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Natural resource abundance, institutions and economic growth in Africa

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Abstract: The study analysed the effect of institution on resource curse abundance-economic growth nexus using the system generalised method of moments. The empirical results refute the resource curse hypothesis in Africa. In addition, institutions have dampening effect on the nexus. This stems from the fact that the institutional development level of most African countries is weak. The study also found out that the resource curse hypothesis is not peculiar to oil wealth as indicated in the literature. Lastly, our results do not support the rentier effect as a possible channel of the hypothesis.

Keywords: natural resources; institutional quality; growth; rentier effect; resource curse hypothesis; Africa.

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1 Introduction

Development economists have argued that countries endowed with natural resources[1] (agricultural products, minerals and fuel) are expected to use the proceeds from the sales of these products for developmental purposes mainly in the area of investment which is anticipated to stimulate growth and eventual development. This view, otherwise called the resource-led-growth (RLG) hypothesis, has been subjected to empirical exercises which broadly tend to suggest that resource-poor countries grow faster than resource-rich countries, leading to what is referred to as 'resource curse'. Empirical studies have shown that the per capita income of resource-poor countries grew by two to three times more than resource rich countries between 1960 and 1990. Thus, economic growth rates appear to have widened by the passage of time (Sachs and Warner, 1995; Auty, 2001). As classical illustrations, in the 17th century, resource poor Netherlands out performed Spain whose export of gold and silver to the world market was significant. Also, in the 19th and 20th centuries, Japan and Switzerland which were considered to be resource poor experienced unprecedented growth as compared to oil and gas-rich Russia. Furthermore, many countries in Africa, the Middle East and Latin America are endowed with oil, minerals, or other natural resources, and yet have displayed much less satisfactory economic performance (Gelb et al., 1998; Auty, 1990; Sachs and Warner, 1995, 1997; Limi, 2006; Larsen, 2004; Mehlum et al., 2005).

Akanni (2007) opined that over the last four decades, the Organization of Petroleum Exporting Countries (OPEC) as a group witnessed negative growth rate.[2] In fact, 65 countries that are considered to be endowed with natural resources, only four[3] were able to attain long-term investment exceeding 25% of GDP and per capita GNP growth exceeding 4% per year on the average between 1970 and 1998. Similarly, Alaska is the only state in the USA with a negative growth rate despite its oil reserve and improved, integrated and sophisticated fish industry (Johnson, 2003). In the same vein, priori to 1970, other Scandinavian countries (precisely Denmark and Sweden) outperformed Norway in terms of economic growth. A decade after the discovery of oil, however, Norway forged ahead of them (Larsen, 2004). Hence, this tends to show that resource curse is not a general phenomenon but on the average, countries with natural resources tend to grow slower than resource poor countries.

The foregoing examples could be termed the direct effect since growth is directly linked to resource abundance. A new strand in the literature has now shifted attention from the determination of the average effect of resource abundance on growth to the examination of why some resource-rich countries were able to avoid the curse. This shift could be termed the indirect effect. It is argued here that countries with developed institutions and good governance can avert the curse syndrome. In line with this reasoning, therefore, the pre-occupation of this paper is to examine the role of institutions in the resource abundance-growth nexus.

It is noteworthy that not all resource-rich countries are prone to the curse syndrome. In the 1980s, for example, Indonesia and Nigeria (both oil producing countries) had

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similar per capita income. Thirty years after, Indonesia's income is four times that of Nigeria. Sierra Leone and Botswana are both endowed with diamond but Botswana's average economic growth is about 9%, while Sierra Leone's growth rate is between 2% to 3% (Polterovich et al., 2010). In addition, Australia, Canada, Chile, Ireland, Oman and Thailand among others are endowed with resources and were able to escape from the curse. Prompted by this phenomenon, Delacroix (1977), Davis (1995), Yang and Lam (2007), Berument and Ceylan (2007), Brunnschweiler (2008) and Alexeev and Conrad (2009) find no statistical evidence of the natural resource curse. In contrast, Algeria, Nigeria, Venezuela, Zambia, Mexico, Ecuador and Saudi Arabia are well engrossed with the curse. Hence, the debate could be said to be inconclusive.

