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MA Thesis

Rebels finances squeezed: Rebellion duration sensitivity to commodity shocks

How do primary commodity shocks affect rebels' ability to fight? Previous studies have examined the impact of economic shocks on the onset, continuation, and intensity of conflict. Bazzi and Blattman (2014) find that commodity price shocks have no impact on the outbreak of new conflicts but play an important role in existing ones. However, their argument is centered on how commodity price shocks affect the state's revenue versus household income, largely ignoring rebel groups. Many rebel groups are funded through commodities, and thus should be impacted by global prices. Collier et al. (2004) find support for the claim that a decline in commodities shorten conflict, but do not distinguish whether the rebels are funded by the commodities. Rebel commodity funding is an important link between the theoretical explanations previously supported and my new proposition. I posit that rebels funded by specific commodities(in this case oil) are more susceptible to economic shocks than rebels that are not funded by commodities, or are funded by different commodities.

Literature Review and Theory

Civil war duration has been a significant topic of conflict scholarship for the past two decades. There is much existing literature explaining the factors that lead some civil wars to be longer or shorter than others. There are several state level attributes that have an effect on conflict duration, such as income, inequality, population, and size(Collier, Hoeffler, and Soderbom 2004; Balch-Lindsay and Enterline 2000). Group level characteristics are also known influencers of conflict duration. These include the number of soldiers, relative strength, capacity, and geographic location(Buhaug, Gates, and Lujala 2009; Cunningham 2006;

Cunningham, Gleditsch, and Salehyan 2009). Additionally, the 'type' of conflict matters, such as ethnic(Licklider 1995; de Rouen and Sobek 2004) and separatist(Balch-Lindsay and Enterline 2000).

An additional factor that is related to resource endowment and longer civil conflicts is separatism. Fearon(2004) suggests that rebels that fight separatist wars are less likely to see successful negotiations, leading to longer wars. This is because both the government and the rebels see natural resources located in a specific region as an indivisible good. Governments are more likely to renege on agreements with separatist's rebels in order to exploit the natural resources. Even if the government does not intend to renege on the agreement, the rebel groups trust in the government is lower because of what is at stake.

Natural resources have been a known influencer of the onset and duration of civil conflict(Fearon 2005; Ross 2004a; 2004b; Ross 2006). Several studies have found that when groups are financed by specific resources such as opium and diamonds conflicts last longer(Fearon 2004; see also Weinstein 2007). Conflicts are also longer when they are fought in areas where oil, natural gas and gemstones are located(Buhaug, Gates, and Lujala 2009; Lujala 2010) A new study has found that rebellions funded by natural resources do have an influence on the duration of conflict, but it matters how they are financed by the resources(Conrad, Greene, Walsh and Whitaker 2018). They argue that groups that smuggle natural resources should tend to fight longer conflicts, as smuggling gives rebel groups the flexibility and mobility to resist the government. The authors find that rebels that smuggle natural resources fight longer civil wars, while those that extort natural resources do not fight longer wars. Given the evidence, it is clear that rebel natural resource funding impacts conflict duration.

There are several other known factors that contribute to rebel funding's influence on war duration. Combatants face severe bargaining challenges when they possess significant amounts of natural resources. Any negotiation between rebels and the government will involve a settlement with the natural resources. Rebels have a general fear that any agreement concerning the natural resources may be broken in the future by the government, reducing the likelihood of negotiated settlement(Fearon 2004; Collier, Hoeffler, and Soderbom 2004). Additionally, natural resources may lead to a cartel style political system that involves doing political favors for resource wealth. This in turn creates grievances which lowers the cost of rebellion for rebels (Lujala 2010, Grossman 1991).

Oil plays a key role in the global economy as well as the individual states themselves. Oil, like any other natural resource, can be used to finance rebellions. However, Ross(2004a) finds that oil is salient for conflict onset but not duration. His test does not show if the rebels are funded by oil, but whether the state is predominantly a petro-state. However Lujala(2010) finds that oil substantially prolongs conflict when located inside the conflict zone. While the authors use different methodology, I aim to resolve the conflict by using data that better tests the causal mechanism. Rebels can exploit both lootable and non-lootable natural resources such as oil that require a lot of capital in order to extract and refine. Rebels can allow oil businesses to continue to operate and receive payment through threats of violence or promises of protection. Or rebels can take control of an oil facility and then refine and the sell the oil themselves as did the Islamic State of Iraq and Syria. The Ejercito de Liberacion Nacional adopted this strategy to earn money during their civil war with the Colombian government(Offstein and Aristiza´bal 2003; Ross 2012).

Bazzi and Blattman(2014) claim that commodity price shocks affect conflict through the lens of three different theories. The first is the opportunity cost of insurrection. Early civil war literature applied the economic analysis of crime theory to rebellion. The rational individual weigh the relative costs, risks and returns when deciding to predate or produce. Thus crime rates are expected to rise as employment falls(Becker 1968). Grossman(1991) applies this logic to rebellion. A civilian's incentive to join a rebellion rises as income and economic opportunities decline. Based on this rationale Collier and Hoeffler (1998) predict an inverse relationship between export price shocks and conflict. However, Bazzi and Blattman (2014) point out that not all price shocks affect household income and state income equally. The authors argue that certain commodity shocks, such as agricultural shocks, disproportionately impact households, whereas capital-intensive commodity shocks mainly impact the state. Opportunity cost theory thus predicts a strong inverse relationship between rebellion and the prices of labor-intensive commodities (Dal Bó and Dal Bó 2011).

