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Diamonds, the Kimberley Process, and Civil War in Sub-Saharan Africa

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DIAMONDS, THE KIMBERLEY PROCESS, AND CIVIL WAR IN SUB-SAHRAN AFRICA

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Abstract

Africa is a region of the world that has been plagued by conflict for decades. Specific civil wars in the 1990s gained worldwide attention due to the perceived source of funding for rebel groups to continue the bloodshed: diamonds. As civil society organizations and journalists exposed the role of diamonds and the diamond industry, a link between diamonds and conflict also emerged in the scholarly literature regarding the "resource curse." In response, policymakers created the Kimberley Process Certification Scheme, an institution designed to address the problem of conflict diamonds and to clean up the diamond industry. While many critics have been quick the exploit the limitations of the institution, there has been relatively no academic work empirically evaluating if the Kimberley Process is effectively reducing conflict outcomes. This thesis seeks to analytically assess whether the institution is actually proving to be an obstacle for the onset and duration of civil war. Using logit regression and a Weibull duration model, this study finds that while the Kimberley Process does not significantly effect the onset of civil war, it does decrease the length of wars for the diamond producing states it was designed to alleviate conflict in.

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Table of Contents

Chapter 1

Introduction

While diamonds are often considered to be a "girl's best friend", many scholars and policymakers have thought it more accurate to alter this cliché and instead claim that diamonds are a "rebel's best friend." These precious gemstones that are commonly considered a luxurious symbol of love, marriage, and commitment in modern society are projecting a drastically different image in the African countries where they are mined. Diamond mining in a number of states has become an avenue for rebel groups to finance their armed conflicts and initiate civil wars through the looting and selling of contraband gems. Additionally, diamonds create incentives for rebels to capture and control territory that is diamond-rich. For several decades, scholars have debated the "resource curse" and the adverse effects natural resources have on economic growth (Auty 1990; Gelb 1988; Sachs and Warner 1997), autocratic political regimes (Bellin 2004; Karl 1997; Ross 2001), and conflict (Collier and Hoeffler 1998; Fearon and Laitin 2003; Le Billon 2001a). While oil has often been examined as the causal variable for these three phenomena, diamonds have also emerged as a common factor between a number of African states that have been ravaged by civil wars.

As particularly bloody conflicts in Angola and Sierra Leone gained worldwide attention in the 1990s, the destructive role of diamonds became even more exposed. Scholars further confirmed the vast media attention with academic studies validating the negative link between diamonds and civil war (Le Billon 2001b; Samset 2002; Smilie, Gbrerie, and Hazelton 2000). This prompted the international community to discuss ways

of better regulating the diamond trade to ensure that consumers would not be indirectly funding violent rebel groups and ending up with blood (diamonds) on their hands, quite literally. The United Nations endorsed the creation of the Kimberley Process Certification Scheme, a voluntary international institution designed to guarantee that diamonds mined in conflict-stricken areas were not illicitly entering the market, and indirectly funding civil wars.

The Kimberley Process first went into effect in 2003 with a unique soft-law structure and members formally agreeing to only engage in diamond trade with other member states. The Kimberley Process now includes 81 countries that account for 99.8% of the world's total diamond production (Kimberley Process 2015). The organization also boasts that less than one percent of diamonds on the market can be considered conflict diamonds, as opposed to approximately four percent in the late 1990s (Wright 2004, 702). Additionally, the civil wars in Angola and Sierra Leone have ended and no other perceptible diamond-driven conflicts have emerged in recent years.

Despite these accomplishments that can at least be acknowledged on face value, the Kimberley Process has not been without criticism from journalists, social groups, and legal scholars. Yet while news stories describing illicit diamonds crossing borders or forged Kimberley Process certificates have frequently emerged, there has been very little empirical research by the academic community regarding whether or not the Kimberley Process is actually achieving what it set out to do—reduce the number of conflict diamonds making their way onto the market and providing funding for the bloody and violent civil wars that had been infamous at the close of the 20th century.

This research seeks to address two important issues: the role that diamonds play in civil war outcomes and also the role that the Kimberley Process has played since 2003, specifically asking the question, "Does the Kimberley Process prove to be an obstacle for the onset of civil wars as well as their duration?" If the organization is functioning as it has been designed, it can generally be hypothesized that diamond producing states with the Kimberley Process in place should be less likely to experience civil wars and also have shorter conflicts when they do break out. The analysis in this study uses statistical modeling to test this hypothesis and finds that while the impact of diamonds on conflict may be less conclusive than previous research has shown, the Kimberley Process does significantly decrease the length of civil war for diamond producing countries. Despite the many criticisms that the organization has faced, these results give some quantitative support for the successes that it has claimed credit for.

Great attention and resources by the international community have been devoted to the Kimberley Process, and it is worth empirically examining how effective it has been at decreasing civil wars and conflict. Scholarly attention to the role that resources play on developing countries has spanned decades, with much particular focus on diamonds and civil war. This study will build upon this prior academic work, introducing a new variable, the Kimberley Process, to examine the determinants of both civil war onset and duration. The analysis particularly focuses on conflict outcomes in sub-Saharan African and the effectiveness of the Kimberley Process in this specific region. While the institution seeks to regulate trade for all states involved in the diamond industry, it was largely created as a result of the "conflict diamonds" emerging from this area of Africa (Bieri 2010). It is a region that has been plagued by conflict, with research showing the

mean duration of civil wars to last 13.1 years (as opposed to an 8.8 year mean worldwide) and wars involving rebel access to contraband goods lasting significantly longer (Fearon 2004). Furthermore, sub-Saharan Africa includes 12 of the world's 18 main diamond producing states, with mining for these gemstones arguably occurring in some of the poorest and most unstable states in the world (Olsson 2007). If an institution created to alleviate conflict outcomes in this war-stricken region is proving successful, the implications for both political scientists and policymakers alike will be important for future research and peacekeeping efforts. This study is a significant contribution to the existing literature for these reasons, finding support for the effectiveness of the Kimberley Process.

This thesis will proceed as follows:

Chapter 2 will review the literature regarding the resource curse, with specific attention given to the research concerning resource abundance and conflict. Focus will also be placed on diamonds, especially diamonds that are considered "lootable". A review of the scholarship connecting diamonds and civil war will be followed by a brief substantive overview of the "blood diamond" wars in the 1990s and the creation of the Kimberley Process as an institution to reduce these conflicts. The criticisms and evaluations of the Kimberley Process found both in journalistic and scholarly literature are included, showing evidence for a lack of empirical analysis regarding its effectiveness.

Chapter 3 will introduce the logit and duration models used to test the influence of the Kimberley Process, explaining why these methods are best suited for the analysis. A brief discussion of the main explanatory variables as well as control variables details the

sources for the data, why they are chosen, and any data issues. Ten specific hypotheses are listed to examine the effects of diamonds and the Kimberley Process on the onset and duration of civil war.

The results presented in Chapter 4 indicate that while the Kimberley Process does not have any significant effect on civil war onset, it does decrease conflict duration in diamond producing states. Interestingly, diamonds do not significantly impact civil war onset or duration in these models, posing questions for the existing scholarship identifying this relationship.

Chapter 5 will conclude with a discussion of the substantive implications for the results of the analysis, highlighting other mechanisms that may be impacting conflict outcomes. The limitations of this study are noted, as well as suggestions for further research to understand the roles that diamonds and the Kimberley Process play in civil war.

Chapter 2

Literature Review

The harmful effects that resource abundance can have on developing states has been documented in scholarly literature for several decades, many years before the perceived "blood diamond" conflicts gained worldwide attention in the 1990s. As these civil wars in sub-Saharan Africa caused great concern for international peacekeeping bodies as well as the diamond industry, they also prompted a series of studies empirically analyzing the impact diamonds have on conflict outcomes. With both policymakers and scholars largely confirming the negative link, the Kimberley Process Certification Scheme was created as an institution designed to address the problem. A careful examination of the research by the scholarly, journalistic, and policymaking communities demonstrates how worries over this "resource curse" led to the creation of an institution designed to alleviate the devastating effects diamond wealth was having on a number of developing states and whether it can be considered an effective solution.

