

Oil and Civil Conflict

Can Public Spending Have a Mitigation Effect?

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Abstract

This paper explores the conditions under which public spending could minimize violent conflict related to oil wealth. Previous work suggests that oil can lead to violent conflict because it increases the value of the state as a prize or because it undermines the state's bureaucratic penetration. Yet, little has been said on how oil wealth could be used to prevent the onset of violent conflict through public spending by buying off citizens and elites, increasing state legitimacy by providing basic services, or strengthening the military and security apparatus. The empirical

analysis (148 countries over 1960–2009) shows that higher levels of military spending are associated with lower risk of small- and large-scale conflict onset in countries rich in oil and gas. By contrast, in economies with little natural resources, increases in military spending are associated with a higher risk of conflict. Welfare expenditure is associated with lower risk of small-scale conflict, irrespective of the level of oil revenue. However, general government spending does not appear to have any robust mitigating effects.

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Oil and Civil Conflict: Can Public Spending Have a Mitigation Effect?¹

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INTRODUCTION

The last decade has seen significant oil and gas discoveries. Ross (2012), for instance, reports that between 1998 and 2006 19 new countries, mostly low and middle-income, have become oil and gas exporters. At the same time, many of these regions have been plagued by political violence, in particular ravaging civil wars. This link between natural resources and conflict outbreak has been confirmed by numerous studies (Fearon and Laitin, 2003; Collier and Hoeffler, 2004; Humphreys, 2005; Lujala et al., 2005; Fearon, 2005; Ross, 2006; Lujala, 2010). Ross (2012) warns that the inflow of oil revenue into mainly poor nations is likely to spread further the oil curse in the form of lack of democracy and civil conflict. While other causal mechanisms have been suggested (Humphreys, 2005; Ross, 2006), such negative outcomes can also be linked to features of oil revenue - non-tax based, unstable and secretive - that limit the ability and incentive of governments to spend such revenue productively (Ross, 2006).⁵

In this paper, we study the conditions under which the patterns of public spending may mitigate the risk of violent domestic conflict. Some recent research suggests that more government spending either in general or specifically for welfare and the military may reduce the risk of civil conflict onset (Hegre and Sambanis, 2006; Basedau and Lay, 2009; Fjelde and de Soysa, 2009; Taydas and Peksen, 2012). While oil wealth has begun to be considered in the study of civil conflict as an important source of revenue for governments, there has not been a systematic analysis of whether oil-rich countries can increase public spending or alter the particular allocation of such spending to social sectors or the military as a way to mitigate the risk of conflict. This paper brings together the literature linking public spending and conflict, on the one hand, and that connecting natural resources and conflict, on the other.

We use time-series cross section data (148 countries, 1960-2009) to test the hypothesis that oil has a conditional effect on civil conflict depending on the size of government expenditure and the allocation of government spending. Our dependent variable is the onset of small and large civil conflict (Gleditch et al., 2002). The empirical estimations show that small and large conflicts alike are less likely when military spending is high in oil and gas rich economies. By contrast, in economies with little natural resources, increases in military spending are associated with a higher risk of conflict. Increased spending in education, health or social security is associated with lower risk of small-scale conflict, irrespective of the level of oil revenue. On the other hand, higher levels of general government expenditure do not appear to have any robust mitigating effects.

The paper proceeds as follows: Section I reviews work on natural resources and conflict; Section II discusses the literature on public spending and conflict; Section III presents our approach,

⁵ Gylfason (2001) links low economic growth in resource rich countries to low investment in education. Cotet and Tsui (2013) find that oil-rich countries tend to spend more on their military.

derives testable hypotheses, and presents the data; Section IV describes the results; and the final section concludes.

I. Natural Resources and Conflict

A significant amount of research has investigated why some countries experience violent civil conflict. Previous work points to rebel motivation coming from grievance and injustice (Gurr, 1970; Wimmer et al., 2009; Cederman et al., 2011) or economic opportunity and greed (Collier and Hoeffler, 1998, 2004). Other parts of the literature emphasize the characteristics of the state and the different facets of state capacity (Fearon and Laitin, 2003; Buhaug, 2006; Hendrix, 2010; Thies, 2010). A key aspect of state capacity is having the material resources to govern and using fiscal policy to advance government's priorities.

Natural resources have been argued to influence conflict through these same channels. A large body of literature on civil war emphasizes that natural resources fuel violent conflict (de Soysa, 2002; Fearon and Laitin, 2003; Ross, 2004a; de Soysa and Neumayer, 2005; Dixon, 2009).⁶ Generally, natural resources are argued to promote violence through three major causal mechanisms (see Ross, 2004b; Humphreys, 2005; Le Billon, 2008): (1) motivation to take up arms may result from grievances, such as ecological damage or the withholding of resource revenues; the costs and benefits related to resources are here the driving forces of conflict; (2) resources also provide the opportunity for conflict by making rebellion or warfare financially feasible; (3) resources may have a detrimental influence on state institutions (the 'weak state') and socio-economic development which in turn makes civil war more likely.

Two groundbreaking papers, Collier and Hoeffler (2004) and Fearon and Laitin (2003), both show that wealth in natural resources increases the probability of civil war onset. Collier and Hoeffler (2004) suggest that natural resources finance rebel groups and thus lower opportunity costs for rebellion. On the other hand, Fearon and Laitin (2003) emphasize the fact that oil producers tend to have weaker state apparatuses, which makes it difficult for governments to sustain efficient conflict prevention.⁷ In addition, Fearon and Laitin (2003), Englebert and Ron (2004), Fearon (2005), and Besley and Persson (2009) argue that natural resources swell the state's coffers and thus increase the value of the state, which is then more likely to induce conflicts over the state as a "prize".

Ross (2004a) observes, however, that this negative effect may be related only to oil and not to natural resources in general. Reviewing 14 quantitative studies of the resource–conflict link, he concludes that primary commodities as a whole cannot be robustly linked to either civil war onset or duration. Only oil-exporting countries seem to be particularly prone to civil war onset.

⁶ For a more exhaustive literature review, see Ross (2006a).

⁷ Alternatively, Bulte and Bruunnschweiler (2009) and Cotet and Tsui (2013) find no statistically significant association between natural resource wealth and risk of conflict, while Ross (2012) continues to find this effect.

This finding is supported by another meta-analysis conducted by Dixon (2009). Furthermore, Lujala (2010) finds that the mode of resource extraction and its location matter: oil is only linked to civil war onset when produced onshore; offshore oil production is unrelated to the onset of civil war.

On the other hand, research has long suggested that oil might provide states with resources to deliver public or private goods and stabilize political regimes, be they democracies or dictatorships. Considerable work suggests that natural resource rents can, in fact, bring stability to the state-society relationship (Mahdavy, 1970; Beblawi and Luciani, 1987; Smith, 2004; Morrison, 2009; Basedau and Lay, 2009; Fjelde, 2009; Morrison, 2010; Ross, 2012). Bueno de Mesquita et al. (2003) point out that government spending decisions are strategic responses aimed at maintaining power. Regimes can offset oil-related or other conflict risks by generous and large-scale distributional policies, and as a result grievances are less likely to emerge. A large security sector, financed by oil money, also helps to render rebellion more difficult.

More specifically, Ross (2001) argues that oil wealth has two mechanisms through which governments provide goods that reduce social pressures against the government. First, natural resource wealth permits governments to buy off citizens using low tax rates and patronage (a “rentier effect”). The second is a “repression effect”: natural resources allow governments to strengthen the military and security forces to maintain social order.⁸ Along the same lines, Smith (2004) and Morrison (2009) both demonstrate that natural resources or non-tax revenues tend to increase political stability by prolonging regime durability. Ulfelder (2007) and, more recently, Wright, Franz and Geddes (2014) also show that autocracy and individual autocratic leaders are more durable in natural resource rich countries.

The above discussion suggests a potential conflict between the “rentier state” argument and the resource curse argument, and research has been seeking background conditions that may condition the effect of oil on civil conflict. For instance, Humphreys (2005) finds that the presence of oil production significantly increases the likelihood of civil war in weak states and may lower conflict risk in strong states. Morrison (2010) finds similar results. Fjelde (2010) finds that oil wealth tends to mitigate civil war risk if political corruption is high enough to help buy off oppositions and placate restive groups by providing patronage in exchange for political loyalty.

⁸ Haber and Menaldo (2011) contest these claims, which are reinforced in Andersen and Ross (2013), particularly after the 1970s.

II. Public Spending and Conflict

Research points out the importance of government spending in preventing violent conflict. This work emphasizes specific types of spending including (1) general government spending, (2) military spending or (3) social spending such as education, health and social security.

General spending

High levels of government expenditures could signal that the political leadership is willing to use its resources to reward its supporters, rather than spending them for personal enrichment. A strategic allocation of state patronage, in the form of government construction contracts, public employment, or economic transfers, might buy support for the government from powerful segments of the population and placate restive groups (Bratton and Van de Walle, 1997; Acemoglu et al., 2004). Fjelde and de Soysa (2009) provide evidence indicating that higher government expenditure enables governments to buy off effectively opposition and increase the welfare of marginalized groups.⁹ This has the potential to increase the status-quo stakes of key social actors, as well as reduce grievance and inequity, thus reducing the appeal of violent challenges to power from both elites and the broader population.

