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RESOURCE CURSE: CASE STUDY OF NIGERIA

Abstract:

The aim of the article is to verify the validity of resource curse in the case of Nigeria at the beginning of the new millennium. The theoretical part defines the role of natural resources as a form of capital, the symptoms of the alleged curse and transmission channels of resource curse. The practical part verifies several hypotheses established by comparing research papers on impacts of natural resources. The validity of the Prebisch-Singer hypothesis, Dutch disease symptoms and a negative impact on political institutions (inclination toward authoritarianism, high level of corruption, high government spending and low efficiency of economic and political decision-making) are verified. Results confirm most of the manifestations of the resource curse.

Keywords:

Introduction

Natural resources can be defined as a stock of natural assets including land, water, air, minerals and wildlife. Although one would expect that the large stocks of natural assets would be a blessing for a country, practice has shown that this need not to be. In the last decades of 20th century, economists observed at first glance an illogical phenomenon that resource-rich continents, such as Africa or Latin America, grow more slowly than resource-poor continents. This phenomenon is called "resource curse". The resource curse is a complex theory that is examined from many points of view in literature.

At the beginning of the new millennium, the alleged curse was subject to criticism. It turned out that some countries were not affected by the curse (Botswana, Norway, Chile…) and thus the estimated curse may be a red herring (Ploeg, Poelhekke, 2009, p. 738-739). A major problem of this theory is the effort to create one big all-embracing explanation. "*The generalization that resource production harms the economy overlooks the complexity of economic development in different countries under different circumstances.*" (Stevens, Lahn, Kooroshy, 2015, pp. 16).

The aim of the article is to verify the validity of resource curse in the case of Nigeria at the beginning of the new millennium. The article is structured as follows. In the theoretical part, the role of natural resources as a form of capital, symptoms of resource curse and transmission channels of resource curse are discussed. In the practical part, all identified transmission channels are analysed on the example of Nigeria. Firstly, resource wealth and growth performance are discussed. Secondly, the economic and political factors of spreading of resource curse are analysed. The source of all included data is the database of the World Bank (2017), unless otherwise indicated.

1   Natural resources as a form of capital

Since 18th century, capital, labour and land were considered as key production factors. According to classical school of economics, countries blessed with natural resources should base its development on these resources. The factor "land" included all natural resources and was regarded as different production factor than capital, because land is a gift of nature and people are not able to change its supply. At the beginning of 20th century, the capital was redefined as any asset that produces revenue stream over time (Farley, 2012, p. 264). Land was considered as one form of capital. Modern macroeconomics models followed this opinion. In 1972, the Rome club published "The Limits to Growth" (Meadows et al, 1972). They warned of future depletion of non-renewable resources if population grows still at the same rate. The report formed a basis of concept of sustainable development [1] which was defined in the message "Our common future" presented by Gro Harlem Brundtland in 1987.

Construction of macroeconomic models did not reflect these threats. The endogenous models of growth incorporated to capital and labour also technology as an input into the growth process. The role of natural resources as a valuable input stayed out of the theory of growth. It was thought that inputs are infinitely substitutable for labour and capital. However, capital takes many forms and different forms of capital are not always mutually substitutable. The substitutability has its limits if a scarce resource must be embodied in the very capital (Ayres, 2001, p. 20). The economic system would not work even a minute without a large influx of available energy and materials these days. So, we should consider different forms of capital differently.

The reason why natural resources are not included in most macroeconomic models, is (among other things) the effort to simplify these models. Although the views on the importance of natural resources differ, all of the above approaches consider the abundance of natural resources as an advantage - either because they increase the total capital or for the reason that the larger natural resources the country has, the less the threat of exhaustion. It is therefore surprising that many empirical researches conclude that natural resources not only did not contribute to economic growth in many countries, but they were in many cases even a disadvantage.

2   Resource curse

The concept of the so-called "resource curse" describes the paradox that resource-rich countries tend to grow more slowly than resource-poor countries. This puzzling finding was the subject of numerous empirical studies (Gelb, 1988; Sachs and Warner; 1995; Auty, 2001; Gylfason; 2001, Sala-i-Martin and Subramanian; 2003; Smith, 2004). The most cited one is the work of Sachs and Warner (1995). Their study offers evidence for a statistically robust inverse relationship between economic growth and resource abundance. The paper includes data for 97 countries at the time period 1970–1989. They used a number of control variables such as an initial GDP, an investment activity, an income inequality, an effectivity of bureaucracy etc. Other studies narrow its focus only on one or a few countries. This method is recommended by Ploeg (2011, p. 381), because it prevents spurious correlation between countries.

