AN ECONOMIC APPROACH TO ANALYZING CIVIL WARS*

By
Stergios Skaperdas
Department of Economics
University of California, Irvine
Irvine, CA 92697
USA
email: sskaperd@uci.edu

Revised: April 6, 2007

ABSTRACT: Civil wars and conflict can be understood from an economic point of view only if there is incomplete contracting. I examine such settings and first discuss sources of incomplete contracting, from geography and ethnic and social distance to external interventions due to geopolitics or the presence of rents. Yet, since war is destructive, the contending parties might normally be expected to settle in the shadow of war. One reason that sometimes they do not, contrary to conventional wisdom, is because the shadow of the future is too long. Subsequently, using a formal model for guidance I examine some consequences of civil wars and emphasize the role hierarchical organization and rents play in determining the severity of conflict.

Keywords: Warlords, incomplete contracting, conflict, appropriation, anarchy, shadow of the future.

JEL: D74, F5, H56, O40

*I would like to thank anonymous referees and Michelle Garfinkel for helpful comments that have improved the paper. The first version of the paper was written as a background paper for the World Bank's project on civil wars. For subsequent support, I would like to thank the John T. and Catherine D. MacArthur Foundation and, at UC Irvine, the Center for Global Peace and Conflict Studies and the Center for the Study of Democracy.

1 Introduction

Individuals and groups can make a living not just by producing and trading but also by taking away what others have produced. This tradeoff between production and appropriation has been the main ingredient in recent research in economics that has examined, among other issues, the sources of conflict, revolution, and organized crime.[1] Civil wars can be similarly analyzed from an economic perspective, whereby the individuals engaged in them pursue their perceived self-interest by making choices between useful production and appropriation.

Self-interested behavior, however, is not sufficient by itself to induce arming and war. Since war takes resources away from production and it typically brings about destruction, the parties could in principle write a contract that would prevent such losses. The impossibility of finding and writing such contracts, often attributed to the catch-all term of "transaction costs," has spawned a considerable literature on incomplete contracting, mostly associated with the theory of the firm (e.g., Hart, 1995). Consequently, the second ingredient of the approach adopted here is incomplete contracting; that is, contracting on arming and war is difficult or impossible. Implicit in the idea of incomplete contracting is that individuals are not all-knowing, so that they cannot anticipate every possible contingency and write it down in a contract.

I first describe the conditions that can lead to the type of incomplete contracting associated with civil wars. They include geographic factors, ethnic distance from the centers of power, economic and social change, the dissolution and formation of new states, and external interventions. Many of these factors, I argue, often create a power vacuum that can be filled by competing

[1] For models of conflict in general and some applications see, for example, Hirshleifer (1988, 1995) or Neary (1997). For revolutions see Grossman (1991) whereas the papers in Fiorentini and Peltzman (1995) and Skaperdas (2001) examine organized crime. Very recently, there have been a number of papers by economists specifically on civil wars. Gershenson and Grossman (2000) adapted the basic model of contests with asymmetries to the type of civil war that can occur, whereas Azam (2002) considered the role of looting in joining rebel groups. Collier and Hoeffler (2001) put particular emphasis on the role of natural resource endowments as a source of rents for adversaries. For a survey of both theoretical and empirical research see Sambanis (2001); see also Engel (2003) for an introduction and overview to related research. Collier et. al. (2003) summarizes the extensive research effort on the subject by the World Bank. Garfinkel and Skaperdas (2006) provide an overview of the theoretical research on the economics of conflict that has appeared over the past fifteen years or so.

groups engaging in war.

Whereas arming can be considered non-contractible, the possibility of short-term or long-term compromise under the threat of warfare would still be possible and in some cases such contracting prevents outright warfare. I therefore subsequently discuss the conditions that lead to outright warfare. One set of conditions, based on incomplete information, has been well analyzed by economists. Another set of conditions, based on the rewards to fighting that are compounded into the future even though there are short-term incentives to compromise, has been barely examined within economics.

In the subsequent section I analyze a model of the emergence of competing groups out of a power vacuum – of anarchy – and use the model to discuss some of the consequences of civil wars. In the final section I offer a few preliminary and guarded remarks about policy towards the prevention and cessation of civil wars.

Since relatively little has been written in economics about wars and much less so for civil wars, many important aspects of civil wars will not be discussed here. For example, I will refer to issues of ethnicity or class only in passing, certainly not because I consider them unimportant but because these issues are not developed at all within economics and the problem of the formation of groups is a very difficult one.[2] These considerations should be at the front of the research agenda but it takes time to develop the sophisticated modeling and empirical scrutiny that they deserve. And as emphasized in the survey by Acemoglu, Johnson, and Robinson (2006), conflict, of which civil wars are a quantitatively important component, is a fundamental force in the evolution of institutions themselves and economic growth.

2 Sources of incomplete contracting and civil wars

Wars are difficult to comprehend from a traditional Coasian economic perspective: Why can't the adversaries just agree not to fight or even arm and save both the cost of arming and the destruction that can be brought about by

[2]Robinson (2001), to my knowledge, is the first paper that models and compares the effects of conflict along class lines versus ethnic conflict. Esteban and Ray (2007) show how economic inequality can perversely accentuate ethnic, instead of class, conflict. Garfinkel (2004) examines aspects of the stability of group formation by taking into account role of internal, as well as, extrenal fighting for each group.

outright warfare? As with the incomplete-contracts approach to the theory of the firm (see, e.g., Grossman and Hart, 1986) in which relationship-specific investments are considered non-contractible, so it can be argued that arming and wars can take place because there is incomplete contracting: Each party is unable to commit not to arm and not to engage in conflict if they were to find it in their interest to do so. They would all prefer to be able to commit not to arm but it is impossible for them to do so. Of course, this is an abstract way of formulating an answer which, to be useful for understanding, needs to be more concrete and adapted to the case of civil wars.[3]

Such wars could be expected to emerge more frequently than wars between sovereign states since the contractual possibilities between states can be considered to be fewer than those within modern states. For modern states typically have in place institutions of conflict management and enforcement like constitutions, normal political processes, bureaucratic procedures, laws, and courts. Such institutions tend to channel contests for power through politics and legal competition instead of through the barrel of a gun. Then, a combination of insufficient institutional development and changing circumstances and opportunities that create demands that cannot be accommodated peacefully create the mix that leads to warfare. But the first step towards civil war is the creation of a power vacuum, of anarchy, whereby for a combination of reasons the state effectively cedes control, and physical and contractual insecurity become rampant. Some of the factors that can contribute to increased contractual incompleteness and then to civil wars will be discussed next. Of course, several of these factors can be correlated or act synergistically with one another and typically more than one of them is to be found in circumstances that war has broken out.