"The Resource Curse": Early and Foundational Research

Concerns over a "resource curse" began arising in the economic development literature as early as the 1950s, with scholars in the subsequent decades noting the remarkably slow growth rates for resource-rich countries as opposed to higher growth rates for states with little natural resources (Baldwin 1966; Hirschman 1958; Levin 1960; Nurske 1958; Prebisch 1950; Singer 1950). However, Gelb (1988) and Auty (1990) are largely credited as the first contemporary scholars to analyze the resource curse. Both use a more systematic and empirical method to demonstrate that over time, countries with

greater oil and mineral resources were not able to use this wealth to boost their economies. In fact, these countries had lower levels of economic growth than countries without natural resources.

Building upon the foundation laid by Gelb and Auty, Sachs and Warner (1997) brought forth what is considered the most comprehensive quantitative study on the slow growth aspect of the resource curse. These scholars examine a sample of 95 developing countries over a 20-year period using regression analysis to measure the impact of mineral and other resource exports on GDP growth. States with a high ratio of natural resource exports to GDP in 1970 had abnormally slow growth rates between 1971 and 1990. Natural resource exports continued to have a statistically significant negative effect on GDP even after controlling for trade policy, investment rates, region, bureaucratic efficiency, terms-of-trade volatility, and income distributions. This research has been followed up by a series of other cross-country studies using growth regressions that largely confirm the negative link (Busby et al. 2004; Mehlum, Moene, and Torvik 2006; Sachs and Warner 1999) and has also been complemented by many well-designed case studies likewise supporting the hypothesis that an abundance of resources may negatively impact development (Karl 1997; Ross 1999, 2001).

The literature in subsequent years evolved as scholars noted that resource-rich countries not only experienced a lack of economic growth, but also were more likely to have autocratic political regimes (Bellin 2004; Karl 1997; Ross 2001) and experience civil war (Collier and Hoeffler 1998; Elbadawi and Sambanis 2002; Fearon and Laitin 2003; Humphreys 2005; Le Billon 2001), the main focus of this research. These three outcomes surely can affect one another, creating an element of simultaneous causality

among them. It is important that this is noted, as much of the literature focuses on just one of the three aspects of the resource curse and there are presumably mechanisms at work that overlap between them. While this research focuses on the negative effect resources (specifically diamonds) have on conflict, the literature does suggest the potential for an overlap between these other two aspects in the theories that explain causation.

Increased Risk of Civil War

The harmful effect natural resources have on an increased risk of civil war and conflict is the aspect of the resource curse that is often referred to when explaining the connection between diamond wealth and the occurrence of civil wars in sub-Saharan Africa. As scholars have identified the link between resources and civil war, they have posited a number of different theories that explain the causation. The bulk of the literature has divided into two dominant explanations. The first argues that where there are easily accessible resources, rebel groups will have incentive to capture and control territory in a state. The second argues that resource dependence leads to rent seeking and corruption, creating a weak state with weak institutions. The state then does not have the capacity to effectively terminate insurrections and civil wars.

The first causal explanation regarding rebel groups capturing resource-rich territory is built upon some of the contemporary civil war literature that examines the economic causes of conflict (Azam 1995; Grossman 1995; Hirshleifer 1987). This research takes on a very rational choice tone with the theoretical framework focusing on the actors involved in a civil war, their preferences, and the actions that are taken to achieve these ends. In simple terms, a civil war occurs in a state if the incentive for a

rebellion is sufficiently large enough relative to the costs (Collier and Hoeffler 1998, 563). The incentive for this rebellion is the product of probability of victory and its consequences. This probability then depends on the ability of a government to defend itself, bringing economic resources into the equation. Resources here are not limited to just natural resources, but any resources used for a state to defend itself in a civil war or a rebel group to incite one. Resources provide the state with a greater probability of victory in war, but also create greater incentives for rebels to engage in insurrection. All participating actors weigh both of these potential costs and benefits before engaging in conflict (Grossman 1999; p. 269).

Rebel groups are faced with a higher cost than the state when engaging in civil war. This is partly due to the opportunity cost of rebel labor and the disturbance in economic activity caused by the conflict (Collier and Hoeffler 1998, 565). For states with a higher per capita income, both costs would increase. Quite simply, higher income populations have more to lose during a rebellion than lower income populations. These costs would also increase with the duration of the conflict. As rational actors, rebels are faced with the choice of remaining peaceful or fighting a war with a specific probability of success and an expected duration which is necessary to achieve the desired outcome (secession or capture of the state). Because the benefits of rebellion will differ according to each state and each group, these rebel groups will also differ in their willingness to accept the costs related to the differing projected durations (Grossman 1995, 191).

Building upon this earlier model of civil war, Collier and Hoeffler (1998) analyze the "greed" dimension of the resource curse that concerns opportunistic rebels capturing resource-rich territory. They likewise posit that natural resources will create large enough

incentives for rebels to engage in insurrection. Using probit and tobit regressions for a dataset containing state-level observations for 98 countries between the years 1960 and 1992, Collier and Hoeffler find that the possession of natural resources (measured as a ratio of primary commodity export revenues to GDP) initially increases the risk and duration of civil war for their model. Higher income per capita in contrast reduces the risk and duration of civil war. The authors go on to explain that where there is higher economic stability, rebel actors have more to lose as they weigh the costs and benefits of rebellion. Governments in these economies also have more resources to defend the state and are less likely to experience civil war. Natural resources, however, provide an incentive for rebel groups to engage in civil war should they succeed. They point to the significance of their primary commodity exports variable as well as GDP per capita as evidence for their theory. Similarly, Herbst (2000) notes that resources play a large role for rebel leaders in assessing the opportunity costs of insurrection, likewise finding that the obstacles to collective action are smaller when there are more natural resources.

Phillip Le Billon (2001a) introduces two other mechanisms that further explain and clarify Collier and Hoeffler's greed concept: motivation and financing. In his qualitative analysis, he observes that areas rich with natural resources are usually very concentrated geographically, and this provides motivation for rebel leaders to stake out and gain control over certain areas in a state. Fights over these territorial areas could result and thus lead to civil war. The financing mechanism in his theory suggests that trade gains from these natural resources can fund the startup costs, purchase of weapons, etc. for rebel groups engaging in civil war. Natural resources are seen as a financial incentive that helps decrease the costs of civil war for rebel groups.

A number of other studies have also found support for civil war as being greed-driven (Collier and Hoeffler 2004; Collier, Hoeffler, and Rohner 2009; Collier, Hoeffler, and Söderbom 2004; Lujala 2010) rather than resulting from grievances in the population against the state, another longstanding explanation (Gurr 1970, 2000). In 2004 Collier and Hoeffler once again find stronger support for civil wars as being driven by greedy rebels, with their primary commodity exports variable generating high predictability of civil war outcomes. Male secondary education enrollment, per capita income, and the growth rate all statistically reduce the risk of conflict, lending support to the idea that rebels facing higher opportunity costs will be less likely to succeed. Collier and Hoeffler use inequality, political rights, ethnic polarization, religious fractionalization, and ethnic dominance as proxy variables to examine if there is evidence for rebellion as being grievance-driven. Only ethnic dominance (one ethnic group being a majority) had significant adverse effects, allowing them to once again make the case for rebellion as being greed-driven (Collier and Hoeffler 2004).

Fearon and Laitin (2003) are commonly regarded as the primary scholars to introduce the second main theoretical connection between resource abundance and civil war, with their analysis finding support for a weak state mechanism. They argue that resource dependence will generally result in rent seeking and corruption creating weak central governments. In these ineffective states, the likelihood of conflict increases because of their inability to manage counterinsurgency at the local level. States that are financially, politically, and organizationally weak render insurgency more feasible for rebel groups due to incompetent local policing or weak and corrupt counterinsurgency

practices (Fearon and Laitin 2003, 75-76).[1] To measure state strength, they include per capita income in their analysis as a proxy variable and find that higher levels reduce the risk of civil war. Additionally, they find larger populations, political instability, being a new state, and an oil exporter to increase the likelihood of civil war. They likewise do not find support for grievances being a cause of civil war with indicators such as ethnic or religious diversity, lack of democracy, and economic inequality resulting in insignificant results. Fearon and Laitin also do not find support for Collier and Hoeffler's (1998, 2004) argument that resources are a cause of greed-based rebellion, with the primary commodity exports variable lacking statistical significance in their analysis. Confirming this study, Elbadawi and Sambanis (2002), Fearon (2005), Humphreys (2005) also find greater support for a weak state mechanism causing civil war than the greedy rebels dimension. In a comparative study of 13 civil wars, Ross (2004b) further does not find evidence of wars being greed or grievance driven; yet he does not test the weak-states mechanism.

