An Empirical Investigation of the Resource Curse Theory and Economic Growth: Panel Data Analysis

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Declaration of Authenticity and Author's Right

This thesis is the result of the author's original research. It has been composed by the author and has not been previously submitted for examination, which has led to the award of a degree.

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Abstract

The economics of natural resources has been a subject of discussion for a number of years. One of the problems that natural resources economics studies is Resource Curse Theory, which refers to the situation where a number of natural resource exporting countries are negatively affected in terms of various economic, political, and social factors. This theory refers to an observed negative correlation between natural resource exports and the economic growth of countries engaging in these exports. This study empirically investigates the Resource Curse Theory. Applying panel data of oil rents share of GDP as different natural resource measurements, various econometric techniques were used in order to obtain robust results. Using panel data fixed effect estimator, a significant positive correlation between oil rents share of GDP and GDP growth rate is found. When using the two-stage least square approach, positive significant results are also found between oil rents share of GDP and GDP growth rate.

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Chapter one: Introduction

1.1 Introduction of the Study

Natural resource production is important for human needs by utilizing natural resources for heating, cooling, electricity, transportation, and lighting. A great many of the global population uses natural resource production for these reasons. Thus, natural resources play an essential role in economic development and economic growth (Keppler, Bourbonnais, and Girod, 2007).

Suleiman (2013) argues that before the late 1980s, the general belief was that natural resources were an important factor for a country attempting to achieve higher economic growth. Rostow (1961) suggests that an abundance of natural resources would support countries to make transaction from developing to developed states such as United States, Australia, and the United Kingdom. Similarly, Krueger (1980) suggests that natural resources could ease countries' transition from underdevelopment to development by providing large amounts of investment funds and a domestic market.

Natural resources are assumed to be a great supporter of a country's economy and naturally rich countries, particularly rich with the resources of oil and gas holds a central position in the global trade. Scholars and economists of the Industrial Revolution underlined the benefits natural resources can bring to a country, and the expanded dimensions for the economic growth of the naturally rich country (Leveille, 2009).

However, several studies such as those by Auty (1986, 1993, 2001a, 2001b), Sachs and Warner (1995; 1997; 1999), Robinson et al (2006), Collier and Hoeffler (2005) and Gylfason (2001) discovered that there is negative correlation between natural resources exporting countries and economic growth in terms of economic, political, and social aspects. This theory refers to the Resource Curse. It refers to an observed negative correlation between natural resource exports and economic growth of the countries engaging in these exports.

The Natural Resource Curse Theory suggested that natural resources exports have negative effect on economic growth in countries which export them through three mechanisms: economic, political, and social. The first mechanism, which is economic, explains the effect through the Dutch disease theory. The Dutch disease theory, proposed by

Corden and Neary (1982) and Corden (1984), refers to the appreciation of the exchange rate of a currency due to the high natural resource revenues in an economy having an adverse effect on the manufacturing sector.

The second mechanism is political and refers to natural resources as obstacles to democracy (Ross, 1999). This is the case in North Africa and the Middle Eastern region, where natural resources have led to civil wars in countries such as Nigeria, Angola, Congo, and Sierra Leone (Collier and Hoeffler,2005), and to a high level of corruption in countries such as Nigeria and Venezuela (Karl, 2003).

The third mechanism is social and refers to human capital. This is the case in North Africa and the Middle Eastern region where natural resource exporting countries tend to reduce their spending on education and health care and these reductions negatively affect economic growth (Gylfason, 2001). Gylfason, (2001, p. 850) explained these reductions by stating that: "Nations that are confident that their natural resources are their most important asset may inadvertently - and perhaps even deliberately! - neglect the development of their human resources, by devoting inadequate attention and expenditure to education. Their natural wealth may blind them to the need for educating their children".

1.2 Motivation of the Study

There are a number of motivations for this research. Firstly, the researcher had often wondered why the inhabitants in some oil and gas rich countries, such as Libya, with small populations, have a low per capita income, a lack of economic diversification, poor standards of education and health care, high levels of corruption, insecure property rights, and greater political instability than other resource-rich countries such as Norway and Canada and resource-poor ones such as Taiwan and Singapore, which perform very well economically, politically, and socially. The United Nations argued that natural resources belong to the people of the state and they should use and be in control of them, rather than having these resources being controlled by the state. The United Nations declared that "The right of peoples and nations to permanent sovereignty over their national wealth and resources must be exercised in the interest of their national development and of the well-being of the people of the state concerned" (General Assembly Resolution 1962, 2). Secondly, some natural resource exporting countries are encountering great challenges to achieve the Eight Millennium Development Goals, such as gender equality, poverty reduction, child mortality and environmental sustainability despite these resource-rich countries obtaining considerable

wealth from large-scale resource exportation. Thirdly, drawn from the finding of this research, suggestions will be made to policy makers and a contribution will be made to new knowledge on ways in which the resource curse can be overcome and on how to convert the oil curse into an oil blessing, as has been done in Norway. This knowledge and these suggestions pertain particularly to Libya, which is currently facing a great challenge to sustain economic growth in the aftermath of the civil war and the fall in oil prices, as well as more generally to natural resource exporting countries that suffer from the curse.

1.3 Research Aim

The aim of this research is to discover the effect of natural resources on the economic growth of natural resources exporting countries. The main specific is to examine the impact of oil rents share of GDP on GDP growth rate.

1.4 Hypothesis of the Study

$H0$: There is no correlation between oil rents share of GDP and GDP growth rate.

