

**OIL WEALTH, ETHNO-RELIGIOUS-LINGUISTIC
FRACTIONALIZATION AND CIVIL WARS IN AFRICA: CROSS-
COUNTRY EVIDENCE**

BY

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¹ The views expressed here are those of the author and in no way reflect those of the AfDB and its Executive Directors.

ABSTRACT

We empirically examine the effect of oil wealth and ethno-religious-linguistic fractionalization on civil war prevalence in Africa, by using three different estimation strategies and alternative measures of societal heterogeneity. We show that oil wealth and the three distributional measures of ethnic fractionalization, religious fractionalization, and linguistic fractionalization are significant correlates of civil war in Africa. These effects persist as we use an alternative measure of the prevalence of civil war. Thus, while oil wealthy, ethnically and linguistically fractionalized countries are more likely to experience civil violence, religiously fractionalized ones are less likely to experience significant civil violence in the Continent. We also find that countries with large population size, rough (mountainous) terrain and coup-prone are at greater risk for civil war than those that are more democratic with high per capita income and economic growth.

(JEL: D74, H56, I71, J15, O17, O55, Q34)

I. INTRODUCTION

Oil wealth can be a political curse when oil-rich dictators oppose democratic development because they will have more to give up from losing power. In Africa, many of the poorest and most troubled states have, paradoxically, high levels of natural resource wealth. Most of these countries are oil producers and have become what the literature calls "rentier states," because a great portion of their national wealth comes from the export of oil and a few political elite collects the revenues from the oil export and use the money for cementing their political, economic and social power by controlling government and its bureaucracy. Thus, there is a growing body of evidence that resource wealth itself may lead to civil conflicts and thus harm a country's prospects for peace and stability. Oil is not the only reason for the prevalence of conflicts in resource-rich states in Africa. Many factors – economic, cultural and political tradition, religion, geography, colonial past and others – promote conflict prevalence and peace and stability. While it is clear that conflict prevalence is always a result of these different factors, it is interesting to find out how important the abundance of oil wealth (as opposed to oil wealth dependence) is for conflict incidence in Africa.

Understanding the effect of oil wealth on civil war in Africa is important. The first principal reason is that Africa has acquired some notoriety when it comes to some conflict data. One, Africa has been by far the most conflict-prone region in the post-Cold War years, with nearly a third of the world's total conflicts. Two, nearly half of the world's state-based battle deaths between 1989 and 2009 took place in sub-Saharan Africa. Three, although non-state conflicts took place in every region during 1989–2009, they were most numerous in sub-Saharan Africa, which experienced an average of 18 non-state conflicts per year. Four, SSA has the highest reported battle-death tolls. Five, by the end of 2012, it was the region with the largest total number of internally displaced persons (IDPs) by armed conflicts. The second principal reason is that Africa is certainly the hot spot of the resource-conflict link, be it oil, diamond, coltan, cocoa, uranium or any other natural resource.

The third principal reason is that despite the apparent high salience of 'conflict resources' and the many civil wars in Africa, a specific and systematic study of this continent has been neglected in recent years, particularly with regard to oil wealth (resource abundance) and conflict incidence since most studies focus on onset, but a few consider incidence (Elbadawi and Sambanis, 2002; Lujala *et al.*, 2005; Montalvo and Reynal-Querol, 2005) or duration (Buhaug *et al.*, 2009; 2004; Fearon, 2004). The fourth key reason is that, unlike countries in other continents of the world, the bulk of African countries share several pertinent deep-rooted conditions such as high ethno-religious-linguistic fractionalization, thus raising the empirical question: Do ethno-religious-linguistic fractionalization matter for the prevalence of civil war in Africa? Thus, focusing on this part of the world is particularly fruitful.

In addition, recently rising coups attempts in some African countries, high energy prices and the North African and Middle East situation characterized by "revolutions" have made the question of the link between oil wealth and civil war timelier than ever. Indeed, the recent wave of "revolutions" and "counter revolutionary" attempts in North Africa and the Middle East has not

only been important political events, they have also re-sparked old academic and policy debates on civil war and oil wealth.

Also, Africa is well endowed with abundant crude oil. Oil is central to the economic growth and fiscal situations of an increasing number of African countries. The disappointing development performance of many oil-rich economies has been a topical issue among policymakers, NGOs, civil society and academics. Many countries have failed to leverage their oil wealth to build strong and stable states with sustained and inclusive long-term development. For some of these countries, oil wealth has instead become associated with increased poverty, environmental devastation, authoritarianism, weak state institutions, corruption and conflicts. That is, for many of them, the resource curse syndrome, oil price volatility, poor oil revenue management, and oil-related social and political conflicts have largely eroded the significant gains from higher but volatile export revenues (Anyanwu et al, 2010).

More hydrocarbon reserves have been discovered in East Africa than in any other part of the world in the last two years. The recent discoveries of oil and gas deposits in some African countries, such as Ethiopia, Ghana, Kenya, Mozambique, São Tomé and Príncipe, Sierra Leone, Tanzania, and Uganda, therefore present new opportunities to chart a sustainable and inclusive growth and development path that facilitates poverty reduction and job creation particularly for the teeming youth of the continent. As more and more countries join the African club of oil-producing nations, they are going to face a great managerial challenge to avoid the resource curse syndrome, especially conflicts. A key question is: Can these African countries avoid a 'resource curse' including conflicts and leverage their oil wealth to fuel inclusive economic development? This question will ripple across many African countries in the coming decade as technology and geology converge to unlock billions of barrels of oil in many African countries where many live below the poverty line. Therefore, part of the aim of this study is to provide some important lessons to these countries to avoid the pitfalls of their "elder oil-producers".

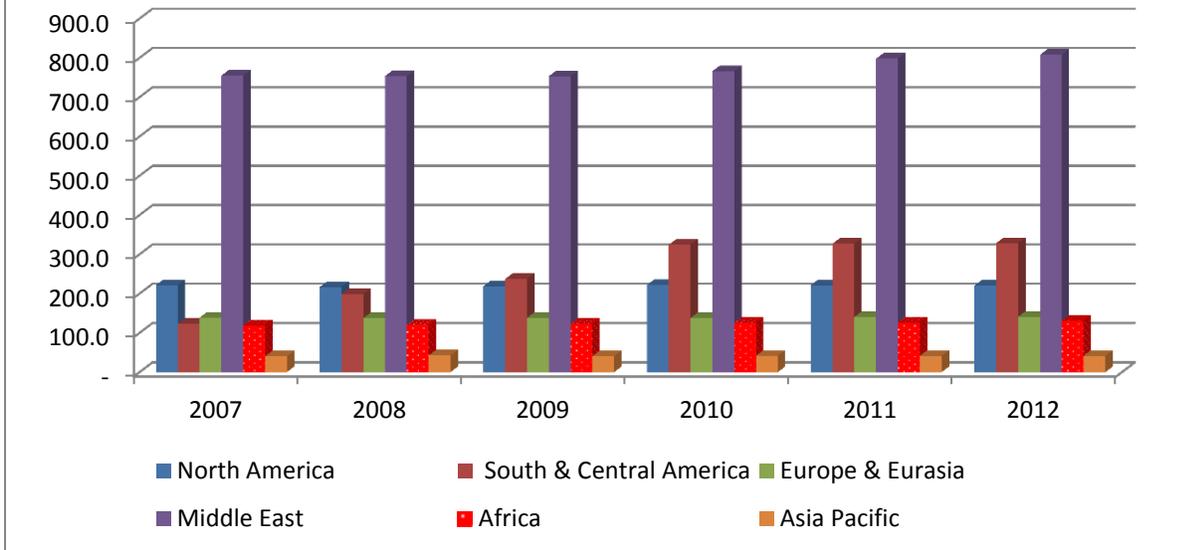
This paper therefore uses recent data on historical oil wealth to provide new evidence on the effect of oil wealth and ethno-religious-linguistic fractionalization on civil war incidence in Africa from 1950 to 2008. Thus, the further contents of the paper can therefore be adumbrated as follows. Section II presents some stylized facts on oil reserves and conflicts in recent years while Section III examines a brief literature review. Section IV presents the model and data while Section V presents and discusses the empirical estimates. Section VI concludes the paper with policy implications.

II. STYLIZED FACTS ON OIL RESERVES AND INCIDENCE OF WAR

2.1 Trend in Oil Reserves

Global oil reserves were estimated to have reached 1669 trillion barrels in 2012 from 1238 trillion barrels in 1980. As Figure 1 shows, the Middle East continues to dominate global oil reserves, recently followed by South and Central America.

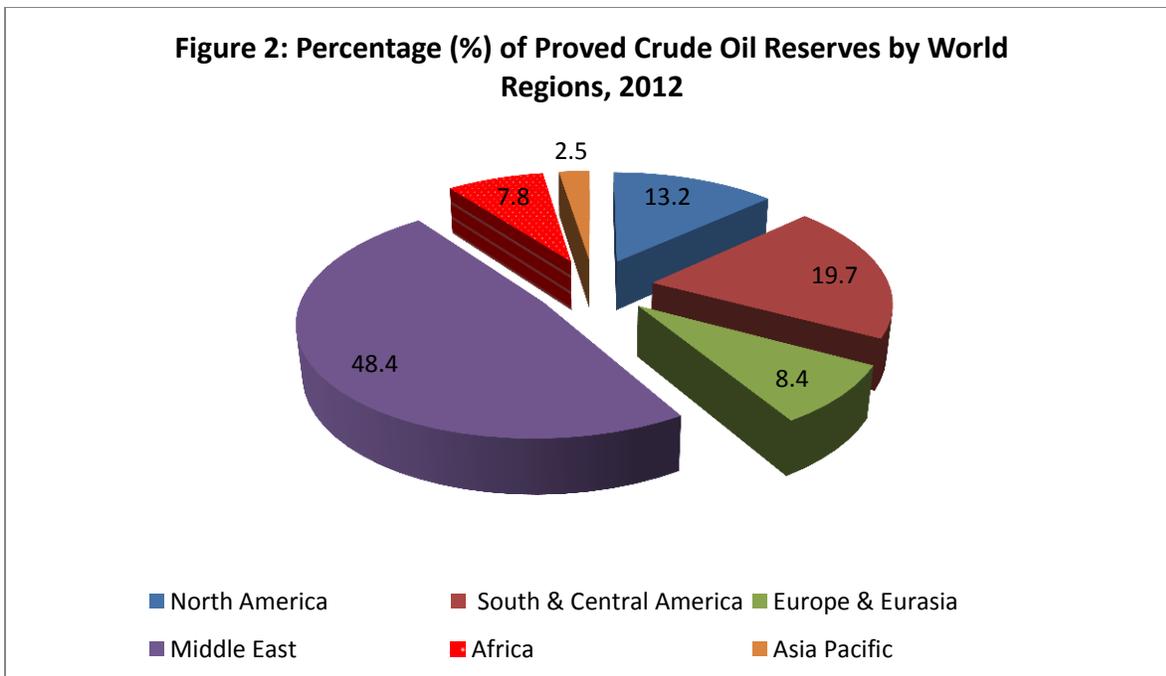
**Figure 1: Proved Crude Oil Reserves by World Regions, 2007-2012
(Trillion Barrels)**



Source: Authors, using data from BP Statistical Review of World Energy 2013

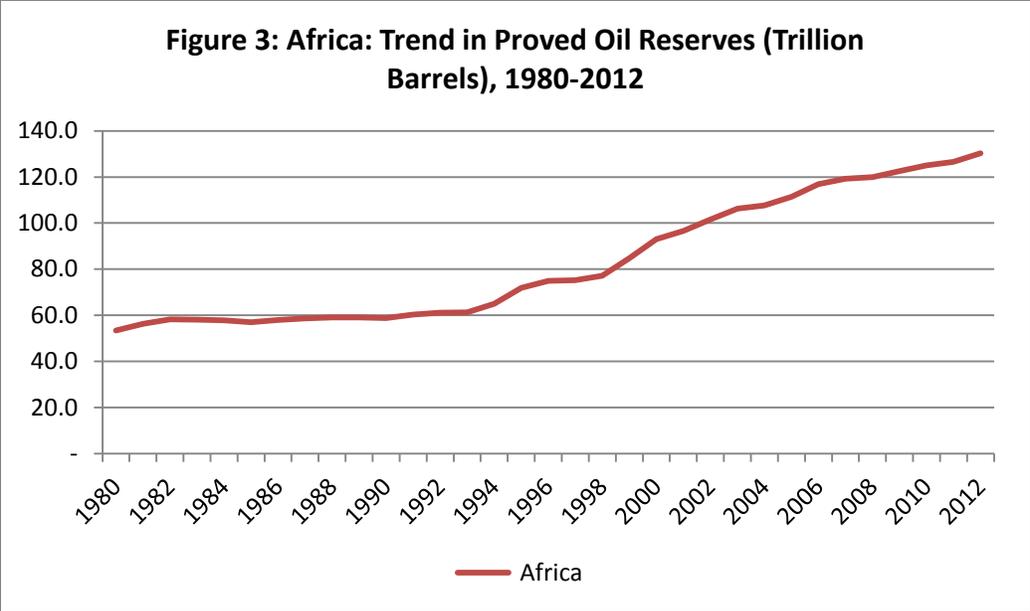
Africa’s share of global oil reserves in 2012 was roughly 8%, with the Middle East dominating at over 48% (Figure 2).

