How Does Natural Resource Wealth Influence Civil War?

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Abstract

According to several recent studies, a country's natural resource dependence is highly correlated with the likelihood it will suffer from civil war. The mechanisms behind this correlation are not obvious: different scholars offer different theories but with little evidence. This paper uses a novel "medium-N" approach to examine the causal mechanisms behind this correlation. It begins by describing nine hypotheses about how resources may influence a conflict; it specifies the observable implications of each; and it reports which of these implications can be observed in a sample of 13 conflicts. The paper finds that resources can have a variety of effects on conflict, not all of them harmful; that resources tend to play different roles in separatist conflicts and non-separatist conflicts; that resources that are "lootable" have a different impact than resources that are "non-lootable"; and that the emergence of a futures market for post-combat resource rights – a "booty futures" market – has contributed to the initiation or duration of several conflicts in sub-Saharan Africa.

Introduction

Several recent studies have found that natural resources and civil war are highly correlated. According to Collier and Hoeffler [1998, 2000], states that rely heavily on the export of natural resources face a much higher risk of civil war than resource-poor states. Using different data, both de Soysa [2000], and Elbadawi and Sambanis [2001] have replicated this finding. Fearon [2001], who uses still another data set, finds that resource dependence is correlated with the duration of civil wars, although not the incidence of civil war.

It is not obvious why natural resource dependence should be linked to civil war. Different scholars tell different stories about how resource dependence can lead to, or lengthen, civil wars.[1] Moreover, there are other ways to explain the correlation. The causal arrow might point in the opposite direction: civil wars might produce resource dependence by forcing a country's manufacturing sector to flee while leaving its resource sector – which is location-specific and cannot depart – the major force in an economy by default. Even though Collier and Hoeffler employ lagged independent variables in their regressions, this does not rule out reverse causality: since civil wars are not recognized as "beginning" until they have generated at least a thousand combat-related deaths, they might be preceded by years of low-level violence that drives off manufacturing firms, producing a higher level of resource dependence before the civil war officially commences.

[1] For a more popular account of the link between resources and conflict, see Klare [2001]. Note there is also a literature on the scarcity of renewable resources (such as water and arable land) and violent conflict,

The correlation could also be spurious: both civil war and resource dependence might be independently caused by some unmeasured third variable, such as the weak rule of law. A state where the rule of law is weak might be unable to attract investment in its manufacturing sector, and hence would depend more heavily on resource exports; it might also face a heightened risk of civil war through a different process. The result could be a statistically-significant correlation between resource-dependence and civil war, even though neither factor would cause the other.

Even if resource dependence does influence the incidence or duration of civil wars, there is no consensus on the causal mechanisms that bring this about. Collier and Hoeffler suggest one possible mechanism; Fearon offers several others.[2] Newspaper reports and case studies sometimes claim that resources have "fueled" a given conflict but are vague about how this occurred. The problem is compounded by the abysmal quality of the data on civil wars in developing states.

This paper uses a novel "medium-N" approach to explore the question of whether and how resource wealth is linked to civil conflict. The method is motivated by an effort to circumvent some of the limitations of large-N statistical research, which tells us much about the prevalence of the resource-civil war correlation but little about the mechanisms that cause it; and to surmount some of limitations of isolated case studies, which can tell us a great deal about causal mechanisms in one or two cases, but little about how

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which this paper does not address; recent works on this latter topic include Gleditsch [1998], Suliman [1999], Homer-Dixon [1998], and Peluso and Watts [2001].

[2] The disparity between those who find a correlation between resource wealth and conflict initiation, and Fearon, who finds a correlation between resource dependence and conflict duration, may be due to the different ways the authors determine the beginning and end of civil wars. A civil war that fluctuates in intensity over several decades can be treated as either a single civil war of long duration, or multiple civil wars of brief duration. Since there is no universal method for coding these events, there is invariably a certain amount of slippage between the categories "incidence" and "duration." This ambiguity underscores the value of looking at case studies to determine what is actually occurring.

prevalent these mechanisms are. The method uses data collected from 13 case studies to scrutinize the mechanisms that link resource wealth to civil war.

I begin by describing nine possible ways that the presence of natural resources – including oil, gas, timber, minerals, and agricultural commodities – may influence the course of a civil war. I formulate these mechanisms as falsifiable hypotheses, and specify the observable implications of each – that is, what we would expect to see in case studies if the mechanism is at work. I then analyze thirteen recent civil wars and report on the presence or absence of each of the observable implications.

Three of these mechanisms were derived from formal models of civil wars devised by Collier and Hoeffler [2000] and Fearon [1999, 2001]. The other six are implied by the case study literature but have not been formalized, and are not part of any broader theory. Rather than assert that these hypotheses were formulated independently from the 13 cases, I prefer to treat this as an exploratory exercise that clarifies potential mechanisms and gathers data on their plausibility without subjecting them to more careful out-of-sample tests.[3]

The thirteen cases are chosen from a larger set of 21 recent conflicts in which – according to available information from scholars and journalists – resource wealth has played a significant role (Table 1).[4] From these I selected a group of 13 that varied by

[3] I conducted two of the case studies – Indonesia (Aceh) and Indonesia (Irian Jaya) – using primary sources and field work in June-July 2000. I based the other eleven case studies on secondary sources, including academic studies, discussions with country experts, United Nations reports, journalistic accounts, and reports from non-governmental organizations.

[4] Most scholars define civil wars as conflicts that a) occur within the recognized boundaries of a single state; b) involve combat between the state and at least one organized rebel force; and c) result in at least one thousand deaths over some period of time, usually one year. To make sure I am capturing as many resource-related mechanisms as possible, I have loosened the definition of "civil war" to include persistent conflicts that may not have produced one thousand combat-related deaths in any single twelve-month period. The 21 cases include five of these low-intensity conflicts. I also include three conflicts that have

the conflict's duration and by the conflict's intensity – that is, the number of casualties over time. The thirteen cases also vary by conflict type, and include five separatist conflicts (Angola-Cabinda, Sudan, Indonesia-Aceh, Indonesia-West Papua, Papua New Guinea, and Sudan) and eight non-separatist conflicts [Afghanistan, Angola, Cambodia, Republic of Congo, Liberia, Sierra Leone, and the 1996-97 and 1998-2001 conflicts in the Democratic Republic of Congo (DRC)]. Finally, the cases vary by resource: in seven conflicts the resource could be easily looted by small teams of unskilled workers (Afghanistan, Angola, Cambodia, Liberia, Sierra Leone, and the two DRC conflicts); in six cases the resource is relatively unlootable (Angola-Cabinda, Republic of Congo, Indonesia-Aceh, Indonesia-West Papua, Papua New Guinea, Sudan).

