

Do Sub-Saharan Countries in Africa Have the Dutch Disease?

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Abstract

The Sub-Saharan countries in Africa are evaluated to determine if conditions exist to cause some to develop the Dutch disease. Two groups are assembled from the study population: those with natural resources rents under 8% of GDP, and those over. Both groups show tendencies for higher resources rents than the baseline World readings. Both groups also experience decreases in both the agriculture and manufacturing sectors during the study period. In addition, both groups see increases in personal remittances received by the host countries. All of these are ingredients which signal potential Dutch disease. In addition to the two group comparisons, individual country assessments are conducted which identify 13 of the 49 countries, or 26.5%, as having conditions which would support the Dutch disease diagnosis. Measurements for the study are taken from the World Bank databank website and categorized into two sections, economic configuration and money flows, for further focus. The study includes discussions on natural resources development, globalization, institutions, the Dutch disease, remittances, and investments.

Keywords: Dutch Disease, Africa, Sub-Saharan, natural resources curse

1. Introduction

This study investigates countries in the Sub-Saharan region of Africa and assesses whether conditions indicate the potential existence of the Dutch disease. The study time frame looks at the economic situation in 2005 and 2015 and makes various assessments as to whether countries in this region have the necessary components to be classified as having the Dutch disease. These characteristics would typically include having natural resources rents which exceed 8% as a percentage of GDP, as well as the reduction in both the agriculture and manufacturing sectors. Another variant of the Dutch disease includes a higher level of personal remittances received in the host country with the threshold level used at 10% of GDP for the study. Various factor combinations are then evaluated to determine the applicability of the Dutch disease diagnosis.

To accomplish this process, the entire study population of 49 countries is reviewed. Two groups are created by separating the population by the natural resources rents as a percentage of GDP, using 8% as the delineation. The two groups are compared to each other using various assessments in areas of economic configuration and money flows for the countries. An additional comparison is made using the World readings to see how trends develop over this study period. The 49 countries are also assessed individually to see if the conditions exist for the potential classification of the Dutch disease.

The results see that both of the groups, the under 8% group and the over 8% group, have higher levels of natural resources rents in comparison to the World reading. The mean readings for both groups also show declines in the agriculture and manufacturing sectors, and increases in personal remittances received over the ten year study period. These indications do not necessarily mean that the countries in both groups necessarily have the Dutch disease, but indicate the groups would be more pre-disposed to acquire it. A separate assessment for each country using the same parameters indicate the 13 out of the 49 countries, or more than a quarter of the countries have environments which would indicate Dutch disease classification.

There have been numerous studies on the Dutch disease in the world at large, and in Africa specifically. This study fills a research gap on the Dutch disease in Africa using some of the comparative methodologies from a widely heralded global ranking report on this topic with baseline years of 1970 and 1991 (Davis, 1995) and another study comparing economies of Asia and the EU (Barrows, 2018). The study then incorporates ideas from studies on the Dutch disease as well (Corden & Neary, 1982; Davis, 1995; Sachs & Wagner, 1995; DeKorne,

2011; Makhoul & Mughal, 2013; Mahama & Gakpe, 2015; Siakwah, 2017).

The study also includes discussions on the development of natural resource (Gelb, 1988; Davis, 1995; Van der Veen, 2004; Ghazvinian, 2007; Gstraunthaler & Proskuryakova, 2012; Ross, 2012; Mahama & Gakpe, 2015; Siakwah, 2017), as well as the need for robust institutions as a foundation for economic success (Davis, 1995; Collier, 2008; Sgard, 2008; Bensidoun, Lemoine & Unal 2009; Muahamat & Gakpe, 2015; Collins & Nissan, 2016; Siakwah, 2017). There are also discussions on investments and globalization as well as personal remittances received in the host countries (Sachs & Warner, 1995; Amuedo-Dorantes & Pozo, 2004; Kapur, 2004; Collier, 2008; Acosta, Lartey & Mandelman, 2009; DeKorne, 2011; Serino & Kim, 2011; Gstraunthaler & Proskuryakova, 2012; Lautier, 2012; Benmamoun & Lehnert, 2013; Makhoul & Mughal, 2013). Mahama & Gakpe, 2015; Collins & Nissan, 2016; Siakwah, 2017).

2. Literature Review

2.1 Natural Resources

The development of raw natural resources has generally not been seen in aiding economic development (Davis, 1995). On the surface, it would seem that such natural abundances have the ability to provide “economic growth, employment, and fiscal revenue” (Mahama & Gakpe, 2015). However, in many cases, in the long term, focusing on natural resources instead of economic diversification sabotages full economic development (Siakwah, 2017). The so-called resource curse is based upon the negative effects of improper development of natural resources, especially in less developed countries (Mahama & Gakpe, 2015). This dynamic seems to be focused on non-renewable natural resources. These issues are caused by minerals and “are not caused by other kinds of natural resources, like forests, fresh water, or fertile cropland” (Ross, 2012).

“Natural resource windfalls can be harmful to an economy when it leads to crowding of capital and labour from the agriculture and manufacturing sectors” (Siakwah, 2017). At certain periods of time, there was a universal distaste for developing countries which chose the natural resource focus. “Let us for a moment agree that the concentrated exploitation of mineral endowments is detrimental to long-run development in certain mineral-based developing countries”, is the way one author summed up the accepted premise (Davis, 1995). We can use this viewpoint to begin the conversation. However, management of natural resources has not always been a curse (Mahama & Gakpe, 2015).

The mismanagement of resources can be identified as beginning with “petroleum-producing states” (Ross, 2012). The primary focus on a single sector can spell doom for the other sectors. “Natural resource rent can crowd-out innovation when returns in the resource sector are higher than entrepreneurial activities” (Siakwah, 2017). Although other natural resources may be identified as having poor performance over the long term. It seems that oil may be the real culprit. Oil “accounts for more than 90 percent of the world’s minerals trade- produces the largest problems for the greatest number of countries” (Ross, 2012). According to one author, “every developing country where oil has been discovered has seen its standard of living decline and its people suffer.” (Ghazvinian, 2007).