Figure 2: Percentage (%) of Proved Crude Oil Reserves by World Regions, 2012



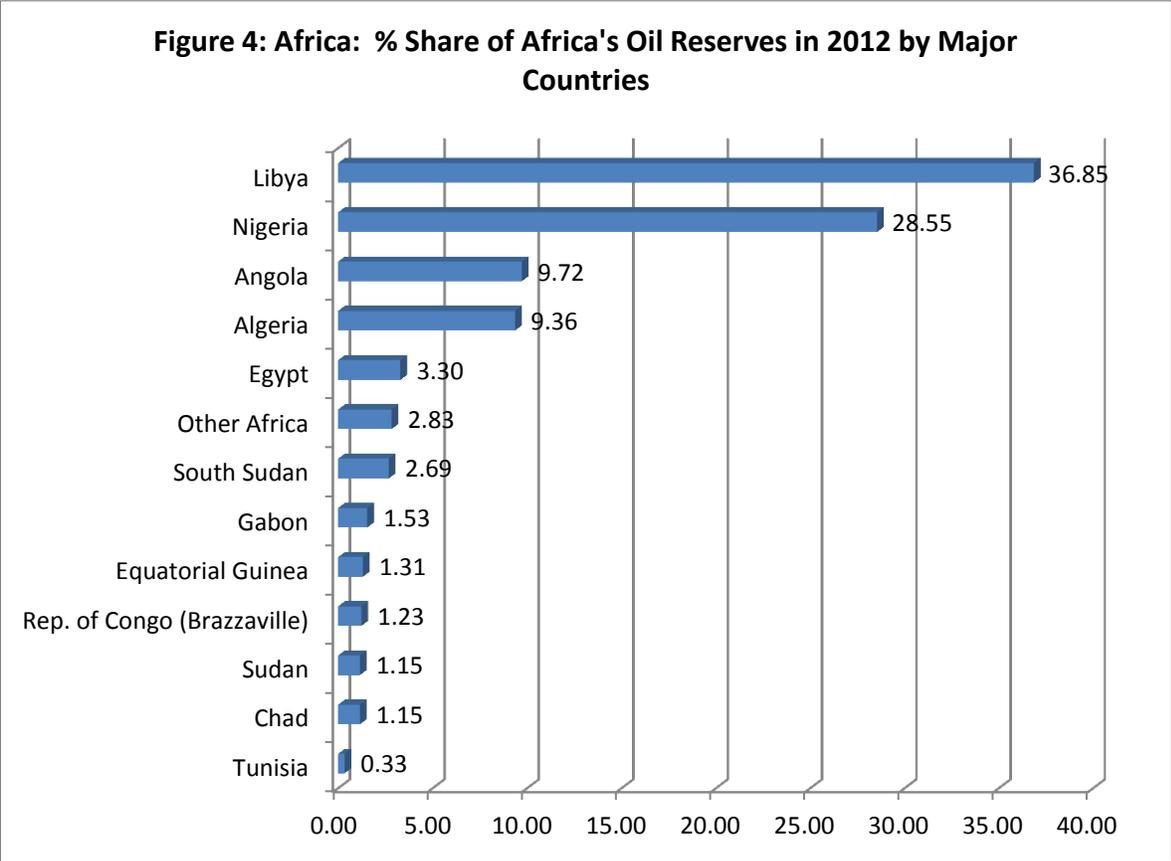
Source: Authors, using data from BP Statistical Review of World Energy 2013

Africa’s oil reserves have maintained an upward trend, rising from 53.4 trillion barrels in 1980 to over 130 trillion barrels in 2012 (Figure 3).



Source: Authors, using data from BP Statistical Review of World Energy 2013

By 2012, Libya controlled more than a third of Africa’s oil reserves (Figure 4), followed by Nigeria that controlled over a quarter.



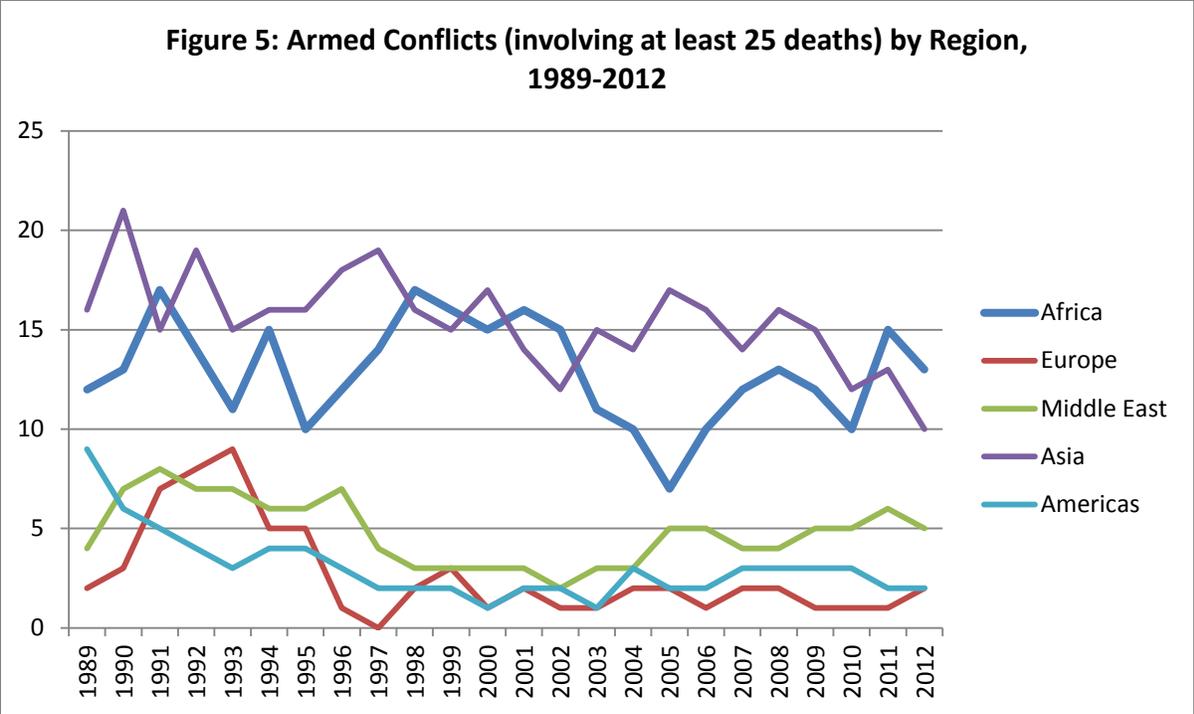
Source: Authors, using data from BP Statistical Review of World Energy 2013

2.2 Trend in War Incidence

While there are diverse definitions of civil war, there is some consensus on its main dimensions, including being an armed combat within a sovereign country, an organized military conflict with at least two parties sufficiently important and armed (distinct from riots, terrorism, crime and genocide), where the authority of the government is at stake (distinct from inter-state wars), being “minor” when battle-related deaths range from more than 25 to less than 1000 deaths per year, and being “major” if battle-related deaths are over 1000 per year. Civil wars have costs and consequences such as economic and costs to citizens of the country involved in war, cost and consequences to the neighbors, and global costs. The economic costs and consequences relate to destructions (infrastructures, victims, livestock); social disorder (insecurity, decrease of productivity); dissaving (decrease in capital stock); diversion of productive expenditure towards unproductive expenditure; capital flights (physical, human and financial); and decrease in the stock of productive factors, national income and growth, thus putting “development in reverse”. Social consequences include immediate and long-term consequences on human capital such as direct impact on morbidity and mortality of war combatants and civilians, high infant mortality, higher incidence of infectious diseases during and after the war, higher incidence of sexual and gender-based violence, higher rates of disability from injury, high flow of refugees and internally displaced persons (IDPs), and higher rates of depression, trauma and emotional distress. The costs and consequences to the neighbors relate to collateral destructions, arms race, refugees inflows, decrease in trade and increase in capital flight, contagion of conflict, and direct impact of overall economic performance. On the other hand, the global effects include increased production and traffic of drugs such as opium and cocaine, across the border spread of disease pandemic, and the spread of international terrorism as territories outside the control of government are used as training camps, for example.

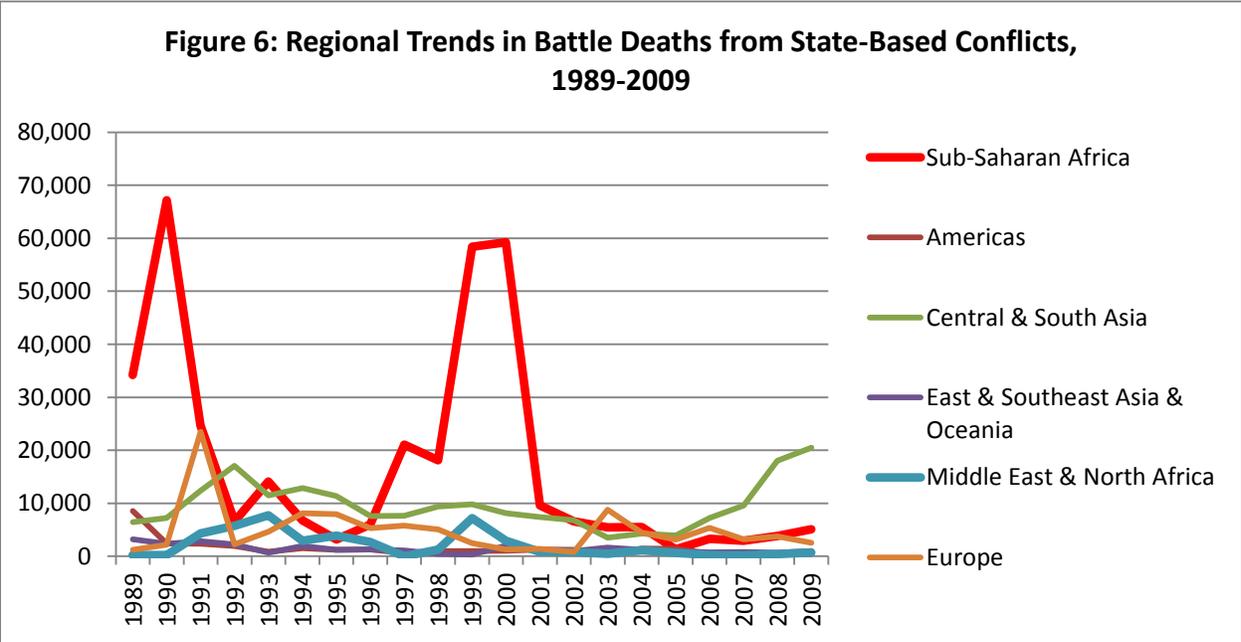
Sub-Saharan Africa has been by far the most conflict-prone region in the post-Cold War years, with nearly a third of the world’s total conflicts. The annual incidence of conflict by region from 1989 to 2012 is shown in Figure 5. Africa exceeded other regions when its share peaked in 1991 and 1998 and since 2011 it has been the region with the highest incidence of wars. Three new conflicts (India (Garoland), Mali and South Sudan vs. Sudan) erupted in 2012 while three previously registered conflicts were restarted by new actors in Central African Republic (CAR), DRC and Mali (Azawad).

