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Source: *International Organization*, Vol. 58, No. 1, (Winter, 2004), pp. 35-67

Published by: Cambridge University Press on behalf of the International Organization  
Foundation

Stable URL: <http://www.jstor.org/stable/3877888>

Accessed: 14/08/2008 15:55

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# How Do Natural Resources Influence Civil War? Evidence from Thirteen Cases

Michael L. Ross

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**Abstract** Recent studies have found that natural resources and civil war are highly correlated. Yet the causal mechanisms behind the correlation are not well understood, in part because data on civil wars is scarce and of poor quality. In this article I examine thirteen recent civil wars to explore the mechanisms behind the resource-conflict correlation. I describe seven hypotheses about how resources may influence a conflict, specify the observable implications of each, and report which mechanisms can be observed in a sample of thirteen civil wars in which natural resources were “most likely” to have played a role. I find that two of the most widely cited causal mechanisms do not appear to be valid; that oil, nonfuel minerals, and drugs are causally linked to conflict, but legal agricultural commodities are not; and that resource wealth and civil war are linked by a variety of mechanisms, including several that others had not identified.

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Recent studies have found that natural resources and civil war are highly correlated.<sup>1</sup> According to Collier and Hoeffler,<sup>2</sup> states that rely heavily on the export of primary commodities face a higher risk of civil war than resource-poor states. Fearon and Laitin, and de Soysa,<sup>3</sup> each using unique data sets, find that oil-exporting states are more likely to suffer from civil wars. Fearon also shows that the presence of certain types of resources (gemstones and narcotics) tends to make wars last longer;<sup>4</sup> similarly, Doyle and Sambanis demonstrate that civil wars are harder to end when they occur in countries that depend on primary commodity exports.<sup>5</sup> Buhaug and Gates show that the presence of mineral resources in a conflict zone tends to increase a conflict’s geographical scope.<sup>6</sup>

For their comments on earlier drafts, I am grateful to Paul Collier, J. R. Deshazo, Pierre Englebert, Barbara Geddes, Anke Hoeffler, Macartan Humphreys, Philippe Le Billon, Roy Licklider, Dan Posner, Ken Shultz, and Libby Wood.

1. For a review of recent findings on national resources and civil war, see Ross 2004.
2. Collier and Hoeffler 1998 and 2002a.
3. See Fearon and Laitin 2003; de Soysa 2002.
4. Fearon 2004.
5. Doyle and Sambanis 2000.
6. Buhaug and Gates 2002.

There is little agreement among these and other scholars on why natural resources have these effects: most scholars have little to say about causal mechanisms—the processes that link “resources” to “conflict.” Journalists often claim that resources have “fueled” a given conflict, but are vague about how this occurred.

Identifying the mechanisms that link resources to civil war would make these theories more complete and persuasive: statistical correlations can only take one so far. Specifying the mechanism would also address three problems in the natural resources–civil wars literature. First, it could help resolve nagging concerns about endogeneity and spuriousness. The natural resource–civil war correlation, for example, might be the opposite of what it appears: 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—as the major force in the economy by default. Even though most scholars employ lagged independent variables in their regressions, this method does not rule out reverse causality: because civil wars do not officially “begin” until they have crossed some threshold of violence, they might be preceded by years of low-level hostilities that drive off manufacturing firms, producing a higher level of resource dependence before the civil war is coded as commencing.

The natural resource–civil war correlation could also be spurious: both civil war and resource dependence might be independently caused by some unmeasured third variable, such as a 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; this state 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.

Second, identifying the causal mechanisms could help settle disagreements among the statistical studies over which resources matter, and what dimensions of conflict they tend to influence. Collier and Hoeffler,<sup>7</sup> for example, find that primary commodities of all types—including oil, minerals, and agricultural goods—are linked to the onset of war. Both Fearon and Laitin, and de Soysa dispute this claim<sup>8</sup> and suggest that only oil matters. Collier, Hoeffler, and Söderbom suggest that primary commodities have no influence on the duration of conflict, a claim that is apparently contradicted by Doyle and Sambanis, and Stedman.<sup>9</sup> Fearon, meanwhile, suggests that contraband commodities, such as diamonds and drugs, make wars last longer.<sup>10</sup> A closer look at case studies may help resolve some of these contradictions.

7. Collier and Hoeffler 2002a.

8. See Fearon and Laitin 2003; de Soysa 2002.

9. See Collier, Hoeffler, and Söderbom 2001; Doyle and Sambanis 2000; Stedman 2001.

10. Fearon forthcoming.

Finally, different mechanisms suggest different policy interventions. For example, if mining causes conflict because it produces grievances over environmental degradation and access to jobs, the solution might be greater community involvement on the part of mining firms. But if conflicts occur because mining provides extortion opportunities for rebel groups and warlords, the solution might be stricter mine site security and less community involvement. The United Nations (UN) Security Council, the World Bank, and the Group of 8 (G8) industrial nations have all been engaged in policy responses to the resource–civil war issue, making this concern highly salient.

Identifying the correct causal mechanisms, however, is not a simple endeavor. Some of the purported causal mechanisms have been carefully specified, but most have not. Once specified, it is not clear how these mechanisms can be tested. If one had sufficiently high-quality data for a large number of civil wars, one could use a large-*N* study, placing intervening variables on the right-hand side of regressions on war onset or war duration. Unfortunately, data on the requisite dimensions of conflict are scarce and typically of poor quality.

In this article I use a small-*N* approach to circumvent this problem. I begin by identifying seven causal mechanisms that might account for the resource–civil war correlation, and I suggest how they might be confirmed or disconfirmed in case studies.<sup>11</sup> I then select a sample of thirteen recent civil wars on a “most likely” basis, as described in the second section. In the third section I report which of the causal mechanisms—or rather, which of their observable implications—are present in the thirteen cases, as well as in subsets of “separatist” and “nonseparatist” civil wars; I also illustrate some of the causal mechanisms at work. In the fourth section I describe four additional mechanisms that I observed in the sample, but which had not been hypothesized *ex ante*. The final section concludes.

My approach is based on a “most likely” research design, in which a scholar examines in depth a single case in which a hypothesized causal relationship is believed “most likely” to be found; if it is present, the hypothesis is pronounced “plausible,” and if not, it is deemed “falsified.”<sup>12</sup> Similar to other small-*N* methods, the most likely approach has valuable properties: it pays close attention to the validity of concepts and to causal linkages; it helps account for variables that are difficult to measure; and it is sensitive to case-specific factors. The heightened attention to validity, however, has a cost: because the sample is biased, the findings cannot be generalized to some larger set of unexamined cases. Still, a systematic study of most likely cases can probe and refine the plausibility of existing hypotheses and generate new ones for future, out-of-sample tests.

My analysis generates eight findings about the thirteen cases: (1) certain types of natural resources—oil, gemstones, and drugs—have indeed influenced the onset

11. I also describe two further hypotheses that, unfortunately, cannot be confirmed or disconfirmed at the case study level.

12. Eckstein 1975.

and duration of civil wars; (2) other types of primary commodities—in particular, legal agricultural commodities—did not have an effect on civil wars; (3) there was little or no evidence to support two of the most commonly cited causal mechanisms; (4) illicit drugs did not lead to the onset of conflict, although they did lengthen preexisting conflicts; (5) resources played a different role in the sample's three separatist conflicts than they did in the ten nonseparatist conflicts; (6) resources did not necessarily make conflicts longer or more severe—at times they appeared to shorten conflicts and promote cooperation among opposing sides; and (7) most civil wars in the sample were influenced by natural resources through several mechanisms simultaneously, which may help account for the analytical muddle of some earlier studies. (8) Finally, several unanticipated mechanisms linked resources and conflict in the thirteen cases: foreign intervention, futures contracts for war booty, and preemptive repression in resource-rich areas.

### **Hypotheses About Resources and Conflict**

Below I describe seven testable hypotheses about the mechanisms that link natural resources and civil war. For the sake of completeness, I also discuss two further hypotheses that I am unable to test at the case study level. The nine mechanisms are listed in Figure 1. The first four hypotheses describe ways that resource wealth could lead to the onset of conflict; the next three suggest ways that resource wealth could influence the duration of a conflict; and the final two describe how resource wealth might influence the intensity of a conflict—that is, the casualty rate.<sup>13</sup>

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 at least one thousand combat-related deaths over some period of time. 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.