Among natural resources, oil is among the most widespread (Ross, 2012). “Oil discovery has been of economic benefit to the most developed countries while it has brought a curse to the economies of most developing countries, with the difference seen in the managerial principles adopted among these two categories of countries” (Mahama & Gakpe, 2015). For starters, there is a common bias against natural resource development where the host countries are dependent on outsiders, similar to the colonial development many of these countries have already witnessed (Davis, 1995). There are many multi-national companies (MNC) searching for long term opportunities. “Securing the supply of raw materials and other natural resources has been acknowledged as an important objective of MNC” (Lautier, 2012).

One of the issues related to securing a supply of a commodity is the pricing level. As with the price of many commodities, forecasts are difficult due to an underlying “inelasticity, with regards to both demand and supply” (Siakwah, 2017). The price volatility of commodities usually results in worse economic performance for economies driven by natural resources as the windfalls from good years do not make up for the shortfalls during the bad years (Gelb, 1988). As a result, commodity price volatility influences instability in domestic demand and therefore tends to slow economic growth (Davis, 1995).

Not all resource rich countries develop with problems with notable exceptions as Australia, Canada, New Zealand, Norway, and Sweden (Gstraunthaler & Proskuryakova, 2012). These countries are all well developed, which certainly influences the outcome. However, with regard to natural resources, many times there “is the inverse relationship between natural resource abundance and economic growth in the developing countries”

(Siakwah, 2017). A study with the selection criteria focused “on the availability of relatively complete economic and social data” of 91 countries measuring the years 1970 and 1991 then compared the results for more developed and less developed countries (Davis, 1995). The work is seen as a watershed study on the Dutch disease topic. The two years were selected because “they were unexceptional years in terms of mineral prices” and it found “some significance that the gap between the more developed mineral economies and the less-developed never-mineral economies is widening” (Davis, 1995).

2.2 Globalization

In the economic market place, there is currently a rush to globalization. The process of globalization “leads to a strong cooperation of all countries in the rapid development of global markets of capital, natural, and human resources” (Gstraunthaler & Proskuryakova, 2012). Globalization formalizes trading arrangements that integrate markets and encourages foreign direct investments (FDI) in host countries (Collins & Nissan, 2016). Depending on the scenario, there may be plenty of capital available for investment. For instance, “oil rich countries can borrow from the capital markets and emerging economies like China” (Siakwah, 2017).

On the surface, globalization appears to be a positive. However, despite globalization, or perhaps because of it, there is still economic “inequality among countries and regions” (Collins & Nissan, 2016). A study evaluating 97 countries found that high natural resource economies had lower growth than other economies, “even after controlling for variables found to be important for economic growth, such as initial per capita income, trade policy, government efficiency” (Sachs & Warner, 1995). The issue is that there is a set of countries falling behind (Collier, 2008). This may not appear to be an issue for those in developed countries. However, approximately 80% of the world’s population live in these developing countries (Collier, 2008).

Because of globalization and specifically “the fast growth of manufacturing exports in East Asia”, the developing world’s export earnings from the primary commodities (like hydrocarbons and minerals), fell from 80% in 1970 to 34% in 1993 (DeKorne, 2011). This is certainly good news and shows that globalization includes the sale of finished products, not just raw natural resources. However, there are still economies, most notably in Africa, that still rely on these raw commodities for the majority of the export incomes (Ross, 2012).

One author sees Africa’s slow rise from poverty as a failure of government on the continent, along with war, disease, and conflict in addition to debt and slow steps to modernization (Van der Veen, 2004). This has occurred even though Africa possesses the majority of the world deposits “of cobalt, manganese, and gold as well as significant supplies of platinum, uranium, and oil” (Mahama & Gakpe, 2015). The colonial states in Africa resulted in dysfunctions, both financial and moral, and their independence did not alleviate these situations (Van der Veen, 2004). Regardless of the social issues, natural resources have been developed and the natural resource industries “accounted for more than 50 percent of African exports and 65 percent of foreign direct investment in Africa in the 1990s” (Ghazvinian, 2007).

2.3 Institutions

Emerging economies are characterized by high GDP per capita growth and the participation in the global markets (Bensidoun et al., 2009). To better participate in these markets, there are some necessary foundations that need to be established. These include economic liberalization and the creation of strong state institutions which will attract investment and signal that trading is open for both imports and exports (Sgard, 2008). Once open for business, countries can prosper. In theory, “given the right institutional framework, natural resources can boost a country's economic and human development” (Siakwah, 2017). However, this is not always the case.

“Countries with weak institutions often struggle to handle the potentially destructive force of corruption and inequality in the distribution of natural resource wealth, and efforts by various actors to capture the wealth generated by the natural resources” (Mahama & Gakpe, 2015). In natural resource economies, “the transfer of mineral revenues to the government is potentially the most damaging” of all processes (Davis, 1995). If natural resource economies cannot properly tax the natural resources, the benefits increasingly get monopolized by a select few, and not the population as a whole (Siakwah, 2017).

Many times, countries lack the technical and managerial expertise to adequately manage the whole process of natural resource development (Mahama & Gakpe, 2015). Hence, windfalls from natural resources and their impact on an economy are largely controlled by how committed the government is to the development of the economy using a long term sustainable plan (Siakwah, 2017). The lack of fiscal restraint and weak institutions are common shortcomings for countries just beginning the development of their natural resources (Mahama & Gakpe, 2015).

Devotion to the budgetary process ensures that improvements will be made, step by step, according to a detailed

plan (Siakwah, 2017). However, when good governance is ignored, countries rich in natural resources “could suffer from environmental destructions, Dutch disease”, and other maladies such as widespread poverty and income inequality (Mahama & Gakpe, 2015). This seems more likely in Africa, as opposed to say Europe and North America.

With regard to Africa, although there is “strong focus on development by many governments, there are still incentive problems in several of the institutions involved in natural resources governance” (Mahama & Gakpe, 2015). A country’s regions associated with natural resources “often gain economic and political power through exploiting the natural resource rich economies” (Siakwah, 2017). Rising commodity prices certainly help the host countries, but concerns about how this windfall is being spent raises doubt among the citizens of these countries (Davis, 1995). “Corruption is only a part of the explanation” also high levels of inequality impact the allocation and distribution of resources and proceeds (Mahama & Gakpe, 2015).