The main goal of this paper is to investigate the effect of natural resource wealth on economic growth in 47 resource-rich African countries[4] for the period spanning from 1996 to 2010. In addition to the main objective, this study also seeks to examine how institution can affect the relationship between resources and growth. Consequent upon this, this study adopts both linear and nonlinear estimation techniques. This serves as the novelty this study introduces to the literature. The rest of the paper is structured as follows: Section 2 highlights the possible channels of resource curse; Section 3 reviews relevant literature related to institutions in brief. Section 4 discusses the methodology and data related issues, while Sections 5 and 6 present the empirical results and, summary and conclusion respectively.

2 Channels of resource curse hypothesis

There are several channels through which Resource Curse hypothesis works. Prominent among them is the rentier effect;[5] when a state generates large revenue from relatively few and easily controlled resources, it tends not to rely on taxation to fund government spending thereby making government less accountable. Therefore, citizens have less incentive to develop effective methods of scrutinising how public funds are being spent. By this token, it may be easier for the government to violently suppress opposition or to buy compliance from opponents rather than through provision of decent public services. This is mostly obtainable in the Middle East, e.g., Saudi Arabia and Iran, where governments routinely thrust the board of taxation aside. The same applies to developing countries especially in Africa (Nigeria, Libya, Algeria, Egypt, and Democratic Republic of Congo) where the ruling elites suppress the activities of the oppositions and resist calls for democratic governance with the aid of public funds. An example of this is the recent 'Arab Spring' in North Africa. It must be noted that rentier effect is mostly associated with autocratic governments.[6]

In addition to the rentier effect, Dutch disease[7] is another important channel. In the set-up, there are three sectors of the economy: non-traded, booming and the lagging sectors. The booming sector is the natural resource sector and the lagging is the manufacturing. The increase in revenue of the natural resource sector would increase the demand for labour in the non-traded goods sector which would result to increase in the price. Since the price of tradable goods are set at the international market, countries that practice floating exchange rate would experience currency appreciation as a result of increase in the price of tradable goods. The Dutch disease is intricately linked to a factor movement effect, a spending effect, and a spillover-loss effect. The factor movement effect is the reallocation of factors of production such as capital and labour from other

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activities to resource extraction. The spending effect arises from the increased aggregate demand created by resource receipts, which if converted to domestic currency, may create periods of excess demand in the economy. The spillover-loss effect lies in the loss of positive externalities associated with the (crowded out) non-traded goods sector.

Another channel hinges on the notion that availability of natural resources may lead to internal conflict and civil war.[8] The positive association between political stability and growth is widely documented in the literature. With the occurrence of civil war, the developmental progress of the concerned state would be prolonged. Since 1980, about 80% of the poorest nations have been confronted with violent conflicts (McKay, 2012). About 1.5 billion people – some 25% of the global population – live in situations of conflict and violence, and the gap in poverty is increasing between stable nations and those affected by violence. It should be noted that it appears the availability of resources is not the problem, but the value, location and ease of extraction. For example in Nigeria, before the advent of oil, the country lived in harmony, however with oil, the incidence of Niger Delta militancy has occurred. Certain resources are attributed to conflicts and violence (oil, gold and diamond among other precious stones), while agricultural related products have little or no contribution to conflict.

Volatility in oil prices is also quintessential to the curse. Most African Governments lack fiscal discipline. During a boom, everything seems normal as there is enough revenue for the government to exercise its duties and obligations to the citizenry. However, during bust, governments resort to borrowing in order to carry out their basic functions. In an effort to cope with volatility in oil prices and thus reduce the vulnerability to external shocks, many oil exporters have established Special Fiscal Institutions (SFIs) aimed at enhancing fiscal management and helping to achieve broader fiscal policy objectives. While SFIs include various mechanisms (oil funds, fiscal rules, fiscal responsibility legislation and budgetary oil prices) to manage oil revenues, they are not a panacea and their quality and effectiveness vary from country to country (Ossowski et al., 2008). Poelhekke and van der Ploeg (2007) argue that the negative effects of such revenue instability tend to drown any possible gains from export receipts. In addition, Torvik (2009) explained that in most cases, poor savings culture of resource-rich countries might account for the curse. Such countries are characterised by overspending of resource income. Nonetheless, Oman which experienced de-saving between 1972 and 2000 escaped from the curse, while Algeria which witnessed higher net adjusted saving was unable to break out of the curse.

