Interconnections between governance shortcomings and resource curse in a resource-dependent economy

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Abstract

Purpose – The paper assesses the role of natural resource rents in Nigeria's economy through the channel of institutional quality.

Design/methodology/approach – The analysis is done with the use of autoregressive-distributed lag (ARDL) bounds testing approach to cointegration, vector error correction model (VECM), Granger causality test and cointegrating regression over the period 1996–2019.

Findings – Findings support the notion that overreliance on natural resources could exacerbate the growing number of dysfunctional economic outcomes in the country. The study confirms that a mix of weak governance quality and natural resource rents could have a negligible effect on economic growth and possible retardation impact on the economy in the long run as well as in the short run. The evidence further reveals that there is unidirectional causality running from the interaction term to growth, suggesting that growth trajectory could be jointly determined by natural resource rents and the quality of institutions.

Originality/value – The divergent arguments associated with the mechanisms of resource curse in each of the resource-rich countries offer ample support for the contention that economic outcomes in resource-abundant states may not be a product of resource windfalls *per se*, but rather the quality of governance or ownership structure. Hence, the ultimate aim of the analysis is to further understanding on the link between resource rents and growth in Nigeria via governance channel.

Keywords Natural resource rents, Resource curse, Institutional quality, Economic growth, ARDL, Nigeria

Paper type Research paper

1. Introduction

In light of diverse cases in resource-rich countries, interconnections between poor governance and resource curse have been a critical issue in the literature. The need to find an explanation for the mechanism underlying the impact of resource rents on economic performance has continued to engender debates about the fundamental cause of the phenomenon of resource curse. Thus, it is logical to assume a link between resource dependence and economic growth. Accordingly, a variety of socioeconomic and institutional factors have been identified to elucidate this connection in the literature. For instance, Zallé (2019), Badeeb and Lean (2017)

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and Farhadi *et al.* (2015) argue that the role of natural resources is conditional by institutional quality and human capital in most resource-abundant countries. However, varying conclusions have been given in the literature on the impact of natural resources. While Shao and Yang (2014), Moradbeigi and Law (2017) and Shahbaz *et al.* (2019) show that resource curse is evidenced in developing countries, James (2015), Ji *et al.* (2014) and Oyinlola *et al.* (2015) challenge the phenomenon of resource curse. Interestingly, Shahbaz *et al.* (2019) establish that natural resource wealth could result in improved growth, but natural resource dependence could retard economic growth and development. Taguchi and Lar (2016) also find support for this argument. Hence, this corroborates the notion that the resource curse phenomenon is not universal, as some countries have successfully managed their resource wealth and transformed it into sustainable development (for example, Botswana, Canada and Norway). The reason a developing country, like Botswana, could be different from countries, like Nigeria, in terms of resource impact and development outcomes has been linked to management factors, such as the quality of institutions (Dinh and Dinh, 2016; Fagbemi and Adeoye, 2020). In view of the current state of development in most resource-rich countries, especially developing countries, investigating the causes of economic performance in a resource–dependent economy, such as Nigeria, is crucial, as the country serves as a prime example of the resource curse (Mähler, 2010). This will, indeed, offer a deeper understanding of the resource curse hypothesis through the transmission channel of the institutional quality.

Prior to 1980s, while most economists considered natural resource abundance as an advantage to the economy, sometimes windfalls received by resource-rich countries might atrophy their bureaucratic capacity and thus amplify the danger that they would be poorly managed (Ross, 2012). Following Sachs and Warner (1995), natural resource-rich states have recorded lower economic growth than natural resource-poor ones. Similarly, Frankel (2012) confirms lower average economic growth over the period 1970–2009 in economies with a higher share of mineral exports, ascribing to the simple empirical fact of the resource curse phenomenon (Auty, 1994). In contrast, it has been argued that natural resources could play a central role in the economic development process as some developed economies (such as Norway) have successfully employed natural resource rents for improved economic performance (Overseas Development Institute [ODI], 2006). Given the divergent views amongst scholars, the effect of resource abundance could be hampered by the relative shortness of the time period considered (Alexeev and Conrad, 2009). In short, many findings from cross-country comparisons have been questioned. For instance, Canuto and Cavallori (2012) downplay the role of natural resource abundance in the economic development process and posit that intangible wealth in the form of the quality of governance is the determining factor in economic growth. On the other hand, Mehlum *et al.* (2006), Zallé (2019) and Badeeb and Lean (2017) give the evidence that a dangerous mix of feeble institutions and resource abundance leads to the resource curse. Hence, governance quality of a country is crucial in the resource paradox. Leveraging natural resource-led development through good policies can only be effective when the level of institutional measures and the political system of the country, in question, are in good shape (Barma *et al.*, 2012).

The systematic examination of various transmission channels of the impact of natural resource abundance on growth has given rise to mixed and ambiguous conclusions. Accordingly, Gylfason (2001) focuses on human capital and emphasizes that the adverse resource effect can in fact be offset by the increasing state of higher education levels, making natural resource abundance a boon for countries with high human capital levels. In another study, it is argued that natural resource abundance induces rent-seeking behavior and lowers income (Torvik, 2002). On the other hand, Manzano and Rigobon (2001) suggest that the real problem for the growth of the economy has been the debt overhang in resource-abundant countries. With the consideration of the Dutch disease hypothesis by Stijns (2003), the typical sectoral change pattern is confirmed, but there is little evidence for overall adverse resource effects on growth. Given the assertion of Matsen and Torvik (2005), if the savings path is

adjusted to take into account the relative significance of the traded and nontraded good sectors, the long-term growth could be positive, while Sala-i-Martin and Subramanian (2003) suggest that more resource rents should be allocated to citizens and less to the government for enhanced poverty reduction and thus economic development.

Given that in a weak institutional environment, governance shortcomings [1] could be pervasive and thus result in inefficient resource allocation (Aljarallah and Angus, 2020), exploring the indirect effect of natural resources through institutional channels could offer more reasonable explanations for the resource curse hypothesis. Hence, the study centers on the indirect effect of natural resources on economic growth in Nigeria. While most resource-dependent developing economies may be suffering from this, Nigeria's case is more critical (Hassan *et al*., 2019; Fagbemi and Adeoye, 2020). Widespread concerns about the ineffective allocation of natural resource rents and associated institutional issues necessitate the need for further consideration of the effect of resource rents on economic growth, particularly in Nigeria. Given the current state of development in the country, exploring the cause of Nigeria's economic performance through a focus on indirect effect of natural resource rents conditional on governance quality could help examine the state of governance and its role.

