from their members' viewpoint, from society's perspective it would be difficult to view gangs as promoters of efficiency since they contribute to conflict with other gangs, the police and sometimes with their own communities. Even if we were to regard the gang's supply of goods and services as productive, as we

would with the goods and services produced in a primitive state, in order to maintain its borders and enforce its rule within its borders a large proportion of the gang's material and human resources is still devoted to directly unproductive activities. Primitive states and gangs are ruled by the gun. Most organisations and institutions of concern to economists are governed by contract.²⁴ Thus the contractarian view of the emergence of organisations and institutions can give only a partial view of the emergence of gangs and primitive states.

In this section, we first present a brief contractarian story about gang formation; we then examine the role of overt coercion and violence; finally, we discuss the effects of ideology.

3.1 How the gang could form

Suppose the anarchic environment examined in the previous section is repeated day after day indefinitely into the future. There are no complicating linkages across time. That is, guns are not durable so they have to be produced anew during every period. Moreover, saving today's resources for use in the future is impossible. In short, this is an ordinary infinitely repeated game with the model of the previous section as its stage game (which is generally asymmetric). By the folk theorem (see e.g. Fudenberg and Tirole, 1991, Ch. 5) it is well known that, as long as the agents value the future sufficiently highly, all the allocations that Pareto-dominate the single-period (Nash) equilibrium²⁵ could emerge as equilibria in the infinitely repeated game.

The set of allocations Pareto-dominating the equilibrium in single-period interactions, though, is not as apparent here as it is in other models. In Figure 3.1 we depict typical utility possibilities set(s) of all the feasible utility pairs, associated with our model. The shaded area is the utility possibilities resulting from the pay-offs given in (3), that is, the pay-offs given the rules of single-period interaction. Point *A* is the point at which neither agent produces guns, with each agent receiving half of the consumption goods and half of the total utility. Point *B* represents the single-period equilibrium. According to the folk theorem then, any point to the north-east of *B* and within the boundary *CD* can be an equilibrium in the infinite repetition of our single-period model. But any point within this set would involve positive gun production by at least one of the agents and, therefore, full efficiency would not be attained.

The reason for this is that, within this utility possibilities set, the agents cannot deviate from the division of utility prescribed by (3) for any given choice between guns, bread and butter. Under indefinite interaction, however, since actions in each period can be conditioned on the past, the

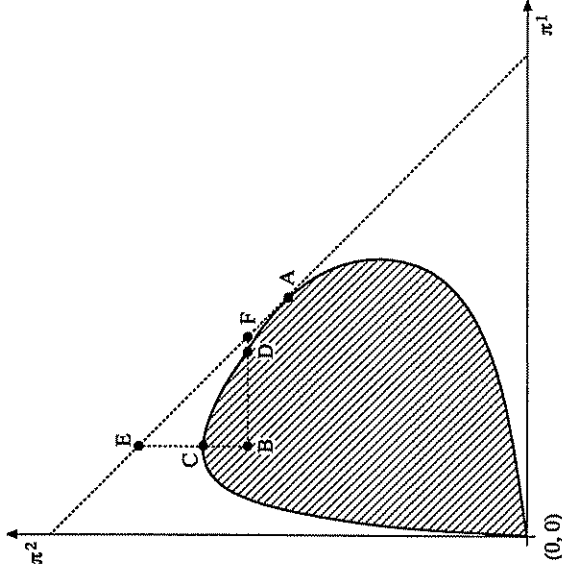


Figure 3.1 How the gang could form

agents need not be constrained to abide by (3). For example, both agents could put all of their resources into bread and butter production and still agree on an unequal division of the surplus, thus achieving any utility combination along the dotted line which represents the Pareto frontier of the fully efficient utility possibilities set. Such a division could be self-enforcing by the threat of reversion to the single-period equilibrium in *B*. By allowing for these possibilities and by appropriately redefining each agent's set of available actions, any allocation to the north-east of *B* and within the line *EF* is an equilibrium if both agents are sufficiently patient.²⁶

Note that in all the fully Pareto-efficient allocations that are supportable as equilibria (points between *E* and *F*) depicted in Figure 3.1, agent 1 receives more than half of the total utility. This is because the bad single-period equilibrium allocation *B* also favours that agent who has a comparative advantage in guns or violence. Thinking of any such repeated-game equilibrium as the establishment of a gang consisting of two agents, agent 1, who receives the larger share, can be thought of as the leader and agent 2 as the follower soldier. Since the model can easily be generalised to more than two agents, we get an idea of how gangs with many members can come together and why the gang will be stratified with differential rewards across its members.