The recent crises of military coups and violence in Central African Republic (2013), South Sudan (2013), Mali (2012 and 2013) (in spite of recent elections), Guinea Bissau (2012) and Niger (2010); the continued escalation of political crises in Libya, Tunisia, and Egypt after the “Arab Spring coup d’états” in those countries; the disputed presidential elections in the Democratic Republic of Congo and Zimbabwe, the unconstitutional third term candidacy of some African leaders; the 2007 post-electoral violence in Kenya; and the emergence of violent Islamist groups, are disturbing developments that posit a profound institutional crisis of democracy and contributing to a trend that threatens the blossoming of peace and stability across Africa.



Source: Themner and Wallensteen (2013)

As Figure 6 indicates, nearly half of the world’s state-based battle deaths between 1989 and 2009 were caused by wars in sub-Saharan Africa, most of them in the 1990s. From the mid-2000s onwards, Central and South Asia has been the deadliest region.



Source Data: HSRP (2012)

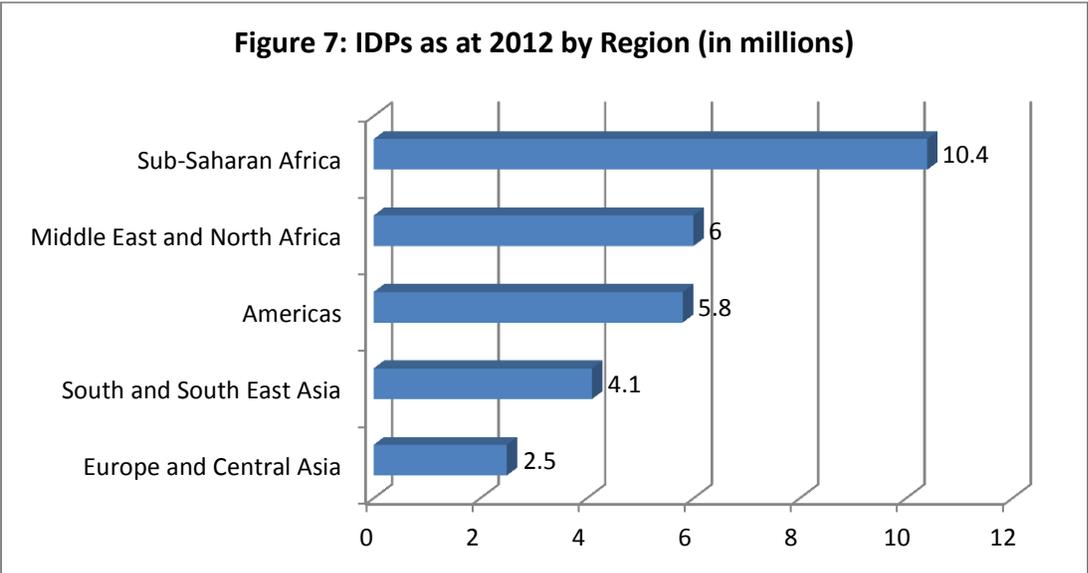
Uppsala Conflict Data Program (UCDP) estimates that there were between 37,175 (low estimate) and 60,260 (high estimate) battle-related deaths in 2012, with a best estimate of 37,941 fatalities. For Africa, it shows that between 6098 (low estimate) and 9379 (high estimate) with a best estimate of 6337 fatalities. Table 1 summarizes the total number of battle-related deaths by region in 2012.

Table 1: Number of Battle-Related Deaths in 2012 by Region and Type of Estimate

Region	Number of battle-related deaths		
	Low estimate	Best estimate	High estimate
Africa	6098	6337	9379
Middle East	18511	18816	34754
Asia	11597	11815	14759
Europe	539	541	750
Americas	430	432	618
Total	37175	37941	60260

Source: Themner and Wallensteen (2013)

In addition, non-state conflicts in sub-Saharan Africa spiked in the late 1990s and early 2000s due in large part to fighting in Somalia, Nigeria, Ethiopia, and the DRC. Indeed, between 1989 and 2009, 271 non-state conflicts in Sub-Saharan Africa resulted in some 60,000 reported battle deaths. The total number of people internally displaced by armed conflict, generalized violence and human rights violations worldwide as of the end of 2012 was estimated to be 28.8 million. The region with the largest total number of internally displaced persons (IDPs) by armed conflicts was sub-Saharan Africa. As of the end of 2012 it was hosting 10.4 million (Figure 7), almost a third of the world’s internally displaced population and an increase of 7.5 percent compared with the year before, thus reversing the downward trend recorded since 2004.



Source: Albuja et al (2013)

III. THE BRIEF REVIEW OF THE LITERATURE

It has been opined that the sum total of the political effects generated by the oil industry makes oil a leading cause of civil war. Between one-quarter and one-half of interstate wars since 1973 have been connected to one or more oil-related causal mechanisms. No other commodity has had such an impact on national and international security (see Colgan, 2013). Many theories exist on the mechanism of the relationship between natural resources such as oil and civil war. Collier and Hoeffler (2004) argue that wealth in primary commodities increases the likelihood of civil war onset by providing opportunity and the related motive of “greed” for armed rebel activity, rather than by spurring conflict-promoting “grievance”. However, these propositions have been further developed, extended and modified in the literature such that generally, natural resources may promote violence through either motive or opportunity as well as through indirect mechanisms such as detrimental impact on institutions and socio-economic development.

Consequently, Humphreys (2005) has proposed six possible causal mechanisms (and several subtypes) for civil war onset. These are: (a) The “grievance” transmission channel (“the grievance hypothesis”), which suggests that perceived deprivation of producing regions and social groups or indirect negative economic consequences of resource wealth, such as the “Dutch disease”, price shocks or uneven distribution of revenues, create “grievances” and trigger violent uprising, especially secessionism in natural resource producing regions; (b) The “greedy rebels” mechanism, which is in line with Collier and Hoeffler’s (2004) argument, suggests that the booty character of natural resources motivates rebels to take up arms and/or continue fighting; (c) A variant of this claim suggests that “greedy outsiders” might be ready to intervene militarily either directly or through support for internal warring factions in order to gain or maintain control over lucrative resources; (d) Based on opportunity, the “feasibility mechanism” refers to natural resources providing the financial means for rebellion; (e) The “weak state” mechanism draws on the harmful effects of resource abundance on the quality of state institutions (corruption, clientelism), which in turn makes internal violent conflict more likely (see Ross, 2006; Fearon, 2005; Fearon and Laitin, 2003); and (f) The “sparse network mechanism” argues that rentier economies have a one-sided integration in the world economy and, hence, cannot develop these “thick” terms of exchange which have been identified as conducive to peace and stability (Humphreys, 2005).

As Basedau and Lay (2009) note, these mechanisms involve numerous contextual conditions, particularly resource-specific conditions (Ross, 2008). For example, the resource type matters hence oil curse may be different from the diamond or copper curse. In particular, the literature has emphasized the relevance of the characteristics of the available resource. It has been argued that “lootability” (“looting” mechanism) makes a difference with respect to the feasibility of rebellion. The exploitation of “distant” and “diffuse” resources such as alluvial diamonds, timber or drugs can hardly be controlled by the central government, hence, rebels can “loot” them more easily than off-shore oil production or deep shaft gems, which in addition require sophisticated technical know-how. Such “point” resources are more likely to trigger secessionist uprisings (“separatist” incentive mechanism) (Collier and Hoeffler, 2002) if

concentrated in certain, presumably peripheral regions (“point” and “distant”) or power struggles over the control of the central state (see Basedau and Lay, 2009).

Fjelde (2009) argues that, contrary to received wisdom, political corruption is not necessarily associated with a higher risk of civil war in oil-rich states. Political corruption can be used to accommodate opposition and placate restive groups by offering private privilege in exchange for political loyalty. Since oil wealth is associated with large rents accruing in state treasuries, it provides an economic foundation for such clientelist rule. The author argues that oil-rich governments can use political corruption to buy support from key segments of society, effectively outspending other entrepreneurs of violence. But this “co-optation argument” tells one of several plausible stories of how oil-wealthy states are able to resist challenges to their regimes. An alternative account holds that oil revenue finances strong military apparatuses that allow regimes to repress dissent (Ross, 2001). Some empirical findings suggest the need for a more nuanced understanding of the relationship between natural resource wealth, governance and armed conflict. Political corruption has prolonged poverty and bred economic and political inequality in many oil-rich states, but it has also helped cement powerful alliances with a stake in the continuation of the corrupt regimes².

Evidence shows that concerns that some natural resources - including oil - may fuel internal armed conflicts arise from looking at oil-rich countries, such as Angola, Colombia, Iraq, Sudan, and Indonesia. A number of influential papers, including Collier and Hoeffler (1998, 2004) and Reno (1999) have investigated the relationship between natural resources and conflict, sparking considerable interest among social scientists and policy makers. Recent contributions to the literature on the effects of natural resources on conflicts include Ross (2004, 2006), Humphreys (2005), Garfinkel and Skaperdas (2007), Besley and Persson (2009), Acemoglu et al. (2010), Blattman and Miguel (2010), Miguel and Satyanath (2011), Caselli et al. (2013), Cotet and Tsui (2013), Lei and Michaels (2013), Koubi, et al (2013), and Wegenast (2013). Thus, surveys of the developing literature on the topic, tend to conclude that there is evidence linking oil to some instances of internal armed conflict. However, not all oil-rich countries experience internal armed conflict, hence these conflicts are clearly not inevitable. For example, Caselli and Michaels (2009) find no evidence of armed conflict in the U.S. South and in Brazil.

Lei and Michaels (2013) examine the effects of giant oilfield discoveries around the world since 1946 and find that they increase the incidence of internal armed conflict by about 5-8 percentage points. This increased incidence of conflict due to giant oilfield discoveries is especially high for countries that had already experienced armed conflicts or coups in the decade prior to discovery.

² For a summary of the different channels through which natural resources may influence countries’ risk of experiencing internal conflict see Collier and Hoeffler (2012); for a more general discussion of the natural resources and conflict linkage see Koubi et al. (2013) and Cotet and Tsui (2013).

The 'oil curse' has been questioned by a number of studies that find less significant – or even positive – results. According to Hegre and Sambanis (2006), only oil exports (and not the production of oil or the production and export of other resources) are marginally linked robustly to low-key armed conflict, but not to civil war. Also, Cotet and Tsui (2013) show that controlling for country fixed effects removes the statistical association between oil reserves and civil war in a sample of more than 100 countries over the period 1930-2003. In addition, other studies argue that the effects of oil on civil war are conditional, including oil abundance versus dependence (Basedau and Lay, 2009), governance of the oil sector, the location and mode of production as well as production type and many other factors (see also Humphreys, 2005). It is argued that since conditions of oil endowment and production differ across countries, explaining why some oil-producing and/or -exporting countries lapse into violence while some do not. Fjelde (2009) finds that the interaction of high levels of corruption and appropriable oil wealth reduces the conflict probabilities of a country, by offsetting the destabilizing effect of oil production.