Regarding few studies on Nigeria (Olayungbo and Adediran, 2017; Aregbeyen and Kolawole, 2015; Hassan *et al*., 2019), efforts have solely centered on the impact of the oil sector (oil revenues) on economic growth through the channel of institutions, which only represents a subset in the resource sector. For example, in Hassan *et al*.'s (2019) panel data study, they focus on oil-exporting developing countries, whereas Olomola (2007) concentrates on oil-exporting African countries. The study of Olayungbo and Adediran (2017), which is specifically for Nigeria, employed oil revenues with only corruption as the institutional factor, while Aregbeyen and Kolawole (2015) examine the role of government spending. Hence, this study differs not only in terms resource variable employed but with the inclusion of institutional indicators that capture the legal (rule of law) and democratic (democratic accountability) structures, which are indeed significant to the domestic institutional formation (Hassan *et al*., 2019). Although the country depends so much on the oil sector, a systematic study of the natural resource sector (covered by total natural resource rents) as a whole will give more comprehensive coverage of the sector's role in economic development process with respect to Nigeria's case. In addition, the divergent arguments associated with the mechanisms of resource curse in each of the resource-rich countries offer ample support for the contention that economic outcomes in resource-abundant states may not be a product of resource windfalls *per se*, but rather the quality of governance or ownership structure. Hence, the ultimate aim of the analysis is to further understanding on the link between resource rents and growth in Nigeria via governance channel.

2. Nigeria's case: an overview

Nigeria's numerous development challenges necessitate a focus on the country. For instance, Nigeria, with her abundant natural resource endowments, has the potential of being one of the richest countries in the world. It is an economy with a diversified population, large and dynamic cities, but with open agrarian practices and pervasive weak governance quality. Nigeria's economic performance since independence (1960) can be characterized as the outcome of a failed order. Over the years, Nigeria's case is worrying as it serves as one of the countries where the political leaders (ruling class) unduly benefit from the resource windfalls at the expense of the masses (Torvik, 2002; World Bank, 2012). In spite of the resource boom and the resultant windfalls in the 1970s, the expected prosperity remained elusive. Gross domestic product (GDP) per capita had not improved significantly until the mid-2000s and only got to the level of the Sub-Saharan African (SSA) average in 2010 (World Bank, 2020). Other measures of economic development have been following the similar trajectory – the share of people living below $1 per day increased from 36% in 1970 to a staggering 70% in 2000, and at the same time, the share of extremely rich individuals grew to the extent that the

level of inequality widened astronomically (World Bank, 2017). Another characteristic of Nigeria's development is the precariousness of her growth rates due to overreliance on commodity exports. The recent global commodity market slump worsened Nigeria's GDP growth between 2015 and 2019 (see Figure 1). Although Nigeria's GDP growth for the full year 2019 was released as 2.21% (as against 1.92% in 2018), the country is not really experiencing growth given the fact that its population growth is estimated to be around 2.7% (annualized) – 2019 GDP growth settled below population growth rate (National Bureau of Statistics (NBS), 2020).

The symptoms of the natural resource curse in Nigeria have been a subject of great concern. In terms of key contextual conditions, huge resource rents have engendered rent-seeking behavior and economic distortions in Nigeria (Sala-i-Martin and Subramanian, 2008). This is exacerbated by the high level of corruption in the country (Transparency International, 2020). Overall, the pervasiveness of these incidences could be attributed to weak governance (Fagbemi and Adeoye, 2020), but little available evidence could affect the adoption of critical policy measures. Over the years, the share of resource rents on GDP (see Figure 2) has not translated into meaningful development. For instance, Nigeria is one of the countries that has the lowest human development index in the world as a result of poor human capital development (World Bank, 2018). Also, in Nigeria, poverty and other poor socioeconomic conditions are well entrenched – the country is the leading poverty nation of the world (Brookings Institution, 2018). This stands in sharp contrast to some resource-rich economies, which have gone through economic changes with the diversion of resources from inefficient production modes (like Canada and Norway) into more efficient ones (Dinh and Dinh, 2016). Hence, these countries experience improved economic growth and increased

Figure 1.
GDP growth (annual %) in Nigeria between 2005 and 2019

Source(s): Authors' estimates based on data from World Development Indicator (WDI), World Bank, 2020

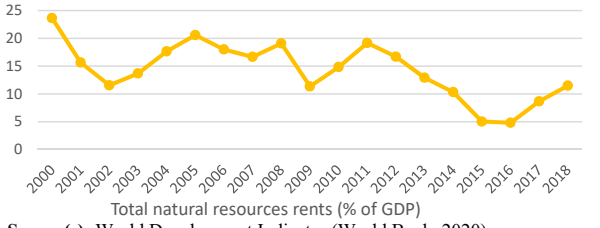


Figure 2.
Percentage share of natural resource rents on GDP in Nigeria between 2000 and 2018

Source(s): World Development Indicator (World Bank, 2020)

international competitiveness. Why this transition to a sustainable development level remains a mirage in Nigeria has continued to agitate minds. However, this development does not suggest a universal denial of the significance of resource wealth in Nigeria, but it calls for the need to address the underlying factors and undertake a comprehensive approach that can systematically take into cognizance the local and foreign measures vital for explaining the historical dynamics of Nigeria's case (Mähler, 2010).

3. Literature review

3.1 Theoretical review

With the proliferation of hypotheses regarding resource curse literature, the initial articulation in the economic domain linking with the structuralist rethinking of classical economics (Prebisch, 1950) has been subsequently extended to the political domain in the Middle East's context. While the resource curse literature stresses that dependence on natural resources engenders a number of dysfunctional incidences, the conventional knowledge rests on two general propositions – that resource-rich countries experience slow growth more than resource poor ones and that political systems in resource-abundant nations are authoritarian. Accordingly, these researchers have impressively given credence to different aspects of the resource curse (Sachs and Warner, 1999; Sala-I-Martin and Subramanian, 2003).

Over the years, there are plausible mechanisms linking natural resource reliance to slow economic growth and developmental outcomes. "Dutch Disease" is one of the most prominent concepts that links natural resource booms to exchange rate effects. The reigning version of the argument postulates that natural resource booms contribute to the appreciation of the real exchange rate and a resulting decrease in the competitive capacity of traditional exports and import-competing sectors (Sachs and Warner, 1995). In relation to this view, Matsuyama (1992) and Auty (1994) emphasize that booming mineral sectors could draw labor and capital away from traditional (real) sectors of the economy, especially when traditional sectors are strongly connected with manufacturing. Hence, the attendant process of deindustrialization may trigger poor developmental outcomes in the long run, and politically induced measures to protect negatively affected producers through trade shield and subsidies always serve to worsen the economic crisis. This substantiates the argument that the presence of resource windfalls contributes to real exchange rate appreciations. However, there are divergent views as to long-term developmental costs of dependence on natural resources, as critics of Dutch disease proponents cite the paucity of evidence that dependence on any particular type of resource endowment is superior to any other (Wright, 2001; Stijns, 2001). They stress the ease with which policymakers can neutralize the effect of mineral-induced inflows on the real exchange rate, although there seems to be no consensus based on cross-national findings on this count.

Another prominent line of arguments is based on the view that the terms of trade associated with commodity exports could give rise to poor developmental outcomes. The earlier assertion on this argument posits that the terms of trade for natural resources would decrease through time, thereby leading to relatively poorer economic outcomes in commodity-dependent nations (Prebisch, 1950). Nonetheless, recent empirical arguments on commodity markets give a skeptical view on these claims (Cashin and McDermott, 2002), while a close argument continues – that it is the volatility of global commodity markets that induces unpredictable export earnings, feeble growth and poor development (Levin, 1960), particularly in a situation whereby commodity exports crowd out nonresource tradables (Hausmann and Rigobon, 2002). These postulations corroborate the assertion that more volatile and unstable economies grow more slowly (Ramey and Ramey, 1995).