Those who get a higher share, and presumably have higher positions in the hierarchy, will tend to be those who have a comparative advantage in violence.

Although this contractarian story indicates how a gang may form and how it might sustain itself as an organisation, it has several weaknesses. First, as for all arguments based on folk theorems, it merely asserts the possibility of cooperation, not that it will be achieved and which particular form it will take. For there are many equilibria, including the single-period equilibrium, and we have no indication which one should be or would be implemented. Second, in practice, within gangs coercion and violence against their own members is ever-present but more importantly violence is continually used against non-members, mainly members of other gangs. The model, as interpreted here, does not consider non-gang members, either community residents or other gangs. Gang members as well as the ruling circle and enforcers in primitive states are small fractions of the populations over which they rule. To enforce their rule they have to exert coercion.

3.2 The importance of coercion

All power is ultimately based on the ability to use force. If a power holder's position is supported by codified law then this ultimate possibility of enforcement may gradually be forgotten in the conscious mind of the subordinate; in the case of the *mafioso* the relationship always remains much more direct. An act of force opens a man's road to power. Without having applied physical force at least once he would find it impossible to meet the other requirements necessary for the exercise of *mafioso* functions. He could not gain recognition, instill fear, or successfully control *mafioso* rivals. (Hess, 1973, p. 46)

A main threat to the leadership of primitive states and gangs is the threat of violent overthrow. As the quote above suggests, the mafioso's rise to power is inextricably linked to his willingness and ability to use force successfully. The rank and file also routinely have to face violence, either as instigators in attack or as defenders of their territory. Reflecting the importance to the gang of the fighting skills of its members, the most important initiation rite for new recruits in urban gangs is a fight against another member (Jankowski, 1991, pp. 49–50). Physical punishment, sometimes as severe as death, as an instrument of control of members and subjects alike is much more common in gangs and primitive states than it is in most modern states.

By contrast, modern states and other bureaucratic organisations rely overwhelmingly on law and contract for the discipline and motivation of their members and subjects. Although power is ultimately based on

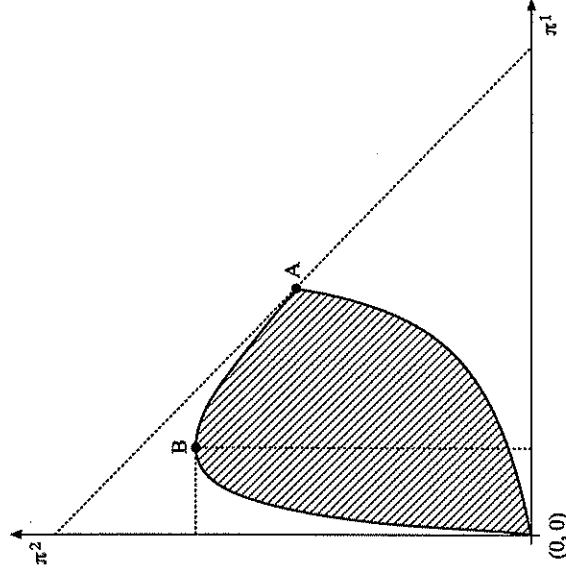


Figure 3.2 Subjugal equilibrium

force, in modern organisations 'this ultimate possibility of enforcement is forgotten in the conscious mind of the subordinate.' The contractarian view of the emergence of the state reflects this forgetfulness of the modern conscious mind.

We can gain some insight into the emergence of the state through coercion by first examining a seemingly limiting case of our model of anarchy. Figure 3.2 depicts a typical utility possibilities set for this case with the equilibrium utility pair located at point *B*. What is distinctive about this case is that, given the 'rule of the gun' prevailing in the interaction between the agents, agent 1 could not possibly receive a higher utility than that received in the depicted equilibrium; he receives his best possible pay-off. The production of guns in this equilibrium is also distinctive: agent 1 produces guns but agent 2 does not, or the more powerful party has the *monopoly of coercion*.²⁷ We can identify agent 1 as the despot, the ruler or the ruling class of a primitive state and agent 2 as its subjects. Alternatively, agent 1 could be the gang and agent 2 the gang's community.