In oil-rich countries, the signaling function and public nature of spending commitments could be even more important than in oil-poor countries. Because oil resources are non-tax revenue, it is generally difficult for citizens and rebels to figure out how much oil resources the government actually has and how much the ruling elites can siphon out from the public coffers (Ross, 2012). In this context, rebels may overestimate the value of the state. Signaling via large-scale provision of public goods could thus lower the rebels' perception about the value of the state as a prize going to small elites and their expectations that they will be able to grab a high state prize pending successful insurgency. This should result in fewer incentives to take up arms, and more readiness to cooperate with the government.

Military spending

Collier, Hoeffler and Rohner (2009) argue that the financial and military feasibility (and thus the coercive and administration capacity of a state) play an important role in explaining the occurrence or not of rebellion. Weak states (i.e. ones that do not have sufficient bureaucratic presence across their national territory, police, and military forces) will face difficulties in enforcing laws, imposing order, and maintaining peace. Similarly, Fearon and Laitin (2003)

⁹ Hypotheses are tested for 141 countries, 1965 - 2006. The onset of violent conflict is measured using the UCDP/PRIO armed conflict dataset, with both the 25 casualties and the 1000 death toll threshold to define conflict onset. Government expenditure as percent of GDP (World Development Indicators) excludes government military expenditures that are part of government capital formation. Statistical results consistently and statistically significant show that countries with large government expenditure ratios to GDP are less likely to experience violent conflict. Thies (2010), however, uses an instrumental variable approach and finds no effect between the share of government spending and large civil wars (1000 death toll threshold).

suggest that “most important for the prospects of a nascent insurgency are the government’s police and military capabilities and the reach of government institutions into rural areas.”¹⁰ Military spending would be an important aspect of state capacity to pacify violent conflict via coercion and policing (Hendrix, 2010).

In consolidated democracies, where there is significant oversight over the budget, increasing military expenditure provides public goods for citizens in the form of domestic and international security. In mixed regimes and autocracies, on the other hand, military spending is primarily used for repression, patronage to regime loyalists, or direct rents to the military to prevent possible coup attempts (Collier and Hoeffler, 2007).

In this regard, Herbert et al. (2013) point out that the emergence of rebel groups in the Central African Republic partly stems from the state’s inability to protect its citizens from violence and poverty. The state capacity and authority in many core state functions is too weak. Along the same lines, Hegre and Sambanis (2006) show that the size of military personnel tends to be negatively and robustly correlated with civil war onset.

The opposite could also be suggested, however. Increasing military spending could provide potential military opposition with the needed equipment to overthrow a regime. Larger military budgets may not generate efficiency and loyalty, but may be a result of leaders bribing the military to keep them from staging a coup (Belkin and Schofer, 2003; Acemoglu et al., 2009; Keefer, 2010). Many countries at risk of civil war face other risks (Bodea and Elbadawi 2007; Svobik, 2009; Roessler 2011). Stacking the military with loyalists or ethnic group members, by shuffling, arresting or executing high ranking officers, or by creating multiple and overlapping units suspicious of each other could undermine the quality of the military forces and weaken further vulnerable regimes.

Furthermore, Henderson and Singer (2000) argue that because higher military expenditure crowds out social spending, economic growth and investment, subsequent citizen grievance is more likely to be linked with insurgency and thus fuel violent conflict. Collier and Hoeffler (2007) find that military spending is at best ineffective in reducing the risk of internal conflict. Similarly, the recent work by Taydas and Peksen (2012) find no effect of military spending on civil war onset.

¹⁰ Previous studies have mainly focused on the duration of violent conflict, relying on military personnel per capita taken from the Correlated of War (COW) Material Capabilities dataset (Hendricks 2010). A key argument is that because the strong military can defeat rebel groups more easily, it contributes to shortening the duration of conflict (Mason and Fett, 1996; Mason et al. 1999; DeRouen and Sobek, 2004). There is also evidence to the contrary (Balch-Lindsey and Enterline, 2000).

Social spending

Azam (2001) observes that “the occurrence of civil conflict is intimately related to the failure of government to deliver the type of public expenditure that people want; i.e. with a strong redistributive component such as health and education”. In earlier work, he uses a game theoretical model that explicitly links redistributive policy adopted by states with domestic peace (Azam, 1995). Governments could thus also foster their legitimacy, and thereby reduce the risk of conflict, by signaling that they care about their population. This could be done in a variety of ways, such as increased spending for water sanitation, securing basic health needs, or providing a strong system of education (Stasavage, 2005).

Taydas and Peksen (2012) argue that spending resources in the form of social welfare policies leads to more loyalty and support from citizens, which increases the difficulty of rebel recruitment.¹¹ Through welfare policies that influence positively the living standards of citizens, governments can outspend the opposition, helping gain support from a broad segment of the population, co-opt political opposition, and decrease the incentives for organizing a rebellion. Social safety nets, transfers and investment in public goods show people that the state cares, and prevents disadvantaged members of society from falling below a certain level of poverty and experiencing absolute desperation. It has been argued that this strategy, namely government commitment to redistribution in favor of the poor, had been used by rulers in the West in the nineteenth century to increase their legitimacy and prevent revolutions (Acemoglu and Robinson, 2000).

Robins (2012) mentions that studies of the attitudes and priorities of conflict-affected people have concluded that the degree to which a state meets its citizens’ every day needs is an important component of their subjective assessment of its legitimacy. From this perspective, positive encounters with frontline service officials is argued to provide a source of legitimacy for the state, particularly in fragile and conflict-affected situations where the state was previously mistrusted, or outright feared (Brinkerhof, Wetterberg, and Dunn, 2012). Similarly, in his study in Medellin, Colombia, Guerrero (2011) finds that a quick upgrading of basic services (infrastructure, health, education) in the city’s less favored districts improved political support for and trust in government.

Taydas and Peksen (2012) also argue that social spending promotes economic development, thereby raising further the opportunity cost of rebellion. Government investment in human capital has a positive influence on social mobility, labor opportunities, and the distribution of

¹¹ Hypotheses are tested using a dataset for 153 countries, 1975 - 2005. The same dependent variable is used as in Fjelde and de Soysa (2009). The independent variable is welfare spending which combines three sources of welfare (education, health and social security spending, as percentage of GDP). Statistical results with imputed data consistently show that welfare spending is negatively related to the onset of both armed conflict (25 battle deaths) as well as major civil war (1000 battle deaths).

earning capacities (Korpi and Palme, 1998; Chu, Davoodi and Gupta, 2000; Justino, 2003; Rudra, 2004; Thyn, 2006). It leads to better skilled and more productive workers, enhancing the international competitiveness of the economy (Schultz, 1963; Van de Walle, 1996; King, 1998; Gupta and Verhoeven, 2001; Brown and Hunter, 2004; Avelino, Brown and Hunter, 2005; Burgoon, 2006). As social policies improve the quality of life in society and promote wealth, the likelihood of domestic violence will decrease.

Based on the existing quantitative evidence, there seems to be an emerging consensus in the literature that education in particular has a general pacifying effect on conflict (Østby and Urdal, 2010).¹² As discussed above, Thyne (2006) argues that by investing state resources in education governments send a strong signal toward citizens that they are trying to improve their lives.¹³ Education creates opportunities for economic development and social equality, each of which lowers grievances that lead to civil war. Education is also argued to increase the opportunity costs for the youth to take up arms (Collier and Hoeffler, 2004). Barakat and Urdal (2009) provide evidence how higher levels of educational attainment increase the opportunity cost for male youth (the key suppliers of rebel labor) to engage in violent conflict and reduce the risk that large male youth bulges are associated with violent conflict.¹⁴

At the micro level, the failure of the Sudanese government to provide educational resources adequately for the southern region has been cited as a major grievance leading to a 22-year-long civil war (Glickman, 2000; Deng, 2001; Breidlid, 2005). Similarly, Richards (2003) places the failure of the government to provide an adequate education at the center of rebel decisions to go to war in Sierra Leone. Brett and Specht (2004), who have been conducting interviews with young soldiers, have found strong micro-level support for the expectation that lack of schooling in addition to poverty, and low alternative income opportunities are important reasons for joining a rebel group. Oyefusi (2008) also finds that low educational attainment significantly increased the willingness of young people to participate in armed struggle for local resource control in the oil-rich Niger Delta in Nigeria.

Furthermore, Thyne (2006) suggests that education promotes social cohesion by encouraging students to cultivate interpersonal skills and thus learn how to resolve disputes peacefully. Such social cohesion enables the country to achieve economic and social stability, which lessens the

¹² See Østby and Urdal (2010) for an extensive literature review.

¹³ Empirical tests are carried on 160 countries, 1980 - 1999. The dependent variable, civil war onset, is based on Fearon and Laitin (2003). Five variables measure education: total government expenditures allocated to education as a percentage of GDP, primary enrollment rates, secondary enrollment rates, postsecondary enrollment rates, and adult literacy rates. Results show a moderate to strong association between all the education variables and lower conflict risk, with the exception of postsecondary education that does not have any significant effect.

¹⁴ They use a new global dataset (120 countries, 1970 – 2000) measuring cohort specific educational attainment rates. Violent conflict is operationalized by the UCDP/PRIO low intensity armed conflict. The key finding is that the effect of large young male cohorts on conflict is mitigated by higher secondary education attainment especially in low-middle income societies.

incidence of violent conflicts. Lipset (1959) argues that education broadens one's outlook, increases tolerance for other members of society, restrains extremist activity and doctrines, and increases a person's ability to pursue their interests using the political process. Similarly, Brady, Verba, and Schlozman (1995) and Heyneman (2003) argue that schools are one of several agents of socialization that provide people the means by which to pursue their needs in a peaceful manner. Education provides civic skills to people, ultimately leading to increased political participation and social stability.

