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ABSTRACT

Understanding the effect of oil wealth on democracy is important. National democratic institutions provide a check on governmental power and thereby limit the potential of public officials to amass personal wealth and to carry out unpopular policies. Democracy promotion has thus been at the top of the US and West European foreign policy agenda since the end of the Cold War. Recently rising coups d’états attempts and oil discoveries 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 democracy timelier than ever. This paper uses recent data on historical oil wealth to provide new evidence on the effect of oil wealth on democracy in Africa from 1955 to 2008. We find that oil wealth is statistically associated with a lower likelihood of democratization when we estimate the relationship in a pooled cross-sectional and time-series setting. In addition, when estimated using fixed effects, the strong negative statistical association continues to hold. Indeed, this result is robust to the source of oil wealth data, the choice and treatment of the variables set, and the sample selection. Our results also show other interesting and important results. The cross-country evidence examined in the study confirms that the “Lipset/Aristotle/modernization hypothesis” (that prosperity stimulates democracy) is a strong empirical regularity. Also, the propensity for democracy rises with population size, population density, ethnic fractionalization, having British legal origin or colonial heritage, and having a supportive institutional environment in the form of maintenance of the rule of law. However, apart from oil wealth, democracy tends to fall with linguistic fractionalization and rough (mountainous) terrain. Moreover, consistent with the data, North Africa consistently fails to favor democratic development.

JEL: D72, L71, J15, O17, O55, Q32

Keywords: Oil wealth, resource curse, democracy, Africa.
1. 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 harm a country's prospects for democracy. Oil is not the main reason for the lack of democracy in resource-rich states in Africa. Many factors – economic, cultural and political tradition, religion, geography, colonial past and others - impede development of democracy and democratic institutions. While it is clear that democracy is always a result of these different factors, it is interesting to find out how important the abundance of oil wealth is for democratic development in Africa.

Understanding the effect of oil wealth and democracy is important. Democratic institutions provide a check on governmental power and thereby limit the potential of public officials to amass personal wealth and to carry out unpopular policies. Democracy promotion has thus been at the top of the US and West European foreign policy agenda since the end of the Cold War. 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 democracy 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 debates on democracy and oil wealth.

In addition, less than half of the world population is living under total or partial democracies. But in Africa, only nine of the 53 countries are at best flawed democracies while 31 of them are authoritarian regimes. Because democratic institutions, which provide checks and balances on elected officials, are prone to reduce corruption (see, for example, Bhattacharyya and Haodler, 2010), improving political institutions may be an effective tool in the global fight against corruption in developing countries.

This paper uses recent data on historical oil explorations, discoveries and extraction to provide new evidence on the effect of oil wealth on democracy in Africa from 1955 to 2008. The dependent variable “democracy” is taken from the Polity IV dataset. It contains coded annual information on regime and authority characteristics for all independent states (with greater than 500,000 total population) in the world. It is calculated from the polity2 index as a measure of democracy, normalized it to a 0–1 scale, with 1 being the most democratic. This variable is a composite indicator constructed to reflect the competitiveness and openness of political executive recruitment, constraints on the chief executive, and the regulation and competitiveness of political participation.

Thus, the further contents of the paper can therefore be adumbrated as follows. Section II presents some stylized facts on oil reserves and democratic development in recent years while Section III examines a brief literature review. Section IV presents the model and descriptive statistics while Section V presents and discusses the empirical estimates. Section VI concludes the paper with policy implications.
2. Stylized Facts On Oil Reserves And Democratic Development

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)](image)

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% (see Figure 2).
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).

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

As Sorensen (1993) puts it, democracy focuses on political arrangements and participation, that is, institutions and processes that guarantee the rights and freedoms to choose and replace leaders through regular and free elections, equality of opportunity and access, and a just distribution of social benefits and burdens are maintained.

Democracy can be generally conceptualized in two ways: electoral democracy and liberal democracy. With the former conceptualization, a country is democratic if there are free and open elections. With respect to the second conceptualization, a democracy is seen through political freedom (in elections, transparency of the government and political participation) and civil liberties (freedom of speech, union rights and rule of law). It is not surprising that this form is characterized as a more substantial type of democracy. This is because in a liberal democracy, elected officials have power as well as authority, and the military and police are subordinate to them. The rule of law is upheld by an independent and respected judiciary. As a result, citizens have political and legal equality, state officials are themselves subject to the law, and individual and group liberties are respected. People are free to organize, demonstrate, publish, petition, and speak their minds. Print and electronic media are free to report and comment, and to expose wrongdoing. Minority groups can practice their culture, their faith, and their beliefs without fear of victimization. Executive power is constrained by other governmental actors.
Property rights are protected by law and by the courts. In addition, corruption is punished and deterred by autonomous, effective means of monitoring and enforcement (Diamond, 1999).

The world is in the fourth decade since the great wave of global democratic expansion began in 1974. The number of democracies has increased—from about 40 in 1974 to around 120 in 2012, slightly over 60 percent of all independent states. The upward trend in democracy holds true for both electoral democracies and liberal democracies. While electoral democracies have doubled from 30% in 1974 to 61% in 2012, liberal democracies have increased from about 22% to 42% during the same period (Figure 5).