Another theory that ties commodities with civil war is the state as prize. When a state has natural resources, it can draw more rents than normal, increasing the incentives for a group to try and seize it. There is strong evidence that natural resource abundance drive conflict(Fearon 2005; Ross 2006). However not all commodities are easily exploited or taxed. Extractive commodities, such as oil or other minerals involve large fixed costs, making them easy targets for taxation. Bazzi and Blattman (2014) assume that the effect of commodity shocks will be larger for mineral/fuels than crops due to the increased taxation. Based on this taxation, the authors assume that a primary commodity shock will decrease the extent to which the state is seen as a prize and shorten conflict.

The final theory Bazzi and Blattman discuss are revenues and state capacity. State's that can extract rents from commodities can better defend themselves by increasing their military, police and administrative processes (Fearon and Laitin 2003). Others such as Ross (2012) theorize that oil regimes have a greater ability to strengthen its security or buy off opposition leadership. Primary commodity shocks are expected to lengthen conflicts as the government's military power is weakened. Bazzi and Blattman (2014) find evidence that supports this theory as well as the opportunity cost theory, but not the state as a prize theory. Specifically, the authors find that rising oil and mineral prices are associated with shorter, less intense conflicts. The balance of power between the two is thus hinged on whether the state or the rebel group can extract more resources. This is also filtered by a government's necessity to govern, which is costly, in order to decrease grievances.

Missing from the three theories Bazzi and Blattman (2014) test and past literature is the relationship between rebel finance of the commodities and commodity price shocks. While each of the three theories explicitly discusses the dynamics of civil war, only the opportunity cost theory discusses how the rebels might be impacted from economic shocks. Specifically, the opportunity cost theory suggests that commodities that affect households has an impact on rebel recruitment. There is empirical evidence that conflicts last longer when the rebel group derives substantial funding from contraband sources such as opium and diamonds (Fearon 2004; Weinstein, 2007) and when they operate in areas where oil, natural gas, and gemstones are located (Buhaug, Gates and Lujala2009; Lujala 2010). I suggest a fourth theory that is centered around rebel capacity that is consistent with Collier et al. (2004). The authors find there that a 10% decrease in the price of primary commodity goods in a state would shorten the civil war by 12%. They theorize that this puts a stranglehold on rebel funding from natural resources which

limits their capabilities. I aim to develop their theory and test it using disaggregated rebel funding data.

This paper assumes that rebels are rational actors, as in, rebels calculate their risk and make decisions based on their risk-outcome analysis. It also assumes that government and rebel knowledge about each other is generally known. When knowledge is not known it is assumed that it is randomly distributed among groups and years. This paper also assumes that rebels independent of each other.

Another key assumption of this paper stems from Ross (2004). Rebels are generally assumed to be the weaker actor in conflicts with the government. Generally, strengthening the weaker side leads to longer conflicts. Bennett and Stam (1996) find supporting evidence when testing this relationship among interstate conflict. The authors find that state's fight longer conflicts when the two states are closer in power. The same power balance dynamic should play out in terms of civil conflict. Rebellions are generally weaker than the government opposition. Natural resource funding, in this case oil funding, should affect conflict duration by sustaining a rebel group over time. Rebels that are funded by natural resources should be able to purchase more weapons, recruit more soldiers, and buy off more government officials. Some rebel groups may use these resources to increase the intensity of the conflict and aim for concessions from the government(Cunningham, Gleditsch, and Salehyan 2009; Buhaug, Gates, and Lujala 2009; Thomas 2014). However, other rebel groups may use the resources to evade and survive against the government opposition. Additionally, the government may not feel sufficiently threatened by rebels to the point where it attempts to resolve the conflict. In these cases, natural resources lead to more to group survival rather than an attempt at victory. This is generally thought of as the rebel's 'power to resist'.

Oil is a capital-intensive commodity. Capital intensive commodities allow a rebellion to distance itself from the civilian population. Fortna(working paper) argues that rebels who exploit these resources can buy soldiers, weapons and information without relying on the local population. Several of these commodities such as gold and diamonds are also easily tradeable in semi-regulated markets. This is especially prevalent in a state experiencing civil war. The state may not have the capacity to regulate exports and impose a tax when rebels control capital resources which is highly correlated with territorial control.

Commodity shocks are the dramatic change in price normalized by the extent that the commodity is prevalent in a country. The shocks can have a profound impact on every possible actor in a state, from the government to the individual. Commodity price shocks broadly impact a state during civil war. If individuals economic standing is significantly worsened they are more likely to join a rebellion according to opportunity cost theory, and shown in Bazzi and Blattman's(2014) results. The shocks can also weaken the government and its ability to oppose rebels, which is also shown in Bazzi and Blattman(2014). Rebellions that are funded by a primary commodity and then experience a shock should be significantly impacted. If the price of oil collapses and a rebel group derives a sizable portion of its funding through oil sales the results could be devastating. This would mean less money for guns, soldiers and corrupt officials. It also is a clear sign to opponents that it has just become weak. *I expect rebels that are funded by oil should be negatively affected by negative economic shocks.*