Following McMahon (1997) and Moradbeigi and Law (2017), resource-abundant countries grow slowly as they systematically engage in overspending and invest in inefficient channels

that nonmineral abundant states do not. In resource-rich nations, government expenditure accelerates substantially during boom periods, while due to the political difficulty of reducing spending in subsequent bust periods, governments/politicians result to borrowing. McMahon (1997) terms this as the "irreversibility of government expenditure." The adverse long-term effect of over-indebtedness could be exacerbated by the political excessiveness and inefficiency of investments that rise very rapidly in boom periods, especially when pursued through government spending (Rodriguez and Sachs, 1999), which often goes to economically deficient capital projects and the unnecessary expansion of the public bureaucracy. Overall, these lower economic performance (Bravo-Ortega and De-gregorio, 2007).

With exchange rates, economic volatility and government overspending form the major theoretical argument, the most prevailing hypothesis in modern research relating resource reliance to poor economic performance is that which anchors on the institutional quality (Sala-i-Martin and Subramanian, 2003; Robinson *et al.*, 2006). This is in line with the former postulation that good institutions are a critical first-order component of long-term economic development (North, 1991; Acemoglu and Robinson, 2006). This supports the role of natural resources in impeding the incentives of countries to build effective institutional measures to gather information from the people through regulatory oversight that could induce better public policy. In short, in most resource-rich states, such effective institutional mechanisms seem to be missing. Since good institutions contribute to income growth during resource booms, huge rents from natural resource production in a poor institutional environment might foster rent-seeking (Leite and Weidman, 1999). Based on these accounts, institutional quality is considered exogenous, and it is the quality of institutions that mediates the nexus between mineral wealth and economic growth (Mehlum *et al.*, 2006). Given the growing concern as to what could be the key first-order ingredient of long-term economic performance in most resource-rich countries, lending credence to these arguments through a further study would accelerate the better understanding of the resource–governance–growth nexus in Nigeria's context.

Based on the foregoing theoretical validations on the resource–growth nexus and the role the quality of institutions plays, it could be hypothesized that resource abundance does undermine economic growth in a weak institutional environment. Thus, following the resource curse phenomenon, Nigeria may be worse off given the possible interconnections between resource wealth and governance shortcomings than it is purported to be in most public debates. Testing for this offers a basis for the study.

3.2 Empirical review

As researchers discussed a plethora of possible effects of natural resource dependence on most resource-rich economies via the channel of the quality of institutions in these countries, there have been variant arguments among economists that natural resource reliance could lead to positive or adverse developmental outcomes. For instance, while focusing on the Middle East and North Africa (MENA) countries, Ali and Sami (2016) employ panel data over the period 1963–2012 for 21 countries to assess the magnitude to which the economic growth, natural resources rent, education for girls and child labor influence economic inequality. Results revealed that economic growth (proxy by per capita income) has an adverse influence on inequality, but natural resource rents have helped reducing the level of inequality. In another study, using data for the period 1990–2013 with two-step system generalized method of moment estimation technique, Karimu *et al.* (2016) investigate the relationship between natural resource revenues and public investment in resource-rich economies in SSA. Findings showed that depending on the quality of political institutions, resource rents stimulate public investment in the region. In addition, Bah (2016) examine the relationship between natural resource dependence and economic growth for Sierra Leone between 1975 and 2014, using the

time series approximation technique. It was found that there exists a positive relationship between economic growth and natural resource dependence, implying that resource curse hypothesis does not hold in the case of Sierra Leone. With the application of cointegrated vector autoregressive (CVAR) estimation within a fiscal framework, Ackah *et al.* (2013) focus on how to manage the macroeconomic performance of an oil-rich country (Ghana) for the period 1970–2011. Findings indicate that oil revenues have a positive impact on macroeconomic performance. However, Vandycke (2013) provides evidence on ways through which natural resources affect physical capital to stimulate development in Eurasian economies. It is posited that rents gotten from natural resources were not been diverted properly for the accumulation of physical capital in Eurasian economies due to the presence of weak institutions – economic policies that accompany the resource rent presence and poor management of public investment process. Other authors that also support the adverse effect of resource dependence include Gonzales *et al.* (2013) who find the existence of resource curse for Papua New Guinea, Gylfason (2001) suggests that natural resources prevent human capital development and in turn reduce the rate of economic development and Jalloh (2013) reveals that, for West African countries, natural resource endowments do not necessarily enhance economic growth, particularly in resource-rich ones.

Furthermore, in recent studies, Hayat and Tahir (2019) explore the effect of natural resources volatility on economic growth for the economy of United Arab Emirates (UAE), Saudia Arabia and Oman between 1970 and 2016 using the autoregressive distributed lag (ARDL) cointegration approach. It is discovered that there exists a positive and significant relationship between natural resources and economic growth for both UAE and Saudi Arabia, while there exists an insignificant relationship between natural resources and economic growth for Oman. Also, based on the ARDL and error correction model (ECM), Aljarallah (2019) investigates the impacts of natural resource rents and institutional quality on human capital. While the author employs corruption and law and order in place of institutional quality, results indicate that natural resource rents and corruption have substantial negative impacts on human capital, but law and order has a positive impact on human capital. Amini (2018) assesses the effect of natural resource abundance and institutions on economic growth over the period 1996–2010 for 22 advanced countries and 61 underdeveloped countries. With the use of the group effects' meaningfulness test to know the data nature, the Breush–Pagan test and Haussmann test to know the difference between fixed and random effect, the author stresses that natural resources' abundance and institutions fail to have a significant effect on economic growth. With a panel dataset of 170 developed and developing economies in transition for the period of 1996–2014, Mohtadi (2017) examined the impact of natural resource rents on quality-adjusted human capital. It is revealed that there is evidence of a quality-adjusted human capital resource curse and that there is a negative association between resource rents and quality-adjusted human capital. Through a panel vector autoregressive (PVAR) approach for the period 1980–2012, Antonakakis *et al.* (2017) examine the effect of oil dependence on economic growth for 76 countries by taking into consideration the endogeneity of institutional quality. They argue that adjusting for the quality of political institutions is critical in making the resource curse hypothesis significant and that in a situation of feeble quality of political institutions, reliance on oil would not enhance growth.

In Nigeria, Olayungbo and Adediran (2017) examine the effects of oil revenue and institutional quality on economic growth over the period 1984–2014 with the use of ARDL model. They stress that institutional quality is crucial in explaining the nexus between oil revenue and economic growth. It is further indicated that institutional quality enhances economic growth in the short run, while it impedes economic growth in the long run. Similarly, oil revenues stimulate economic growth in the short run, but hinder it in the long run. Also, in the work of Aregbeyen and Kolawole (2015), while employing ordinary least

square, cointegration, vector error correction model (VECM) and granger causality estimations techniques to analyze the relationships that exist among oil revenue, government spending and economic growth in Nigeria between 1980 and 2012, they argue that oil revenues granger cause aggregate government spending and economic growth, but with no causality between government spending and growth.