$H1$: There is a correlation between oil rents share of GDP and GDP growth rate.

1.5 Research Contribution

This research contributes to existing literature by finding out the impact of oil rents share of GDP on GDP growth rate in the panel countries .A further contribution in this research is the use of appropriate methodological techniques such as panel data fixed effect and two-stage least squares estimators.

1.6 Thesis Structure

This thesis is divided into four chapters.

Chapter One provides an introduction, explains the motivation behind the research undertaken, sets the aim and the hypothesis and determines the contribution done to the literature.

Chapter Two introduces an overview of the theoretical and empirical literature related to resource curse theory through economic, political, and social aspects.

Chapter Three introduces the empirical model, hypothesis testing, data description, and empirical strategy for the impact of natural resources on economic growth.

Chapter Four provides the conclusions drawn from this research and makes recommendations.

Chapter Two

Review of the Literature

This chapter offers a review of the literature on the of Natural Resources Curse Theory as well as a review of the literature of empirical evidence for the existence of Natural Resources Curse Theory with specific emphasis on its economic, political, and social aspects. More specifically, the researcher discusses the relationship between natural resource endowments related to gas, oil, and minerals and economic, social, and political performance.

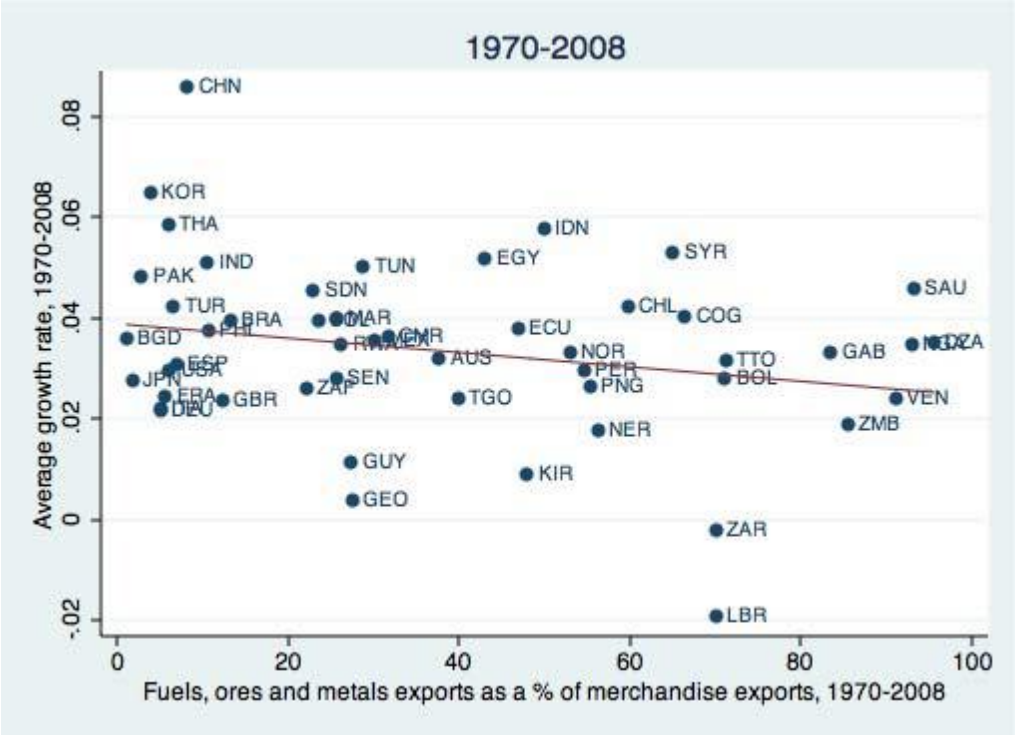
2.1 What is the Resource Curse? Empirical Evidence

According to Stevens (2003), historically, natural resources have played an important role in economic growth in industrialised states such as Australia, Canada, the Scandinavian countries, and the United States. Natural resources should bring wealth to a society, support economic performance, and reduce poverty. However, many studies such as those Auty (1986, 1993, 2001a, 2001b), Sachs and Warner (1995; 1997; 1999), Robinson et al (2006), Collier and Hoeffler (2005) and Gylfason (2001) have found that a number of natural resource exporting countries are negatively affected in terms of various economic, political, and social factors. This fact refers to the Resource Curse, which refers to an observed negative relationship between natural resource exports and the economic growth of countries engaging in these exports.

Frankel (2010) pointed out that it is noticeable how natural resource-rich countries including oil and gas have not grown successfully, while countries without natural resources have done so. Large numbers of African countries, including Angola, Nigeria, Sudan, and the Congo, have an abundance of natural resources such as diamonds and oil; however, per capita income is below average level and there is poor quality of life. In contrast, East Asian countries such as Japan, Korea, Taiwan, Singapore and Hong Kong have a good economic performance despite the fact that they are natural resource-poor countries.

The figure below is taken from Frankel (2010) and shows those countries which export fuels, ores, and metals. The percentage of these exports over the total merchandise exports appears on the horizontal axis and the average growth rate appears on the vertical axis. Clearly, China and some other Asian countries enjoy very high growth rates despite natural resources being only a small percentage of overall merchandise exports. In addition,

considerable natural resources and lower growth are found in Venezuela and Zambia. As can be seen in the diagram, the correlation is negative.



