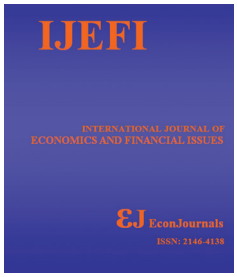

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Revisiting the Curse: Resource Rent and Economic Growth of Sub-Sahara African Countries

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ABSTRACT

This paper empirically verifies the drivers of economic growth of resource abundant Sub Sahara African countries (SSA) and examines the extent to which they are typical or unique to the resource curse hypothesis. To this end, using an econometric model of Driscoll-Kraay an assessment is made on a sample of 22 resource-rich Sub-Saharan African countries over the period 1998–2016. The result contradicts the argument of the resource curse due to a positive and significant relationship between resource rent, institutional quality, and economic growth. Nevertheless, the study provides evidence of the curse through the exchange rate, foreign debt, and education. The results are also robust under alternative econometrics estimation model of IV-2SLS and GMM-System.

Keywords: Resource Curse, Resource Rent, Sluggish Economic Growth
JEL Classification: Q

1. INTRODUCTION

Since late 1990's, a reasonable amount of the literature depicts natural resources more of a curse than the blessing. One of the surprising features of the argument is that resource-poor countries often outperform resource-rich countries in terms of economic growth (Sachs and Warner, 1997; Andreasson, 2015; Kim and Lin, 2015; Badeeb et al., 2017). After 20 years of intensive research and action, "the curse" still lingers as a very real global problem, as evident from the multiple challenges many mineral and oil-rich countries currently face (Papyrakis, 2016).

Empirical studies explicitly considered various transmission channels of the effects of natural resource curse (RC). For instance, Gylfason (2001), concentrated on the different links with human capital and found that the negative growth effects of NR stem from the lower education spending and less schooling in resource-rich countries. Frankel (2010), argue on the reason for such inconsistency of the empirical findings could be due to the different type of resources, either point or diffuse, and different economic backgrounds, a difference in the area of level of human capital, level of debt overhang, and export diversification. Similarly, Brunnschweiler (2008) postulates the inconsistencies in the empirical finding to originate from the inappropriateness of resource abundance measurement to proxy natural resources.

Recent studies which challenge the resource-curse hypothesis have gained momentum among policymakers (North and Thomas, 1973; Brunnschweiler, 2008; Brunnschweiler and Bulte, 2008; Alexeev and Conrad, 2011; Boschini et al., 2013), argue countries such as Australia, the United States, and Canada benefited from primary commodity exports in the early stages of their economic development. Besides, Ecuador's significant developments after the resource boom and Norway's ability to use its natural wealth for economic prosperity have brought the fading hope of growing with resource plenty. Such experiences lead resource-rich countries to aspire more from their oil and mineral rents (North and Thomas, 1973; Auty and Mikesell, 1998; Papyrakis and Gerlagh, 2003; Papyrakis, 2016).

Two issues emerge when examining the original Sachs and Warner's data. First, the sample of countries may not be random if resource-rich countries are more likely than resource-poor countries to report data and therefore error appears in the sample. Second, the Sachs and Warner sample, which includes primary resource export from almost 50 years ago (1970) to explain average economic growth between 47 and 27 years ago (from 1971 and 1990) is dated to depict the dynamic reality of economic growth of the epoch. The other spontaneous reason to doubt the existence of the RC is the apparent persistence of institutional quality between countries and regions (Alexeev and Conrad, 2011; Bennett et al., 2017). The growing literature documents that the institutions are found to play a vital role in determining the economic performance of resource-rich economies, and should therefore be awarded a more prominent place in the analysis of the resource-curse analysis. Hence, the study uses the composite measure of institutional quality to capture the various aspects of institutional quality and understand how the institutional quality drives the growth of the Sub Sahara African (SSA) countries.

Despite, the factors that have been empirically associated with the natural RC and the Dutch disease prevails in most SSA resource-rich countries, there are countries that have succeeded in improving the economic growth. Excluding South Africa, the recent economic growth trend buoyed by new mineral exports—iron ore in Sierra Leone and uranium and oil in Niger, Uganda, a return to peace Cote D'Ivoire is making the region one of the fastest growing developing regions (Lundgren et al., 2013; Olanya, 2015; World Bank, 2016). Moreover, since 1993 the overall decline in the incidence of conflicts in SSA region and general improvements in quality of the institutions, as well as bilateral and multilateral aids, the growth is further augmented the average household consumption by more than one third from US$1580 to $2080 (Addison et al., 2017). In addition to these, despite the global financial crisis of 2008/09 Africa has grown at 4.7% between 2000 and 2009, such economic leaps made the region to fasten the catching up process (World Bank, 2016). With the glimpse of such economic growth, long history of oil and mineral resource extraction and with the increasing doubt over the results obtained in S and W, it is fair to ask how does the RC affect the region?