The way a government receives its revenues has an impact on its citizens. Government receipts from natural resources instead of taxes from citizens reduces accountability and discourages citizen involvement (Siakwah, 2017). In addition, many in government believe that they have limited influence on contractor companies (Mahama & Gakpe, 2015). As a result, government reliance on transnational companies “can weaken accountability and social contract between the citizens and the state” (Siakwah, 2017). The “resource booms depend on state policy responses” (Mahama & Gakpe, 2015). “Where citizens do not pay taxes ..., they become less assertive in asking questions on ... efficiency and corruption” (Siakwah, 2017).

Host country policy changes which encourage business and investments “include decreasing regulation, liberalizing the economy, improving property rights, and increasing the ease of conducting business” (Collins & Nissan, 2016). “The experiences of countries such as Norway, Botswana, Thailand, and Malaysia give hope that the natural resource curse can be avoided if there are strong institutions as well as strategic policies to govern the sector” (Mahama & Gakpe, 2015). In Africa, Botswana is an outlier, because of a strong budgetary process, and a commitment from the highest levels to develop resources properly (Collier, 2008).

2.4 Dutch Disease

Despite various definitions, the Dutch disease is nothing more than the combination of concurrent booming and lagging sectors in an economy. According to one author, the Dutch disease signals “the coexistence of booming and lagging sectors in an economy due to a temporary or sustained increase in export earnings” (Davis, 1995). A more refined view separates the various sectors even further. Technically, the dynamic of a Dutch disease “refers to three sectors, the boom sector, lagging sector, and non-traded sector” (DeKorne, 2011). The boom sector is self-evident, it is resources extracted, normally in a raw or near raw state, while the lagging sector is the tradable goods sectors such as agriculture and manufacturing (Corden & Neary, 1982). The non-traded sector is the construction industry, homes, buildings, factories, and related services, which cannot be exported (DeKorne, 2011).

In the Dutch disease, this non-traded sector is subject to boom as well. “Government expenditure in developing countries is predominantly spent on non-tradables (principally on public sector salaries), contributing to real exchange rate appreciation” (Makhlouf & Mughal, 2013). Given these dynamics, the Dutch disease is not always the outcome, but if “trade is reliant on one or two main commodity exports”, it certainly is more likely. (DeKorne, 2011). “The volatility of the mineral-driven exchange rate” appears to make the situation worse (Auty, 1993). If public sector expenditures on infrastructure improve the efficiency of the productive sectors, however, then these have a reducing effect on the appreciation of the exchange rate (Makhlouf & Mughal, 2013).

The Dutch disease is called this because of the development of natural gas in the Netherlands and the resultant effects on the economic sectors. This was caused from the rise in natural gas production and “the Netherlands export boom and simultaneous decline of the manufacturing sector in the late 1970s” (DeKorne, 2011). The increased natural gas exports increased the value of the currency so much so that other sectors were not competitive and hence declined. This also “resulted in an increase in domestic unemployment” (DeKorne, 2011). Labor and capital are used in agriculture, manufacturing, and the non-traded (construction) sector, but less so in the resource extractions (Sachs & Warner, 1995). The higher the proportion of resource extraction, while increasing the non-tradeable sector, while also diminishing the agriculture and manufacturing sectors, the Dutch disease is considered serious when economic growth slows because of it (DeKorne, 2011).

The Dutch disease as an economy malady “refers to the potential negative effects natural resource windfalls and accompanying appreciations of exchange rates can have for the rest of the economy” (Mahama & Gakpe, 2015). Hence, one of the outcomes of the Dutch disease is inflation (DeKorne, 2011). The prime danger is that currency appreciation makes agricultural and manufactured goods too expensive for export and thus causes these sectors

to decline (Mahama & Gakpe, 2015). This drives up the costs of these sectors and ends up killing these sectors while the country then looks to imports to provide these sector goods. Adjustments in the economy do not always suggest the Dutch disease, for example, “moving labor from agriculture to industry would not pose a problem, as it should promote economic development” (Dekorne, 2011). However, manufacturing decline by itself is cause for concern because it “can negatively affect other sectors of the economy like agro-processing” (Siakwah, 2017).

Losses in the agricultural sector “seems to be the most notable modified Dutch disease result, along with a booming government sector” (Davis, 1995). The decline in agriculture and the rise of urbanization feed each other, but employment in each sector may not be realized as many wish (Siakwah, 2017). This phenomenon is usually in concert with an increase in the construction and services industries (Mahama & Gakpe, 2015). This focuses the country on a limited number of productivities which provides less opportunities for employment. In addition, the currency appreciation leads to a decline in competitiveness (Mahama & Gakpe, 2015). “If the mineral boom is indefinite, the Dutch disease merely describes the transformation of the economy from one long-run equilibrium to another” (Davis, 1995).

“As a developing country catches up with developed economies, its tradable sector productivity increases faster relative to the non-tradable sector” (Makhlouf & Mughal, 2013). Increases in GDP and GDP per capita can verify this occurrence. As expected, normally “this leads to higher income and increased demand for the non-tradables, thus causing structural inflation (Makhlouf & Mughal, 2013). With regard to Africa, Africa’s backbone industry, agriculture, faces declines if focus on natural resources makes food imports cheaper than indigenous farming (Siakwah, 2017). Given the history of famine and drought in Africa, these events can have catastrophic impacts for the continent.

The most common form of the Dutch disease is from the development and export of a significant level of raw natural resources. However, there also exists another variant when there exists a proportionally high level of personal remittances sent to the host country which drive up the currency of the host country (Makhlouf & Mughal, 2013). In both of these variants, there is too much support for the local currency which adversely affects the development and support for the sustainable operation of other sectors in the host country’s economy.