Many strong empirical studies support the existence of the natural resource curse theory, which refers to negative correlation between natural resources exporting countries and economic growth. Many economists such as Auty (1986, 1993, 2001a, 2001b), Bulmer-Thomas (1994), Lal and Myint (1996), and Sachs and Warner (1995, 1997, 1999) found a negative correlation between natural resource exporting and economic growth.

Sachs and Warner (2001) report that since the post-war period, many natural resources countries have undergone in a decline in economic growth. Sachs and Warner (1995) state that based on standard cross section growth regression; the growth of natural resources countries was slower on average, by 1 percent per year during 1970-1980. In addition, Sachs and Warner (1997) tested 95 developing countries. They found a negative correlation between natural resource exporting countries and economic growth from 1970 to 1990. In contrast, Malaysia and Mauritius were found to have grown by 2% annually from 1970 to1980. Leite and Weidermann (1999) support this result, as does Gylfason et al. (1999) in his examination of 125 countries. Doppelhofer et al (2000) used regression analysis and

found that rich natural resources countries had not grown rapidly over the previous 20 years; indeed, most of the states that grew rapidly during that period were resource poor.

Similarly, Auty (2001a, p.3) found that "between 1960 and 1990, the GDP per capita of resource poor countries grew between two to three times faster than those of the resource abundant countries". While Auty (2001a) mentions that the expectation from agricultural resources would be lower growth than from the industrial sector, the difference is larger than the expectation and countries which were driven by minerals are among the weakest performers.

Auty (2001a) asserts that prior to 1970; countries with large reserves of natural resources grew faster than those without. However, as oil prices fluctuated; this may potentially have distorted the result. He claimed that a poor performance in per capita GDP growth of natural resource exporting countries occurred between 1985 and 1997 (Auty, 2001a).

Gelb and Associates (1998) examined the resource boom of natural resource exporting countries in 1970 and found that the economies of natural resource exporting countries from 1971 to 1983 (this period included the downturn as well as the boom) deteriorated in terms of efficiency of domestic capital formation more than those of natural resource-poor countries. However, they argue that although states that natural resources benefits did not perform very well, they showed very good average growth when the resource boom was absent.

Stijns (2001) argues that data on energy and minerals support the suggestion that endowment of natural resources was not an important factoring determining economic growth between 1970 to1980. In another empirical study cited in Davis and Tilton (2003), Lederman and Maloney (2002) used Sachs and Warner's (1995) statistic techniques found that the negative correlation between natural resource abundance and labour productivity disappeared when they used a suitable statistical test. Mikesell (1997) reports that empirical work has discovered that oil and mineral exporting countries suffer from poor capital performance.

De Ferranti et al (2002) sought to illustrate how successful economies have been based on primary commodity exports. Nevertheless, they state that empirical analysis presents that the impact of resource production on the concentration of exports causes negative growth, and not the impact of government investment, crowding out manufacturing, education, and entrepreneurship. "Some countries that are members of the OPEC

organization had a negative correlation between oil revenue and GNP in the long run and between oil revenue and investment in the short run" (Shams,1989, p, 978). A further study by Mikesell (1997) shows the annual growth rates of GDP decreased in some oil exporting countries including Saudi Arabia, Mexico, and Venezuela. Ross (2001) notes that states with abundances of natural resources have a low score in terms of poverty alleviation. Many researchers observed that there is a positive correlation between natural resources exporting countries and income inequality (Auty, 1994b; Fields 1989; Sarraf and Jiwanji, 2001). Kronenberg (2004) suggest that there is strong negative link between natural resource abundance and economic growth.

Van der Ploeg (2010) presented evidence on why some countries gain advantages from the natural resources and others not. The countries which did not gain advantages were volatile, had bad institutional frameworks, injustice legislation, high levels of corruption, there was no true democracy, while there was rent seeking, and civil conflict.

Collier and Hoeffler (2000) and Ross (2001) explain the natural resource curse is correlated with greater conflict in a society. A windfall of natural resources that is often fought over and the resources are often looted by people who are in power. At the same time higher revenue leads to increasing military spending. They added that natural resources may lead to separate tendencies due to environmental damage or the feeling that natural resources are diverted from their region of origin to the capital (Collier and Hoeffler, 2000;Ross ,2001) However, many researchers do not agree with this point. For example, Smith (2001) conducted a survey of 109 countries between 1957 and 1990; he found that oil revenue does not cause unrest or conflict in the society. Conflict and poverty are related in many ways, such as inflation being caused by war. Poor countries are affected larger than the rich ones because the poor need the resources in order to reduce the effect of resource curse.

Auty (2001b, p.11) explains that an element of the resource curse is that natural resource abundance "retards political change" and entrenches regimes; therefore, the exploitation of large natural resources is affected by dictatorship, weak institutions, and issues of public finance, corruption, and bureaucracy.

2.2 Explanations for and Causes of the Resource Curse

How are natural resource endowments affected by economic, political, and social factors? Why do some natural resource-rich countries gain an advantage from them while others do not? One would predict that when a county has large quantities of natural resources this would be a blessing for the country, as the exports of these natural resources would support country's income that would be used to improve people's quality of life such as

education and health care. Stevens (2003) notes that many studies show that an abundance of natural resource have a negative association with economic, social and political development. This is supported by the World Bank (2004) who report that, in economic terms, a natural resources in countries have a negative association with economic growth (World Bank, 2004). Socially, natural resource dependence of a country has a negative effect on important social factors such as standard of living, poverty rate, child mortality, life expectancy, and educational attainment (UNDP, 2004). Politically, such countries are affected by high levels of corruption, civil war, and poor quality of institutions (Stevens, 2003). Collectively, these negative consequences are referred to as the "resource curse".