The role of the quality of institutions and good governance cannot be overemphasised. In fact, Sala-i-Martin and Subramanian (2003), Isham et al. (2005), Johnson (2003), Carmignani and Chowdhury (2007) and McKay (2012) opined that the poor quality of institutions might be the principal cause of the curse. If good institutions were in existence, the effects of other channels of the curse would be suppressed most notably, the rentier effect and corruption which could be a judged as fundamental characteristics of African Countries. Mehlum et al. (2005) see the primary determinant of growth performance in resource-rich countries as resting with the institutional arrangements governing the distribution of rents from these resources. For example, Norway was able to evade the curse because as at the time oil was discovered, the country had good institutions and political will in place. In Africa, Botswana was able to turn its natural resource abundance into blessing as a result of its earlier seeds of good institutions. Limi (2006) stated that "… *the reason Botswana has nevertheless achieved marked growth to date seems to be that it has sound institutions and good governance…*

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economic growth has not been too impressive in countries like Venezuela, Indonesia and Nigeria partly because of inadequate governance". Hence, it could be said that it is disastrous for countries that have discovered oil without developed institutions. The studies mentioned above, among other influential ones, contradict the finding of Sachs and Warner who were of the opinion that institutions had little or no influence in the growth process of resource-rich countries.

Nevertheless, caution must be taken as regards the importance of institutions and governance since here seems to be some anomalies.[9] For example, Malaysia is blessed with natural resources and has good institution in place but the growth rate of the economy is rather slow. Albania is a resource-scare country with poor level of governance but, experiencing a remarkable growth rate. Consequently, it is therefore not in all cases that high level of governance and institutions leads to growth,[10] but interaction with other macroeconomic variables[11] would ensure the positive association between resource wealth and economic growth (Limi, 2006).

3 Brief literature review

As earlier stated, resource curse is not new in the field of development economics. Empirical studies have investigated the sources and consequences of the curse and hence, have offered remedies to the problem. These investigations have been carried out both from a global perspective and the use of series of country case studies. It is interesting to note that there appears to be no consensus on the issue. However, there is appreciable agreement in the empirical circle that among the channels of the curse, rentier and Dutch disease effects are prominent. Seminal papers by Sachs and Warner (1995, 1997), brought the generally negative relationship between resource exports and economic growth to the attention of the academic community, thereby generating much follow-up research. Their studies therefore provide a useful starting point for subsequent discussion.

Using the share of natural resource exports in GDP as resource abundance indicator, Sachs and Warner (1995) found statistically significant evidence for a negative relationship between per capita economic growth and resource abundance over the period 1970–1990. Similarly, they concluded that quality of institutions and bureaucracy had no prominent role in explaining the resource curse hypothesis.

Sala-i-Martin and Subramanian (2003) while limiting their scope to Nigeria, considered both the direct and indirect effects of resource abundance on growth. The direct effect negates the resource curse hypothesis, while the result of the indirect effect shows that resource abundance retards growth through institutional quality. They concluded that while rentier effects (especially corruption and waste) were more of a problem, Dutch disease[12] appears to have little or no effect on growth. According to the authors, this weakness seems to arise from over investment in physical capital which has suffered poor productivity as a result of weak capacity utilisation in government as well as companies and corporations, the majority of which are in the manufacturing industry.

Carmignani and Chowdhury (2007) opined that resource dependence is not necessarily a curse but is detrimental to growth because of poor existing institutional quality. In a comparative study between Sub-Saharan African (SSA) countries and the rest of the world (ROW), they found that based on weak institutional quality which is a major characteristic of SSA, natural resources do not contribute significantly to the region's growth process. Similarly, the degree of specialisation on primary products

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could account for the differential effects of natural resources on growth between SSA and the ROW. It could be stated that SSA specialises in primary products that are intrinsically bad for growth while the converse applies to the ROW sample. On the interaction between natural resources and institutional quality, at low levels of institutional development, resources retard growth but as institutions improve, resources turn from curse into a blessing.