![Figure 5: The Global Expansion of Democracy (Percentages of Electoral and Liberal Democracies), 1974-2012](chart)

Source: Authors, using data from Diamond (2012a) and Freedom House (2013)

By region, the Euro/Anglo areas continue to dominate in both electoral and liberal democracy at 100%, with Sub-Saharan Africa languishing at just 14% of liberal democracy and 37% of electoral democracy. The Middle East and North Africa (MENA) performed worst in both categories (Figure 6). A similar pattern emerges when democracy is calculated as index (Figure 7).
Although almost one-half of the world’s population lives in a democracy of some sort, only 11% reside in “full democracies”, representing just 15% of all the countries in the world. More than 37% of the people in the world still lives under authoritarian rule (Figure 8).
In addition, while democracy has expanded since 1974, there has been a rising tide of democratic breakdowns or “democratic recession” since 1999. Of the 54 democratic breakdowns or reversals since 1974, nearly half (26) of them have occurred since 1999 (Diamond, 2013). They include some countries in Africa such as Nigeria, Kenya, and Egypt. Indeed, between 1974 and 2011, there had been a 32% of democratic breakdowns globally against 16% between 1974 and 1985; 12% between 1986 and 1998, and 20% between 1999 and 2011 (Figure 9).

Source: Authors, using data from EIU (2013)

Interestingly too, the Polity IV Project has rated the levels of both democracy and autocracy for each country and year using coded information on the general qualities of political institutions and
processes, including executive recruitment, constraints on executive action, and political competition. These ratings have been combined into a single, scaled measure of regime governance: the Polity score, which ranges from -10, fully institutionalized autocracy, to +10, fully institutionalized democracy. A perfect +10 or democracy, has institutionalized procedures for open, competitive, and deliberative political participation; chooses and replaces chief executives in open, competitive elections; and imposes substantial checks and balances on the discretionary powers of the chief executive. On the other hand, in a perfect -10 or autocracy, citizens participation is sharply restricted or suppressed; chief executives are selected according to clearly defined (usually hereditary) rules of succession from within the established political elite; and, once in office, chief executives exercise power with no meaningful checks from legislative, judicial, or civil society institutions. Countries with Polity scores from +6 to +10 are counted as democracies while those with Polity scores from -10 to -6 are counted as autocracies. The middling category refers to “Anocracies”, which are characterized by institutions and political elites that are far less capable of performing fundamental tasks and ensuring their own continuity. Anocratic regimes very often reflect inherent qualities of instability or ineffectiveness and are especially vulnerable to the onset of new political instability events, such as outbreaks of armed conflict, unexpected changes in leadership, or adverse regime changes through military coups or other violent means. Anocracies are countries whose governments are neither fully democratic nor fully autocratic but, rather, combine an, often, incoherent mix of democratic and autocratic traits and practices. Polity scores for anocracies range from -5 to +5 (Marshall. and Cole, 2011).

As Figure 10 shows, taken together, 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, especially in the poorer countries of Africa. Indeed, autocracies persist in most war-torn countries and in oil-producing nations. Indeed, between 1960 and 2012, the global average polity score was just 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”.

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With respect to Africa, from the early 1990s, the Continent experienced a "second liberation" that opened up new prospects for democratic development on the Continent. Most countries legalized opposition parties and held competitive, multiparty elections, which, though, have often not met the minimal democratic criteria of freeness and fairness. They have therefore been qualified as "pseudo-democracies" or “virtual democracies” (Joseph, 1999).

However, the recent crises of military coups in Central African Republic (2013), Mali (2012) (in spite of recent presidential 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 democracy across Africa.

3. The Brief Review Of The Literature

One of the natural “resource curse” arguments in the literature is that oil-rich countries tend to adopt less democratic ways of governance. Ross (2001, 2008) argues that there are three mechanisms that ties oil wealth to authoritarianism: a “rentier effect” (“taxation effect” and “spending effect”, through which governments use low tax rates and high spending to dampen pressures for democracy; a “repression effect”, by which governments build up their internal security forces; and a “modernization effect”, in which the failure of the population to undergo certain social changes renders them less likely to push
for democracy. More recently, others have suggested alternative mechanisms: Fish (2005) faults corruption; Box (2003) points to asset specificity; and others emphasize international factors.

The “taxation effect” suggests that when governments derive sufficient revenues from oil, they are likely to tax their populations less heavily. In turn, the population will be less likely to demand accountability from, and representation in, the government. The argument on the “spending effect” is that oil wealth may lead to greater spending on patronage, which dampens latent pressures for democratization. Citizens in oil-rich states may want democracy as much as citizens elsewhere, but oil wealth may allow their governments to spend more on internal security and militarization and so block the populations democratic aspirations, sometimes resulting in "rentier absolutist states". As Cotet and Tsui (2011) show, oil-rich non-democratic countries have significantly higher military expenditures.

According to the “modernization effect” or the “group formation effect”, the government will use the oil largesse to prevent the formation of social groups which are independent from the state and hence which may be inclined to demand political rights from the government. In the latter case, oil inhibits democratization by retarding certain social changes that tend to produce more accountable government. The modernization argument draws on the work of earlier scholars – most importantly Inglehart (1997), but also Lipset (1959) and Deutsch (1961) – who suggest that democratization comes about when a society is transformed by higher education levels, urbanization, the development of modern communications, and greater occupational specialization. If oil wealth inhibits these social changes, it could also impede the democratization process.