It is common knowledge in investment strategy that one should diversify holdings to avoid major losses. The logic is simple, if one particular holding drops in value the other holding may not necessarily decrease. While this eliminates the possible upside of 100% of the holdings being one stock that sees extreme growth, there is also a much smaller chance that the

total value of the holdings decreases dramatically in a short period of time. The same logic can be applied to rebel group funding. Rebels that are funded by one resource live and die by that resources value, while rebels that diversify their funding strategy can take hits to the value of certain commodities they are funded by. *I expect rebel groups funded by multiple strategies to be less sensitive to economic shocks than groups funded by one commodity.*

Hypotheses:

1. *Civil wars with rebellions that are funded by oil are expected to be shorter (longer).*
2. *Civil wars with rebellions that are funded by oil are expected to be shorter (longer) when they experience a negative (positive) oil price shock.*
3. *Civil wars with rebellions that are funded by oil and crime are expected to last longer than civil wars with groups only funded by oil when they experience a negative oil price shock.*

Research Design:

The dependent variable for my analysis is the duration of armed conflict and is calculated using the Uppsala Conflict Data Program's (UCDP) Conflict Termination Dataset (Kreutz 2010). The dataset provides the start and end dates of all civil conflicts that occurred during the period 1946-2008. Conflicts are coded as ending if there is a victor, a peace agreement, or if the intensity of the conflict drops below 25 battle deaths(and does not return above it). An observation is a dyad-year, or a conflict year between a state and a rebel group. Merging together the data from UCDP, the natural resources data, and the commodity shock data gives a span from 1990 to 2007. To account for right censoring of the data, I code any conflict that was ongoing in 2007 (the final year of the UCDP data) as a censored observation.

For my multivariate analysis I use a cox proportional hazards model. The model does not assume linearity nor is it restricted to time-invariant covariates which is ideal for the variables that are tested. The model shows how the covariates selected either increase or decrease the baseline hazard, or the likelihood of war termination. The hazard rate at year *t* for conflict dyad *i* is a function of the baseline hazard rate, h_0t, and the covariates. Using an exponential link function, the overall hazard rate for conflict dyad *i* is $h_i(t) = h_0(t)^{e_{xi}}$ so that the baseline hazard corresponds to the case where all covariates are set to 0.

Independent Variables:

Economic Shocks: I use Bazzi and Blattman's database of commodity price shocks. Their data covers 1957 to 2007 for all countries in Africa, the Middle East, Latin America, and Asia(excluding nations with populations under 1 million, due to data availability). They focus on export price shocks but also include food and imports. They also develop a new country-specific measure annual commodity export price shocks for each country-year. The measure is the annual difference in each country's log commodity export price index. Each price index is a geometric average of all commodity export prices weighted by lagged export shares. The measure also multiplies the price difference by the ratio of commodity export values to GDP at the midpoint of the period. This accounts for countries that are more sensitive to shocks because they are commodity dependent nations (Bazzi and Blattman 2014). I use their data on oil price shocks for this analysis.

Bazzi and Blattman identify three potential sources of endogeneity in the shock. First, an unobserved variable that contributes to conflict risk could also reduce a nation's export diversity. Second, not all nations are 'price-takers'. Some nations that produce a huge portion of the world's supply of a commodity are 'price makers'. Observations in which the state produces

more than 10% of the share of global exports are omitted from the nations price shock. Essentially, states cannot affect themselves with a price shock. "Third, commodity prices can affect real incomes through consumption." Workers can get paid larger wages when the price of goods increases, however theoretically speaking the fact that the price is growing means that real incomes of all households decreased.

Rebel Funding: Rebels employ two major tactics to exploit commodities: Extortion and Smuggling(Conrad et al. 2018) Extortion is defined as: "the seizure of property with the knowledge and consent of the owner through the use of violence or the threat of violence." (Lotspeich 1997) Rebel groups that use extortion basically threaten individuals with violence if they will not give them profits/resources. While most previous research focuses on how rebels can extort the resources themselves from workers, they can also extort fixed, non-lootable resources such as oil. They can do this by taking over production facilities by force or by allowing production to continue but demanding payment. Extortion is strongly related to territorial control. Rebels that control the extraction site can better monitor production or receive more consistent payments. While extortion involves a resource or commodity, a rebel group that extorts a commodity that is hit by a shock would have a cushion, especially if they extort the production rather than the resource itself. Rebels can demand a similar or even the same payment from workers who are impacted by the shock because of the power dynamic(Conrad et al. 2018).

Smuggling involves the illicit transport of goods within countries and across international borders. Rebels smuggle both illegal goods such as opium, and licit goods, but move them clandestinely across border to avoid seizure and/or customs. Rebels are well equipped to smuggle because they generally have the means to transport the goods, contest law enforcement,

and control territory near borders. Smuggling is distinct from extortion, meaning that rebels can partake in smuggling without extorting the resources. Smuggling is essentially an illegal trade of goods across borders. Groups that use smuggling to fund themselves should be especially sensitive to primary commodity shocks, as this directly affects the price of the good they distribute(Conrad et al. 2018).

In my analyses I merge these two strategies of funding. While Conrad et al.(2018) find a statistically significant difference between the strategies, I expect the effect of the shock to be the same on both. Whether rebels smuggle the oil or extort a business, the price of oil still determines how much money they are able to extract from either option. While some may argue that the rebel group is going to come for the same amount of money on a consistent basis, a price shock has a significant effect to where the business should not be able to pay the previous amount.