In a study based on 50 states in the USA, Johnson (2003) identified three channels of the curse as in the literature- neglect in education, Dutch disease and rentier effect. The results of the study confirm the existence of resource curse in the USA but the three channels stated above are not vehicles through which natural resources have impacted negatively on growth. Hence, it would be difficult to make policy recommendations on the results since the cause has not been established. He, however, reckoned that geography of natural resources is a conceivable explanation in the case of the USA.

Limi (2006) examined the hypothesis for 89 countries (both developing and developed). The result confirms the hypothesis without the interaction of measures of governance. Furthermore, the study equally strengthens the case for the importance of good quality institutions. In order to account for endogeneity issues, some estimations were limited to developing countries and the result was quite similar to the one obtained for the full sample. There is no clear evidence to support the validation of Dutch disease as a plausible channel linking resource wealth to growth. It was concluded that Botswana was able to avoid the curse based on her high level of governance. In fact, the study advocated for further improvement in regulatory quality and control of corruption.

In their study, Busse and Groning (2010) considered the effect of resource abundance on governance indicators such as corruption, law and order and bureaucracy quality for 129 countries. In order to account for endogeneity related issues, the study employed system GMM. Their result confirmed the negative effect of the three governance indicators. For the robustness test, the sample was divided into developing and developed countries. The results still hold but were more pronounced in developing countries relative to developed countries and the full sample. Similarly, the OLS estimates of Arezki and van der Ploeg (2007) confirmed the resource curse hypothesis for countries that are deficient in quality institutions, have low level of investment and are encumbered with restrictions. However, their OLS result does not survive the use of Instrumental Variables techniques and when institutions are measured using *de jure* method (logarithm of colonial settler mortality, legal origin and the fraction of the population speaking English language). Hence, it could be argued that measures of institutions matter in the resource curse-growth debate.

In a case study of Indonesia, Komarulzaman and Alisjahbana (2006) revealed the existence of resource curse at the national level. Institutions was measured by government spending and investment ratio of GDP and three proxies were used to measure resource abundance – share of forest rent in GDP, share of oil and gas rent in GDP and mining rent as a percentage of GDP. Interaction of resource abundance measured in forest rent and mining rent negates the hypothesis when institution is captured by investment ratio of GDP, while for resource abundance as measured by oil and gas rent, the results confirm the hypothesis.

Brunnschweiler (2008) empirically tested the hypothesis and found that individually, resources (particularly mineral resources) and institutions matter for growth, though, institutions have a diminishing effect on growth. On the interaction between resources and institutions, the results negate the empirical studies that have advocated for

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improvement in the level of institutions. Hence, improvement in the level of institutions offers no obvious advantage to the growth pattern of resource abundant countries. Again, the study refutes the indirect negative growth effect of natural resources via institutional quality. Subsequently, the study concluded that there is no evidence of resource curse and the rent seeking hypothesis as a channel to the causation is statistically unfounded.

Using Sachs and Warner's (1997) dataset, Mehlum et al. (2005) validated the resource curse hypothesis. Taking a step further, Mehlum et al. made a proposition about the importance of institutions. They hypothesised that resource curse can be neutralised in 'producer friendly' rather than 'grabber friendly' countries. However, the hypothesis could not hold when measures of institution were incorporated in the growth regression. Again, their result showed that Dutch disease is less of a problem in the resource curse hypothesis. While trying to confirm if the curse was peculiar to Africa, it was rather found to be a global phenomenon.

4 Methodology

4.1 Definition and measurement of resource abundance

Measurement of resource abundance has generated a heated debate that is as prominent as the hypothesis itself. It can also be argued that RCH depends on the proxy for resource abundance.[13] Resource abundance looks simple but quite difficult to measure and/or quantify. However, there are three conceptual indicators that accurately measure resource abundance: Produced assets, Human resources and Natural capital. It should be stated here that most studies limit their measurement to the last indicator. Despite this, there appears to be no consensus among scholars.