If I were trying to determine *whether* resource wealth is correlated with civil war, this would be the wrong set of cases to look at, since in these cases such a link is highly likely. But this is not my concern: the resource dependence-civil war correlation has already been established by the large-N studies discussed above. What I wish to discover are the causal processes that link the variables together. By examining cases in which some type of causal link is likely, I can make two types of inferences. First, if any of the causal mechanisms are *not* present in these thirteen cases – a set in which they are likely to be found – I can make the strong inference that the mechanism is unlikely to be valid more generally. Similarly, by observing whether a mechanism is absent in all of the separatist or non-separatist conflicts, or in all of the conflicts with lootable or unlootable resources, I can make inferences about the mechanism's validity in each of these sub-categories of conflicts. Second, by examining the prevalence of these mechanisms in

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both the properties of civil conflicts and of international conflicts: the war in Sierra Leone, and the two wars in the Democratic Republic of Congo.

the 13 cases I can make inferences – albeit weaker inferences – about their prevalence in the larger population of civil wars in which resources have played a role. Due to sample bias, I cannot make inferences about patterns in the full population of civil wars.

Since I only examine cases in which resource wealth is likely to have an effect on the onset or duration of a civil war, I am unlikely to find – and indeed, do not find – evidence that the resource-civil war correlation is spurious, or that civil wars cause resource dependence instead of the reverse. But by determining whether the resource wealth-civil war link is internally valid in a substantial number of cases, I can ease (or heighten) suspicions that the correlation is spurious or reversed.

To make my within-case inferences both transparent and consistent across the 13 cases, I code each of the cases using a uniform process. This entails using the best available data to determine the presence or absence of each of these observable implications for each of the nine possible mechanisms. When data are missing or ambiguous, I note this either in the text or an appendix of case studies.[5] Since I am not making claims about statistical significance, I believe my findings are robust to alternative codings of the data that are ambiguous.

1. Nine Possible Mechanisms

There are at least nine ways that a country's natural resource wealth might influence the initiation or duration of a civil war.[6] The first three mechanisms describe

[5] I intend to make this appendix available on my personal website, once this paper has been accepted for publication.

[6] I use the terms "resource wealth" and "resource dependence" interchangably here. The large-N studies measure the correlation between civil war and resource *dependence*, defined as the ratio of natural resource exports (including oil, gas, minerals, timber, and agricultural commodities) to GDP. Since this indicator is sensitive to changes in the size of the non-resource sector, and the size of GDP, it is a less-than-ideal

ways that resource wealth could lead to the initiation of conflict; the next three suggest ways that resource wealth could influence the duration of a conflict; and the final three describe how resource wealth might influence the intensity of a conflict, i.e., the casualty rate. I include the hypotheses on conflict intensity because it is possible that the resource wealth-civil war correlation is produced solely (or partly) by an intensity effect. To become classified as a civil war, a conflict must pass a certain threshold, producing a certain number of combat-related deaths (usually one thousand) over some period of time (usually one year). The presence of resource wealth might turn low-intensity conflicts into high-intensity conflicts without influencing the total number of conflicts; this could produce a statistical correlation between resource dependence and the incidence of civil war by increasing the number of conflicts that cross the critical threshold. Similarly, if resource wealth increased the number of years in which the conflict crossed the thousand-death threshold without influencing the conflict's beginning and end dates, it could produce a spurious correlation between resource wealth and duration. Hence it is important to explore whether resource wealth has an influence on the intensity of civil wars.

Incidence of Civil War

The presence of resource wealth might increase the incidence of civil wars in three ways.

The first is the Collier-Hoeffler "looting" mechanism: if nascent rebel organizations have the opportunity to extract and sell resources (or extort money from

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measure. In the case studies I observe the effects of commercially-exploited resource *wealth* on conflict, which eliminates this problem.

those who do), then they are more likely to launch a civil war.[7] Collier and Hoeffler note that natural resources offer rebel groups a unique funding opportunity, because they typically produce rents and are location-specific, and can be looted on a sustained basis. If rebels instead tried to loot or extort money from manufacturing firms, the firms would relocate or be forced out of business altogether. States whose economies are more heavily based on resource exports should therefore also face a higher risk of civil wars.

If this is correct, then in case studies we should observe rebel organizations raising money, prior to the start of the civil war, through the extraction and sale of natural resources, or from the extortion of resource firms.[8]

The second possible mechanism would be resource-related grievances.[9] Many scholars have found that grievances over economic issues, often proxied by poverty or inequality, tend to influence the danger of civil war.[10] If resource extraction leads to land expropriation, environmental damage, and labor migration to remote areas it may increase the probability of extraction-related grievances, which in turn could contribute to the onset of civil war. If resource extraction leads to disputes over how resource wealth

[7] Collier and Hoeffler [2000] estimate that the correlation between resource dependence and civil war is curvilinear, suggesting that the risk of civil war declines when resource dependence reaches exceptionally high levels, at which point "the increased tax revenue eventually augments the capacity of the government to defend itself sufficiently to offset the enhanced finances of the rebels." Other scholars estimate the correlation to be linear.

[8] The looting mechanism suggests a second observable implication: if looting resource firms is easier, or more sustainable, than looting non-resource firms, we should observe rebel groups gaining a greater fraction of their financing from the resource sector (relative to its size in the economy) than from other economic sectors. This would be hard to test unless rebel organizations agree to have their finances audited.

[9] Some might argue that resource wealth should promote economic growth, and hence reduce poverty and grievances. In fact, resource exploitation appears to *reduce* economic growth rates [Sachs and Warner 1995; Leite and Weideman 1998], and to increase poverty rates, child malnutrition, and infant mortality [Ross 2001].

[10] See, for example, Gurr [1970]; Muller and Seligson [1987]; Muller and Weede [1990]; Auvinen [1997]; Dudley and Miller [1998].

should be distributed, these distribution-related grievances could also contribute to the initiation of conflict.

If resource dependence led to civil war through a grievance mechanism, we should observe the rebels complaining about the resource sector in their propaganda; and we should see them make resource firms a target of their violence, apart from looting or extortion attempts. Of course, neither of these indicators would prove that the rebels are *truly* motivated by resource-related grievances; but they do imply that the rebels believe that these are salient concerns in the target population, and that voicing them will help them raise support.

Resource wealth might also generate conflict indirectly through what might be called a "predation" mechanism, if it fosters the growth of predatory groups such as private armies, militias, and warlords, which in turn may increase the hazard of civil conflict. In much of the developing world, the state's ability to provide "law and order" – and hence, to protect firms from extortion – is limited, and tends to dwindle in remote areas. For this reason, large firms avoid operating in areas beyond state control; and if they did operate in remote areas and were subject to significant predation, they would soon fail. But since resource firms are location-specific they must sometimes operate in areas where the state's authority is weak; moreover, because they commonly generate rents they can turn a profit even when subject to predation. If resource wealth is located in a region where the state's authority is weak, and the availability of resource rents leads to the rise (or strengthening) of organized predation – in the form of private armies, militias, or warlords – it could lead to civil war in one of several ways: these groups might challenge the state directly; they might support a rebel group once it arises; or they

might further weaken the state's influence in the region, and make it easier for rebel groups to form.[11]

If resource wealth contributes to the incidence of civil war through this predation mechanism, we should observe in case studies the rise of predatory groups associated with resource extraction before the war breaks out; and we should see these groups either aiding or joining the rebel movement, or impeding the government's efforts to suppress an insurrection.

Duration

Natural resource wealth may influence the duration of civil war, independent of its effects on the incidence of civil war. There are three mechanisms that could either lengthen or shorten a conflict, depending on how they occur.