Fish (2005) also argues that corruption can help explain the connection between oil wealth and the absence of political freedom. Massive official malfeasance reduces popular demand for democracy but also undermines elites’ interest in democracy: the more corrupt the public official, the greater his or her interest in avoiding public scrutiny and thwarting popular control of politics. While oil wealth strengthens authoritarian regimes through a domestic mechanism, perhaps foreign influence also plays a role. It is argued that that oil-rich governments are less accountable to their citizens because they receive exceptionally strong backing from foreign powers. To assure a steady flow of hydrocarbons, oil-importing governments may use their influence to help friendly autocrats stay in power – either by intervening on their behalf or by augmenting their military and police forces through arms transfers and training, enhancing their ability to ward off popular uprisings and military coups.

Thus, the argument suggests that it is the massive, easily appropriated profit from oil that provides greater incentives for dictators to monopolize the state. These have led to “oil hinders democracy” literature, which dates back to the contribution on rentier states and oil in Iran by Mahdavy (1970) and Luciani (1987). Drawing on the rentier state theory, the political resource curse literature argues that oil wealth entrenches autocracy and hinders democracy (Anderson, 1987; Beblawi and Luciani, 1987; Ross, 2001; Jensen and Wantchekon, 2004). Mulligan and Tsui (2008) and Tsui (2010) show that lucrative oil reserves provide strong incentives for greedy dictators to remain in power – and they use fear to deter their greedy political opponents.

Thus, empirical results that support the “oil-hurts-democracy” thesis include Barro (1999), Ross (2001), Jensen and Wantchekon (2004), Smith (2004), Tsui (2011) and Aslaksen (2010). In a re-visitation of the evidence, Ross (2009) finds that oil wealth strongly inhibits democratic transitions in
authoritarian states; oil’s anti-democratic effects seem to vary over time and across regions, and they have grown stronger over time, but do not hold in Latin America.

Additionally, Caselli (2006) develops a model of the natural resource curse which predicts a negative relationship between resource income and political survival. The model’s essential idea is that natural resource wealth is more easily appropriated by the governing elites than are other sources of wealth. As a result, countries with large natural resource endowments experience frequent power struggles, in the sense that potential challengers have a stronger incentive to replace the existing government by staging a coup or engaging in other forms of forced leadership changes. Hence, in countries with large amounts of natural resources, there will be a greater probability that the government will lose power to challengers.

The results from Tsui’s (2011) panel data analysis suggest a conditional natural resource curse. Despite the conditional effect, Tsui concludes by supporting the claim that “richness in natural resources leads to negative economic and political outcomes”. In a regression analysis of time-series cross-section data on 18 Latin American countries, Dunning (2008) finds that oil wealth is positively and significantly linked to democracy. Tsui (2011) uses detailed industrial data on the history of worldwide oil discoveries to provide new evidence for the long-term significant negative effect of oil wealth on democracy. Using meta-regression analysis, Ahmadov (2013) finds a nontrivial negative association between oil and democracy across the globe, with a notable variation in this relationship across world regions and institutional contexts.

Its critics contend that this negative association is far from conclusive. Some claim that it is circumscribed to specific instances or geographic areas, such as the Middle East and North Africa (MENA) (Herb, 2005). Oskarsson and Ottosen (2010) argue that there can be a temporal variation in the strength and direction of the relationship. Others argue that oil may not hinder democracy and can even be a blessing in other geographic regions, such as Latin America (Smith and Kraus, 2005; Dunning, 2008), or across regions (Gurses, 2009; Haber and Menaldo, 2011). The claim that oil wealth tends to block democratic transitions has recently been challenged by Haber and Menaldo (2011), who use historical data going back to 1800 and conclude there is no “resource curse.” They thus confirm the results of Gurses (2009). However, Andersen and Ross (2012) revisit Haber and Menaldo data and models, and show they might be correct for the period before the 1970s, but since about 1980 there has been a pronounced resource curse. They argue that oil wealth only became a hindrance to democratic transitions after the transformative events of the 1970s, which enabled developing country governments to capture the oil rents that were previously siphoned off by foreign-owned firms. They also explain why the Haber-Menaldo study failed to identify this: partly because the authors draw invalid inferences from their data; and partly because they assume that the relationship between oil wealth and democracy has not changed for the last 200 years.

Dunning (2008) argues that some Latin American countries such as Venezuela have experienced an increase in democracy when crude prices rise. Dunning argues that the positive relationship has to do with a political bargain between the elite and society, particularly the role of minimal taxes on the elite in non-oil sectors and increased spending by the government on social programs. Brooks and Kurtz (2012), using global data from 1960-2009, conclude that oil wealth is not necessarily a curse, and may even be a ‘blessing’ with respect to democratic development. Still others find that political regime dynamics are determined by factors other than oil wealth (Horiuchi and Wagle, 2008).
contributions that do not find empirical support for the oil/natural resource hurts democracy thesis include Alexeev and Conrad (2009), Ulfelder (2007), Brunnschweiler and Bulte (2008) and Horiuchi and Wagl’s (2008).