Geography

Perhaps this is the most basic factor that could be considered. States, contrary to its common deterministic Weberian definition, can never have the absolute monopoly in the use of force within their territories. Geographic distance, for which we allow the difficulty of terrain and transportation in-

[3]Recent definitions of civil war are variations of that in the World Bank's Research Report: "[C]ivil war occurs when an identifiable rebel organization challenghes the government militarily and the resulting violence results in more than 1,000 combat deaths, with at least 5 percent on each side" (Collier et. al., 2003, p.11).

The analysis in this paper applies to a wider set of conflicts than implied by this definition, including possibly intercommunal violence, that does not involve the government.

frastructure, reduces the extent of control that states can exert. A power vacuum often then exists in distant areas that become the breeding ground initially for brigandage and later for rebellions and independence movements. The Congolese jungle in which large movements of troops and materiel can effectively go only slowly up the Congo river is one recent example of geographic distance contributing to political fragmentation and civil war. The Amazon jungle as well has been a vast area over which the governments of Brazil, Colombia, and Peru have had tenuous control over their respective areas. The vacuum is often filled by guerrillas and the private armies of landlords and drug traffickers who fight amongst themselves and against the police and the militaries of their governments. When the fighting takes a more overt political character, as it did at the time of Shining Path's insurrection in Peru, and a greater number of military forces is involved, as it has been the case intermittently in Colombia, the conflict can be characterized as a civil war. But the difference from the less organized, more atomized, anarchy that exists otherwise in such areas is often not large.

Mountainous terrain also contributes to distance from state control. The Caucasus is a well-known example. The Russian czars were finally able to control Chechnya in the 19th century only after many decades of attempts and only after they systematically cut down the dense beech forest in which the Chechen guerrillas were able to hide (Lieven, 1999, p. 310). And, of course, more than a century afterwards and still without the forest, the current Russian government only has a precarious control over Chechnya. Similarly, the mountains both gave refuge to the resistance movements and facilitated the beginnings of civil wars in Greece and Yugoslavia during World War II.

Ethnic distance

Even autocratic and dictatorial regimes need the acquiescence and loyalty of significant proportions of their subjects (see, e.g., Wintrobe, 1998). Otherwise, the amount of resources that have to be devoted to policing becomes too burdensome and is likely to doom the long-term viability of such regimes. Ethnicity, even if we were to consider it a constructed attribute, can be rather easily used as a focal point for rallying support and creating oppositional organizations, regardless of how much members of a particular ethnicity initially care about it. Through a threshold or "tipping" process described by Granovetter (1978), Kuran (1989), and others, small initial events can quickly lead to segregation and hostility between groups that were for-

merly living peacefully with one another. Precipitating events can include a small piece of legislation that can be seen as targeting an ethnic group or a particularly virulent speech by a politician who is in power. Although such small events could be thought of as epiphenomena of essentially doomed relationships, the separation of ethnicities in different states and even the delineation of ethnic identities in the first place are not cast in stone. Much historical contingency, it can be argued, plays a role on which ethnicities manage to get their own ethnic state, which ones peacefully become absorbed and integrated into another state, or which ones receive formal status within a multi-ethnic or explicitly non-ethnic state.

For ethnic groups for which absorption or integration within the state has been minimal, distrust of state institutions by its members marks the beginning of the process that can easily lead to armed resistance. The distrust of the police implies that physical security depends on the social cohesion of the group and possibly, in urban settings, on more organized protection groups that could easily turn into mafias and later transform themselves into guerrilla groups. When members of the ethnic group might also stop using the courts, contractual insecurity becomes an additional problem which, in cases the state was previously functioning reasonably well, can reduce economic activity and lead to the emergence of parallel, more informal, less predictable, and less efficient institutions.[4] The deteriorating economic conditions further alienate members of the ethnic group in question and reinforce the process of the group's political and organizational independence. With such a process, then, we effectively have the beginning of a state within a state that sooner or later leads to an open clash with the central government.

Economic and social change

For the first half of the nineteenth century, slavery and other contentious issues between the North and the South in the United States were kept in the background through the agreement that no free state would be admitted to the union without a slave state also being admitted. The arrangement gave veto power to Southern States in the Senate and ensured that no legislation that was vital to the South's interests would pass (see Weingast, 1998). The North in the meantime had a much faster population growth and an industrializing economy, whereas the expansion of slavery to the West

[4] Skaperdas (2001) describes in some detail how the difficulties of using the legal system both reduces economic activity and leads to subsitutes that are can best be described as organized crime groups.

was economically unprofitable. These were changes that made the political agreement between the South and the North nonviable, leading not to a revised agreement but to Civil War.

Economic change brings social change, and the changing economy and society precipitate demands for political change as well. New markets need new institutions to govern them and perhaps more importantly a changing social landscape often involves new groups and social classes demanding representation and political accommodation. As has been argued by Acemoglu and Robinson (2000), the extension of the democratic franchise in Britain and other Western European countries can be considered to be a response to the potential for social conflict, which in turn was a result of the rapidly changing economic and social landscape brought about by the second, capital-goods based, phase of the industrial revolution.

Outside Britain this process, however, was not achieved easily at all. In addition to the two world wars of the twentieth century, there was much internal turmoil in all of Europe. Russia, of course, experienced revolution and civil war. And, during the interwar years in all of continental Europe democratic institutions were under siege. (See the graphic account of the time in Mazower, 1998, Chapter 2.) In Spain, which along with Russia had more ossified state institutions than Northwest Europe, no compromise was found and civil war ensued after its brief experiment with democracy (for a comparison of civil wars in Southern Europe, see Minehan, 2006). In others, rapidly changing governments, parliamentary fights, street protests, and economic depression led to dictatorial governance in most countries on the eve of World War II.

Dissolutions and New States

From the Caucasus to Central Asia, many states that emerged from the Soviet Union have experienced internal problems that have led to rebellion and civil wars. And whether new countries emerged from wars of liberation, like the former Spanish colonies of Colombia, Equador, and Venezuela did under Simon Bolivar's leadership, or more peacefully like the many decolonized countries since World War II, the risk of civil war and further dissolution appears to be high. At the time of these transitions, contractual incompleteness is high because building political institutions, the laws, the bureaucracy, the courts takes time. In the meantime people can face basic physical insecurity, more complex problems of uncertainty and insecurity of contract enforcement, and uncertainty about the political system itself. For

example, more than ten years after the breakup of the Soviet Union, Russia had barely settled on a property law on land and the political systems of many of the other post-Soviet states as well as many former colonies are far from being settled. Just as the threat of the barrel of the gun was present and actually materialized during the first century of the history of the United States, so that threat is present in many such new states today.