Rebel funding consists of three dummy variables, one for *oil funding*, one for *crime funding*, and one for *diversified oil funding*. To measure rebel funding, I am using "The Rebel Contraband Dataset"(Walsh, Conrad, Whitaker and Hudak 2018) that has rebel funding strategies from 1990 to 2012. The data are measured yearly at the level of rebel-state dyad based on the list of conflicts compiled by the Uppsala Conflict Data Program. Each observation is coded based on the rebels funding during that year. Rebels were coded as funded by oil if the group extorts, smuggles or steals oil. Rebels were coded as funded by crime if the group engages in general extortion(non-natural resources), general theft(non-natural resources), or kidnapping. Oil diversification is a dummy variable that is coded as a one if the group engages in oil funding and crime in the given year. The data were coded from United Nations reports, newswires, reports from NGO's, books, and academic articles. This data source is a large step

up from previous sources that attempted to code rebel funding strategies. Previous data sets such as Lujala, Gleditsch, and Gilmore(2005) and Buhaug et al. (2009) account for natural resources within conflict zones but do not directly measure if rebel groups earned money from the resources. Fearon(2004) codes data on rebel funding but it is reliant on gems and narcotics as does not vary over time. This data has the advantage of being at the group level and varying over time.

Dependent Variable: The dependent variable is *conflict duration*, which is calculated using the Uppsala Conflict Data Program's (UCDP) Conflict Termination Dataset. The dataset includes the start and end dates of all civil conflicts between 1946 and 2009. Conflicts can end by peace agreement, ceasefire, or if one party completely defeats the other. Conflict termination also includes when a conflict falls below the 25 battle death threshold. This is not a perfect measure as groups may fall out of the data set that is given, but then reenter after 2009. This is right censored data which is specified in the cox proportional hazards model.

Control Variables: In order to determine the true effect of rebel funding and commodity shocks on conflict duration I have several control variables drawn out of the civil war duration literature. These include several state level variables. One is an indicator if a state is a democracy. I use Polity IV in order to create a *democracy* dummy variable(A score of 7 or above is a democracy). I also include a variable measuring the percentage of a state's GDP the government takes as revenue. This variable measure both government capabilities as well as the government's sensitivity to economic shocks. An increase in government revenue should shorten conflicts. This variable is coded using the IMF's data.

I also include data related to the civil war. These variables include third party intervention in the civil war which is coded as a one when a state intervenes in a dyad year and

zero if no state intervenes. States that have third party intervention last longer and are more violent(Reagan 2002). I also include an indicator variable for whether the civil war is a territorial conflict. Territorial conflicts have been found to increase the duration and intensity of the war as well.(Findley 2005)

Results

Overall, the results are mixed. Figure one shows the Kaplan-Meier survival curve for all civil wars. Most civil wars end after a few years but the probability of failure does not stay tapers off after about 7 years. Table one includes the multivariate duration models testing my first and second hypotheses. Much of the existing literature is replicated in the analysis. Separatist rebel groups fight civil wars that last longer, and third-party intervention increases the duration of civil wars. Model one does not include the interaction between oil funding and oil price shocks. With regards to my hypotheses, the findings show that rebels funded by oil fight longer civil wars than civil wars in which rebels are not funded by oil. Figure two displays this relationship with a survival curve. Roughly one fifth of groups that last sixteen years(the maximum in this data) are funded by oil. This is in accordance with previous literature that suggests rebels that exploit resources such as diamonds, oil and other gems fight longer, deadlier conflicts. This affirms my first hypothesis. Rebels that are funded by crime fight longer civil wars. Oil price shocks are not significant in reducing conflict, which is counter to what Bazzi and Blattman(2014) find.

To test my second and third hypotheses I use the same cox proportional hazard model with an interaction term. Model two shows the results of my model when interacting the variables oil funding with oil price shocks. When there is no oil shock, civil wars in which the rebellion is funded by oil last longer. It also shows that groups that are funded by oil fight

shorter conflicts when they experience a shock. This is support for hypothesis two, as it suggests that in order for a commodity shock to have an effect on an ongoing civil conflict, the rebel group must derive funding from it. Model three interacts diverse oil funding with economic shocks in order to test whether diversification creates a shield for groups funded by oil. I did not find support for hypothesis three. Civil wars in which rebels are funded by oil and crime do last longer, but oil shocks significantly shorten the length of those conflicts. It may be possible that this result is sensitive to alternative measures of diversity. Like my first model, incompatibility and intervention are significant at the .05 level and is correlated with longer civil conflicts.

Oil shocks interacted with diverse funding significantly shorten the conflict. One possible explanation for this is that in my current measurement groups that are funded by both oil and crime are disproportionately funded by oil and thus when they lose some of that funding it has a greater impact. Additionally, these may just be stronger groups in general that are fighting more intense conflicts, so any change in their funding will have a significant impact on the outcome of the fight. Most groups that are funded by oil are also funded by crime. 7.64% of the group-years are funded by oil, while 7.55% of group-years are funded by oil and crime.