Apart from oil wealth, other variables have been identified in the literature for influencing democracy. The “modernization theory” of democratization posits that increases in income are conducive to increases in democracy levels, that is, democratic regimes are created and consolidated in affluent societies (e.g. Lipset, 1959; Przeworski et al, 1997; Barro, 1999; Epstein et al, 2006). This is because higher incomes 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). Alternatively, citizens of wealthier countries with high levels of human capital and high incomes may be more effective at creating and sustaining democratic institutions (e.g. Glaeser, et al, 2004). However, papers by Acemoglu, et al (2008, 2009) cast doubt on the robustness of the cross-country empirical relationship between income and democracy. Using Freedom House and Polity measures of democracy in a cross-country panel between 1960 and 2000 as well as a binary democracy measure used by Przeworski, et al (2000), these authors find no statistically significant effect of income on democracy. However, more recently, Benhabib, Corvalan and Spiegel (2011) find a robust statistically significant positive income-democracy relationship. Gundlach and Paldam (2009) found that income explains the long-term political regime. Economic development as represented by per capita income can lead citizens to ask for institutional changes suitable for investments.

This akin to “Lipset hypothesis”. A common view since Lipset’s (1959) research is that prosperity stimulates democracy; 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). Despite the lack of clear predictions from theoretical models, the cross-country evidence examined in the present study confirms that the Lipset/Aristotle hypothesis is a strong empirical regularity. In particular, increases in various measures of the standard of living forecast a gradual rise in democracy. In contrast, democracies that arise without prior economic development—sometimes because they are imposed by former colonial powers or international organizations—tend not to last. Given the strength of this empirical regularity, one would think that clear-cut theoretical analyses ought also to be attainable.

Using a panel of over 100 countries from 1960 to 1995, Barro (1999) finds the propensity for democracy rises with per capita GDP, primary schooling, and a smaller gap between male and female primary attainment. Also, for a given standard of living, democracy tends to fall with urbanization and with a greater reliance on natural resources (oil country dummy). Democracy has little relation to country size but rises with the middle-class share of income. In addition, the apparently strong relation of democracy to colonial heritage mostly disappears when the economic variables are held constant. In the same vein, allowance for economic variables weakens the interplay between democracy and religious affiliation though the negative effects from Muslim and non–religious affiliations remain intact.
Fiorino and Ricciuti (2007) investigate the demographic (population size and population density), economic, political and cultural determinants of direct democracy in 87 countries using an index of direct democracy. They find that per capita income, education and a larger share of Catholic population are positive determinants, whereas ethnic fractionalization is depending on the estimation technique. In addition, political rights and stability also work as prerequisites to direct democracy while direct democracy seems independent from the institutional structure.

The ethnological fractionalization of a country, including ethnicity, religion, and language can be important determinants of democracy. 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).

According to Lipset (1959), the British rule during the colonial time provided crucial learning experience for subsequent democracy. Similar positive impact has been argued by Bollen and Jackman (1985) as well as 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).

4. The Model And Descriptive Statistics

4.1. The Model

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

\[ Democracy_{it} = \alpha_i + \beta_1 \log(Oilwealth_{it}) + \beta_2 \log(X_{it}) + \lambda_t + \epsilon_{it} \]

\[(i = 1, \ldots, N; t = 1, \ldots, T), \ldots \ldots (1)\]

where Democracy\(_{it}\) is the democracy index (calculated from the polity2 and normalized to take values between 0 and 1, with 1 being most democratic) in country \(i\) in year \(t\). The polity2 index is a composite indicator constructed to reflect the competitiveness and openness of political executive recruitment, constraints on the chief executive, and the regulation and competitiveness of political participation. The main variable of interest is Oilwealth\(_{it}\), (the log of) oil wealth per capita. The parameter \(\beta_1\) measures the causal effect (also a semi-elasticity) of oil wealth per capita on democracy. All other potential covariates are included in the vector \(X_{it}\). The vector of country characteristics \(X_{it}\) includes per capita GDP, population, population density, mountainous area, ethnic fractionalization, religious fractionalization, language fractionalization, a dummy for British legal origin, and an institutional
variable, rule of law. In addition, $\lambda_i$ denotes key regional fixed effects while $e_{it}$ is an error term capturing all other omitted factors, with $E(e_{it}) = 0$ for all $i$ and $t$.

It has been posited that the duration of political leadership depends on the economic environment in which the leader acts (Lipset 1960). Indeed, Lipset (1959) discusses a broad category of economic development as determinant of democracy, including indices of wealth (per capita income). Specifically, Lipset (1959) supports the idea that prosperity, measured particularly by per capita GDP and education, stimulates democracy. This idea is often called the Lipset hypothesis. The key element of this hypothesis is that richer countries are more willing to promote democratic values and receptivity to democratic political tolerance norms. This is also referred to as the “modernization hypothesis”. According to the “modernization hypothesis”, economic development spurs the introduction and maintenance of higher-quality institutions, including well-functioning representative democracy (Lipset, 1959; Huntington, 1991). To proxy for modernization, we use the log of per capita GDP. Modernization here refers to social changes linked with income. These social changes are likely to increase standards of living and to promote the process of democratization (Kalyvitis and Vlachaki, 2011).