Such a subjugal arrangement could arise as an equilibrium in circumstances with strong asymmetries in the following variables: (i) the relative valuations of bread and butter, with the agent producing the less valuable consumption good becoming the ruler; (ii) initial resource

endowments, with greater resources providing the advantage of power; (iii) the rates of transformation between guns and butter and guns and bread, with the agent possessing the comparative advantage in gun production also having the advantage of power.

Some of the asymmetries required for the realisation of this subjugational equilibrium could be induced in a dynamic context by plausible dependences across time. One such dependence could be the linkage of every year's resource endowment for each agent to the utility received in the previous year, with greater utility leading to greater resources.²⁸ Another type of dependence would be to allow the agents to invest in improving the productive efficiency of guns, bread or butter. Although ordinary repeated games, including the one sketched in the previous sub-section, usually do not allow for time-dependence for analytical convenience, it would be difficult to dispute its empirical relevance. We have not derived analytical results about the effects of time dependence in the presence of asymmetries, but we conjecture that, if anything, any initial asymmetries that might exist would be accentuated over time. Given that the method of distribution employed favours the production of guns, the incentives to invest in improving the efficiency of gun production over those of bread or butter, if that were possible, would certainly be present. Since those who receive a higher share of the pie could invest more in improving their relative efficiency of gun production, there appears to be a tendency for polarisation of power and the development of ever-increasing asymmetries. A similar argument could be made about the effect of dependence of resources on previous utility. The asymmetries could eventually be arrested by the fact that not doing so would not be in the interest of the more powerful side, as it is not in the interest of agent 1 in Figure 3.2 to reduce the pay-off of agent 2 because that would imply a reduction in her own pay-off as well.

Perhaps the point we are trying to establish can be stated more simply. When force determines how many resources you receive and the amount of force you exert depends on your resources, there are compounding rewards to having an initial superiority in resources. The resultant organisation, if any, is more likely to be subjugational, authoritarian and hierarchical rather than an efficient contractual arrangement. This is not to say that organisations, once established through coercion, cannot improve efficiency later on. The rulers would always want to reduce the waste of resources associated with the use of force and protracted conflict if it could be done with minimal threat to their rule. One way to do that would be to convince their subjects of their rule's legitimacy.

3.3 *The role of ideology*

In the long run, probably the most effective way to make other people work to further your interest is to have them believe that your interest is their interest. Another way is to have them pretend they believe your interest is their interest because of peer pressure. Material incentives, including the potential use of force, work best only in the short run when beliefs are given. That's why most firms and other organisations constantly try to inculcate organisational loyalty and pride in work for its own sake.²⁹ Similarly, the long-run success of gangs and primitive states depends heavily on the articulation and internalisation by members, subjects and community of a workable ideology, a logically connected system of beliefs about the world.

There are of course varying degrees to which the affected parties may subscribe to the 'official' ideology. In turn, there are layers to the ideology itself, each with a different degree of credibility and strength. Part of the core ideology of all the gangs studied by Jankowski (1991, pp. 84-5), including Irish gangs, is a picture of American society 'as structured in such a way that certain groups are discriminated against and prevented by other groups from enjoying all the benefits of society. Nearly all the gangs believed that their ethnic group had been denied access to conventional opportunities that would allow them to live more comfortable lives.' Gang members have a Social Darwinist perspective according to which illegality and predatory behaviour are the primary determinants of success not only in their own community but in the larger society as well. With this world view, the everyday activities of the gang that are considered morally reprehensible by the larger society are rationalised as legitimate by gang members.

Often participants in organised crime can see themselves as providers of public service. This was more true in rural societies, where the mafioso performed straightforward intermediary and judicial duties enjoying legitimacy from the local society, rather than in urban communities where wider legitimacy may be lacking. But even when extreme brutality was involved, the self-image of the perpetrator could be that of a 'sacrifice which he makes for the benefit of the public weal' (Hess, 1973, p. 68). The public display of beliefs does not necessarily imply adherence to them. Part of the official organisational ideology of American gangs is that all gang members are 'brothers'; they are all 'family'. The gangs actively promote this view, with all members frequently alluding to versions of it. Yet, Jankowski (1991, pp. 86-7) found this brotherhood ideology to be largely symbolic and ultimately contradicting the intense individualism of gang members and the Social Darwinist perspective to

which they subscribe. Rather, the gang, by getting its members to pay lip-service to the brotherhood ideology, hopes to alleviate the negative effects of the intense individualism of its members on organisational unity.