The first mechanism is looting: resource wealth may lengthen a conflict if it enables the weaker side to fund itself, and hence continue fighting instead of being crushed or forced to the negotiating table. Alternatively, if resource looting is carried out exclusively by the stronger party, it could shorten a conflict by bringing about a quicker victory or settlement, at least in non-separatist conflicts. In the case studies, I look for evidence that either side has raised money from the resource sector – through looting, extortion, or other means – after the war began. If both sides raised funds from the resource sector simultaneously, I infer that the net effect has been to lengthen the conflict,

[11] On the notion of protection rents, see Lane [1958].

based on the conjecture that combat is likely to continue as long as the weaker party does not run out of money. [12]

Resource wealth could also act as an incentive, or disincentive, for a peace settlement. On one hand, wartime looting may be so profitable for the combatants that they prefer war to peace. This is a slippery mechanism to observe in case studies. It should not be sufficient to observe that war is profitable for some combatants: this is virtually inevitable when combat takes place on resource-rich territory. What we must determine is whether high level officers, who have the ability to negotiate (or block) a treaty, believe they would profit *more* if the war continues than if the war comes to a negotiated end. If this is occurring we should observe evidence that resource looting is generating personal profits for high-level officers; evidence that they would not be compensated in some comparable way by a proposed peace treaty; and evidence that they chose not to sign or adhere to an unprofitable peace accord.

On the other hand, if one or both parties believe that peacetime profits would be greater than wartime ones, it could help induce them to reach a settlement. If this occurs, we might find evidence that officers who support a peace agreement subsequently profit from – or attempt to profit from – the resource industry.

Wartime resource looting could also affect a conflict's longevity in a third way, if it is carried out by either side in a decentralized manner that benefits lower-ranking

[12] An important assumption is that conflicts will tend to last longer when the two sides have more equal resources. This assumption is supported by evidence of a similar effect in interstate conflicts [Bennett and Stam 1996].

I do not assume this pattern holds in separatist conflicts, however. As Fearon [2001] points out, separatist and non-separatist conflicts appear to have substantially different characteristics: separatist conflicts tend to last longer, and often continue even when the separatist movement is at an overwhelming financial disadvantage. This may be because separatist movements can often sustain themselves indefinitely in a territory dominated by members of their own ethnic group, in which government forces are

officers, and thereby creates discipline problems that influence the likelihood of a settlement. Both rebel and government armies in developing states commonly have difficulty maintaining the chain of command during wartime. Fearon [1999] has suggested that the presence of lootable resources will make principal-agent problems worse by giving officers an incentive to accumulate personal wealth instead of adhering to the orders of their commanding officers. If resource wealth creates principal-agent problems for either side, this may make it more difficult for negotiators to forge a binding, enforceable settlement.

If this mechanism has lengthened a conflict, we should observe that at least one side of the conflict suffers from major principal-agent problems; that disobedient officers are personally benefitting from resource looting; and that these discipline problems have made it harder for that party to sign or adhere to a peace settlement.

It is possible, however, for a resource-related agency problem to have the opposite effect: it could cripple one side's fighting capacity, and thereby hasten that party's military defeat or force them to sign a peace agreement. If this has occurred, we should again see that at least one side of the conflict suffers from major principal-agent problems; that disobedient officers are personally benefitting from resource looting; and that these agency problems helped cause the party's defeat, or forced it to sign a peace agreement that it might otherwise have opposed.[13]

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considered alien. For this reason, I assume that looting by the stronger side is likely to shorten non-separatist conflicts but not separatist conflicts.

[13] Fearon [2001] has suggested another way that resource abundance might lengthen *separatist* conflicts. He specifies a model in which rebels are likely to settle a conflict through an agreement for regional autonomy only if they believe the government is likely to adhere to it. The model suggests that if the region has resource wealth the government is more likely to renege on any such agreement, in order to gain access to future resource revenues; even if the government does not plan to renege, the rebels are more likely to *expect* them to renege, and hence should be more hesitant to sign a peace accord. The net result is that separatist conflicts over resource-rich regions should be unusually difficult to settle.

Intensity

Resource wealth might also influence the intensity of civil conflicts, producing more (or fewer) conflict-related deaths over time. At least three mechanisms might bring this about.

The most obvious mechanism is resource-related combat, in which opposing armies do battle over resource-rich territory. I look for evidence in each case of these types of battles; and evidence that these sites had no other intrinsic strategic value.

A second mechanism might be pre-emptive repression: a government that anticipates resource-related rebellion might act strategically, and use terror and repression against a population to prevent the rise of a strong rebel organization. Here we might *not* witness a full-blown civil war – if the repression is "successful" in the government's eyes – but nonetheless have a large number of resource-related casualties. If this has occurred in case studies, we should observe an unusually high level of government repression in an area of resource exploitation.

A third mechanism might reduce the intensity of civil wars. In a plunder-rich environment, battlefield opponents might prefer to cooperate and get rich instead of fighting and staying poor. If this type of cooperative plunder occurs, there should be reports of wartime trade and cooperation in resource exploitation between the two sides.[14]

Unfortunately, this final mechanism is hard to verify in case studies unless we know a great deal about the perceptions and motivations of rebel leaders. For this reason, I am unable to test it in these case studies.

[14] I am deliberately omitting a fourth possible mechanism: that resource looting enables one or both combatants to arm themselves with more lethal equipment and hence kill each other at a faster rate. It is not obvious that greater military spending produces more lethal combat; moreover, I am already assuming that resource revenues influence the duration of conflict and do not wish to double-count.

TABLE TWO ABOUT HERE

2. Results

The findings from the thirteen cases are summarized in Table 2. Overall there is good evidence to support the claim that resource wealth makes conflict more likely, and the claim that resource wealth tends to make conflicts last longer. In most cases, resource wealth has a mixed influence on the intensity of conflict. There are important differences between separatist and non-separatist conflicts, and between conflicts with lootable and non-lootable resources.

Incidence of Conflict: Evidence

Resource wealth may have contributed to the outbreak of conflict in eight of the thirteen cases. There is evidence for both the grievance mechanism and the predation mechanism; and while there is no evidence for a narrowly-defined looting mechanism, there is good evidence of a broader type of looting.

TABLE 3 ABOUT HERE

There were no cases of resource looting of the type that Collier and Hoeffler describe: in these thirteen cases, nascent rebel groups *never* gained funding before the war broke out from the extraction or sale of natural resources, or from the extortion of others who extract, transport, or market resources. If interpreted strictly, the Collier-Hoeffler looting mechanism gains no support from these cases.[15]

But if we expand the definition of looting is expanded to include all types of resource-related funding, it finds support in four cases [Table 4]. In two cases rebels gained start-up funding by selling future mineral rights to a private firm (Congo

Republic) or neighboring government (Sierra Leone).[16] In two cases (Sierra Leone again, and the second Democratic Republic of Congo war) neighboring governments who aspired to loot the country's natural resources helped initiate the civil war by organizing and fighting alongside domestic rebel forces. And in one case (Sudan), rebels funded themselves by extorting money from western firms who were building oil-related infrastructure, and wished to protect their equipment from attack.