We assume, the important empirical explanations linked with the question of why some resource-rich countries thrive while others lag behind, have different and extended explanations than simple and straightforward. Therefore, in this paper, we undertake an assessment on the economic performance of the SSA resource rich-countries and re-examine the RC hypothesis through relaxing the criteria of resource richness to include the resource-poor SSA countries. Besides identifying the genuine channels through which the curse is affecting the countries, it provides robust, reliable estimation. The study considers the exhaustible resource-rent; specifically; mineral and oil resource rent and the selection of the countries further may depict better the phenomenon of the RC in the region.

The remainder of the paper is structured as follows. Section 2 presents the literature reviews, section 3 methodology, and the data set and section 4 presents empirical results based on alternative estimations. Finally, section 5 provides the conclusion of the study.

2. LITERATURE REVIEW

Concern over the impact of great wealth on society goes back as far as the writing of the delightful quote of the sixteenth century French philosopher Jean Bodin which states *"Men of a fat and fertile soil are most commonly effeminate and cowards; whereas, contrariwise a barren country makes men temperate by necessity, and by consequence careful, vigilant and industrious"* (Stevens, 2003). Studies on the curse of natural resources can be seen as an extension of the standard endogenous growth theory where economic growth is determined within a model by factors such as economic institutions and policies and the accumulation of capitals (Karabegović, 2009). In exogenous growth models, on the other hand, the long-run economic growth is determined by factors outside of the model such as the rate of technological progress." Karabegović (2009), gave an exhaustive review of the literature on the "curse" of natural resources and a detailed explanation of many of the theories about the topic referee can be made on.

Literatures have identified different economic channels through which resource abundance to hurts country's economic growth. Hypotheses developed to explain the RC. Among the many to mention some; natural resources crowd out manufacturing activity (the so-called Dutch disease) (Sachs and Warner, 1995; Sachs and Warner, 2001; Torvik, 2001; 2002). It results in underinvestment in human capital (Gylfason et al., 1999; Gylfason, 2001), it also leads to rent-seeking and corruption (Baland and Francois, 2000; Torvik, 2002). Empirical studies also identified the resource abundance to creates volatility and price fluctuations in international commodity markets and also to create weak backward and forward linkages between sectors makes the RC inevitable to less developed countries with weak macroeconomic management and weak institutions to appear (Stevens, 2003; World Bank, 2012; Siakwah, 2017). Studies also associated the resource to increase incidences of social conflict, rivalries and civil war (Collier and Hoeffler, 1998; Hodler, 2006; Collier and Hoeffler, 2016) and to undermine institutional qualities (Ades and Di Tella, 1999; Acemoglu and Robinson, 2001; 2006).

Contrary to the pessimists, the question as to whether natural resources are a curse for economic growth and development or not is subject to considerable debates and remained controversial (Kim and Lin, 2015). The more recent literature, however, questioned the existence of this curse, pointing out serious pitfalls with the empirical work that claims to demonstrate its existence. For instance, contrary to our initial expectation, natural resource abundance between 1990 and 2010 had positive impacts on economic growth, (James, 2015; Gerelmaa and Kotani, 2016). They further test Dutch disease theory, and found the result to contradict the Dutch disease hypothesis. Hence, they tilt to support the largely capital accumulation leads to better economic growth keeping other things constant. Overall, their analysis suggests that in the period from 1970 to 1990, the hypotheses of a RC and Dutch disease had a ground. However, from 1990 to 2010, the hypotheses have no longer holds, because manufacturing sectors have grown sufficiently in resource-rich countries (James, 2015; Gerelmaa and Kotani, 2016). Badeeb et al. (2017), empirically identified the mechanisms in which resource wealth might slow

down economic growth, he also called for future studies to better address the endogeneity of factors of studies, to expand the years of study and range of empirical methodologies used (Badeeb et al., 2017). Such arguments on the ban or boom of resource abundances certainly brought a conceptual puzzle of the RC (Andersen and Aslaksen, 2008; Miller, 2015).

Recent studies include data from the 1990s and 2000s and generated a positive association between resource dependence and economic growth, leading some to reject the very existence of a RC (Brunnschweiler and Bulte, 2008; Alexeev and Conrad, 2011; Ayelazuno, 2014). This counter-intuitive result reinforces the so-called RC puzzle (Nankani, 1979; Saha and Ben, 2017). Putting it the other way round, as there are growths winners among the resource-rich countries, also there are losers. A prominent example of growth winner in SSA is diamond-rich Botswana with the world's highest growth rate since independence in 1966 (Boschini et al., 2003). The other exemplary growth winner is Norway, the world's third-largest oil exporter (Van Der Ploeg and Poelhekke, 2016). Peru, Malaysia, and Thailand are developing countries that can be added to the list of resource-rich countries that have avoided the curse. In addition, Chile, Brazil, and Australia can also be included in recent examples where the mineral sector has contributed positively to the economic boom.