External intervention: geopolitics and rents

Hitler's invasion and occupation of Yugoslavia and Greece destroyed the previously existing political systems and led to the temporary dismemberment of these states. [5] The successor occupation governments had difficulties exerting control outside the cities, despite the rather large commitment of troops by the Axis powers. In the power vacuum that was created, partisan groups quickly emerged with ties and support from different allied powers. The rivalries between the partisan groups further developed, during the occupation and afterwards, into full-fledged civil wars. Such civil wars, brought about by external intervention that can be considered geopolitically motivated, are common. The civil war in Afghanistan is one recent example. Initially fueled by the Cold War, it now concerns all – and to different degrees has brought involvement from all – neighboring countries as well as major powers beyond the neighborhood.

For the civil war in Zaire/Congo it is perhaps less geopolitics and more the rents that can be obtained from the country's natural resource endowment that have attracted the intervention of economic interests and governments from neighboring countries. Rents can include the profits that can be obtained from drug production and distribution, with Colombia perhaps being the prime example of such source of rents that has contributed to civil war. Though foreign investments in natural resource extraction and various forms of foreign aid, including possibly humanitarian, are typically meant to contribute to economic development, sometimes when there are serious problems of stability they can have the unintended consequence of intensifying conflict for the capture of the resultant rents.

Overall, the effect of external forces in civil wars can hardly be underes-

[5] For a comparison of the conditions that led to civil war in Greece, Yugoslavia as well as Spain, see Minehan (2006). For an overall description of the process of social and political disintegration brought about by the German occupation of Greece, see Mazower (1993). Kalyvas (2000) provides a detailed account of the emergence of a power vacuum in parts of Greece.

timated. The Cold War fuelled many of them. Earlier, competition among the Great powers was associated with large areas of unstable governance. For example, at the turn of the nineteenth century, the area from today's Pakistan, to Afghanistan, Iran, the Ottoman Empire all the way to the border of Austria-Hungary was the buffer zone between the British and Russian empires and subject to numerous interventions from both of these empires. Regardless of the problems that governments in these areas might have had without any outside influence, great power rivalry could hardly have made their condition better. Official pronouncements, of course, were phrased as if the actions of the great powers were in the interests of the locals, but it would be hard to imagine that such actions could be induced by anything other than the perceived interest of these powers. Similarly, we can expect that the actions of external actors to civil wars nowadays are not necessarily motivated by what is being said in official proclamations. If there is anything that an economic approach to the problem can contribute is to first ask what are the interests of the actors involved in the conflict, both domestic and external.

3 Why not compromise?

Properly speaking, the factors that have just being discussed would call for arming, not necessarily for armed conflict. That is, incomplete contracting concerns the impossibility of writing contracts on the amount of arms that each side can have. While the parties to prospective war may have taken up arms, they could still use these to better their bargaining position against their adversaries and all could then find a compromise solution. There can be a number of compelling reasons for finding such a solution instead of resorting to outright warfare. For one, both leaders and common folk tend to be risk averse and the outcome of war is unpredictable. Moreover, war can be very destructive, and unpredictably so as well. Overall, then, the case for compromise can be overwhelming.[6] However, in practice when arms are

[6]The type of compromise and settlement we examine is a short-term one which is enforced through the level of arming that each side possesses. Long-term contracts on guns are not enforceable because the sole means of enforcement are the guns themselves. (This is an even more compelling reason than the inability to contract in relationship-specific investment encountered in the incomplete-contracts literature that has flourished since Grossman and and Hart, 1986.) For an illustration of how settlement and bargaining

taken up, avoiding civil war or ending it soon after that is rare. The median civil war lasts seven years (Collier et. al., 2003, 80) and that length has increased over the past two decades (Fearon and Laitin, 2003). To see why war may occur, then, without invoking irrationality we briefly discuss two sets of explanations that have been proposed.

3.1 Incomplete information and absence of common knowledge

In models of the type we will analyze in the next section, the adversaries know the exact size of the rents and the level of production; the number of their adversaries and their preferences; the exact nature of the conflict that determines the disposition of the surplus; and in the case of negotiation and settlement they are supposed to share a norm about how to divide up the surplus. That is, they face what economists and game theorists refer to as complete information about all aspects of the game. Moreover, all this information is common knowledge, in the sense that everybody knows that everyone knows, that everyone knows and so on.

In practice adversaries face incomplete information in, at least, one of the above dimensions and the requirement of common knowledge is rather stringent. They might have only a general estimate of the size of the surplus, the strengths and preferences of their adversaries, the nature of the contest, and they might have no shared norms, or at least they are not sure about them, in the event of negotiations. If the beliefs of the adversaries about any of these dimensions deviate significantly from one another, then it would be perfectly possible to have equilibria (in appropriately defined games) in which overt conflict is the outcome despite the presence of incentives to compromise. Bester and Warneryd (2006) examine environments where there is war because at least one side rationally underestimates the strength of the other, and there is much other research that shows how suboptimal outcomes occur under incomplete information in many different contexts.

Many wars can at least partly be attributed to the presence of incomplete information. World War I, for example, has been described to have occurred after a series of misunderstandings, miscalculations, and even inattention to details by some leaders at a time that trade and other interdependencies

takes place in each period in this context, see Garfinkel and Skaperdas (2000). Anbarci et. al. (2002) show how different bargaining solutions can lead to different outcomes.

among the future combatants made war unthinkable in the minds of opinionmakers on both sides (see, for example, Joll, 1992, pp.10-41). If war could occur, then, between the great powers of Europe that had established channels of communication, regular diplomatic exchanges, and norms of conduct that had been evolving for centuries, it would be far easier to take place between loosely organized groups that face a far less predictable environment, possibly without regular channels of communication and without established norms of conduct to guide many of their critical moves. Furthermore, as Chwe (2000) has argued attaining common knowledge itself is non-trivial, and again the anarchic environments in which civil wars emerge are not as conducive to the attainment of that condition.

3.2 How a long shadow of the future can induce conflict

It has become a rather common belief in economics and political science that conflict typically yields to cooperation as adversaries value the future more highly, or, as the shadow of the future becomes longer (Axelrod, 1984). This belief is based on evolutionary arguments or on folk-theorem type of arguments in conditions of repeated interaction. A long shadow of the future encourages long-term relationships and the development of a live-and-let-live attitude between the adversaries.