For example, Sachs and Warner (1995) measured resource abundance with primary commodity export in GDP. However, this has met stiff criticisms as it is argued that it is a crude measure for a number of reasons. First, not all countries are endowed with primary commodities. Since in certain settings, weather conditions and topography may not be conducive for agricultural products. Second, a resource-rich country might export few of its resources because it has a vibrant manufacturing sector that utilises high proportion of the available resources. Third, if a resource rich country fails to develop the productive capacity of the resource sector, low output would be produced and exported. Hence, this serves as a bad proxy (Stijns, 2005; Limi, 2006; Bond and Malik, 2008).

In addition, the type of growth model developed is also crucially important. For example, if an endogenous growth model is developed, the most appropriate measure of resource abundance is the oil, gas and or coal rent or revenue derived from export. This is because the oil/mineral sector is high skill intensive and requires innovative technology (Stijns, 2005). In an attempt to measure the fiscal impact of oil revenue in an economy, it was proposed that oil resource abundance can be captured by the ratio of revenues from oil related products to total government revenue (Sala-I-Martin and Subramanian 2003; Akanni, 2007). In an attempt to reconcile this diverging view and reach a consensus, Stijns (2005) opined that resource abundance should be measured based on natural resource exports, production or reserves, but cautioned that the last two have a high degree of correlation with oil/mineral data.

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4.2 Model specification

This study follows Sachs and Warner (1995), Mehlum et al. (2005) and Limi (2006) with the following specification:

$$g = \propto_0 + \propto_1 RES + \propto_2 \theta + \propto_3 RES * \theta + \propto_4 X' + \varepsilon \quad (1)$$

where g is the real growth per capita, RES is a measure of resource abundance and θ serves as proxy for institutions/governance. X' is a set of control variables. In the standard growth literature, there are over 70 variables that serve as determinant of growth but only 17 of them are statistically robust to deserve inclusion in growth regressions (Carmignani and Chowdhury, 2007; Sala-i-Martin and Subramanian, 2003). Due to data availability, this is further reduced to 4.[14] To the emphasis of the study, $\propto_3$ is the interactive term between resource abundance and institutional measures while ε is the random error term.

4.3 Econometric issues and data

In recent years, ordinary least square has been the most common estimation technique for both time series and panel data. However, this technique has been considered to exhibit biasness behaviour and endogeneity problems, thus, recent empirical analysts tend not to base their policy recommendations on OLS result only. Hence, we employ a more sophisticated technique: the generalised method of moments (GMM) which was initially proposed by Holtz-Eakin et al. (1988) and later developed by Arellano and Bover (1995) and Blundell and Bond (1998)

The first-differenced GMM estimators applied to panel data models address the problem of the potential endogeneity of all explanatory variables, measurement errors and omitted variables. The basic idea of the first-differenced GMM is to take first differences to remove unobserved time invariant country specific effects, and then apply instruments to the right hand-side variables in the first-differenced equations using levels of the series lagged one period or more, under the assumption that the time varying disturbances in the original levels equations are not serially correlated (Bond et al., 2001). The system GMM estimator combines the previous set of equations in first differences with suitable lagged levels as instruments, with an additional set of equations in levels with suitably lagged first differences as instruments. Blundell and Bond (1998) have evidence from Monte Carlo simulations that system GMM performs better than first-differenced GMM, the latter being seriously biased in small samples when the instruments are weak. All data used in the study apart from measures of institution are collected from World Development Indicators of the World Bank dataset. Data on institution are sourced from World Governance Indicators.

5 Empirical results and discussions

In trying to unravel the linkage between institutions and resource abundance on one hand and its effect on growth on the other, the study employs two measures of resource abundance.[15] The study measures institution with the six governance indices provided by the World Bank.[16] The following results were obtained:

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First, it was observed that resource abundance is positively and significantly related to growth across all regressions. Hence, supporting the resource led growth hypothesis, and negating the resource curse results of earlier studies. Second, all the indices of institution and the aggregated indicator are positively and significantly related to growth with the exception of government effectiveness and control of corruption, though insignificant. A possible explanation for negative effect of these two indices could be linked to their weak performance. Corruption is a common place in Africa and it is also regarded as one of the major causes of underdevelopment in the continent. As for government effectiveness, it is scarcely arguable that government responsibilities are not well discharged and the citizenry typically lack access to critical social services.