2.5 Remittances

“Remittances are an important source of foreign exchange for developing countries”, in fact in many countries, this amount “exceeds that of foreign private capital and official development assistance”, also known as ODA (Makhlouf & Mughal, 2013). A study using data from 1990-2006 found “that international remittances, foreign direct investments (FDI), and ODA are positively and significantly associated with the economic growth rate of low income countries..., the impact is greater with international remittances” (Benmamoun & Lehnert, 2013). The “effect of remittances was more pronounced” for those in the highest level of poverty (Serino & Kim, 2011).

Remittances can have a positive effect as they allow governments of developing countries to be “less reliant on other financial inflows for their foreign exchange requirements (Makhlouf & Mughal, 2013). They can provide for increased household consumption and savings along with economic development (Serino & Kim, 2011). In addition, remittances make bigger economic impacts in comparison to ODA and FDI (Benmamoun & Lehnert, 2013). As a result, remittances now dwarf ODA “by a significant margin” (Serino & Kim, 2011). However, remittances can influence both the exchange rate and the buying behavior of recipients and can have an impact of the tradable sector, thus “can hurt competitiveness popularly known as Dutch disease” (Collins & Nissan, 2016).

One study in Pakistan from 1980 to 2009 found that remittances “caused a shift in resource allocation through consumption of non-tradable goods and services” (Makhlouf & Mughal, 2013). The result being that there was an increased demand for these items. This caused the country’s exports to become too expensive and thus less competitive in relation to other economies (Makhlouf & Mughal, 2013). This dynamic seems to be more pronounced in smaller countries according to one study (Kapoor, 2004).

“The rising spending power of remittances-receiving households that increases the relative demand for services raises the price level of the non-tradable sector” (Makhlouf & Mughal, 2013). Thus, there are consequences for these changes. “This leads labour and capital movement towards the non-tradable sector at the cost of tradable goods sector, resulting in the loss of export competitiveness” (Makhlouf & Mughal, 2013). Another study looking at 109 developing countries from 1990 to 2003, found that increased capital flows assisted the currency in its appreciation from prior periods (Acosta et al., 2009).

A study on 66 countries from 1981 to 2005 found “that international remittances have an uneven effect across

poverty quantiles for developing countries” (Serino & Kim, 2011). The distribution of these funds can vary wildly from region to region. However, not all households benefit and there is the risk of consumable price inflation and the potential for Dutch disease in which increased currency flows position local industries at a disadvantage to imports (Serino & Kim, 2011).

Another study of 13 Latin American and Caribbean countries found that a 100 percent increase of remittances caused the currency to appreciate by 22 percent (Amuedo-Dorantes & Pozo, 2004). Thus, an over-reliance on remittances can have the effect of driving up the country’s currency which places its tradable products at a disadvantage to imports because it makes its exports more expensive and imports cheaper, in a version of the Dutch disease (Makhlouf & Mughal, 2013).

Increased assistance does not always hurt an economy. ODA, as compared to remittances, “does not appear to have a damaging impact on the country's exchange rate” (Makhlouf & Mughal, 2013). There is some debate why this occurs. But there is some consensus that this is “due to the fact that these inflows, being official transfers, are not spent in the same way as remittances” (Makhlouf & Mughal, 2013). ODA funds are spent differently. The effect is that “foreign assistance is often directed at infrastructure development and provision of public service projects with high social and economic returns in developing countries, adding to the economy's productive capacity” (Makhlouf & Mughal, 2013). The productive sectors then see improvements based on these investments. This is in contrast to foreign remittances as “foreign remittances may cause the real exchange rate to appreciate” (Makhlouf & Mughal, 2013).

2.6 Investments

Among the factors companies use to evaluate investments in host countries, an overall risk assessment is important as is the level of investments made by local entrepreneurs (Lautier, 2012). Supply and demand factors influence on the country participants and the country participants also influence increases in investments and the resultant increases in production (Gstraunthaler & Proskuryakova, 2012). However, research on the Dutch disease “shows that natural resources abundance rarely stimulates domestic investment”, at least not by itself (Lautier, 2012). There needs to be other measures in place before investments can be realized.

Many developing countries have focused policies and incentives on foreign investors who can provide FDI to these countries (Lautier, 2012). FDI “shows a small but helpful influence on the non-tradables' sector... therefore, clearly exhibits neither the spending nor the resource movement effects of the Dutch disease” (Makhlouf & Mughal, 2013). However, there is the expectation for “domestic investment to lead foreign direct investment”... and as such, “domestic investment acts as a catalyst for foreign investment” (Lautier, 2012). There is empirical evidence to support this. According to a study which included 68 countries from 1984 to 2004 “lagged domestic investment has a strong influence on FDI inflows”, and that multinational companies are looking for local economic development prior to making FDI inflows to a country (Lautier, 2012).

There are also other factors involved as well. Uncertain social circumstances plus “a high level of poverty in a country, will discourage MNC investments” (Lautier, 2012). Resolving this issue seems important for foreign investors. This constraint seems to be alleviated “once the country has escaped from poverty” (Lautier, 2012). There is some debate on what level this is. However, there is some consensus that a per capita of \$1500 in 2000 constant USD is enough to demonstrate eradication from poverty (Lautier, 2012). Once this level has been achieved, increases in “production, investment and employment” have the potential for realization of benefits to both the foreign investor and the host country (Collins & Nissan, 2016).

Once a certain amount of poverty has been eradicated, other factors come into play. A base level of infrastructure provides some sort of insurance for investors and “the better the state of the host-country infrastructure, the more profitable the FDI is” (Lautier, 2012). In addition to infrastructure, there are other provisions which countries use to entice investments. These can include “indirect support, which mostly consists of generous tax credits” (Gstraunthaler & Proskuryakova, 2012). Foreign investors tend to “target the same type of profitable environment, as do local entrepreneurs” (Lautier, 2012). This is a feedback loop that contributes to both local and foreign investors. Host country domestic investment is used as a guide for foreign firms looking to invest (Lautier, 2012). As this happens, different cost dynamics enter the equation. “An increase of domestic private investments... contributes to reduce transaction costs” (Lautier, 2012). The resultant increases benefit all involved. Hence, the FDI inflows or investments certainly promote growth for the host countries (Lautier, 2012).