However, a long shadow of the future can have a different effect when the parties cannot commit to a particular level of arming, even though they are able to divide whatever surplus is available and avoid costly warfare. By pursuing war now, one side could weaken its adversaries permanently or even possibly eliminate them and take control well into the future. Therefore, a party that values the future highly could indeed take the chance of war instead of pursuing negotiation and compromise, despite the short-term benefits of compromise, because the expected long-run profits could be higher in case the opponents become permanently weakened or eliminated. In environments in which those who win gain an advantage well into the future, both the intensity of conflict, as measured by the amount of resources devoted to it, increases (Skaperdas and Syropoulos, 1996) and the choice of overt conflict over negotiation becomes more common (Garfinkel and Skaperdas, 2000) as the future becomes more important.[7]

[7] After the initial draft of this article was written, it was brought to my attention that

To see how this argument goes through consider the following simple example. Suppose there are two adversaries and they care about what happens *today* and about what happens in the $future$; that is, for simplicity, we can think of the game as having two periods. In each period there is an economic surplus of 50 units. Because of incomplete contracting on arming, each side has to devote 10 units of resources to guns in each period. Given the guns they have there are two options, war and compromise. If they were to compromise, each side would receive half of the surplus for a net payoff of 15 units ($\frac{1}{2}50 - 10$). If they were to engage in war, each adversary would have half a chance of winning and half a chance of losing the entire surplus, which would however be reduced by 10 units as a result of the destruction that war would bring. The expected payoff of each side under war in a particular period would then be $\frac{1}{2}(50 - 10 - 10) + \frac{1}{2}(0 - 10) = 10$. Therefore, because war is destructive both sides would have the short-term incentive to compromise. War, however, has long-term effects on the relative power of the adversaries. For simplicity and starkness suppose that if there were war *today*, the loser would be eliminated and the winner could enjoy all the surplus by itself in the $future$ and do that without having to incur the cost of arming. Letting $\delta \in (0, 1)$ denote the discount factor for the $future$, the expected payoff from compromise as of *today* - which would also imply compromise in the $future$ - would be $15 + \delta 15$. The expected payoff from war, again as of *today*, would be $10 + \delta(\frac{1}{2}50 + \frac{1}{2}0) = 10 + \delta 25$. Thus, war would be preferable to compromise by both adversaries if $10 + \delta 25 > 15 + \delta 15$, or if and only if $\delta > \frac{1}{2}$. That is, war would be induced if the "shadow of the future" were long enough, whereas compromise and peace would ensue only if the future were not valued highly.[8]

Indeed, much ethnic conflict takes place not because the adversaries do not value the future highly enough, as many participants appear to care little about their own well-being and much about what occurs to future generations

Fearon (1995) covers similar ground to that discussed below but for the case of wars between countries. Fearon, however, did not develop a model to describe how war can occur. More recently, Powell (2004) and McBride and Skaperdas (2007) have developed models similar in spirit to that of Garfinkel and Skaperdas (2000) to make a similar argument and derive comparative static results that apply to different conflict conditions.

[8] However, as shown in Genicot and Skaperdas (2002), costly investments in institutions of conflict management, which improve the chance of compromise, are more likely to occur when the future is valued more highly. The combined effects of the shadow of the future on the compromise/fight decision and on investments in conflict management has yet to be studied.

of their kind. And, more generally, the argument of many parties that initiate wars is that they are forced to do so because otherwise they would lose any advantage they might have and thus have a lower probability of winning as a result. The length of civil wars as amply described in the World Bank's report on civil wars (Collier et. al., 2003) suggests that informational problems cannot be their sole source. For, as Sanchez-Pages (2004) argues, wars and conflict reveal information to each party about relative strengths that in a dynamic setting would reduce informational asymmetries quickly and lead to settlement. The large number of protracted civil wars can well be accounted for by the fight-to-the-death approach due to the future's importance, or at least in the rational hope of each side that they will gain a permanent strategic advantage over their opponents.[9]

4 On the consequences of civil wars: a basic model

To illustrate some possible consequences of civil war, we next analyze a simple setting with a power vacuum. We first examine a condition with insecurity but without any collective organization. Although such atomized anarchy never literally prevails - in practice there is always some form of collective social and political organization beyond the individual - its examination helps clarify ideas and sets the stage for the more complex interaction among collective organizations by showing how the leadership of these collective organizations might emerge. We then examine contests between hierarchically organized groups as a framework for analyzing civil wars[10].

[9] This is not to deny the possibility of non-rational misperceptions and emotional responses could play a role in the length of civil wars or to their occurrence. We bring attention to the role of the future here because we think it has received very little attention, but we cannot obviously engage in a sustained empirical argument in its favor within the confines of the present paper.

[10] The model is based on Konrad and Skaperdas (2006). The model of atomized anarchy I examine here is more general in that it allows for heterogeneous productivities, but the model of organized anarchy is a simplified version of the framework in Konrad and Skaperdas.

4.1 Atomized Anarchy

Suppose there are N individuals who can be become either *producers* or *bandits*. Each producer has one unit of resource that he can allocate between useful production, denoted by y, and private protection against bandits, denoted by x. There are two types of individuals, with one type being more usefully productive than the other. The output of low-type individuals is $y_l = 1 - x_l$ whereas the output of the high types equals $y_h = A(1 - x_h)$ where $A > 1$. Given a private level of protection x by a producer, the share

of output that can be kept away from bandits is $p(x)$, where $p(\cdot)$ is an increasing function of its argument. The function $p(x)$ can be thought of a "contest success function" (see, eg, Hirshleifer, 1989, Tullock, 1980), which specifies the share as a function of the relative efforts of the producer and the bandit. For example, we could have $p(x) = \frac{f(x)}{f(x)+f(1)}$, where $f(\cdot)$ is a positive increasing function; note that in this case the bandit's "effort" is set equal to 1 since he puts all of his resources into appropriation. The payoff function of the two types of producers are then as follows:

$$\begin{aligned} V_{ph} &= Ap(x_h)(1 - x_h) \\ V_{pl} &= p(x_l)(1 - x_l) \end{aligned} \tag{1}$$

Assuming a unique maximum, which can be guaranteed with a concave $p(\cdot)$, it can easily be shown that both types of producers choose the same level of private protection which we denote by x^*.[11] Therefore, the equilibrium payoffs of producers are $V^*_{ph} = Ap(x^*)(1 - x^*)$ and $V^*_{pl} = p(x^*)(1 - x^*)$, so that $V^*_{ph} = AV^*_{pl}$.[12]

[11] The first-order condition for the high type is:

$A[p'(x^*_h)(1 - x_h) - p(x^*_h)] = 0$

Note that this condition does not depend on A and, therefore, the first-order condition for the low type is the same. Thus, the optimal choice for both types must be the same

[12] Note that the payoff of a producer does not depend on the numbers of peasants and bandits. Although the main reason for not allowing for such a dependence is analytical simplicity, the assumption can be justified by the following matching process. Suppose that there is an indefinite number of periods during which the population can be matched in pairs and the probability in every period of any individual matching with another one is the same. That is, in every period the probability of matching with a producer is $\frac{N_p}{N}$ and the probability of matching with a peasant is $\frac{N_b}{N} (= 1 - \frac{N_p}{N})$. If a bandit matches with

Bandits specialize in preying upon producers. A bandit extracts an $1 - p(x^*)$ share of output from each producer he meets and all bandits have the same expected payoff. That expected payoff should depend positively on the number of producers and negatively on the number bandits. Thus, letting N_p denote the number of producers and N_b the number of bandits (and, therefore, $N_p + N_b = N$) , the payoff function of a bandit is the following:

$$V_b = \bar{A}(1 - p(x^*))(1 - x^*)\frac{N_p}{N_b} \tag{2}$$

where $\bar{A}$ denotes the average "productivity" parameter of those who become producers and takes values between 1, the productivity of the low type of producer, and A, the productivity of the high type. (If all the low-type individuals were to become bandits and all high-type individuals were to become producers then we would have $\bar{A} = A$.)