While the greed-driven rebellion and state-capacity mechanisms appear to be at odds with each other, de Soysa and Neumayer (2007) argue that they can in fact be complementary. A strong state will be able to deter most rebel looting; the motive might yet exist while the opportunity for success does not. If cases exist where resource abundance and wealth does not cause corruption and state weakness, the state should be able to use resource rents to constrain rebels and circumvent conflict. They find that energy rents slightly increase the risk of minor armed conflict, but not major civil war onset, with mineral rents having no effect. Generally, their study lends more support for

[1] This theory hearkens back to the slow-growth and autocratic regime aspects of the resource curse, with causal mechanisms in these fields also explaining the weak states.

the state capacity mechanism, but does not rule out the potential for greed-driven civil war when the state is weak and cannot deter it.

Snyder (2006) further argues that natural resources may not necessarily lead to conflict and disorder. He maintains that outcomes can vary depending upon the actions of rulers and private economic actors, also when taking into consideration the institutions of resource extraction. If rulers are able to implement extraction methods that give them tight control over natural resources, these incomes can help maintain the order in a state. Natural resources may actually have a stabilizing effect for states that are able to control the institutions of extraction, such as Botswana's state-owned mining companies. However, the collapse or absence of institutions of extraction can also lead to instability in two ways, by causing a financial crisis that threatens state failure and by making it easier for rebel groups to organize and claim control over resource wealth.

According to Snyder, the type of resource including how it is extracted, whether the means of doing so are state-owned or privately controlled, and how susceptible it is to looting matters for conflict outcomes. Further research began to examine these characteristics and more specifically differentiate the effects that different types of resources have on conflict. The previous general measure of primary commodity exports began to be replaced by specific resource types such as oil (Aslaksen 2010; de Soysa and Neumayer 2007; Lujala 2010), forest resources (Buhaug and Rød 2006; Rustad et al. 2007), and the main focus of this study—diamonds.

Diamonds as Lootable Resources

In order for scholars to better understand the causation between resources and civil war, this more nuanced look at natural resources became necessary. Under the

greed-driven rebellion theory, the resources under consideration must actually be accessible to the rebel leaders for Le Billon's (2001a) motivation and financing mechanisms to hold true. Oil requires expensive machinery and investment before the financial gains of it can actually be realized. This is also the case for timber and many types of mining. Diamonds, however, often require little to no infrastructure and simple, unsophisticated methods for excavation. Essentially, they could be classified as highly "lootable." A resource that can be considered lootable is one that is a high value good with low economic barrier to entry. Some natural resources therefore can be considered lootable while others are non-lootable. As mentioned above, oil, timber, and other heavy-machinery mining would thus be classified as non-lootable natural resources with some research arguing that resources such as these actually positively affect regime stability and peace (Basdeau and Lay 2009; Smith 2004; Thies 2010). Diamonds, however, can be a resource that is extremely lootable and therefore highly beneficial to rebel actors because of the low economic barriers to entry. Olsson (2007, 286) even goes as far to state that diamonds are the ideal reward for potential predators due to their "high value per carat, flexible practical size and scale of extraction, their indestructability, their tradability all over the world, and the difficulty with which their place of origin can be established."

While some scholars have found support for a general measure of overall diamond production significantly increasing civil war outcomes (Humphreys 2005; Olsson 2007), many have extended the concept of lootable vs. non-lootable resources even further by paying specific attention to the type of diamonds and diamond mining

occurring in a state. When understanding some basic diamond geology, it is evident that some diamonds can be considered lootable while others are not.

Diamond mining methods fall into two separate categories: alluvial and kimberlite mining. Alluvial mining and alluvial (secondary) diamonds are removed from their primary source by natural erosion over millions of years and eventually deposited in a new environment such as an ocean floor, riverbed, shoreline, or other nearby areas. Kimberlite mining extracts primary diamonds at their original source: kimberlite beds found under the Earth's crust. Kimberlite mining requires advanced technology and machinery, and is capital-intensive. Alluvial mining, on the other hand, is done through artisanal methods and recovered through sand, gravel, or clay by digging with tools requiring little sophistication or investment: human labor, shovels, sieves, etc.

Lujala, Gleditsch, and Gilmore (2005) are some of the first scholars to quantitatively examine the effects of primary (kimberlite) and secondary (alluvial) diamonds. They use regression models and data from 53 diamond producing countries from 1945 to 1999 and find that most diamond-rich countries experience conflict. However, when they introduce the diamond variables into standard civil war models, the results are a little more mixed. They find that secondary or alluvial diamonds increase the risk of civil war, especially in states with higher levels of ethnic fractionalization. Primary or kimberlite diamonds in turn actually have the opposite effect: making civil war *less* likely. Similar results by Ross (2006) and Østby, Nordås, and Rød (2009) show that secondary diamond deposits significantly increase the likelihood of civil war onset, with Ross noting, however, that there is no impact on conflict duration. This was disputed by Lujala (2009, 2010; see also Buhaug and Lujala 2005) who finds that the duration and

intensity of a conflict increases when secondary and lootable diamonds are found within the conflict zone.

A number of qualitative case studies have also found support for the role lootable resources play in conflict outcomes, with specific attention given to the bloody civil wars witnessed in Africa (Keen 2005; Le Billon 2001b; Samset 2002; Smilie, Gbrerie, and Hazelton 2000). Studying diamond-rich states in sub-Saharan Africa, Olsson (2006) finds that diamonds do largely correlate with economic underdevelopment and civil war. However, he does note that different outcomes on these variables across his cases are due to the type of mining that is being done in each state, with alluvial mining leading to conflict outcomes such as the civil wars in Angola, DRC, and Sierra Leone in the 1990s. Snyder and Bhavani (2005) also consider the differences in lootable vs. non-lootable resources. Through a small-N analysis looking at the cases of Ghana, Guinea, and Sierra Leone, they determine that the ability of rulers to achieve political order depends on the availability of non-lootable resources, the mode of extraction of the lootable resources, and patterns of state spending. While their study does not differentiate on the types of diamond mining, the underlying concepts at work are extremely similar. Resources that are lootable will provide the motivation for rebel leaders to capture a geographic area and then be able to use that as an economic incentive to lessen the costs associated with rebellion.

Shortcomings in the Literature

Although there is an abundance of literature supporting the theory that diamonds (especially lootable diamonds) exacerbate conflict outcomes, there is nearly as much research devoted to debunking, or at least questioning the "myth" of the resource curse

regarding resources and civil war (Brunnschweiler and Bulte 2009; Smith 2004; Sorens 2011). Even studies that generally agree upon the underlying theory vastly differ in how to capture the relationship. No agreed-upon statistical conflict model exists, and there are numerous shortcomings and differences in the literature. Koubi et al. (2014) detail some of the deficiencies they find in the existing scholarly work, noting first that studies differ in how they measure civil war and conflict. Not only do the commonly used datasets differ in operationally defining civil war (for example with the Correlates of War project using 1,000 or more battle-deaths as the threshold necessary for civil war as opposed to the UCDP/PRIO Armed Conflict Dataset that has a lower threshold of only 25 battle-deaths in a year), but studies also use different measures. Civil war is sometimes used in the form of onset (Basdeau and Lay 2009; Lujala 2010; Østby, Nordås, and Rød 2009), duration (Lujala 2009), severity (Sorens 2011), or even recurrence (Rustad and Binningsbø 2012). While there certainly is merit to understand these different aspects of civil war and conflict, it does become more difficult to form a generally agreed-upon quantitative model.

Koubi et al. (2014) also note the differences regarding the literature's sample coverage of both space and time. Some scholars use worldwide data (Humphreys 2005; Ross 2006; Lujala 2009, 2010), with others focusing on specific regions (Østby, Nordås, and Rød 2009) or even single countries (Bellows and Miguel 2009). Furthermore, the time span differs greatly with some studies 10 to 20 years (Fjelde 2009; Bellows and Miguel 2009) with others analyzing 40 or more years (Brunnschweiler and Bulte 2009; Thies 2010; Sorens 2011).