3. Methodology

The intent of this article is to make quantifiable comparisons on various aspects of economies in the Sub-Saharan region of Africa and assess whether there appears to be dynamics of the Dutch disease in these countries. To

accomplish this, two sets of countries are assembled delineated by the total natural resources rents as a percentage of GDP. Natural resource economies have previously been defined in other similar studies as at least 8% of the GDP (Gelb, 1988; Auty, 1993; Davis, 1995). This was the threshold used in this study as well.

The baseline year used was 2005 and a subsequent comparison was made in 2015 to assess how the two groups performed over time. A duration of ten years provides for a reasonable time frame, and more importantly provides a recent indication into the current dynamics. At the time of data collection for this study, measurements more recent than 2015 do not provide the same completeness of measurements as the 2015 year does, so 2015 was used. The two groups are displayed in Table 1 in the Appendix.

To evaluate the performance of the two groups, two sections are created which provide insight into the two groups. The component measurements included in this study are a combination from two comparative studies using country assessments on related topics (Davis, 1995; Barrows, 2018). The two sections are: economic configuration and money flows.

The economic configuration section includes total natural resources rents as a percentage of GDP; agriculture value added as a percentage of GDP; and manufacturing value added as a percentage of GDP. The expectation is that the greater the level of total natural resources rents as a percentage of GDP, the less the expected levels of agriculture value added as a percentage of GDP and manufacturing value added as a percentage of GDP. This would be the expected dynamic if there were tendencies toward the Dutch disease, either in terms of percentage of GDP or from trends established during the study time period.

The money flows section includes FDI; personal remittances received as a percentage of GDP; and GNI, or gross national income, per capita using the Atlas method in current USD. FDI is seen a beneficial for economic growth. The same can be said for personal remittances. However, there is a risk that a heightened level of personal remittances can lead to unhealthy economic results. Both of these variables are analyzed in the framework established in this section. Also, the per capita income is evaluated as one of the best measurements to economic success of a country.

With regard to these variables, the movement between the base year of 2005 and 2015 is measured and provides for the identification of trends during this time period. The two groups were fairly evenly matched as the under 8% group had 24 countries and the over 8% group had 25 countries. A baseline measurement for the world economy is also included to provide reference points for these measurements.

In addition, a country by country analysis is included which provides further detailed readings of the measurements. National resources rents as a percentage of GDP for 2005 and 2015 are included as well as personal remittances received for the same two years. The growth (or decline) in agriculture as a percentage of GDP along with the same for the manufacturing sector is included as well. In addition, the GNI per capita is included for each country. Calculations to determine Dutch disease applicability are performed for each country and classified as such if the country sees natural resources rents greater than 8%, or personal remittances received greater than 10%, along with the required negative growth in both the agriculture and manufacturing sectors.

The quantitative data collected for this article is provided by the World Bank. The World Bank provides extensive data feeds grouped by country and aggregated into various regions. The data used in this study is provided by the World Bank database website called World Development Indicators, but a portion originates elsewhere including from: International Monetary Fund; International Labour Organization; the Organization for Economic Cooperation and Development; United Nations; Eurostat; various national statistics offices; US Census Bureau; Secretariat of the Pacific Community; Food and Agriculture Organization; Food Security Statistics; and the World Health Organization; (World Bank, 2018).

4. Results

4.1 Economic Configuration

The first group of items is the economic configuration series. Tables 2A and 2B in the Appendix display these items. There are three component measurements in this group: total natural resources rents as a percentage of GDP; agriculture, value added as a percentage of GDP; and manufacturing, value added as a percentage of GDP. For the under 8% group, the mean of the total natural resources rents as a percentage of GDP grew from 3.76% to 6.60%, or an increase of 76%, while the median grew from 3.93% to 5.48%, or an increase of 39%. For the over 8% group, the mean of the total natural resources rents as a percentage of GDP fell from 24.68% to 16.82%, or a decrease of 32%, while the median fell from 23.14% to 15.09, or a decrease of 35%. For comparison, the World mean for total natural resources rents as a percentage of GDP fell from 3.23% in 2005 to 1.73% in 2015 or

a decrease of 47%.

With regard to the agriculture sector as a percentage of GDP, the under 8% group mean saw a decrease from 21.02% to 20.30% or a decrease of 3% while the median saw a decrease from 25.70% to 21.79% or a decrease of 15%. The over 8% group mean saw a decrease from 32.87% to 27.00% or a decrease of 18% while the median saw a decrease from 31.02% to 25.20% or a decrease of 19%. The World mean for the agriculture sector as a percentage of GDP saw a decrease from 4.28% to 3.79%, or a decrease of 11%.

With regard to the manufacturing sector as a percentage of GDP, the under 8% group mean saw a reduction from 13.18% to 11.24% or a decrease of 15% while the under 8% group median saw a reduction from 11.69% to 10.35% or a reduction of 11%. The over 8% group mean saw a reduction from 8.72% to 7.94% or a reduction of 9% while the over 8% group median saw an increase from 7.12% to 7.63 or an increase of 7%. The World mean for the manufacturing sector as a percentage of GDP saw a decrease from 18.06% to 16.62%, or a decrease of 8%.

4.2 Money Flows

The money flows section measurements include FDI; personal remittances received as a percentage of GDP; and per capita income. Tables 3A and 3B in the Appendix display these items. For the under 8% group, the mean FDI grew from 3.23% to 3.91%, or an increase of 21%, while the median reading saw an increase from 2.29% to 3.00%, or an increase of 31%. For the over 8% group, the mean FDI grew from 4.93% to 6.79%, or an increase of 38%, while the median reading saw an increase from 2.14% to 4.37%, or an increase of 105%. The world mean saw a decrease from 3.26% to 3.04%, or a reduction of 7%.