It appears that gangs cannot survive for long without the tacit acceptance of their communities. Acceptance can mean, though, approval in public and condemnation in private. The cost of publicly condemning those who have the monopoly in violence is usually high and, therefore, it would be difficult to observe public condemnations except in cases of uncertainty when nobody is clearly in charge. Universal expressions of support for the gang or the state can suddenly evaporate when an event makes the perceived expression of true preferences less costly.³⁰ Consequently, organisations established by the use of force cannot ascertain the support of their subjects or their communities with much accuracy. They can only hope that when a moment of crisis comes they will have enough loyal supporters to stay in power or that the perception of their strength will hold up sufficiently.

Organisational ideologies, almost by definition, promote the interests of the organisation but they can also encourage social fragmentation by promoting intrinsically conflictual viewpoints. The Social Darwinist perspective is not confined to American gangs. Our guess is that it would be the majority belief in most of southern Europe when pitted against a belief like 'successful are those who are most usefully productive.' Beliefs and ideologies evidently interact with institutions and together shape the economic decisions made by individuals. But, as economists, we know little about how this occurs.

4 Concluding comments

We have used the term gangs to designate long-lived organisations engaged mostly in criminal activity. We have argued that gangs can be thought of as primitive states with a near-monopoly in violence within their territories. They arise out of anarchy where those who have the comparative advantage in the use of force tend to prevail. This implies that gangs as well as primitive states, in contrast to other organisations examined by economists, emerge primarily through coercion and not through contract. The ideologies rationalising gangs to their leaders, members and communities are correspondingly different, emphasising the importance of predatory behaviour as a determinant of success.

In addition to any challenge they may encounter from state authorities, gangs have to be constantly vigilant against attacks from rivals trying to snatch away territory and its accompanying rents. Although our model

of anarchy could be used to examine inter-gang warfare, it would be desirable to add the state as a third party with objectives different from those of gangs and examine in greater detail the sources of gang growth and break-down. What is the effect of increases in the efficiency of gun acquisition, a phenomenon that appears to have occurred over the past decade? Is an intensification of warfare a long-run effect of such a change, or is it a transitory phase eventually contributing to gang consolidation, with in the end fewer and more powerful gangs? What are the effects of instruments at the disposal of the state, including police protection, changes in legal codes (like the legalisation of previously prohibited activities that contribute to the gang's rents), publicity and education? These are only few of many questions that can be asked in modifications of our framework. Here we have just given an account of the origins of gangs that, we think, helps us understand their prevalence, persistence and differences from other organisations.

NOTES

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1 *Webster's* (1979).

2 Partly for brevity, we will be using the term 'gang' to signify any long-term illegal organisation. The ordinary usage of the term does not necessarily imply permanence or organisation. Here, however, a gang is meant to be a long-lived organisation, not just a group of individuals who get together for a specific purpose after the completion of which it disbands. See also our discussion on 'crews' and bands of brigands.

3 Jankowski (1991), which analyses the results of an invaluable ten-year field research project on American urban gangs, emphasises how such arrangements take the form of procedural rituals between police, social workers and the justice system on the one hand, and gang members on the other (see pp. 252-83). According to Jankowski, military-type police mobilisations against gangs were more common in Los Angeles than in New York and Boston, the two other cities covered in his study, but even in Los Angeles the live-and-let-live relationship between the police and gangs was the norm. The Sicilian mafia had an even closer relationship with state authorities since politicians were very closely associated with the mafia 'capos' (Hess, 1973). Such cosy relationships were interrupted during the Fascist period, but continued after World War II. Their precise nature and extent remain unknown but are becoming increasingly clear.

4 This includes the adjudication of criminal and civil disputes, but also the enforcement of cultural norms. Thus, on the last point, a young man could be forced by the mafiosi to marry the girl he has 'seduced' (Hess, 1973, p. 145).