There are also large differences in how scholars measure resource abundance and dependence. Some studies use dichotomous variables to indicate whether or not a country has natural resources such as oil or diamonds, or specifically primary vs. secondary diamonds (Østby, Nordås, and Rød 2009; Snyder and Bhavani 2005; Sorens 2011). Other scholars rely on the export value of natural resources and relate this to the size of the economy or total exports (Brunnschweiler and Bulte 2009; Ross 2004a), with others creating a dummy variable for resources that reach above a certain threshold point (Fearon and Laitin 2003). Still, other scholars use measures of resource production as a ratio of GDP or population (Basdeau and Lay 2009; Fjelde 2009) while a number of others use total value or rents from resource production (de Soysa and Neumayer 2007; Humphreys 2005).

Finally, data on natural resource production and wealth used in earlier studies have come to be regarded as rather low quality (Humphreys 2005). The quality of this information has greatly improved in recent years with the creation of new datasets on diamond deposits and mine production as well as oil and gas reserve locations (de Soysa and Neumayer 2007; Flöter, Lujala, and Rød 2005; Gilmore et al. 2005; Lujala, Rød, and Thieme 2007; Østby et al. 2011; Sorens 2011; Thieme, Rød, and Lujala 2007).

"Blood Diamonds" and The Kimberley Process for Diamond Certification

Despite the lack of total consensus on a model capturing the impact diamonds play in conflict outcomes, public awareness of the association became heightened in the late 1990s as "blood diamonds" were viewed as a main culprit for the civil wars ravaging Angola and Sierra Leone at the time, among other African conflicts. After independence in 1975, Angola had experienced prolonged civil war, stemming from existing ethnic and

social tensions, but intensified through the clashes between the two main colonial liberation movements, the People's Movement for the Liberation of Angola (MPLA) and the National Union for the Total Independence of Angola (UNITA). In the mid-1990s the conflict continued, despite a lack of support from Western powers and the local population. A number of social groups and eventually the United Nations pointed to UNITA's persistence as a result of its control over diamond-rich land. It has been estimated that between 1992 and 1998, UNITA received a minimum of US$3.72 billion in diamond revenues while controlling 90 percent of the country's diamond reserves (Gooch and Yearsley 1998). Stories also emerged of Angolan diamonds being illicitly funneled into Zaire, where stockholders in the De Beers diamond corporation collected them in exchange for military equipment and arms originating from Eastern Europe (Fowler 2000).

Similar to Angola, Sierra Leone encountered decades of political turmoil, corruption, mismanagement and electoral violence after gaining independence in 1961. Years of this instability led to a weak civil society, the collapse of the education system, and an entire generation of dissatisfied youth by the 1980s and 1990s. These young men were particularly attracted to the message of the Revolutionary United Front (RUF). With aid from the special forces of Charles Taylor's National Patriotic Front of Liberia (NPFL), the RUF attempted to overthrow the Joseph Momoh government. Diamonds had long been considered a source contributing to the widespread government corruption since their discovery in the 1930s, and this in turn intensified the grievances of the people against the ruling elite. However, the role played by diamonds in the Sierra Leone civil war became even more prominent as RUF rebels primarily took control of territory in and

around the diamond districts, resulting in brutal violence including the rape, murder, and mutilation of local civilians in order to control and work the mines. RUF rebels were able to use diamond incomes to arm themselves and purchase additional weapons and ammunition from neighboring Liberia and Guinea. Diamonds were regarded as a significant resource in the sustained conflict which after 11 years claimed an estimated 75,000 lives, left 500,000 Sierra Leoneans as refugees, and displaced nearly half of the country's 4.5 million people (Tamm 2002).

The destructive wars in both Angola and Sierra Leone drew the attention of several human rights organizations including the well known Amnesty International and Human Rights Watch. However, it was Global Witness, a small NGO at the time, which gained the attention of the worldwide mainstream media with its 1998 report that shed unpleasant light on diamond firms' dealings with UNITA rebel leaders in Angola and also on De Beers' dealings with the notoriously corrupt government-owned enterprises in the country (Gooch and Yearsley 1998). In 2000, Partnership Africa Canada (PAC) published an equally disagreeable report about the illicit diamond trade in Sierra Leone (Smillie, Gberie, and Hazleton 2000). Through the efforts of Global Witness and PAC, conflict diamonds began to gain even greater attention. Stories began to emerge in outlets such as the BBC, the *New York Times*, and the *Washington Post* exposing the role diamonds (and the diamond industry) were playing in several African civil wars.[2]

Amidst the growing public awareness of conflict diamonds, the United Nations took action against Angola in 1998 and Sierra Leone in 2000, imposing sanctions on all diamond trade with these states. Reports subsequently emerged, however, detailing how sanctions could do little to remedy the situation if diamonds from conflict zones were

[2] See, for example, *New York Times* (2000) and *BBC News* (2001).

crossing borders into non-sanctioned neighboring countries (Fowler 2000). Fearing widespread consumer boycott, the South African government invited representatives from other diamond producing and trading states as well as representatives from the diamond industry and NGO's to meet in Kimberley in May 2000. The purpose of the meeting was to come up with the framework for an institution that could prevent the trade of conflict diamonds. After a series of other meetings and nearly two and half years later, the Kimberley Process Certification Scheme (KPCS) emerged as an overarching regulatory agreement that would oversee the international trade in rough diamonds for Kimberley Process member states.

Seeking to regulate the trade of diamonds, the Kimberley Process incorporates a tripartite system to ensure that diamonds being imported and exported by member countries are conflict-free. The process engages the governments of member states (considered "participants") as well as the diamond industry acting through the World Diamond Council and a number of NGO's that play an oversight role (considered "observers"). Initially, 37 member states plus the European Union joined the global certification scheme with the number now totaling 54 participants representing 81 countries in 2015 (Kimberley Process 2015). Although it has been supported by the United Nations, the KPCS itself functions independent of the body after concerns that without autonomy the negotiations would have been slow and ineffective. This also allows for the inclusion of industry and civil society representatives that were thought to play a vital role in creating a successful and lasting structure.

The Kimberley Process itself is a voluntary agreement between member states, as opposed to a formal treaty. However, because member states agree to only engage in

diamond trade with other member states, it has in practice become as legally binding as more traditional international law. Member states also agree to meet minimum requirements in implementing national legislation and institutions, import, export, and internal controls, and commit to transparency and the exchange of annual statistical data. Specifically, each shipment of diamonds crossing an international border should be transported in a tamper-resistant container and be accompanied by a government-validated Kimberley Certificate. Each certificate must be uniquely numbered, forgery resistant, and also provide details on the contents of the shipment including the number of carats, value in US dollars, identification of the importer and exporter, etc. Failure to comply with these minimum criteria may cause for the suspension or removal of a non-complying country (Kimberley Process 2015).

Despite these praiseworthy intentions, the legitimacy of the Kimberley Process has been called into question by numerous commentators and investigative journalists in the years since its creation. Reports of forgery emerged in early 2012 with false Kimberley Process certificates being issued from Cameroon, before the country had even been accepted as a participant member. The Kimberley Process organization issued official warnings for these illegitimate certificates plainly stating "Any document purporting to be a Kimberley Process certificate from Cameroon is fake and should not be used" (Ntaryike 2012). Additionally the U.S. State Department under a 2009 administrative decision collected a number of false Kimberley Process certificates that it came across between 2004 and 2010, originating from the Democratic Republic of Congo, Ghana, Guinea, Namibia, and Sierra Leone (U.S. Sate Department 2011).

While government and Kimberley Process officials have been able to spot many forged certificates, a larger problem has been illicit diamonds smuggled across borders. The United Nations has reported diamonds mined in rebel-controlled areas of Côte d'Ivoire emerging on the international market (United Nations 2007), often being sold through Mali (United Nations 2008). Liberia has also been identified as another state where diamonds are smuggled into from Sierra Leone, the Marange field in Zimbabwe, and the Central African Republic (Legal Monitor Worldwide 2013). Venezuela additionally is acknowledged as a country smuggling diamonds beyond its borders while it has been under Kimberley Process sanctions. Although Venezuela has a high level of diamond production, it lists no official exports since 2005 (Partnership Africa Canada 2006). The application of neighboring Panama (a non-diamond producing country) to the Kimberley Process suggests the presence of smuggled gems inside its borders (Allen 2012).