The variation in performance in economic growth is also evident in human development index (HDI) of the resource abundant countries. For example, there are close to forty countries in the world with oil revenues that constitute at least 30% of their export earnings. Many of them have a substantially lower HDI rank than GDP rank. Yet such an underperformance in human development is not true for all, as close to half of these oil-rich countries have an HDI rank equal to, or higher than, their GDP rank (Mehlum et al., 2006). This example shows that the existence of natural resources can be both a blessing and a curse to economic growth and development (Gylfason, 2004).

Furthermore, interestingly, a substantial number of empirical papers that discussed RC have found conditioning factors for the S and W results, found no statistical relationship between resources and growth, or found a positive relationship. However, the direction of the literature is less certain – if you take away the S and W results and those papers that use the same data, then empirical support for a negative relationship between resources and economic growth is rare. Thus, according to the proponents of resource windfall is an asset for economic growth, the S and W largely stands alone in this empirical debate. To ascertain this debates continuous study with different perspectives and methodologies are required if it has to benefit the policymakers and economics specialists.

3. METHODOLOGY

Early empirical studies regarding the RC contained measuring the impact of natural resources on economic growth regardless, the heterogeneity of resource-rich countries of the world. Taking in to account the heterogeneity of countries in the administration of natural resource rents, level of economies and other economic, socio-political factors may give better details of the matters of the specific region. Indeed, resource rents and institutional frameworks and qualities differ from one country to another, which could hide the reality of the genuine effect of dependence on economic performance indicators of countries. Combining the data (data pooling) from developing countries and those of developed countries may also generate biases that result from the spatial and temporal correlation errors, as well as may cause problem of heteroscedasticity (Beck and Katz, 1995). Such problems might cause some estimation to be inefficient.

Hence, we focus on resource dependence of the SSA countries, which is defined as the share of total non-renewable natural resource rents (oil, natural gas, coal and mineral rents) in the GDP. Due to limitations with the natural resource abundance indicator of Sachs and Warner (1995), several studies have opted to use diverse parameters such as the share of mineral production in the GDP, the share of exports of minerals in the GDP or the share of resource rents in the GDP (Manzano and Rigobon, 2001; Mehlum et al., 2006). The proxy of resource dependence is considered a reliable indicator (Stijns, 2006). Though the strategy employed differ, this study considers and further build on Mehlum et al. (2006) Mehlum et al. and Boschini et al. (2013)'s influential works and highlight the impact of institutional quality on growth. In other words, when there is good public order and the absence of corruption, resource abundance may be perceived as good fortune. Accordingly, un-weighted average of five Institution's quality indicator (IQ) such as; estimates of Control of Corruption, Government Effectiveness, Political Stability and Absence of Violence or Terrorism, Regulatory Quality, Rule of Law, and Voice and Accountability) are used to measure institutional quality. The value of the index ranges from −2.50 to 2.50. The higher the value of the institutional quality indicates the better the institutional quality of the country.

Regarding the sample of countries explored, the primary concerns are; the sample consists of 22 SSA countries rich in nonrenewable resources. In addition to these, for purposes of robustness controls, overcome sample bias limitations and assess the validity of the empirical findings in relation to the region's context, the restrictions of being resource-rich are removed to allow 14 resource-poor countries to make the largest set of 36 SSA countries[1]. This remains to be examined primarily in the context of countries heavily dependent upon exhaustive resources. We assume pooling data from heterogeneous regions (developed and developing) may generate biased estimation due to the incomparable institutional, cultural, spatial, temporal and economic characteristics of the countries. A similar strategy is also followed by (Tsani, 2013).

From the perspective of economic growth determinant, domestic capital formation measured by gross fixed capital formation as the percent of GDP and average primary school enrollment are considered in the study. These variables were included in the study due to their strong correlation with RC and they are justified by the decline in savings and physical investment and the low investments in education and human capital (Bravo-Ortega and De Gregorio, 2007). Furthermore, terms of trade and economy openness are

1 List of countries are annexed with the paper.

used. Moreover, we also included control variables for exchange rate and external debt to the models. The exchange rate is one of the proven variables identified by most economists as having a direct impact on economic growth. Exchange rates have a greater impact on commodity-rich countries, as a commodity price boom can result in exchange-rate appreciation. Similarly, external debt creates challenges for developing countries, as repayment of external debt requires countries to pay more than the actual debt. This may create an additional burden on the country's ability to grow (Pedro, 2004). All of these control variables are consistent with the empirical growth model.