5 Hess (1973, pp. 5-12) discusses the differences between brigands and mafiosi. Koliopoulos (1987) examines banditry in nineteenth-century Greece where in

some mountain areas the bands resembled the ideal type of gangs. Probably the most powerful organisation based almost solely on appropriative activities that was by any definition a state was that of the pirates based on the coast of western North Africa in the sixteenth century with Algiers as its effective capital. The city of Livorno in Italy was a smaller state of Christian pirates during the same period. Braudel (1973, throughout Vol. II) refers to the important economic, military and political role of pirates in the Mediterranean at that time.

- 6 We consider that the contractarian view of the emergence of the state out of an agreement among equal partners is not very illuminating in the understanding of the institution itself. Two complementary views to the one we develop here, based on relative coercive power and other factors, are Carneiro (1967) and Oppenheimer (1972).
- 7 This is an Albanian term which can be translated as 'word of honour.' A verbal promise in Albanian society, even today, represents a near perfect commitment. Those who do not fulfil their promises do not have *besa* and they can have their homes destroyed to their foundations. According to Doder (1992) this is not an infrequent sight in Albanian villages. While *besa* can solve the numerous commitment problems that have been identified by economists and other social scientists, it introduces other problems. Doder reports the difficulties one has with extracting the simplest of promises, like replacing a light bulb by a hotel employee, out of fear that it will not be fulfilled. Parenthetically, Albanian society appears very much like Schelling's (1960, p. 39) 'cross-my-heart' society, where crossing one's heart represents perfect commitment.
- 8 For an examination of the rather extreme social fragmentation and lack of trust in a post-war southern Italian village see Banfield (1958). Gambetta (1988) discusses this phenomenon in relation to the mafia.
- 9 This is an important but difficult issue in any examination of anarchic systems. Skaperdas (1992b) provides a preliminary analysis of alliance formation in the case with three agents.
- 10 The model is also interpretable as a production model with the two goods interpreted as production inputs and the function $U(\cdot, \cdot)$ interpreted as a production function; this is the interpretation in the papers on which our model is based.
- 11 Risk aversion or destructive conflict would make exchange under the threat of conflict strictly Pareto superior, but would introduce multiple exchange possibilities. Risk-seeking behaviour would make conflict strictly preferable to exchange. For a similar model with risk aversion see Skaperdas (1991).
- 12 Denoting by $\pi^i(G_1, G_2)$ the pay-off function of agent $i = 1, 2$, a Nash equilibrium is a strategy pair (G_1^*, G_2^*) such that $\pi^1(G_1^*, G_2^*) \geq \pi^1(G_1, G_2^*)$ for all G_1 and $\pi^2(G_1^*, G_2^*) \geq \pi^2(G_1^*, G_2)$ for all G_2 . Existence of a Nash equilibrium is guaranteed if $p_{11}p < p_1^2$ (and by the symmetry property in (2), $-p_{22}(1-p) < p_2^2$) where the subscripts 1 and 2 denote derivatives with respect to the first and second arguments of $p(\cdot, \cdot)$. This property is satisfied by all contest success functions that are concave in each agent's strategy, but they are also satisfied by others which are not 'too convex' in each agent's strategy. This property is also less stringent than those required for the existence of equilibrium in the class of rent-seeking games inaugurated by Tullock (1980) (see Perez-Castrillo and Verdier, 1992).

Uniqueness of equilibrium is guaranteed when p has the following additive representation:

$$p(G_1, G_2) = f(G_1)/[f(G_1) + f(G_2)]$$

where $f(\cdot)$ is a non-negative increasing function. This property is also satisfied by the functional forms used in the above-mentioned rent-seeking games. For precise statements of theorems and proofs, the reader is referred to Skaperdas and Syropoulos (1992).