Education, however, may not always lead to civil peace. Rapid expansion of education in developing countries may increase the number of educated people to the level where the market cannot absorb them, so that it fuels violent conflict (Huntington 1968; Oyefusi 2010). Urdal (2006), for example, shows that the impact of large youth cohorts on terrorism is magnified in countries experiencing a rapid expansion of education. Lange and Dawson (2010) and Lange (2012) also argue that education is more likely to fuel violent conflict, especially ethnic violence in countries with ethnic divisions, ineffective political institutions and/or low incomes. Reasons include the fact that education is often provided in a segregated manner with biased curricula and tends to deepen ethnic antagonisms. Also, schools provide diverse resources that can be exploited to organize collective movements, so that education intensifies citizens' mobilization power, triggering ethnic violence.

III. Data and Methodology

The manner in which the government uses natural resource revenue could affect significantly rebels' view of rewards and costs from violent conflict. In a paper most closely related to ours, Basedau and Lay (2009) find that oil wealth (when controlling for dependence on oil revenue) reduces the chances for civil war onset. Their work on a small sample of countries with high average dependence on oil revenues shows that, comparatively, the countries rich in oil can maintain peace because they engage in larger scale distribution and spend more on the military. The analysis is based, however, on a simple comparison of country values to sample medians for 27 oil dependent countries (after 1990) and may overlook important differences among countries. A more rigorous approach taking into account the possible non-linearities mentioned by Basedau and Lay (2009) and the endogeneity issues that plague many of the existing studies would be needed to understand the possible mitigation effect of public spending on the risk of conflict onset related to oil.

Method and Hypotheses

Based on our literature review, we derive the following three hypotheses:

- H1 (general public spending): A larger size of public spending in oil rich countries is associated with a lower risk of violent conflict onset.

- H2 (military spending): More military spending in oil rich countries is associated with a lower risk of violent conflict onset.
- H3 (social spending): More social spending (education, health and social security) in oil rich countries is associated with a lower risk of violent conflict onset.

Our dependent variable is the dichotomous indicator for conflict onset and empirical estimations are logit models with robust standard errors, that include the duration of peace years (or years since independence) and cubic splines to control for time dependence (Beck et al., 1998). To test our conditional hypotheses, we use interaction terms between the measure of oil value and measures of broad public spending and the specific spending items described above. Similar to previous work, all time varying variables are lagged one year.

Dependent Variable

Several data sources have been used for conflicts, explaining part of the different results found in the literature. There are four major datasets: (1) Armed Conflict Dataset (ACD) from the Uppsala Conflict Data Program PRIO (Gleditsch et al., 2002); (2) Fearon and Laitin (2003); (3) Sambanis (2004); and (4) the Correlates of War, or COW (Sarkees and Wayman, 2010). All four use a threshold of 1000 battle deaths to define a civil war. The UCDP/PRIO dataset also codes smaller civil conflicts of at least 25 battle deaths per year, leading to three common UCDP/PRIO conflict constructions: low intensity (25 deaths) conflict years, cumulatively high-intensity (1000 death) years, and high-intensity years only. These competing measures differ in relation to when to code the start, what counts as a war, and how to treat breaks in violence.

To measure the onset of violent conflict, we use in this paper the Armed Conflict Dataset (ACD) for years 1960-2009 (Gleditsch et al. 2002, Version 4.1.) to generate a dichotomous variable that takes the value of one in years with a new conflict onset and zero otherwise. This dataset has become the standard reference for cross-country analyses of conflict determinants. The majority of the recent studies have tended to use this source. Furthermore, along with major civil conflicts, PRIO also codes the onset of minor conflicts as those above 25 battle deaths per year. These smaller conflicts provide a relevant complement to the rarer full blown civil conflicts. Adding these smaller conflicts to define conflict onset should assist in estimating the determinants of rare events such as conflict onset.

Following Ross (2012), we regard a conflict as a new conflict onset if it occurs two years after the previous conflict. The ACD defines violent conflict as “a contested incompatibility that concerns government and/or territory where the use of armed force between two parties, of which at least one is the government of a state, results in at least 25 battle-related deaths” (UCDP/PRIO 2012). As mentioned above, in addition to the low intensity violence indicator, we also use the 1000 battle-related deaths threshold to measure the onset of major civil conflict.

Key Independent Variables: Natural Resources and Public Spending

Oil revenue: to operationalize oil revenue, we follow Ross (2012) and use his oil-gas value per capita¹⁵. The data measures the value of oil and gas production per capita, multiplying the amount of oil gas production in a country with current oil and gas prices.¹⁶

General government spending: we use general government final consumption expenditure relative to GDP (WDI). This includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes expenditure on national defense and security, but excludes government military expenditures.

Military spending: the Correlates of War Project (COW) provides information on total military expenditure that we scale by total population.¹⁷

Welfare spending: this includes total health, social security and education expenditures. Total health expenditure (public and private) is based on the WDI, complemented with data from the IMF and Kugler et al. (2000). Social security expenditure includes public pensions and unemployment benefits. We use for this variable the data provided by Kugler et al. (2000) and Burgoon (2006). The education spending variable is the total public expenditure (current and capital) on education expressed as a percentage of GDP in a given year. We use education spending from the IMF to complement the WDI data. Following Burgoon (2006) and Taydas and Peksen (2012), we create a welfare spending variable by combining the health, social security, and education spending indicators to see the impact of aggregate social spending and oil on conflict.

Missing observations in the welfare spending variable, especially in developing countries, is an important issue that may pose difficulties in interpreting results.¹⁸ To address this issue and for the purpose of comparison and replication, we use the same approach as in Taydas and Peksen (2012) and use Stata's ICE multiple imputation procedure. The procedure specifically imputes

¹⁵ The data is available online at <http://dvn.iq.harvard.edu/dvn/dv/mlross> (accessed on March 14th, 2013). Previous work shows that even when looking at a wider range of natural resources, it is hydrocarbons that affect civil war onset (Fearon, 2005; de Soysa and Neumeyer, 2008).

¹⁶ This data has advantages over other measures that scale oil production to GDP or exports, both of which can be driven down by risk of civil war. More importantly, it gives a sense of the size of the oil wealth available to the government for spending. We use both logged and non-logged oil variables in our analyses. For models using non-logged oil variable, one may suspect that results are driven by a handful of outliers. Yet, this is not the case for our results. Excluding outliers that have more than 10,000 dollars oil-gas value per capita from the models did not change the main results. In Tables 1 and 2, we report models using the non-logged oil variable without excluding outliers. In the Appendix, we show results using the logged oil variable, including replications of the results of Ross (2012).

¹⁷ We prefer scaling military spending by total population because the GDP data from sources other than the COW are not in the same metric. For comparison, in our summary Table 1 we scale military spending with GDP data from the Penn World Table 7.1.

¹⁸ Education spending, for instance, has significantly more missing values than health and social security spending.

missing observations based on the pattern of the observed values of the non-missing variables in the same row and creates a completed dataset. In the new completed dataset, the observed values are the same, while the missing observations are filled in with the imputed data.

Table 1 shows descriptive statistics on oil revenue and public spending based on data for all countries except western developed democracies. We group oil-rich countries in two categories: *oil abundant* countries (more than 996 dollars of oil-gas value per capita, or above the 90th percentile for Ross' (2012) oil-gas value per capita in the sample of non-western countries); and *oil producing* countries (oil gas value per capita is between 109 and 996 dollars, or the range between 75th and 90th percentiles). We further classify countries according to whether they are low or high on various categories of public spending (the cut point is the mean). The classification of countries in the tables is based on national means, which are computed by taking within-county means over time.

Table 1: Variations in Spending Among Oil-Rich Countries: Average Spending

		Oil Abundant	Oil Producer
Total Government Spending	High	21.29% (8.17)	18.2% (6.0)
	Low	12.3% (6)	12.12% (3.11)
Military Spending	High	7.85% (9.09)	4.69% (4.27)
	Low	0.97% (1.12)	1.09% (0.76)
Education Spending	High	5.51% (2.11)	5.52% (1.57)
	Low	3.44% (1.08)	3.15% (1.43)
Health Spending	High	2.69% (1.05)	3.32% (1.32)
	Low	1.86% (0.92)	1.37% (0.82)
Social Security Spending	High	4.78% (2.48)	3.6% (2.08)
	Low	0.55% (0.62)	1.0% (0.97)

Note: Countries are defined as oil abundant if oil-gas value per capita (Ross, 2012) ranges above the 90 percentile (more than 996 dollars). Countries are oil producers if oil-gas value per capita ranges between the 75 and 90 percentiles (between 109 and 996 dollars). Each spending item is regarded as high if it is above the mean.