$$Y_{i,t} = \beta_0 + \beta_1 Y_{i,t-1} + \beta_2 NR_{i,t-1} + \beta_3 X_{i,t-1} + \beta_4 K_{i,t} + IQ_{i,t-1} + \varepsilon_{i,t} \quad (1)$$

Where following Kim and Lin (2017) and Alexeev and Conrad (2011) we measure y; the economic growth over year t and in a country i using log of GDP per capita. NR is an indicator capturing natural resource abundance and IQ is the quality level of institutions. $X_{i,t}$, is other explaining variables such as; education, investment, external debt, exchange rate, country's dummy[2] the variable term of trade and trade openness. $K_{i,t}$ is an indicator for dummy variable if the country is resource rich 1 if a country is resource-poor 0. ε is the error term which is not explained by the study.

The study covers a panel data of 22 resource-rich SSA countries and 14 non-resource rich SSA countries Table A1 (annexed) from 1998–2016 for a period of 19 years. Resource-rich economies are defined as countries whose exports of natural resources exceeded one-fourth of total goods exports in 2005–2010 (Lundgren et al., 2013). To find out the sole effect of the economic growth nexus exhaustive resource, the study uses total non-renewable resource rent through deducting renewable rents from total resource rent (as a percent of the GDP). The data was collected from World Development Indicator and an absolute value of latitude is obtained from (La Porta et al., 1999). The descriptive statistics of all the variables used in the regressions and their source are reported in Tables A2 and A3 (Appendix A). Moreover, to check the Multicollinearity between the independent variable the variances of inflation factors is estimated and the values are found to be very low to indicate the issue of Multicollinearity is not a concern (Table A4 andA5 Appendix).

2 Category is made based on the IMF definition of resource abundance.

The major challenging impediment associated with the work on the RC that takes account the effects of institutional quality and economic growth is the problems of causal influence between economic growth and institutional quality. A number of explanations such as omitted variables, errors-in-variables, and, in particular, a potential simultaneous causality between institutional quality and economic growth are given to be the underline reason to believe that institutional measures are correlated with the error term (Brunnschweiler, 2008). Besides, the p-value of Durbin Chi-square test and Wu-Hausman F test is 0.008 and 0.009 consecutively indicate the institutional quality is endogenous. Hence, to address the underlying problems with the data, an extension of the GMM-system of the robust estimator of White (1980) is used. The technique used by Driscoll and Kraay (1998) takes into account the spatial and temporal correlation problem and gives standard errors robustness to heteroscedasticity and serial correlation are also considered in the assessment. Furthermore, Driscoll and Kraay estimate the parameters by considering the variables with one lag, allowing for the control of the potential endogeneity problems between variables. Another econometric problem is endogeneity between variables. Although the Driscoll-Kraay technique addresses the endogeneity bias, the instrumental variable technique is also relevant to triangulate the estimations. Therefore, the methods of the IV-2SLS and GMM-System are also used for robustness.

4. RESULTS

Table 1, reports the correlations between economic growth and the independent regressors and addresses different correlation issues between the dependent variables and independent variables. The correlation indicates the measure of natural resource and the economic factor included in this study by themselves are proxies for countries level of economic development. According to the table, the correlations between per capita GDP and the different measures are fairly strong. The measure of resource rent and institutional quality are fairly correlated with the economic growth of the region. These indicate resource rent and institutional quality are more likely affect economic growth positively. However, though there is a question of endogeneity of institutional quality, the resource rent does not appear to correlate with institutional quality positively. Other, control variables such as especially initial GDP, education, and investment are correlated positively with institutional quality, resource rent and LGDP. Furthermore, the simple correlation test also reveals that both debt and exchange

Table 1: Correlation between natural resource rent and economic variables

Variables	LGDP	IQ	L.GDP	RR	DBT	SCL	TOT	EXC	GCF	OPEN
GDP	1									
IQ	0.4149*	1								
L.GDP	0.9893*	0.4074*	1							
RR	0.3339*	−0.2774*	0.3028*	1						
DBT	−0.4007*	−0.2219*	−0.3775*	−0.1598*	1					
SCL	0.5139*	0.2639*	0.4892*	0.2314*	−0.0821	1				
TOT	0.6020*	−0.0327	0.5846*	0.4723*	−0.1555*	0.2764*	1			
EXC	−0.2219*	−0.2178*	−0.2249*	−0.0358	−0.0584	0.0139	−0.1849*	1		
GCF	0.2148*	0.0798	0.2215*	0.2529*	−0.1121*	0.1535*	−0.1547*	−0.0865	1	
OPEN	−0.1526*	−0.1236*	−0.2223*	0.1187*	0.4195*	0.0465	−0.2202*	−0.0227	−0.0865	1

rate are negatively correlated. We take into account when we perform the empirical estimation and robust tests.