Often diamonds are smuggled after receiving a minimal number of facets, allowing them to be considered "manufactured goods" and thus outside of the purview of the Kimberley Process, not needing certification prior to export. A UN Panel of Exports reported in 2013 the possibility of a manufacturing facility in Côte d'Ivoire producing partially polished stones that created a new loophole in the Kimberley Process (United Nations 2013). The same UN panel warned that if diamonds emerging from sanctioned states (such as Côte d'Ivoire) or otherwise of controversial origin can be minimally polished to fall outside the oversight of the KPCS, this is problematic.

Another loophole in the Kimberley Process that has been identified is the use of certificates of "mixed origin". Section I of the Kimberley Process Core Document allows

for parcels of mixed origin, meaning a parcel that contains rough diamonds from two or more countries of origin, mixed together. The problem with this allowance is that the parcel of mixed origin then receives a new certificate, issued only with information for the country where the contents were mixed. Reports and lawsuits have emerged specifically regarding Omega Diamonds, a Belgian company that would purchase diamonds of questionable origin for a small price tag in Angola, the Democratic Republic of Congo, and Zimbabwe. These diamonds would then be shipped to Dubai where they would be given a certificate of mixed origin and subsequently marketed at an over-value price (Sharife and Grobler 2013).

Despite the incidents of diamond smuggling and forged or deceptive certificates, many supporters of the Kimberley Process point to the limited number of actual "conflict diamonds" on the market emerging from areas controlled by rebels in order to finance war. However, many critics have pointed out the limited scope of the Kimberley Process in solely focusing on the elimination of diamonds exported for the benefit of rebel armies, despite this being the initial goal. This definition of "conflict diamonds" does not consider other disagreeable aspects of the international diamond trade, particularly abuses sustained at the hands of participating member governments. The system is structured to incorporate multiple actors involved in diamond production and trade, with diamonds producers expected to present evidence of the conflict-free gems to a government monitoring body, and the government agency in turn confirming that this evidence is legitimate. With this system, the Kimberley Process does not directly account for the illegitimate acts committed by the government, or the corruption of these institutions and the payoffs taking place in order to certify diamonds as "conflict-free". Various other

forms of violence, including social and financial in addition to physical, fall outside the Kimberley definition. These include actions taken by those who control the state as well as their corporate partners in the diamond industry.

An example of this limitation has been the 2006 discovery of diamonds in the Marange district of Zimbabwe and the continual obstacles it has created for the Kimberley Process. Concerns first emerged regarding the large number of unlicensed miners and lack of regulation, also addressing the water, housing, and sanitation crisis that emerged after the initial diamond rush. However, in 2008 government officials deployed the Zimbabwe military to the diamond fields and stories of serious human rights abuses developed. Illegal miners have been subject to harmful violence and even killed at the hands of these state security forces (Partnership Africa Canada 2010). Forced labor, including child labor, as well as torture and other inhuman treatment has also been documented by Human Rights Watch (2009, 2010).

The Kimberley Process placed restrictive measures on Zimbabwe in 2009 over the unsettling concerns of violence from the military-controlled zone. However, despite protests from civil society organizations and member governments (including the United States), the organization allowed exports to resume once again in 2011. In response to this decision Global Witness withdrew its "observer" membership in December of that year. While there may be less danger of diamonds funding conflict for anti-government rebels, Global Witness vocally emphasized the likelihood that diamond revenues in Zimbabwe were financing a ruling government that uses brutal intimidation of voters to stay in office. Questionable mining contracts in the Marange field were granted to several companies in Zimbabwe with known associations to senior members in Robert

Mugabe's Zanu PF party. Off-budget diamond revenues in Zimbabwe have even been reported by some newspapers to be directly benefiting the Zimbabwean Central Intelligence Organisation, the state security service that allegedly has committed acts of violence against Mugabe's political opponents (Global Witness 2011).

In the official press release after the decision to withdraw from the Kimberley Process, Global Witness founder and director Charmian Gooch suggested, "We now have to recognize that this scheme, begun with so many good intentions, has done much that is useful but ultimately failed to deliver. It has proved beyond doubt that voluntary schemes are not going to cut it in a multi-polar world where companies and countries compete for mineral resources" (Global Witness 2011). Despite the many successes the KPCS has claimed credit for, groups such as Global Witness have become highly critical of the limited scope of the Kimberley Process, publicly noting that its narrow focus will not continue to clean up the diamond industry without accounting for other issues such as these described.

Although there has been vast media attention both praising and criticizing the Kimberley Process during the twelve years since its implementation, there has been surprisingly little scholarly attention regarding the topic. This is furthermore curious, as there has been such controversy and little consensus in the resource curse literature. Most of the academic work concerning the Kimberley Process is limited to studies in legal reviews and journals, some concluding that although it is considered international soft law by classification, the KPCS obligations function as a conventional treaty for member states and is essentially binding in practice (Ezedeu 2014). Other studies have criticized the weak enforcement of the Kimberley Process due to its soft law nature and contend

that with a feeble framework merely suggesting ways for member states to conduct investigations and punish violators, it inevitably cannot be an efficient mechanism for preventing illicit diamond trade (Cullen 2013; Fishman 2005; Holmes 2007). Cullen does note, however, that it has worked well with some states such as Liberia, but less well with states with weak compliance capacity such as Côte d'Ivoire.

Besides these legal-based scholarly works, there are very few other studies that actually evaluate the effectiveness of the Kimberley Process, with even fewer doing so through an empirical process and certainly none with quantitative data. Wright (2004) discusses some of the achievements and limitations of the KPCS, yet makes his evaluations before the regulatory structure had even been in place a full two years. Hughes (2006) offers a more extensive critique of the process, noting that the largest roadblock is how to enforce its mechanisms and obligations on alluvial-diamond producing countries. He describes instances of diamonds illegally crossing borders into Ghana and the Republic of Congo as well as forged KPCS certificates. However, much of his "analysis" does come off as anecdotal storytelling with normative suggestions for improvement. Bieri (2010) also evaluates the Kimberley Process in her qualitative study using content analysis of core documents, news articles, and personal interviews. Although she presents a thorough account of the creation and implementation of the institution, she likewise merely lists the accomplishments it has made as well as the issues it faces, without actually analyzing if fewer conflict diamonds can be attributed to the Kimberley Process or if it is having a decreasing impact on civil war outcomes.

It is here where this research attempts to fill a gap between the existing literature regarding diamonds and conflict and the limited work evaluating the effectiveness of the

Kimberley Process. It can generally be hypothesized that if diamonds are indeed having a negative impact on civil war outcomes, then the Kimberley Process should prove to be an obstacle for the onset and duration of civil war, if it is functioning as it has been designed. The ensuing analysis may show that both diamond abundance and the Kimberley Process actually play an insignificant role in determining conflict outcomes when also controlling for other factors such as economic performance of a state, the level of governance, and ethnic fractionalization. However, with the attention, time, and money that has been and continues to be spent on behalf of this institution, it certainly is a worthwhile question to be investigated and synthesized into the existing literature.

Chapter 3

Data and Methods

An examination of the literature assessing the effectiveness of the Kimberley Process in reducing "conflict diamonds" illuminates the lack of empirically driven analyses necessary for this evaluation. If the Kimberley Process is functioning as it has been designed, it should prove to be a significant obstacle for the onset and duration of civil war. This analysis seeks to test this general hypothesis as well as the overall impact diamond abundance has on conflict outcomes, with the specific methodology and data collection details discussed below.

Methodology

This study will replicate many of the traditional resources and civil war quantitative models, with new attention given to the Kimberley Process. Since the Kimberley Process largely was instituted as a result of the civil wars in Angola and Sierra Leone and other conflicts in diamond-rich areas in sub-Saharan Africa, this study will focus specifically on civil war outcomes in sub-Saharan Africa between 1980 and 2010. Reliable data on diamond production is only available beginning in 1980, justifying this as the start of the time series. This also allows for available and reliable data for other control variables, an issue often targeted at studies focusing on sub-Saharan Africa. Furthermore, the Kimberley Process went into official effect for original member states in 2003, so beginning the analysis at 1980 allows for enough variation on the Kimberley Process variable to examine its effect before and after implementation.