- 13 The complete analysis for this and other results reported below is in Skaperdas and Syropoulos (1992).
- 14 Hirshleifer (1988, 1991) examines the latter case with $\alpha = 1/2$.
- 15 These effects could be reversed in some cases when $\sigma < 1$ (e.g. for β_1); there is an intuition for such reversals but an explanation here would take us too far afield. Again, see Skaperdas and Syropoulos (1992) for a complete analysis.
- 16 Baumol (1990) and Murphy *et al.* (1991) have drawn attention to the importance of the institutional framework in encouraging economically beneficial, as opposed to unproductive, entrepreneurship. Here we indicate how the distributional method prevailing in anarchy (and, we would say, in most pre-capitalist economies), in addition to directly reducing welfare by the amount of unproductive activities that are undertaken, contributes to dynamic inefficiency through the disincentives it creates for some types of productive innovation.
- 17 Implicitly in this statement is an n -person model instead of the 2-person model we have examined. As mentioned earlier, the basic results continue to hold in basic n -person extensions. Although the emigration of the most usefully productive agents reduces the overall average productivity, the reduction of average welfare does not necessarily follow. There is a counter-acting influence which we touch upon later. Emigration may reduce the intensity of competition by reducing the total percentage of resources converted into guns. Thus, although those who remain would be less usefully productive, they might devote a smaller percentage of their resources to warfare and, therefore, their welfare could conceivably increase.
- 18 Southern Italians have emigrated, among other places, to northern Italy, North America and Australia. Many middle-class residents of American inner cities have moved to the suburbs over the last thirty years. We do not wish to imply that these areas of immigration are perfect examples of neoclassical economies, but we certainly believe they approximate it a lot more than the areas of emigration do.
- 19 This can be understood by going back to (4) and noting that the marginal utility of an agent's own consumption good (U_i^* for agent i) is decreasing in the resource of that agent when the elasticity of substitution is less than infinite; otherwise, this marginal utility is constant. Hence, following the earlier discussion of (4), the opportunity cost of guns is reduced whereas the marginal benefit (p^*U^*) increases, with the net effect unambiguously favouring an increase in gun production. It can be shown that the opponent also has an incentive to increase his gun production, but not so much so that his equilibrium share is increased.

- 20 Since the agents in the model have identical linearly homogeneous utility functions, we can make interpersonal comparisons of utility and speak of total welfare.
- 21 Comparable effects are found in Garfinkel (1990) who employed a model different from ours. The result no longer holds, however, when the elasticity of substitution is infinite (see Hirshleifer, 1991).
- 22 This ratio is a measure of how easy it is to increase one's probability of winning in conflict as a result of a small change in the quantity of guns and for that reason we call it the *effectiveness* of conflict.
- 23 Such contracts are usually implicit. They are self-enforcing typically because of repeated interactions between agents.
- 24 Under some other politico-economic approaches to distribution like that of Aumann and Kurz (1977), the use of coercion is limited to that of the majority being able to tax the minority. Otherwise, distribution is determined in a typical neoclassical fashion where, other things being equal, the more productive receive higher incomes.
- 25 We assume uniqueness of equilibrium in single-period interactions. Footnote 12 provides a sufficient condition.
- 26 One way of redefining the actions taken within each period is to suppose that, in addition to choosing between guns and the consumption good, each agent makes a proposal about the division of the surplus. If the proposals of the agents agree, then that proposal is implemented; if not, they revert to the division prescribed by (3).
- 27 An examination of this equilibrium in a more specific model is in Skaperdas (1992a). Grossman (1991) finds an intuitively similar equilibrium in a model with a ruler who hires soldiers to suppress potential revolts by peasants. In this equilibrium the ruler hires soldiers but the peasants do not spend any time on insurrections.
- 28 In Skaperdas and Syropoulos (1993) we examine a two-period model with such a time-dependence. We establish there that increasing the importance of the future may in fact harm instead of facilitating the cooperative outcomes based on folk-theorem arguments.
- 29 This is of course not a mainstream view in economics. A penetrating discussion of this issue and its relation to basic human psychological traits is in Simon (1991, pp. 34–8). For the importance of ideology in the development of institutions in general, we have learned from North's (1984) short discussion.
- 30 This discussion is based on Kuran's simple yet powerful model (see e.g. Kuran, 1987, 1989). The basic ingredients are the distinction between private and publicly expressed preferences and the costliness of expressing private preferences when they differ from the dominant position.

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Discussion

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The very stimulating paper by Skaperdas and Syropoulos (henceforth S&S) accomplishes many things. It extends the formal analysis of the economics of crime yet another step and shows once again how powerful and suggestive the economist's tools have become, even outside the discipline's traditional realm. The article shows, in particular, that it is useful in an analysis of one side of their operations to think of criminal organisations as quasi-governments, serving in lieu of the state in arenas into which governments fear to tread, and in other areas forcing government by the state to let itself be replaced by the gang in some of the tasks of governance. Finally, the paper stimulates the reader to venture into new directions, as these few comments will illustrate.