13. I use the terms “resource wealth” and “resource dependence” interchangeably here. Most of 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, and agricultural commodities) to gross domestic product (GDP). Most scholars treat this as an indicator of the relative abundance of natural resource wealth in the economy. But resource dependence is a less-than-ideal indicator: it is sensitive to changes in the size of the nonresource sector, and the size of GDP; moreover, it fails to capture natural resources that are produced and consumed domestically, or exported illegally. Two of the cases in my sample (Afghanistan and Cambodia) were strongly influenced by illicit resources, even though they have low levels of resource dependence (see Table 1).

To avoid these problems in the case studies, I examine whether the conflicts were influenced by any type of domestically produced and commercially valuable natural resource, regardless of its legality or export status.

<b>Hypotheses on the onset of civil war</b>
1. <b>Looting</b> by potential rebels → startup costs funded → civil war
2. Resource extraction → <b>grievances</b> among locals → civil war
3. Resource extraction → incentive for <b>separatism</b> → civil war
4. State depends on resource revenues → <b>state weakness</b> → civil war*
<b>Hypotheses on the duration of civil war</b>
5. <b>Looting</b> by weaker (stronger) party → more arms → war prolonged (shortened)
6. War (peace) appears financially profitable → less (more) <b>incentive</b> for peace → war prolonged (shortened)
7. Resource wealth in separatist region → commitment problem → war prolonged*
<b>Hypotheses on the intensity of civil war</b>
8. Two sides engage in <b>resource battles</b> → more casualties
9. Two sides engage in <b>cooperative plunder</b> → fewer casualties

\*Hypothesis is not tested in the sample.

FIGURE 1. *Hypothesized causal mechanisms*

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 useful to explore whether resource wealth has an influence on the intensity of civil wars.

The nine hypotheses below were taken from other scholars' accounts of resource-based civil wars. Often these scholars discussed causal mechanisms briefly or indirectly; I have tried to turn their implicit hypotheses into explicit ones. Some of the mechanisms are linked to each other. By treating them as discrete mechanisms, I can specify them more clearly and test them more directly. None of the mechanisms are mutually exclusive, and most scholars cited below discuss multiple causal mechanisms.

### *Onset of Civil War*

The presence of resource wealth might cause the onset of civil wars in four ways, three of which can be tested with case studies. Perhaps the most influential hy-

pothesis on resources and conflict comes from the work of Collier and Hoeffler.<sup>14</sup> I refer to this hypothesis as the “looting” mechanism. Collier and Hoeffler suggest that explanations for civil wars fall into two categories: those that focus on the motives or “grievances” of rebel organizations, and those that focus on their funding. The most significant funding opportunities for insurgents, they suggest, tend to come from exportable natural resources: if rebels can extract and sell resources, or extort money from those who do, then they are more likely to launch a civil war. Their explanation parallels Keen’s argument that in the post–Cold War era, rebel groups have replaced the funding they once received from their superpower sponsors with money from looted natural resources.<sup>15</sup>

The Collier-Hoeffler argument comes from their observation that natural resources offer rebel groups unusual funding opportunities, because resources typically produce rents and are location-specific. If rebels try to loot or extort money from manufacturing firms, the firms will relocate to a safe area or be forced out of business; but if rebels extort money from resource firms, the firms cannot relocate and can often make payments to rebels and still turn a profit. States whose economies are more heavily based on resource exports should, therefore, also face a higher risk of civil wars.

Collier and Hoeffler do not suggest that rebels launch a conflict in anticipation of resource wealth; rather, they argue that rebels use looted resource wealth in the prewar phase to buy arms and hire soldiers—thus funding the “start-up costs” of initiating a rebellion. This subsequently allows them to challenge government forces strongly enough to generate at least one thousand battle-related deaths, thus producing a conflict large enough to be classified as a “civil war.”

In their empirical tests, Collier and Hoeffler find that the effect of a country’s primary commodity exports on its conflict risk is “both highly significant and considerable”; they state, “we have interpreted (this correlation) as being due to the opportunities such commodities provide for extortion, making rebellion feasible and even attractive.”<sup>16</sup> They reject the possibility that primary commodities lead to conflict through a grievance mechanism.

The “looting” mechanism might be stated as the following:

*H1: Primary commodities increase the probability of civil war by enabling nascent rebel groups to raise money either by extracting and selling the commodities directly, or by extorting money from others who do.*

14. Collier and Hoeffler 2002a.

15. Keen 1998.

16. Collier and Hoeffler 2002a, 16. Collier and Hoeffler 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, such as Hegre, estimate the correlation to be linear. Hegre 2002.

If this hypothesis is correct, then in case studies one should observe rebel organizations raising money before the start of the civil war, through the extraction and sale of natural resources, or from the extortion of resource firms.<sup>17</sup>

The second possible mechanism—which has been widely cited by policy analysts and journalists—is a “grievance” mechanism. It suggests that resource extraction creates grievances among the local population, because of land expropriation, environmental hazards, insufficient job opportunities, and the social disruptions caused by labor migration; these grievances, in turn, lead to civil war. Klare, for example, suggests that “resource wars” are caused in part by logging or mining firms that are “ravaging the environment” and “driving off the people who have long inhabited the area or depriving them of any benefits from the appropriation of their traditional lands.”<sup>18</sup> Gedicks and Switzer offer similar arguments; so do many journalists.<sup>19</sup> These arguments suggest the following:

*H2: Resource wealth increases the probability of civil war by causing grievances over insufficiently compensated land expropriation, environmental degradation, inadequate job opportunities, and labor migration.*

If resource exploitation leads to civil war through a grievance mechanism, one should observe the rebels criticizing resource firms or the resource sector in their propaganda; and one should see rebels make resource firms a target of their violence, apart from looting or extortion attempts. Of course, neither of these indicators would prove that insurgents are truly motivated by resource-related grievances. But these indicators would imply that the rebels believe that resource issues are salient concerns in the population they wish to mobilize, and that raising these issues will help them build support.

A third possibility is that resource wealth, if it is located on a country’s periphery or in an area populated by an ethnic minority, will give local residents a financial incentive to establish a separate state, thus raising the risk of a civil war. Le Billon discusses this mechanism; Collier and Hoeffler offer it as well.<sup>20</sup> It implies the following:

*H3: Resource wealth increases the probability of civil war by giving residents in resource-rich areas an incentive to form a separate state.*

17. The looting mechanism suggests a second observable implication: if looting resource firms is easier, or more sustainable, than looting nonresource firms, one 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.

18. Klare 2001, 208.

19. See Gedicks 2001; Switzer 2001; Norimitsu Onishi, “As Oil Riches Flow, Poor Village Cries Out,” *New York Times*, 22 December 2002, A1. These theories might be seen as part of a larger literature arguing that grievances, often proxied by poverty or inequality, tend to influence the danger of civil war. See, for example, Muller and Weede 1990; Auvinen 1997; Dudley and Miller 1998.

20. See Billon 2001; Collier and Hoeffler 2002b.

If this mechanism is valid, one should observe in case studies that (1) the conflict is a separatist war; (2) the conflict began after the separatist region was identified as having exploitable resource wealth; and (3) the rebel group discusses the unfair distribution of resource wealth in its propaganda. One would not necessarily observe rebels attacking resource firms in this instance, because they should in principle support resource extraction and may not wish to alienate companies working in the sector. To distinguish the second and third mechanisms from each other—because both entail local grievances around resource extraction—I look for evidence of the second mechanism only in nonseparatist conflicts, and the third mechanism only in separatist conflicts.

Fearon and Laitin, among others, have suggested a fourth mechanism: that resource wealth—in particular, oil—causes “state weakness,” which in turn increases the probability of civil war.<sup>21</sup> The claim that oil wealth influences the character of the state has a long heritage among Middle East scholars: they commonly suggest that oil wealth relieves governments of the need to levy taxes, which in turn produces a state that is less responsive to its citizens.<sup>22</sup> Karl developed this argument further, suggesting that oil wealth also tends to impede the ability of states to resolve social conflicts.<sup>23</sup> Fearon and Laitin adopt this argument, and further suggest that the absence of a “socially intrusive and elaborate bureaucratic system to raise revenues” will make states more susceptible to civil war.<sup>24</sup> This claim could be stated as the following:

*H4: Oil wealth increases the probability of civil war by weakening the state's bureaucratic capacity.*

It is difficult to know what the observable implications of this hypothesis are at the case study level. The mechanisms that may link oil to bureaucratic weakness—and more problematically, bureaucratic weakness to subsequent conflict—could be diffuse and subtle. Advocates of this mechanism must further specify its logic before it can be tested with case studies.