However, it cannot be concluded that all natural resource exporting countries suffer from the resource curse. Norway, Canada, Botswana, and the USA are blessed by natural resources because they have managed their natural wealth in such a way as to achieve economic, political and social development.

So, why have some natural resource exporting countries been blessed while others have not? To answer this question, there are many explanations as to the causes of the resource curse, including theoretical framework and empirical evidence, and a number of these will be discussed in this section.

Firstly, commodity prices could cause a decline in terms of trade. Secondly, global price volatility of oil, gas, mineral, and agriculture, which could be upward or downward, seems to be problematic. Thirdly, there may be low productivity of the manufacturing sector of a natural resource exporting country, due to increasing production or increasing oil prices in countries; this phenomenon is known as Dutch disease. Fourthly, natural resources could be controlled by a government or political elite that grants wealth to themselves and their close associates without distributing the wealth directly to citizens and without developing institutions, which affects corruption level and rent-seeking behaviour which causes a negative effect on economic growth. Fifthly, natural resources could be exhausted, leaving nothing for future generations, particularly when property rights cannot be imposed. Sixthly, states with large natural resource endowments are subject to armed conflict, which harms their economic performance. Finally, natural resource-rich countries make lower investments in human capital and social welfare.

2.2.1 Economic Explanations

2.2.1.1 Long-Term Decline in Terms of Trade:

Bleany and Greenaway (1993) point out that the classical economists Malthus and Ricardo held that the trade of primary products would increase due to the limited size of land and natural resources that cause increases in the cost and prices of marginal products. However, economists Prebisch (1950) and Singer (1950) developed a theory of primary products, which is that prices of primary products such as minerals and agricultural products would decrease dramatically in the long run compared to the prices of manufactured products. This theory used to be identified as belonging to the "structuralist school". Prebisch (1950) and Singer (1950) argue that the income elasticity of the world demand for manufacturing goods is higher than that for primary products. As a result, when income rises, the demand for manufactured goods also rises more than that for primary products. Moreover, primary products have a low elasticity of demand. Therefore, a fall in the price of primary products leads to decrease in a country's income rather than an increase (Prebisch, 1950; Singer, 1950).

Frankel (2010) suggests that if this theory is true, it would support that a focus on exporting natural resources products is not significant factor in enhancing economic growth. Franke (2010, p.5) argues that "hewers of wood and drawers of water" would remain forever poor if the economy was not diversified.

Prebisch (1950) and Singer (1950) argue that natural resource-rich countries would import fewer and fewer capital goods because of deteriorating of natural resource; as a result, development and investment would be restrained in the economy. In addition, they suggest that economic performance and technological advances in industrialised states have raised the demand for manufacturing products compared to the demand for agricultural products; therefore, people with higher wages spend a limited amount of their increased purchasing power on food. Primary product exporting countries had seen a falling off of trade and, as producers export primary products, these become cheaper and consumers import manufactured goods, these become expensive, resulting in a relative fall in income. In addition, Prebisch (1950) and Singer (1950) suggested that the industrial sector creates profit and this profit will increase the real wage. Since primary products are competitive and demand for them is income inelastic, there would therefore be production of the commodity products that comes from fall in the price rather than increase in the wage.

Developing countries with protectionism and import tariffs should be encouraged to support local manufacturing and economic diversification instead of being in comparative

advantage of classical international trade theory. The decline in the term of the trade offers a partial explanation for the resource curse (Prebisch, 1950; Singer, 1950).

Prebisch (1950) and Singer (1950) used data on prices, wages, and manufacturing and examined prices trends of primary products and manufacturing goods over time; as a result, they presented evidence of negative consequences of primary products producer which is more than positive. Spraos (1980) used data from 1900 to 1970 to examine the Prebisch (1950) and Singer (1950) hypothesis, and found that prices of primary product fell significantly.

Bleaney and Greenaway (1993) examined new and improved data series for primary product prices from the World Bank's Grilli and Yang (1988). They discovered that the term of the trade declined particularly when primary product prices were very high. Cuddington (1992) tested price trends for 24 individual commodities, concluding that long-run trends for all but three seem to be zero or positive. In addition, León and Soto (1997) used the same data, but at different estimation technique, they found 17 out of the 24 commodities negative long-run prices trend. Harvey and others (2010) used time series analysis from 17^{th} to 21^{st} centuries and the data included 25 commodities .They presented evidence that the prices of 11 primary products fell significantly in the long run. Sala-i-Martin (1997) used regression analysis to examine large number of countries. He found that specialisation in primary product leads to slow economic growth. Hadass and Williamson (2003) supported the theory that primary products reduce economic growth, particularly between 1870 and World War I.

Several studies have been carried out by Bloch and Sapsford (1991, 1996, 1997, and 2000). They used a multiple equation model that distinguishes between the primary commodity and the manufacturing sectors. Their results supported the decline in terms of the trade of primary products.

2.2.1.2 Revenue Volatility

Frankel (2010) notes that natural-resource exporting countries faced commodity price volatility. However, the commodity prices of oil, gas are more volatile than those of mineral and agricultural commodities such as copper, coffee, bananas, and sugar, although the prices of agricultural commodities are more volatile than those manufactured products and services. Some studies have pointed out that natural resource price volatility has a negative effect on economic growth. This could be attributed to low short run elasticity of demand and supply. Therefore, when the price goes up, the demand does not fall in the short run due to the weather and the supply does not rise either, due to disruptions. Elasticity of demand is low in

the short run because the capital stock at any point is designed to operate with a particular ratio of energy or agriculture to output. Since it takes time to adjust output, the elasticity of supply is also inelastic (Frankel, 2010).