Four models will be used to examine the determinants of civil war in sub-Saharan Africa. The first two models will use civil war onset as the dependent variable, with each including different independent variables. Due to the dichotomous nature of civil war onset, logistic regression is used to estimate these models.[3] The units of analysis for these models are country year. The third and fourth model will specifically examine civil war duration, using this as the dependent variable. In a duration model, the dependent variable captures the length of time (measured here in years) until the failure event occurs (in this case, failure actually refers to a civil war ending). This is estimated using a parametric Weibull regression that allows for positive, negative, or no duration dependence.[4] The Weibull model estimates the effects of the independent variables on the hazard rate of a civil war ending. The hazard rate is analogous to probability although it does not have an upper bound. As the hazard rate increases, the expected duration of civil war also increases.

Variables and Measures

The dependent variable for this study is civil war, with different models examining both war onset as well as duration, as mentioned above. Data on civil war is gathered from the Ethnic Power Relations Project, which is based upon the UCDP/PRIO Armed Conflicts Data Set (ACD) (Gleditsch et al. 2002). ACD defines armed conflict as

[3] The Hausman test was used to determine if the model should control for fixed or random effects. Because the test did not find the difference between the random and fixed effects estimates to be statistically different from zero, the random effects model is used due to its efficiency and ability to estimate all parameters in the model. In order to control for autocorrelation that is inherent in time series, cross-sectional data with a binary dependent variable, a counter variable for spells (peace years) and cubic splines are used, as developed by Beck, Katz, and Tucker (1998).

[4] A Weibull regression is used because the effects of the covariates were not found to be proportional over time when running diagnostics for a Cox Hazard Model. The parametric Weibull model is appropriate because it can be assumed that the longer civil wars go on, the more likely they will be to end. See Figure 1 for visual evidence of the increasing hazard function over time. See Fearon (2004) and Hartzell and Hoddie (2003) for other studies using Weibull models to estimate civil war duration.

any armed and organized confrontation between government troops and rebel organizations, or between army factions, that reaches an annual battle-death threshold of 25 people. Massacres and genocides are not included because the government is not organized or armed, communal riots and pogroms are excluded because the government is not directly involved. The Ethnic Power Relations data set is selected among other similar projects because it codes civil wars through the year 2010, providing the most recent data. Because the Kimberley Process only went into effect in 2003, it is imperative that the analysis utilizes the most available data for contemporary years.

The two main explanatory variables are *Diamonds* and the *Kimberley Process*. Data for *Diamonds* is gathered from the British Geological Survey and is measured in terms of overall production (thousands of carats). For the purposes of this analysis, overall diamond production is also logged. The *Kimberley Process* data is gathered from the Kimberley Process official website and is coded as a binary variable, with 0 representing the absence of the KPCS in place that year and 1 indicating that the KPCS is established for that country in that year. An interaction term is also included to examine the effect of both diamonds and the Kimberley Process together (*Diamonds x Kimberley Process*), which controls for states that are members of the KPCS, but participate only as diamond importers rather than diamond producers and exporters. It can be reasonably assumed that membership in the KPCS will have a differing impact on civil war outcomes depending on whether the state is actually engaging in diamond production.

Models 2 and 4 also include data on the specific type of diamond production occurring in a country, differing between primary and secondary diamond production. These are measured as two separate binary variables, with *Primary Diamond Production*

coded 1 if a country engages in the production of primary or kimberlite diamonds for a given year, and coded as 0 if it does not. *Secondary Diamond Production* is likewise coded for countries engaging in the production of secondary or alluvial diamonds. Data on these variables is gathered from the DIADATA dataset, compiled by Gilmore et al. (2005) and in partnership with the Peace Research Institute. The *Diamonds* variable measuring production in terms of actual output (carats) is generally more preferable than these binary variables since it accounts for greater variation between producing countries. However, the *Primary Diamond Production* and *Secondary Diamond Production* variables are included to also examine the hypothesized negative effect that secondary diamonds have on civil war outcomes and the potential positive effect that primary diamonds have. These are also included for robustness checks.

Additional control variables are selected from the existing literature concerning diamonds and civil war. These include level of democracy, GDP per capita, GDP growth, ethnic fractionalization, mountainous terrain, population, and whether the state is an oil exporter.

Democracy data is gathered from the Polity IV Project and is coded as the country year's Polity II score (*Polity II*). The measure is the difference between the country's AUTOC and DEMOC scores and ranges from +10 (strongly democratic) to -10 (strongly autocratic). The literature assumes that countries with higher levels of democracy will be less likely to experience civil war. Due to the difficulty of obtaining reliable data for much of sub-Saharan Africa, Polity IV does not include information for Eritrea (1980-1993), Namibia (1980-1989), Sao Tome and Principe, and Seychelles.

Data for *GDP Per Capita* is from the Penn World Tables and is measured as expenditure-side real GDP per capita at chained purchasing power parity (PPP) rates in millions of 2005 US$. *GDP Change* is measured as the change in percent from the previous year for the expenditure-side real GDP at chained PPP rates in millions of 2005 US$. Both the rebellion as greed-driven and state-capacity theories expect that civil war will be less likely in states with higher GDP and GDP growth. GDP data is not available for the cases of Eritrea, Seychelles, and Somalia.

Ethnic Fractionalization is coded using the Alesina et al. (2003) index of ethnic fractionalization. The data set measures the degree of ethnic, linguistic, and religious heterogeneity in various countries. Ethnic fractionalization is often used as a proxy variable for grievance and to examine whether rebellion is grievance-driven. The corresponding literature expects higher ethnic fractionalization to lead to greater likelihood of civil war onset. The Alesina index does not include data for Cape Verde, Eritrea, Sao Tome and Principe, and Swaziland.

Mountainous Terrain is measured as the proportion of a country that is considered "mountainous", as gathered by Fearon and Laitin (2003) but also according to the codings of geographer A.J. Gerard. These authors hypothesize that mountainous terrain will be more favorable to rebels and difficult for weak states to terminate insurrections in, thus leading to civil war. Fearon and Laitin do not include data for Cape Verde, Comoros, Equatorial Guinea, Sao Tome and Principe, and Seychelles.

Data for *Population* is from the Penn World Tables and is measured in millions, as well as logged. The literature commonly cites states with higher populations being

more likely to experience civil war. Data is not available for Eritrea, Seychelles, and Somalia.

Data for *Oil* is coded as 1 if oil represents one third or more of a country's GDP and 0 if this threshold is not met. Data for years 1980 to 2001 is provided by Leonarda Arriola (see Arriola 2009). Data for years 2002 to 2010 is from World Development Indicators. The resource curse literature has generally assumed that states with an abundance of oil will be more likely to experience civil war, yet some recent work instead finds a stabilizing effect. Data is unavailable for Eritrea (1980-1991), Namibia (1980-1989), Sudan (2009-2010) and Swaziland.

Hypotheses

Models 1 and 2 examine the determinants of civil war onset. According to the vast majority of the literature, diamonds should render states more likely to experience civil war. If the Kimberley Process is effectively eliminating conflict diamonds, however, states with the Kimberley Process in place should be less likely to experience civil war. Hypotheses for Model 1 are as follows:

> *H_1: States with higher diamond production will have greater likelihood of civil war onset.*
>
> *H_2: The Kimberley Process will decrease the likelihood of civil war onset.*
>
> *H_3: The interaction of diamonds and the Kimberley Process will decrease the likelihood of civil war onset.*

Model 2 includes the additional hypotheses:

> *H_4: States with primary diamond production will have less likelihood of civil war onset.*
>
> *H_5: States with secondary diamond production will have greater likelihood of civil war onset.*

Models 3 and 4 examine the determinants of civil war duration. Once again, according to much of the previous research, diamond production should increase the length of civil wars, providing a source of funding for rebel groups. However, if the Kimberley Process is working as intended, these diamonds could not be legally traded by member states. Rebels could not use "conflict diamonds" to continue violence against the state. The hypotheses for Model 3 are as follows:

H_6: States with higher diamond production will have longer civil wars.

H_7: The Kimberley Process will decrease the length of civil wars.