To better compare and understand the growth effects of oil and mineral resource rent, and the vice associated with RC estimate, instigations and reports are made with the Driscoll-Kraay, IV-2SLS and the GMM-system models. The idea is that economic growth from 1998 to 2016 in the SSA oil and mineral resource dependent country is a function of a vector of explanatory variables, including the oil and mineral resource rent, exchange rate and institutional quality institutional quality. Prior investigation of the RC, pooled OLS estimations are made with all explanatory, and control variables, without the institutional quality, with, and without dummy variable that characterizes the resource-rich countries, whether the effects of the RR and the other important explanatory variable included responding the same (Table 5A).

To instrument the institutional quality, absolute value of the latitude, initiated by Hall and Jones (1999) is used and the estimate indicates that the latitudinal location is a strong instrument for institutional quality with a correlation value of partial R-square 0.3769 and F statistics 273.575 of with institutional quality. The IV-2SLS results reported in Tables 2 and 3, column 3 are those obtained when instrumenting institutional quality. Therefore, the result from the IV-2SLS is satisfactory given that the absolute value of latitudinal location is a strong instrument for institutional quality. Moreover, the robustness check addresses the GMM-System estimates rather than those of the IV-2SLS. According to the GMM-System estimator, both the AR (1) and AR (2) tests support the validity of the estimator. In the same manner, the p-values of the Hansen test were found to be insignificant, suggesting the model does not suffer from over-identification. Table 2 presents estimates solely for resource-rich countries and Table 3 displays the estimates of the sample including 14 resource-poor countries of the region, totaling 36 countries.

For the purpose of comparison, and as a first approach, we look at the statistical relationship between economic and RR with pooled OLS estimation. Table 5A, column 2 and 3 (annexed), show consistent and significant positive influence of natural resource abundance on growth. All other things being equal, the results would imply that an increase in per capita resource rent would bring large growth effect if we assume a direct causality. Across the three methods of estimations on average, an increase by one standard deviation in per capita resource rent would increase income growth over the period by 0.002 for resource-rich countries and 0.001 when relaxing the criteria of being richness and include all the sample size. The result contradicts the resource-curse hypothesis when Institutional quality is controlled. However, course does not appears directly through the resource rent when institutional quality is not controlled Table 4A column 1 and 4 (annexed) the estimation is only significant at 90% confidence interval. This implies, we do not rule out the curse with 95% and 99% confidence interval estimation.

Table 2 Columns (1-3) depict the results of coefficients of concern. First, by taking into account the existence of institutional quality in the estimations, the effect of resource dependence on growth remain to be consistently positive and highly significant, including

Table 2: The effects of RR on growth (resource reach countries)

Variables	(1)	(2)	(3)
	dris-kraay	Sys-GMM	IV-2SLS
L.GDP	0.827*** (22.34)	0.883*** (34.15)	0.924*** (68.99)
RR	0.003** (2.48)	0.003** (2.49)	0.003*** (3.48)
IQ	0.004 (0.05)	0.094*** (3.12)	0.039** (2.17)
DBT	−0.001*** (−2.93)	−0.000 (−1.48)	−0.001** (−2.56)
SCL	0.001** (2.43)	0.001 (0.91)	0.001* (1.68)
TOT	0.001*** (3.89)	0.002** (2.31)	0.001*** (3.69)
EXC	−0.000 (−0.51)	−0.000 (−0.35)	−0.000 (−1.00)
GCF	0.001** (2.13)	0.003* (2.05)	0.003*** (4.28)
_cons	0.809** (2.61)	0.725*** (4.49)	0.626*** (5.36)
N	396	396	396
F	254.774	2263.951	
N_g	22.000	22.000	22.000
AR (1)		0.001	
AR (2)		0.689	

*P<0.1, **P<0.05, ***P<0.01

Table 3: The effects of RR on growth (mixed countries)

Variables	(2)	(3)	(4)
	dris-kraay	Sys-GMM	IV-2SLS
L.GDP	0.942*** (100.62)	0.831*** (32.04)	0.935*** (88.53)
SCL	0.000 (0.03)	0.000 (0.32)	0.000 (0.84)
IQ	0.037** (2.35)	0.228*** (3.89)	0.043* (1.93)
RR	0.001*** (2.97)	0.008*** (3.50)	0.002*** (3.01)
DBT	−0.000*** (−4.81)	−0.001*** (−5.09)	−0.000*** (−4.33)
TOT	0.001*** (11.10)	0.002** (2.19)	0.001*** (5.33)
EXC	−0.000 (−0.71)	−0.000 (−0.48)	−0.000 (−1.31)
GCF	0.002*** (3.64)	−0.003 (−1.15)	0.001*** (2.73)
OPEN	4.3e+05*** (6.72)	1.5e+06*** (4.00)	4.7e+05*** (3.15)
_cons	0.000 (.)	1.162*** (6.70)	0.364*** (4.83)
N	648	648	648
F		4491.549	
r2_a			
N_g	36.000	36.000	36.000
AR (1)		0.063	
AR (2)		0.079	