According to Basedau and Lay (2009), oil dependence increases the risk of civil war onset, creating a U-shaped relationship (see also Ross, 2012: 153), whereas high levels of abundance – measured in per capita resource revenues – are seemingly used to buy peace through large-scale distribution and/or the establishment of a huge and effective security apparatus. It has also found that (though only significant at the 10% level) 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. A number of other studies supports the idea that ethnic exclusion in oil production forms a particularly risky combination (see Wegenast and Basedau, 2013), specifically for the onset of secessionist conflict (Sorens, 2011) (see also Basedau and Richter, 2013).

Grievances over the distribution of oil revenues and any negative side effects – such as environmental damage – aligned along ethnic or other identity lines facilitate mobilization and provide significant incentives for uprising as witnessed in the Niger Delta of Nigeria. In fact, as both ethnic identities and grievances can ease the collective and coordination problems that rebels face. The ethnological fractionalization of a country, including ethnicity, religion, and language can be important determinants of civil war. Ethnic and other societal divisions, for example, are known to be correlated with civil conflict (see e.g., Collier and Hoeffler, 2004; Ross, 2004; Montalvo and Reynal-Querol, 2005; Fearon, 2005; Lujala, Gleditsch and Gilmore, 2005; Humphreys, 2005). Barro (1999) opines that the more heterogeneous a country, the more difficult is it to sustain democracy. Besides the impact of single religions, the religious composition of a country might also play a role. According to Przeworski et al (2000), in religious heterogeneous countries political systems are less stable. Indeed, ethnic fragmentation is shown to affect political regimes (see, for example, La Porta et al., 1999). Riding on the lack of cultural and ethnic cohesion, elites in heterogeneous societies are likely to maintain their political power and to avoid institutional reforms (Alesina et al., 2003; Aghion et al., 2004). Other authors focus on the decision of the dominant ethnic group to exploit or not the other groups in terms of the proceeds from extraction of natural resources. Mobilization depends on the availability of collective identities, shared motivations, and opportunities for collective action.

Thus, three key mechanisms have been posited on why and how societal fractionalization motivates civil wars: grievance, informational advantages, and technology of exploitation. First, it is hypothesized that because of the kind of entrenched, built-in support rebels can find within ethnic, religious, or language groups, large-scale civil wars will tend to develop in socially fractionalized societies (Bodea and Elbadawi, 2007). Socioeconomic grievance or political grievance can contribute to the articulation of group shared motivations and collective action. It is suggested therefore that socially fractionalized societies are likely to harbor grievances against the ruling elites and, in such societies, there are more opportunities for would-be rebel leaders to emerge or manipulate a larger number of aggrieved communities. Indeed, a key source of objective grievance is social cohesion. Ethnic, religious and linguistic diversity within organizations tends to reduce their ability to function. A newly formed rebel army may be in particular need of social cohesion, constraining recruitment to a single ethnic, religious or linguistic group. A diverse society might in this case reduce the opportunity for rebellion by limiting the recruitment pool. However, ethnic, religious and linguistic hatreds (inter-group hatreds) are widely perceived as a cause of civil conflict. Such hatreds occur in many African societies that are multi-ethnic, multi-religious and multi-linguistic hence our proxies measure various dimensions of diversity.

Second, Fearon and Laitin (2003) posit an information mechanism instead of the grievance explanation of the effect of fractionalization on civil war: Rebel groups take advantage of “local knowledge” and dense social networks in ethnic groups to credibly enforce punishment for denunciation (p. 80). Third, Caselli and Coleman (2006) argue that if countries are ethnically heterogeneous, coalitions can be formed along ethnic lines, where ethnic identity (particularly visible, unalterable identifiers like skin color or height) can be used as a marker to recognize potential infiltrators. By lowering the cost of enforcing membership in the winning coalition, ethnic diversity makes it less susceptible to ex-post infiltration by members of the losing party. Therefore, a “strong” ethnic group finds it more profitable to bid for a country’s resources in an ethnically heterogeneous country. It is argued then that we should observe more conflict over resources in ethnically heterogeneous societies. Thus, even if the grievance-based mechanism or, instead, the ones posited by Fearon and Laitin apply, one should still expect fractionalization to increase the chance of civil wars. While rebel groups in civil wars do not need a very large number of members as support basis (Fearon and Laitin, 2003), they still need a level of support that would make them transcend the status of a terrorist network, or of an unorganized mob.

The nature of fractionalization determines the scope for losers to ‘mimic’ the winners and infiltrate the winning coalition—thereby eroding the benefit of coalition membership (Brunnschweiler and Bulte, 2009). For example, it is most difficult to mimic winners when coalition membership is along ethnic lines since changing features associated with physical appearances is often not feasible. This agrees with the primordialist theory, which argues that ethnicity is unchanging and a direct cause of ethnic conflict by means of “ancient hatreds” (see Blimes, 2006) though the instrumentalist theory argues that ethnicity is merely a tool that an individual or group uses to achieve an end. It is also posited that ethnicity contributes to increased mobilization through the creation of social ties and institutions, which increase the ability to overcome collective action problems. Thus, the ties created by ethnic groups can

provide natural cleavages on which society can fracture under stress. On the other hand, while a schism along religious lines may be equally salient and insurmountable as one along racial lines, hiding one's religious denomination can be relatively easy, and history provides important examples of this phenomenon in many parts of the world. Also, while overcoming linguistic barriers is harder, parents can encourage their offspring to adopt the winning coalition's language (Brunnschweiler and Bulte, 2009).

Employing logit and various alternative models for pooled time-series cross-sectional data, Luengo-Cabrera (2013) shows that various societal fractionalization indicators are robustly linked to a substantially increased risk of civil war incidence in oil-abundant African countries. Thus, while some earlier papers report a positive association between fractionalization and the onset of civil war, some more recent literature suggests this effect is much less robust (e.g. Fearon and Laitin, 2003; Hegre and Sambanis, 2006). Ellingsen's (2000) analysis provides interesting details to the "diversity is dangerous" argument. One consistent finding from the study is that while large-sized minorities do not correlate with civil war, medium-sized ones do—regardless of whether they are ethnic, linguistic, or religious minorities. Moreover, she finds two dichotomous ethnic diversity variables—several ethnic groups and many ethnic groups—to be significant and positive predictors of civil war.

Analysis has also been made as to whether engaging in conflict over future benefits (in our case, oil wealth) is worthwhile for a coalition of potential rebels. "Greed-based" theory of conflict centers around the insight that conflict only "pays" when victors can identify and exclude the losers from sharing in the spoils of the victory. However, the scope for identifying losers depends on the characteristics which distinguish the winning coalition from the rest of the population. To capture this idea, we use three measures of fractionalization - ethnic, religious and linguistic fractionalization - advanced by Alesina *et al.* (2003). As in Alesina *et al.* (2003), fractionalization is believed to reduce the provision of public goods. Montalvo and Reynal-Querol (2003) show that social polarization, measured by ethnic and religious polarization, is the appropriate measure to capture the potential social conflict from social cleavages, rather than the fractionalization measure. Apart from oil wealth, other variables have been identified in the literature for influencing civil war incidence. Hegre and Sambanis (2006) have empirically identified non-resource-related conditions such as income level and growth, population size, and rough terrain as robust correlates of civil war.

The "modernization theory" posits that increases in income reduce the intensity of conflict over the distribution of income, and thereby give way to democratic institutions that discourage expropriation and support redistributive fiscal policies under the rule of law (e.g. Benhabib and Rustichini, 1996; Benhabib and Przeworski, 2006). This is akin to the "Lipset hypothesis". A common view since Lipset's (1959) research is that prosperity stimulates democracy and prevents civil wars; this idea is often called the Lipset hypothesis. Lipset credits the idea to Aristotle: "From Aristotle down to the present, men have argued that only in a wealthy society in which relatively few citizens lived in real poverty could a situation exist in which the mass of the population could intelligently participate in politics and could develop the self-restraint necessary to avoid succumbing to the appeals of irresponsible demagogues" (p. 75). The cross-

country evidence examined in many studies confirms that the Lipset/Aristotle hypothesis is a strong empirical regularity.

Thus, Fearon and Laitin (2003) argue that per capita income is a proxy for the state's overall financial, administrative, police and military capabilities. When a government is weak, rebels can expect a higher probability of success. In addition, a low level of income per capita reduces the opportunity cost of engaging in a civil war.

One of the most widely-recognized causes of civil war is population size or the presence of more people in a state. Population size is another factor in the explanation of civil wars. Collier and Hoeffler (1998) consider population size as an additional proxy for the benefits of a rebellion because it measures potential labor income taxation. In the same vein, Fearon and Laitin (2003) argue that a large population implies difficulties controlling events at the local levels, which increases the number of potential rebels that can be recruited by the insurgents. The log of a given state's population has been found to be a significant and positive predictor of civil war by many studies (Sambanis, 2001; Anyanwu, 2002; Collier and Hoeffler, 2002, 2004; Elbadawi and Sambanis, 2002; Fearon and Laitin, 2003; Miguel, Satyanath, and Sergenti, 2004; Reynal-Quero, 2004; Fearon, 2005; Jusu, 2005; Lujala, Petter Gleditsch, and Gilmore, 2005; Blimes, 2006; Ross, 2006). However, a handful of studies have failed to find a significant relationship between population and civil war (Reynal-Querol, 2002; de Soysa, 2002; while Hendrix and Glaser (2007) find a marginal ($p < .1$) negative relationship (Hendrix and Glaser, 2007).

According to Lipset (1959), the British rule during the colonial time provided crucial learning experience for subsequent democracy and less civil conflict. Similar positive impact has been argued by Przeworski et al (2000). This is because the British introduced reforms that facilitated the way towards democracy, including bureaucratic structures or the rule of law (Rueschemeyer et al, 1992; Iqbal, 2012). In a number of papers Shleifer with his co-authors has argued that legal origins have an impact on institutions and therefore on outcomes (Glaeser and Shleifer, 2002). Legal origins affect judicial independence and this has an effect on the protection of property rights; legal origins influence the regulation of entry and this affect corruption (Djankov *et al.*, 2002); the quality of government and political rights impinge on the legal origins (La Porta *et al.*, 1999).

Mountains are a dimension of opportunity because this terrain could provide a safe haven for rebels. Consequently, many studies have examined the relationship of terrain and internal location to the probability of civil war. The presence of mountainous terrain (typically measured as the logged percentage of a state's territory) is found to positively and significantly affect civil war. A negative and significant coefficient for mountains was found in Buhaug and Rød (2006) model of territorial (separatist) conflicts; however, unlike most studies, this one addressed whether the conflicts were actually occurring in the mountainous areas rather than in states that happened to have many mountains. Fearon and Laitin (2003, 85) find mountainous countries to have a higher risk of war than other countries (because they provide rebels with natural sanctuaries), but Collier and Hoeffler (2004) and Sambanis (2004) do not find this result.

Most of the literature considers the effects of democracy. Democracy is usually found to be either insignificant or positively associated with civil war. In principle, political rights and civil liberties should reduce the risk of armed conflict because they attenuate discrimination and repression. Elbadawi and Sambanis (2002), use an empirical analysis of civil war prevalence to show that the prevalence or amount of war observed at any given time is important. Civil war prevalence is defined as the probability of observing either a new war onset or the continuation of an ongoing war or both. Two economic theories of war onset and duration are combined to estimate the prevalence of civil war across more than 150 countries and over 40 years. The analysis is consistent with the findings of earlier studies on war onset and duration. They find that democracy, ethnic diversity and previous coup attempts are significant determinants of civil war prevalence. While the correlation between regime type and civil war is still open to question, the results for the square of regime type are remarkably consistent. Extreme democracy and extreme autocracy both reduce the risk of civil war, while anocracy increases it. In particular, as democracies became more inclusive, the risk of ethnic civil war declined, whereas autocracies that became more inclusive saw their risk rise. Thus, intermediate regimes are far more dangerous than extreme (non-inclusive) autocracy or extreme (inclusive) democracy.