The basic point of the article is obviously valid, and obvious only in retrospect. The distinguishing feature of crime that is organised is, of course, the fact that it is controlled and directed by a group whose role is far more than just administrative. In particular, it determines the rules that the gang members will be expected to follow, and it adopts procedures designed to enforce those rules. Thus, the gang leadership takes on *legislative* and *judicial* tasks, in addition to its administrative activities and, by virtue of these undertakings, it becomes a government. One can easily see what other governmental roles it plays, entailing such activities as warfare, diplomacy, the provision of employment and

welfare benefits to its members, etc. In places where 'legitimate government' abdicates its role, or is simply prevented by circumstances from performing it, organised gangs frequently spring up and fill the gap. From the mountains of Sicily to the inner cities of the United States something like that has occurred, and the S&S paper analyses this phenomenon and its implications.

The authors acknowledge that their model, quite properly, builds on the work of others. This model, which describes a mini-economy that produces two outputs, guns and butter (or bread), is both suggestive and illuminating. It focuses upon distribution as well as production. Gun output is taken to provide no utility in itself, but it offers the possessors of the preponderant share of firearms the probability that they will be able to control the distribution process and command the bulk of butter output for themselves.

In studying the model one is likely to feel that it does not devote enough attention to the incentives for butter production. Why do not all the inhabitants of the model's mini-state devote themselves exclusively to gun production, fearing that if they fail to join the arms race in earnest whatever butter they produce will be taken away from them by the victorious gang? That is to say, it remains for the authors to study what the gangs should do in their own self-interest, to provide the incentive to others to engage in effective butter producing activity. What part should be taken by naked coercion, and what part by incentive payments – by a promise to share the economy's butter output with the butter producers, with the pay-off to them possibly increasing with the total amount they succeed in producing? Perhaps even more important, is there a defect inherent in gangster government leading the economy to produce output bundles that fall far short of the production frontier? It seems to me that these are issues that S&S and others can usefully explore, and that these efforts promise to enrich the authors' results.

The analysis stimulates other additional thoughts, some of them considerably further afield. A little study of history, much of it unfortunately contemporary, suggests that the authors have been excessively modest in their hypotheses about the similarities of gangs to governments. I suggest that there is also much to be learned from a reversal of the comparison, this time not thinking of gangs as quasi-governments, but rather by interpreting most governments in human history as gangster associations.

The governments that began to emerge after the Tudors in England and after William the Silent in the Netherlands are, after all, freaks of history. The normal dynasty was established by effective exercise of violence, and the rulers felt free (by divine right) to engage in wholesale murder,

torture and mutilation. The preponderance of government by homicidal maniacs is hardly fortuitous, for it is just such individuals who could reasonably be deemed 'most likely to succeed', to succeed, that is, in wresting uneasy control in a world of anarchy provided with no restrictions upon the use of force. The term 'liberty', it is true, does occur frequently before the sixteenth century but, like Magna Carta, it refers merely to the freedom of the powerful nobles to deal arbitrarily and violently with their own inferiors, without being subjected to onerous constraints by the monarch. Gangster governments ruled the earth in medieval China, in the Ottoman Empire, in pre-Columbian Mexico and Peru as much as they did in Europe, and a reign of terror was the normal state of affairs, with the head of government often no more secure against violent demise than many of his subjects. The twentieth century has, of course, had its share of government by pathological murderers organised into hierarchical organisations.

In short, I am offering two suggestions for further consideration, both apparently far fetched, but actually resting on rather moderate interpretations of the facts. The first is that governments concerned with the welfare of the governed and constrained by rule of law from arbitrary and violent measures are the rare exceptions in human history, perhaps most realistically interpreted as a curious aberration of a very recent period in rather limited portions of our planet. Second, I suggest that study of the economics of crime may offer a pay-off going well beyond its immediate subject. For this line of investigation also promises to offer profound insights into the origins and workings of governments, not as most of us know them, but like those that have ruled the bulk of humanity in the past, and continue their sway in many countries today.