With regard to personal remittances, for the under 8% group, the mean grew from 5.01% to 5.47%, or an increase of 9%, while the median reading saw an increase from 1.70% to 2.58%, or an increase of 52%. For the over 8% group, the mean personal remittances grew from 2.15% to 4.95%, or an increase of 130%, while the median reading saw an increase from 0.92% to 1.66%, or an increase of 80%. The world mean for remittances saw an increase from 0.55% to 0.76%, or an increase of 38%.

With regard to per capita income, for the under 8% group, the mean GNI per capita increased from 1842 to 2826 USD, or an increase of 53%, while the median reading increased from 700 to 1145 USD, or an increase of 64%. For the over 8% group, the mean GNI per capita increased from 830 to 1776 USD, or an increase of 114%, while the median reading saw an increase from 430 to 850 USD, or an increase of 98%. The world mean saw an increase from 7342 to 10582, or an increase of 44%.

4.3 Individual Country Results

There are separate readings for the 49 individual countries included in the study. Table 4A in the Appendix displays these items. Included in these measurements are natural resources rents as a percentage of GDP for 2005 and 2015; personal remittances received as a percentage of GDP for 2005 and 2015; the growth or decline in the agriculture sector as a percentage of the GDP between 2005 and 2015; the growth or decline in the manufacturing sector as a percentage of the GDP between 2005 and 2015; along with the per capita income in USD for 2015.

As stated in the Section 3 Methodology, a formula was calculated for each country to determine if it possessed the dynamics normally expected with the Dutch disease. Table 4B in the Appendix displays these items. Using this formula, there are 13 countries out of the 49 deemed to have the Dutch disease, or 26.5% of the study participants. The countries deemed to have Dutch disease were: Burkina Faso, Burundi, Democratic Republic of Congo, Ethiopia, Gabon, The Gambia, Ghana, Lesotho, Liberia, Malawi, Mozambique, Zambia, and Zimbabwe.

It is interesting to note that the 2015 income per capita for the entire 49 countries was 2278 USD. The average for the non-Dutch disease countries was 2663 USD and the average for the countries with Dutch disease was 1302 USD. The non-Dutch disease group saw per capita incomes at two times the level of the Dutch disease countries. The highest income per capita for the non-Dutch disease group was Seychelles at 14680 USD while the highest income per capita for the Dutch disease group was Gabon at 8010 USD. Excluding these two countries changes the average from 2663 USD to 2288 USD for the non-Dutch disease group and changes the average from 1302 USD to 743 USD for the Dutch disease group. This changes the dynamic even further with the non-Dutch disease countries at a per capita income level at three times the level of the Dutch disease countries.

5. Discussion

With regard to the natural resources rents as a percentage of the GDP, despite the fact that the under 8% group

reading increased and the over 8% group decreased, the over 8% group readings for both the mean and median were still 155% and 175%, respectively, larger as a percentage of GDP than the under 8% group readings. The readings for the agriculture sectors have both groups decreasing, but the over 8% group decreased more than the under 8% group, however, the over 8% group's mean agriculture sector is still 33% larger as a percentage of GDP. The readings for the manufacturing sectors also have both groups declining, but the under 8% group's mean is still more than 41% larger than the over 8% group's mean, showing a comparatively larger sector in the under 8% group.

These results show that the under 8% group increased its dependency on natural resources while the over 8% group slightly reduced its dependency. Against this backdrop, both groups saw their agriculture and manufacturing sectors decline while their personal remittances received increased. These dynamics point toward a greater risk of Dutch disease for the individual countries in the study (Corden & Neary, 1982; Davis, 1995; Sachs & Wagner, 1995; DeKorne, 2011; Makhoul & Mughal, 2013; Mahama & Gakpe, 2015; Siakwah, 2017). This result is confirmed by the individual country assessments which saw 13 out of the 49, or 26.5%, as experiencing conditions prevalent with the Dutch disease.

Although, there are studies that document positive outcomes when developing economies develop their natural resources (Gstraunthaler & Proskuryakova, 2012; Mahama & Gakpe, 2015), most studies document the adverse results when developing countries use natural resources as one of the prime contributors to their economies (Gelb, 1988; Davis, 1995; Van der Veen, 2004; Ghazvinian, 2007; Ross, 2012; Mahama & Gakpe, 2015; Siakwah, 2017). One of the issues is that well-functioning institutions are seen as a necessary foundation for a country to fully enjoy the benefits of economic development, including natural resource development (Davis, 1995; Collier, 2008; Sgard, 2008; Bensidoun, et al., 2009; Muahamat & Gakpe, 2015; Collins & Nissan, 2016; Siakwah, 2017).

With regard to FDI, both groups saw increases in the readings, but the over 8% group's mean is more than 73% higher as a percentage of the group's GDP as compared to the under 8% group. This can be expected as the over 8% group natural resources rents were significantly higher as well. The readings for personal remittances received for both groups increased, but the under 8% group's mean reading is more than 10% higher than the over 8% group's mean reading. A certain level of personal remittances received is seen as supporting a host country's economy, however, excess remittances can introduce inflation and in certain cases the Dutch disease (Amuedo-Dorantes & Pozo, 2004; Kapur, 2004; Acosta et al., 2009; Serino & Kim, 2011; Benmamoun & Lehnert, 2013; Makhoul & Mughal, 2013; Collins & Nissan, 2016).

The per capita income of both groups increased tremendously for both groups, but the under 8% group's mean is more than 59% greater than the over 8% group. FDI grew as well and is seen to have a positive effect on the development of economies (Gstraunthaler & Proskuryakova, 2012; Lautier, 2012; Makhoul & Mughal, 2013; Mahama & Gakpe, 2015; Collins & Nissan, 2016; Siakwah, 2017). It is also seen as a necessary step toward a country's participation in global markets (Sachs & Warner, 1995; Collier, 2008; DeKorne, 2011; Gstraunthaler & Proskuryakova, 2012; Collins & Nissan, 2016; Siakwah, 2017).

6. Conclusion

The intent of this study was to explore the prevalence of the Dutch disease in the Sub-Saharan sections of Africa. Splitting the countries into two groups allowed for a further view into their characteristics. Both groups had similar dynamics in that both saw natural resources rents as a percentage of GDP well above the World readings, and both groups saw their agriculture and manufacturing sectors decline during the study period, along with increases in personal remittances received. These factors indicate economic imbalances which can lead to the Dutch disease.