Governingability of countries seems to become more difficult in large countries (Cuaresma et al., 2011; Andersen and Aslaksen, 2012) hence the use of population size as a key determinant of democracy. Following this argument, a negative correlation between the population variable and democracy is expected. After the end of the cold war, an increased interest in demographic factors as potential causes of armed conflict and reduction of democracy has emerged. The debate about demography and democracy originates from the “resource scarcity” or “neo-Malthusian” school of thought. Rapidly growing populations, especially in developing countries, may outpace the local natural resource base, eventually forcing groups to fight over resource access. Another prominent demographic concern is that as population increases, youth bulges (especially in Africa with the largest youth growth globally) potentially increase the opportunity for political violence (e.g., Collier and Hoeffler, 2004), including terrorism and rioting, all of which undermine democracy (Urdal, 2008). Population size is also a measurement of state cohesion and institutional pluralism, that is, the degree to which the population takes a state’s territorial borders for granted and identifies with a state independent of who controls its government. Thus, low state cohesion reinforces the dynamics of exclusion and segmentation and leads challengers to secessionist paths and undermining of democracy. A large country population, makes it necessary for the center to multiply layers of agents to keep tabs on who is doing what at the local level, and also increases the number of potential recruits to an insurgency.

High population density is likely to increase collective dissent; a higher population density might increase social tensions arising from a scarcity of land, housing, and employment, and in turn may as well as act as a pressure on some regions to “opt out” and lower the threshold for democratization (see, for example, Deiwiks, Cederman and Gleditsch, 2012).

According to some recent studies, geographic position is a factor that contributes to the shaping of political institutions. Geography can work against democratization in several ways. First, geographic disadvantages such as lack of access to services and government due to poor terrain gravely impact human development in general. Second, people living in isolated landlocked regions and other harsh environments often struggle just to survive. Thus, participation in a democratic government are often considered luxuries in the face of these basic survival needs. Fearon and Laitin (2003), for example,
view terrain as part of the technology of insurgency (mountains provide hideouts for rebels and favor guerrilla tactics), thus undermining democracy. This insurgency model maintains that wars break out when government forces are weak and when mountainous terrain allows rebels to hide and retreat (Hegre and Sambanis, 2006).

The population’s degree of heterogeneity with respect to ethnicity, language, and religion/culture may also matter for democracy. The usual idea is that more heterogeneity makes it more difficult to sustain democracy. In connection with this is also the ethnological fractionalization, including language, culture and ethnicity. Barro describes that the more heterogeneous a country, the more difficult is it to sustain democracy (Barro 1999). According to Fish and Brooks (2004) greater diversity is associated with a higher propensity for major civil conflict, which is an antagonist of open rule, hence greater fractionalization makes things hard for democracy. This is akin to what Diskin, Diskin, and Hazan (2005) call "cleavages" whereby "countries with deep or parallel social cleavages, or both, are more prone to democratic collapse than those with low or cross-cutting cleavages, or both” (p.293). A standard measure of a population’s heterogeneity is its ethnolinguistic and religious fractionalization, a measure of disparity of ethnicity, languages and religion within a country. The variable runs between zero and one and is intended to measure the probability that two randomly chosen persons in a country come from different groups. Hence, zero is the most homogeneous, and one is the most heterogeneous. Mauro (1995), La Porta et al. (1999), and Alesina et al. (2003) point on ethnic heterogeneity as determinant of economic success both in terms of output (GDP growth) and the quality of institutions (measured by the extent of corruption, political freedom, etc.). The results show that the democracy index they use is negatively impacted by racial fractionalization. The role of cultural conditions – especially religious fractionalization - on democracy has been discussed by Huntington (1991), Putnam (1993), Lipset (1994), Boone (1996), Landes (1998), La Porta et al. (1999), and Goldsmith (2001).

Colonial heritage would be important for democracy if countries inherited tendencies for more or less political freedom from their previous rulers. For example, Lipset et al. (1993) argue that British rule provided a crucial learning experience for subsequent democracy. Diskin, Diskin, and Hazan (2005) see colonial history as a proxy for "unfavorable history", which they rationalize as "countries with undemocratic or mixed historical backgrounds...are more prone to democratic collapse than those with democratic historical, cultural, and civil societal backgrounds” (p.294). In their view, British colonialism brought at least the premise of democracy to the nations that were colonies hence a positive unit-change in the British Colonialism variable should significantly increase the dependent variable of democracy.

A measure of risk guide to democracy is the overall maintenance of the rule of law or the “law and order tradition”. As the Canadian Bar Association (2007) has opined, the rule of law is a key pillar of good governance and democracy requires the commitment to the rule of law for without the rule of law, democracy is not sustainable. According to Barro (1999, 2013), efforts to promote the rule of law can bear substantial fruit in promoting development; promotion of democracy, by contrast, is uncertain at best in spurring economic growth or laying a solid foundation for economic freedom (Barro, 1999, 2013). There is plenty of evidence from around the world that rule of law is a critical factor in empowering individuals, ending discrimination, and enhancing competition (Feulner, 2013).
4.2. Descriptive Statistics

The descriptive statistics are presented in Table 1. It reports the sample mean, median and standard deviation of the variables used in the estimations.

Figure 11 shows a statistically significant negative association between average oil wealth and democracy over the period, 1955 to 2008. This indicates that oil rich countries are less likely to experience democracy. The slope of the regression line from the simple plot is -0.005, suggesting that a reserve of 10 billion barrels of oil will make a country 5 percentage points less democratic than one with no oil.