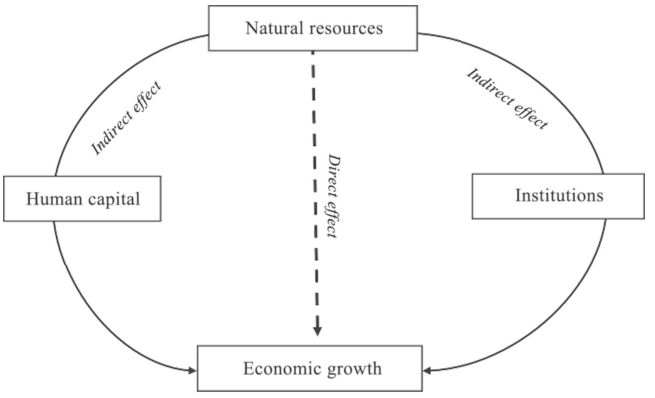
In view of the foregoing, there are divergent arguments on the link between natural resource rents and macroeconomic performance via the quality of institutions. The persistent opposing views among authors in the literature have increasingly justified the need for a further empirical study to broaden knowledge. Also, based on the review, the few studies on Nigeria specifically focus on the impact of oil revenues with no consideration given to total natural resource rents. Hence, in addition to the differences in scope, this study differs in this respect by accounting for the effect of total natural resource rents on economic performance through the channel of institutions mainly in Nigeria's context.

4. Methodology

4.1 Theoretical framework

Based on the theoretical linkage established in the work of Bulte *et al.* (2005) and Bravo-Ortega and De-gregorio (2007), our model is developed to further ascertain the role of institutional quality in the connection between resource richness and economic growth mainly in Nigeria's context. While the study by Olayungbo and Adediran (2017) examined the conditional effect of natural resources on institutions (using only corruption) and on economic growth, we consider two institutional variables (including rule of law and democratic accountability) in relation to the indirect effects of natural resources on economic growth in the model. It is assumed that the level of the institutional quality and other socioeconomic factors (like the quality of human capital) are critical to explaining the resource curse phenomenon. Strong institutions can stimulate better usage of resource windfalls in an economy, whereas poor institutions can cause huge resource rents to be a curse (Zallé, 2019). Hence, natural resources interact with institutional quality to influence economic growth. Accordingly, these possible causal connections are illustrated in Figure 3 following the work of Zallé (2019).

Zallé (2019) posits that African countries need to strengthen their institutions and stimulate investments in human capital in order to curb the resource curse phenomenon in the



Source(s): Authors' adaptation from the work of Zallé (2019)

Figure 3.
Indirect effects of natural resources on economic growth

region. However, unlike Zallé (2019) who addressed this with the combination of all direct and indirect effects based on both institutional quality and human capital in one model, this study focuses on the indirect effect of natural resource rents on economic growth through institution channel using different models for the two institutional indicators (rule of law and democratic accountability) employed. While natural resource rents are a significant source of domestic resources for resource-abundant economies, how domestic resources are mobilized depends on the management factors, such as the quality of institutions. Hence, the quality of institutions matters for the level of the absorption and utilization of huge rents from natural resources. In view of this, we hypothesize that in the absence of strong institutions, resource rent is a curse.

4.2 Model specification and data source

In the study based on the previous section and following the work of Mehlum *et al.* (2006); Sala-i-Martin and Subramanian (2003) and Sachs and Warner (1995), the model is specified in a functional form as follows:

$$Y_t = f(RES_t, INT_t, (RES * INT)_t, EXH_t, INF_t) \tag{1}$$

Y is defined as economic growth (GDP growth (annual %)), *RES* represents natural resource rents. *INT* is the institutional indicator (rule of law, democratic accountability and corruption index). The interaction between natural resource rents and institutions is represented by *RES* * *INT*, while the control variables are exchange rate (*EXH*) and inflation rate (*INF*). t is the time period.

Given the existence of a possible dynamic relationship between natural resource rents and economic growth, the econometric technique employed is ARDL bounds test cointegration approach proposed by Pesaran *et al.* (2001). Since this approach could account for the long-run and short-run relationship among the variables, the long run and short run effect would be better captured by ARDL. This cointegration technique developed by Pesaran *et al.* (2001) is more advantageous compared to other cointegration techniques (such as Ganger causality of Engle and Granger (1987); Johansen and Juselius (1990) and Johansen cointegration test (1991)). Irrespective of the order of integration, this method can be applied. For instance, if the variables are either I (1) or I (0), it is applicable, although it is not in the case of the existence of any I (2) variable or above. With a simple linear transformation, the dynamic unrestricted ECM can be derived from the ARDL bounds test. The technique gives more reliable empirical estimates and also for small samples [2]. The estimated models for the ARDL bounds testing technique is stated as follows:

$$\begin{aligned} Y_t = {} & \alpha + \gamma_1 Y_{t-1} + \gamma_2 RES_{t-1} + \gamma_3 INT_{t-1} + \gamma_4 (RES * INT)_{t-1} + \gamma_5 EXH_t + \gamma_6 INF_t \\ & + \sum_{i=1}^{n} \theta_1 \Delta Y_{t-1} + \sum_{i=0}^{n} \theta_2 \Delta RES_{t-1} + \sum_{i=0}^{n} \theta_3 \Delta INT_{t-1} + \sum_{i=0}^{n} \theta_4 \Delta (RES * INT)_{t-1} \\ & + \sum_{i=0}^{n} \theta_5 \Delta EXH_{t-1} + \sum_{i=0}^{n} \theta_6 \Delta INF_{t-1} + \varepsilon_t \end{aligned} \tag{2}$$

where Δ represents the differenced operator. $\gamma_1 \ldots, \gamma_6$ are long-run estimates. $\theta_1 \ldots, \theta_6$ are defined as short-run estimates while ε represents the error term. i denotes numbers from 0 to n. At different lag orders, ARDL F-test gives different F-statistic. For the calculation of ARDL F-statistic, the null hypothesis (H_0) of no cointegration for all models is given as H_0: $\theta_1 = \theta_2 = \theta_3 = \theta_4 = \theta_5 = \theta_6 = 0$. The alternative hypothesis (H_1) of the existence of cointegration is H_1: $\theta_1 \neq \theta_2 \neq \theta_3 \neq \theta_4 \neq \theta_5 \neq \theta_6 \neq 0$. Following the rule of thumb, if the ARDL

F-statistic is greater than the upper critical bound, there exists a long-run relationship among the variables. However, if the lower critical bound exceeds the F-statistic, there is no existence of cointegration among the series. The decision will be inconclusive when the F-statistic is in-between the bounds. The confirmation of the existence of cointegration would necessitate the formulation of an ECM in the short-run dynamics way (Pesaran *et al.*, 2001). Thus, ECM equation is stated as follows:

$$Y_t = \alpha + \sum_{i=1}^{n} \theta_1 \Delta Y_{t-1} + \sum_{i=0}^{n} \theta_2 \Delta RES_{t-1} + \sum_{i=0}^{n} \theta_3 \Delta INT_{t-1} + \sum_{i=0}^{n} \theta_4 \Delta (RES * INT)_{t-1} + \sum_{i=0}^{n} \theta_5 \Delta EXH_{t-1} + \sum_{i=0}^{n} \theta_6 \Delta INF_{t-1} + \omega_i ECT_{t-1} + \varepsilon_t \quad (3)$$

The speed of adjustment parameter is represented by ω. It is expected to be significant and negative (−). Also, given the relevance of the test of stability, cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) will be carried out in order to know the stability of the long-run and short-run association established for the study period. The CUSUM and CUSUMSQ tests developed by Brown *et al.* (1975) are applied. These methods can be used even if the structural break point is not stated or unknown. This is different from the Chow test that requires break points to be given.