The orientation of exports towards natural resources generally arises after the discovery of new resources or because of a sudden rise in prices. That's why natural resources usually have a positive impact on economy in the short run. They support export (and export companies), decrease unemployment and therefore boost economic growth. Nevertheless, it does not hold in the long run. What are the theoretical long-run symptoms of the resource curse? Firstly, slow economic growth is at the centre of interest of most studies regarding resource curse. The boom of mining sector makes other economic sectors less competitive (see below). The resource curse may also spill to the wider set of development indicators (Bulte, Deacon, 2005, p. 1038-1039). Furthermore, it

can lead to a widening of the gap in the distribution of wealth between different population groups. Secondly, natural wealth often leads to the lack of political efforts. The reason is that natural resources are "a gift from above". Thirdly, resource-rich countries may consider the extraction of resources as too important. This leads to an insufficient diversification of economy. Lastly, an excessive extraction of natural resources may have a negative impact on environment. Symptoms associated with the environment include a wide range of problems: dust from mining, deformation of country-side, noise, contamination of water resources, massive use of water etc. (NRGI, 2015, p. 5).

All these symptoms are attributed mainly to the so-called "point resources", in other words to the resources geographically concentrated in one place. This is why almost all studies on resource curse have focused only on minerals and fuels. It should be noted that all countries need not suffer from all these symptoms, but all symptoms attributed to resource curse can have a negative impact on economic growth.

3   Transmission channels

Literature analysing spreading of the resource curse is various. The main attention is devoted to transmission channels of the resource curse. These transmission mechanisms can be divided into two groups: economic factors and political factors. Let us begin with economic factors. Countries with exports specialized in several commodities can be disadvantaged by the long-term development of prices of these commodities on global market. According to the so-called "Prebisch-Singer hypothesis", the relative prices of commodities grow more slowly than prices of other products (Prebisch, 1950; Singer, 1950). This assertion is based on the Engel's rule which says that an increase in income by 1 % leads to an increase in consumption of food and other necessities by less than 1 %. So, if income grows, demand for commodities grows less rapidly than demand for other products and services. The hypothesis was confirmed for instance by Lutz (1999), Harvey et al. (2008) and Arezki (2013).

Another economic transmission channel is the concept of the Dutch disease which is a popular explanation of theory of resource curse. The model was named on the basis of experience of Netherlands where decrease in competitiveness of manufacturing sector occurred after discovery of natural gas. The core of this theory was formulated by Corden and Neary (1982). If there is a rapidly growing sector – typically mining – in a small open economy, increase in the export of these commodities on the global market will lead to an increase in demand for the national currency. Thus, the national currency will appreciate (assuming floating regime of exchange rate). It will harm other economic sectors, because their competitiveness on global market will decline with appreciation of the national currency. In the case of fixed regime of exchange rate, the central bank will have to accumulate reserves to preserve fixed exchange rate. The central bank will issue the national currency into circulation which will lead to inflation and thus to real appreciation

of national currency (Lewis, 2011, p. 86). Moreover, the expansion of mining sector will cause an increase of demand for labour and capital. If the production factors are mobile, labour and capital will be reallocated to the mining sector. The output and employment in the manufacturing sector will decline. This is called as a "resource movement effect". The expansion of mining sector also raises an aggregate demand and subsequently the price level ("spending effect"). That also causes real appreciation (Oomes, Kalcheva, 2007, p. 8).

The resource-rich countries can be also exposed to the short-run movement of prices, exchange rate and even economic growth. High volatility of these indicators makes the decisions of public authorities more difficult and raises an uncertainty for private entities. Ploeg and Poelhekke (2009, p. 754) claims that the resource curse is foremost a problem of volatility. However, the volatility transmission channel can be tested only on a wider sample of countries.