In the long run, the numbers of producers and bandits should be such that no bandit has an incentive to become a producer and no producer has an incentive to become a bandit. Given by (1) that the high producers have a higher payoff than the less productive ones, the bandit's payoff cannot be higher than that of the high producers and not lower than that of the low producers. Overall, there are three possible types of long-run atomized equilibrium:

(i) All high-type individuals become producers whereas some low-type individuals become producers and the rest become bandits. In such an equilibrium the payoffs of bandits and low-type producers are equal.

(ii) All high type individuals become producers and all low-type individuals become bandits.

(iii) All low-type individuals become bandits, whereas some high-type individuals become producers and others bandits. In such an equilibrium the payoffs of bandits and high-type producers are equal.

Let $\alpha \in (0, 1)$ denote the proportion of the high-productivity individuals within the population N, for brevity let $p^* = p(x^*)$, and denote by N_p^* and N_b^*

---

a producer who has not met a bandit before, then the bandit steals from the producer. If the producer has been already robbed, then the bandit does not get anything. Then, the probability of a producer meeting a bandit equals
$\frac{N_p}{N} + (1 - \frac{N_p}{N})\frac{N_p}{N} + (1 - \frac{N_p}{N})^2\frac{N_p}{N} + ... = \frac{N_p}{N}[1 + (1 - \frac{N_p}{N}) + (1 - \frac{N_p}{N})^2 + ...] = \frac{N_p}{N}\sum_{t=0}^{\infty}(1 - \frac{N_p}{N})^t = \frac{N_p}{N}\frac{1}{1-1+\frac{N_p}{N}} = 1.$

Thus, the limit of such a matching process yields the absence of dependence of the payoff of producers on the numbers of producers and bandits.

the numbers of producers and bandits in the long-run atomized equilibrium. It can be shown, then, that which type of equilibrium prevails depends on how the how the proportion of high-productivity individuals, α, is related to the security of property as measured by the value of p^* and to the productivity parameter A. Below are these combinations of parameter values for which each type of equilibrium prevails, along with the numbers of producers and bandits in each type (for the derivation, please see the Appendix):

If $\alpha \leq \frac{p^*}{p^*+A(1-p^*)}$, then the type (i) equilibrium prevails with $N_p^* = [p^* - (A-1)\alpha(1-p^*)]N$ and $N_b^* = (1-p^*)(A\alpha + 1 - \alpha)N$.

If $\frac{p^*}{p^*+A(1-p^*)} \leq \alpha \leq p^*$, then the type (ii) equilibrium prevails with $N_p^* = \alpha N$ and $N_b^* = (1-\alpha)N$.

If $\alpha \geq p^*$, then the type (iii) equilibrium prevails with $N_p^* = p^* N$ and $N_b^* = (1-p^*)N$.

It appears that the higher is the security of property (i.e., the higher is the value of p^*), the more likely is that the type (i) equilibrium, in which some of the low-productivity individuals become producers. In such cases, stealing just does not pay for enough individuals to become bandits. The higher is the proportion of high-productivity individuals, however, the less likely it is for the type (i) equilibrium to emerge and the more likely is that a type (ii) or a type (iii) equilibrium will occur. In the latter type of equilibrium, there is enough loot around to entice even high-productivity individuals to become bandits.

We can also calculate a "degree of efficiency" of equilibrium by taking the ratio of equilibrium total output to the potential "Nirvana" output that would occur in the absence of any banditry and any private protection measures ($x^* = 0$) that would be taken by producers. This degree of efficiency is as follows for the three types of equilibria:

Type (i): $p^*(1-x^*)$.

Type (ii): $\frac{\alpha A}{\alpha A+1-\alpha}(1-x^*)$

Type (iii): $\frac{p^* A}{\alpha A+1-\alpha}(1-x^*)$

First, note that the private protection measures by producers, x^*, reduce efficiency. Second, the higher is the security of property - as measured by p^* - the higher is the degree of efficiency (with the exception of the knife-edge, type-(ii) equilibrium). It can be argued that with the modern weapons that bandits have in the developing countries under near anarchy, the security of producers is perhaps lower than it was in pre-modern times. Third, except for the type (i) equilibrium, the higher is the productivity ratio A, the higher is

the degree of efficiency. The effect of the proportion of high-type producers, α, is not always the same. For type (i) there is no effect, for type (ii) a higher α increases efficiency but the opposite is true for the type (iii) equilibrium. This is because an increase in the proportion of high-productivity individuals does not change the number of them who become producers, as their number is fixed by p^*; a higher proportion of high-productivity individuals just raises potential output but not equilibrium output.

Another rather obvious, but empirically important, effect is that bandits tend to come from those who are less usefully productive. Although in the model we have just examined the more productive individuals do not attain a lower equilibrium payoff than bandits, this is not the case in other models of anarchy that could be considered more general.[13] At least since the agricultural revolution, rulers tend to come from those who specialize in violence, not production. The long-run effects of such a condition can be more important than its immediate static effects. The incentives for productive investment, for innovation, or for human capital accumulation are low, if they exist at all.[14] And, once some individuals become bandits, soldiers or guerrillas, it becomes difficult for them to change occupations later in life, for their comparative advantage is in violence. Demobilized soldiers and guerrillas or former bandits and robbers have difficulties adapting to conventional occupations later in life. Many find robbery and brigandage a more familiar and profitable lifestyle than its alternatives. Thus, even once anarchy and war are over their destructive effects can linger far into the future.

4.2 Organized Anarchy

We now allow for collective organizations that control a certain territory with producers and possibly bandits within them. These organizations have an advantage in providing to producers protection from bandits more efficiently than producers can provide to themselves individually. A militia patrolling the streets or fortifications that protect a whole community, for example, would typically provide more protection to each producer than if the same amount resources were divided up and given to each producer for individual,

[13] For example, in Skaperdas (1992) there is an inverse relationship between productivity and power, where the latter is also related to equilibrium payoffs.

[14] For dynamic models that emphasize these effects see Mehlum et. al. (2003) and Gonzalez (2005).

private protection. But there is not a single way of delivering this collective protection.