### *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; two of them have implications that can readily be observed in case studies.

21. Fearon and Laitin 2003.

22. See, for example, Mahdavy 1970; Beblawi and Luciani 1987; Chaudhry 1997. Although these scholars discuss oil, their arguments may apply to natural gas as well.

23. Karl 1997.

24. Fearon and Laitin 2003, 81.

The first mechanism, once again, is looting. Many observers—including scholars, nongovernmental organizations (NGOs), and analysts from international organizations—have suggested that resource wealth can lengthen a conflict if it enables the rebels to fund themselves and hence continue fighting instead of being crushed or forced to the negotiating table.<sup>25</sup> Many journalistic accounts of recent wars in the mineral-rich states of Central and West Africa—including Liberia, Sierra Leone, the Democratic Republic of Congo, and Angola—allude to this mechanism when they claim that resources are “fueling” a conflict.

The mechanism entails two key assumptions: that the rebels are the weaker side; and that strengthening the weaker side tends to lengthen conflicts. In fact, there is evidence from interstate conflicts to support the latter claim: Bennett and Stam find that international conflicts tend to last longer when the two sides have more equal resources.<sup>26</sup>

If one assumes that when the weaker side in a civil war gains additional resources, the conflict will be lengthened, one must also assume that when the stronger side gains additional resources, the conflict will be shortened, by bringing about a quicker victory or settlement.<sup>27</sup> This implies the following:

*H5: Resource wealth tends to increase (decrease) the duration of civil wars when it provides funding to the weaker (stronger) side.*

If this mechanism has occurred, there should be evidence that one side or the other 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, based on the conjecture that combat is likely to continue as long as the weaker party does not run out of money.<sup>28</sup>

Some scholars have suggested a second duration-related mechanism: that resource wealth discourages peace settlements, if wartime looting is sufficiently profitable for either soldiers or their commanding officers. Sherman, for example, suggests that

25. See, for example, UN Panel of Experts 2000 and 2001; Sherman 2000; and the reports of Global Witness, a London-based NGO, available at ([www.globalwitness.org](http://www.globalwitness.org)).

26. Bennett and Stam 1996.

27. This raises several important problems for the coding of case studies. First, a judgment must be made about the relative military strength of the two sides before the resource is exploited, to avoid the problem of endogeneity. Second, it is necessary to restrict the analysis to contested resources. Virtually all governments derive at least a fraction of their revenue from the sale of natural resources; but I only treat these as relevant if they are located in the contested terrain. For civil wars that are national in scope, I treat all resources as contested.

28. This is less likely to be true in separatist conflicts than in nonseparatist conflicts. As Fearon points out, separatist and nonseparatist 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. Fearon 2004.

Rebel groups in Angola, Sierra Leone, Democratic Republic of Congo (DRC) and elsewhere enrich themselves through the sale or exchange of diamonds . . . economic interests not only shape the conflict, but, if the economic advantage of fighting outweighs that of peace, perpetuate it as well.<sup>29</sup>

Fearon makes a slightly different version of this argument, suggesting that the presence of lootable resources could exacerbate principal-agent problems within one or both of the armies by giving soldiers an incentive to accumulate personal wealth instead of obeying their commanding officers.<sup>30</sup> This could make it harder for negotiators to forge a binding, enforceable settlement.

Once again, this mechanism has a seldom-noticed corollary: if commanding officers believe that peacetime profits would be greater than wartime profits, it could help induce them to reach a settlement. Similarly, if soldiers believe that peace would be more profitable than war, they may refuse to fight and force their commanders to negotiate or surrender. In hypothesis form, this “incentive” mechanism and its corollary may be stated as the following:

*H6: Resource wealth tends to increase (decrease) the duration of civil wars by offering combatants a financial incentive to oppose (support) a peace settlement.*

This hypothesis 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, and it hardly proves that the parties are deliberately lengthening the conflict. One must instead determine that one of two possible scenarios has transpired. First, high-level officers, who have the ability to negotiate (or block) a treaty, believe they would profit more if the war continues than if it comes to a negotiated end. If this is occurring, one should observe: (1) evidence that resource looting is generating personal profits for high-level officers; (2) evidence that officers would not be compensated in some comparable way by a proposed peace treaty; and (3) evidence that officers chose not to sign or adhere to an unprofitable peace accord. Conversely, if resource wealth is facilitating a peace accord, one should observe officers who support a peace agreement subsequently profit from—or attempt to profit from—the resource industry.

Alternatively, if resource wealth is lengthening a conflict through the incentives it creates for the rank and file, one should observe the following: (1) that at least one army in the conflict suffers from major discipline problems; (2) that disobedient soldiers are personally benefiting from resource looting; and (3) that these discipline problems have made it harder for that party to sign or adhere to a peace settlement.

29. Sherman 2000, 699.

30. Fearon 2004.

If the same mechanism has shortened a conflict, one should again see: (1) that at least one army suffers from major discipline problems; (2) that disobedient soldiers are personally benefiting from resource looting; and (3) that these problems helped cause their army's defeat or forced it to sign a peace agreement that it might otherwise have opposed.

Finally, Fearon has suggested a third way in which resource abundance might lengthen separatist conflicts.<sup>31</sup> He specifies a model in which the likelihood that rebels will settle a conflict through an agreement for regional autonomy depends, in part, on whether 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.<sup>32</sup> The net result is that separatist conflicts over resource-rich regions should be unusually difficult to settle, because of the commitment problems that are aggravated by resource wealth. It may be phrased as the following:

*H7: Resource wealth tends to increase the duration of separatist civil wars by making it less likely that the government will adhere to a peace accord that gives the region fiscal autonomy.*

Unfortunately, this final mechanism is hard to verify in case studies unless one knows a great deal about the perceptions and motivations of rebel leaders. For this reason, I do not attempt to test it in these case studies.

### *Intensity*

Resource wealth might also influence the intensity of civil conflicts, producing more (or fewer) conflict-related deaths over time. Two mechanisms might bring this about. The most obvious mechanism is resource-related combat, in which opposing armies battle over resource-rich territory. Many observers of Africa's recent civil wars have suggested that combatants are "fighting for control" of a resource, implying the following:

*H8: Resource wealth tends to increase the casualty rate during a civil war by causing combatants to fight for resource-rich territory that would otherwise have little value.*

31. Ibid.

32. The Fearon model includes the further suggestion that resource wealth discourages a peace settlement when it provides rebels with a source of wealth during combat. Because this is already covered by the "looting" and "incentive" hypotheses (H5 and H6), I do not include it here.

I look for evidence in each case of resource-related battles, over sites that had little or no intrinsic strategic value.

The second mechanism might reduce the intensity of civil wars. Keen describes a number of wars in which battlefield opponents laid down their arms and cooperated to extract resources;<sup>33</sup> this suggests the following:

*H9: Resource wealth tends to decrease the casualty rate during a civil war by causing combatants to cooperate in resource exploitation.*

If this type of cooperative plunder occurs, there should be reports of substantial wartime trade and cooperation in resource exploitation between the two sides. From this, one might infer that the presence of resource wealth has reduced the casualty rate.<sup>34</sup>

## Case Selection

The thirteen cases in the sample were selected from the Collier-Hoeffler list of thirty-six civil wars that began or continued between 1990 and 2000 (see Table 1).<sup>35</sup> The cases were chosen on a “most likely” basis: the sample includes all civil wars that occurred between 1990 and 2000 in which scholars, nongovernmental organizations, or UN agencies suggested that natural resource wealth, or natural resource dependence, influenced the war’s onset, duration, or casualty rate (see Table 2).<sup>36</sup>

I employ a broad definition of “natural resources,” encompassing oil, gas, gemstones, nonfuel minerals, timber, and agricultural commodities, including illicit

33. Keen 1998.

34. I am deliberately omitting a third 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.

35. I made several amendments to the original Collier-Hoeffler list. Collier and Hoeffler treat the conflicts in four countries (Afghanistan, Angola, Liberia, and Sierra Leone) as making up two successive wars each. Collier and Hoeffler 2002a. For convenience, I treat each of them as a single conflict. This has no bearing on my results. I also—after consulting Collier and Hoeffler—changed their coding for Indonesia, replacing the East Timor conflict (which I regard as an invasion and temporary occupation of a separate country, and hence not a civil war) with the Aceh conflict (which meets their strict definition of a civil war, generating at least one thousand battle-related conflicts in a calendar year). I believe this corrects a miscoding in the original Singer-Small data set.