State weakness in the form of political instability and mixed political regime precipitates the risk of conflict in countries rich in oil and diamonds (Bodea, 2012) hence political instability such as coup d'état affects the incidence of civil wars. Interethnic coup attempts have emerged as the dominant type of coups in postcolonial Africa such that the spread of the technology of the coup d'état and the militarization of political bargaining had transformed the dynamics of elite accommodation and ethnic power sharing in the continent. As Roessler (2011) had stated, the shadow of such coup d'état and the militarization of elite accommodation undermine ethnic power sharing and give rise to a commitment problem that rulers seek to resolve through a strategy of ethnic exclusion, but at the cost of forfeiting societal control and risking civil war. In essence, the principal downside of exclusion after coups, especially when it is carried out along ethnic lines, is that it tends to facilitate insurgency formation, while compromising the regime's counterinsurgency capabilities, leaving the regime vulnerable to a future civil war. Bodea (2012), using data from 1946–2003, finds that past coup d'état positively and significantly affects civil war.

III. THE MODEL AND DATA

3.1 The Model

Based on the above review, the relationship that we want to estimate can be written as:

$$CivilWar_{it} = \alpha_i + \beta_1 \log(Oilwealth_{it}) + \beta_2 \log(F_{ij}) + \beta_3 \log(X_{it}) + \lambda_r + \pi_t + \varepsilon_{it}$$

(i = 1, ..., N; t = 1, ..., T),.....(1)

where $CivilWar_{it}$ is civil war incidence dummy (1 if war, 0 otherwise) in country i in year t . One of the main variables of interest is $Oilwealth_{it}$, (the log of) the value oil wealth per capita. The parameter β_1 measures the causal effect (also a semi-elasticity) of oil wealth per capita on civil war incidence. The other variables of interest are represented by F_{ij} , which are the relevant fractionalization indices ($j = \text{ethnic, religious, and linguistic}$). All other potential covariates are included in the vector X_{it} . The vector of country characteristics X_{it} includes per capita GDP, population, mountainous area, a dummy for British legal origin, economic growth, democracy, and number of coup d'état attempts. In addition, λ_r denotes key regional fixed effects and π_t time (year) fixed effects while ε_{it} is an error term capturing all other omitted factors, with $E(\varepsilon_{it}) = 0$ for all i and t . Finally, we include the previous incidence of civil war to take into account temporal dependence between the observations. Indeed, a number of studies indicate that civil war incidence is deeply affected by past war incidence hence the use of lagged civil war incidence as an additional control in estimations.

Because of the nature of the data, the econometric specification should accommodate a discrete variable with the panel data structure. For this purpose, a reasonable choice is the logistic model.

Existing macro-level studies of the oil-fuels-war hypothesis establish a cross-country correlation between oil dependence (measured by flow variables such as share of fuel exports in a country's GDP, oil production rate or oil rent per capita) and onset of civil war, but do not typically control for factors that simultaneously affect both variables. Thus, concerns have been raised that the endogeneity of the rate of oil extraction can bias the studies based on simple pooled OLS estimation in any direction. First, unfavorable institution can reduce extraction rates (Bohn and Deacon, 2000), and such unfavorable institution may be more prone to civil conflict. In addition, there is a concern of reverse causality because armed conflict could directly damage oil production process. These omitted variable and endogeneity problems tend to bias the oil impact on conflict downward. However, the "tragedy of commons" suggests that countries with incomplete property rights are likely to overuse resource stocks. In addition, when leaders over-extract relative to the efficient extraction path in a politically unstable environment because they heavily discount the future (Robinson, Torvik, and Verdier, 2006), simple pooled OLS estimates can also exaggerate the effect of oil on political violence.

However, following Cotet and Tsui (2013), we note that, as a stock variable, oil reserves are less likely to be subject to this endogeneity bias. In particular, oil wealth, being the capital value of future oil rents, is better proxied by oil reserves than by oil production, since the production profile of each oilfield follows an inverted U-shaped pattern over time because of geological constraints. Also, production rate understates the oil wealth of the swing producers who produce below their full capacity.

We investigate the causal effect of oil abundance (instead of oil dependence) on country-level civil war incidence by using the data set used by Cotet and Tsui (2013). In the dataset, the long panel of oil abundance (over the 1950-2008 period for African countries) based on industrial data, oil abundance is measured by the stock of oil reserves instead of other flow measures. We

take care of possible endogeneity problem by including region and time effects (year and decades) as well as using IV-2SLS estimations. Also, as in Cotet and Tsui (2013), to account for the possible endogeneity of oil to civil conflict, we employed instrumental variables analysis, using log of lagged oil reserves per capita, log of out-of-region natural disaster, and their product as the instruments.

3.2 The Data

This paper uses data on oil reserves to provide new evidence of the effect of oil abundance, ethno-religious-linguistic fractionalization on civil war incidence in African countries. In particular, we re-examine the oil-fuels-war hypothesis and diversity-war hypothesis using a unique industrial dataset describing oil reserves. Fractionalization data are from Alesina *et al.* (2003), who sought to distinguish between ethnic, religious and linguistic heterogeneity. Although language is one of the criteria ethnologists and anthropologists use to define ethnicity in some areas of the world (e.g. Africa), and therefore inevitably enters any ethnic fractionalization measure, the authors improve on other fractionalization variables by explicitly distinguishing the language component in a separate measure. According to Alesina *et al.* (2003, p.160), “It would be wrong to interpret our ethnicity variable as reflecting racial characteristics alone, but it does reflect these characteristics to a greater extent than our language variable, and it should thus be expected to bear a different relationship to economic variables”. The correlation between the language and ethnic fractionalization variables is obviously significant, but the correlation coefficient of 0.72 also suggests that the ethnic fractionalization measure picks up additional information.

The data set is taken from Cotet and Tsui (2013) (see Appendix Table 1 for details of the data, data sources and country list). The descriptive statistics are presented in Table 2. It reports the sample mean, median and standard deviation of the variables used in the estimations.

Figure 8 shows a statistically significant negative association between average oil wealth and war prevalence over the period, 1950 to 2008. This indicates that oil rich countries are more likely to experience civil war. The slope of the regression line from the simple plot is 0.431, suggesting that a reserve of one billion barrel of oil will make a country 43 percentage points more likely to have a civil war than one with no oil.

On the other hand, Figures 9 to 11 show positive association between ethnic fractionalization, religious fractionalization, and linguistic fractionalization on one hand and war prevalence on the other over the period, 1950 to 2008. Note however, that the positive association between religious fractionalization and civil war incidence is rather poor.

Figure 9: Ethnic Fractionalization and War Incidence in African Countries, 1950-2008.

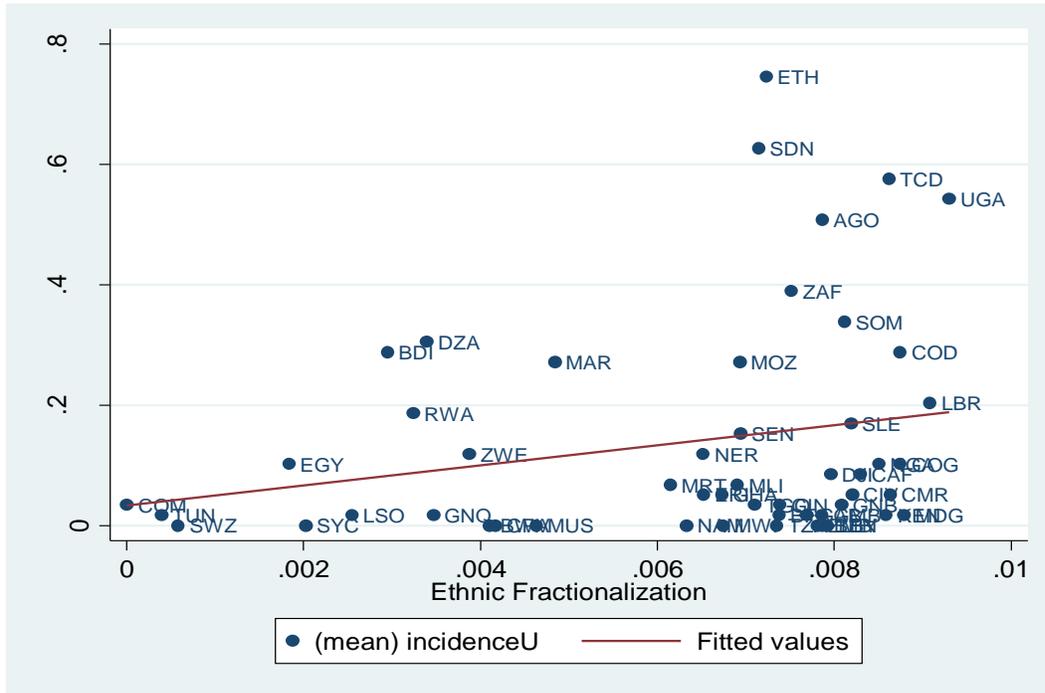


Figure 10: Religious Fractionalization and War Incidence in African Countries, 1950-2008.

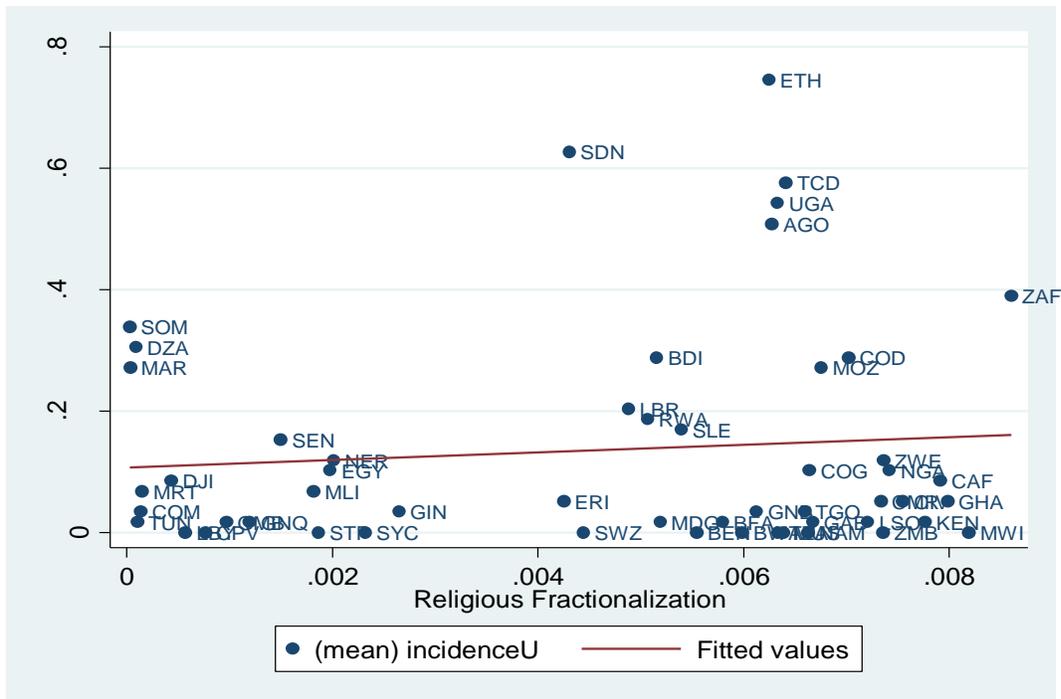
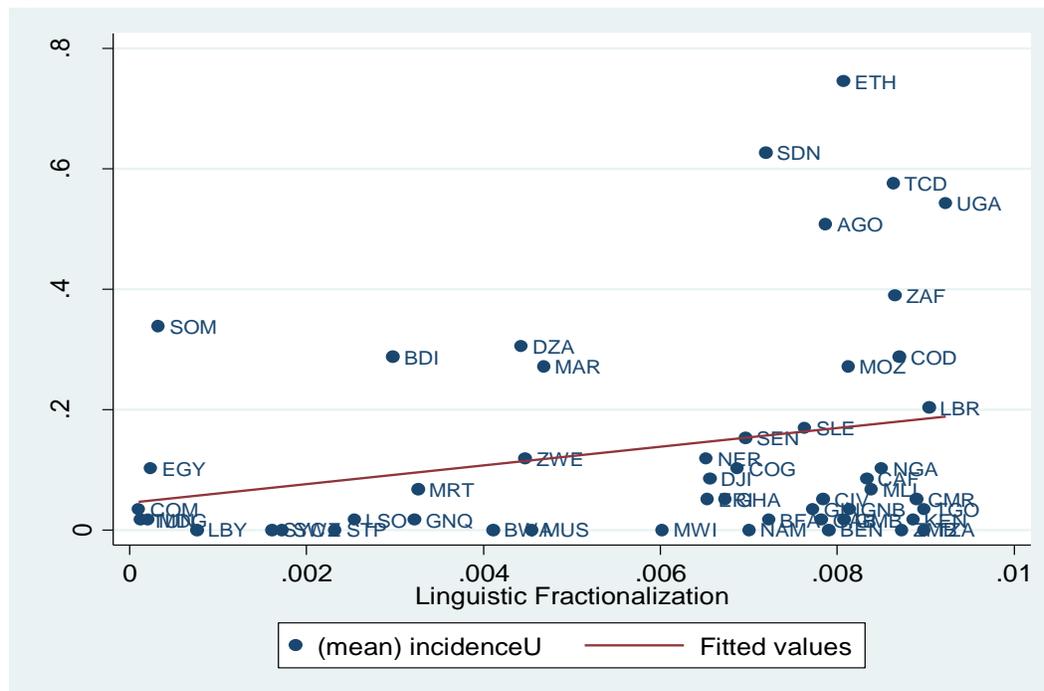