In particular, two ideal types of organizations could be considered: Those in which producers participate as equal partners and contribute to the collective protection of the group to which they belong and those that are hierarchical and provide protection to producers in return for some tribute. Konrad and Skaperdas (2006) show that the former, self-governing organizations provide higher welfare for the producers, provided hierarchical organizations are not present. For these latter types are essentially the uninvited guests of the producers; each shows up like a mafioso does to ask for protection money and – though providing the service of protection against bandits – he cannot help but behave as a big bandit himself, usually with a higher enforcement and extraction potential than that of individual bandits. Furthermore, hierarchical providers of protection will attempt to take self-governing groups out of business by fighting against them and, as shown in Konrad and Skaperdas (2006), these groups cannot be expected to survive because, to control the free-rider problem, they have to be small in size and they thus cannot provide much of a challenge to the hierarchical juggernauts. This is also reflected in the dearth of self-governing states in history and the fact that almost all mature groups participating in civil wars are hierarchically organized.[15]

We therefore consider competition between hierarchically organized groups, headed by "warlords." One of these could be considered to be the government of a disintegrating state, even though I do not make special allowance for that warlord to be any different than the rest. Warlords maximize the difference between the revenue extracted and the costs of providing protection and competition with other warlords. This is similar to the approach the theory of state organization taken by Olson (1991, 2000) and other authors. One component of the revenue comes from producers who are to be found in each warlord's territory. Each warlord hires a fixed number of "guards," denoted by $\bar{g}$, who protect against bandits. For simplicity, we suppose that guards are effective enough against bandits so that there is perfect security and no individuals choose to become bandits. That is, no output is taken away from producers by bandits. The guards, however, can also be used to extract tribute from producers. How much tribute is extracted depends on the relative power of the warlord and his guards against individual producers

[15] Even democratic political parties tend to revert to some some type of oligarchy as Michels (1962) argued some time ago.

and we suppose that extraction power is the same as that of bandits, so that producers choose the same level of private protection x^* against the warlord that they choose against bandits.[16] Therefore, the rate of taxation or the tribute rate extracted from each peasant is $1-p(x^*) = 1-p^*$. For simplicity, we also suppose that all producers are the same with $A = 1$, so that the output of each producer is $1 - x^*$.

In addition to ordinary production, the area under consideration has additional rents that are not available to individual producers but are available for exploitation by collective organizations. These rents can have different sources: natural resources like oil, gas, timber, or diamonds; drug production and distribution; cash, loans, and in-kind contributions from foreign governments, international organizations, or NGOs. Let the net size of these rents available to warlords be T.

The total rent and production available for division among the warlords is $T + (1-p^*)(1-x^*)N_p$, where as before N_p denotes the number of producers. This total surplus is divided among the warlords and its division depends on the relative number of "fighters" that each warlord has at his disposal. Given a number of warlords $L(\geq 2)$, denote the number of fighters chosen by warlord $l = 1, ..., L$ by f_l. The share of the surplus received by that warlord is determined by following the most common form of a contest success function:

$$\frac{f_l}{\Sigma_{j=1}^{L} f_j} \tag{3}$$

The guards and fighters come from the total population N and their compensation equals that available elsewhere in the economy, which is the payoff received by producers and equals $p^*(1 - x^*)$. The payoff function of warlord l then is as follows:

$$V^l = \frac{f_l}{\Sigma_{j=1}^{L} f_j}(T + (1 - p^*)(1 - x^*)N_p) - p^*(1 - x^*)(\bar{g} + f_l) \tag{4}$$

Due to the risk neutrality assumed in this specification and in the absence of destructive war, $\frac{f_l}{\Sigma_{j=1}^{L} f_j}$ can also be interpreted as the probability of winning the total surplus. By introducing the possibility of destructive war, we would arrive at quantitatively different results but the basic effects of

[16] Konrad and Skaperdas (2006) allow for different levels of extraction and with the choice of the number of guards being endogenous, not fixed. In general, in that setting, security from bandits does not have to be perfect and some bandits will exist in equilibrium.

different parameters we describe below would not be qualitatively affected. Of course, as with the example we discussed in the previous section, in a dynamic setting we could characterize the cases that would yield compromise under the threat of war and those that would yield actual war.

To somewhat simplify the analysis, we suppose that each warlord does not take account of his effect on the total number of producers his choice of warriors have. (This is analogous to the price-taking assumption under perfect competition that is employed in neoclassical economics.) Then, the Nash equilibrium choices of fighters and the induced equilibrium payoff or profit of a warlord are:

$$f^* = \frac{(L-1)(T+(1-p^*)(1-x^*)N_p)}{L^2 p^*(1-x^*)} \tag{5}$$

$$V^* = \frac{T+(1-p^*)(1-x^*)N_p}{L^2} - p^*(1-x^*)\bar{g} \tag{6}$$

The higher are the rents and the number of producers, the more intense is the competition among the warlords as indicated by the number of fighters chosen. The intensity of competition also increases, as could be expected, when the number of warlords is larger. The effect on the profit of warlords is similar: increasing in the size of the rents and the number of producers and decreasing in the number of warlords.

The number of producers and the size of total output will depend on the number of fighters and guards hired by the warlords, and are therefore endogenous. (Note that there are no bandits under this version of organized anarchy.) In particular, the number of producers under organized anarchy, denoted by $\hat{N}_p$, is determined by how the population sorts among the three "occupations" of producer, fighter, or guard:

$$N = \hat{N}_p + L\bar{g} + Lf^* \tag{7}$$

Substituting f^* from (5) and rearranging, we obtain:

$$\hat{N}_p = \frac{L}{L-1+p^*}p^*(N-L\bar{g}) - \frac{L-1}{(L-1+p^*)(1-x^*)}T \tag{8}$$

Note first how the number of producers is decreasing in the value of the rents T. As the value of these rents increases, the warlords hire additional fighters to compete for these rents and therefore fewer individuals become producers. It can also be shown that a higher number of warlords reduces the number

of producers. Equation (8) has been derived under the assumption that the number of producers is positive. When the rents are high enough, though, it is possible that no one will become a producer and everyone available becomes employed as a fighter competing for the rents. That occurs, when rents are high enough relative to the population.

The total "GDP" or "income" of this economy includes the value of the rents and the value of production which, given (8), equals:

$$\hat{Y} = T + \hat{N}_p(1 - x^*) = \frac{p^*}{L - 1 + p^*}T + \frac{L}{L - 1 + p^*}p^*(1 - x^*)(N - L\bar{g})$$

Given that an increase in the value of the rents intensifies unproductive competition among the warlords and reduces the number of producers, it is not surprising that an increase in the value of the rents increases income by a lot less than the increase in the value of the rents itself. That "crowding out" effect can be almost complete when the number of warlords L is large, since this is when the competition for rents becomes more intense. Note that official statistics of income include military, police and related expenditures and therefore would tend to overstate the amount of income available for consumption.

The number of warlords can be endogenized in this model by substituting $\hat{N}_p$ into the equilibrium profit in (6) and setting that quantity equal to a constant that reflects the profit that would induce "potential" warlords to enter that business. The cost of hiring guards serves in this case as a fixed cost of entering the business of civil war.