All three models have comparable R^2 and log-likelihood, which demonstrates similar model fit. When comparing the results of the three models together, the second model in Table One has the highest R^2, indicating that interacting rebel oil funding with and oil price shock explains more of the variation in civil conflict than not interacting the terms, or interacting diverse funding with oil price shock. These results also maintain when adding additional control variables such as inequality and size. In additional tests I also split the oil funding into Conrad et al.'s(2018) two categories, smuggling and extortion and attempted to run the tests with the same

specification. However, there was not enough variation between the two categories and the covariates in order for the model to overcome collinearity.

Figure 1-Civil War Survival Curve

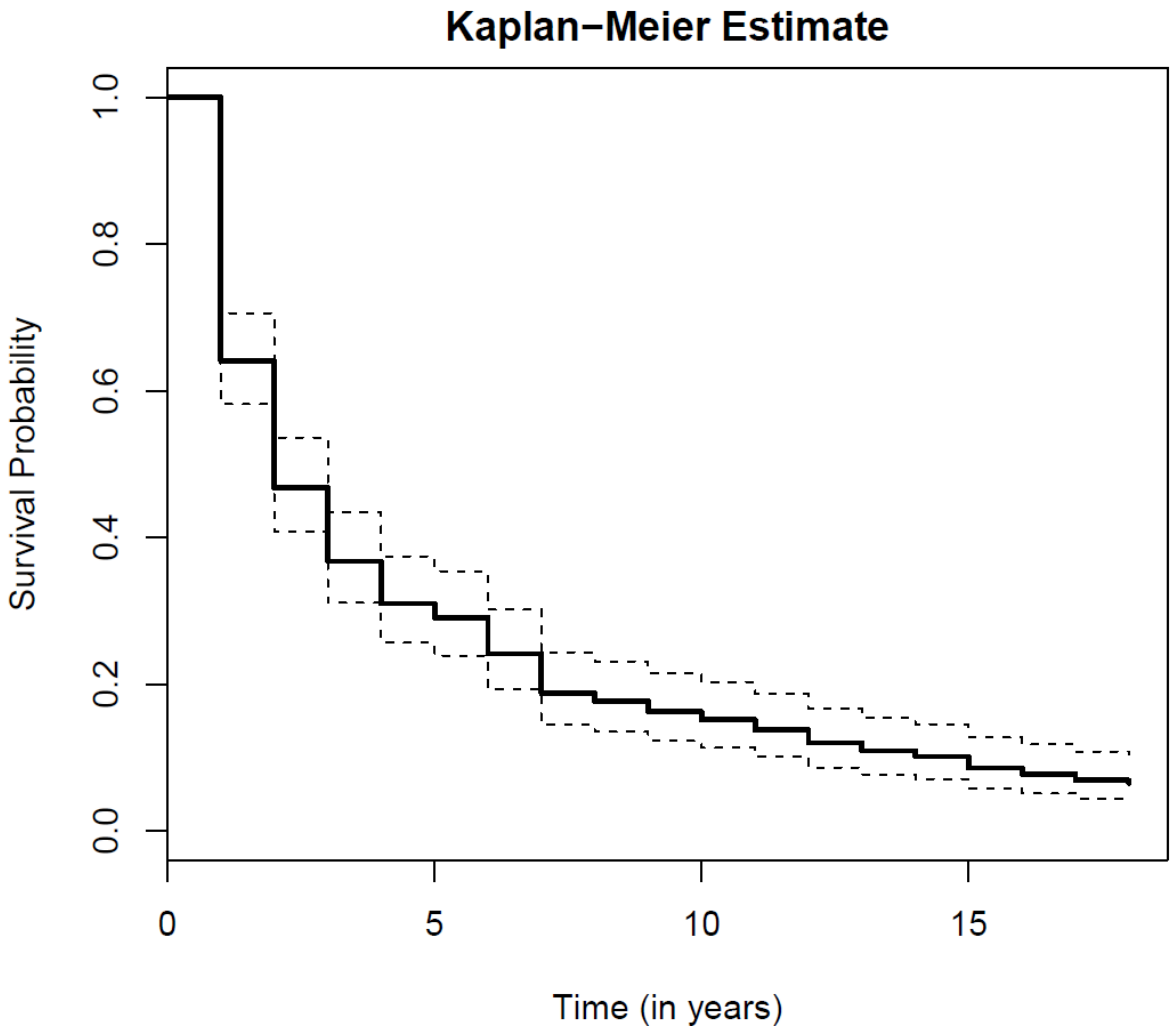

Figure 2- Survival Curve Strata: Rebel Oil Funding

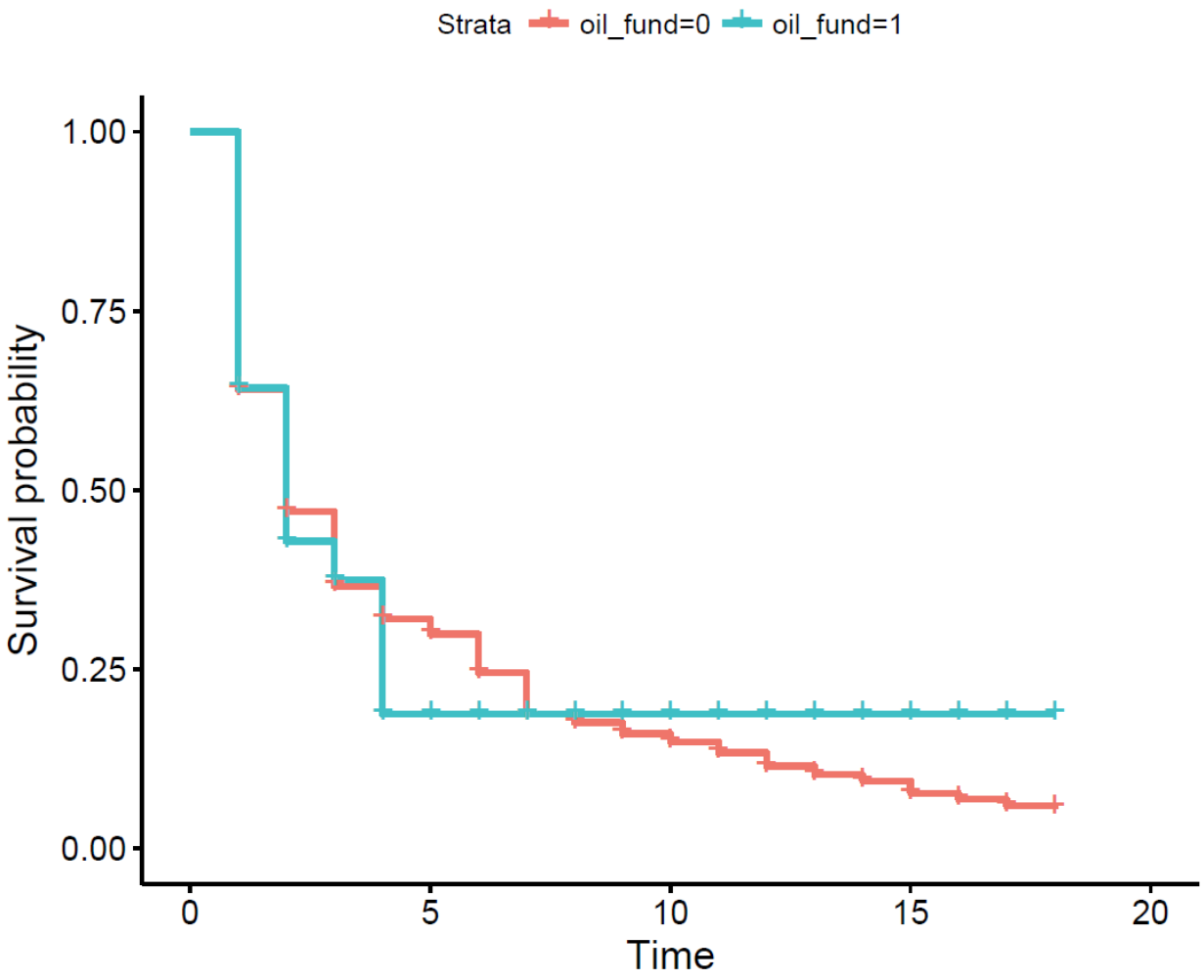

Figure 3- Survival Curve Strata: Rebel Crime Funding

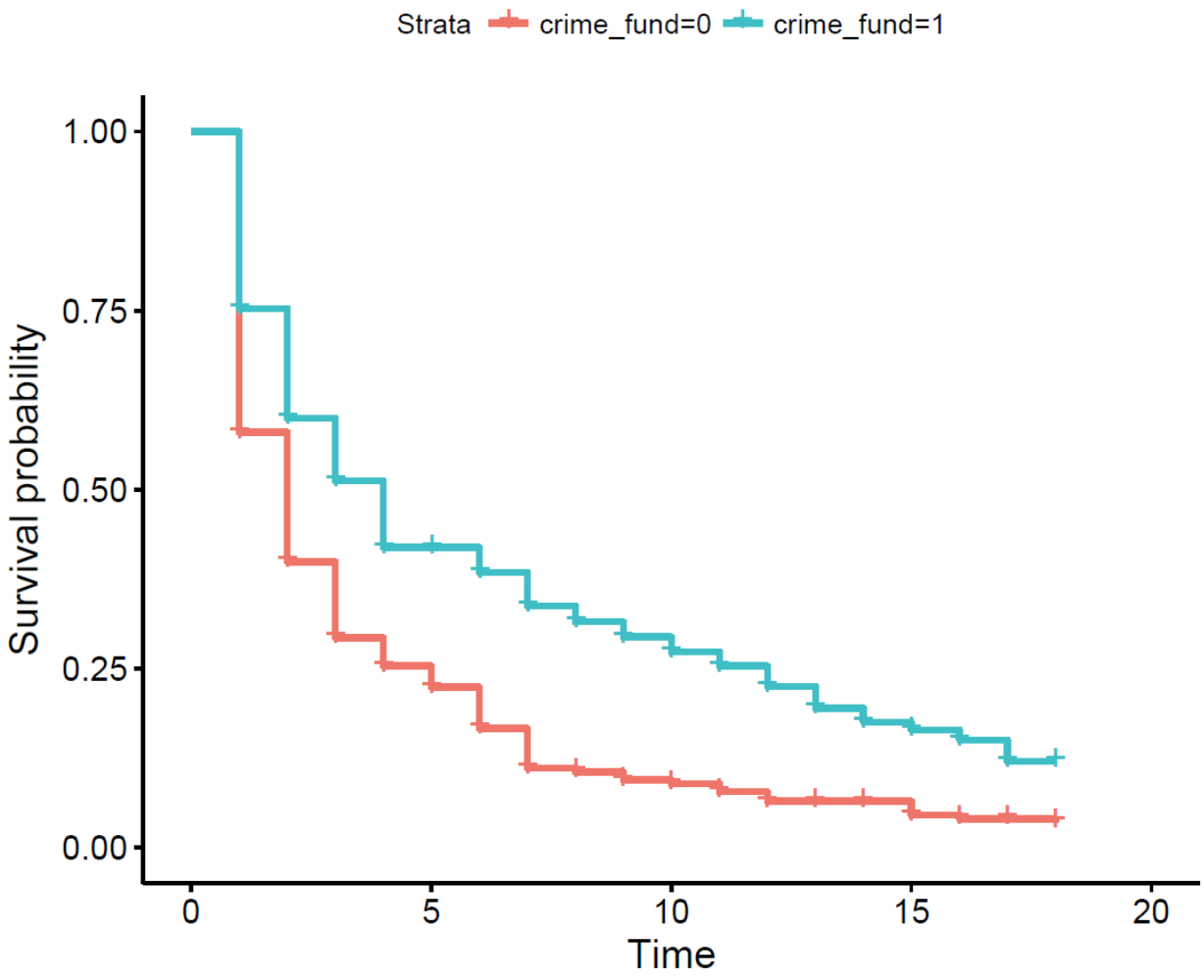

Figure 4- Survival Curve Strata: Rebel Oil Funding with Diversification

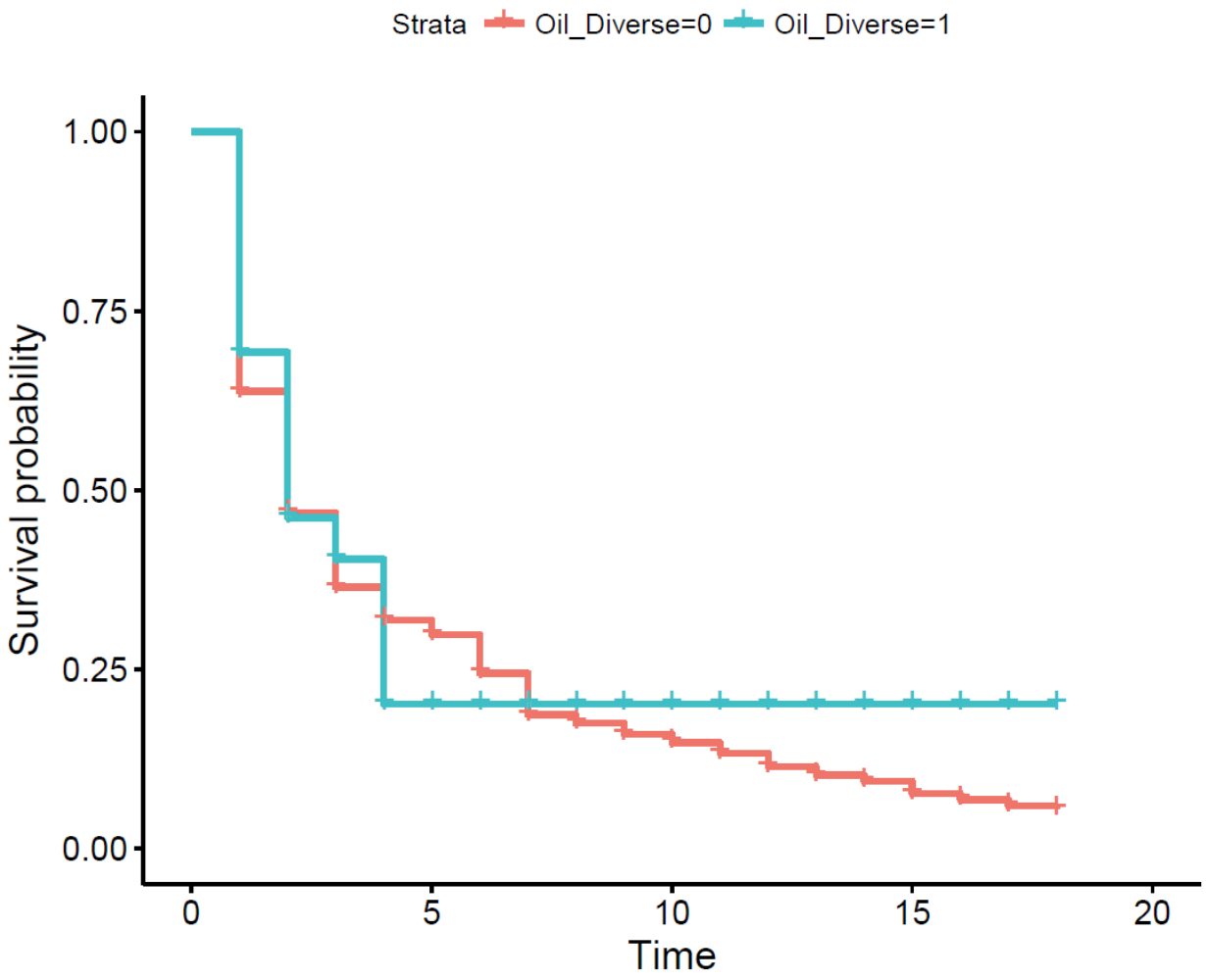

Table 1-Cox-Proportional Hazards Models H1 and H2

Cox's Proportional Hazards Model

	Dependent variable:	
	Conflict Duration	
	(1)	(2)
Oil Price Shock	0.149	-0.215
	(0.728)	(0.769)
Rebel Oil Funding	-1.284**	-1.890**
	(0.612)	(0.786)
Crime	-0.894***	-0.892***
	(0.221)	(0.221)
Democracy	0.100	0.092
	(0.264)	(0.262)
Territorial Dispute	-0.655***	-0.696***
	(0.201)	(0.203)
Intervention	-4.074***	-4.069***
	(1.005)	(1.005)
Log GDP	-0.146**	-0.141**
	(0.061)	(0.061)
Oil Price Shock*Rebel Oil Funding		6.985***
		(2.259)
Observations	851	851
R^2	0.180	0.186
Max. Possible R^2	0.882	0.882
Log Likelihood	-825.169	-822.157
Wald Test	93.170*** (df = 7)	93.690*** (df = 8)