Table 1: Africa: Descriptive Statistics of Regression Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Observations</th>
<th>Mean</th>
<th>Median</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Democracy</td>
<td>2275</td>
<td>0.343</td>
<td>0.200</td>
<td>0.283</td>
</tr>
<tr>
<td>Log (oil wealth per capita) (ASPO)</td>
<td>2156</td>
<td>-16.364</td>
<td>-20.694</td>
<td>8.073</td>
</tr>
<tr>
<td>Log (oil wealth per capita) (BP &amp; OGJ)</td>
<td>2476</td>
<td>-15.783</td>
<td>-20.694</td>
<td>8.031</td>
</tr>
<tr>
<td>Log (oil wealth per capita) (ASPO, BP &amp; OGJ)</td>
<td>2598</td>
<td>-14.093</td>
<td>-20.694</td>
<td>10.585</td>
</tr>
<tr>
<td>Log (value of oil wealth per capita) (ASPO, BP &amp; OGJ)</td>
<td>2598</td>
<td>-10.829</td>
<td>-17.665</td>
<td>10.971</td>
</tr>
<tr>
<td>Log (GDP per capita)</td>
<td>2754</td>
<td>07.082</td>
<td>6.963</td>
<td>0.699</td>
</tr>
<tr>
<td>Log (population)</td>
<td>2754</td>
<td>8.188</td>
<td>8.446</td>
<td>1.602</td>
</tr>
<tr>
<td>Log (population density)</td>
<td>2754</td>
<td>3.045</td>
<td>3.161</td>
<td>1.402</td>
</tr>
<tr>
<td>Log (mountainous)</td>
<td>2646</td>
<td>-0.974</td>
<td>1.163</td>
<td>5.110</td>
</tr>
<tr>
<td>Ethnic fractionalization</td>
<td>2808</td>
<td>0.631</td>
<td>0.719</td>
<td>0.247</td>
</tr>
<tr>
<td>Religious fractionalization</td>
<td>2862</td>
<td>0.460</td>
<td>0.554</td>
<td>0.276</td>
</tr>
<tr>
<td>Language fractionalization</td>
<td>2754</td>
<td>0.593</td>
<td>0.701</td>
<td>0.294</td>
</tr>
<tr>
<td>British legal origin</td>
<td>2808</td>
<td>0.346</td>
<td>0</td>
<td>0.476</td>
</tr>
<tr>
<td>Rule of law in 1996</td>
<td>2700</td>
<td>-0.721</td>
<td>-0.782</td>
<td>0.737</td>
</tr>
</tbody>
</table>

Source: Author’s calculations, using data from the World Bank WDI (2012).
5. Empirical Results

Table 2 reports the main regression results. Consistent with most previous results, we find that more oil wealth is statistically associated with less democratization when we estimate the relationship both in a pooled cross-sectional and time-series and fixed effect settings. The estimates of the oil wealth coefficient are respectively, -0.003 and -0.005. Point estimates of semi-elasticity of 0.003 to 0.005 imply that a 1 standard deviation increase in oil wealth per capita (approximately 10 log points) corresponds to a decrease in the annual democracy by 0.024 to 0.040 (0.003 \times 8.073 to 0.005 \times 8.031), with an implied elasticity of 0.009 and 0.015, respectively (evaluated at the mean of democracy variable, 0.343).
Table 2: Oil Wealth and Democracy in Africa

<table>
<thead>
<tr>
<th>Variable</th>
<th>Oil wealth is oil reserves per capita from ASPO</th>
<th>Oil wealth is oil reserves per capita from BP &amp; OGJ</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Robust Pooled OLS</td>
<td>Fixed Effects</td>
</tr>
<tr>
<td>Log (oil wealth per capita)</td>
<td>-0.003** (-2.35)</td>
<td>-0.003** (-2.48)</td>
</tr>
<tr>
<td>Log (GDP per capita)</td>
<td>0.071*** (4.74)</td>
<td>0.058*** (4.50)</td>
</tr>
<tr>
<td>Log (population)</td>
<td>0.033*** (4.32)</td>
<td>0.016** (2.27)</td>
</tr>
<tr>
<td>Log (population density)</td>
<td>0.023*** (3.87)</td>
<td>0.016** (3.10)</td>
</tr>
<tr>
<td>Log (mountainous)</td>
<td>-0.011*** (-7.41)</td>
<td>-0.011*** (-7.54)</td>
</tr>
<tr>
<td>Ethnic fractionalization</td>
<td>0.302*** (5.33)</td>
<td>0.303*** (6.49)</td>
</tr>
<tr>
<td>Religious fractionalization</td>
<td>0.008 (0.23)</td>
<td>0.036 (1.18)</td>
</tr>
<tr>
<td>Language fractionalization</td>
<td>-0.192*** (-5.36)</td>
<td>-0.196*** (-7.54)</td>
</tr>
<tr>
<td>British legal origin</td>
<td>0.091*** (5.61)</td>
<td>0.099*** (7.24)</td>
</tr>
<tr>
<td>Rule of law in 1996</td>
<td>0.106*** (9.08)</td>
<td>0.101*** (9.24)</td>
</tr>
<tr>
<td>North Africa</td>
<td>-0.159*** (-3.87)</td>
<td>-0.108** (-2.64)</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-0.594*** (-3.86)</td>
<td>-0.359** (-2.72)</td>
</tr>
<tr>
<td>R-squared (overall)</td>
<td>0.2288</td>
<td>0.2441</td>
</tr>
<tr>
<td>F-statistic</td>
<td>49.11</td>
<td>43.31</td>
</tr>
<tr>
<td>Prob &gt; F</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>N</td>
<td>1535</td>
<td>1535</td>
</tr>
<tr>
<td>Hausman test</td>
<td>303.08***</td>
<td></td>
</tr>
</tbody>
</table>