36. I do not wish to claim that the sample is exhaustive: there may be other conflicts where resource wealth has played an important but subtle—and perhaps, difficult to observe—role. In these thirteen cases, however, there was prima facie evidence that natural resources had influenced the conflict.

TABLE 1. *Civil wars in the 1990s*

<i>Country</i>	<i>Primary exports/GDP</i>	<i>Duration</i>
<b>Congo Republic</b>	<b>0.505</b>	<b>1997</b>
<b>Angola</b>	<b>0.476</b>	<b>1975–2002</b>
<b>Liberia</b>	<b>0.393</b>	<b>1989–96</b>
Iraq	0.22	1985–92
<b>Indonesia</b>	<b>0.219</b>	<b>1976–</b>
Sri Lanka	0.211	1983–
El Salvador	0.209	1979–92
Algeria	0.179	1991–
Nicaragua	0.166	1982–90
Philippines	0.146	1972–96
<b>Congo, Dem. Rep.</b>	<b>0.141</b>	<b>1997–99</b>
<b>Congo, Dem. Rep.</b>	<b>0.141</b>	<b>1996</b>
<b>Peru</b>	<b>0.13</b>	<b>1982–96</b>
<b>Sierra Leone</b>	<b>0.12</b>	<b>1991–2000</b>
Russia	0.117	1999–
Yemen	0.105	1990–94
Somalia	0.103	1988–92
Mozambique	0.099	1976–92
<b>Colombia</b>	<b>0.094</b>	<b>1984–</b>
<b>Sudan</b>	<b>0.086</b>	<b>1983–</b>
<b>Myanmar/Burma</b>	<b>0.078</b>	<b>1983–95</b>
Russia	0.066	1994–96
Ethiopia	0.065	1974–91
Burundi	0.064	1991–
<b>Cambodia</b>	<b>0.052</b>	<b>1970–97</b>
Rwanda	0.047	1990–94
Turkey	0.038	1991–
Lebanon	0.036	1975–92
<b>Afghanistan</b>	<b>0.033</b>	<b>1992–2001</b>
Yugoslavia	0.032	1990–92
India	0.018	1984–94
Azerbaijan	N.A.	1991–94
Bosnia	N.A.	1992–95
Georgia	N.A.	1991–93
Tajikistan	N.A.	1992–94
Yugoslavia	N.A.	1998–99

*Source:* Adapted from Collier and Hoeffler 2001.

*Note:* The “primary exports/GDP” variable is the Collier-Hoeffler measure of primary commodities as a fraction of GDP preceding the onset of conflict. The cases in the sample are listed in bold. N.A. = not applicable.

drugs. While there are additional countries where *commercially natural resources* may have influenced low-level conflicts, the sample is limited to cases that meet the common definition of a civil war: a conflict between a government and an

TABLE 2. *Civil wars linked to resource wealth, 1990–2000*

<i>Country</i>	<i>Duration</i>	<i>Resources</i>
Afghanistan	1992–2001	Gems, opium
Angola	1975–2002	Oil, diamonds
<i>Burma</i>	1983–95	Timber, tin, gems, opium
Cambodia	1978–97	Timber, gems
Colombia	1984–	Oil, gold, coca
Congo Republic	1997	Oil
Congo, Dem. Rep.	1996	Copper, coltan, diamonds, gold, cobalt
Congo, Dem. Rep.	1997–99	Copper, coltan, diamonds, gold, cobalt
<i>Indonesia (Aceh)</i>	1976–	Natural gas
Liberia	1989–96	Timber, diamonds, iron, palm oil, cocoa, coffee, marijuana, rubber, gold
Peru	1982–96	Coca
Sierra Leone	1991–2000	Diamonds
<i>Sudan</i>	1983–	Oil

*Note:* Separatist conflicts are listed in italics.

organized rebel movement that produces at least one thousand battle-related deaths.<sup>37</sup>

The thirteen cases vary by conflict type, and include three separatist wars (Sudan, Indonesia, and Burma) and ten nonseparatist wars (Afghanistan, Angola, Cambodia, Colombia, Republic of Congo, Liberia, Peru, Sierra Leone, and two successive wars in the Democratic Republic of Congo [DRC]).

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, because in these cases such a link is likely because of the selection method. 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 determine are the causal processes that link the variables together.

The “most likely” method of case selection enables me to carry out three types of analysis. First, if the causal mechanisms that others have proposed can be illustrated in these thirteen cases, I may deem them “plausible.” Second, and more powerfully, if a purported causal mechanism is not observed in this set of cases, I can infer that it is unlikely to be valid more generally. Similarly, by observing whether a mechanism is absent in all of the separatist or nonseparatist conflicts in the sample, I can make inferences about the mechanism’s validity in each sub-

37. Low-level conflicts that may be linked to natural resources include the Bougainville rebellion in Papua New Guinea; the Cabinda conflict in Angola; the West Papua rebellion in Indonesia; the conflict in Senegal’s Casamance region; and the independence movement in Western Sahara. For a more extensive discussion of these and other cases, see Le Billon 2001.

TABLE 3. *Summary of findings*

	<i>Onset</i>	<i>Duration</i>	<i>Intensity</i>
Afghanistan	No	Longer	None
Angola	No	Longer	Mixed
Burma	No	Mixed	Mixed
Cambodia	No	Mixed	Mixed
Colombia	No	Longer	Mixed
Congo Republic	Yes	Shorter	None
Congo, Dem. Rep. I	No	Shorter	None
Congo, Dem. Rep. II	Yes	Longer	Mixed
Indonesia	Yes	None	Worse
Liberia	No	Longer	Mixed
Peru	No	Longer	Worse
Sierra Leone	Yes	Longer	Mixed
Sudan	Yes	Longer	Mixed

category of conflicts. Finally, I can use the cases to develop new hypotheses about causal mechanisms.

The most-likely research design does not permit me to make cross-national inferences within my sample (except for comparisons between two subcategories of cases, the separatist and nonseparatist conflicts); nor can I make valid inferences for the larger population of states about the frequency, or relative weight, of the causal mechanisms I observe.

Because the sample only includes 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.

## Results from Case Studies

The causal mechanisms observed in the thirteen cases are summarized in Tables 3 through 6.<sup>38</sup> Overall, there is evidence in five of the thirteen cases that resource wealth made conflict more likely, and in eight of the thirteen cases that resource

38. I conducted one of the case studies—Indonesia—using primary sources and field work in June–July 2000. I based the other twelve case studies on secondary sources, including academic studies, interviews with country experts, UN reports, journalistic accounts, and reports from nongovernmental organizations. When data are missing or ambiguous, I note this in the text.

wealth made conflict last longer. Within the sample, the influence of resource wealth on conflict intensity varied greatly—appearing to increase the casualty rate in two cases, having a mixed effect in eight, and no effect in three.

The most striking finding may be that there is no evidence in the sample of the looting mechanism, and little if any evidence of the grievance mechanism. There were several notable differences between separatist and nonseparatist conflicts. Resources also contributed to the onset, duration, and intensity of conflict in four ways that were not predicted by the seven hypotheses tested.

### *Incidence of Conflict: Evidence*

Resource wealth contributed to the outbreak of conflict in five of the thirteen cases: in two cases (Indonesia and Sudan), resource wealth appeared to create an incentive for a separatist rebellion; and in three cases (Congo Republic, DRC II, and Sierra Leone) resources seemed to contribute to the outbreak of conflict in ways that were not predicted by the hypotheses (see Table 4). To account for these latter cases, I develop two new hypotheses in the following section.