There is also a huge range of political factors contributing to the spreading of resource curse. Firstly, natural resources can induce and maintain internal conflicts since different groups fight for the control of natural resources and revenues from them. Proponents of the theory of the curse of natural resources further argue that revenues from natural resources are positively associated with authoritarianism. The reason is that revenues from natural resources exempts the government from the need to raise revenue through a domestic taxation. Revenues from natural resources prevents the demand for democracy. In the same time, revenues from natural resources are means to withstand a pressure of democracy (Morrison, 2007, p. 3). This explanation is associated with rent-seeking which occurs mainly in countries with badly defined property rights (Deacon, Rode, 2012, p. 3). The rent-seeking distorts resource allocation, reduce economic efficiency and leads to a higher level of corruption. Lastly, the efficiency of fiscal policy is often weak. *"In general, a sudden resource bonanza tends to erode critical faculties of politicians and induce a false sense of security. This encourages them to invest in projects that are unnecessary, keep bad policies in force, and dress up the welfare state so that it is impossible to finance once natural resource revenues dry up. Politicians are likely to lose sight of growth-promoting policies, free trade, and "value for money" management."* (Ploeg, 2011, p. 392). In addition, politicians are also prone to increases in public spending during period of resource boom.

All of the above mentioned hypotheses will be tested on the example of Nigeria. Many studies have already dealt with Nigeria in relation to this topic, but this study verifies the validity of the resource curse in the case of Nigeria using the latest available data.

4   Case study: Nigeria

Federal republic of Nigeria is the typical country for illustration of resource curse because of combination of its resource abundance and low economic performance in the decades after the discovery of natural resources. Nigeria is situated in the Gulf of Guinea. Its territory has a range of 924 thousand km^2 and it's divided into 36 federal states. Nigeria has more than 182 million inhabitants. GDP per capita in PPP made 6 004 USD in 2015 and its growth rate was in average 2.44 % in 2010-2015. The average unemployment rate was 12.68 % in the 2010-2014 (figure is not available for 2015) [2].

- **Natural wealth and economic growth**

A key item of the natural wealth of this country is crude oil, which was discovered here in 1956. Currently, Nigeria is the Africa's largest oil producer and the 10th largest producer in the world (NRGI, 2017). Nigeria's proven reserves of oil are estimated at 37,062 billion barrels (OPEC, 2017). Oil is simultaneously the main export article of Nigeria. The share of fuels in exports of goods [3] rose from 10 % to more than 90 % between 1962 and 1974, held above this level until 2009. In the time period 2010-2013, the share of oil in exports of goods fell below 80 %. After that, oil's share in export of goods grew again and its short-term drop was therefore only a reaction to the crisis. In 2014, oil accounted for 91 % of export of goods again. Other minerals, ores and metals reached 7.16 % share of exports of goods in 1968, then dropped to below one percent in 1975, where it remained until 2010, when once accounted for 1.08 % of export goods (World Bank, 2017).

Table 1 shows the long-term growth performance of Nigeria. Nigeria reached very high growth performance in the 70s of the 20st century (because of oil shocks). In the upcoming decades, the growth rate was very slow considering the fact that Nigeria is a developing country. It revealed that the effects of commodity booms can quickly wear off. Still, Nigeria reached very high growth performance during the first years of the new millennium.

Table 1 Long-run growth performance of Nigeria

Indicator	%
Growth of GDP 1970-1979	6.66
Growth of GDP 1967-1999	2.32
Growth of GDP 2000-2015	7.34

Source: own calculations, geometric averages, data from World Bank (2017)

Table 3 in Appendix shows calculations of the share of fuels in export of goods and the ratio of fuel exports to GDP (in the absolute values, USD). The significant change occurred from 2000 to 2015. The share of fuels in export of goods declined by 10 percentage points and what was even more interesting, the ratio of fuel's exports in GDP declined from 45 % to 15 %. Since during the selected period exports of fuel

increased, this development indicates a growing diversification of the Nigerian economy. Table 3 also allows us to identify periods of commodity booms – years 2003-2008 and 2010-2011.

- **The long-term development of commodity prices**

The main export article of Nigeria is crude oil, as already stated. The average annual price per barrel has been growing since 1970. Unfortunately, data for the worldwide price level are not available before 1980. The worldwide price level grew on average by 6.26 % per annum in 1980-2015. In the same time, the average price of crude oil grew on average by 0.89 % per annum. In the 2000-2015 the worldwide price level grew on average by 3.91 % per annum, the average price of crude oil 3.75 %. So, Nigeria has been disadvantaged in the long term and the Prebisch-Singer hypothesis was (in this case) confirmed. In 2014-2015, price of crude oil rapidly declined (from 108.8 USD/per barrel in September 2013 to 29.8 USD/per barrel in January 2016). It caused a dramatic drop in GDP per capita by 17.06 % between years 2014 and 2015.