When the individual countries were evaluated, over a quarter indicated they had acquired the Dutch disease, or at least they were in an environment where the imbalances could prove detrimental to their economies. On the plus side, both the under 8% group and the over 8% group saw increases in FDI and income per capita during the study period, but when the countries were assessed on an individual bases and the Dutch disease countries were compared against the non-Dutch countries, the non-Dutch disease countries had per capita incomes more than double the Dutch disease countries. If the highest per capita readings in each group were excluded, the comparison saw the non-Dutch disease countries with more than triple the per capita income as the Dutch disease countries.

The answer to the research question is that over a quarter of the Sub Saharan countries in Africa either do have the Dutch disease, or see dynamics consistent with the so-named economic malady. Furthermore, according to this study, there is a documented cost in economies that experience these shifts to losses in productivity of the

various sectors. That is, they have per capita incomes substantially less than other countries who do not have these sector imbalances.

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Appendix

Table 1.

Natural resources rents less than 8% of GDP				Natural resources rents greater than 8% of GDP			
	Country	2005	2015		Country	2005	2015
1	Mauritius	0.01	0.00	1	Mozambique	8.11	13.06
2	Seychelles	0.09	0.12	2	Central African Republic	8.42	15.41
3	Cabo Verde	0.50	0.97	3	Cameroon	9.12	6.17
4	Djibouti	0.53	0.92	4	Zimbabwe	9.33	8.69
5	Namibia	1.27	2.32	5	Niger	9.63	14.77
6	Swaziland	2.10	2.88	6	Sierra Leone	9.94	23.47
7	Comoros	2.20	4.61	7	Ghana	11.58	17.09
8	Senegal	2.43	5.79	8	Guinea-Bissau	13.25	21.45
9	Sao Tome and Principe	2.93	3.11	9	Zambia	13.29	14.38
10	Eritrea	3.25	NA	10	Uganda	14.15	13.54
11	Lesotho	3.43	6.93	11	Sudan	15.47	4.20
12	Botswana	3.82	2.71	12	South Sudan	NA	15.85
13	Kenya	4.04	3.29	13	Guinea	23.14	24.54
14	Benin	4.15	6.73	14	Ethiopia	23.30	14.28
15	Gambia, The	4.27	7.67	15	Congo, Dem. Rep.	24.25	34.02
16	South Africa	4.78	4.20	16	Burundi	26.48	17.16
17	Cote d'Ivoire	5.47	5.48	17	Somalia	NA	17.82
18	Tanzania	5.67	6.86	18	Mauritania	25.95	NA
19	Mali	5.97	12.50	19	Nigeria	32.86	4.71
20	Madagascar	6.29	12.84	20	Liberia	34.21	46.44
21	Togo	6.46	24.67	21	Chad	38.62	13.07
22	Malawi	6.66	9.61	22	Gabon	41.19	13.10
23	Rwanda	6.69	6.72	23	Congo, Rep.	55.94	23.34
24	Burkina Faso	7.15	20.99	24	Equatorial Guinea	59.54	15.95
				25	Angola	59.91	11.25

Table 2A. Economic Configuration - Mean

	<u>Year</u>	<u>World</u>	<u>Increase</u>	Under 8%		Over 8%	
				Natural Resources Rents as % of GDP		Natural Resources Rents as % of GDP	
				<u>Mean</u>	<u>Increase</u>	<u>Mean</u>	<u>Increase</u>
Total natural resources rents (% of GDP)	2005	3.23		3.76		24.68	
	2015	1.73	-47%	6.60	76%	16.82	-32%
Agriculture, value added (% of GDP)	2005	4.28		21.02		32.87	
	2015	3.79	-11%	20.30	-3%	27.00	-18%
Manufacturing, value added (% of GDP)	2005	18.06		13.18		8.72	
	2015	16.62	-8%	11.24	-15%	7.94	-9%

Table 2B. Economic Configuration - Median

	<u>Year</u>	<u>World</u>	<u>Increase</u>	Under 8%		Over 8%	
				Natural Resources Rents as % of GDP		Natural Resources Rents as % of GDP	
				<u>Median</u>	<u>Increase</u>	<u>Median</u>	<u>Increase</u>
Total natural resources rents (% of GDP)	2005	3.23		3.93		23.14	
	2015	1.73	-47%	5.48	39%	15.09	-35%
Agriculture, value added (% of GDP)	2005	4.28		25.70		31.02	
	2015	3.79	-11%	21.79	-15%	25.20	-19%
Manufacturing, value added (% of GDP)	2005	18.06		11.69		7.12	
	2015	16.62	-8%	10.35	-11%	7.63	7%

Table 3A. Money Flows - Mean

	<u>Year</u>	<u>World</u>	<u>Increase</u>	Under 8%		Over 8%	
				Natural Resources Rents as % of GDP		Natural Resources Rents as % of GDP	
				<u>Mean</u>	<u>Increase</u>	<u>Mean</u>	<u>Increase</u>
Foreign direct investment, net inflows (% of GDP)	2005	3.26		3.23		4.93	
	2015	3.04	-7%	3.91	21%	6.79	38%
Personal remittances, received (% of GDP)	2005	0.55		5.01		2.15	
	2015	0.76	38%	5.47	9%	4.95	130%
GNI per capita, Atlas method (current US\$)	2005	7342		1842		830	
	2015	10582	44%	2826	53%	1776	114%

Table 3B. Money Flows - Median

	<u>Year</u>	<u>World</u>	<u>Increase</u>	Under 8%		Over 8%	
				Natural Resources Rents as % of GDP		Natural Resources Rents as % of GDP	
				<u>Median</u>	<u>Increase</u>	<u>Median</u>	<u>Increase</u>
Foreign direct investment, net inflows (% of GDP)	2005	3.26		2.29		2.14	
	2015	3.04	-7%	3.00	31%	4.37	105%
Personal remittances, received (% of GDP)	2005	0.55		1.70		0.92	
	2015	0.76	38%	2.58	52%	1.66	80%
GNI per capita, Atlas method (current US\$)	2005	7342		700		430	
	2015	10582	44%	1145	64%	850	98%