Furthermore, the presence of a long-run association implies that it is important to confirm a causal link between natural resource rents and economic growth through the channel of institutions. If the series are cointegrated, following Engle and Granger (1969), a causal link between the series in at least one direction should exist. Hence, VECM Granger causality will be used to ascertain any causal relationship between the variables in both the long run and short run. This empirical approach could help policy actors design better policies. The equation representing VECM Granger causality approach is stated as follows:

$$1 - P \begin{bmatrix} Y_t \\ RES_t \\ INT_t \end{bmatrix} = \begin{bmatrix} \alpha_1 \\ \alpha_2 \\ \alpha_3 \end{bmatrix} + \begin{bmatrix} d_{11i} & d_{12i} \\ d_{21i} & d_{22i} \\ d_{31i} & d_{32i} \end{bmatrix} X \begin{bmatrix} Y_{t-1} \\ RES_{t-1} \\ INT_{t-1} \end{bmatrix} + \ldots + \begin{bmatrix} d_{11i} & d_{12i} \\ d_{21i} & d_{22i} \\ d_{31i} & d_{32i} \end{bmatrix} X \begin{bmatrix} Y_{t-1} \\ RES_{t-1} \\ INT_{t-1} \end{bmatrix} + \begin{bmatrix} \varphi \\ \vartheta \\ \pi \end{bmatrix} ECT_{t-1} + \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \end{bmatrix} \quad (4)$$

where (*1-P*) is the differenced operator. The lagged correction obtained from the long-run equation is represented by ECT_{t-1}, while its statistical significance implies that there is long-run causality. In addition, the selection of lag in the study is based on Schwarz information criteria (SIC), which seems to be more efficient (Pesaran *et al.*, 2001).

Annual time series data between 1996 and 2019 are employed in the study. The scope includes both the period of the global commodity market boom and slump, and it is also based on the availability of data on governance quality. In the study, three governance indicators are used. They include corruption perception index, rule of law and democratic accountability. GDP growth (annual %) is proxy for economic growth. Total natural resource rents account for the role of the natural resource sector in the economy. Two control variables used are exchange rate and inflation rate. Based on the theoretical assertion, these variables matter in any economy (Cashin and McDermott, 2002). The description of these variables and their respective sources are given in Table 1.

Data	Description	Source
GDP growth (annual %)	It is the sum of gross value added by all resident producers in the economy in addition to any product taxes and minus any subsidies not included in the value of the products. It is measured without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources	The WDI (World Bank, 2020)
Natural resource rents	Represent the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents and forest rents	The WDI (World Bank, 2020)
Corruption perception index	It is an index that scores countries on how corrupt their governments are viewed to be. A country's score ranges from 0 to 100, with 0 indicating high levels of corruption and 100 representing low levels	Transparency International (2020)
Rule of law	It measures perceptions of the extent to which agents have confidence in and abide by the rules of society and in particular the quality of contract enforcement, property rights, the police and the courts, as well as the likelihood of crime and violence	The WGI (Kaufmann *et al.*, 2010)
Democratic accountability	It represents various ways in which citizens, political parties, parliaments and other democratic actors can provide feedback to, reward or sanction officials in charge of setting and enacting public policy	The WGI (Kaufmann *et al.*, 2010)
Exchange rate	It represents the price of the domestic currency in relation to foreign currencies (in particular N/US$1.00)	The WDI (World Bank, 2020)
Inflation rate	It is defined as the annual % change in the cost to the average consumer of getting a basket of goods and services that can be fixed or changed at defined intervals, such as annually	The WDI (World Bank, 2020)

Note(s): WDI denotes World Development Indicators (2020 Edition) sourced from the World Bank database, while WGI indicates World governance indicators

Table 1. Data description and sources

5. Empirical results and discussion

5.1 Descriptive statistics

Tables 2 and 3 show the descriptive statistics of the series, which represent the peculiar features of the variables used in the study. In Table 2, the average value of GDP growth is 5.15, and the standard deviation is 3.47, indicating the level of variation form the mean. Regarding the institutional indicators (democratic accountability, rule of law and corruption index), the mean values are −0.76, −1.15 and 20.46, respectively, while the minimum and maximum values for democratic accountability are −1.55 and −0.32; rule of law values are −1.43 and −0.87 and corruption index values are − 7.00 and 28.00. This indicates a weak level of institutional quality in the country (Nigeria). For total natural resource rents, the mean value is 20.86, whereas the minimum and maximum figures are 4.60 and 37.75 accordingly. Based on the correlation analysis showed in Table 3, all the institutional indicators and the control variables (inflation and exchange rate) are negatively correlated with GDP growth, while only natural resource rents found to be positively correlated to it.

5.2 Unit root, cointegration and stability test

Following the theoretical assertion that in ARDL, the series can be either I (0) or I (1), and in some cases, the combination of both I (0) and I (1) is acceptable, the unit root features of the variables are presented in Table 4. Hence, with the application of augmented Dickey–Fuller (ADF) and Phillip–Peron (PP) test, the order of integration is affirmed, and the adoption of

	GDP	DACCT	LAW	CORDEX	RES	INF	EXH
Mean	5.15	−0.76	−1.15	20.46	20.86	12.65	146.37
Median	5.61	−0.71	−1.14	22.00	21.42	11.90	132.82
Maximum	15.33	−0.32	−0.87	28.00	37.75	29.28	305.79
Minimum	−1.62	−1.55	−1.43	7.00	4.60	5.38	21.89
Std. dev	3.47	0.33	0.17	6.34	10.71	5.20	76.35
Skewness	0.65	−0.86	−0.15	−0.63	−0.05	1.25	0.46
Kurtosis	4.49	3.13	2.12	2.19	1.72	5.31	3.06
Jarque–Bera	3.89	2.95	0.81	2.25	1.64	11.61	0.91
Probability	0.04	0.03	0.07	0.03	0.44	0.00	0.04
Sum	123.55	−18.20	−27.54	491.00	500.71	303.66	3512.75
Sum sq. dev	277.27	2.53	0.64	923.96	2640.37	623.09	134064.20
Observations	24	24	24	24	24	24	24

Table 2.
Summary statistics

Note(s): GDP = GDP growth; DACCT = democratic accountability; LAW = rule of law; CORDEX = corruption index; RES = Natural resource rents; INF = inflation rate and EXH = exchange rate

Variable	GDP	DACCT	LAW	CORDEX	RENTS	INF	EXH
GDP	1.00						
DACCT	−0.09	1.00					
LAW	−0.54**	0.58**	1.00				
CORDEX	−0.32	0.64***	0.65***	1.00			
RENTS	0.31	−0.69***	−0.61***	−0.82***	1.00		
INF	−0.06	−0.27	−0.11	−0.33	0.07	1.00	
EXH	−0.31	0.81***	0.72***	0.68***	−0.79***	0.10	1.00