- **Symptoms of the Dutch disease**

The national currency of Nigeria is the Nigerian Naira (NGN). Naira was in the floating regime until February 2015 when the Central bank of Nigeria intervened in order to maintain the exchange rate on the value of 197 NGN/USD. This commitment lasted 16 months. The declining price of oil would lead to the depreciation of this currency in the case of a floating exchange rate. In June 2016, the central bank decided to end the commitment and Naira markedly depreciated. Nevertheless, Nigeria was plagued by high inflation during the whole period 2000-2015 and that reduced competitiveness of other economic sectors.

Data on value added in mining and manufacturing are shown in Table 2 [4]. Data for 2008 are not available. In the first commodity boom, the mining sector grew more rapidly than the manufacturing sector. Data on value added in mining are not available for period of the second boom, but it is possible to assume that the value added in the manufacturing grew faster.

Table 2 Annual growth rate of added value in selected sectors

Period	Mining (%)	Manufacture (%)
2002–2007	26.06	13.23
2009-2011	-	92.34

Source: own calculations, geometric averages, input data from World Bank (2017)

- **Political regime and corruption**

Nigeria gained independence in 1966. Previously, it had been a British colony. After obtaining the independence, a military type regime was launched. Nowadays, governmental structure is formally federalist and democratic, but Nigerian institutions do not work like that in general. Nigeria experienced numerous conflicts in the long term precisely because of the resource wealth. There has been the dispute in the Nigerian delta over control of oil resources since the mid-90s. In addition, the tensions between different ethnic groups for access to the oil wealth has been going on, using political power (Oyefusi, 2007, pp.2-3).

The development of an active civil society were thwarted (among other things) by corruption. In 2016, Nigeria was ranked 136th out of 176 countries in the Corruption Perception Index (Transparency International, 2017).

- **Efficiency of fiscal policy**

The hypothesis about increasing public spending during resource boom was not confirmed, government expenditures were related to government revenues (see Graph 1). In the reporting period, public authorities managed to reduce public debt - it amounted to almost 70 % of GDP in 2003, in 2013 (more recent data are not available) they managed to reduce the debt to less than 2 %.

However, these figures alone do not reflect the overall effectiveness of natural resources management. One useful indicator is the assessment of Natural Resource Governance Institute, which compares the effectiveness of natural resources management in 58 countries. Nigeria is ranked as 40th and thus falls to the category "Weak". Nigeria is also poorly assessed with regard to environmental protection, according to Environmental Protection Index Nigeria was ranked 133rd out of 180 countries evaluated in 2016.

Another problem is that Nigeria does not invest enough resources for capital formation. In 2005 (so in the period of commodity boom) capital formation reached its lowest value (in the new millennium) of 5.5 % of GDP. After the crisis, there was a significant increase in investment and that is reflected in the growing diversification of economy (mentioned above). Regarding expenditure on education, the Nigerian Bureau of Statistics provides the latest figure for 2012. The share of 8.43 % of national budget was allocated on education. Of this amount, 82 % was used for expenses and only 18% of capital expenditures.