There is a remarkable variation in the pattern of government spending in countries with significant oil revenue. No clear pattern appears to emerge. Oil abundant countries can have high ratios of government spending to GDP (21.29 percent: Russia, Equatorial Guinea, Saudi Arabia, Kuwait, Bahrain, Qatar, Oman, Brunei) or more modest ones (12.3 percent: Trinidad, República Bolivariana de Venezuela, Gabon, United Arab Emirates, Turkmenistan). Similarly, resources in oil abundant countries can be directed to the military (average of 7.85 percent of military spending to GDP: Bahrain, Brunei, Iraq, Kuwait, Libya, Oman, Qatar, Russia, Saudi Arabia, United Arab Emirates) or military spending can be much less prominent (0.97 percent: Equatorial Guinea, Gabon, Trinidad, Turkmenistan, República Bolivariana de Venezuela). The average difference between high and low spenders on welfare is less impressive but it exists. Oil abundant countries that allocate significant resources to social security spend on average 4.7 percent of GDP (Kuwait), while those that allocate little spend on average 0.55 percent of GDP (Bahrain, Equatorial Guinea, Gabon, Iraq, Libya, Oman, Qatar, Saudi Arabia, Trinidad, United Arab Emirates, República Bolivariana de Venezuela). Education spending shows similar

patterns, with some oil abundant countries spending above the mean for developing countries (5.51 percent: Brunei, Kuwait, Saudi Arabia, Trinidad, República Bolivariana de Venezuela), while other spend below that mean (3.44 percent: Bahrain, Gabon, Iraq, Libya, Oman, Qatar, Russia, United Arab Emirates).

Control Variables

Along the lines of Fearon and Laitin (2003), our model also includes a range of control variables, capturing the variety of factors possibly explaining conflict. All time-varying variables are lagged one year. All models include the following variables:

- The logged income per capita to control for the “state’s overall financial, administrative, police, and military capabilities.” (Fearon and Laitin, 2003). This variable also captures the argument that there exist fewer grievances in a society with higher levels of income;
- The log of the country’s population to control for “the number of potential recruits to an insurgency at a given level of income.” (Fearon and Laitin, 2003);
- Noncontiguous territory, because if a country has a territorial base separated from the state’s center due to geography, rebel groups could find it easier to take up arms;
- A country’s democracy score: a more democratic country should be less likely to experience violent conflict because political rights and civil liberties are guaranteed in democracies so that people find it easier to resolve conflict through non-violent means;¹⁹
- Political regime instability: unstable regimes signal a weakened state capacity, leading to an increase in the risk of violent challenges to government power;
- Ethnic and religious fractionalization captures the notion that civil wars are more frequent in heavily heterogeneous societies. Ethnically or religiously divided societies may face strong grievances, which increases the risk of violent conflict;
- A dummy variable for ongoing war: if a country is in a violent conflict with another group, other rebel groups may find it easier to challenge the government.²⁰

¹⁹ Following Vreeland (2008), we also recode Polity IV score to avoid possible endogeneity issues.

²⁰ Income per capita comes from Penn World Tables and World Development Indicators, supplemented with per capita energy consumption. Population size is based on World Bank World Development Indicators. We do not control for recent independence because for some of our specifications data is only available post 1960. Democracy is based on Polity IV (-10 to 10). For political instability, we follow Fearon and Laitin (2003) and use a dummy variable for country/years that had a three or greater change on the Polity IV regime index in any of the three years prior to the country-year in question.

Econometric Issues

While previous studies have been influential, the cross-country empirics they are based on have not always taken fully account of cross-country heterogeneity or the likely endogeneity between conflict and its determinants. The endogeneity bias may arise from measurement errors, omitted variables or potential reverse causality between the dependent variable, conflict onset, and our variable of interest, public spending. It is possible, for instance, that education enrollment drops as a civil war approaches because people flee their homes in anticipation of fighting. Likewise, expenditures may drop before an insurgency as the government diverts resources from social expenditures to the military in order to defend itself. Studies of conflict onset typically address this problem by lagging the explanatory variables so that conflict onsets in a given year are explained by the values on the explanatory variables in the previous year. However, it is possible that problems with reverse causality appear before $t-1$.

To take account of unmeasured regional effects, all estimations include regional dummies as in Fearon and Laitin (2003) for Asia, the Americas, Africa, and Europe (the Middle East being the reference region). We also use random effects logit models. Since the dependent variable is binary, fixed effects would drop all the countries that do not experience any conflict over the period of study. Yet, at the same time, it may be the case that the effect of interactions may differ systematically due to country specific conditions, even after the inclusion of our control variables. Therefore, as an alternative, we include country-level random effects to account for the likelihood that each country may have different effects with regard to the interaction term.

Finally, to test our results for military spending – as shown below, these are our most statistically significant results – we also employ instrumental variable (IV) estimations. It is not hard to imagine that increases in military spending could be driven by high risk of civil war. To mitigate the risk of reverse causality, we use IV estimations in which we first predict military spending with models including instrumental variables that are not clearly determined by the risk of civil war. Following Collier and Hoeffler (2007), we use two instrumental variables: neighboring countries' military spending relative to home country's GDP and a Cold War dummy.²¹ From the first stage model we predict values of military spending per capita and subsequently estimate logit models of civil conflict onset that include: oil-gas value per capita, predicted military spending per capita, and the predicted interaction between military spending and oil wealth.²²

²¹ We also include neighboring countries' military spending relative to their own GDP and our results do not change.

²² Besides the exogenous instruments, we include the following independent variables in the first stage model: a country's coup history and the years since the last coup, an indicator variable for military regimes, international war duration, and one year lagged values for Polity IV, per capita GDP, trade openness, oil-gas value per capita. To avoid the Wooldridge (2002) forbidden regression the predicted interaction between military spending and oil wealth comes from a similar model that also includes the interaction of predicted military spending and oil wealth.

IV. Results

Tables 2 and 3 report our key results. We show the results for both small and large conflict onset. The coefficients on the control variables have broadly the expected signs. Political instability increases the risk of both small and large conflict. More populous countries also face a higher chance of civil conflict. The estimated coefficient for states with noncontiguous territory is positive and consistent with Fearon and Laitin (2003). Ethno-linguistic fractionalization (ELF) increases the risk of small scale war, while it does not appear to be associated with larger scale conflicts. Democracy reduces the risk of large scale conflict, while it has an ambiguous effect on small scale war. Finally, economic development, operationalized as income per capita is not predicting civil conflict in our models.

Table 2 Conditional Effect of Oil Wealth on Conflict Onset

	Model 1 Small conflict onset	Model 2 Large conflict onset	Model 3 Small conflict onset	Model 4 Large conflict onset	Model 5 Small conflict onset	Model 6 Small conflict onset
Oil-Gas Value per capita	0.17 (0.124)	-0.52 (0.381)	0.2 (0.149)	-0.08 (0.236)	-0.08 (0.166)	-0.51 (0.3570)
Government Expenditure	0.016 (0.01)	0.004 (0.02)				
Gov Expenditure*Oil	-0.013* (0.008)	0.01 (0.016)				
Military Expenditure per capita			0.0012*** (0.00)	0.002*** (0.00)		
Military Expenditure*Oil			-0.001*** (0.0004)	-0.001*** (0.0003)		
Welfare Expenditure					-0.109*** (0.0340)	-0.008 (0.046)
Welfare Expenditure*Oil					0.02 (0.0003)	0.02 (0.0175)
ELF	1.609*** (0.48)	0.508 (0.95)	1.508*** (0.44)	0.517 (0.93)	1.484*** (0.51)	0.257 (0.915)
Religious Fractionalization	-0.704 (0.46)	0.672 (0.71)	-0.23 (0.50)	0.603 (0.81)	-0.3 (0.54)	0.778 (0.817)
Political Instability	0.686*** (0.19)	0.715** (0.30)	0.741*** (0.17)	0.739*** (0.29)	0.792*** (0.22)	0.716** (0.29)
Non Contiguity	1.166*** (0.38)	1.286* (0.68)	1.171*** (0.33)	1.325** (0.60)	1.293*** (0.28)	1.678*** (0.54)
Polity IV	0.038 (0.03)	-0.115** (0.05)	0.026 (0.02)	-0.127*** (0.04)	0.0529* (0.03)	-0.107** (0.05)
Logged Population	0.362*** (0.07)	0.417*** (0.11)	0.348*** (0.06)	0.397*** (0.09)	0.219*** (0.07)	0.318*** (0.10)
Logged GDP per capita	-0.009 (0.09)	0.155 (0.12)	-0.091 (0.10)	0.025 (0.13)	-0.286* (0.16)	-0.211 (0.23)
Constant	-12.43*** (1.54)	-14.46*** (2.33)	-11.61*** (1.30)	-13.59*** (2.00)	-6.015*** (2.107)	-10.27*** (2.90)
Pseudo R squared	0.126	0.114	0.123	0.118	0.14	0.12
Log pseudolikelihood	-611.51	-253.83	-692.3	-288.59	-503.73	-254.78
Wald Chi-squared	355.51***	98.17***	414.25***	125.25***	175.81***	96.23***
Observations	5,190	5,190	5,618	5,618	4,108	4,226

Note: ***p<0.01, **p<0.05, *p<0.1. The estimation method is logistic regression. Models 5 and 6: Welfare spending is imputed using Taydas and Peksen (2012) data. Regional dummies, half decade dummies, peace years and cubic splines are included in all models. Country clustered standard errors in parentheses.