Table 3.
Correlation matrix

Note(s): *** indicates the level of significant at 1%, while ** represents the significant level at 5%

Variable	Augmented Dickey–Fuller (ADF)			Phillips–Perron (PP)		
	Level	First difference	Status	Level	First difference	Status
GDP(Y)	0.02 (0.25)	−4.12*** (0.00)	I (1)	−0.13 (0.84)	−4.26*** (0.00)	I (1)
Inflation (INF)	−1.49 (0.52)	−4.64*** (0.00)	I (1)	−2.52 (0.12)	−6.83*** (0.00)	I (1)
Exchange rate (EXH)	1.97 (0.99)	−3.21** (0.02)	I (1)	1.97 (0.10)	−3.22** (0.03)	I (1)
Rule of law (LAW)	−2.49 (0.13)	−3.49** (0.02)	I (1)	−1.89 (0.34)	−3.44** (0.02)	I (1)
Democratic accountability (DACC)	−2.29 (0.18)	−5.53*** (0.00)	I (1)	−2.20 (0.21)	−9.02*** (0.00)	I (1)
Corruption index (CORDEX)	−1.35 (0.19)	−3.01** (0.02)	I (1)	−1.41 (0.17)	−3.11** (0.02)	I (1)
Natural resource rents (RES)	0.86 (0.99)	−5.83*** (0.00)	I (1)	−0.53 (0.87)	−5.92*** (0.00)	I (1)
LAW*RES	−1.77 (0.39)	−4.11*** (0.00)	I (1)	−1.42 (0.56)	−3.27** (0.03)	I (1)
DACC*RES	−2.81 (0.07)	−5.81*** (0.00)	I (1)	−2.67 (0.09)	−8.63*** (0.00)	I (1)
CORDEX*RES	−1.16 (0.28)	−4.01*** (0.00)	I (1)	−1.19 (0.37)	−4.20*** (0.00)	I (1)

Table 4.
Unit root test

Note(s): ***represent 1%, **represent 5% and *represents 10%. Values in bracket are probability values, while the ones with no bracket are *t*-statistical values. The critical values of both augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) technique are (−3.679322) and (−2.967767) at 1 and 5%, respectively

ARDL approach is justified as all the series are integrated of order one I (1). As reported in Table 5, *F*-bounds test for cointegration is also performed to ascertain the existence of cointegrating relationship among the series. The existence of a long-run relationship is established between the explanatory variables and economic growth *[GDP (Y)]*. Based on the

Test statistic	Value	K
F-statistic (Model 1) (1, 0, 0, 1, 2, 0)	9.25***	5
F-statistic (Model 2) *(1, 0, 0, 0, 2, 1)*	8.76***	5
F-statistic (Model 3) *(0, 1, 0, 0, 2, 0)*	10.02***	5
Significance	I(0) lower bound	I(1) upper bound
1%	3.74	5.06
5%	2.86	4.01
10%	2.45	3.52

Note(s): ***indicates the significant level at 1%
In the ARDL model, K is the number of independent variables

Table 5.
F-bounds test for cointegration

test, it is indicated that F-statistical values are greater than the upper bounds critical values in model 1, 2 and 3, respectively. Thus, the null hypothesis of no cointegration is rejected (Pesaran *et al.*, 2001). Also, in order to confirm the stability of the specification, the test addressing the issue of paramenters' stability is presented in Figure 4 – cumulative sum of squares of recursive residuals (CUSUMSQ) and cumulative sum of recursive residuals (CUSUM). Accordingly, both CUSUMSQ and CUSUM fall within the critical boundaries, suggesting that there is no evidence of structural instability in the estimated model. Essentially, the analyses are conducted based on three respective models. Model 1 represents the interaction effect of natural resource rents and rule of law (*LAW*RES*) on GDP growth; model 2 centers on the interaction effect of natural resource rents and democratic accountability (*DACC*RES*) and model 3 covers the interaction effect of natural resource rents and corruption index (*RES*CORDEX*). .

5.3 Long-run and short-run estimates

In the study, in order to capture the effect of institutional constraints on the effectiveness of natural resource rents, we follow the interaction between rule of law and natural resource rents (*LAW*RES*); democratic accountability and natural resource rents (*ACC*RES*) and corruption perception index and natural resource rents (CORDEX*RES) as model 1; 2 and 3, respectively. In Table 6, both ARDL long-run and short-run estimates are presented. Empirical evidence indicates that a mix of weak governance quality and natural resource rents is insignificant in explaining economic growth in both long run and short run. In addition, results reveal the possibility of an adverse indirect effect of resource rents through institutional quality on the economy within the period. These findings justify again that the dangerous combination of poor institutional quality and huge resource rents can exacerbate resource curse phenomenon (Mehlum *et al.*, 2006; Zallé, 2019). In this case, institutional quality could be considered exogenous, which mediates the nexus between resource rents and growth. A high level of corruption, lack of democratic accountability and weak rule of law could foster rent-seeking and thus lead to poor growth. In the absence of good institutions, leveraging natural resource rent for improved growth could be ineffective in the country. Since in Nigeria, the quality of institutions is yet to reach an optimal level (World Bank, 2020), it has constrained the effectiveness of resource rent, which retards the long-term development drive. These results corroborate the views of Leite and Weidman (1999), Sala-i-Martin and Subramanian (2003) and Hassan *et al.* (2019).

Furthermore, estimated parameters of natural resource rents in the long run as well as in the short run are not significant in explaining economic growth. Persistent ineffective