Graph 1 Development of public finance
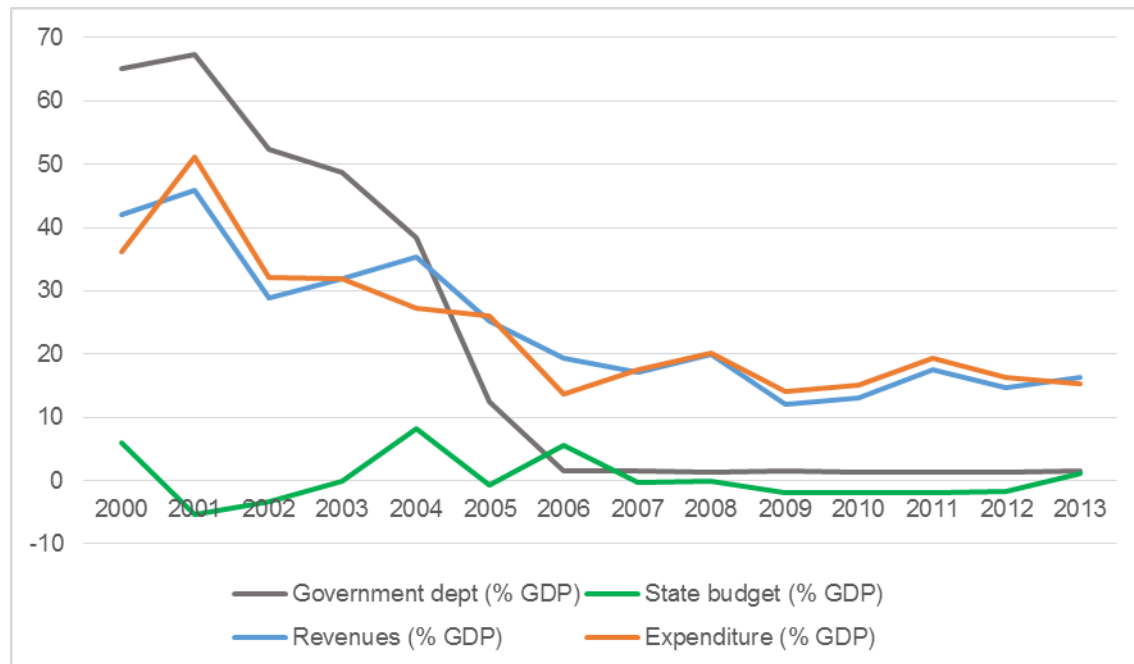
Source: own construction, data from Open Data for Africa (2017)

5   Conclusion

Although the concept of natural resources curse has many critics currently, its symptoms can still be observed in some countries, such as Nigeria. Prebisch-Singer hypothesis was confirmed in the case of oil. Thus, Nigerian economy has been permanently disadvantaged in this manner. Moreover, a strong vulnerability of the Nigerian economy to short-term fluctuations in oil prices was demonstrated (in 2015). Certain symptoms of Dutch disease have been confirmed, namely real appreciation of the exchange rate through inflation plus relatively slower growth in value added in manufacturing during the first period of boom. Policy transmission channels were manifested even more significantly. In Nigeria, ethnic groups has been fighting for control of natural resources constantly. There is also a high level of corruption, the efficiency of natural resource management is poor, the environmental protection is at a low level and public authorities do not invest enough resources in the education sector.

However, throughout the reporting period the public authorities managed to significantly reduce government debt and they managed to increase the diversification of the Nigerian economy especially after the world crisis. In the future, the Nigerian government should strive to increase transparency in the management of natural resources in order to effectively prevent corruption, they should compensate areas affected by mining in order to prevent social unrest, and ultimately should invest more in education.

Appendix

Table 3 Export of fuels/GDP 2000-2015

Year	Export of goods (thousands of USD)	Share of fuels (%)	Export of fuels (thousands of USD)	GDP (current prices, thousands of USD)	Export of fuels/GDP (%)
2000	20 975 000	99.635	20 898 441	46 385 996	45.05
2001	18 045 000	99.656	17 982 925	44 138 014	40.74
2002	17 975 000	94.037	16 903 151	59 116 868	28.59
2003	24 031 000	97.897	23 525 628	67 655 840	34.77
2004	38 631 000	-	-	87 845 404	-
2005	50 467 000	-	-	112 248 325	-
2006	58 726 000	98.239	57 691 835	145 429 765	39.67
2007	66 605 950	93.666	62 387 129	166 451 213	37.48
2008	86 273 500	91.000	78 508 885	208 064 754	37.73
2009	56 741 900	90.362	51 273 115	169 481 318	30.25
2010	84 000 000	87.132	73 190 880	369 062 465	19.83
2011	116 000 000	89.126	103 386 160	411 743 802	25.11
2012	114 700 000	84.039	96 392 733	460 953 836	20.91
2013	102 400 000	87.621	89 723 904	514 966 287	17.42
2014	94 200 000	90.854	85 584 468	568 498 940	15.05

Source: own calculations, data from World Bank (2017)

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[1] Sustainable development was defined as development that does not compromise future generations to meet their needs.

[2] Own calculations, geometric averages based on data from World Bank (2017)

[3] "Fuel exports" corresponds to category SITC Rev. 3 code 3, which includes coal, oil, natural gas and electricity. However, according to UN Comtrade oil accounted for more than 90 % of the total volume of export commodities in 2015. Other commodities did not reach no more than two-percent representation in commodity exports.

[4] In the calculation, there is always included the year preceding the boom, since there was a year-to-year growth at the beginning of resource boom.

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