Figure 11: Linguistic Fractionalization and War Incidence in African Countries, 1950-2008.



IV. EMPIRICAL RESULTS

4.1 Baseline Results and Some Robustness Checks

Our primary dependent variable is civil war incidence. Table 3 reports our results with alternative estimation strategies (logit, probit, and pooled OLS) with oil wealth, ethnic fractionalization, religious fractionalization, and linguistic fractionalization without other control variables and region and time fixed effects. In all cases, we compute p-values (in parenthesis) using robust standard errors adjusted for clustering at the country level. Throughout, oil wealth, ethnic fractionalization, religious fractionalization, and linguistic fractionalization are significant. In all specifications, the oil wealth coefficient is positive and highly significant, suggesting that more oil wealth is associated with more civil war incidence. Ethnic fractionalization has positive coefficient and is highly significant. Also, linguistic fractionalization has positive coefficient and is highly significant. On the other hand, the coefficient associated with religious fractionalization is negative and is also highly significant. The sizes of the estimated long-term impacts of oil wealth and fractionalization indices on civil war incidence are broadly consistent with those suggested by Figures 8 to 12.

Table 4 reports our baseline results also with alternative estimation strategies (logit, probit, a pooled cross-sectional and time-series and IV-2SLS estimations), including region and time effects. Again, we allow for robust standard errors to be clustered at the country level, in the goal of addressing omitted variable bias and unobserved heterogeneity. The IV-2SLS results pass the relevant tests. Again, throughout, oil wealth, ethnic fractionalization, religious fractionalization, and linguistic fractionalization are significant. The coefficients for oil wealth,

ethnic fractionalization and linguistic fractionalization are positive and significant, while the coefficient for religious fractionalization is negative and significant. Thus, our findings show that oil abundant, ethnically and linguistically fractionalized and less religiously fractionalized states are more likely to experience civil war incidence.

Table 3: Oil Wealth, Ethno-Religious-Linguistic Fractionalization and War Incidence in Africa, 1950-2008

Variable	Logit (UCDP/PRIO) (1)	Probit (UCDP/PRIO) (2)	Pooled OLS (UCDP/PRIO) (3)	Logit (Updated Fearon-Laitin) (4)	Probit (Updated Fearon-Laitin) (5)	Pooled OLS (Updated Fearon- Laitin) (6)
Log (oil wealth per capita)	3.038 (6.53***)	1.701 (6.42***)	0.391 (5.78***)	2.968 (6.30***)	1.616 (6.07***)	0.374 (5.48***)
Log (Ethnic fractionalization)	0.665 (4.15***)	0.327 (4.43***)	0.042 (4.72***)	0.982 (5.00***)	0.460 (5.26***)	0.052 (5.63***)
Log (Religious fractionalization)	-0.190 (-4.59***)	-0.100 (-4.40***)	-0.020 (-3.61***)	-0.244 (-6.14***)	-0.130 (-5.97***)	-0.025 (-4.49***)
Log (Language fractionalization)	0.214 (2.73**)	0.109 (2.70**)	0.023 (3.36***)	0.245 (3.45***)	0.137 (3.70***)	0.025 (3.76***)
Constant	1.770 (2.41**)	0.693 (2.08**)	0.398 (9.34***)	3.171 (3.70***)	1.309 (3.47***)	0.426 (10.57***)
Region Fixed Effects	No	No	No	No	No	No
Year Fixed Effects	No	No	No	No	No	No
Wald chi2/R-squared	84.90/0.0485	90.39/0.0488	0.0420	94.69/0.0615	105.85/0.0617	0.0420
Log likelihood	-952.04	-951.75		-935.47	-935.31	
Prob > F	0.0000	0.0000	0.000	0.0000	0.0000	0.000
N	2585	2585	2585	2585	2585	2585

Source: Author's calculations.

Note: *** 1% significant level; ** 5% significant level; * 10% significant level.

Consistent with most previous results, we find that more oil wealth is statistically associated with more civil war incidence when we estimate the relationship both in logit, probit, a pooled cross-sectional and time-series and IV-2SLS settings. The estimates of the oil wealth coefficients in the pooled OLS (columns 3 and 6), for example, range from 0.290 to 0.391. Thus, point estimate of semi-elasticity of 0.290 (column 6) implies that a 1 standard deviation increase in oil wealth per capita (approximately 10 log points) corresponds to an increase in the annual probability of civil war incidence of 0.031 (0.290×0.107), with an implied elasticity of 2.2 (evaluated at the mean of the war incidence variable, 0.133).

In the same vein, for ethnic fractionalization, the point estimate of semi-elasticity of 0.027 corresponds to an increase in the annual probability of civil war incidence of 0.042 (0.027×0.638), with an implied elasticity of 0.004. For religious fractionalization, the point estimate of semi-elasticity of -0.033 corresponds to a decrease in the annual probability of civil war incidence of 0.049 ($-0.033 \times 0.1.477$), with an implied elasticity of -0.004. Also, for language fractionalization, the point estimate of semi-elasticity of 0.034 corresponds to an increase in the annual probability of civil war incidence of 0.04 (0.034×1.163), with an implied elasticity of 0.005.

Therefore, we find that the presence of natural resources (proxied by the value of per capita oil reserves) seems to provide easily “lootable” assets for “loot-seeking” rebels or convenient sources of support of “justice-seeking” movements as espoused by Collier. As ethnic

fractionalization and linguistic fractionalization significantly increase the risk of civil war incidence, these forms of social cohesion help rebel effectiveness hence they makes a society substantially less safe.

Table 4: Oil Wealth, Ethno-Religious-Linguistic Fractionalization and War Incidence (UCDP/PRIO Data) in Africa, 1950-2008

Variable	Logit (1)	Probit (2)	Pooled OLS (3)	IV-2SLS (4)
Log (oil wealth per capita)	2.344 (2.52**)	1.190 (2.43**)	0.290 (2.74**)	0.364 (3.12***)
Log (Ethnic fractionalization)	0.384 (1.84*)	0.177 (1.66*)	0.027 (1.77*)	0.036 (1.65*)
Log (Religious fractionalization)	-0.313 (3.90***)	-0.179 (-4.42***)	-0.033 (-4.44***)	-0.36 (-4.19***)
Log (Language fractionalization)	0.241 (2.57**)	0.148 (3.03***)	0.034 (3.50***)	0.031 (2.61**)
Log (GDP per capita)	-53.011 (-2.80**)	-23.887 (-2.38**)	-3.001 (-1.95**)	-2.775 (-1.41)
Log (population)	30.807 (3.11***)	20.256 (3.95***)	2.746 (2.79**)	2.699 (2.40**)
Log (mountainous)	12.076 (5.70***)	6.435 (6.30***)	1.120 (7.09***)	1.159 (5.42***)
British legal origin	-17.921 (-0.96)	-13.749 (-1.40)	-1.306 (-0.67)	-0.175 (-0.08)
Log (Economic Growth)	-68.340 (-2.07**)	-17.749 (-1.40)	-1.702 (-1.13)	-1.245 (-0.74)
X_Democracy	-30.761 (-2.12**)	-30.590 (-1.78*)	-5.571 (-1.47)	-11.727 (-3.23***)
Coup d'état	0.573 (3.92***)	0.336 (3.96***)	0.079 (3.42***)	0.085 (3.81***)
Lag of war incidence	-0.315 (-1.56)	-0.160 (-1.47)	-0.035 (-1.56)	-0.055 (-2.13**)
Constant	71.756 (2.15**)	39.755 (2.27**)	4.045 (1.16)	3.226 (0.83)
Region Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Wald chi2/R-squared	233.44/0.1896	255.63/0.1886	0.1421	268.60/0.1705
Log likelihood	-616.51	-617.24		
Prob > F	0.000	0.0000	0.0000	0.0000
N	1778	1778	1830	1312
F-Statistics of excluded instruments				5630.96
P-value				0.0000
Sargan test				5.9149 (p=0.5497)
Basmann test				5.5929 (p=0.5880)
Durbin test				0.5569 (p=0.4555)
Wu-Hausman test				0.5270 (p=0.4680)

Source: Author's calculations.

Note: *** 1% significant level; ** 5% significant level; * 10% significant level.

These results seem to accord with the reality in Africa, which is characterized by high degree of ethnic and linguistic fractionalization. In addition, as religious fractionalization significantly reduces the risk of civil war incidence, it means that religious fractionalization detracts from rebel effectiveness hence religious fractionalization makes a society substantially safer. Thus,

we conclude that oil abundant, ethnically and linguistically fractionalized and less religious fractured states are more likely to experience civil war incidence.

Focusing on the logit results, we also find important results for other control variables. Other coefficients seem to be plausibly estimated and are consistent with previous findings. We find that, for example, both the level of per capita income and economic growth are negatively and significantly related to civil war incidence in Africa. Thus, economic development and higher economic growth significantly reduces civil war incidence in the continent.

Population does have a systematic positive effect on civil war incidence. The estimated coefficient on the log of population is positive and highly significant in all the estimations. Thus, there is strong indication that larger (more populous) countries are more likely experience civil war incidence.

Mountainous terrain is also a variable that has been argued to increase the feasibility of mobilizing efficient insurgency groups (Fearon and Laitin, 2003). The variable is, as anticipated, positively associated with the incidence of civil war across all models, and highly significant.

Democracy is clearly significant and negatively associated with civil war incidence in Africa. This supports the findings of Elbadawi and Sambanis, Ellingsen et al, and Anyanwu (2002) but contradicts the findings of Collier and Hoeffler (2004). In our results, democracy is shown to be an important explanatory variable, and gives strength to a more traditional “grievance-based” and liberal peace-rooted explanation of civil war.