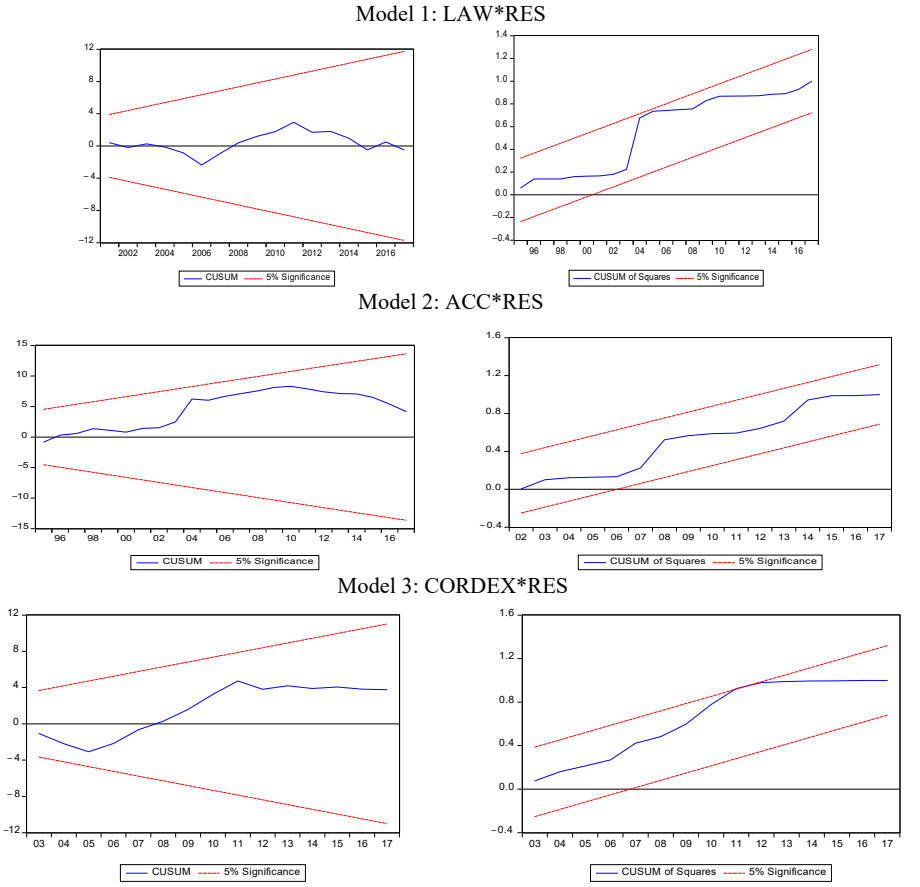


Figure 4.
Stability test

allocation of natural resource rents might be attributed to this insignificant role. It is assumed that a weak policy framework by the state apparatus might have led to the seemingly negligible effect. With the presence of a positive relationship between *RES* and *GDP (Y)*, it could be suggested that resource rents would have potentially stimulated economic growth and offset poor economic performance in the presence of good introduction and firm execution of better policy measures. This may make natural resource abundance a boon (gain) for the country rather than a curse (Gylfason, 2001). Regarding other variables of interest – governance indicators (rule of law, democratic accountability and corruption index), no statistically significant association is found between these indicators and economic growth in both long run and short run. This implies that the problem associated with the absence of strong institutions constrains optimal institutional practices and thus retards economic progress (Bates, 2005). Hence, sound institutional development measures could engender improved economic outcomes. Based on the control variables – exchange rate and inflation rate, while exchange rate *(EXH)* maintains a statistically significant relationship with *Y*, there is no existence of such relationship between inflation *(INF)* and *Y*, suggesting that the possible evidence of real exchange rate appreciations under the existence of resource windfalls could be a key determinant of growth (Mendoza, 1997).

Table 6.
ARDL long-run and short-run estimates

Variable	Model 1		Model 2		Model 3	
	Long run	Short run	Long run	Short run	Long run	Short run
Constant		0.51** [2.97]		0.24** [3.10]		0.21** [3.11]
INF	−0.01 [−0.56]	−0.13 [−0.69]	−0.01 [−0.19]	−0.01 [−0.19]	−0.02 [−0.31]	−0.01 [−0.56]
EXH	0.01** [2.93]	0.12*** [3.88]	0.01** [3.12]	0.001*** [4.01]	0.04** [2.92]	0.02** [3.01]
RES	0.07 [1.25]	0.20* [1.78]	0.69 [1.48]	0.17 [1.51]	0.21 [0.34]	0.30 [0.18]
LAW	0.54 [1.23]	0.29 [1.35]				
DACC			0.62 [1.32]	0.15 [1.19]		
CORDEX					0.14 [0.28]	0.23 [0.31]
LAW*RES	−0.45 [−1.25]	−0.08 [−1.59]				
DACC*RES			−0.01 [−0.19]	−0.05 [−1.31]		
CORDEX*RES					−0.03 [−0.22]	−0.06 [−0.51]
ECT		−0.19*** [−4.72]		−0.24*** [−4.65]		−0.12*** [3.99]
Diagnostic test						
Durbin–Watson		2.15		1.98		2.01
Breusch–Godfrey serial correlation test		0.21		0.39		0.13
Ramsey reset test		0.70		0.28		0.24
Normality test		0.15		0.17		0.19

Note(s): ***, ** and * indicate 1, 5 and 10% level of significance, respectively, while figures in parentheses are *t*-values

5.4 Granger causality results

In Table 7, Granger causality results based on VECM are presented. Findings reveal that resource rents and governance quality jointly Granger cause economic growth in the long run, while *GDP (Y)* does not in any way Granger cause the combination (interaction) of resource rents and quality of institutions. This suggests that causality only runs from *LAW*RES, ACC*RES* and *CORDEX*RES* to *GDP (Y)*, indicating that growth trajectory could be strongly influenced by the state of development in the natural resource sector and the level of institutional capacities in the economy. This points to the existence of unidirectional causality across models. In this section, the colossal role of governance quality in "resource paradox" has been shown to be crucial. Hence, adopting institutional strengthening measures may abate the dominance of the "natural resource curse" regarding developmental issue in Nigeria (World Bank, 2012) and, by extension, in Africa as a whole. A typical example of this is the ubiquitous poor institutional framework in most resource-rich African states – Angola and Nigeria (McMillan, 2005). Overall, the lag order selection criteria for this purpose are present in Tables 8–10, respectively. The selection is based on SIC.

Model	Lag	Resource rents*institutions-led growth			Growth-led resource rents*institutions		
		Variable	Short run[a]	ECT[b]	Variable	Short run[a]	ECT[b]
1	2	*LAW*RES*	0.61	−0.13** [−2.91]	*GDP (Y)*	0.47	−0.07 [−0.43]
		INF	5.96*		*INF*	0.71	
		EXH	5.44*		*EXH*	5.18*	
2	2	*DACC*RES*	4.84*	−0.07** [−3.44]	*GDP(Y)*	3.36	−0.18 [−1.27]
		INF	6.32**		*INF*	2.84	
		EXH	0.61		*EXH*	8.53**	
3	2	*CORDEX*RES*	4.91*	−0.21** [−3.01]	*GDP (Y)*	0.61	−0.10 [−0.20]
		INF	4.89*		*INF*	2.74	
		EXH	0.71		*EXH*	6.11*	

Table 7. Granger causality estimates based on VECM

Note(s): [a]The Wald statistic is reported. It tests the joint significance of the lagged values of the variables, which follow a x^2 distribution. [b]captures the long run causal relationship. ** and * indicate the level of significance at 5 and 10%, respectively

Lag	LogL	LR	FPE	AIC	SC	HQ
0	634.7882	NA	9.34e+08	37.13647	37.35766	37.22317
1	489.2349	242.3683*	9,527,603	30.24199	31.57515	30.70220*
2	474.0923	48.22546	8,250,604*	30.11951*	32.56362*	30.96321

Table 8. Lag order selection criteria (model 1)

Note(s): *indicates lag order selected by the criterion at 5% level. LR: sequential modified LR test statistic; FPE: final prediction error; AIC: Akaike information criterion; SC: Schwarz information criterion; HQ: Hannan–Quinn information criterion

Lag	LogL	LR	FPE	AIC	SC	HQ
0	56.45246	NA	5.12e-09	−4.900235	−4.651539	−4.846261
1	168.9825	160.7572	1.33e-12	−13.23643	−11.74426	−12.91259
2	214.5277	43.37639*	3.09e-13*	−15.19312*	−12.45746*	−14.59941*

Table 9. Lag order selection criteria (model 2)