H_8: The interaction of diamonds and the Kimberley Process will decrease the length of civil wars.

Model 4 includes the additional hypotheses:

H_9: *States with primary diamond production will have shorter civil wars.*

H_{10}: *States with secondary diamond production will have longer civil wars.*

The ensuing analysis tests these ten specific hypotheses in the four outlined models. Results for assessing the impact of diamonds and the Kimberley Process on both the onset and duration of civil war are reported in the following chapter.

Chapter 4

Results

Table 1 presents the results for Models 1 and 2 examining the determinants of civil war onset. Interestingly enough *Diamonds*, the *Kimberley Process*, nor the *Diamonds x Kimberley Process* interaction has any significant effect on civil war onset, contradicting Hypotheses 1-3. Hypotheses 4 and 5 also cannot be confirmed, with the coefficients for primary and secondary diamonds likewise having no significant impact in Model 2. *GDP Per Capita* is the only variable significantly affecting the likelihood of civil war, with higher GDP per capita decreasing the likelihood of civil war onset. The significance of the *GDP Per Capita* coefficient lends support for both the rebellion as being greed-driven mechanism in the literature and the state capacity argument. States with higher GDP under the greedy rebels theory will have higher opportunity costs for engaging in civil war. The state capacity argument holds that states with greater financial strength will be more effective at managing counterinsurgency and preventing civil wars. Ultimately however, it is difficult to make a strong case for either of these theories based on the analysis because of the lack of significance for the diamond variables.

The lack of significant predictors in both Models 1 and 2 is likely a result of the very limited variance on the dependent variable, civil war onset. The dataset contains 1210 observations (country years), with 96.2 percent of these coded as 0, meaning no onset of a new civil war. With such a limited number of actual civil war onsets, the model simply does not have enough variance to generate any significant predictability. Further

research may expand the dataset to include a larger case selection in order to address this.[5]

Table 1
Logit Analysis of Civil War Onset
In sub-Saharan Africa, 1980-2010

Independent Variables	**(1)**	**(2)**
Diamonds	0.019	0.015
	(0.028)	(0.043)
Kimberley Process	-4.922	-5.962
	(3.745)	(3.999)
Diamonds x Kimberley Process	0.335	0.415
	(0.251)	(0.271)
Primary Diamond Production		-0.619
		(0.582)
Secondary Diamond Production		0.375
		(0.534)
Ethnic Fractionalization	0.890	0.681
	(1.325)	(1.335)
Polity II	-0.007	-0.013
	(0.032)	(0.033)
Mountainous Terrain	0.003	0.003
	(0.009)	(0.009)
Population	0.027	0.085
	(0.145)	(0.155)
GDP Per Capita	-0.000*	-0.000*
	(0.000)	(0.000)
GDP Change	0.009	0.008
	(0.013)	(0.013)
Oil	0.322	0.167
	(0.476)	(0.496)
Constant	-3.564	-3.657
Observations	1210	1210
Chi-square	15.66	16.98

*** p < 0.01, ** p < 0.05, * p < 0.1
Note. Standard errors in parentheses.

Table 2 presents the results for Models 3 and 4, examining the duration of civil war. Given the manner in which Weibull models are parametrized, a positive coefficient

[5] Other models including a scobit regression were used in an endeavor to address the skewed distribution of the dependent variable (see Nagler 1994), but none of these could converge on an estimation, leaving the logit model as the best attempt at explaining the onset of civil war.

estimate indicates that an independent variable increases the hazard of a civil war ending. Since the duration of civil war is inversely related to the hazard of a civil war ending during a given year, a positive coefficient indicates that an independent variable increases the expected duration of civil war for a state.

Table 2
Weibull Analysis of Civil War Duration
In sub-Saharan Africa, 1980-2010

Independent Variables	**(3)**	**(4)**
Diamonds	0.028	-0.027
	(0.048)	(0.058)
Kimberley Process	3.305***	3.154***
	(1.175)	(1.274)
Diamonds x Kimberley Process	-0.164**	-0.158**
	(0.067)	(0.074)
Primary Diamond Production		1.230*
		(0.717)
Secondary Diamond Production		0.345
		(0.692)
Ethnic Fractionalization	-0.103	0.120
	(2.245)	(2.568)
Polity II	0.045	0.024
	(0.045)	(0.044)
Mountainous Terrain	-0.008	-0.009
	(0.015)	(0.018)
Population	-0.157	-0.347
	(0.284)	(0.272)
GDP per capita	-0.000	-0.000
	(0.000)	(0.000)
GDP change	0.035**	0.035*
	(0.018)	(0.019)
Oil	-1.342	-1.836
	(1.044)	(1.477)
Constant	-1.671	-1.838
Observations	178	178
Wald chi-square	157.00***	182.24***
P	1.129	1.298
Time at risk	178	178
Subjects/Failures	26/26	26/26

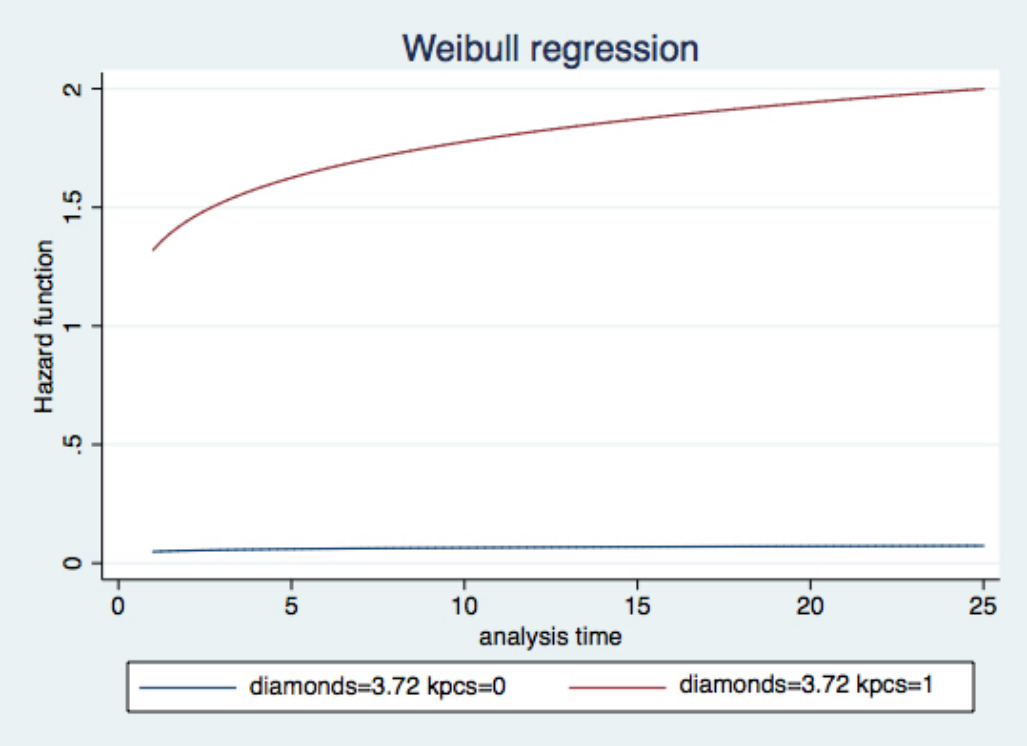
*** p < 0.01, ** p < 0.05, * p < 0.1
Note. Hazard coefficients represented in table
Robust standard errors in parentheses

Table 2 shows the coefficients for *Diamonds* as statistically insignificant in both Model 3 and Model 4, preventing Hypothesis 6 from being confirmed. The literature's theory of diamonds providing a "financing" mechanism thus is not supported in this model. While the *Kimberley Process* variable is significant, Hypothesis 7 cannot be confirmed, since the positive coefficient implies the variable increases the length of civil war. However, the theoretically relevant effect is the interaction between diamond production and the Kimberley Process, assuming KPCS members will be diamond producing states. The coefficient for the *Diamonds x Kimberley Process* interaction variable is statistically significant in the hypothesized direction, confirming Hypothesis 8. In other words, states having greater diamond production and the Kimberley Process in place experience shorter civil wars, as understood by the negative sign. States where the Kimberley Process was intended to mitigate conflict (diamond producing states) are experiencing less destructive civil war outcomes (measured here as length). According to the estimation in this model, the Kimberley Process is indeed having its intended effect on civil war duration for diamond producing states.