TABLE 4 ABOUT HERE

The grievance mechanism helps account for the origins of five conflicts [Table 5]. Grievances over distribution were far more prevalent than grievances over extraction. In all five cases, rebel organizations raised criticisms about the maldistribution of resource wealth; in two of these cases (Indonesia-Aceh and Papua New Guinea), they or their supporters also objected to the social or environmental consequences of the extraction process itself, although these concerns were relatively minor in Indonesia. Only in Papua New Guinea were extraction-related grievances a major cause of conflict; and even in this case, distribution-related grievances appeared to be more important than extraction-related grievances.

TABLE 5 ABOUT HERE

Resource grievances mattered almost exclusively in separatist conflicts: they contributed to the initiation of four of the five separatist conflicts, but played no discernible role in seven of the eight non-separatist conflicts. In the four separatist conflicts where resource grievances played a role (Angola-Cabinda, Indonesia-Aceh,

[15] The closest fit to the Collier-Hoeffler model was the case of Sudan, described below.
[16] The topic of mineral futures is discussed in greater detail below.

Papua New Guinea, and Sudan), it was never the *only* source of grievance: in each case, the region's inhabitants had some prior basis for a claim to independence.[17] Hence resource grievances do not appear to be sufficient (and are obviously not necessary) for causing a secessionist movement.[18]

Do resource grievances sometimes matter in non-separatist conflicts, too? Only one non-separatist conflict in this sample was coded positively for grievance – and even in this case, the evidence that grievances mattered is disputed by area specialists. The case is the war in Sierra Leone, which began in March 1991 when the Revolutionary United Front (RUF) first crossed the border from Liberia. RUF propaganda complained about resource exploitation, and it targeted diamond-mining operations in its attacks – although these attacks may well have been motivated by a desire to loot, rather than grievances.

According to Richards [1996], RUF believed that "Sierra Leone has been robbed of its mineral and forest resources"; he cites RUF propaganda that rails against "the raping of the countryside to feed the greed and caprice of the Freetown elite and their masters abroad" – a reference to the Lebanese and Afro-Lebanese businessmen who managed the diamond trade. He also suggests that youths in the diamond areas in southern and eastern Sierra Leone were receptive to this message, and this in turn helped RUF recruit volunteers and successfully indoctrinate conscripts. Richards' account is disputed by Abdullah [1998, 223], who contends that RUF was a collection of fighters

[17] This is also true for Indonesia-West Papua, the only separatist rebellion in the sample in which grievances did not contribute to the initiation of conflict. The conflict began before any mining occurred in the province; yet once the mining began, it created a set of grievances similar to the other cases.
[18] Note that it would be false to infer from this pattern that resource extraction in regions with separatist aspirations tends to produce grievance-based rebellions. I have only examined cases in which rebellions occurred; there may be a much larger number of cases in which resource extraction did not lead to separatist rebellions.

with no real ideology, organization, or discipline, who succeeded thanks to "the indiscriminate use of drugs, forced induction, and violence – to further their ultimate goal of capturing power." Abdullah suggests that RUF's putative ideology was hastily patched together from borrowed quotations and unrelated documents, and was irrelevant to RUF's actual practices. Hence it is unclear whether resource grievances actually mattered in the case of Sierra Leone; however it is coded, though, resource grievances appear to be rare in non-separatist conflicts.

The predation mechanism was apparent in two cases (Sierra Leone and the 1996-97 war in the Democratic Republic of Congo). In both cases, predatory organizations arose around the mining of alluvial diamonds – that is, diamonds that can be extracted from the topsoil of alluvial plains by small teams of unskilled workers. Before the outbreak of civil war, Sierra Leone's diamond fields were controlled by a network of armed gangs, private armies and paramilitary forces that sold protection services to miners and traders [Hirsch 2001, Richards 1996]. The presence of these organizations weakened the government's authority in the diamond areas; when the government tried to re-establish control in early 1991, it displaced thousands of illicit miners, many of whom were recruited by RUF, the rebel organization. The government's efforts also drove local strongmen into alliances with RUF [Reno 1998].

In the DRC, there was a gradual shift in the 1980s and early 1990s from large-scale deep-shaft mining (for which the government provided security) to small-scale alluvial mining, which helped foster independent military units that were economically and politically autonomous from the government. Some units were organized by local strongmen, who sold protection to small-scale miners; sometimes miners themselves

would organize their own self-defense units [MacGaffey 1991]. In other cases, DRC military units were forced to become self-financing, and organized themselves around commerce in diamonds, gold, coffee, timber, cobalt, and arms. One general sold protection services to alluvial diamond miners in Kivu; another general used his unit to ship cobalt from the Shaba province to Zambia [Reno 1998]. These activities may have weakened the DRC military, and hence encouraged the rebel group (organized and led by the Rwandan and Ugandan armies) to launch its assault in October 1996.

To summarize, the data support the following inferences on the incidence of conflict. First, there is no evidence for a strictly-defined looting mechanism, but there is evidence of a more broadly-defined looting mechanism, in both separatist and non-separatist conflicts. Second, resource grievances sometimes play a role in initiating separatist conflicts, but they play little if any role in the initiation of non-separatist conflicts. Even in separatist conflicts, resource grievances are not sufficient to initiate conflict. Finally, there is evidence of a predation mechanism, albeit only in states with alluvial diamonds.

Duration of Conflict: Evidence

Resource wealth appears to have influenced the duration of nine of the thirteen conflicts: it lengthened six, shortened two, and had a mixed effect in one [Table 6].

Resource looting again took several forms [Table 7]. While looting-by-extraction played no role in the *initiation* of these thirteen conflicts, it played a role in the *duration* of six conflicts. In other words, while rebel groups do not extract resources before the conflict, they commonly do so once it starts. This may have a simple explanation: until a

conflict has begun, rebels cannot hold territory – including resource-rich territory – and hence have few opportunities to engage in resource exploitation. In all six of these conflicts, the resources themselves (generally gemstones) were highly lootable. In the seven cases with no looting-by-extraction, the resource was invariably of a type – such as oil, natural gas, or minerals – that was much harder to exploit.

Once again, the futures market played an important role: in three cases (Sierra Leone, Angola, and the DRC II conflict) the weaker party sold oil or mineral futures to help pay the costs of ongoing combat, thereby lengthening the conflict. In one case (the DRC I conflict), the stronger party sold minerals futures, and hence shortened the conflict. Finally, in one case (Sudan), rebels used resource extortion to raise money.

Of the eight conflicts where looting mattered, seven conflicts were lengthened. But in one case – the 1996-97 conflict in the Democratic Republic of Congo (DRC) – resource looting most likely shortened the conflict since it benefited the stronger side almost exclusively. In this conflict, the rebel organization (the Alliance of Democratic Forces for the Liberation of Congo/Zaïre, led by Laurent-Desiré Kabila[19]) received a huge resource windfall after it became clear that it was defeating the government in combat. In April 1997, Kabila signed an $885 million contract with American Mining Fields, a U.S. firm intent on exploiting Congolese copper, cobalt, and zinc; around the same time, the minerals parastatal, Miniére de Bakangwa, switched its support from the government to ADFL, offering Kabila both cash and the use of its aircraft fleet [French 1997; Reed 1998]. One month later, Kabila entered the capital and became the new

[19] The ADFL was led by the Rwandan army and backed by the Ugandan army, who were principally concerned with eliminating the threat created by the exiled Rwandan government in eastern Congo. The exiled Rwandan government was led by ethnic Hutus and was responsible for the 1994 Rwandan genocide. Kabila was a longtime political figure who had opposed Mobutu since the early 1960s.