LR Test	169.325*** (df = 7)	175.348*** (df = 8)
Score (Logrank) Test	142.494*** (df = 7)	146.039*** (df = 8)
Note:		*p<0.1; **p<0.05; ***p<0.01

Table 2- Cox-Proportional Hazards Models H3

Cox's Proportional Hazards Model	
	Dependent variable:
	Conflict Duration
Oil Price Shock	-0.109
	(0.731)
Diverse Funding	-2.576***
	(0.949)
Democracy	-0.134
	(0.261)
Territorial Dispute	-0.708***
	(0.205)
Intervention	-3.991***
	(1.004)
Log GDP	-0.207***
	(0.059)
Oil Price Shock*Diverse Funding	6.935**
	(2.702)
Observations	851
R^2	0.170
Max. Possible R^2	0.882
Log Likelihood	-830.498
Wald Test	76.020*** (df = 7)
LR Test	158.666*** (df = 7)
Score (Logrank) Test	124.036*** (df = 7)
Note:	*p<0.1; **p<0.05; ***p<0.01

Thoughts and Conclusion

Rebel groups funded by oil that experience a price shock fight shorter wars than those that don't experience a shock. The mechanisms suggested by Bazzi and Blattmann, Fearon, and Ross do not hold up under better empirical testing. Using new data that directly tests the relationship between rebel funding and commodity price shocks better gets at an issue that scholars claimed to have understood. Previous literature tested whether the presence of natural resources in the state or combat zone impacted the duration of conflict, or ignored that rebels may be influenced by the shocks as well as the government they are fighting. This piece presents the argument that both one must understand the effect commodity shocks have on all sides in order to understand their true effect on the conflict.

My findings also break this notion that rebel groups are immune from global economic trends, that groups will find a way to make money and survive. While rebel groups do operate outside of the legal system in their state, they do not operate outside the law of supply and demand. An important area of future research needs to continue to improve the types of theory testing Bazzi and Blattman(2014) present by using new disaggregated data to better test the causal mechanisms past theories.