Our evidence shows that countries that have a history of attempted coups will be more likely to see rebel movements evolve into large-scale civil wars. That is, attempted coups and the resulting inefficient use of military resources make it both more likely for insurgents to rebel and for the government to have an inadequate response.

Having British legal origin or colonial heritage does not seem to affect civil war incidence in Africa. As in Fearon and Laitin (2003), recent incidence of civil war seems to reduce the likelihood of a new incidence of civil war in the same country, but the coefficients are not significant.

4.2 Further Robustness Tests, Extensions and Variations

We analyze some extensions and variations to examine the robustness of the baseline. We study (a) the effects of oil wealth, ethnic fractionalization and religious fractionalization but without linguistic fractionalization; (b) an alternative measure of civil war incidence— an update of Fearon and Laitin (2003) definition; (c) alternative measures of societal fractionalization (ethnic polarization (ETHPOL_reynal), ethnic fractionalization (ETHFRAC_reynal), religious polarization (RELPOL_reynal) and religious fractionalization (RELFAC_reynal) from Montalvo and Reynal-Querol, 2005)); and (d) alternative measure of democracy.

Table 5 summarizes our results of estimating the effects of oil wealth, ethnic fractionalization and religious fractionalization but without linguistic fractionalization; using an alternative measure of civil war incidence (an update of Fearon and Laitin, 2003 definition), and using alternative measures of societal fractionalization from Montalvo and Reynal-Querol, 2005.

Table 5: Logit Estimation of Oil Wealth, Ethno-Religious Fractionalization/Polarization and War Incidence in Africa, 1950-2008

Variable	(UCDP/PRIO) (1)	(UCDP/PRIO) (2)	(UCDP/PRIO) (3)	Logit (Updated Fearon-Laitin) (4)
Log (oil wealth per capita)	2.695 (2.99***)	1.686 (1.89*)	1.499 (1.67*)	2.534 (2.71**)
Log (Ethnic fractionalization ⁺)	0.600 (3.44***)			0.392 (2.50**)
Log (Religious fractionalization ⁺)	-0.239 (-3.62***)			-0.313 (-5.72***)
Log (Ethnic fractionalization ⁺⁺)		0.883 (5.65***)		
Log (Religious fractionalization ⁺⁺)		-0.357 (-5.31***)		
Log (Ethnic polarization ⁺⁺)			0.720 (4.58***)	
Log (Religious polarization ⁺⁺)			-0.254 (-3.98***)	
Log (GDP per capita)	-59.066 (-3.18***)	-49.694 (-2.73**)	-53.621 (-2.97***)	-61.675 (-3.39***)
Log (population)	26.111 (2.67**)	33.908 (3.26***)	50.696 (5.09***)	32.327 (3.11***)
Log (mountainous)	12.253 (5.79***)	13.225 (5.30***)	10.730 (4.90***)	13.468 (5.90***)
British legal origin	-17.049 (-0.95)	-43.185 (-2.21**)	-34.777 (-1.80*)	-28.467 (-1.56)
Log (Economic Growth)	-33.015 (-2.46**)	-33.352 (-1.50**)	-34.759 (-2.61**)	-11.998 (-0.75)
X_Democracy	-0.310 (-3.42***)	-0.324 (-3.50)	-0.284 (-3.06***)	-0.316 (-3.60***)
Coup d'état	0.505 (3.42***)	0.480 (3.18***)	0.478 (3.11***)	0.080 (0.49)
Lag of war incidence	-0.355 (-1.76*)	-0.348 (-1.73*)	-0.339 (-1.70*)	-0.226 (-1.15)
Constant	76.392 (2.47**)	74.139 (2.41**)	76.075 (2.47**)	25.032 (0.68)
Region Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Wald chi2/R-squared	240.03/0.1929	226.58/0.1973	228.93/0.1923	269.64/0.1764
Log likelihood	-635.409	-617.654	-621.489	-636.156
Prob > F	0.0000	0.0000	0.000	0.0000
N	1825	1760	1760	1807

Source: Author's calculations.

Note: +: From Alesina et al (2003); ++: From Montalvo and Reynal-Querol (2005); *** 1% significant level; ** 5% significant level; * 10% significant level.

In these variations, our conclusions are unaltered. The significance of oil wealth as well as ethnic fractionalization and religious fractionalization (from both Alesina et al and Montalvo and Reynal-Querol) overwhelmingly remain. The coefficients of oil wealth and ethnic fractionalization are positive and significant while the religious fractionalization coefficient is highly significant and continues to have the ubiquitous negative sign. In addition, we find that

the ethnic polarization coefficient is positive and highly significant (consistent with Esteban et al, 2012) while that of religious polarization is negative and highly significant. Our results are robust to the choice of an alternative dependent variable. The performance of the other control variables remains unchanged.

Table 6 also presents results of further variations and robustness.

Table 6: Logit Estimation of Oil Wealth, Ethno-Religious Fractionalization/Polarization and War Incidence in Africa, 1950-2008

Variable	Logit (UCDP/PRIO) (1)	Logit (UCDP/PRIO) (2)	Logit (UCDP/PRIO) (3)	Logit (Updated Fearon-Laitin) (4)	Logit (Updated Fearon-Laitin) (5)	Logit (Updated Fearon-Laitin) (6)
Log (oil wealth per capita)	3.794 (4.41***)	2.538 (3.03***)	2.392 (2.85***)	4.432 (4.93***)	2.595 (3.00***)	2.312 (2.63**)
Log (Ethnic fractionalization ⁺)	0.539 (3.25***)			0.351 (2.29**)		
Log (Religious fractionalization ⁺)	-0.242 (-4.62***)			-0.390 (-8.64***)		
Log (Ethnic fractionalization ⁺⁺)		1.011 (6.86***)			1.163 (8.36***)	
Log (Religious fractionalization ⁺⁺)		-0.329 (-5.70***)			-0.444 (-8.62***)	
Log (Ethnic polarization ⁺⁺)			0.982 (5.82***)			1.330 (8.47***)
Log (Religious polarization ⁺⁺)			-0.196 (-3.66***)			-0.299 (-6.41***)
Log (GDP per capita)	-85.300 (-4.98***)	-64.321 (-3.90***)	-68.904 (-4.17***)	-105.208 (-6.08***)	-76.929 (-4.74***)	-84.639 (-5.30***)
Log (population)	5.284 (0.60)	7.487 (0.80)	24.729 (2.72**)	12.106 (1.29)	12.758 (1.31)	33.870 (3.44***)
Log (mountainous)	13.971 (7.21***)	16.377 (6.96***)	13.540 (6.72***)	15.038 (7.34***)	17.668 (7.62***)	14.510 (6.92***)
British legal origin	2.179 (0.13)	-26.758 (-1.47)	-12.607 (-0.69)	-3.317 (-0.19)	-39.912 (-2.15**)	-23.507 (-1.22)
Log (Economic Growth)	-31.905 (-2.69**)	-32.924 (-2.79**)	-34.546 (-2.90***)	-15.485 (-1.10)	-16.202 (-1.11)	-16.960 (-1.19)
Democracy	-4.567 (-4.07***)	-3.979 (-3.53***)	-4.735 (-4.19***)	-4.250 (-3.56***)	-3.824 (-3.15***)	-4.887 (-3.94***)
Democracy Squared	-0.402 (-4.33***)	-0.359 (-3.88***)	-0.422 (-4.51***)	-0.383 (-3.80***)	-0.354 (-3.48***)	-0.445 (-4.25***)
Coup d'état	0.613 (4.79***)	0.585 (4.50***)	0.540 (4.18***)	0.295 (2.15**)	0.303 (2.18**)	0.241 (1.73*)
Lag of war incidence	-0.366 (-1.94*)	-0.354 (-1.87*)	-0.351 (-1.86*)	-0.234 (-1.30)	-0.162 (-0.88)	-0.167 (-0.90)
Constant	66.441 (2.41**)	68.023 (2.48**)	68.102 (2.46**)	27.531 (0.85)	29.816 (0.88)	27.067 (0.82)
Region Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Wald chi2/R-squared	240.03	271.46/0.2056	254.63/0.2054	343.74/0.2152	269.64	343.13
Log likelihood	-635.409	-703.741	-703.875	-713.364	-636.156	-690.830
Prob > F	0.0000	0.0000	0.000	0.0000	0.0000	0.0000
N	1825	1844	1884	1892	1807	1828

Source: Author's calculations.

Note: +: From Alesina et al (2003); ++: From Montalvo and Reynal-Querol (2005); *** 1% significant level; ** 5% significant level; * 10% significant level.

Here, we estimate the effects of oil wealth, ethnic fractionalization and religious fractionalization but without linguistic fractionalization, using an alternative measure of civil war incidence (an update of Fearon and Laitin, 2003 definition), using alternative measures of societal fractionalization from Montalvo and Reynal-Querol, 2005, and using alternative measure of democracy, which is calculated from the Polity2 (from Polity IV) variable and normalized to take values between 0 and 1, with 1 being most democratic.

Again, our conclusions are unaltered, with the coefficients of oil wealth and ethnic fractionalization (from the two sources) are positive and significant while the religious fractionalization (from the two sources) coefficient is highly significant and continues to have the ubiquitous negative sign. Also, the ethnic polarization coefficient is positive and highly significant just as the religious polarization is negative and highly significant. Thus, both ethnic fractionalization and ethnic polarization are quantitatively important in civil war incidence in Africa. While religious fractionalization and polarization fuel terrorism, they appear to deter civil wars. As before, these results are robust to the choice of an alternative dependent variable. The sign and significance of the other control variables are also unaltered. An additional important result is the highly negative significance of both the level and quadratic terms of the democracy variable.

V. CONCLUSION AND LESSONS FOR POLICY IMPLICATIONS

This paper has investigated empirically the effects of oil wealth, ethno-religious-linguistic fractionalization on civil war incidence in Africa. In a cross-country panel data, covering 52 African countries between 1950 and 2008, we estimate the effects of oil wealth and ethno-religious-linguistic fractionalization on civil war incidence in the Continent. The paper finds a nontrivial positive association between oil wealth and civil war incidence in Africa. It confirms findings of the rentier-state theorists and scholars who arrived at the same conclusion through empirical tests. In particular, we find that oil wealth is statistically associated with a higher of civil war incidence when we estimate the relationship in a logit, probit, pooled cross-sectional and time-series and IV-2SLS settings. In addition to alternative estimation strategies, when also estimate using an alternative measure of civil war incidence, alternative measures of societal fractionalization/polarization, and alternative measure of democracy. The strong negative statistical association continues to hold. We also find that ethnically and linguistically fractionalized/polarized and less religiously fractionalized/polarized states are more likely to experience civil war incidence. Essentially, we find that oil abundant, ethnically and linguistically fractionalized/polarized, less religiously fractionalized/polarized, less democratic, coup-prone, very populated states with low GDP per capita and economic growth more likely to experience civil war incidence.

Our results also show other interesting and important results. The cross-country evidence examined in the study confirms that GDP per capita (prosperity deters civil war), economic growth, and democracy are negatively correlated with the incidence of civil war, whereas population size (propensity for civil war incidence rises with population size), mountainous

terrain, and political instability represented in attempted coup d'états are positively correlated with civil war incidence.

Our findings add to the large and controversial literature on the “natural resource curse,” which contends that richness in natural resources leads to negative economic and political outcomes. The resource curse doctrine holds that natural resource wealth is an obstacle to economic and political development that can be overcome only through well-designed resource wealth management.

These results are guideposts for policy to reduce civil war incidence in Africa. That is, these results have important implications for countries in Africa given the reality that civil wars have become the most destructive and prevalent form of conflict. The paper, therefore proffers policy recommendations along these lines and in particular to reduce the incidence of civil war in the Continent as well as promote effective peace and stability and prevent and properly manage key scenarios fuelling civil wars due to oil wealth (especially rentier, repression and corruption effects) and societal fractionalization and polarization.