*P<0.1, **P<0.05, ***P<0.01

under the robust GMM-System (column 2). The results also do not show deviation from the pooled-OLS estimation when institutional quality is controlled Table 4A column 1. In other words, regardless the types of estimation followed, the RC is reversed due to the institutional quality. Estimating the resource rent without controlling the institutional quality (not included in the article) indicates the RC occurrence in the region for resource-rich countries. Hence, we find institutional quality capturing the curse component of the resource. The estimations seem to supplement the empirical findings of Brunnschweiler (2008) argument of good institutional quality is a mandatory pre-requisite for resource-rich economies if they meant to develop. The result also seems to contradict with Sachs and Warner (2001) and Sachs and Warner (1995) RC hypothesis of countries that rely on resource tend to have low economic growth.

The second coefficient of concern is that of the institutional quality which indicates a positive and significant effect on the growth of the resource-rich SSA countries Table 4A (column 2 and 3). Empirically, institutional quality due to natural resources effects is shown to be

nonlinear, both with respect to income and with respect to the total amount of resources in a country (Brunnschweiler, 2008). In this study, we find positive effects of institutional quality on economic growth. The result shows that institutional qualities directly augment resource rent to affect economic growth positively. Table 4A (column 2 and 3) pooled OLS estimation reveals the effects of natural resource abundance on growth are positive and significant when institutional quality is controlled at 99% confidence interval. There may in fact be a curse when natural resource rent occurs together with weak individual indicator of institutional quality, as studies identify the most important institutional aspects in the context of RC appear to be the rule of law and corruption, and the competence of the state and particularly the bureaucracy aspects (Leite and Weidmann, 1999; Auty, 2001; Isham et al., 2005). However, in this study, we use the un-weighted average of five different indicators including estimates of Control of Corruption, Government Effectiveness, Political Stability and Absence of Violence or Terrorism, Rule of Law, and Voice and Accountability. The result corresponds with the prominent findings of former studies that gave attention to the quality of the institutional setting, such as corruption levels, law and order, and bureaucracy. The good institutional setting could diminish rent-seeking activities, and ensure the security of property and contractual rights. In turn, this would encourage investment and economic growth (Boschini et al., 2007; Bakwena et al., 2009; Boschini et al., 2013).

Table 3 shows the result with the total sample of 36 SSA countries; including 14 resource-poor SSA countries. The correlation of Institutional quality and resource-rent with economic growth shows significant, positive and strong correlation (Table 1). Moreover, the result of Institutional quality and resource rent over economic growth seems robust when the resource-poor countries of the region are also included. The coefficient points no curse due to RR, as the effect on dependence on RR is positive and robust under the GMM-system method.

The result challenges the paradox of the course as the findings indicate against the hypothesis of the RC, with a positive effect of resource rent and robust under all the estimations including GMM-system and pooled OLS method. In other words, natural resources rent, particularly mineral and oil resources rent seem to have robust direct positive effects when institutional quality is controlled. Furthermore, the result also reveals no indication of indirect negative growth effect due to natural resource dependence and institutional quality, apparently contradicting the rent-seeking hypothesis. In sum, the hypothesis of the resource-curse does not seem to be a curse directly through the oil and mineral rents and indirectly through institutional quality.

However, the considered relevant economic variables indicate ways in which natural resource wealth may affect the economic growth indirectly. The results specify the effects of debt to be negative and significant, whereas education and exchange rate show insignificant coefficients respectively. The estimation does not show significant deviation when also the resource-poor countries are included in the estimations Table 3 (column 1-3). The results are robust and may specify the possibility of RC due to the exchange rate, foreign debt and, education.

Considering, the correlation coefficient between real exchange rate and GDP growth is −0.2332, which is significant, and with resource rents, it is weakly but positively correlated with a coefficient of 0.0322, indicating the positive association with resource rent (Table 1). However, the estimated coefficients of exchange rate show insignificant effect for resource abundant countries' economic growth column (1-3) of Table 2-4A. The results signal the presence of negative effect due to the exchange rate. One of the spontaneous reason might be the so-called "Dutch disease," whereby mineral and oil revenues raise a country's exchange rate, hurting the economic growth and hurt the competitiveness of the non-resource sectors of the commodity-rich countries adversely. The estimations are comparable with the results of Gylfason et al. (1999) and Auty (2017).