Source: Author's calculations.
Note: *** 1% significant level; ** 5% significant level; * 10% significant level.
ASPO: The Association for the Study of Peak Oil and Gas;
BP: British Petroleum Statistical Review of World Energy;
OGJ: Oil & Gas Journal.

The direction and size of the estimated long-term impact of oil discovery on democratic development are broadly consistent with those suggested by Figure 11.

Other coefficients estimates seem plausible and are consistent with previous findings. For example, GDP per capita is positively correlated with democracy. This positive and highly significant effect of per capita income of democracy means that direct democracy is an ordinary good that is consumed more in richer societies. Therefore, our results are consistent with the Lipset/modernization hypothesis.

Population and a country’s population density do have a systematic positive effect on democratic development. 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 to be democratic. The same applies to population density. However, mountainous terrain has strong negative effect on democracy in Africa.
The proposition by Aghion et al. (2004) is that in more fragmented societies a group imposes restrictions on political liberty to impose control on the other groups is not verified. Ethnic fractionalization, in all the estimated results, is positive and highly significant, contrary to this theory. That is, ethnic fractionalization promotes democracy. Thus there is strong indication that more ethnically diverse countries are more likely to sustain democracy. On the other hand, the coefficient of the language fractionalization variable is negative and highly significant, strongly indicating that more linguistically diverse countries are less likely to sustain democracy. The religious fractionalization variable, though positive, is not consistently significant.

In addition, our results suggest that the influence of former colonial status, in the form of British legal origin, on democratic tendency is very strongly positive. The coefficient is positive and highly significant in all the estimations. Thus, countries with British legal origin appear to become more democratic over time.

We find that a significant variable concerned with the political infrastructure of a country is the the rule of law. Our results also show that the estimated coefficient on the rule-of-law variable is positive and highly significant. Thus, better maintenance of the rule of law promotes democratic development. The positive and significant coefficient of this variable suggests that the higher the quality of the democratic process, the higher the likelihood of sustaining direct democracy. There is thus evidence that better maintenance of the rule of law promotes democracy.

Consistently, North African countries are significantly less democratic than Sub-Saharan African ones. This is also consistent polity2 data presented on Figure 10 earlier.

Robustness checks with combined data from ASPO, BP and OGJ for the period, 1955 to 2008, confirm the above results (see Table 3). The estimates of the coefficients and their significance are similar to those in Table 2. This suggests that antidemocratic property of oil wealth is a general phenomenon.
Table 3: Oil Wealth and Democracy in Africa - Robustness Check

<table>
<thead>
<tr>
<th>Variable</th>
<th>Robust Pooled OLS</th>
<th>Fixed Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log (oil wealth per capita)</td>
<td>-0.002** (-2.95)</td>
<td>-0.003*** (-4.14)</td>
</tr>
<tr>
<td>Log (GDP per capita)</td>
<td>0.083*** (6.44)</td>
<td>0.055*** (5.15)</td>
</tr>
<tr>
<td>Log (population)</td>
<td>0.052*** (7.45)</td>
<td>0.024*** (3.82)</td>
</tr>
<tr>
<td>Log (population density)</td>
<td>0.028*** (5.21)</td>
<td>0.014*** (3.03)</td>
</tr>
<tr>
<td>Log (mountainous)</td>
<td>-0.010*** (-7.46)</td>
<td>-0.010*** (-8.13)</td>
</tr>
<tr>
<td>Ethnic fractionalization</td>
<td>0.250*** (4.85)</td>
<td>0.263*** (6.32)</td>
</tr>
<tr>
<td>Religious fractionalization</td>
<td>-0.009 (-0.27)</td>
<td>0.053* (1.90)</td>
</tr>
<tr>
<td>Language fractionalization</td>
<td>-0.172*** (-5.08)</td>
<td>-0.179*** (-6.30)</td>
</tr>
<tr>
<td>British legal origin</td>
<td>0.068*** (4.55)</td>
<td>0.080*** (6.48)</td>
</tr>
<tr>
<td>Rule of law in 1996</td>
<td>0.097*** (9.53)</td>
<td>0.089*** (9.57)</td>
</tr>
<tr>
<td>North Africa</td>
<td>-0.266*** (-7.33)</td>
<td>-0.147*** (-4.30)</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-0.789*** (-5.84)</td>
<td>-0.367*** (-3.28)</td>
</tr>
<tr>
<td>R-squared (overall)</td>
<td>0.2354</td>
<td>0.2197</td>
</tr>
<tr>
<td>F-statistic</td>
<td>65.65</td>
<td>51.36</td>
</tr>
<tr>
<td>Prob &gt; F</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>N</td>
<td>1928</td>
<td>1928</td>
</tr>
<tr>
<td>Hausman test</td>
<td>2494.47****</td>
<td></td>
</tr>
</tbody>
</table>

Source: Author's calculations.
Note: *** 1% significant level; ** 5% significant level; * 10% significant level.
ASPO: The Association for the Study of Peak Oil and Gas;
BP: British Petroleum Statistical Review of World Energy;
OGJ: Oil & Gas Journal.