Both elasticity of demand and supply are highly elastic in the long run (Frankel, 2010). This is the case in oil price shock; therefore, the price should be increased to respond to the shock. The price was increased after the Arab oil embargo and doubled after Iranian revolution. However, many states started obtaining oil from different sources in the short run. In addition, after around two years, oil prices were adjusted, people begun more building houses, driving more cars, and more oil fields were had discovered (Frankel, 2010).

In the medium run, due to the lag in the response, oil is the context where the cobweb cycle model is applied. The initial equilibrium marker is a high price that leads to lower demand. After around two years, a lower price is re-introduced. According to this theory, Frankel (2010) recommends looking carefully at the next price cycle before starting any oil drilling investment. However, according to the boom-bust-boom since 1975, Frankel (2010) argues that the cobweb cycle theory applies to oil exporting countries (Frankel, 2010).

Van der Ploeg (2011) holds that revenue volatility is the most perfect example of the resource curse. He recommends pursuing savings, macroeconomic stability, financial market efficiency, and economic diversification policies to maintain the economy. One aspect of this argument has been statistical. Van der Ploeg and Poelhekke (2009) pointed out that the volatility of per capita income growth is associated with the volatility of the prices of such commodities as oil and coffee. Blattman, Hwang, and Willimson (2007) tested the economic performance of 25 states from 1870 to 1939. They note that countries that suffer from price volatility appear to have more volatile trade. In addition, the investment and growth rate are considerably lower than in industrialized countries. Similarly, Hausmann et al. (2004) claim that commodity price volatile of natural resource exporting developing countries have a negative effect on economic development, particularly if the economy is not diversified. In addition, they found that the exchange rate volatility in developing countries is three times greater than in developed states. Aghion et al (2006) examined 83 countries from 1960 to 2000, and found strong support for a negative correlation between real exchange volatility and economic performance.

Van der Ploeg and Poelhekke (2009) extended Ramey and Ramey's (1995) stating by stating that the effect of natural resources on economic growth is direct and the effect of natural resources on economic growth via volatility is indirect. Van der Ploeg (2011) notes that natural resource-rich countries have debt crises because of price volatility. Moreover, if

debt is the independent variable in the panel data estimation, the impact of natural resources is not shown. He adds that natural resources countries are affected by boom-bust cycle because of volatile commodity prices. Van der Ploeg (2011) also concluded from his analysis that volatile commodity prices lead to changes in natural resources revenues. Gylfason et al. (1999) suggested that Dutch disease leads to exchange rate volatility that reduces investment, the learning by doing process, and the non-tradable sector, and finally has negative economic consequences.

Rose and Spiegel (2009) note that since natural resource rich countries are affected by weak financial systems, they will face macroeconomic volatility issues. Aizenman and Marion (1999) and Flug et al (1998) suggest that volatile harms economic growth, investment, income, poverty, and education. Ramey and Ramey (1995) tested the correlation between macroeconomic volatility and economic growth in 92 developing and developed nations from 1962 to 1985 and found a correlation between government spending fluctuations and volatility. Therefore, they concluded that higher macroeconomic volatility leads to negative economic consequences (Ramey and Ramey, 1995).

2.2.1.3 Dutch Disease

The term 'Dutch disease' was coined on the 26th of November1977 in *The Economist* to describe the consequences of the discovery of a large quantity of natural gas in 1959 in the Netherlands. Corden (1984) refers to Dutch disease as the adverse effect on Dutch manufacturing in 1960 due to the discovery of large natural gas field.

Corden and Neary (1982) and Corden (1984) described the model through two channels of resources: spending effect and movement effect.

Spending effect: Additional income brought by the oil sector is spent by factor owners or by the government, corresponding to income effect. This leads to an increased demand for services and imports also increase. Since the price of tradable is set internationally, the prices in the non-tradable sector relative to the tradable sector rise, causing appreciation of the real exchange rate.

Resource movement effect: Increases in the oil price increase the value of the marginal product of labour in oil sector, at a constant wage in terms of tradable sectors. Therefore, demand for labour in booming sectors rises correspondingly to the substitution effect, therefore causing a movement of labour from the manufacturing and non-tradable sectors to the oil sector. This effect has two components:

1-The movement of labour from a lagging sector such as manufacturing and agriculture into the oil sector causes output to fall in the lagging sector. This is known as direct de-industrialisation.

2- Movement of labour from a non-tradable sector to a booming sector will shift the supply curve to the left. In addition, the spending effect creates a greater demand for the non-tradable sector. Therefore, this brings an additional real appreciation rate. In addition, more movement of labour would take place from the lagging sector to the non-tradable sector. Combining the two effects causes movement of labour from lagging sector to the non-tradable sector and is known as indirect de-industrialization (Corden and Neary, 1982; Corden, 1984).