Note(s): *indicates lag order selected by the criterion at 5% level. LR: sequential modified LR test statistic; FPE: Final prediction error; AIC: Akaike information criterion; SC: Schwarz information criterion; HQ: Hannan–Quinn information criterion

5.5 Dynamic least squares (DOLS) and canonical cointegrating regression (CCR)

Given the existence of only I (1) variables in the model, findings are further consolidated with the use of dynamic ordinary least squares (DOLS) and canonical cointegrating regression (CCR), and these techniques are only applicable when all series in the model are integrated in their first difference, like the case in this study. The validity of the estimates for DOLS and CCR is enhanced following Johansen cointegration tests conducted and reported in the Appendix (Table A1). As presented in Table 11, results obtained are somewhat analogous to the findings of the previous section (Table 6) as all the estimated parameters seem to have exhibited similar signs. However, the results of DOLS and CCR show the robustness of the estimates and allow us to account for the possible presence of any dynamic relationship across models. For instance, the value of GDP growth in the previous period is found to have substantially determined the level of economic growth in the current period. The use of these techniques has lent credence to the assertion that there is evidence of resource curse in Nigeria conditional on institutional factors. For instance, the interaction term of resource rents and institutional indicators reveals a negative relationship with GDP growth. This could be attributed to the poor state of public institutions and its attendant effect on the resource-rich economy (Nigeria). Given the study of Olayungbo and Adediran (2017), which asserts that institutional quality could be crucial to explaining the nexus between resource rents and economic growth in Nigeria, it is necessary to strengthen the institutional policy framework. Results indeed indicate that if Nigeria could improve its governance quality through a genuine espousal to sound institutional development measures, the country might circumvent the resource curse phenomenon, corroborating the assertion that the quality of institutions has a key role in determining whether natural resource rents lead to a boon or bane in the economy.

In sum, research findings show that although Nigeria has huge resource revenues in the form of rents, these do not necessarily result in enhanced economic growth at a level commensurate with the resource revenues. Furthermore, the negative joint effect could be attributed to the state of the institutional quality in the country (within the sample period), which affirmed the resource curse phenomenon. This validates the hypothetical ground of the study.

6. Concluding remarks

The study presents an overview of the existing arguments and empirical findings in the literature on the resource–growth nexus. It also assesses the extent to which economic performance could be influenced by natural resource rents through the channel of institutions in order to gauge the level of developmental outcomes arising from the presence of natural resource abundance in Nigeria. This paper critically gives detailed accounts on the quality of institutions in Africa's biggest economy (Nigeria) (Akwagyiram, 2019), with the use of ARDL bounds test cointegration approach, VECM Granger causality test, DOLS and CCR over the period 1996–2019. In the study, three governance indicators (rule of law, democratic

Lag	LogL	LR	FPE	AIC	SC	HQ
0	724.7862	NA	9.35e+08	36.14657	38.23776	36.33427
1	479.2449	233.3683*	9,447,613	29.24189	30.67525	29.80310*
2	484.0824	49.23446	7,340,614*	29.12941*	31.46372*	29.10423

Note(s): *indicates lag order selected by the criterion at 5% level. LR: sequential modified LR test statistic; FPE: Final prediction error; AIC: Akaike information criterion; SC: Schwarz information criterion; HQ: Hannan–Quinn information criterion

Table 10. Lag order selection criteria (model 3)

Table 11. Cointegrating regression

Variable	Dynamic least squares (DOLS)			Canonical cointegrating regression (CCR)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Constant	0.61** [2.15]	1.14** [2.21]		0.39* [1.84]	1.08** [2.40]	
GDP (Y) [−1]	0.81*** [14.22]	0.76*** [10.66]		0.84*** [17.04]	0.77*** [13.59]	
INF	−0.01 [−0.87]	−0.01 [−0.26]		−0.03 [−0.88]	−0.001 [−0.80]	
EXH	0.001** [2.14]	0.01 [2.66]		0.01** [2.11]	0.003* [1.84]	
RES	0.19** [2.66]	0.17* [2.02]		0.20*** [2.99]	0.16* [1.60]	
LAW	0.29 [1.32]			0.29 [0.11]		
DACC		0.15 [1.59]			0.15 [1.34]	
CORDEX			0.11 [0.15]			0.04 [1.45]
LAW*RES	−0.08 [−1.38]			−0.19 [−1.60]		
DACC*RES		−0.05 [−1.15]			−0.05 [−1.12]	
CORDEX*RES			−0.01 [−1.21]			−0.31 [−0.75]

Note(s): ***, ** and * indicate 1, 5 and 10% level of significance, respectively, while figures in parentheses are *t*-values

accountability and corruption index) were employed, and each of the indicators is interacted with natural resource rents to form different models.

Following the central aim of the analysis, findings lend credence to the pervasive incidence of bad governance in Nigeria and that overreliance on natural resources has exacerbated the growing number of dysfunctional outcomes in the country. The study confirms that a mix of weak governance quality and natural resource rents has negligible effects on economic growth and a possible retardation impact on the economy in the long run as well as in the short run. It is asserted that persistent ineffective allocation of natural resource rents and the low level of institutional and administrative capacities have resulted to poor growth. The evidence further reveals that there is unidirectional causality running from the interaction term to growth, suggesting that growth trajectory could be jointly determined by natural resource rents and the quality of institutions. In general, the study posits that the combination of natural resource rents and weak institutional systems contributes to poor economic outcomes – a case of resource curse phenomenon, while exchange rate appreciations in the existence of resource windfalls serve as a key determinant of growth.

Hence, the study suggests that weak rule of law, an absence of democratic accountability and a high level of corruption, which are strongly associated with an underperformed economy, should be addressed and tackled holistically by policymakers. Also, there should be result-based reforms in the natural resource sector that would stimulate improved performance and the betterment of the economy as a whole. Essentially, if Nigeria could improve its governance quality through the adoption of sound institutional development measures, the country would overcome the resource curse phenomenon. Across levels of governance, the prevalence of corrupt incidence in the public domain, which abets misappropriation of resources and poor economic outcomes, should be curbed. In addition, fashioning policy towards enhancing efficient and effective utilization of resource windfalls need to be a key formative approach of governance.

Notes

1. Governance shortcomings are the institutional failures attributable to poor governance practices in any economy (Dinh and Dinh, 2016).
2. For more on the advantage of ARDL, see Laurenceson and Chai (2003); Narayan (2005).

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Appendix

Table A1. Johansen cointegration test

Lags interval (in first differences): 1 to 2 Unrestricted cointegration rank test (trace) Hypothesized no. of CE(s)	Eigenvalue	Trace statistic	0.05 Critical value	Prob.**
None*	0.890000	158.6894	95.75366	0.0000
At most 1*	0.705454	90.26373	69.81889	0.0005
At most 2*	0.552730	52.37180	47.85613	0.0177
At most 3	0.453383	27.42941	29.79707	0.0916
At most 4	0.239146	8.705181	15.49471	0.3934
At most 5	0.007470	0.232435	3.841466	0.6297

Note(s): Trace test indicates 3 cointegrating eqn(s) at the 0.05 level; * denotes rejection of the hypothesis at the 0.05 level and **MacKinnon *et al.* (1999) *p*-values

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