From this model as well as from other related work in economics, we can identify the several characteristics and costs of civil wars. First, static economic costs include the resources expended by producers on defensive activities and the absence of production by non-producers. Second, there are costs due to more conventional productive and investment distortions, as well as the reduction in trade, that one could identify in such settings (Hess, 2003, has developed estimates for such costs for a number of countries). Third, contrary to ordinary economies, greater competition among conflicting groups - as could be captured by their number – increases these costs and much of the value of rents is crowded out by less production. Fourth, among the dynamic costs perhaps the most important one is that the development of human skills are biased towards appropriation and not towards production. It should be no wonder then that the consequences of civil wars are typically devastating

for material welfare. The deterioration of material welfare, in turn, can have a negative feedback effect on investments in institutions of conflict management that are costly. Thus the likelihood of peaceful settlement is reduced and civil wars can keep going on for a long time.

5 Concluding Remarks

The conditions that contribute to incomplete contracting and lead adversaries to figure out their differences in the battlefield instead of in courts and through politics cannot be expected to disappear any time soon. The importance of ethnicity, as a focal point for coalition formation and as a possible contributor to civil war, is not diminishing, although if ethnicity did not exist some other focal point for organization would likely take its place. Economies and societies are going through changes that, for most countries, are unprecedented in their rapidity while both informal institutions and governments have a hard time keeping up with them. And, foreign actors cannot be expected to reduce the chance of civil wars as they have their own interests to pursue that often fuel such wars. Even the ease of modern transportation and communication does not make much of a dent into the geographic isolation of, say the Amazon, the Congo, or the Caucasus. For the many states today that lack the capacity to provide basic infrastructure, education, and health to their citizens also tend to have the least ability to withstand challenges that turn from the arena of politics to that of war. In the medium run if not for longer, there does not appear to exist a magic wand that the New Economy can offer.

Obviously, it would be helpful to alleviate those conditions that lead to civil war by pumping more money and effort into infrastructural and institutional development, but the question is who would do that and where the money and effort would come from when, in large measure, the absence of those items usually helps induce war in the first place. While an economic approach can be useful in understanding the structural causes of civil wars, at this point little could be offered in terms of concrete policy proposals for their resolution. Building bridges across groups of people is very different from building bridges across the water. For, contrary to the engineering of bridges across the water, there are few social engineering principles in the case of bridges across people that would be free of controversy. A major problem is seeing through the cloud of rhetoric that adversaries and their

supporters typically advance. Economists and other social scientists, being human beings, are not immune to being influenced by rhetoric themselves and from possibly having very different interpretations of the same events.

What an economic approach can help with is its emphasis on the importance of interests and the need to look for that behind the veil of rhetoric. That necessitates having intimate knowledge of the local conditions. Outsiders do not have it and they can be easily manipulated. Furthermore, outsiders typically have their own interests and their interests, to put it mildly, rarely have the interests of the locals in mind. Thus, treading cautiously, trying to find out whose interests are behind which actions, and following the "do-not-harm" principle would be advisable before any concrete advise were to be provided.

APPENDIX

In this Appendix, I show how equilibrium of type (i) in section 4.1 holds. The conditions for the two other types of equilibrium are similarly derived.

For the type (i) equilibrium, all high types become producers whereas some low types become bandits and some producers. Then, the payoffs of the low-type producers and those of the bandits are equalized:

$$p^*(1-x^*) = \bar{A}(1-p*)(1-x^*)\frac{N_p^*}{N_b^*} \text{ where } p^* = p(x^*)$$

Note that $N_b^* = N - N_p^*$ and that $\bar{A} = \frac{\alpha N}{N_p^*}A + \frac{N_p^* - \alpha N}{N_p^*}1 = \frac{A\alpha N + (N_p^* - \alpha N)}{N_p^*} = (A-1)\alpha\frac{N}{N_p^*} + 1$. Substituting these two quantities, in the equality above, we obtain:

$$p^* = [(A-1)\alpha\frac{N}{N_p^*} + 1](1-p^*)\frac{N_p^*}{N - N_p^*}$$

Note that the sole endogenous variable in this equation is N_p^*. Solving for it, we obtain:

$$N_p^* = [p^* - (A-1)\alpha(1-p^*)]N$$

Therefore, we have:

$$N_b^* = N - N_p^* = (1-p^*)(A\alpha + 1 - \alpha)N$$

By construction, this type equilibrium can hold if and only if the number producers is at least as great as the number of high types (that is, $\alpha N \leq N_p^*$). (If the condition holds, then no high type has an incentive to become a bandit since all bandits receive the payoff of the low type and all low types are indifferent between becoming bandits or producers, thus conforming to the equilibrium type. If the condition does not hold, then some high types cannot be producers, and a type (i) equilibrium would not be possible.) Using the equations above, it can be easily shown that $\alpha N \leq N_p^*$ is equivalent to $\alpha \leq \frac{p^*}{p^* + A(1-p^*)}$, the condition given in section 4.1.

References

[1] Acemoglu, Daron, Johnson, Simon and Robinson, James, (2006) Institutions as the Fundamental Cause of Growth, in Aghion, P. and Durlauf (eds.), *Handbook of Economic Growth,* New Yor: North Holland.

[2] Acemoglu, Daron and Robinson, James, (2000) Why Did the West Extend the Franchise? Democracy, Inequality and Growth in Historical Perspective, *Quarterly Journal of Economics*, November, 115: 1167-1199.

[3] Anbarci, Nejat, Stergios Skaperdas and Constantinos Syropoulos (2002), Comparing Bargaining Solutions in the Shadow of Conflict: How Norms Against Threats Can Have Real Effects, *Journal of Economic Theory,* 106(1): 1-16.

[4] Axelrod, Robert (1984) *The Evolution of Cooperation*. New York: Basic Books.

[5] Azam, Jean-Paul, (2002) Looting and Conflict between Ethnoregional Groups: Lessons for State Formation in Africa, *Journal of Conflict Resolution,* February, 46(1): 131-153.

[6] Bester, Helmut and Karl Warneryd (2006). Conflict and the Social Contract, *Scandinavian Journal of Economics,* 108 (2): 231-249.

[7] Chwe, Michael (2000) Communication and Coordination in Social Networks, *Review of Economic Studies,* 67: 1-16.

[8] Collier, Paul, (2000) Rebellion as a Quasi-Criminal Activity, *Journal of Conflict Resolution,* 44(6): 839-853.

[9] Collier, Paul and Hoeffler, Anke (2001) Greed and Grievance in Civil War, manuscript, January.

[10] Collier, Paul, Elliott V.L., Hegre Havard, Hoeffler, Anke, Reynal-Querol, Marta, and Sambanis, Nicholas, (2003) *Breaking the Conflict Trap; Civil War and Development Policy*, (World Bank Policy Report), Washington, DC: World Bank and Oxford University Press.