There were no cases of the looting mechanism (*H1*) that Collier and Hoeffler suggest: 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. While

**TABLE 4.** *Origins of conflict*

	<i>Looting</i>	<i>Grievance</i>	<i>Separatism</i>	<i>Other</i>
Afghanistan	No	No	—	No
Angola	No	No	—	No
Burma	No	—	No	No
Cambodia	No	No	—	No
Colombia	No	No	—	No
Congo Republic	No	No	—	Yes†
Congo, Dem. Rep. I	No	No	—	No
Congo, Dem. Rep. II	No	No	—	Yes*
Indonesia	No	—	Yes	No
Liberia	No	No	—	No
Peru	No	No	—	No
Sierra Leone	No	No?	—	Yes*,†
Sudan	No	—	Yes	No

*Note:* The “grievance” mechanism is (by definition) only observable in the ten nonseparatist conflicts; and the “separatism” mechanism is observable in the three separatist conflicts. \* Unanticipated mechanism: foreign intervention. † Unanticipated mechanism: sale of future rights to war booty.

there is abundant evidence that rebel groups engage in looting after a war begins (as discussed below), in this sample no rebel group funded its startup costs from the resource sector.

There was also no evidence that the grievance mechanism (*H2*) has led to civil war, although the case of Sierra Leone is ambiguous. In general, however, no non-separatist civil wars were associated with complaints about land expropriation, environmental degradation, insufficient employment opportunities, or pressures caused by labor migration to resource-rich areas. This does not suggest that these grievances are illusory: they are real and ubiquitous. But they never appeared to contribute to the outbreak of a nonseparatist civil war.

There may be an exception to this pattern: the case of Sierra Leone, where the evidence is ambiguous. The war in Sierra Leone began in March 1991 when the Revolutionary United Front (RUF) first crossed the border from Liberia. The following January, RUF conducted operations in diamond-rich southeastern Sierra Leone; beginning in September 1992, RUF and government troops fought for control of the diamond-rich areas.

The case of Sierra Leone exhibits one of the indicators of a grievance-based conflict: RUF propaganda complained about resource exploitation, railing against “the raping of the countryside to feed the greed and caprice of the Freetown elite and their masters abroad.”<sup>39</sup> Whether or not it met the second criteria—attacking resource firms—is uncertain: although RUF conducted operations in Sierra Leone’s diamond-producing areas and drove out many Lebanese diamond traders, these operations may have simply been part of RUF’s diamond-looting tactics. Hence it is unclear whether resource grievances helped initiate the war in Sierra Leone.<sup>40</sup> Even if Sierra Leone is coded as an example of a “grievance” mechanism, it is notable that the grievances exploited by the rebel group concerned the distribution of resource wealth, not land expropriation, labor migration, environmental damage, or lack of job opportunities.

The sample includes three separatist civil wars; in two of them (Indonesia and Sudan) there is evidence of the “separatist” mechanism (*H3*). The Indonesian civil war occurred in the northwest province of Aceh. The rebel group—widely known as GAM (*Gerakan Aceh Merdeka*, Aceh Freedom Movement)—started in 1976, shortly before a large natural gas facility began operations. GAM’s 1976 “Declaration of Independence” denounced the Indonesian government for stealing Aceh’s resource revenues, but GAM did not criticize the natural gas facility itself, or Mobil (now ExxonMobil), which operates the facility.<sup>41</sup> One of its first acts was to attack

39. RUF, quoted in Richards 1996, 27. Specialists disagree as to whether the RUF leadership actually believed these charges—see Richards 1996—or simply used this rhetoric for recruitment purposes—see Abdullah 1998. For the purposes of this analysis, however, this dispute is irrelevant.

40. On RUF’s 1992 activities in the diamond-rich areas, see Richards 1996; Reno 1998; and Abdullah and Muana 1998.

41. Indeed, the founder of GAM, Hasan di Tiro, was a businessperson who failed in his effort to win a bid for a work contract at the natural gas facility. Robinson 1998.

the plant.<sup>42</sup> During the subsequent conflict, GAM propaganda often claimed that if Aceh were independent, its citizens would be as wealthy as their neighbors in the tiny oil-rich sultanate of Brunei. Although the claim was wildly exaggerated—by at least an order of magnitude—it became widely accepted as fact within the province.

The war in the Sudan began in 1983, when Sudanese President Gaafar Numeiry took a series of measures that upset the delicate balance between the predominantly Muslim north and the heavily Christian and Animist south; among these measures was his decision to place newly discovered oil in the country's south under the jurisdiction of the north, and to build an oil refinery in the north instead of the south. The Sudan People's Liberation Army (SPLA) subsequently complained that the north was stealing the resources of the south, including oil; demanded that work cease on a pipeline to take oil from the south to the refinery in the north; and in February 1984, attacked an oil exploration base, killing three foreign workers and bringing the project to a halt.<sup>43</sup>

To summarize, there is good evidence that natural resources helped initiate two of the three separatist conflicts in this sample; however, there is no evidence of a looting mechanism, and little or no evidence of a grievance mechanism. Resource wealth apparently led to conflict through two unanticipated mechanisms, which are discussed in the next main section. Illicit drugs were not linked to the origins of any of the thirteen wars.

#### *Duration of Conflict: Evidence*

Resource wealth appears to have influenced the duration of ten of the thirteen conflicts: it lengthened eight, shortened two, had a mixed effect in two, and had no effect in one (see Table 5). Once again, an unanticipated mechanism also influenced several conflicts.

While looting played no role in the *initiation* of these thirteen conflicts, it played a role in the *duration* of ten conflicts (*H5*). In other words, in these thirteen cases, rebel groups only started to loot resources after the conflicts began. In nine of the ten cases, the looted commodity was a type of resource that can be easily extracted, or cultivated, by small groups of unskilled workers—mostly gemstones (five cases), drugs (four cases), or timber (two cases).

In two cases, however, rebels have used extortion and kidnapping to raise money from a more difficult-to-loot commodity. In Colombia and Sudan, insurgents have been able to raise money by blowing up oil pipelines and ransoming kidnapped oil workers. In both cases, the rebels have capitalized on the precarious geography of their country's oil industry by sabotaging pipelines that stretch for hundreds of miles, crossing territory where they have a strong presence. In Colombia, two in-

42. Robinson 1998.

43. See O'Ballance 2000; Anderson 1999.

TABLE 5. *Duration of conflict*

	<i>Looting</i>	<i>Incentive</i>	<i>Futures</i>	<i>Net effect</i>
Afghanistan	Yes	No	No	Longer
Angola	Yes	No	Yes	Longer
Burma	Yes	Yes*	No	Mixed
Cambodia	Yes	Yes*	No	Mixed
Colombia	Yes	No	No	Longer
Congo Republic	No	Yes*	No	Shorter
Congo, Dem. Rep. I	No	No	Yes*	Shorter
Congo, Dem. Rep. II	Yes	Yes	Yes	Longer
Indonesia	No	No	No	None
Liberia	Yes	Yes	No	Longer
Peru	Yes	No	No	Longer
Sierra Leone	Yes	No	Yes	Longer
Sudan	Yes	No	No	Longer

\*Made the conflict shorter.

dependent rebel movements bombed the pipelines ninety-eight times in 2000. Together, they have used these attacks to extort an estimated \$140 million annually; this windfall has enabled one group, the National Liberation Army (ELN), to grow from fewer than forty members to at least 3,000.<sup>44</sup>

There was evidence in two cases (DRC II and Liberia) that resource wealth lengthened a conflict through an incentive mechanism (*H6*), giving combatants an economic incentive to avoid signing, or adhering to, a peace agreement. In three other cases (Congo Republic, Cambodia, and Burma), however, the incentive mechanism had the opposite effect, giving combatants an inducement to settle.

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 that the warring parties—or at least, significant factions within them—feared they would lose access to Liberia's resource wealth. This fear reduced the incentive of the parties to comply with the terms of the agreements. The failure of the 1993 Cotonou accord—signed by the parties under heavy international pressure—provides one of the sharpest illustrations. Almost immediately after the agreement was signed, 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.<sup>45</sup> It also implies that combatants subverted the treaty so they could continue their looting, thus lengthening the conflict.