Similarly, external debt creates challenges for developing countries, as repayment of external debt requires countries to pay more than the actual debt. This may create an additional burden on the country's ability to grow (Pedro, 2004). The impact of external debt on economic growth in countries of SSA has several explanations and theories. The debt accumulation coefficient indicates negative and significant at 99% and 95% Table 2 (column 1 and 3); implying the resource rent boom may increase the value of the existing resources, stretching the ability of resource-rich economies to attract foreign loans and run up debts. When resource prices subsequently came down, international credit became scarce and debt servicing turns out to be problematic as it requires countries to pay more than the actual debt. These may impede the countries to economic growth (Pedro, 2004). The result also could be justified by excessive borrowing by developing countries and the indiscriminate lending by international commercial lenders lead the SSA countries debt effect to be negative. Studies suggest, a lower rate of external debt is good for an economy, however, beyond a certain level, like the extravagant external borrowing of successive governments in Sub-Saharan African countries can only affect economic growth adversely.

Correspondingly, despite the general expectation of Maximizing income from resources such as oil and minerals through providing education to children, the result from the various estimation of this study report different implications. The correlation estimation of Table 1, indicates a weak positive correlation between education and economic growth and unlike the expectation, the correlation between resource-rent and SCL indicates positive but nearly zero correlation. Moreover, even though the rigorous estimation of Table 2 (column 1 and 3) education a has positive and significant effect on economic growth at 90% and 95% confidence interval, the estimation does not seem robust when the countries are expanded to accommodate resource-poor countries of the region Table 3 (column 1-3). The finding appears to supplement the finding of Gylfason (2001), resource rent from oil and mineral appears to crowd out human capital development, thereby slowing down the pace of economic development.

Regarding the other economic variables of the study, the result indicates that gross fixed capital investment, the term of trade and openness have a positive, robust and significant effect on growth (Tables 2, 3 and 6A and 5A). For example, during the commodity

price boom of the early 2000s, resource-rich developing countries experienced increases in their terms of trade due to selling oil and copper. This enabled them to invest more in fixed capitals. Moreover, the finding regarding trade openness is in favor of international economics insight. Tables 2, 3 and Annex 5A regarding the relationship between trade openness and growth suggest a positive long-term effect of trade openness for the economic growth.

Due to the dynamics of macroeconomic variables and the socio-politics of the region coupled with the complex nature of the topic, usually, it requires relentless studies to prove the relationship between an economic growth and the different economic growth factors. Hence, the estimations indicate the direction where the RC may catch the SSA resource-rich countries. Besides, we assume the study contributes to the growing empirical literatures regarding the RC and macroeconomic development of the SSA region.

5. CONCLUSION

Considering the assessments of RC, numerous literatures were devoted to institutional quality as a way out of the phenomenon. This work aims to revisit an important yet still unresolved topic of the RC and, analyze the implications of resource rent, institutional quality and other economic factors in terms of economic performance of SSA using the most updated set of data. Hence, the study analyzed a panel of 22 resource rich SSA countries over the period of 1998–2016 while allowing for differences and communalities across countries. Specifically, for the comparative purposes, the sample of the countries is extended to accommodate 14 resource poor SSA countries, totaling the number to 36. Furthermore, due to the superior advantages of the Driscoll-Kraay, IV2SLS and GMM-system in addressing the problem of reverse causality between variables, their results are used and reported. Moreover, for the sake of methodological contrast, the results of pooled OLS are also considered in the study.

Considering the result, the study identified two main findings. First, resource rent and institutional quality do not seem to have direct negative impact on economic growth. The results do not validate the RC directly through the resource rent or indirectly through weakening the institutional quality to affect the economic growth negatively. This confirms dependency on resource by itself does not lead to RC. Instead, the study provides evidence of the curse through which the RC affect the economic growth of the SSA countries.

The considered relevant economic variables that indicate ways in which natural resource wealth may affect the economy growth adversely are exchange rate, external debt accumulations and education. Despite the institutional quality diminish the RC effect, exchange rate, external debt accumulations and education do not have the same positive effects. Hence, we cannot rule out Dutch disease indirectly to affect the long-term growth performance of the region.

However, natural resource dependence have positive effects and the countries could escape the effects of the Dutch disease if they were able to device a policy to mitigate the negative effect of exchange rate, foreign debt and education. Besides, the result does not show significant deviation when also the resource-poor countries are included in the estimations Table 3 (column 1-3), suggesting the robustness of the results and could be considered consistent with recent theoretical findings.