Figure 1 shows a substantive representation of the effect that the Kimberley Process has for diamond producing countries. The graph captures the duration (measured in years) on the x-axis and the hazard function on the y-axis. The blue curve represents a state with the mean level of diamond production (logged = 3.72) and that does not have the Kimberley Process in place. The red curve represents a state that also has the mean level of diamond production, yet does have the Kimberley Process in place. The red curve shows that at the baseline, the state with the Kimberley Process in place has a greater hazard function than the blue curve. This means that the red curve state with the

Kimberley Process in place, is more likely to reach the hazard (end of civil war), visually demonstrating that states with the Kimberley Process have shorter civil wars.

Figure 1
Graph of Hazard Function (Model 3)



Model 4 (Table 2) suggests the same relationship on civil war duration for the *Diamonds*, *Kimberley Process*, and *Diamonds x Kimberley Process* coefficients found in Model 3, confirming the robustness of these results. The significance of the *Primary Diamond Production* coefficient presents interesting implications regarding the "lootability" argument found in the literature, with its lengthening effect on civil war duration (contrary to Hypothesis 9). Additionally there is no significant impact for *Secondary Diamond Production* on civil war duration, rejecting Hypothesis 10. Because of the extensive mining infrastructure and investment that is required to harvest primary

diamonds from kimberlite beds deep underground, the literature has generally suggested that rebel groups are not able to use these resources as a means to continue funding armed conflict, but could do so through the availability of secondary or alluvial diamonds. However, the analysis in Model 4 does not support this. Perhaps the viewpoint in the literature does not take into account potential instances where primary diamond mines (including their infrastructure) are captured by rebel groups. A situation such as this could possibly increase civil war duration if rebels are able to continue financing conflict from primary diamond revenues. Furthermore, this evidence might suggest that states with primary diamond mining also have greater resources to continue fighting civil wars. Many countries with an abundance of kimberlite diamonds directly benefit from their profits, having state-owned (or partially owned) extraction enterprises. The analysis might also suggest states with primary diamond mining (that are able to retain control of their mines during civil war) are able to continue financing the conflict through this income, having an even greater incentive to keep control of these mines. While the evidence from this analysis does not give empirical support for either of these hypothesized causal mechanisms, it does question the body of literature that has shown primary diamonds to have a stabilizing effect and secondary diamonds to lengthen civil wars.

GDP Change also is a significant determinant of civil war duration in both Models 3 and 4. Interestingly, the positive coefficient for *GDP Change* demonstrates that higher levels of economic growth in a state increase the length of civil war. This finding questions support for the state capacity theory of civil war, which suggests that states with greater economic strength will have a better ability to terminate insurrections and

manage counterinsurgency. However, perhaps once again higher levels of economic growth simply give the state more resources to keep financing prolonged conflict. Because of the unexpected direction of the effect of *GDP Change*, further research should continue to examine the role that it plays in conflict duration.

The following chapter will go into a broader substantive discussion of these results, as well as present limitations of this study, suggestions for further research, and conclusions.

Chapter 5

Discussion and Conclusions

This paper proposes a quantitative model for examining the effects of the Kimberley Process on civil war outcomes. Although there have been a number of studies in the field of international law evaluating the structure of the Kimberley Process and frequent normative arguments offering both criticism and acclamation for it, there has been relatively no systematic analysis from political science scholars assessing its role in preventing conflict. The inclusion of the Kimberley Process as an independent variable in a relatively standard model of civil war outcomes is a simple and unsophisticated addition, yet the results are nonetheless interesting for understanding the impact of this international soft-law structure. While the Kimberley Process has no significant impact on civil war onset, it does lead to shorter civil wars for the diamond producing states where it was intended to ameliorate conflict outcomes. This suggests that when civil wars do break out in diamond producing states that are members of the Kimberley Process, rebels are not able to use diamonds as a source of revenue to keep funding conflict.

The analysis also challenges the conventional wisdom for the determinants of civil war onset. Much of the literature has found support for the included control variables in Models 1 and 2. As previously discussed, perhaps a reason for the lack of significant predictors (besides GDP per capita) is the limited number of years in this case selection and thus limited variance on the dependent variable, as compared to many civil war studies using time-series data beginning much earlier in the 20th century. The insignificance of the diamond variables in both models, as well as the parceled out

primary and secondary diamond variables in Model 2 certainly are at odds with much of the literature regarding diamonds and conflict (Lujala, Gleditsch, and Gilmore 2005; Østby, Nordås, and Rød. 2009; Ross 2006). The quality of data regarding total diamond production has greatly improved in recent years, with some credit to be given to the Kimberley Process's requirement for member states to provide this detailed information. Further research using total diamond production as well as the formerly used binary variables indicating diamond presence or production will continue to illuminate the relationship between diamond abundance and civil war.

The duration models in this study also question the effect that diamonds are actually having on civil war outcomes. The lack of a significant effect for overall diamond production and secondary diamonds, as well as the increasing effect of primary diamonds prompts further review of the body of research that has found diamonds to be having an impact on conflict duration (Buhaug and Lujala 2005; Lujala 2009, 2010). As with the onset models, further research using improved diamond data should be pursued to understand the role that diamonds have on civil war duration.

The significant decreasing impact on civil war duration for states having greater diamond production and the Kimberley Process in place provides strong empirical support for the international soft-law structure, despite many of the criticisms described in Chapter 2. Perhaps, however, these limitations should still be given consideration, with the Kimberley Process having no measurable effect on civil war onset. Many of the issues such as forged certificates and smuggled gems remain troubling, even in light of the analysis results in Models 3 and 4. Yet supporters of the Kimberley Process can be

somewhat validated by these results, allowing them to suggest that the Kimberley Process is indeed preventing rebel groups from financing conflict through "blood diamonds".

This also suggests broader implications for the role that institutions might have in addressing societal and economic problems, such as other aspects of the "resource curse". The Kimberley Process was designed as an institution to stop the trade of diamonds that indirectly fund conflict, and the evidence presented in this study shows that it has been somewhat successful. This information may be valuable for further policymaking and peacekeeping efforts that use institutions to address problems such as conflict. Civil society organizations have called for the creation of structures similar to the KPCS to regulate the illicit trade of other resources such as timber and cocoa (see Global Witness 2015). The effectiveness of the Kimberley Process may impact the potential future of these other regulatory institutions and how they are designed.

As is inherent in any quantitative analysis focused on sub-Saharan Africa, this study could be biased by unreliable data for many of the variables, especially for diamond production data. The onset analysis in Models 1 and 2 could be biased by the limited case selection of 1980-2010. Extending the dataset earlier could allow for more variation on the dependent variable (civil war onset), although both the availability and reliability of data might then be compromised.

Beyond the reach of this study, further research might explore the effect that governance and corruption have on civil war outcomes for diamond producing states, seeking to better understand cases such as Zimbabwe. This could also allow for greater consideration of the autocratic regime aspect of the resource curse that has also been identified. Perhaps using a different measure for conflict that captures unilateral state-

sponsored violence and oppression might further illuminate the potential negative effects diamond abundance might have, looking beyond the two-sided conflicts examined in this study.

While unrelated to conflict, future studies might also examine the impact that the Kimberley Process has had on small-scale artisanal miners in order to better understand the more general effects of the organization. Navigating the government bureaucracy that is necessary to obtain a Kimberley Process certificate may be creating obstacles for miners with little formal education or familiarity with such tasks. Measures have been taken by the Kimberley Process and civil society organizations to aid alluvial miners in these procedures, yet the impact it has had on this group and their livelihood is likewise given little attention in the literature.

The Kimberley Process can certainly be esteemed for the measures that it has taken to increase transparency in international diamond trade and reduce the number of conflict diamonds on hands of consumers. Yet there is still much to be understood regarding the effectiveness of the institution, especially in terms of actual conflict outcomes. This study takes a step towards that direction, with its systematic analysis offering more insight than the various commentaries and criticisms that can be found regarding the KPCS. While considerable further scholarship and attention is necessary to make any concrete claims, this study does give some empirical backing for the many supporters of the Kimberley Process, 12 years after its initial praiseworthy intentions were set into action.

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