President. Since Kabila's April 1997 sale of mineral futures helped strengthen the hand of the winning side, while the weaker side lost its resource funding, I infer that it helped bring about a swifter end to the war.

There is reliable evidence that in two cases resource wealth created agency problems that influenced the duration of a conflict: in Liberia it lengthened the civil war, while in Cambodia it shortened the civil war.

The Liberian civil war lasted from December 1989 to August 1996. Between June 1990 and August 1996 the combatants signed fourteen peace accords, thirteen of which failed. One important reason for these failures was competition within the parties over the control of resource wealth – competition that made it impossible for some of them to get their own troops to comply with the terms of the agreements [Accord 1996; Ellis 1999].

Conversely, in Cambodia resource wealth created agency problems within the rebel group (the Khmer Rouge) that hastened their breakdown and – at least after 1996 – shortened the civil war. Until 1995, income from the sale of timber and gemstones had helped the Khmer Rouge continue fighting, and hence helped lengthen the civil war. But in 1996 Ieng Sary, one of the Khmer Rouge's top officials, surrendered to the government along with 4,000 soldiers under his command. As part of the surrender agreement, he was allowed to retain his troops and keep control of a gem-and-timber-rich area near the Thai border. The Khmer Rouge never recovered from his defection, and by 1998 the Khmer Rouge had collapsed – bringing about an end to war.

There was persuasive evidence in two cases (DRC II and Liberia) that resource wealth lengthened a conflict by giving combatants an economic incentive to avoid

signing, or adhering to, a peace agreement. There was also circumstantial evidence in one case (Congo Republic) that resource wealth shortened a conflict by giving combatants a financial incentive to settle.

In Liberia, parties to the conflict signed the 1993 Cotonou accord under heavy international pressure. But almost immediately the signatories created nominally-independent surrogate groups that – because they were not signatories – could carry on with profitable wartime looting. This practice contributed to the accord's collapse [Alao et al. 1996, Ellis 1999]. It also implies that combatants subverted the treaty for economic reasons, and thus lengthened the conflict.

In the war that has plagued the DRC since 1998 – which has both the qualities of a civil war and an international war – the profitability of resource looting for foreign governments, rebel militias, and individual officers has substantially reduced their incentive to end the conflict [ICG 2000; Vick 2001; UN Panel of Experts 2001] . Even though a peace accord was signed in Lusaka in July 1999, it has not been implemented, in part because it would force foreign combatants to withdraw from the DRC, and they are loathe to lose their access to the DRC's resource wealth.

Conversely, the 1997 civil war in the Congo Republic may have been shortened by the combatants' belief that peace would be more profitable for both sides than war.[20] A key difference between the Liberia and DRC cases on one side, and the Congo Republic case on the other, was in the lootability of the resource. In Liberia and the DRC, multiple combatants were able to simultaneously profit during wartime by mining and selling resources (including diamonds, timber, coltan, and other minerals). In the

[20] Pierre Englebert, personal communication, October 2001.

Congo Republic the only germane resource was offshore petroleum. Neither side could profit from petroleum under conditions of war; it was unlootable.

I did not find evidence of a resource incentive problem in two cases where others suspect it exists: Angola and Sierra Leone [Sherman 2000]. In both cases, rebel leaders have at times generated enormous sums from resource looting; this has caused observers to falsely infer that the rebels must prefer war to peace. But in each case, peace negotiators have acted strategically by anticipating this problem and drafting peace accords that would enable rebel leaders to continue getting rich – or get even richer – in peacetime.[21] In these cases, I infer that peace failed for reasons other than the lure of wartime looting.

In sum, there is good evidence that resource wealth can influence the duration of civil wars. In this sample, resource wealth lengthened six wars, shortened two wars, and had a mixed effect on one war. The probability that resources will lengthen a war appears to be higher if the resource is easily lootable. Of the seven conflicts with lootable resources, five were lengthened, one was shortened, and one was both lengthened (in one period) and shortened (in another). Of the six with non-lootable resources, one was lengthened, one shortened, and four were unaffected. This pattern should not be surprising. Each of the three mechanisms are linked to a resource's lootability: resource looting can occur, by definition, only when the resource is lootable; resource-related agency problems only arise when soldiers are able to profit from looting; and resource-related incentive problems only happen when wartime looting is profitable.

[21] In each case, a peace agreement (the 1999 Lomé accord in Sierra Leone, and the 1994 Lusaka Protocols in Angola) was devised that would place the rebel leader (Foday Sankoh in Sierra Leone and Jonas Savimbi in Angola) in charge of the country's natural resources under a unity government. Peace would also allow

Only one duration mechanism can work without looting: a resource may act as an incentive for peace if it cannot be looted during wartime.

Hence we should expect that when resources are not lootable, they will have no influence on a conflict's duration, unless they act as a pro-peace incentive. In general, this is confirmed by the cases. Of the six conflicts with non-lootable resources, the resources had no influence on duration in four, and served as a pro-peace incentive in one (Congo Republic). The outlier is the Sudan – a conflict in which rebels have turned a non-lootable resource (oil) into a lootable resource by attacking a 936-mile pipeline that runs through rebel-held territory, and extorting money from the government and oil firms that wish to protect it.

Intensity of Conflict: Evidence

In general, resource wealth appeared to heighten the casualty rate in separatist conflicts but not non-separatist conflicts: in three of the five separatist conflicts it raised the casualty rate; in the eight non-separatist conflicts it had either a mixed effect with no clear trend (in five cases) or no effect at all (in three cases) [Table 8]. The differences in outcomes are produced by two patterns observed in the sample: the influence of resource battles tend to be offset by the influence of cooperative plunder, and hence may have no net effect; and the only mechanism that appears to consistently matter, pre-emptive repression, only occurred in separatist conflicts.

Resource battles occurred in six of the thirteen cases; yet cooperative plunder occurred in these same six cases. There were no cases in which combatants fought over

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the minerals sector in each country to expand by enabling abandoned mines to reopen and new ones to develop.

resources, but did not (at other junctures) also cooperate in exploiting them. There were also no cases in which opposing sides cooperated but did not also fight over these same resources.

In each of these six cases, the resources in question were distributed over a large geographical area and were either intrinsically lootable or (in the case of Sudan) made lootable by rebel activity. The geographic dispersion of these resources made it impossible for any one group to control, producing both periodic battles over the control of resource deposits, and commercial alliances between combat opponents. In five of the six cases (Sudan, Sierra Leone, Liberia, the DRC, and Cambodia) the presence of lootable resource seemed to help fracture rebel or government alliances based on ethnic, religious, or ideological grounds, and create new alliances based on commercial grounds.[22] In four cases (Sierra Leone, Liberia, the DRC, and Cambodia) there were long periods in which the major parties more or less ceased their combat and entered a kind of commercial equilibrium.