Table 3: Additional Analysis: Logit Models of Conflict Onset

	Model 7 Small Conflict onset	Model 8 Large conflict onset	Model 9 Small conflict onset	Model 10 Large conflict onset	Model 11 Small conflict onset	Model 12 Large conflict onset	Model 13 Small Conflict onset	Model 14 Large conflict onset
	Random effects		Random effects		Random effects / Imputed spending		Instrumental variable	
Oil-Gas Value per capita	0.165 (0.220)	-0.476 (0.988)	0.16 (0.182)	-0.02 (0.41)	-0.138 (0.388)	0.231 (0.734)	0.00 (0.000)	0.00 (0.000)
Government Expenditure	0.016 (0.016)	0.021 (0.032)						
Gov Expenditure*Oil	-0.013 (0.015)	0.001 (0.043)						
Military Expenditure per capita			0.001** (0.0005)	0.002** (0.00)			0.001*** (0.0004)	0.001*** (0.0005)
Military Expenditure*Oil			-0.001* (0.0006)	-0.001* (0.00)			-0.001** (0.0004)	-0.001* (0.0004)
Welfare Expenditure					-0.119*** (0.037)	-0.008 (0.050)		
Welfare Expenditure*Oil					0.001 (0.047)	-0.073 (0.116)		
ELF	1.609*** (0.429)	0.951 (0.922)	1.547*** (0.465)	0.825 (0.87)	1.482*** (0.551)	0.214 (0.841)	1.770*** (0.516)	0.361 (0.927)
Religious Fractionalization	-0.704 (0.493)	1.117 (1.280)	-0.178 (0.529)	0.865 (1.18)	-0.202 (0.625)	0.492 (1.158)	-0.50 (0.516)	0.44 (0.916)
Political Instability	0.686*** (0.192)	0.730** (0.352)	0.791*** (0.19)	0.793** (0.33)	0.862*** (0.224)	0.530 (0.339)	0.689*** (0.18)	0.779*** (0.28)
Non Contiguity	1.166*** (0.310)	1.272** (0.640)	1.179*** (0.33)	1.310** (0.61)	1.368*** (0.403)	1.875*** (0.661)	1.202*** (0.40)	1.703** (0.82)
Polity IV	0.038 (0.028)	-0.112** (0.045)	0.0292 (0.03)	-0.123*** (0.04)	0.061* (0.032)	-0.093** (0.046)	0.030 (0.03)	-0.126*** (0.05)
Logged Population	0.362*** (0.070)	0.543*** (0.175)	0.354*** (0.07)	0.521*** (0.16)	0.209** (0.086)	0.471*** (0.164)	0.310*** (0.07)	0.323** (0.13)
Logged GDP per capita	-0.009 (0.096)	0.036 (0.204)	-0.0757 (0.10)	-0.0865 (0.20)	-0.304** (0.151)	-0.354 (0.259)	0.000 (0.00)	0.0803 (0.14)
Constant	-12.433*** (1.604)	-17.687*** (3.731)	-12.18*** (1.64)	-16.66*** (3.435)	-6.321*** (2.244)	-12.557*** (3.815)	-11.33*** (1.26)	-13.45*** (2.59)
Log likelihood	-611.5	-250.6	-691.60	-284.82	-502.7	-267.9	-576.84	-246.59
Wald Chi2	153.81***	36.27***	121.44***	121.85***	100.2***	38.5 ***	413.88***	137.38***
Observations	5190	5190	5,618	5,618	4,108	4,108	4,836	4,836

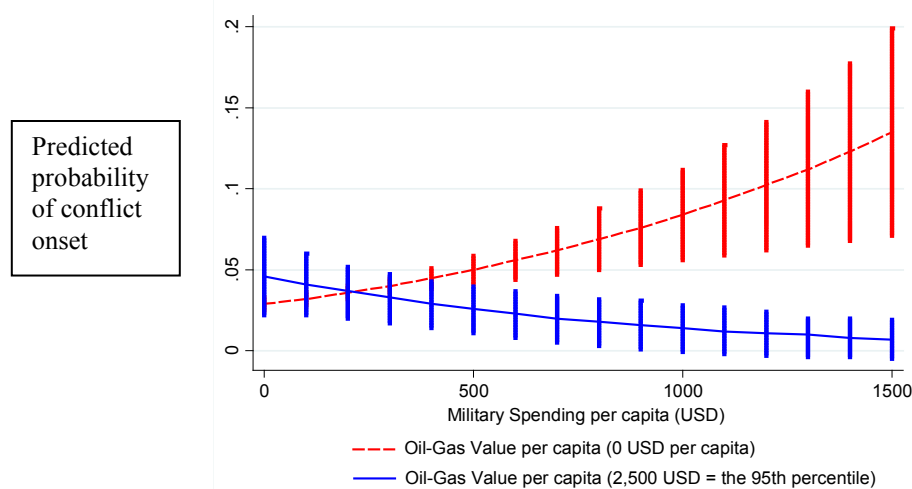
Note: ***p<0.01, **p<0.05, *p<0.1. Models 9-14: Random effect models. Models 11 and 12: Welfare spending is imputed using Taydas and Peksen's (2012) data. Models 13 and 14: Military spending per capita is instrumented. Regional dummies, half decade dummies, peace years and cubic splines are included.

General government spending is not robustly associated with a lower risk of conflict. Models 1 and 2 present the estimation results for oil revenue interacted with general government spending. While the results in Table 1 indicate a negative and statistically significant coefficient (at the 10 percent level) in the case of small-scale conflicts, this result does not hold once random effects are included (Table 3). Hypothesis 1 does not seem to hold, whereby governments are able to contain the increased risk of conflict onset related to oil revenue by signaling their willingness to use this revenue not just for their own enrichment, but also to reward their supporters.

Military spending, by contrast, appears to have a mitigating effect both on large- and small-scale conflicts. Models 3 and 4 report coefficients from estimations that include the interaction between oil-gas value per capita and military spending per capita. The negative and statistically significant coefficients on the interaction terms show that higher levels of spending on the military are associated with lower risk of both small and large civil conflict. These results remain unchanged even when random effects are included (Table 3) and support our Hypothesis 2.

In logit models the substantive effect of a particular independent variable depends on the levels of all other variables. Therefore, to facilitate the substantive interpretation of the result, Figure 1 shows the predicted probability of small conflict at low and high oil-gas value per capita for increasing levels of military spending using estimation results from Model 3. These predicted probabilities range between 0 and 1 by definition, with all the variables kept at their observed mean with the exception of the two that are varying (military spending and oil/gas production).

Figure 1: The Effect of Military Spending on Conflict at Different Levels of Oil-Gas Value



Note: Predicted probability of small conflict onset using Model 3. The vertical lines show the 90 percent confidence interval around the predicted probabilities of conflict.

At low levels of military spending per capita, the production of oil and gas tends to increase the risk of violent conflict. The dotted line (no oil/gas production) is below the continuous line (high oil/gas production). In oil and gas rich economies, however, this increase in risk of small-scale

conflict can be mitigated and even reversed with higher levels of military spending. Moving along the military spending per capita scale (from zero to 1,500 dollars), the predicted probability of conflict onset not only returns to its initial level (when both oil/gas production and military expenditure were set at zero), but falls below it and tends to zero. For economies not endowed with oil or gas, by contrast, a similar increase in military spending is associated with continuously higher risks of conflict. For large conflicts, a similar pattern emerges. In this case, however, the downward slope for oil and gas rich economies is less pronounced (Appendix B).

These non-linearities may explain at least in part the diverging results observed in the literature. For oil-poor countries with limited resources, military spending could be perceived as crowding out more important spending, fueling citizen grievance and possibly leading to higher risk of conflict. As countries become richer in oil and can tap more resources, they may be less constrained and military spending can take place without crowding out other expenses. Furthermore, as these governments grow richer they may represent more attractive prizes, and would need larger military budgets to fend off unwanted claims on their treasury, either through patronage or military action.

In both cases, signaling and patronage seem to prevail over any possible loss of efficiency in the military apparatus. The results presented here would suggest that, in oil and gas rich economies, spending on repression, patronage to regime loyalists, or direct rents to the military to prevent possible coup attempts offsets any undermining in the quality of the armed forces. These governments seem to have been able to spend on military and contain the increased risk of conflict onset related to oil resources, while not becoming more vulnerable to other threats.

Finally, higher welfare spending seems to be associated with lower risk of small-scale conflict. Results from Models 5 and 6 indicate a negative and statistically significant coefficient for the level of welfare spending. The coefficient of the interaction term with the oil-gas value per capita is, however, not statistically significant. These results remain unchanged once random effects are included (Table 3). This would suggest that the reduction in conflict risk associated with higher levels of spending on education, health, and social protection is independent from the oil-gas value. The relation is here linear and the effect on conflict higher than military spending for low levels of oil revenue.

Robustness Tests

The use of instrumental variables for military spending does not alter the results. Models 13 and 14 in Table 3 show estimations using instrumented values for military spending per capita and indicate that the earlier results remain robust. Interaction terms remain negative and statistically significant and their magnitude changes little (large conflict) or not at all (small conflict).

We also investigate the robustness of the results by imposing various sample restrictions that previous work suggest may be relevant. In all cases, the results reported above remain unchanged.

- A first restriction is whether a country is having another violent conflict or not and only observations that do not have an ongoing war were kept in the sample;
- We also restrict our sample by only focusing on non-democracies (autocracies and anocracies);²³
- We also exclude non-oil producing countries and include only country-year observations that produce more than 106 dollars per capita of oil and gas;
- The sample was restricted to very poor countries (the bottom 25 percentile based on logged GDP per capita), selecting only the post-Cold War period (1990-2009);
- We include both military and welfare spending (and their interacted terms with oil gas value per capita) in the same model and the results for small conflict are very similar to the ones reported so far.
- Finally, we use logged oil gas value per capita to replicate the findings in Ross (2012). The results are shown in Models 15-19 in Appendix C and remain broadly unchanged.

CONCLUSION

If natural resources increase the risk of violence in a country, are there ways for the government to change this course of events? Contributing to this ongoing debate in the study of civil war, our paper sheds light on one key aspect of governments' political decisions: the allocation of natural resource wealth, in particular oil wealth, for various public spending items. This pacifying outcome may be due to a signaling effect of spending, showing potential rebels the size of the coalition they would be facing; a reduction of grievance; or a deterrent effect due to a greater security apparatus. By doing this, the paper brings together the literature on public spending and conflict, on one hand, and that on natural resources and conflict, on the other.