In the war that plagued the DRC beginning in 1998—which has both the qualities of a civil war and an international war—the profitability of resource looting

44. Dunning and Wirpsa forthcoming.

45. See Alao et al. 1999; Ellis 1999.

for foreign governments, rebel militias, and individual officers substantially reduced their incentive to end the conflict. Even though a peace accord was signed in Lusaka in July 1999, it was not implemented until 2002, in part because it forced foreign combatants to withdraw from the DRC, which hampered their ability to siphon off the country's remarkable resource wealth.<sup>46</sup>

Conversely, the 1997 civil war in the Congo Republic may have been shortened by the combatants' agreement to share the oil revenues.<sup>47</sup> Similarly, the Burmese government reached settlements with the Shan State Army (in 1989) and the Kachin Independence Army (in 1994) after agreeing to jointly exploit the opium, timber, and precious stones in rebel-held territory. Although rebel groups already controlled these resources, the agreements made it easier for them to attract new investment in, process, and export their goods.<sup>48</sup>

The Cambodia civil war was also shortened after 1996 when the country's resource wealth gave a faction in the rebel group (the Khmer Rouge) an incentive to defect to the government. Until 1995, income from the sale of timber and gemstones had helped fund the Khmer Rouge and, hence, lengthened 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 the war.<sup>49</sup>

There was little evidence of an incentive mechanism in two cases where others suspect it exists: Angola and Sierra Leone.<sup>50</sup> In both cases, rebel leaders generated enormous sums from resource looting; this may have led some observers to falsely infer that resource wealth caused the rebels to prefer war to peace. But in each case, peace negotiators anticipated this problem and drafted accords that would enable rebel leaders to continue getting rich—or get even richer—in peacetime. Both the 1999 Lomé accord in Sierra Leone, and the 1994 Lusaka Protocols in Angola, offered to 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 the minerals sector in each country to expand by enabling abandoned mines to reopen and new ones to develop, presenting the rebels with new opportunities for enrichment.<sup>51</sup> In both cases, these peace accords failed, but for reasons other than the lure of wartime looting.

46. See ICG 2000; and UN Panel of Experts 2001 and 2002. The foreign armies withdrew in 2002 only after making arrangements—by establishing joint ventures, and by using local militias that acted as their surrogates—to continue profiting from the DRC's mineral wealth. UN Panel of Experts 2002.

47. Pierre Englebort, Pomona College, personal communication, October 2001.

48. Lintner 1999.

49. See Brown and Zasloff 1998; Le Billon 2000.

50. Sherman 2000.

51. See Le Billon 1999; Vines 1999.

TABLE 6. *Intensity of conflict*

	<i>Battles</i>	<i>Plunder</i>	<i>Repress</i>	<i>Net effect</i>
Afghanistan	No	No	No	None
Angola	Yes	Yes	No	Mixed
Burma	Yes	Yes	No	Mixed
Cambodia	Yes	Yes	No	Mixed
Colombia	Yes	Yes	No	Mixed
Congo Republic	No	No	No	None
Congo, Dem. Rep. I	No	No	No	None
Congo, Dem. Rep. II	Yes	Yes	No	Mixed
Indonesia	No	No	Yes	Worse
Liberia	Yes	Yes	No	Mixed
Peru	Yes	No	No	Worse
Sierra Leone	Yes	Yes	No	Mixed
Sudan	Yes	Yes	Yes	Mixed

In sum, there is evidence to support both of the hypothesized mechanisms: the looting mechanism (*H5*) appeared to lengthen ten of the thirteen conflicts and the incentive mechanism (*H6*) ostensibly lengthened two. When both the looting and incentive effects are aggregated, resource wealth prolonged eight conflicts, shortened two, had a mixed effect in two, and had no impact in one.<sup>52</sup> The analysis also suggests, however, that analysts should approach claims about the importance of the incentive mechanism skeptically: it may have lengthened two conflicts, but it shortened three others, and there was no evidence of it in several other conflicts where some have suggested it operates.

#### *Intensity of Conflict: Evidence*

There was evidence of both hypothesized effects—resource battles and cooperative plunder—in the thirteen cases (see Table 6). Often, both mechanisms appeared in the same war. There was, once again, evidence of an unexpected mechanism influencing the intensity of conflicts. Collectively, resource wealth heightened the casualty rate in two wars, had no effect in three wars, and had a mixed impact in eight wars.<sup>53</sup>

Resource battles (*H8*) occurred in nine of the thirteen cases, as combatants fought for control of areas rich in alluvial gemstones (Sierra Leone, Liberia, Cambodia),

52. I determine the net effect as follows: if a case exhibited only conflict-lengthening, or conflict-shortening, effects, I judge the net effect as “longer” or “shorter,” respectively. If a case has both conflict-lengthening and conflict-shortening effects, I list the net effect as “mixed.”

53. I evaluate the net effect as follows: if a case exhibited only conflict-enhancing, or only conflict-reducing effects, I list the net effect as “worse” or “better,” respectively. If there are both conflict-enhancing and conflict-reducing effects, I judge the net effect to be “mixed.”

drug fields and processing plants (Peru, Burma), oil pipelines that traveled over disputed lands (Colombia, Sudan), mines (DRC I and II, Liberia), and commercially valuable forests (Cambodia, Liberia).

Yet in eight of these nine cases, combatants intermittently cooperated in exploiting the same resources they fought over (*H9*). In four cases (Sierra Leone, Liberia, DRC II, and Cambodia) there were long periods in which the major parties more or less ceased their combat and entered a kind of commercial equilibrium. Even in extraordinarily bitter wars such as the one in Sudan, profitable alliances were often struck between groups on opposing sides—in this case, to guard the pipeline and oilfields that the rebels had long opposed.<sup>54</sup>

The only war that featured resource battles but not cooperative plunder was in Peru, between the government and the hard-line Maoist group, Sendero Luminoso. Beginning around 1983, Sendero Luminoso controlled a large coca-producing area in Peru's Upper Huallaga Valley; they also periodically clashed with both government forces and a rival guerrilla group over control of the coca trade. Sendero Luminoso's failure to cooperate with the Peruvian military in coca production likely reflected both their highly disciplined and ideological character, and their ability to fly coca paste directly from the Upper Huallaga Valley to Colombia without passing through government-controlled territory or airspace.

Resource battles and cooperative plunder seem to be closely linked. In the eight cases where both occurred, it was impossible to judge which of these two effects had the greatest impact. I hence infer that they at least partially offset each other and produced a "mixed" effect on the intensity of combat.<sup>55</sup>

## Unexpected Mechanisms

In these thirteen cases, not all of the resource-conflict correlations could be accounted for by the seven hypothesized mechanisms; I also identified four additional mechanisms at work. Two influenced the onset of conflict, one influenced conflict duration, and one affected the intensity of conflict (see Figure 2).

In four of the thirteen cases, natural resource wealth helped trigger conflicts in two ways that were not predicted by the hypotheses. The first was by encouraging interventions from neighboring powers: in Sierra Leone, and the DRC II war, foreign forces decided to support nascent rebel groups against incumbent governments, in part, to gain access to natural resource wealth.

54. ICG 2002.

55. In five of these nine cases (Sudan, Sierra Leone, Liberia, DRC II, and Cambodia), resources appeared to help fracture rebel or government alliances based on ethnic, religious, or ideological grounds, and create new alliances based on commercial grounds. It was difficult to judge whether these fractures influenced the casualty rate; moreover, it is not possible to know if resource wealth leads to an unusually high rate of alliance fracture without examining alliance stability in comparable resource-poor conflicts.

- |  |
|--|
| <p>10. Resource wealth → <b>foreign intervention</b> → civil war</p> <p>11. <b>Futures contracts for resource booty</b> → startup costs funded → civil war</p> <p>12. Weaker (stronger) side sells <b>futures contracts for resource booty</b> → war lengthened (shortened)</p> <p>13. <b>Preemptive repression</b> by government to protect resources → more casualties</p> |
|--|

FIGURE 2. *Unanticipated mechanisms*

In Sierra Leone, Liberia's Charles Taylor helped organize and support the 1991 RUF invasion to gain access to Sierra Leone's diamond fields.<sup>56</sup> Similarly, the Ugandan and Rwandan governments decided to organize, and fight alongside, rebels in the DRC partly because of the DRC's resource wealth. The UN Panel of Experts found that Uganda's decision to enter the war was influenced, in part, by at least three figures who were eager to profit from the occupation of resource-rich parts of the DRC.<sup>57</sup> In Rwanda, the government's decision to back an incursion was influenced by the belief—which was subsequently proved correct—that resource looting would help offset the cost to the government of the invasion, which might have otherwise been prohibitive. Once inside the DRC, the Rwandan army established well-disciplined procedures for extracting Congolese resources and using them to fund the military effort.<sup>58</sup>

Based on these two cases, a new hypothesis might be stated as the following:

*H10: Resource wealth increases the likelihood of civil war by increasing the probability of foreign intervention to support a rebel movement.*

The second and more surprising mechanism entailed the sale, by rebel groups, of what might be called "booty futures"—the right to exploit mineral resources that the seller has not yet captured. In three cases (Congo Republic, Sierra Leone, and possibly Liberia), rebel groups that had no resources to sell, but had a chance of securing them in combat, were able to sell future mineral rights to foreign firms or neighboring governments. The rebels then used the proceeds from the sale of booty futures to pay soldiers and buy arms, and thus gain the capacity to capture the promised resource.