One of the objectives of this study is to examine how the interaction of resource abundance with institutions affects growth. All the indices of institutions apart from regulatory quality and control of corruption are positively related to growth. Countries with high level of institution particularly political stability, government effectiveness, rule of law and voice and accountability stand the chance of experiencing oil wealth driven growth. The results imply that the mere abundance of resource is not a precursor to growth; rather good governance, which ensures proper management of resource wealth, boosts the chances of attaining growth. This conclusion confirms the influential studies of Sala-i-Martin and Subramanian (2003), Busse and Groning (2010), Limi (2006), and Arezki and van der Ploeg (2007) among others who all argued in favour of the positive effect of institutions in the oil wealth-growth nexus.

In order to confirm the importance of institutions as indicated by the results, an overview of the study's data set showed that countries with strong institutions such as Botswana, Cape Verde, Lesotho and South Africa grew faster than countries with weak institutions such as Burundi, Chad, Djibouti, Algeria, Nigeria, among others. Subsequently, we split the dataset into two developed (Botswana, Cape Verde, Lesotho and South Africa) and underdeveloped. As expected, the interaction term between institutions and measure of natural resource abundance produces higher coefficients as compared to the coefficients in Tables 1 and 2.[17]

Other variables such as trade openness and investment have positive association with growth which follows the intuition in the literature. The importance of these variables cannot be over-emphasised in the growth process. The results also confirm the convergence hypothesis that low income countries will grow faster and catch up with the high income countries which is consistent with earlier studies. Population growth has a negative coefficient. All the control variables are in most cases statistically robust as evident from Table 1.

The study went ahead to confirm if resource curse is peculiar to oil rent. Interestingly, the result obtained is very similar to that of the total natural resource rent. Hence, refuting the argument of Sala-i-Martin and and Subramanian (2003) who posits that Nigeria's problem is more of corruption and mismanagement of oil wealth through the rentier effect. It should be stated that caution must be exercised when interpreting this result because in reality, African Countries rich in oil are susceptible to mismanagement, embezzlement and laundering of oil wealth. Experiences in Nigeria, Libya and Egypt where governments of Sanni Abacha, Mohammar Ghadafi and Hosein Mubarak respectively were accused of the aforementioned. The significance of these results further worsens the situation. In fact, all the phases of rentier effect[18] were witness under these regimes.

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Table 1 Total natural resource rent

Variables	*1*	*2*	*3*	*4*	*5*	*6*	*7*
RES	0.371 (0.020)*	0.253 (0.005)*	0.405 (0.020)*	0.220 (0.018)*	0.187 (0.015)*	0.387 (0.019)*	0.342 (0.013)*
AGG	1.496 (0.625)**						
RES * AGG	0.113 (0.014)*						
TRA	0.058 (0.003)*	0.066 (0.002)*	0.050 (0.002)*	0.057 (0.002)*	0.057 (0.002)*	0.053 (0.003)*	0.040 (0.003)*
INV	0.089 (0.009)*	0.098 (0.005)*	0.107 (0.005)*	0.099 (0.005)*	0.111 (0.007)*	0.098 (0.251)*	0.102 (0.010)*
POP	–0.903 (0.185)*	–0.733 (0.157)*	–0.320 (0.186)	–0.405 (0.181)**	0.048 (0.275)	–0.969 (0.252)*	–0.635 (0.260)**
INI	–3.258 (0.176)*	–3.300 (0.080)*	–2.382 (0.121)*	–2.165 (0.117)*	–2.659 (0.098)*	–3.140 (0.224)*	–3.066 (0.210)*
POL		0.808 (0.061)*					
RES * POL		0.058 (0.003)*					
GOF			–0.644 (0.889)				
RES * GOF			0.157 (0.016)*				
RUG				1.185 (0.572)**			
RES * RUG				–0.015 (0.011)			
COR					–0.581 (0.617)		
RES * COR					–0.041 (0.009)*		
RUL						2.024 (0.948)**	
RES * RUL						0.136 (0.018)*	
VOI							3.209 (0.300)*
RES * VOI							0.075 (0.009)*
J-statistics	39.027	40.565	43.086	43.526	43.300	39.393	37.163
SER	8.560	8.535	8.520	8.483	8.538	8.560	8.686

Notes: Values in parenthesis represent the standard error coefficient, while * and **show the level of significance at 1 and 5% respectively. AGG is the aggregate of the six governance indicators; POL is political stability; GOF means government effectiveness; COR is the control of corruption. RUG is the regulatory quality, while RUL measures rule of law and VOI accounts for voice and accountability. SER is the standard error of regression.