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APPENDIX

Table A1: List of resource-rich and total samples

Resource rich countries	Angola, Botswana, The central African, Republic, Cote d'Ivoire, Cameroon, Congo, Dem. Rep.Gabon, Ghana, Guinea, Equatorial Guinea, Liberia, Mali, Mozambique, Mauritania, Namibia, Niger, Nigeria, Sierra Leone, Chad, Tanzania, Zambia
List of total-sample	Burundi, Benin, Cabo Verde, Eritrea, Ethiopia, Gambia, The, Guinea-Bissau, Kenya, Mauritius, Malawi, Rwanda, Senegal, Togo, Uganda

Table A2: List of research variables

Variables	Descriptions	Sources
GDP per capita	Logarithm of average GDP per capita	WDI
Institutional quality	Un-weighted average of estimates of Control of Corruption, Government Effectiveness, Political Stability and Absence of Violence or Terrorism, Regulatory Quality, Rule of Law, and Voice and Accountability	WDI
Openness of the economy	Sum of exports plus imports of the country's GDP	WDI
Gross capital formation (investment) as % GDP	Additions to the fixed assets of the economy, plus net changes in the level of inventories	WDI
Natural resource Rents	Natural resources rents are the sum of oil rents, natural gas rents, coal rents (hard and soft) and mineral rents	WDI
Latitude	Absolute latitudinal location of countries	WDI
Primary education	The total enrollment in primary education, regardless of age, expressed as a percentage of the population of official primary education age	WDI
Exchange rate	Determined in the legally sanctioned exchange market. It is calculated as an average annual (local currency units relative to the U.S. dollar)	WDI
Term of trade	The percentage of the ratio of export prices to import prices	WDI
External debt	Debt owed to non-residents repayable in currency, goods, or services	WDI

Table A3: Descriptive statistics of resource abundant and non-abundant countries

Variable	Obs	Mean±SD	Min	Max
LNRGDP	684	6.64752±1.139732	4.631275	10.03199
INSTQ	681	−0.61646±0.638089	−2.06087	0.927589
RR	684	6.983854±13.40457	−34.7526	83.54878
GCF	684	22.77636±15.99864	−15.314	218.9857
DBT	684	69.77266±119.5634	−3.28746	1380.766
SCL	684	96.6501±25.08793	−12.3357	204.6855
TOT	684	78.30434±40.48491	9.534938	280.7542
OPEN	684	2.88E-08±7.84E-08	0	1.43E-06
EXC	684	583.5795±1013.769	0.231166	7956.915

Table A4: Descriptive statistics of resource abundant countries

Variable	Obs	Mean±SD	Min	Max
LNRGDP	417	6.836026±1.19581	4.631275	10.03199
INSTQ	415	−0.68508±0.638428	−2.06087	0.896959
RR	417	10.81144±14.40783	−6.20914	83.54878
GCF	417	23.19556±18.69218	−15.314	218.9857
BDT	417	75.00286±145.6753	0	1380.766
SCL	417	93.78008±23.30057	29.79633	204.6855
TOT	417	89.98288±42.70689	11.16474	263.2566
OPEN	417	2.66E-08±9.46E-08	0	1.43E-06
EXC	417	662.56±1205.174	0.231166	7956.915

Table A5: Pooled-OLS estimation Baseline estimation. Dependent variable; average annual GDP per capita

	(1)	(2)	(3)	(4)
L.GDP	0.949*** (84.02)	0.935*** (73.23)	0.944*** (103.92)	0.953*** (117.92)
RR	0.001* (1.72)	0.002** (2.48)	0.001*** (2.78)	0.001* (1.96)
GCF	0.001* (1.96)	0.001** (2.27)	0.002*** (3.30)	0.002*** (3.31)
DBT	−0.000*** (−4.75)	−0.000*** (−4.29)	−0.000*** (−4.32)	−0.000*** (−4.53)
SCL	0.001* (1.83)	0.001 (1.36)	0.000 (0.01)	0.000 (0.58)
TOT	0.001** (2.57)	0.001*** (3.22)	0.001*** (5.04)	0.001*** (4.57)
OPEN	5.9e+05*** (3.17)	6.0e+05*** (3.21)	4.4e+05*** (3.17)	4.1e+05*** (2.90)
EXC	−0.000 (−1.40)	−0.000 (−1.10)	−0.000 (−0.81)	−0.000 (−0.91)
IQ		0.040** (2.26)	0.033** (2.42)	
_cons	0.180* (1.65)	0.309** (2.10)	0.166* (1.73)	0.076 (1.08)
N	396	0.935***	648	648
F		(73.23)	1805.544	
r2_a		0.002**	0.987	
N_g	22.000	(2.48)		36.000

*P<0.1, **P<0.05, ***P<0.01, AV: Pooled-OLS estimation, dependent variable: Logarithm of average annual GDP per capita

Table A6: Variance Inflation Factors estimation

Variable	VIF	1/VIF
L.GDP	2.92	0.342966
OPEN	2.32	0.431058
TOT	2.31	0.432373
DBT	2.23	0.448553
IQ	2.02	0.493936
RR	1.72	0.579788
GCF	1.67	0.599023
SCL	1.24	0.807417
EXC	1.17	0.854473
Mean VIF	1.9	

VIF: Variance inflation factors