Buiter and Purvis (1983) note that de-industrialisation in open economy is caused by an increase in oil market price or monetary disinflation. They developed a model incorporating different speeds of adjustment in goods and asset markets and concluded that domestic goods prices respond slowly to excess demand while the exchange rate and adjust rapidly. Bruno and Sachs (1982) used a dynamic perfect foresight equilibrium model in a multi sector open economy. They found that the production of a lagging sector fell through the net effect of the oil sector and improvement of the trade in final goods. Corden (1984) analysed literature on the booming sector economy and Dutch disease, and he filled a theoretical gap (dealing with immigration, endogenous term of trade, domestic absorption, dynamic of spending, saving and investment) in the study of Dutch disease. He suggested ways to protect the lagging sector in the Dutch disease economy.

Edwards (1985) extended the Dutch disease model and analysed the oil price boom and the real exchange rate in the monetary economy. He found that an oil boom leads to an excess demand or an excess supply in the short run. Sachs and Warner (1995) suggest that a manufacturing sector leads to the learning by doing process and productivity. In addition, if the manufacturing sector is a very important sector for economic growth and is hit by an oil boom, a natural resource exporting country will be affected by the resource curse because the manufacturing sector that supports economic performance shrinks.

Rudd (1996) used simple OLS regression analysis and time series data from 1960 to 1990. He found that there was a decline in the Dutch manufacturing sector and in Nigeria's and Indonesia's agricultural sectors.

Lartey (2007) investigated Dutch disease in a small open economy and employed a monetary version of the two-sector dynamic stochastic general equilibrium model with sticky price in the non-tradable sector. He found that Dutch disease is associated with a fixed nominal exchange rate regime during capital flow, which pushes the domestic price. Sala-i-Martin and Subramanian (2003) present evidence that an increase in the oil price leads to a decline in the manufacturing sector and an appreciation in the real exchange rate. Harding and Venables (2010) tested 135 countries from 1975 to 2007. They conclude a high dependence on natural resources in a country leads to 30 % saving, a falling of 35-70 % in the tradable sector, and an increase in non-natural resources of 0-35 %.

Fardmanash (1991) developed a three-sector reduced form the model to test the impact of international oil prices on the share of services, agriculture, and the manufacturing sector in five oil exporting countries in OPEC. He found that oil price shock is negatively associated with services, agriculture, and manufacturing. Kamas (1986) analysed the Dutch disease effect that derived from coffee and drugs boom on the Colombian economy from 1976-1982. She concluded that prices in the service sector increased and the exchange rate appreciated. Thus, the services sector grew and the manufacturing sector (non-coffee) declined.

Sabah (1988) examined the Dutch disease theory in 1973 during oil boom using a general equilibrium model. He found that the tradable sector shrank and the service sector expanded. Looney (1990) examined the effect of the oil boom on the Saudi Arabian economy. The examination was of non-oil GDP, exchange rate and inflation. He found that the Dutch disease existed based on inflation and exchange rate appreciation. Ross (1986) points out that oil production began in 1975 in the UK. The real exchange rate of the UK appreciated by 51 %-55 % from 1977 to 1980 and the manufacturing sector was declined by 4 % from 1973 to 1979 and by 14 % from 1979 to 1982.

Nicholas (1983) reports that the large quantity of treasure from the Americas obtained by Spain in the 16th century, led to a decline in the industrial sector in that country. Cairnes (1859) notes that, after gold was found in Australia in the 1850s, the industrial sector suffered negative consequences. These could be early manifestations of Dutch disease.

Davis (1995) suggests that mineral-rich countries as a group are not affected by Dutch disease. Oomes and Kalcheva (2007) show empirical evidence for Dutch disease in Russia; however, they state that this might be due to other, unobserved factors. Sachs and Warner (1995, 1997) support the contention that the Dutch disease has a strong negative effect on

economic growth. They add that the primary sector contracts the tradable sector .Stijns (2005) found evidence for Dutch disease in the oil and gas sector.

2.2.2 Political Explanations

2.2.2.1 Institution

Many studies have suggested that the institution is the most influential factor to determine economic growth. North (1991) defined the institution as humans' plan to establish the structure of the state in terms of political, economic, and social interaction. In addition, Alonso and Garcimartin (2009) and Greif (2006) described the institution as a component of society such as lifestyle, religion, and law, which are associated with people in the society and with their social behaviour. Smith (2000, p. 510) states that "commerce and manufacture can seldom flourish long in any state which does not enjoy a regular admiration of justice, in which the people do not feel themselves secure in the possession of their property, in which the faith of contracts is not supported by law, and in which the authority of the state is not supported to be regular employed in enforcing the payments of debts from all those who are able to pay".

Robinson et al. (2006) argue that a strong institution can support economic growth by eliminating rent seeking, corruption, clientelism, and patronage. Therefore, what does a strong institution look like? Again, according to Mehlum, Moene, and Torvik (2006), a strong institution can beat the resource curse and natural resource-rich countries can support entrepreneurs in investment and production, while in states with weak institutions, entrepreneurs are interested in rent seeking and corruption rather than being producers. In Mehlum et al's (2006) theory, there are two categories of institution in natural resource-rich developing countries resources: the grabber-friendly institutions and the producer-friendly institution.

Mehlum et al (2006) describe the grabber friendly institution as weak, with the features of this institution being the absence of democracy which supports political action for rent seeking, a lack of transparency, which encourage bureaucratic corruption, insecure property rights, which cause fraud, and weak rule of law leading to crime, organised crime activities, and chaos. Rent seeking flourishes in this type of the institution. In contrast, in producer-friendly institutions, since the law is powerful, rent seeking becomes less effective, the bureaucratic structure is strong, corruption is low, property rights are secured, there is

greater transparency, and the government is effective (Mehlum et al., 2006). Therefore, good institutions encourage, support, and pursue the Washington Consensus agenda (Williamson, 2002).