How can political leaders and elites use oil wealth to avoid the political resource curse and reduce civil war incidence in Africa? Three measures proposed by van de Ploeg and Venables (2012) are relevant here. The first mechanism is to establish measures to promote high levels of transparency. This involves making the Executive Head's spending spree visible so that he/she can be held accountable for inefficient spending; and putting a check on grossly inefficient spending by making spending agencies accountable to parliament and the public. The second mechanism is to ensure that the political system has a centralized system of financial authority and control. We believe that the Ministry of Finance of each country is the best organ of government that can trade-off the competing demands of spending ministries, regional/state and local authorities, or other lobby groups. The Ministry is best placed to internalize the free rider problem associated with a common pool of government revenues.

However, as the Nigerian case has demonstrated through NEITI reports, to play this role effectively the Ministry of Finance has to have control of incoming natural resources revenues, and the political will and power to be able to resist competing demands. The third is the legislation of a ‘fiscal constitution’ (as in Chile) that imposes ceilings (and perhaps also floors) on public spending from resource revenues or public funds more generally. However, to be effective, such a fiscal constitution has to be robust to changing political and economic circumstances, while at the same time not being so rigid as to rule out extraordinary responses in extraordinary times, especially since natural resources prices (and hence revenues) are subject to wide volatility. But the issue of volatility can complementarily be obviated by the establishment of an independent Sovereign Wealth Fund (SWF) that caters for both future generations through saving and present generation through productive investments in infrastructure, institutional and human capital development.

The international community should also take measures (including appropriate sanctions) to make it more difficult for rebel organizations to sell the commodities (such as bunkered oil as

from the Niger Delta of Nigeria) that they loot. African countries need to diversify their economies away from dependence upon primary commodity exports, especially oil. Appropriate economic reforms and policies would therefore be imperative in this direction. And to make loot-seeking rebels unpopular, African governments should transparently use revenues from primary commodity exports such as oil to finance effective basic social services, including education and health.

Our results confirm prosperity and higher economic growth deter civil war. In particular, increases in GDP per capita and economic growth rate, measures of standard of living, lead to a large decrease in civil war incidence in Africa. Therefore, African countries must take measures to increase their national incomes and economic growth. To increase per capita income and its growth, African countries must deepen macroeconomic and structural reforms to increase their competitiveness, create increasing and more quality jobs and hence increase participation in economic activity, dismantle existing structural bottlenecks to private and public investment, scale-up investments in hard and soft infrastructure to enhance local production and regional integration, structurally transform the economy for increased trade competitiveness in knowledge-intensive manufacturing, and increase productivity, especially in agriculture, through creating incentives and opportunities for the private sector and increasing government support to small farm holders in terms of finance, formalization of land ownership, and technical advice. Indeed, African countries and their development partners need to take measures to accelerate economic growth given that rapid economic growth will gradually make rebel recruitment harder.

However, given that such high, sustainable and inclusive growth rates cannot be realized without external assistance, especially for poorer and new oil-rich economies, it is imperative that Africa's development partners and the international community as a whole increase aid to the Continent. This is particularly so because it has been shown that aid is effective in accelerating economic growth (Anyanwu, 2013).

Given that higher population size stimulates civil war in Africa, there is urgent need to intensify family planning services efforts and activities in African countries so as to improve knowledge, acceptance and practice (KAP) of family planning. This will involve not only increased financial outlay but also research on fertility determinants as well as decentralized planning, delivery and supervision of family planning services (Anyanwu et al, 1998a, b). Indeed, recent developments have shown that several countries in Eastern, Southern and Northern Africa are well on their way in the transition to smaller families. For example, Rwanda's increased investments in voluntary family planning and child survival have led to significantly lower fertility. Greater political commitment and increased resources for family planning and child survival have put the country on a path to making the demographic transition a reality. Unfortunately, family planning use and fertility declines in West and Central Africa (the hotbeds of conflicts in Africa and where incidentally most wars continue to rage), however, are lagging, particularly due to

underfunding and inadequately managed family planning programs (Gribble and Bremner, 2012).

As the case of some countries has demonstrated, natural-resource abundance, its discovery and profitable exploitation, is neither an automatic blessing nor an inescapable death sentence for a nation's economy and its polity. Norway is a good example of how natural-resource abundance can be a blessing when accompanied by strong public and private institutions. Norway has sound and stable institutions. For example, Norway has the fourth-highest GDP per capita in the world and ranks number one out of 168 countries in the EIU democracy index in 2012 (scoring 9.93 out of 10) —far from a curse, economic or political! A majority of the African oil giants are classified among the authoritarian regimes. The world was essentially non-democratic till 1990; for Sub-Saharan Africa it was till 1999 but North Africa has remained undemocratic. However the shift, which has been most dramatic since the early 1980s was essentially from "autocratic" to "anocratic" regimes (see Marshall. and Cole, 2011), especially in the poorer countries of Africa. Indeed, autocracies persist in most war-torn countries and in oil-producing nations. Between 1960 and 2012, the global average polity score was 0.39 compared with -2.80 for the whole of Africa, -2.39 for Sub-Saharan Africa, and -6.26 for North Africa and hence being mired in what Brumberg (2002) called "the trap in liberalized autocracy" (see also Anyanwu and Erhijakpor, 2013).

Thus, economic development must be complemented by political development and liberalization to attain an amplified effect. The pace of political reforms toward better governance and improved political rights should be accelerated in Africa given that our results have shown that democracy is a useful tool to reduce the incidence of civil war in the Continent. It is therefore imperative that African countries take measures to reduce civil wars and promote and maintain effective, stable, peaceful and democratic societies, given the reality that civil wars have become the most destructive and prevalent form of conflict in Africa. An effective rule of law is the one that protects the rights of citizens, maintains order, and limits power of government. In such a state, all citizens are equal under the law; there are no arbitrary arrest, exile, or imprisonment; no one is above the law; no government official or its agent may violate the legal and constitutional limits of government; the courts are independent in structure and in fact; the right to know the charges against one with the presumption of innocence until proven otherwise by a legitimate, independent and impartial court of law; there is right to a fair, speedy, and public trial by an impartial court; where no one may be taxed or prosecuted except by a law established in advance for that purpose; and where no one may be subjected to torture or cruel and inhumane treatment.

Democracy will thrive and be sustained and stable when there is the willingness to lose (contestation) and when there are capacities to challenge and enforce the rules of the game. Contestation means that parties are able to win but are willing to lose. In other words, opposition parties have to be able to compete effectively with incumbents, with the credible potential to hold incumbents accountable while voters and parties must be willing to lose elections. Also, laws must be effectively enforced. This means that a sturdy, thriving, durable and stable democracy requires a government with the capacity to enforce both the rules of the

game and the policies produced through those rules against violation or nullification either by abusive agents of the government itself or by private actors, whether common criminals, would-be warlords or the military.

Indeed, the rule of law is fundamental to securing African democracy. That is, democratic governance also needs the architecture of law: ministry of justice, courts, legislative scrutiny, law enforcement agencies, regulatory bodies, public defenders, police, correctional system, legal statutes, contracts, university level academic education to train lawyers, judges, and investigators, along with engagement with civil society to promote a culture of lawfulness. The presence of the rule of law is a major factor in assuring voluntary acceptance of a government's authority and therefore its legitimacy. A government's respect for preexisting and impersonal legal rules can provide the key to gaining it widespread, enduring social support. Such government respect for rules—ideally ones recorded in a constitution and in laws adopted through a credible, democratic process—is the essence of the rule of law. As such, it is a powerful potential tool for counterinsurgents and anti-democratic elements. All these call for political will on the part of politicians, elites and bureaucrats in Africa, ensuring that laws are sound and stable, that the legal interpretation and enforcement of contractual and statutory obligations are reliable, and ensuring effective collaboration of the legislature, the executive, and the judiciary (Anyanwu and Erhijakpor, 2013).

To transform to effective liberal democracies that deters civil war, large African autocracies and anocracies need to adopt deep introspection and political reform of the various institutions and political parties seeking to govern so as to promote a sustained commitment to democracy that will ensure the embrace and guarantee of equal citizenship, political pluralism, freedom, human rights, general respect for others, and socio-political cum economic inclusion. This will also ensure that public frustrations are expressed at the ballot box, in the media, and in peaceful assemblies, with the state actively responding with corrective policies rather than simply suppressing criticisms and opposition that could fuel civil wars.

Our results show that coup d'état attempts fuel civil war incidence in Africa. And as Horowitz (1985) observes, the strength of the military and its constant proximity to power accord it a kind of counterpoint status to political parties and civilian regimes in struggles for ethnic inclusion and exclusion. Consequently, the shadow of the coup d'état and the militarization of elite accommodation undermine ethnic power sharing and give rise to a commitment problem that rulers seek to resolve through a strategy of ethnic exclusion, even at the cost of forfeiting societal control and risking civil war. Thus, given the preponderance of military coups in Africa and the ethnic configuration of most African countries, there is need for the institutionalization of interethnic elite accommodation, in which elites from rival ethnic groups are co-opted into the political system (ethnic power sharing) as a means by which to federate the different ethnic groups via a coalition of their elites. Such ethnic power sharing is expected to provide a win-win solution for rulers and societal elites while safeguarding social and political peace. This should be supported by the intensification of the implementation of the institutionalization of political power and growing anti-coup measures (also a kind of "coup proofing" technique) by the African Union (AU) and international donors so as to reduce the spate of civil wars in Africa.

Appendix 1- Data and Data Sources

The data set is from Cotet and Tsui (2013), with the following sources:

War Incidence data

IncidenceU - dummy for war incidence (1 if war, 0 otherwise) (Source: UCDP/PRIO Armed Conflict dataset (UCDP/PRIO).

Fearon_war – dummy for war incidence (1 if war, 0 otherwise) (Updated of Fearon and Iaitin, 2003).

Oil Data

Log (*Oil Wealth per capita*) represents (the log of) the value of oil reserves per capita. Data sets are from the Association for the Study of Peak Oil and Gas (ASPO), BP Statistical Review of World Energy (BP), and Oil & Gas Journal (OGJ).

The ASPO dataset provides detailed information on both oil discoveries, reserves and production for 62 top oil-producing countries over the period 1930-2003 – our own sample starts from 1955 to match other variables. The BP and the OGJ data provide self-reported oil reserves data for a larger sample (we use data from 1955 to 2008), which include countries with little or no oil reserves. We use these data to identify countries with no oil in the main sample we use in our panel regressions.

Ethnic Fractionalization is computed as one minus the Herfindahl index of ethnic group shares– (Source: Alesina et al, 2003).

Religious and language fractionalizations are computed in a similar way- (Source: Alesina et al, 2003).

Other Variables

Log (*GDP per capita*) is defined as (the log of) GDP per capita in a country-year expressed in 1990 US Dollars. (Source: Maddison's Statistics on World Population)

Log (*Population*) is (the log of) population (expressed in thousands) in a country-year (source: Maddison's Statistics on World Population).

British Legal Origin is a dummy variable indicating whether a country's legal system is based on British common law (Source: Easterly's Global Development Network Growth Database).

Log (*Mountainous*) is (the log of) the mountain area percentage in a country (Source: Gerrard, 2000).

X_Democracy is democracy calculated from the Polity IV using Vreeland, 2008 definition).

Democracy is calculated from the Polity2 (Source: Polity IV) variable normalized to take values between 0 and 1, with 1 being most democratic.

Time (year) fixed effects: All years in the data set.

Regional fixed effects: North Africa and Sub-Saharan Africa.

Country List: The 49 African countries used in the estimations are: Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Democratic Republic of Congo, Republic of Congo, Cote d'Ivoire, Djibouti, Egypt, Equatorial Guinea, Gabon, Gambia, Ghana, Guinea, Guinea Bissau, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal,

Sierra Leone, Somalia, South Africa, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia, Zimbabwe.

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