The statistical analysis presented in this paper confirms that the association between natural resources and conflict is not a fatality. The pattern of public spending could play a role. Higher levels of military spending in oil-rich countries are associated with lower risks of both small- and large-scale conflict. This mitigating effect is all the more potent when oil revenue grows larger.

²³ We consider countries as autocracies or anocracies if a combined score of *xrconst*, *xrcomp* and *xropen* in Polity IV is no more than 11 (the maximum score is 14).

As these resources grow in importance, larger military budgets may be called for either for repression, patronage to regime loyalists, or direct rents to the military to prevent possible coup attempts. At low levels of oil revenue, however, the opportunity costs of military expenditure in terms of foregone alternative spending may fuel grievance. Higher levels of military expenditure are in this case associated with higher risk of conflict.

Higher spending in education, health, and social protection is associated with lower risk of small scale conflict. This effect is independent from the level of oil revenue and could be more effective than military spending in reducing conflict risk for countries not well-endowed with natural resources. While unable to prevent full-scale wars, higher spending on public services for which the citizens care could be enough to reduce grievance, foster a government's legitimacy, and reduce the risk of small-scale conflict. Finally, higher levels of general government spending are not robustly associated with lower risk of conflict.

These results uncover interesting non-linearities in the relations between conflict, natural resources (oil and gas in this case), and public spending that could explain partly the divergent results presented in the literature and call for further investigation. First, while general government spending does not seem to have any effect on conflict risk, patronage usually goes through construction contracts or civil service employment. Examining the association between higher investment budgets or higher wage bills and the risk of conflict may yield different results.

Furthermore, citizens may care more about actual improvements in public service delivery than higher public spending. Signaling without delivering the actual service may backfire and fuel grievance. Examining the possible role of improving education or health outcomes in reducing grievance and conflict risk could also be a fruitful venue for future research.

REFERENCES

- Acemoglu, Daron and James Robinson, 2000, "Why Did the West Extend Franchise? Democracy, Inequality, and Growth in Historical Perspective," *Quarterly Journal of Economics*, Vol. 115 (4), 1167-1199.
- Acemoglu, Daron and James Robinson, 2006, *The Economic Origins of Democracy and Dictatorship*, Cambridge University Press.
- Acemoglu, Daron and James Robinson, 2012, *Why Nations Fail?* Random House LCC.
- Acemoglu, Daron, James Robinson, and Thierry Verdier, 2004, "Alfred Marshall Lecture: Kleptocracy and Divide-and-Rule: A Model of Personal Rule". *Journal of the European Economic Association* 2(2-3): 132-192.
- Andersen Jørgen and Michael Ross, 2013, "The Big Oil Change: A Closer Look at the Haber-Menaldo Analysis". *Comparative Political Studies* 47: 993-1021.
- Avelino, George, David S. Brown and Wendy Hunter, 2005, "The Effects of Capital Mobility, Trade Openness, and Democracy on Social Spending in Latin America, 1980-1999", *American Journal of Political Science*, Vol. 49 (3): 625-641.
- Azam, Jean-Paul, 1995, "How to Pay for the Peace: A Theoretical Framework with References to African Countries," *Public Choice*, Vol. 83: 173-184.
- Azam, Jean-Paul, 2001, "The Redistributive State and Conflicts in Africa," *Journal of Peace Research*, Vol. 38: 429-444.
- Balch-Lindsay, Dylan and Andrew Enterline, 2000, "Killing Time: The World Politics of Civil War Duration, 1820-1992," *International Studies Quarterly*, Vol. 44-4: 615-642.
- Barakat, Bilal and Henrik Urdal, 2009, "Breaking the Waves? Does Education Mediate the Relationship Between Youth Bulges and Political Violence?" *World Bank Policy Research Working Paper No. 5114*.
- Basedau, M. and J. Lay, 2009, "Resource Curse or Rentier Peace? The Ambiguous Effects of Oil Wealth and Oil Dependence on Violent Conflict", *Journal of Peace Research*, Vol. 46(6): 757-776.
- Beblawi, Hazem and Giacomo Luciani eds., 1987, *The Rentier State*, Croom Helm.
- Beck, Nathaniel, Jonathan Katz, and Richard Tucker, 1998, "Taking Time Seriously: Time-Series-Cross-Section Analysis with a Binary Dependent Variable," *American Journal of Political Science*, Vol. 42-4: 1260-1288.
- Belkin, Aaron and Evan Schofer, 2003, "Toward a Structural Understanding of Coup Risk," *Journal of Conflict Resolution*, Vol. 47-5: 594-620.

Besley, Timothy and Torsten Persson, 2009, "The Incidence of Civil War: Theory and Evidence" Discussion Paper EOPP/2009/5, STICERD, London School of Economics.

Bodea, Cristina and Ibrahim Elbadawi, 2007, "Riots, Coups and Civil War: Revisiting the Greed and Grievance Debate," *The World Bank Policy Research Working Paper* No. 4397.

Boix, Carles, 2003, *Democracy and Redistribution*, Cambridge University Press.

Brady, Henry, Sidney Verba, and Kay Schlozman, 1995, "Beyond SES: A Resource Model of Political Participation". *American Political Science Review* 89:271–294.

Bratton, Michael and Nicholas van de Walle, 1997, *Democratic Experiments in Africa: Regime Transitions in Comparative Perspective*. New York: Cambridge University Press.

Breidlid, Anders, 2005, "Education in the Sudan: The Privileging of an Islamic Discourse". *Compare* 35:247–263.

Brett, Rachel and Irma Specht, 2004, *Young Soldiers: Why They Choose to Fight*. Boulder, CO: Lynne Rienner.

Brinkerhoff, Derick, Anna Wetterberg, and Stephen Dunn, 2012, "Service Delivery and Legitimacy in Fragile and Conflict-Affected States." *Public Management Review* 14 (2): 273–293.

Brown, Davis S. and Wendy Hunter, 2004, "Democracy and Human Capital Formation: Education Spending in Latin America, 1980 to 1997", *Comparative Political Studies*, Vol. 37 (7): 842-864.

Brunnschweiler, Christa N. and Erwin H. Bulte, 2009, "Natural Resources and Violent Conflict: Resource Abundance, Dependence and the Onset of Civil Wars" *Oxford Economic Papers*, Vol. 61-4: 651-674.

Bueno de Mesquita, Bruce, Alastair Smith, Randolph Siverson, and James Morrow, 2003, *The Logic of Political Survival*, Cambridge, MA and London, UK: MIT Press.

Buhang, Halvard and Jan Ketil Rød, 2006, "Local Determinants of African Civil Wars, 1970-2001, *Political Geography*, Vol. 25: 315-335.

Burgoon, Brian, 2006, "On Welfare and Terror: Social Welfare Policies and Political-Economic Roots of Terrorism," *Journal of Conflict Resolution*, Vol. 50: 176-203.

Cederman, Lars-Erik, Nils Weidmann, and Kristian Skrede Gleditsch, 2011, "Horizontal Inequalities and Ethnonationalist Civil War: A Global Comparison," *American Political Science Review*, Vol. 105-3: 478-495.

Chu, Ke-Young, Hamid Davoodi and Sanjeev Gupta, 2000, "Income Distribution and Tax and Government Social Spending Policies in Developing Countries", IMF Working Paper, WP/00/62

- Collier, Paul and Anke Hoeffler, 1998, "On Economic Causes of Civil War," *Oxford Economic Papers*, Vol. 50-4: 563-573.
- Collier, Paul, and Anke Hoeffler, 2004, "Greed and Grievance in Civil War," *Oxford Economic Papers*, Vol. 56:563–595.
- Collier, Paul, and Anke Hoeffler, 2005, "Resource Rents, Governance, and Conflict." *The Journal of Conflict Resolution*, Vol. 49-4: 625-33.
- Collier, Paul and Anke Hoeffler, 2007, "Military Spending and the Risks of Coups d'Etats," Working Paper.
- Collier, Paul, Anke Hoeffler and Dominic Rohner, 2009, "Beyond Greed and Grievance: Feasibility and Civil War," *Oxford Economic Papers*, Vol. 61-1: 1-27.
- Cotet, Anca M., and Kevin K. Tsui, 2013, "Oil and Conflict: What Does the Cross Country Evidence Really Show?" *American Economic Journal: Macroeconomics*, Vol. 5-1: 49-80.
- Deng, Francis M, 2001, "Sudan Civil War and Genocide: Disappearing Christians of the Middle East". *Middle East Quarterly*. Vol. 8 (1): 13-21.
- DeRouen, Karl and David Sobek, 2004, "The Dynamics of Civil War Duration and Outcome", *Journal of Peace Research*, Vol. 41-3: 303–320.
- Devarajan, Shantayanan, Vinaya Swaroop and Heng-fu Zou, "The Composition of Public Expenditure and Economic Growth," *Journal of Monetary Economics*, Vol. 37: 313-344.
- Dixon, J. 2009, "What Causes Civil Wars? Integrating Quantitative Research Findings", *International Studies Review*, Vol. 11(4): 707–735.
- Easterly, William and Sergio Rebelo, 1993, "Fiscal Policy and Economic Growth: An Empirical Investigation," *Journal of Monetary Economics*, Vol. 32: 417-458.
- Englebert, Pierre and James Ron, 2004, "Primary Commodities and War: Congo-Brazzaville's Ambivalent Resource Curse," *Comparative Politics*, Vol. 37: 61-81.
- Fearon, James and David Laitin, 2003, "Ethnicity, Insurgency and Civil War," *American Political Science Review*, Vol. 97-1: 75-90.
- Fearon, James, 2005, "Primary Commodity Exports and Civil War," *Journal of Conflict Resolution*, Vol. 49: 483-507.
- Fjelde, Hanne and Indra de Soysa, 2009, "Coercion, Co-optation, or Cooperation: State Capacity and the Risk of Civil War, 1961-2004," *Conflict Management and Peace Science*, Vol. 26-5: 5-25.
- Fjelde, Hanne, 2009, "Buying Peace? Oil Wealth, Corruption and Civil War, 1985-1999," *Journal of Peace Research*, Vol. 46: 199-218.