According to Robinson et al. (2006) the effect of a resource booms on the economy depends on the institution because the institution will determine the policy outcomes. A good institution will encourage politicians' accountability; reduce the power of the political leader, and the use of rationality and meritocracy in the public resources sector. They report that states with institutions that support accountability and competition will benefit from the natural resources boom because this type of institution improves the political incentive that booms create. States without institutions could suffer from the resource curse and consequent rent seeking and corruption (Robinson et al., 2006).

Murshed (2004), together with, Woolcock, Pritchett and Isham (2001), and Boschini et al. (2007) suggests that the quality of the institution is affected only by hydrocarbons and minerals and not by all natural resources, such as agricultural products. Murshed (2004) argues that oil and mineral revenues are substantial, while revenue from agriculture revenue is low in comparison. High natural resource revenue encourages greater rent-seeking activities in comparison to agricultural revenue. This causes institution failure, specifically in less effective institutions under the influence of corruption and greed, leading to negative consequences for economic growth.

Crosby (1986) points out that the policies of European colonisation produced two different of states: extractive states that are associated with neo-colonialism and settler colonies that are associated with New Europe.

Acemoglue, Johnson, and James (2001) state that the settler colonies reproduced European institutions, with secure property rights, a rule of law, democratic institutions, and a balance against government power. However, the extractive colonies did not copy the European institutions; for example, the Congo which was colonised by Belgium. The extractive states only used to transfer the natural resources from the colony to the colonizer. Further, Acemoglue, Johnson, and James (2001) add that the reason for the large variations in per capita income among states is due to the institution and colonial settlement. Their final argument is that the highly volatile revenue in developing states after World War II came about because of the institution and was not about macroeconomic policies.

Persson and Tabellini (2003) and Anersen and Aslaksen (2008) suggest that the resource curse is associated with presidential, and not parliamentary democracy. The presidential system is less accountable and representative and therefore, leads to more resource extraction. Conversely, parliamentary systems use natural resources efficiently and enjoy economic growth.

Bult, Damania, and Deacon (2005) presented evidence using cross- country regression. They suggested that high dependence on natural resources led to unsound institutions and had a negative effect on social welfare such as the Human Development Index factors, the water supply, and life expectancy. Mehrara ,Alhosseini and Bahramir (2011) found that oil is the most important natural resource, constituting revenue for many natural resource exporting countries, and relying on state's constitution, can lead to more long-run economic growth in that state or to long-run economic decline.

Alonso and Garcimartin (2009) examined four features of the institution quality concept. They conclude that static efficiency, dynamic efficiency, credibility, and predictability are determined by institutional quality. In addition, they identified institutional quality as having two parts. The first part comprises historical characteristics of the state such as colonial origin, and geographic location, while the second part comprises features of the institution's quality. Their empirical research concludes that the quality of the institution is significantly associated with income distribution, tax revenue, education, and development level. They argue that there is an indirect impact of natural resources on institution quality through income distribution and lower tax revenue (Alonso and Garcimartin, 2009).

Alexeev and Conrad (2009) found no positive correlation between natural resource exporting countries and the institution. However, Arezki and Van der Ploeg (2007) used an instrumental variable to control the dependent variables of institution quality and trade. They indicated that the negative association between natural resources and economic performance was based on poor quality of the institution, particularly if associated with a low level of trade.

Robinson et al (2006) presented a political economy development model which indicates that the effect of a resource boom essentially relies on the quality of political institutions, and specifically, the degree of clientelism in the public sector. Atkinson and Hamilton (2003) offer evidence to suggest a negative correlation between natural resources

and the economy, particularly when the government spends the natural resource revenue on consumption instead of using it for investment.

Acemoglue, Johnson, and James (2001) used an exogenous variable for the institution and argue that the United States, New Zealand, Australia, and Canada have good institutions and are not cursed due to having been European settler colonies. In contrast, extractive colonies with poor institutions and natural resource abundance are cursed rather than blessed.

According to Andersen and Aslaksen (2008), policy outcome is determinable by the arrangement of the constitution. They maintain that different types of government in presidential and parliamentary states are either blessed or cursed by natural resource revenue. They found evidence that the constitution is subject for how natural resources affect economic growth. They argue that the constitution does not essentially affect growth directly, but has a negative association with natural resource abundance.

Nevertheless, Glaester, La Porta, Lopez-de-Silanes, and Shleifer (2004) contradict Andersen and Aslaksen's (2008) empirical findings. Glaester et al. (2004) claimed that China does not support the constitution theory and hold that education and human developments determine economic growth.

Luong and Weinthal (2010) studied five oil-rich countries of the former Soviet Union (Russia, Azerbaijan, Kazakhstan, Turkmenistan, and Uzbekistan), and conclude that oil revenue results in weak state institutions when the government controls the role of oil sector. Mehlum et al. (2006) used the Sachs and Warner data covering 87 states. They concluded that there is a strong effect of institution quality on natural resource exporting countries.