The special danger of selling booty futures comes from its self-fulfilling properties. If the rebel group was unable to sell the future right to exploit the resource,

56. See Abdullah 1998; UN Panel of Experts 2000.

57. UN Panel of Experts 2001.

58. UN Panel of Experts 2001 and 2002.

it might not have the funds it needs to capture the resource itself. Selling the future right to the resource makes its seizure possible. Without the futures market, the rebel offensive—and perhaps the conflict itself—would be less likely.<sup>59</sup>

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 or through a national election; the payment was clearly meant to ensure Elf's access to Congolese oil in a future Sassou government.<sup>60</sup> 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.<sup>61</sup>

Something similar occurred in Sierra Leone, when RUF launched its 1991 invasion. RUF received material support from a variety of sources; they included the Liberian leader, Charles Taylor, and a Sierra Leone businessperson who had recently been forced out of the diamond industry.<sup>62</sup> There is circumstantial evidence that the RUF leadership traded this financial support for future diamond rights—in effect, using informal mining futures to purchase their assistance.<sup>63</sup>

The notion of “booty futures,” in hypothesis form, might be stated as the following:

*H11: Resource wealth increases the probability of civil war by enabling rebel groups to sell future exploitation rights to minerals they hope to capture.*

A third unanticipated mechanism—once again, the sale of booty futures— Influenced the duration of three conflicts: Sierra Leone, Angola, and the DRC.

During the war in Sierra Leone, the government saved itself from defeat twice by selling off the right to exploit diamond fields that it did not yet control. In March 1995, RUF had taken control of the country's main diamond fields and advanced to within twenty miles of the capital. To stave off defeat, the government sold future mining rights to the Kono diamond fields—then in rebel hands—to Branch Energy, a South African company; the government then used the proceeds to hire a South African mercenary firm, Executive Outcomes, to beat back the

59. In principle, rebels could sell futures for any type of war spoils, not just mineral resources. In practice, minerals appear to be the only commodities for which future exploitation rights have been sold—perhaps because they are easier to exploit under wartime conditions.

60. Elf had lost its oil contract under the government of Lissouba, Sassou's rival.

61. Martine-Renée Galloy and Marc-Éric Gruénai, Fighting for Power in the Congo, *Le Monde Diplomatique*, November 1997.

62. See UN Panel of Experts 2000; Reno 1998.

63. There may have been a similar sale of booty futures in Liberia, although the evidence is unclear. The Liberian civil war began on Christmas Eve 1989, when Taylor led one hundred troops from the NPFL into Liberia from neighboring Côte D'Ivoire. According to Ellis, just before the invasion Taylor met with business interests who hoped to gain access to Liberia's iron ore and timber; Taylor reportedly received “sympathetic attention” from them. Ellis is uncertain, however, whether these business interests actually helped finance Taylor's efforts. Ellis 1999.

RUF offensive and recapture the mortgaged diamond fields.<sup>64</sup> Just two years later, a deposed president, Ahmad Tejan Kabbah, sold \$10 million in diamond futures to a Thai banker; Kabbah used the revenues to hire Sandline, a London-based mercenary firm, to take back the capital and the diamond fields.<sup>65</sup> In each case, the sale of future mineral rights helped prolong the conflict.

The sale of booty futures also lengthened the Angolan conflict. In 1992–93, the rebel group UNITA waged an offensive that brought more than 70 percent of the country—including all of its diamond-rich areas and the northern oil town of Soyo—under its control. To fund a counteroffensive, the government sold off future exploitation rights to both oil fields (still under the government's control), and diamond areas (some of which were under rebel control). In one deal, the government hired International Defence and Security (IDAS), a private military services company, to retake the diamond fields near the DRC border; the government paid IDAS with a share of the contested diamonds.<sup>66</sup>

In the 1996–97 conflict in the DRC, the sale of booty futures most likely shortened the conflict because it generally benefited the stronger side. In this conflict, the rebel organization—the Alliance of Democratic Forces for the Liberation of Congo/Zaire (ADFL), led by Laurent-Desiré Kabila—received a huge resource windfall after it became clear that it was defeating the government in combat.<sup>67</sup> 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.<sup>68</sup> Around the same time, the minerals parastatal, Minière de Bakangwa, switched its support from the government to ADFL, offering Kabila both cash and the use of its aircraft fleet.<sup>69</sup> This support helped Kabila move his troops across the country to the capital, Kinshasa, and take over the Congolese government. Since Kabila's April 1997 sale of mineral futures helped strengthen the hand of the winning side, I infer that it helped bring about a swifter end to the war.<sup>70</sup>

These three cases suggest the following:

*H12: Resource wealth tends to increase (decrease) the duration of civil wars by enabling the weaker (stronger) side to earn revenues by selling future exploitation rights to minerals they hope to capture.*

64. Hirsch 2001.

65. Africa Confidential 2001.

66. See Peleman 2000; Vines 1999.

67. 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.

68. The \$885 million figure represented future investment. However, it is customary in large deals for the company to also pay a signing bonus, which would have augmented the ADFL's revenues. The Kabila government later reneged on the contract.

69. See Howard W. French, *The Great Gold Rush in Zaire*, *New York Times*, 18 April 1997, A6; Reed 1998.

70. For more details on this booty futures market, see Ross 2002.

In two of the cases (Indonesia and Sudan), a final unexpected effect appeared to link resource wealth with the intensity of combat; the mechanism might be called “preemptive repression.” In each case, a government facing a small, separatist rebellion in a resource-rich area acted strategically to protect its control of the resource, by using terror against the region’s population. Had the region been resource-poor, the governments might have responded less harshly to these challenges, producing fewer casualties.

In the Indonesian case, the government imposed martial law, terrorized villages, and carried out egregious human rights abuses in Aceh between 1990 and 1998 to crush a small independence movement that had claimed that the government was unjustly appropriating Aceh’s resource wealth.<sup>71</sup> By the end of 1991, all of the group’s active members had been captured, killed, or driven into exile; yet martial law, and widespread repression, continued until 1998. There is evidence that the harshness of the repression was, in part, because of Aceh’s natural gas deposits: the government gave the military an exceptionally large role in planning and running the natural gas project; it placed the Military Operations Command for Aceh near the gas facility, instead of in the province’s capital; and officers assigned to protect the plant were involved in the torture and execution of Acehnese in neighboring areas.<sup>72</sup> Ironically, the repression backfired, generating a flood of new recruits for the rebels after the dictator Suharto fell, leading to a renewal of the conflict in 1999.

In Sudan, the preemptive repression has been severe: beginning in the late 1990s, the government attempted to create a *cordon sanitaire* around a 936-mile pipeline 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.<sup>73</sup> There has often been a close correlation—both temporally and geographically—between oil exploitation and extreme repression. 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 villages, and summary executions to depopulate a large area around the oilfield. Shortly after depopulation was completed, Lundin Oil resumed operations.<sup>74</sup>

Preemptive 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 popu-

71. In 1990–91, the independence movement had between 200 and 750 active members. Ross 2003a.

72. Ross 2003a.

73. Amnesty International 2000.

74. Christian Aid 2001.

lation. Perhaps governments are more likely to expect trouble when resource exploitation occurs in regions with separatist aspirations than when it occurs in other regions. In either case, the Indonesian and Sudanese conflicts suggest a final hypothesis:

*H13: Resource wealth tends to increase the casualty rate during a separatist civil war by giving the government an incentive to react to small challenges with unusually harsh countermeasures.*

## Conclusion

This article discusses several hypotheses about how resources may influence a conflict; specifies their observable implications; and reports which of these implications can be observed in a “most likely” sample of thirteen cases. This method facilitates three types of analysis: if the hypothesized causal mechanisms can be observed in these thirteen cases, they may be considered plausible; if they cannot, the mechanisms are unlikely to be valid more generally; and the cases may be used to develop new hypotheses.