Gandhi, Jennifer and James Vreeland, 2004, "Political Institutions and Civil War: Unpacking Anocracy," Working Paper.

Gandhi, Jennifer and Adam Przeworski, 2007, "Authoritarian Institutions and the Survival of Autocrats," *Comparative Political Studies*, Vol. 40-11: 1279-1301.

Gates, Scott, Håvard Hegre, Mark P Jones and Håvard Strand, 2006, "Institutional Inconsistency and Political Instability: Polity Duration 1800–2000," *American Journal of Political Science*, Vol. 50(4): 893–908.

Gauthier, Bernhard and Waly Wane, 2009, "Leakage of Public Resources in the Health Sector: An Empirical Investigation of Chad," *Journal of African Economics*, Vol. 18-1: 52-83.

Gauthier, Bernard and Albert Zeufach, 2011, "Governance and Oil Revenues in Cameroon," in Paul Collier and Anthony Venables eds., *Plundered Nations?: Successes and Failures in Natural Resource Extraction*, Palgrave Macmillan, 27-78.

Gelb, Alan, 1988, *Oil Windfalls: Blessing or Curse*, Oxford University Press.

Gleason, Gregory, 2010, "Natural Gas and Authoritarianism in Turkmenistan," in Indra Overland, Heidi Kjaernet and Andrea Kendall-Taylor eds., *Caspian Energy Politics: Azerbaijan, Kazakhstan, and Turkmenistan*, Routledge.

Glickman, Harvey, 2000, "Islamism in Sudan's Civil War", *Orbis*, Vol. 44:267–282.

Guerrero, Alejandro, 2011, *Rebuilding Trust in Government via Service Delivery: The Case of Medellin, Colombia*. Washington, DC: World Bank.

Gupta, Sanjeev and Marijn Verhoeven, 2001, "The Efficiency of Government Expenditure: Experience from Africa", *Journal of Policy Modeling*, Vol. 23(4): 433-467.

Gurr, Ted, 1970, *Why Men Rebel*, Princeton University Press.

Gylfason, Thorvaldur, 2001, "Natural Resources, Education, and Economic Development," *European Economic Review*, Vol. 45: 847-859.

Haber, Stephen and Victor Menaldo, 2011, "Do Natural Resources Fuel Authoritarianism? A Reappraisal of the Resource Curse," *American Political Science Review*, Vol. 105-1: 1-26.

Hegre, Havard, Tanja Ellingsen, Scott Gates, and Nils Petter Gleditsch, 2001, "Toward a Democratic Civil Peace? Democracy, Political Change and Civil War, 1916–1992," *American Political Science Review*, Vol. 95: 33–48.

Hegre, Havard and Nicholas Sambanis, 2006, "Sensitivity Analysis of Empirical Results on Civil War Onset," *Journal of Conflict Resolution*, Vol. 50-4: 508-535.

Henderson, Errol and David Singer, 2000, "Civil War in the Post-Colonial World, 1946–1992," *Journal of Peace Research*, Vol. 37-3: 275–299.

Hendrix, Cullen, 2010, "Measuring State Capacity: Theoretical and Empirical Implications for the Study of Civil Conflict," *Journal of Peace Research*, Vol. 47: 273–285.

Herbert, Siân., Dukhan, Nathalia and Debos, Marielle, 2013, *State Fragility in the Central African Republic: What Prompted the 2013 Coup?* *Rapid Literature Review*, Birmingham, UK: GSDRC, University of Birmingham.

Herbst, Jeffrey, 2000, *States and Power in Africa*, Princeton University Press.

Heyneman, Stephen P., 2003, "Education, Social Cohesion, and the Future Role of International Organizations", *Peabody Journal of Education*, Vol. 78:25–38.

Humphreys, Macartan, 2005, "Natural Resources, Conflict and Conflict Resolution: Uncovering the Mechanisms," *Journal of Conflict Resolution*, Vol. 49: 508–537.

Huntington, Samuel, 1968, *Political Order in Changing Societies*. New Haven and London: Yale University Press.

Justino, Patricia, 2003, *Social Security in Developing Countries: Myth or Necessity? Evidence from India*, Sussex: University of Sussex Poverty Unit.

Keefer, Philip, 2008, "Insurgency and Credible Commitment in Autocracies and Democracies," *World Bank Economic Review*, Vol. 22(1), 33–61.

Keefer, Philip, 2010, "The Ethnicity Distraction ? Political Credibility and Partisan Preferences in Africa," Policy Research Working Paper 5236.

Keefer, Philip and Stuti Khemani, 2005, "Democracy, Public Expenditures, and the Poor: Understanding Political Incentives for Providing Public Services," *World Bank Research Observer*, Vol. 20-1: 1–27.

King, Loren A, 1998, "Economic Growth and Basic Human Needs", *International Studies Quarterly*, Vol. 42 (2): 385–400

Korpi, Walter and Joakim Palme, 1998, "The Paradox of Redistribution and Strategies of Equality: Welfare State Institutions, Inequality, and Poverty in the Western Countries", *American Sociological Review*, Vol. 63 (5): 661–687.

Kugler, Jacek; Yi Feng and Paul J Zak, 2002, "Politics of Fertility and Economic Development", *International Studies Quarterly*, Vol. 44(4): 667–693.

Lange, Matthew and Andrew Dawson, 2010, "Education and Ethnic Violence: A Cross-National Time-Series Analysis," *Nationalism and Ethnic Politics*, Vol. 16-2: 216–239.

- Lange, Matthew, 2012, *Educations in Ethnic Violence: Identity, Educational Bubbles, and Resource Mobilization*, Cambridge University Press.
- Le Billon, Philippe, 2008, "Diamond Wars? Conflict Diamonds and Geographies of Resource Wars", *Annals of the Association of American Geographers*, Vol. 98(2): 345–372.
- Lipset, Seymour Martin, 1959, "Some Social Requisites of Democracy: Economic Development and Political Legitimacy," *American Political Science Review*, Vol. 53-1: 69-105.
- Lujala, Päivi, Nils Petter Gleditsch, and Elisabeth Gilmore, 2005, "A Diamond Curse? Civil War and a Lootable Resource," *Journal of Conflict Resolution*, Vol. 49-4: 538-562.
- Lujala, Paivi, 2010, "The Spoils of Nature: Armed Civil Conflict and Rebel Access to Natural Resources," *Journal of Peace Research*, Vol. 47-1: 15-28.
- Mahdavy, Hussein, 1970, "The Patterns and Problems of Economic Development in Rentier States: The Case of Iran." In *Studies in Economic History of the Middle East*, M.A. Cook. ed., 428-467. London: Oxford University Press.
- Mason, David and Patrick Fett, 1996, "How Civil Wars End: A Rational Choice Approach," *Journal of Conflict Resolution*, Vol. 40-4: 546–568.
- Mason, T David, Joseph Weingarten Jr and Patrick Fett, 1999, "Win, Lose, or Draw: Predicting the Outcomes of Civil Wars," *Political Research Quarterly*, Vol. 52-2: 239–268.
- Morrison, Kevin. 2009. "Oil, Nontax Revenue, and the Redistributive Foundations of Regime Stability." *International Organization*, Vol. 63: 107-138.
- Morrison, Kevin M., 2010, "Oil, Conflict, and Stability." Working Paper, Cornell University.
- Ostby, Gudrun and Henrik Urdal, 2010, "Education and Civil Conflict: A Review of the Quantitative, Empirical Literature," *Background Paper Prepared for the Education for All Global Monitoring Report*.
- Oyefusi, Aderoju, 2008, "Oil and the Probability of Rebel Participation Among Youths in the Niger Delta of Nigeria", *Journal of Peace Research*, Vol. 45(4): 539–555.
- Oyefusi, Aderoju, 2010, "Oil, Youths, and Civil Unrest in Nigeria's Delta: The Role of Schooling, Educational Attainments, Earnings and Unemployment," *Conflict Management and Peace Science*, Vol. 27-4: 326-346.
- Raleigh, Clionadh, 2010, "Seeing the Forest for the Trees: Does Physical Geography Affect a State's Conflict Risk?" *International Interactions*, Vol. 36: 384-410.
- Reinikka, Ritva and Jacob Svensson, 2004, "Local Capture: Evidence from a Central Government Transfer Program in Uganda," *The Quarterly Journal of Economics* 119-2: 679-705.