Resource battles and cooperative plunder seem to be closely linked. It was impossible in these six cases to judge which of these two effects had the greatest impact. I hence infer that they offset each other and had no net influence on the intensity of combat in these six cases.[23]

[22] It is impossible, however, to know if resource wealth has a consistent effect on alliance stability without having data on alliance stability in comparable resource-poor conflicts – something I have not attempted to collect.

[23] Of the eight non-separatist conflicts in the sample, resources did not influence combat intensity in three cases: in the Congo Republic, where the resources were offshore; in Afghanistan, where the Northern Alliance resistance movement – which was formerly the government – controlled the resource area for the duration of the conflict; and the DRC I conflict, in which the rebels swept over the country and defeated the government in just seven months, which left little time for either cooperation or conflict over resource-rich areas.

The third effect, pre-emptive repression, was less ambiguous. It occurred in three cases: Indonesia-Aceh, Indonesia-West Papua, and the Sudan. All were separatist conflicts, in which the resource was located in the rebellious region. In each case, the government took exceptionally harsh measures protect its access to the resource wealth. In the two Indonesian cases, the government imposed martial law, terrorized villages, and carried out egregious human rights abuses to preclude any challenge to its control of the resource. In the case of West Papua, the military found repression profitable, shaking down the resource firm for tens of millions of dollars.[24]

In Sudan pre-emptive repression was extraordinarily severe: since the late 1990s the government has attempted to create a *cordon sanitaire* around a 936-milepipeline that brings oil from the rebellious south to a port in the north. Since early 1999, the government has used summary executions, rape, ground attacks, helicopter gunships, and high-altitude bombing to force tens of thousands of people from their homes in the oil regions [Amnesty International 2000].[25] The correlation between oil exploitation and pre-emptive repression has often been transparent. In one well-documented case, Lundin Oil (a Swedish firm) discovered a major oil reserve in April 1999 at Thar Jath; a month later, government troops displaced tens of thousands of people from the area. When fighting nonetheless erupted ten months later around the Thar Jath site, Lundin Oil suspended operations while government troops used aerial bombing, the burning of

[24] Confidential interviews, Indonesia, June-July 2000.
[25] Although foreign observers have often been prevented from entering the affected areas, the pattern of displacements has now been well documented by both the UN Commission on Human Rights [2001] and several NGOs.

villages and summary executions to depopulate a large area around the oilfield. Shortly after depopulation was completed, Lundin Oil resumed operations [Christian Aid 2001].[26]

Pre-emptive repression only occurred in separatist conflicts, at least within this sample. This may be because governments are more willing to take repressive measures against peripheral minority groups than members of the majority population. It may also be that governments are more likely to expect trouble when resource exploitation occurs in regions with separatist aspirations than when it occurs in other regions. Of the five separatist conflicts in the sample, there was no pre-emptive repression in two cases: in the Angola-Cabinda conflict, where the resource was entirely offshore, and hence the government had no reason to worry that the independence movement would disrupt supplies; and in Papua New Guinea, where the democratic nature of the government may have helped rule out pre-emptive repression as strategy.

3. Booty Futures

One striking pattern in the 13 cases is that five conflicts have been initiated or lengthened by the sale of future rights to resource exploitation – what might be called "booty futures." In the Congo Republic and Sierra Leone, rebel leaders were able to finance their cause by selling off booty futures before the conflict began. In Angola, Sierra Leone, and the second DRC conflict, incumbent governments were able to finance

[26] In the Sudan, all three effects – resource battles, cooperative plunder, and pre-emptive repression – have occurred. Since the first two effects offset each other, while the third effect dramatically raised the casualty rate, I infer that overall resources tended to heighten the intensity of combat.

counterattacks – in each case, at a point when they were on the verge of defeat – by selling booty futures to private businessmen or neighboring governments.[27]

The creation of a futures market for war booty may have far-reaching consequences for conflicts in resource-rich states. Collier and Hoeffler [2000] suggest that rebel movements tend to face a problem of start-up costs: once they have reached a critical size they can become self-funding, and can defend themselves against government attacks; but until they reach that size they must rely on some exogenous source of funding, and are too small to protect themselves from government offensives. If there is a market for booty futures, however, it should be easier for rebels in resource-rich states to fund their start-up costs than rebels in resource-poor states.

This is what apparently occurred in the Congo Republic and Sierra Leone. In the Congo Republic, a former president, Denis Sassou-Nguesso, received $150 million from the French oil company, Elf-Aquitaine, to help him defeat the incumbent president, Pascal Lissouba either by force through a national election. The election never took place. Instead, Sassou and Lissouba fought a four-month war that destroyed much of Brazzaville and cost 10,000 lives, eventually leaving Sassou in charge [Africa Confidential v 38 n 21-24, 1997].

Sierra Leone's civil war began in March 1991 when a handful of fighters associated with RUF first crossed the border from Liberia. There is overwhelming evidence that the Liberian leader, Charles Taylor, helped organize and support the invasion; indeed, soldiers from Taylor's NPFL made up part of the "RUF" incursion [UN Panel of Experts 2000]. Taylor apparently had several motivations, one of which was to

[27] The market for booty futures may or may not be restricted to sub-Saharan Africa; I have not yet found any examples from outside the region.

gain access to Sierra Leone's diamond fields, which were less than 100 miles from the Liberian border [Reno 1998]. This implies that the RUF leadership was able to fund its start-up costs by selling informal mining futures to Taylor.[28]

Through a similar mechanism, the market for booty futures can also make conflicts last longer. Imagine that no such market existed; that a state whose economy was based entirely on resource extraction was in the middle of a civil war between two armies of similar size and weaponry; that a financing advantage could be directly translated into a military advantage; and that neither side had any foreign funding. Under these simplified conditions, the conflict should have the properties of a tipping game. The side that controlled 51 percent of the country's natural resources would have an insurmountable advantage, since even a small financial edge would give it the ability to capture an ever-larger fraction of the country's natural resources, which would in turn give it an even-larger financial advantage, and so on. But if the disadvantaged side can sell booty futures, it can offset the other side's financial advantage, and hence prolong the conflict.

This is an abridged version of what occurred in Angola, Sierra Leone, and the second DRC conflict. In 1993-94 the Angola war turned sharply against the government when the rebel National Union for the Total Independence of Angola (UNITA) captured most of the country's diamond fields and threatened to defeat the government on the battlefield. To fund a counteroffensive – one that proved successful, and hence

[28] A similar process may have occurred in Liberia, although the evidence is ambiguous. Liberia's catastropic civil war began in December 1989, when Charles Taylor led 100 troops from the National Patriotic Front of Liberia (NPFL) into Liberia from Côte D'Ivoire. Taylor was supported by the leaders of Côte D'Ivoire and Burkina Faso, and had earlier had received assistance from the Libyan government. According to Ellis [1999], just before the invasion Taylor also received "sympathetic attention" from businessmen who hoped to gain access to Liberia's iron ore and timber; Ellis is uncertain, however, whether these businessmen actually helped finance Taylor's efforts [Ellis, personal communication].

prolonged the war – the government mortgaged off seven future years of projected oil revenues [Vines 1995].