6. Conclusion And Lessons For Policy Implications

This paper has investigated empirically the effects of oil wealth on democracy. In a cross-country panel data, covering 52 African countries between 1955 and 2008, we estimate the effects of oil wealth on democracy. The paper finds a nontrivial negative association between oil wealth and democracy 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 lower likelihood of democratization when we estimate the relationship in a pooled cross-sectional and time-series setting. In addition, when estimated using fixed effects, the strong negative statistical association continues to hold. Indeed, this result is robust to the source of oil wealth data, the choice and treatment of the variables set, and the sample selection.

Our results also show other interesting and important results. The cross-country evidence examined in the study confirms that the “Lipset/Aristotle/modernization hypothesis” (that prosperity stimulates...
democracy) is a strong empirical regularity. In particular, increases in GDP per capita, a measure of standard of living, lead to a rise in democracy. Also, the propensity for democracy rises with population size, population density, ethnic fractionalization, having British legal origin or colonial heritage, and having a supportive institutional environment in the form of maintenance of the rule of law. However, apart from oil wealth, democracy tends to fall with linguistic fractionalization and rough (mountainous) terrain. Moreover, consistent with the data, North Africa consistently fails to favor democratic development.

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 have important implications for countries in Africa where improving democracy is at stake for the international community. The paper, therefore, proffers policy recommendations along these lines and in particular to promote effective democracy and prevent key scenarios hindering democracy due to oil wealth: rentier, repression and corruption effects.

How can political leaders and elites use oil wealth to avoid the political resource curse and promote democracy 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 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.

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. Institutions, like the rule of law, matter. 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, it cores well above the global average in the rule of law indicator of the World Bank. It scored 1.89 (out of the range of -2.5 to +2.5)
in 2011 against the global average of -0.00014 – compared to very poor scores by key African oil and
gas exporters: DRC (-1.60), Chad (-1.46), Sudan (-1.26), Nigeria (-1.25), Angola (-1.23), Equatorial
Guinea (-1.21), Congo (-1.16), Libya (-1.16), and Algeria (-0.82). As a result, 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 – for example, Nigeria ranks 120 with
a score of only 3.77.

It is therefore imperative that African countries take measures to promote and maintain effective rule of
law and other related institutions. 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.

Finally, our results confirm the “Lipset/Aristotle/modernization hypothesis”, that is, prosperity
stimulates democracy. In particular, increases in GDP per capita, a measure of standard of living, lead
to a rise in democracy. Therefore, African countries must take measures to increase their national
incomes. To increase per capita income, 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, check rapid population growth, 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.

Our results also show that North Africa consistently fails to favor democratic development. Unfortunately, the recent overthrow or challenge of former regimes in the region have not yet led to smooth transitions to democratic and pluralistic societies governed by the rule of law in any of the North African countries. Rather, these countries have moved very quickly from ‘revolutionary’ moments to what are essentially civil wars (with the exception of Tunisia), showing that those who succeeded the liberalized autocracies have proved to be incompetent clods in the business of governance. This is essentially because the ways of soldiers and spirituality (especially when couched under “fundamentalism” versus “secularism”) are designed for other worlds than the responsibility of governance that is inclusive and equitably providing services and opportunities for millions of people from different religions, ideologies and ethnicities (Khouri, 2013). What is needed, therefore, is 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.

Appendix 1- Data, Data Sources and Country List

The data set is from Cotet and Tsui (2013), with the following sources:
Oil Data: Log (Oil Wealth per capita) represents (the log 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) as follows:
Source: The Association for the Study of Peak Oil and Gas (ASPO)
1) oilreserves – oil reserves in trillion barrels
2) logoilres - log of oil reserves per capita
3) valoilres – value of oil reserves (oilpop*crude oil price)
4) logvaloilres – logarithm of oil reserves per capita
5) logvalprod – log of value of oil production
Combined Sources: The Association for the Study of Peak Oil and Gas (ASPO), BP Statistical Review of World Energy(BP) and Oil & Gas Journal (OGJ)
1) oilpop_public – oil reserves per capita (BP and OGJ used to extend the ASPO data to 2008)
2) oilreserves_public - oil reserves per capita from public data (BP and OGJ used to extend the ASPO data to 2008)
3) logoilres_public – log of oilreserves_public (BP and OGJ used to extend the ASPO data to 2008)
4) oilreserves_full - oil reserves per capita from all sources (ASPO, BP and OGJ)
5) logoilres_full – log of oilreserves_full (ASPO, BP and OGJ)
6) logvaloilres_full - log of value oil reserves per capita from all sources (ASPO, BP and 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.

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).

Log (Population Density) is (the log of) population per square kilometer.

Democracy is calculated from the polity2 (source: Polity IV) variable normalized to take values between 0 and 1, with 1 being most democratic.

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

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


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).

Rule_law96 – rule of law measured in 1996 (source: World Bank Governance Indicators)

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


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