A potential area of further research may be to examine different natural resources and test whether the result is the same. Of all possible natural resources, oil is more volatile in the global market compared to diamonds or gold Another area of research could examine the effect the global market has on rebel group behavior, specifically territorial control. If the price of gold spikes do rebels respond by attempting to secure goldmines or steal mining equipment?

While the rebel funding data is from 1990 to 2012, the commodity shock data limits my analysis to 2007. This may be especially problematic given that there may be bias towards the later years of the rebel funding. The data is primarily coded from news articles that are posted online, which leads to more information being present in the later years of the data set. That being said, rebel funding information is rare enough as it is that this may not be an issue. If the commodity shock data were to be extended up until 2012 would the results change? I suspect that many commodity prices experienced substantial shocks in 2008 that may serve as either an outlier in the non-predicted direction or a spark for more rebellion.

One possible explanation of the lack of support for my third hypothesis is I am currently not able to disaggregate between facility control and payment claiming. Theoretically speaking, rebels that control facilities should be more sensitive to economic shocks than rebels that are funded by extractable or labor resources generally. A possible extension(or better version) of this paper could use this disaggregated measure, however this would involve recoding the rebel funding data which could take a serious amount of time. Additionally, while there is surely a difference between control facilities and those that claim payments, it may be more efficient for rebels to payment claim, being as they don't need to spend the time and capital it takes to control facilities and keep them operational. The relationship between facility control and commodity shock sensitivity is unclear.

Another possible reason the third hypothesis is supported is the measure of funding diversity is too broad. If a rebel group is powerful enough to extort or smuggle oil it is probably going to commit general crime as well. A better measure may count the number funding sources. However, the data does not have great information on the amount of money each group is making from the funding source each year. If data existed with more precise amounts I could

then create a measure that was a proportion of total funding for each specific resource. This would better demonstrate rebel funding diversity.

Overall, the previously theorized mechanisms that relate civil war duration to commodity shocks do not hold up under greater scrutiny. Civil war duration is only longer when rebels control extractable resources and do not experience economic shocks, suggesting that Bazzi and Blattman's avoidance of rebel funding is short sighted. Additionally, civil wars are significantly shorter when rebels are funded by oil and experience a shock. This indicates that civil wars are influenced by the international economic system in a way that was theorized but never thoroughly tested before. This finding advances the resource curse literature by better testing the theoretical relationship between natural resources, the international economic system, and civil war duration.

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