The second war in the Democratic Republic of Congo might have been over in a month – instead of, at this writing, lasting over three years – were it not for the booty futures market. In September 1998, just weeks after the war began, Rwandan troops were on the verge of entering Kinshasa and overthrowing the Kabila government; Kabila appealed to Zimbabwe and Angola for assistance. In exchange for sending troops, Kabila provided both Zimbabwe and Angola with extensive mineral rights.

During the war in Sierra Leone, the government saved itself from defeat twice by selling off booty futures. In March 1995, the Revolutionary United Front (RUF) had taken control of the country's main diamond fields and advanced to within 20 miles of the capital. To stave off defeat the government hired a South African mercenary firm, Executive Outcomes, to push the rebels back; as payment, the government gave Executive Outcomes mining rights in rebel-held territory, reportedly worth some $30 million. By the end of 1995, Executive Outcomes had recaptured the diamond mining areas, and put RUF on the defensive.

The government also traded booty futures for military support a second time, in 1997-1998 when President Ahmad Tejan Kabbah had been sent into exile by a military coup. Kabbah hired a second mercenary firm, Sandline International, for $10 million to reinstate him; Sandline's bill was apparently paid by a Thai banker, Rakesh Saxena, in exchange for future mineral rights [Africa Confidential 1999].

4. Conclusion

This paper uses 13 case studies to examine the causal links between resource wealth and civil wars. It uses prior studies, and cases themselves, to generate nine hypotheses about how resources may influence a conflict; it specifies the observable implications of each; and it reports which of these implications can be observed in the 13 cases.

There are seven notable findings.

The first concerns the debate framed by Collier and Hoeffler [2000] over whether civil wars are primarily caused by "greed" (i.e., economic opportunity) or "grievance"; they argue that the correlation between resource dependence and civil war supports the "greed" hypothesis, inferring that rebel groups are funding themselves by looting natural resources. The cases in this sample provide only weak support for the Collier-Hoeffler argument. If interpreted strictly, the Collier-Hoeffler mechanism is strongly rejected: it occurred in none of the thirteen cases. But if the definition of "resource looting" is expanded to include related phenomena – such as the sale of resource futures, the extortion of money from firms building resource infrastructure, and the incentives facing neighboring governments – then the Collier-Hoeffler looting mechanism is found in four of the 13 cases. Even the expanded Collier-Hoeffler mechanism accounts for fewer than half of the cases in which resources are linked to the initiation of conflict. In five cases there is evidence of a "grievance" mechanism, while in two cases there is indication of a "predation" mechanism.[29]

The second finding concerns the discrepancy between Collier and Hoeffler [2000], who find that resource dependence is tied to the incidence of conflict but not its

[29] This slightly understates the validity of the Collier-Hoeffler claim: two of the "grievance" conflicts cannot be classified as civil wars because they did not meet the "thousand deaths" criteria.

duration, and Fearon [2001], who finds a correlation between resource dependence and the duration of civil wars but not their incidence. This paper finds evidence to support both claims: resource wealth is linked to the onset of conflict in 8 of 13 cases and the duration of conflict in 9 of 13 cases. The differences between the Collier and Hoeffler findings and the Fearon findings may be in part an artifact of the different ways they code the beginning and end of civil wars.

A third finding is that claims that resource wealth heightens the intensity of conflict are misspecified. Observers often note that combatants fight for the control of natural resources, and that these battles appear to increase the war's overall casualty rate. But they fail to note that natural resources also lead to battlefield cooperation that may reduce the casualty rate. In six of the thirteen cases examined here, combatants fought battles over resource wealth; in the same six cases, they also laid down their arms (at other junctures) to cooperatively exploit these same resources. These two effects roughly offset each other, which implies that resource wealth had no net influence on the intensity of these conflicts.

Yet this study also finds that resource wealth can heighten casualty rates through a different mechanism: pre-emptive repression, which is a government's use of terror to preclude the rise or growth of rebel movements that may interfere with resource exploitation. This mechanism amplified the intensity of conflict in three cases, and may help account for the statistical link between resources and civil war.

The fourth finding is that resources appear to play a different role in separatist conflicts than non-separatist conflicts. In non-separatist conflicts, resources were generally linked to the incidence of civil war through looting and predation; in separatist

conflicts, they were mostly linked by grievances over the distribution of resource wealth. In non-separatist conflicts, resources had no net influence on conflict intensity; in separatist conflicts, they sometimes heightened the intensity of conflict due to pre-emptive repression by the government.

The fifth finding is that lootable resources are more likely to lengthen conflicts that non-lootable resources. The degree to which a resource is lootable has no obvious influence in this sample on the initiation of conflict, but once conflict begins the exploitation of unlootable resources – such as oil, natural gas, and deep-shaft minerals – either comes to a halt, or must be protected from battle. If they are protected from battle and continue to operate they will almost certainly benefit the stronger side in the conflict – since it is the side most likely to be able to provide the requisite security guarantees – and hence are unlikely to lengthen the war. But lootable resources – like alluvial gemstones, which can be exploited by small-scale miners and off-duty soldiers – can provide funding to either side. In this sample of cases, the exploitation of lootable resources appeared to lengthen six conflicts by helping the weaker party fund its operations. It two of these six cases, looting had a second consequence, prolonging the conflict by making war look more profitable than a prospective peace agreement. Although resource lootability created agency problems in two cases, agency problems had no consistent effect on conflict duration: they lengthened one war (Liberia) but shortened another (Cambodia).

The sixth finding is that a futures market for post-combat resource rights – what I call the "booty futures" market – has emerged in sub-Saharan Africa. The market enables the weaker party to raise money to initiate or prolong conflicts; in this sample it

contributed to the onset of at least two major wars (Sierra Leone and the Congo Republic) and the prolongation of three (Angola, Sierra Leone, and the DRC II). The market for booty futures may have far-reaching consequences for resource-rich states.

The seventh and final finding is that there is good evidence at the case study level – based on a sample that is biased but relatively large – that natural resource wealth is causally linked to civil conflict. This study cannot dismiss the possibility that the natural resource-civil war correlation is, in part, spurious, or that causality runs in the opposite direction. Indeed, there is good evidence in at least one case (Angola) that the onset of civil war made the economy more dependent on resource exports [Minter 1994]. But in these 13 conflicts there is strong evidence that resource wealth has made conflict more likely to occur, and last longer and produce more casualties when it does occur.