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Table 2 Oil rent

Variables	*1*	*2*	*3*	*4*	*5*	*6*	*7*
RES	0.283 (0.104)*	0.215 (0.079)*	0.207 (0.107)**	0.185 (0.236)	0.003 (0.015)	0.361 (0.159)**	0.279 (0.217)*
AGG	1.091 (4.113)						
RES * AGG	0.062 (0.056)						
TRA	0.029 (0.014)**	0.017 (0.026)	0.030 (0.020)	0.018 (0.026)	0.039 (0.018)**	0.021 (0.012)	0.030 (0.010)*
INV	0.144 (0.042)*	0.140 (0.049)*	0.158 (0.071)**	0.148 (0.054)*	0.165 (0.082)**	0.183 (0.074)**	0.125 (0.033)*
POP	–2.087 (2.213)	–1.913 (2.330)	–2.048 (1.474)	–3.303 (4.419)	–5.827 (5.077)	–2.058 (2.354)	–1.611 (1.941)
INI	–4.089 (0.665)*	–4.773 (1.097)*	–3.314 (1.049)*	–4.086 (1.925)**	–5.464 (3.024)	–3.886 (0.885)*	–3.725 (1.009)*
POL		–0.091 (2.954)					
RES * POL		0.056 (0.041)*					
GOF			11.120 (3.337)*				
RES * GOF			–0.028 (0.073)				
RUG				13.339 (10.418)			
ES * RUG				–0.309 (0.191)			
COR					6.569 (4.396)		
RES * COR					–0.205 (0.151)		
RUL						12.084 (7.441)	
RES * RUL						0.140 (0.113)	
VOI							6.368 (5.500)
RES * VOI							0.035 (0.138)
J-statistics	5.880	6.725	5.443	7.951	8.037	6.503	3.966
SER	8.904	9.006	8.789	8.436	8.649	9.501	10.407

Notes: Values in parenthesis represent the standard error coefficient, while * and **show the level of significance at 1% and 5% respectively. AGG is the aggregate of the six governance indicators; POL is political stability; GOF means government effectiveness; COR is the control of corruption. RUG is the regulatory quality, while RUL measures rule of law and VOI accounts for voice and accountability. SER is the standard error of regression.

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6 Conclusions and policy implications

In trying to determine the linkage between resource abundance and institution on one hand and its effect on growth on the other, the study adopted a panel data analysis for about 47 countries and for the sample period of 1996–2010. It was found that just as the interaction of resource abundance and overall institution matter for growth, the importance of individual components of institutions cannot be overemphasised. The result also cast doubt on the peculiarity of oil rent to resource curse which has been the view in the literature. The following are policy implications that can be drawn from the study:

- There is urgent need for African Governments to step up their institutional development that is advanced enough to turn around the ill fortune of resource curse. Particularly, Africa is still bedeviled with high level of corruption, government ineffectiveness and poor regulatory quality.
- The importance of trade openness and investment has been emphasised in numerous theories and studies. Hence, to further derive the benefits of growth, policies must be put in place to supplement the gains from trade and investment.

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Notes

1 In this study, resource abundance, resource dependent countries and resource rich countries are used interchangeably.

2 Specifically, Gylfason (2001) orate that OPEC on the average (1965–1998) has a negative GNP per capita growth rate of 1.3% while in the rest of the developing world, GNP per capita growth was an average of 2.2%.

3 They are Botswana, Indonesia Malaysia and Thailand. They were able to achieve this through the diversification of their economies away from oil and a vibrant manufacturing sector with the exception of Botswana. Some plausible reasons for Botswana's success include based on improved institutions, good governance, democratic stability and rapid income growth.