[11] Engel Chistoph, (2003) Causes and management of conflicts: Editorial preface, *Journal of Institutional and Theoretical Economics,* 159 (1): 1-15.

[12] Esteban, Joan M. and Debraj Ray (2007), On the Salience of Ethnic Conflict, working paper, January.

[13] Fearon, James D. (1995), Rationalist Explanations for War, *International Organization,* 49(3): 379-414.

[14] Fearon, James D. and David D. Laitin (2003), Ethnicity, Insurgency, and Civil War. *American Political Science Review,* February, 97(1): 75-90.

[15] Fiorentini, Gianluca and Peltzman, Sam (eds.) (1995), *The Economics of Organized Crime,* New York: Cambridge University Press.

[16] Garfinkel, Michelle R., (2004), On the Stability of Group Formation: Managing the Conflict Within, *Conflict Management and Peace Science,* 21(1): 43-68.

[17] Garfinkel, Michelle R. and Stergios Skaperdas (2000), Conflict Without Misperceptions or Incomplete Information; How the Future Matters, *Journal of Conflict Resolution,* 44(6): 792-806.

[18] Garfinkel, Michelle R. and Stergios Skaperdas (2006), Economics of Conflict: An Overview, forthcoming in Sandler, T. and Hartley, K. (eds), *Handbook of Defence Economics, Vol. II,* New York: Elsevier.

[19] Genicot, Garance and Skaperdas, Stergios (2002) Investing in Conflict Management, *Journal of Conflict Resolution,* 46(1): 154-170.

[20] Gershenson, Dmitriy and Grossman, Herschel I. (2000) Civil Conflict: Ended or Never Ending?, *Journal of Conflict Resolution*, 44 (6): 808-822.

[21] Gonzalez, Francisco M., (2005), Insecure Property and Technological Backwardness, *Economic Journal*, 115: 703-721.

[22] Granovetter, Michael (1978) Threshold Models of Collective Behavior, *American Journal of Sociology*, 83(6), 1420-1443.

[23] Grossman, Herschel I. (1991) A General Equilibrium Model of Insurrections, *American Economic Review,* 81: 912-921.

[24] Grossman, Sanford and Hart, Oliver (1986) The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration, *Journal of Political Economy*, 84: 691-719.

[25] Hart, Oliver (1995) *Firms, Contracts, and Financial Structure,* New York: Oxford University Press.

[26] Hess, Gregory**,** (2003), The Economic Welfare Cost of Conflict: An Empirical Assessment, CESifo Working paper, No. 852.

[27] Hirshleifer, Jack (1988), The Analytics of Continuing Conflict, *Synthese*, 76: 201-233.

[28] Hirshleifer, Jack (1989), Conflict and Rent-seeking Success Functions, *Public Choice*, 63: 101-112.

[29] Hirshleifer, Jack (1995) Anarchy and its Breakdown, *Journal of Political Economy,* 103: 26-52.

[30] Joll, James (1992) *The Origins of the First World War*, Second Edition, New York: Longman.

[31] Kalyvas, Stathis (2000) Uses and Forms of Terror in the Greek Civil war: Argolis and Beyond, manuscript.

[32] Konrad, Kai and Stergios Skaperdas (2006), The Market for Protection and the Origin of the State, working paper.

[33] Kuran, Timur (1989) Sparks and Prairie Fires - A Theory of Unanticipated Political Revolution, *Public Choice,* 61: 41-74.

[34] Lieven, Anatol (1999), *Chechnya: The Tombstone of Russian Power.* New Haven and London: Yale University Press.

[35] Mazower, Mark (1993) *Inside Hitler's Greece: The Experience of Occupation 1941-44,* New Haven: Yale University Press.

[36] Mazower, Mark (1998) *Dark Continent: Europe's Twentieth Century,* New York: Vintage Books.

[37] McBride, Michael and Skaperdas, Stergios (2007) Explaining Conflict in Low-Income Countries: Incomplete Contracting in the Shadow of the Future, forthcoming in M. Gradstein and K.A. Konrad, (eds.), *Institutions and Norms in Economic Development*, Cambridge, MA: MIT Press.

[38] Mehlum Halvor, Moene, Karl and Torvik, Ragnar (2003) Predator or Prey? Parasitic Enterprises in Economic Development, *European Economic Review*, 47(2): 275-294.

[39] Michels, Robert, *Political Parties; A Sociological Study of the Oligarchical Tendencies of Modern Democracy,* translated by Eden and Cedar Paul, 1962, New York: Free Press.

[40] Minehan, Philip B. (2006) *Civil War and World War in Europe: Spain, Yugoslavia, and Greece, 1936-1949.* New York: Palgrave Macmillan.

[41] Neary, Hugh (1997) Equilibrium Structure in an Economic Model of Conflict, *Economic Inquiry,* July, 35: 480-494.

[42] Olson, Mancur, (1991), Autocracy, Democracy, and Prosperity, in R.J. Zekhauser (ed.), *Strategy and Choice*, 131-157, Cambridge, MA: MIT Press.

[43] Olson, Mancur, *Power and Prosperity: Outgrowing Communist and Capitalist Dictatorships*, 2000, New York: Basic Books.

[44] Powell, R. (2006), War as a commitment problem, International Organization 60: 169-203.

[45] Robinson, James A. (2001) Social Identity, Inequality, and Conflict, *Economics of Governance,* 2: 85-99.

[46] Sambanis, Nicholas (2001) A Review of Recent Advances and Future Directions in the Literature on Civil War, April.

[47] Sanchez-Pages, Santiago, (2004), Conflict as a Part of the Bargaining Process: Theory and Empirical Evidence, Department of Economics, University of Edinburgh.

[48] Skaperdas, Stergios (1992). Cooperation, Conflict, and Power in the Absence of Property Rights, *American Economic Review,* 82: 720-739.

[49] Skaperdas, Stergios (2001). The Political Economy of Organized Crime: Providing Protection When the State Does Not, *Economics of Governance,* 2: 173-202.

[50] Skaperdas, Stergios and Constantinos Syropoulos (1996). Can the Shadow of the Future Harm Cooperation?, *Journal of Economic Behavior and Organization,* 29: 355-372.

[51] Tullock, Gordon (1980). Efficient Rent Seeking, in J.M. Buchanan, R.D. Tollison, and G. Tullock (eds), *Toward a Theory of the Rent Seeking Society,* College Station: Texas A&M University Press: 355-372.

[52] Weingast, Barry. (1998). Political stability and civil war: institutions, commitment, and American Democracy, In Bates, Robert et. al. *Analytic Narratives.* Princeton: Princeton University Press.

[53] Wintrobe, Ronald (1998). *The Political Economy of Dictatorship.* New York: Cambridge University Press.