Figure 1: Causal Mechanisms

Incidence of Civil War
1. **Looting** by Potential Rebels → Start-up Costs Funded→ Civil War 2. Resource Extraction → **Grievances** → Civil War 3. Resource Extraction → **Predation** opportunities → Rise of violent non-state groups → Civil War
Duration of Civil War
4. **Looting** by weaker (stronger) party → more arms → war prolonged (shortened) 5. War (peace) appears financially profitable → less (more) **incentive** to sign peace accord → war prolonged (shortened) 6. Looting by either party → **agency** problems → leaders' peacemaking (warfighting) capacity undermined → war prolonged (shortened)
Intensity of Civil War
7. Two sides engage in **resource battles** → more casualties 8. Two sides engage in **cooperative plunder** → fewer casualties 9. **Pre-emptive repression** by governement to protect resources → more casualties

Table 1: Recent Civil Conflicts Reportedly Linked to Resource Wealth

Country	R/GDP	Duration	Resources
Afghanistan	.039	1978-	Gems, opium
Angola (UNITA)	.360	1975-	Oil, Diamonds
*Angola (Cabinda)**	.476	1975-	Oil
Burma (Karen NLA)	n.a.	1949-	Timber, tin, gems, opium
*Burma (Kachin)**	.140	1961-94	Gems
Cambodia	.007	1978-97	Timber, gems
Colombia	.130	1984-	Oil, gold, coca
Congo, Rep.	.505	1997	Oil
Congo, Dem. Rep.	.521	1996-97	Copper, coltan, diamonds, gold, cobalt
Congo, Dem. Rep.	.521	1998-	Copper, coltan, diamonds, gold, cobalt
El Salvador	.034	1977-92	Coffee
Indonesia (Aceh)	.248	1975-	Natural gas
*Indonesia (W Papua)**	.073	1969-	Copper, gold
Liberia	.393	1989-96	Timber, diamond, iron, palm oil, cocoa, coffee, marijuana, rubber, gold
Nigeria (Biafra)	.062	1967-70	Oil
*Nigeria (Ijaw)**	.457	1995-	Oil
*Papua New Guinea**	.230	1988-	Copper, gold
Peru	.142	1980-1995	Coca
*Senegal**	.030	1990-	Cashews, marijuana
Sierra Leone	.040	1991-2000	Diamonds
Sudan	.024	1983-	Oil

Separatist conflicts are listed in italics. R/GDP measures the ratio of resource exports to GDP for the country as a whole in the year prior to the outbreak of conflict; if that year is unavailable, figures for the closest year with available data are used. Most of these figures are taken from Collier and Hoeffler 2001; the remaining were calculated based on data in World Bank 2001.

*conflict did not generate 1000 battle deaths in any twelve-month period.

Table 2: Summary of Findings

	Incidence	Duration	Intensity
Afghanistan	No	Longer	No
Angola (UNITA)	No	Longer	Mixed
Angola (Cabinda)	Yes	None	No
Cambodia	No	Mixed	Mixed
Congo, Rep.	Yes	Shorter	No
Congo, Dem. Rep. I	Yes	Shorter	No
Congo, Dem. Rep. II	Yes	Longer	Mixed
Indonesia (Aceh)	Yes	None	Yes
Indonesia (W Papua)	No	None	Yes
Liberia	No	Longer	Mixed
Papua New Guinea	Yes	None	No
Sierra Leone	Yes	Longer	Mixed
Sudan	Yes	Longer	Yes

Cases in italics are separatist conflicts

Table 3: Origins of Conflict

	Looting?	Grievance?	Predation?
Afghanistan	No	No	No
Angola (UNITA)	No	No	No
Angola (Cabinda)	No	Yes	No
Cambodia	No	No	No
Congo, Rep.	Yes	No	No
Congo, Dem. Rep. I	No	No	Yes
Congo, Dem. Rep. II	Yes	No	No
Indonesia (Aceh)	No	Yes	No
Indonesia (W Papua)	No	No	No
Liberia	No	No	No
Papua New Guinea	No	Yes	No
Sierra Leone	Yes	Yes	Yes
Sudan	Yes	Yes	No

Table 4: Origins of Conflict, types of looting[30]

	Extraction	Futures	Extortion	Neighbor
Afghanistan	No	No	No	No
Angola (UNITA)	No	No	No	No
Angola (Cabinda)	No	No	No	No
Cambodia	No	No	No	No
Congo, Rep.	No	Yes	No	No
Congo, Dem. Rep. I	No	No	No	No
Congo, Dem. Rep. II	No	No	No	Yes
Indonesia (Aceh)	No	No	No	No
Indonesia (W Papua)	No	No	No	No
Liberia	No	No	No	No
Papua New Guinea	No	No	No	No
Sierra Leone	No	Yes	No	Yes
Sudan	No	No	Yes	No

Table 5: Origins of Conflict, types of grievance

	Distribution	Extraction
Afghanistan	No	No
Angola (UNITA)	No	No
Angola (Cabinda)	Yes	No
Cambodia	No	No
Congo, Rep.	No	No
Congo, Dem. Rep. I	No	No
Congo, Dem. Rep. II	No	No
Indonesia (Aceh)	Yes	Yes
Indonesia (W Papua)	No	No
Liberia	No	No
Papua New Guinea	Yes	Yes
Sierra Leone	Yes	No
Sudan	Yes	No

[30] In both the DRC II and Sierra Leone cases, the presence of resource wealth led to military intervention from a neighboring country, but I code these cases differently. In the case of Sierra Leone, I treat this as both an intervention from a neighboring state, and the sale of booty futures by the Sierra Leone rebel group (the Revolutionary United Front) to a Liberian group (the National Patriotic Front of Liberia). In the case of the DRC 1998 conflict, I treat this only as the intervention of neighboring states (Rwanda and Uganda). This is because in Sierra Leone, an autonomous rebel group (RUF) existed prior to the intervention, while no such group existed in the DRC conflict.

Table 6: Duration Effects

	Looting	Agency	Incentive	Net Effect
Afghanistan	Yes	No	No	Longer
Angola (UNITA)	Yes	No	No	Longer
Angola (Cabinda)	No	No	No	None
Cambodia	Yes	Yes*	No	Mixed
Congo, Rep.	No	No	Yes*	Shorter
Congo, Dem. Rep. I	Yes*	No	No	Shorter
Congo, Dem. Rep. II	Yes	No	Yes	Longer
Indonesia (Aceh)	No	No	No	None
Indonesia (W Papua)	No	No	No	None
Liberia	Yes	Yes	Yes	Longer
Papua New Guinea	No	No	No	None
Sierra Leone	Yes	No	No	Longer
Sudan	Yes	No	No	Longer

*Made the conflict shorter

Table 7: Duration, types of looting

	Extraction	Futures	Extortion
Afghanistan	Yes	No	No
Angola (UNITA)	Yes	Yes	No
Angola (Cabinda)	No	No	No
Cambodia	Yes	No	No
Congo, Rep.	No	No	No
Congo, Dem. Rep. I	No	Yes	No
Congo, Dem. Rep. II	Yes	Yes	No
Indonesia (Aceh)	No	No	No
Indonesia (W Papua)	No	No	No
Liberia	Yes	No	No
Papua New Guinea	No	No	No
Sierra Leone	Yes	Yes	No
Sudan	No	No	Yes

Table 8: Intensity

	Battles	Plunder	Repress	Net Effect
Afghanistan	No	No	No	None
Angola (UNITA)	Yes	Yes	No	Mixed
Angola (Cabinda)	No	No	No	None
Cambodia	Yes	Yes	No	Mixed
Congo, Rep.	No	No	No	None
Congo, Dem. Rep. I	No	No	No	None
Congo, Dem. Rep. II	Yes	Yes	No	Mixed
Indonesia (Aceh)	No	No	Yes	Increase
Indonesia (W Papua)	No	No	Yes	Increase
Liberia	Yes	Yes	No	Mixed
Papua New Guinea	No	No	No	None
Sierra Leone	Yes	Yes	No	Mixed
Sudan	Yes	Yes	Yes	Increase

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