4 See Appendix for the list of countries under investigation.

5 Prominent studies like Auty (2001), Gylfason (2001), Sachs and Warner (1995, 1997), Sala-i-Martin and Subramanian (2003) and among others identified rentier effect and corruption as the major causes of the curse. Resource abundance is not a direct cause of corruption but lack or absence of property rights, a condition that seems to be present in many developing states.

6 Andersen and Aslaksen (2008), as cited in Torvik (2009), illustrated that resource curse is more rampant in presidential democracies than parliamentary democracies. Similarly, parliamentary democracy matters for growth than presidential or autocratic style of governance. However, Haber and Menaldo (2007) find evidence suggesting that increasing dependence on natural resources promotes democratisation; they also provide evidence that there is no relationship between resource dependence and authoritarianism in Latin America.

7 Dutch disease is caused by other mechanisms and there appears to be no consensus on its nature, causes and symptoms (Larsen, 2004). McKay (2012) opined that in the African context, Dutch disease is less of a problem in explaining the woes and poor growth performance of most resource-rich countries. The manufacturing sectors of most SSA countries are not developed, hence, the potential de-industrialisation posed by currency appreciation is not really a problem.

8 An example is the movie –*The Blood Diamond* which captured the conflict in Sierra Leone – a West African Country that has diamond as a natural resource.

9 Though, Isham et al (2005) and Sala-i-Martin and Subramanian (2003) stated that countries with large deposit of natural resources tend to have poorer quality of institutions and this consequently negatively impacts on growth. Torvik (2009) measured resource abundance by oil and mineral exploration only, his result indicated that institutions had a stronger positive growth effect in countries with poor institutions and vice versa. Arezki and Van der Ploeg (2007) criticised the work of Mehlum et al. (2005) on the ground that once the scope of Mehlum et al. was updated with new data, the significant effect of institutions and its interaction with resource exports on growth disappears.

10 In fact, Brunnschweiler (2008) showed that development of institutions diminishes the growth pattern though, still positive.

11 Torvik (2009) argued that institution alone might not be able to account for the effect of resource abundance on growth. Hence, Arezki and Van der Ploeg (2007) viewed that resource rents might work better in countries with high openness to trade while Poelhekke and van der Ploeg (2007) linked their interactive term to financial development. In their study, Komarulzaman and Alisjahbana (2006) measured institutions by government spending and investment ratio of GDP.

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12 Nonetheless they acknowledged that Dutch disease took place in the 1970s. However, this was followed by prolonged depreciation for almost 15 years. The explanation for this reversal remains knotty.

13 See Komarulzaman and Alisjahbana (2006) and Arezki and van der Ploeg (2007) for more details.

14 Trade openness, investment (gross fixed capital formation), initial income and population growth were considered. This is due to inability of the authors to have full data set of some variables for the full sample.

15 The two measures are total natural resource rent and oil rent. Oil rent is included in order to confirm the hypothesis, postulated by Sala-i-Martin and Subramanian that oil resources significantly retard growth prominently through the rentier effect. Agricultural rent was not considered here because it is an over flogged issue. See Johnson (2003) for studies that captured resource rent via agricultural export.

16 The six indices were assigned equal weight and aggregated into a composite index in order to examine aggregated effects. The study also investigated their individual effects.

17 These results are not presented here for want of space. But interested readers can request from the authors.

18 Corruption, suppression of oppositions, delayed modernisation and stifle calls for democracy.

Appendix

Table A1 List of countries in the sample

Resource rich		*Non-resource rich*	
Oil	*Non-oil*	*Coastal*	*Landlocked*
Angola	Botswana	Central African Rep.	Ethiopia
Cameroon	Burundi	Kenya	Mauritania
Rep. of Congo	Congo Demo Rep.	Madagascar	Niger
Gabon	Egypt	Mozambique	Rwanda
Ghana	Liberia	Senegal	Burkina Faso
Equatorial Guinea	Morocco	South Africa	Lesotho
Nigeria	Namibia	Tanzania	Malawi
Chad	Sierra Leone	Togo	Mali
Libya	Sudan	Zimbabwe	Swaziland
	Tunisia	Cape Verde	Uganda
	Zambia	Cote d' Ivoire	
	Algeria	Djibouti	
	Benin	Guinea	
	Comoros		
	Eritrea		

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