Collectively, these three types of analysis have led to eight notable findings. First, there is good evidence in the thirteen cases that natural resource wealth is causally linked to civil conflict. I 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.<sup>75</sup> But in these thirteen conflicts, there is strong evidence that resource wealth has made conflict more likely to occur, last longer, and produce more casualties when it does occur.

Second, while oil, nonfuel minerals, and illicit drugs appear to influence conflict, other types of primary commodities—notably legal agricultural commodities—seem to be unrelated to civil war, at least in these thirteen cases. Scholars have found statistical correlations between conflict and all types of primary commodities,<sup>76</sup> minerals,<sup>77</sup> oil,<sup>78</sup> and lootable contraband.<sup>79</sup> These cases suggest that the latter three categories are indeed causally linked to violent conflict, and that the primary commodities variable should be pared down to include only oil, nonfuel minerals (including gemstones), and (if possible) illicit drugs.

The third finding is that two of the most widely cited causal mechanisms, the looting and grievance mechanisms, do not appear to be valid. There was no evi-

75. Minter 1994.

76. Collier and Hoeffler 1998 and 2002a.

77. Buhaug and Gates 2002.

78. See Fearon and Laitin 2003; de Soysa 2002.

79. Fearon forthcoming.

dence in these thirteen cases that rebel groups funded their startup costs by looting natural resources or extorting money from resource firms. Nor was there evidence that grievances over insufficiently compensated land expropriation, environmental degradation, inadequate job opportunities, or labor migration contributed to the initiation of nonseparatist conflicts. This does not imply that such grievances are irrelevant; they may have contributed to the rise of low-level conflicts and separatist conflicts. But neither of these mechanisms explain the link between natural resource wealth and the ten nonseparatist civil wars in this sample.

The fourth finding is that in these thirteen cases, illicit drugs were not linked to the onset of conflict. In each of the four conflicts that occurred in major opium- and coca-exporting states (Afghanistan, Burma, Colombia, and Peru), rebel movements were uninvolved with the cultivation of or trade in drugs before the war began. In several cases (Burma and Colombia), the causal arrow ran in the opposite direction: the civil war led to drug production by creating a fertile region that fell outside the government's control for a significant number of consecutive growing seasons, offering the rebels ideal drug-producing conditions. In the other two cases (Afghanistan and Peru), drug production and civil war seemed to be independently associated with the weakness of the state's jurisdiction in remote rural areas, but neither one caused the other. In all four cases, however, the production of opium and coca—once it began—seemed to lengthen the conflicts by providing funding to the rebels, or to both sides simultaneously.<sup>80</sup>

Fifth, resource wealth does not always make existing conflicts worse. While the net effect of resource wealth on conflict in this sample was harmful, the cases suggest that resources sometimes have contradictory and even peace-enhancing effects over the course of a civil war. Resource wealth appeared to bring about a quicker end to two wars. Claims that resource wealth tends to heighten the intensity of conflict may also be only partly correct. 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 resources also lead to battlefield cooperation that may reduce the casualty rate. In nine of the thirteen cases examined here, combatants fought battles over resource wealth; in eight of these cases, combatants also laid down their arms (at other junctures) to cooperatively exploit these same resources.

The sixth finding is that resource wealth and civil war are not linked by a single mechanism, but a variety of mechanisms. Moreover, these mechanisms can influence a conflict's onset, duration, and intensity. No single mechanism appeared in more than nine of the thirteen cases. In twelve of the thirteen cases, resources had more than one type of effect on conflict. This multiplicity of causal linkages—and the absence of a single, ubiquitous mechanism—may help account for the analytical muddle, and contradictory findings, of earlier studies.

80. On the different impacts of different natural resources, see Le Billon 2001; and Ross 2003b.

Seventh, resources appear to play a different role in separatist conflicts than in nonseparatist conflicts. Grievances over the distribution of resource wealth helped initiate two of the three separatist wars in the sample (Sudan, Indonesia), but grievances of all types played no role in the ten nonseparatist wars, except for the ambiguous case of Sierra Leone. These two separatist conflicts were also the only ones to face preemptive repression, which is a government's use of terror to suppress rebel movements that may interfere with resource exploitation. This implies that the geographical distribution of natural resources across a nation's territory may be important: if resource wealth is located in a region with separatist aspirations, it may help precipitate a war and increase the war's casualty rate.

Finally, the article describes four unforeseen mechanisms that link resource wealth to subsequent conflict. The first is that resource wealth may increase the danger that a foreign state will intervene on behalf of a nascent rebel movement; in both the Sierra Leone and DRC II conflicts, these interventions triggered long and costly civil wars. The second and third mechanisms concern the sale of booty futures—future exploitation rights to resources not under the seller's control—which may either initiate or prolong a conflict. The sale of booty futures is a tool of the weak against the strong: it can help provide aspiring rebel groups with the funds they need to launch attacks on governments; it can also give governments on the verge of defeat the ability to fund counterattacks. 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 final unanticipated mechanism is preemptive repression. In two of the three separatist conflicts in the sample (Indonesia and Sudan), the government took exceptionally harsh measures against insurgencies, because they appeared to threaten the government's control of resource wealth. These four mechanisms—along with five of the seven mechanisms whose implications were tested in the sample—can help account for the frequency, duration, and intensity of civil wars in resource-rich states.

There are several ways that scholars might build on these findings to advance the natural resources–civil war research agenda. One way is by statistically testing the hypotheses discussed here, using a complete civil war data set. Thanks to leading scholars, there are now several excellent databases on civil wars.<sup>81</sup> At least some of the hypotheses discussed in this article should be simple to test with existing data sets—for example, hypothesis *H10*, which suggests that resource wealth increases the likelihood of foreign intervention. Hypotheses that are difficult to test with existing data sets—such as those concerning resource battles, cooperative plunder, and booty futures—might be fruitfully explored with small-*N* studies that assess their validity in a different (and ideally, less-biased) sample of cases.

A second avenue of future research concerns the influence of gemstones and narcotics on conflict. Gems and drugs were causally linked to nine of the thirteen

81. See Collier and Hoeffler 2002a; Sambanis 2001; Gleditsch et al. 2002; Fearon and Laitin 2003.

conflicts in this study; yet these two resources are almost never included as explanatory variables in large-*N* conflict studies. There is, unfortunately, good reason for this: data on the production of gemstones and illegal narcotics is scarce and sometimes unreliable, because these items are often traded on the black market, and it is difficult to identify their countries of origin. Better cross-national data on gems and drugs would open the door to large-*N* testing and facilitate a critical advance in knowledge.<sup>82</sup>

A third area for further study is how resources influence conflict intensity. In this thirteen-case sample, natural resources had an ambiguous effect on conflict intensity: in nine cases, it appeared to heighten the casualty rate by causing combat over resource wealth; but in eight of those nine cases, it may have reduced the casualty rate at other junctures by fostering cooperation among the warring parties. A large-*N* study on the determinants of conflict intensity, testing natural resources as an explanatory factor, would help assess the net effect of resource wealth on conflict. Existing data sets have limited information about conflict intensity; improved data could yield new insights on the role of resources.<sup>83</sup>

Finally, more work should be done to address the problems of endogeneity and spuriousness. While there is good evidence that natural resources influenced civil war within this thirteen-case sample, it is still possible that the statistical correlation between resources and conflict is caused by endogeneity or spuriousness. Until these possibilities can be ruled out, a cloud of uncertainty will linger over the claim that natural resources increase the hazard, duration, and intensity of civil war.

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82. Important steps in this direction have been made by Humphreys 2003; Lujala et al. 2003; Fearon forthcoming.

83. The Gleditsch et al. database classifies conflicts based on whether they caused a low, intermediate, or high number of combat-related deaths for each calendar year. Gleditsch et al. 2002.

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