- Richards, Paul, 2003, *Are there Common Causes to Recent West African Insurgencies? Economic Opportunities and the War Economy*. Organization for Economic Co-operation and Development.
- Robins, Simon, 2012, “An Empirical Approach to Post-conflict Legitimacy: Victims’ Needs and the Everyday.” *Journal of Intervention and Statebuilding*, Vol. 7 (1): 45–64.
- Ross, Michael, 2004a, “What Do We Know About Natural Resources and Civil War?”, *Journal of Peace Research*, Vol. 41(3): 337–356.
- Ross, Michael, 2004b, “How Do Natural Resource Influence Civil War? Evidence from Thirteen Cases”, *International Organization*, Vol. 58(1): 35–67.
- Ross, Michael, 2001, “Does Oil Hinder Democracy?” *World Politics*, Vol. 53: 325-61.
- Ross, Michael, 2006a, “A Closer Look at Oil, Diamonds and Civil War”, *Annual Review of Political Science*, Vol. 9: 265–300.
- Ross, Michael, 2006b, “Is Democracy Good for the Poor?” *American Journal of Political Science*, Vol. 50-4: 860-874.
- Ross, Michael, 2012, *The Oil Curse*, New Jersey: Princeton University Press.
- Rudra, Nita, 2004, “Openness, Welfare Spending, and Inequality in the Developing World”, *International Studies Quarterly*, Vol. 48 (3): 683-709
- Roessler, Philip, 2011, “The Enemy Within: Personal Rule, Coups, and Civil War in Africa.” *World Politics*, Vol. 63 (2): 300-346.
- Schultz, Theodore W, 1963, *The Economic Value of Education*, New York: Colombia University Press.
- Smith, Benjamin, 2004, “Oil Wealth and Regime Survival in the Developing World, 1960-1999.” *American Journal of Political Science*, Vol. 48 (2): 232-246.
- de Soysa, Indra, 2002, “Paradise is a Bazaar: Greed, Creed, and Governance in Civil War, 1989–99”. *Journal of Peace Research*, Vol. 39(4): 395–416.
- de Soysa, Indra and Eric Neumayer, 2007, “Resource Wealth and the Risk of Civil War Onset: Results from a New Dataset of Natural Resource Rents, 1970–1999”, *Conflict Management and Peace Science*, Vol. 24(3): 201–218.
- de Soysa, Indra and Eric Neumayer, 2008, “Disarming Fears of Diversity: Ethnic Heterogeneity and State Militarization, 1988-2002”, *Journal of Peace Research*, Vol. 45 (4). 497-518.
- Svolik, Milan, 2009, “Power-Sharing and Leadership Dynamics in Authoritarian Regimes,” *American Journal of Political Science*, Vol. 53-2: 477-494.

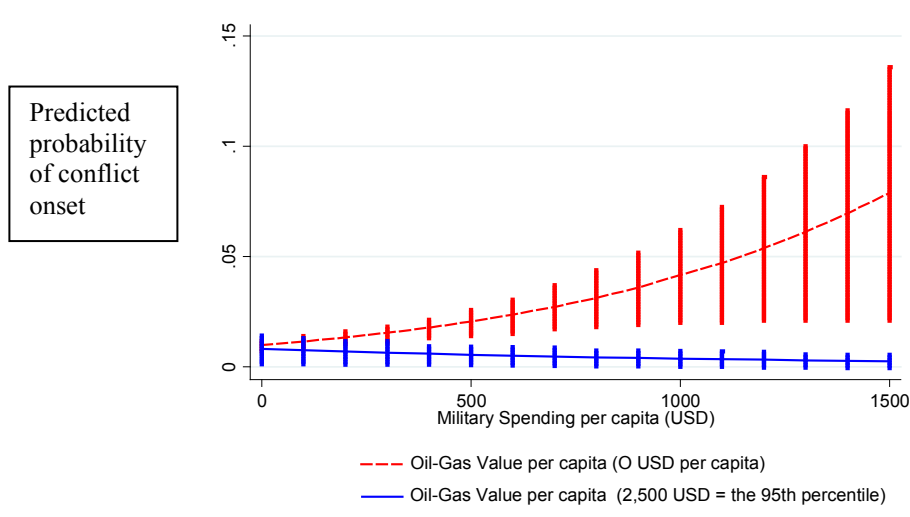
- Taydes, Zeynep and Dursun Peksen, 2012, "Can States Buy Peace? Social Welfare Spending and Civil Conflicts," *Journal of Peace Research*, Vol. 49-2: 273-287.
- Thies, Cameron, 2010, "Of Rulers, Rebels, and Revenue: State Capacity, Civil War Onset, and Primary Commodities," *Journal of Peace Research*, Vol. 47-3: 321-332.
- Thyne, Clayton, 2006, "ABC's, 123's and the Golden Rule: The Pacifying Effect of Education on Civil War, 1980-1999," *International Studies Quarterly*, Vol. 50, 733-754.
- Ulfelder, Jay, 2007, "Natural-Resource Wealth and the Survival of Autocracy," *Comparative Political Studies*, Vol. 40-8: 995-1018.
- Urdal Henrik, 2006. "A Clash of Generations? Youth Bulges and Political Violence", *International Studies Quarterly*, Vol. 50(3): 607–630.
- Van de Walle, Dominique, 1996, "Assessing the Welfare Impacts of Public Spending", World Bank Policy Research Paper 1670.
- Vreeland, James, 2008, "The Effect of Political Regime on Civil War: Unpacking Anocracy," *The Journal of Conflict Resolution*, Vol. 52-3: 401-425.
- Wimmer, Andreas, Lars-Erik Cederman and Brian Min, 2009, "Ethnic Politics and Armed Conflict: A Configurational Analysis," *American Sociological Review*, Vol. 74-2: 316-337.
- Wright, Joseph, Erica Franz and Barbara Geddes, 2014, "Oil and Autocratic Regime Survival". *British Journal of Political Science*, October: 1-20.
- Wooldridge, Jeffrey, 2002, *Econometric Analysis of Cross Section and Panel Data*, Cambridge: MIT Press.

Appendix

Appendix A: Descriptive Statistics

	Number of Observations	Mean	Standard Deviation	Min	Max	Data Sources
Small Conflict Onset	9,097	0.03	0.18	0	1	PRIO Armed Conflict Dataset
Large Conflict Onset	9,097	0.014	0.11	0	1	PRIO Armed Conflict Dataset
Government Consumption Expenditure	6,485	15.71	6.63	2.04	76.22	World Development Indicators (WDI)
Military Spending per capita	6,695	135.59	342.72	0	7631.69	Correlates of War Project
Military Spending per capita (instrumented)	5,415	123.47	286.6	-15.71	7543.43	
Welfare Spending	2,561	11	7.17	0.76	35.1	WDI, IMF Fiscal Affairs, Kugler et al. (2002), Burgoos (2006)
Welfare Spending (Imputed)	5,129	9.82	6.19	-2.14	35.1	
Gap in Infant Mortality	3,563	0.00	1.84	-8.31	86.78	Infant Mortality data comes from WDI
Ethno-Linguistic Fractionalization	8,450	0.39	0.28	0.001	0.92	Fearon and Laitin (2003)
Religious Fractionalization	8,423	0.37	0.21	0	0.78	Fearon and Laitin (2003)
Political Instability	8,609	0.16	0.37	0	1	Fearon and Laitin (2003)
Noncontiguity	8,423	0.16	0.37	0	1	Fearon and Laitin (2003)
Polity IV (xconst, xtcomp + xropen)	8,329	8.32	3.68	0	14	Marchall and Jagers (2008)
Logged Population	8,317	15.78	1.64	11.59	21	WDI
Logged GDP per capita	7,671	7.61	1.51	3.72	11.87	Penn World tables 7.1.
Ongoing war (small conflict)	8,918	0.14	0.35	0	1	PRIO Armed Conflict Dataset

Appendix B: The Effect of Military Spending on Conflict at Different Levels of Oil-Gas Value



Note: Predicted probability of large conflict onset using Model 4. The vertical lines show the 90 percent confidence interval around the predicted probabilities of conflict.

Appendix C: Replication of Ross (2012) and the use of logged Oil-Gas Value per capita

	Model 15 Small Conflict	Model 16 Large Conflict	Model 17 Small conflict	Model 18 Large conflict
	Ross (2012)	Ross (2012)		
Logged Oil-Gas Value per capita	0.089** (0.035)	0.1 (0.065)	0.098** (0.044)	0.004 (0.069)
Military Expenditure per capita			0.001*** (0.000)	0.001** (0.001)
Military Expenditure*Oil			- 0.0002*** (0.0001)	- 0.0002** (0.0001)
ELF			1.159*** (0.42)	0.47 (0.82)
Religious Fractionalization			-0.213 (0.50)	0.936 (0.74)
Political Instability			0.665*** (0.19)	0.735*** (0.28)
Non Contiguity			0.612 (0.42)	1.153** (0.51)
Polity IV			0.0329* (0.02)	-0.109*** (0.04)
Logged Population	0.303*** (0.06)	0.314*** (0.09)	0.228*** (0.06)	0.292*** (0.09)
Logged GDP per capita	-0.519*** (0.099)	-0.612*** (0.165)	-0.461*** (0.18)	-0.12 (0.27)
Constant	-4.154*** (1.21)	-4.437* (2.31)	-5.459** (2.43)	-10.10*** (3.09)
Pseudo R squared	0.083	0.077	0.116	0.105
Log Likelihood	-944.82	-176.47	-758.34	-326.55
Wald Chi2	94.42***	54.69***	413.72***	125.42***
Observations	6,862	2,709	5,747	5,747

Note: ***p<0.01, **p<0.05, *p<0.1. Regional dummies, half decade dummies, peace years and cubic splines are included. Country clustered standard errors in parentheses.