Table 4A. Country data

Natural Resources Rents	Personal Remittances	Growth in agriculture,	Growth in manufacturing	2015 GDP
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	(% of GDP)		(% of GDP)		(% of GDP)	(% of GDP)	per capita (USD)
	2005	2015	2005	2015	2005 to 2015	2005 to 2015	
Angola	60%	11%	NA	0%	NA	NA	4040
Benin	4%	7%	3%	3%	-8%	-36%	870
Botswana	4%	3%	1%	0%	20%	16%	6680
Burkina Faso	7%	21%	1%	4%	-14%	-37%	620
Burundi	26%	17%	0%	2%	-9%	-26%	280
Cabo Verde	0%	1%	14%	13%	NA	NA	3150
Cameroon	9%	6%	0%	1%	6%	-25%	1470
Central African Rep.	8%	15%	NA	NA	-23%	12%	360
Chad	39%	13%	NA	NA	-4%	1118%	880
Comoros	2%	5%	14%	23%	NA	NA	790
Congo, Dem. Rep.	24%	34%	0%	0%	-9%	-15%	430
Congo, Rep.	56%	23%	0%	NA	59%	83%	2350
Cote d'Ivoire	5%	5%	1%	1%	NA	83%	1490
Djibouti	1%	1%	4%	4%	NA	NA	NA
Equatorial Guinea	60%	16%	NA	NA	NA	NA	9510
Eritrea	3%	NA	NA	NA	NA	NA	NA
Ethiopia	23%	14%	1%	2%	-12%	-9%	600
Gabon	41%	13%	0%	NA	-11%	-23%	8010
Gambia, The	4%	8%	10%	15%	-36%	-30%	440
Ghana	12%	17%	1%	13%	-49%	-44%	1470
Guinea	23%	25%	1%	1%	-14%	NA	690
Guinea-Bissau	13%	21%	3%	8%	8%	NA	620
Kenya	4%	3%	2%	2%	22%	-13%	1310
Lesotho	3%	7%	36%	15%	-14%	-28%	1320
Liberia	34%	46%	6%	32%	-48%	-53%	380
Madagascar	6%	13%	2%	3%	-10%	NA	420
Malawi	7%	10%	1%	1%	-20%	-10%	340
Mali	6%	12%	3%	7%	16%	NA	790
Mauritania	26%	NA	NA	NA	-9%	-36%	1230
Mauritius	0%	0%	0%	0%	-41%	-26%	9780
Mozambique	8%	13%	1%	1%	-2%	-34%	580
Namibia	1%	2%	0%	0%	-43%	-21%	5280
Niger	10%	15%	2%	2%	NA	NA	390
Nigeria	33%	5%	13%	4%	-36%	237%	2850
Rwanda	7%	7%	0%	2%	-21%	13%	710
Sao Tome and Principe	3%	3%	1%	6%	NA	NA	1690
Senegal	2%	6%	9%	14%	1%	NA	980
Seychelles	0%	0%	1%	1%	NA	NA	14680
Sierra Leone	10%	23%	0%	1%	15%	-32%	550
Somalia	NA	18%	NA	NA	NA	NA	NA

South Africa	5%	4%	0%	0%	-13%	-26%	6100
South Sudan	NA	16%	NA	NA	NA	NA	820
Sudan	15%	4%	3%	0%	25%	NA	2000
Swaziland	2%	3%	3%	2%	-10%	-5%	3280
Tanzania	6%	7%	0%	1%	3%	-27%	910
Togo	6%	25%	9%	9%	3%	-42%	540
Uganda	14%	14%	4%	3%	-2%	27%	670
Zambia	13%	14%	1%	0%	-67%	-27%	1560
Zimbabwe	9%	9%	NA	13%	-38%	-40%	890
Average	14%	12%	4%	5%	-10%	29%	2278

Table 4B. Dutch disease	Natural Resources Rents above 8% of GDP		Remittances above 10% of GDP	Negative growth in agriculture, manufacturing (% of GDP)	Dutch Disease calculation	2015 GDP per capita (USD)	
	2005	2015	2015		2015	DD	non-DD
<i>Dutch Disease calculation:</i>		<i>If (this</i>	<i>or this) plus</i>	<i>this >= 2 then</i>	<i>Dutch D.</i>		
Angola	1	1					4040
Benin				1			870
Botswana							6680
Burkina Faso		1		1	1	620	
Burundi	1	1		1	1	280	
Cabo Verde			1				3150
Cameroon	1						1470
Central African Rep.	1	1					360
Chad	1	1					880
Comoros			1				790
Congo, Dem. Rep.	1	1		1	1	430	
Congo, Rep.	1	1					2350
Cote d'Ivoire							1490
Djibouti							NA
Equatorial Guinea	1	1					9510
Eritrea							NA
Ethiopia	1	1		1	1	600	
Gabon	1	1		1	1	8010	
Gambia, The			1	1	1	440	
Ghana	1	1	1	1	1	1470	
Guinea	1	1					690
Guinea-Bissau	1	1					620
Kenya							1310
Lesotho			1	1	1	1320	
Liberia	1	1	1	1	1	380	
Madagascar		1					420

Malawi		1		1	1	340	
Mali		1					790
Mauritania	1	1		1			1230
Mauritius				1			9780
Mozambique	1	1		1	1	580	
Namibia				1			5280
Niger	1	1					390
Nigeria	1						2850
Rwanda							710
Sao Tome and Principe							1690
Senegal			1				980
Seychelles							14680
Sierra Leone	1	1					550
Somalia	1	1					NA
South Africa				1			6100
South Sudan	1	1					820
Sudan	1						2000
Swaziland				1			3280
Tanzania							910
Togo		1					540
Uganda	1	1					670
Zambia	1	1		1	1	1560	
Zimbabwe	1	1	1	1	1	890	
Total from 49 countries	25	27	8	19	13		
Average						1302	2663

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