Sala-i-Martin and Subramanian (2003) argue that the only factor involved in the natural resource curse is only point natural resource including oil and gas and the quality of the institution. They conclude after analysis of natural resource endowment and growth in three different ways by expanding Sachs and Warner's (1995) export of natural resources ratio to GDP. These are share of exports of four types of natural resources (oil, gas, agricultural raw material, and foods) in GDP and total export, the share of exports of all natural resources in total exports, and a dummy for oil-producing countries. After analysing these natural resource variables against institutional variables such as the rule of law, voices, accountability, government effectiveness, corruption, and political instability, they found that in some countries, some natural resources appear to have strong, robust and negative effect

on growth by impairing institutional quality. When the institution is strong, there is a slight effect or even a positive effect. Point source natural resources determine the institutional quality and have negative consequences on economic growth while other natural resources such as fish, timber, and wheat do not affect the quality of the institution. Sala-i-Martin and Subramanian (2003) conclude that the effect of natural resources on institution quality is non-linear. The negative marginal impact of resources on institutional quality depends on an increase in the quantity of natural resources.

2.2.2.2 Corruption

Nye (1967) defines corruption as human behaviour that derives from the attempt of employees in the public sector and their family, friends, and private clique to gain financial benefit. Similarly, Yadav (2005) views corruption as inappropriate action from the public section actor with. Stevens (2003) states that corruption refers to stolen resources, while, according to Mbaku (1997, p.117), corruption derives from the "clash between traditional values and foreign norms". Corruption is seen as the most significant issue associated with the decline of economic growth in developing natural resource-exporting countries.

Theoretically, Leite and Weidmann (1999) discussed the effect of corruption on countries with rich natural resources, its effect on growth within an open economy. They found that resources that are managed in a corrupt manner lead to a fall in growth. Dammani and Bulte (2003) suggest that if there is little political competition in a regime leads to bribery to special interest groups in the form of official documents or licences to utilise the natural resources. Therefore, if this occurs frequently, it will result in a reduction in the manufacturing sector, which leads to Dutch disease effects on the economy.

Further, Shleifer and Vishny (1993) noted that bribery is an indication of the corruption and claim that corruption leads to slow economic growth. They analysed the implications of networks of corruption in states such as Russia and South Korea where investors pay bribes for government goods and services and investigated why corruption is more distortionary than taxation. They found that when the central government is inefficient, government agents take bribes from the private sector to issue licences, visas, and passports. Thus, the requirement for secrecy diverts the state's investment away from higher quality projects in education, health, and infrastructure (Shleifer and Vishny, 1993).

Karl (2003) states that the causes of high level of corruption in natural resource-rich developing countries is that these countries do not have an advanced democracy, rule of law

is weak, the recruitment of administrative capacity is based on patronage rather than merit, and authoritarian regimes tend to be more powerful. Therefore, weak government offers greater opportunities for corruption.

Ades and Tella (1999) argue that many economists had not analysed the corruption associated with natural resource-rich states and its effect on economic growth and development until the mid-1990s because of the lack of reliable and systematic data. Empirically, Leite and Weidmann (1999) examined the correlation between natural resource exporting countries and corruption. They found a negative correlation of growth with corruption level and support the theory that corruption is a significant reason for lack of growth in natural resource-rich developing countries (Ades and Tella, 1999).

Sala-i Martin and Subramanian (2003) analysed the impact of natural resource exporting on various government measures using a cross-sectional instrumental variable approach. They found that natural resources had an adverse effect on the governments in terms of corruption, rule of law, and government instability. Isham et al (2005) used cross-sectional analysis regression to compare natural resources that are controlled by a government, such as oil and natural resources that are subject to less government control, such as agriculture. They found that oil sector revenue has a stronger negative association with corruption than the agriculture sector (Sala-i Martin and Subramanian, 2003).

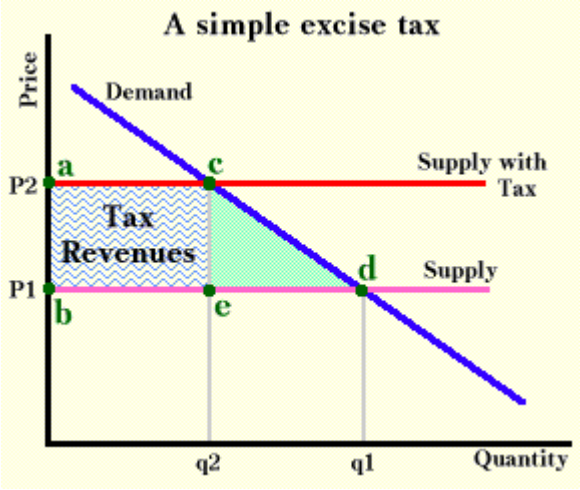
Bhattacharrye and Hodler (2010) found evidence that natural resource-rich countries leads to a higher level of corruption in autocratic countries. Vicente (2010) says that when oil was discovered in São Tomé, the level of corruption increased. Aslaksen (2009) tested 132 countries using large panel data set effects regression. She found that both oil and minerals are associated with a high level of corruption. However, she did not show that whether corruption is associated with democratic or non-democratic countries. Arezki and Brückner (2009) analysed the effect of oil rents on corruption and government stability for a panel of 31 oil-exporting countries between 1992 and 2005, finding that higher oil rents lead to an increase in the corruption level and degrade political rights.

2.2.2.3 Rent Seeking

Another explanation for the slowing-down of economic growth in natural resource exporting countries is rent-seeking. Stevens (2003) refers to rent-seeking as a normal legitimate human reaction based on self-interest. Tollison (1982 p. 576) expanded the

definition of rent seeking, stating that it refers to competition for "artificially contrived transfers".

Krueger (1974) introduced the term 'rent-seeking', but Tullock (1967) developed the theory. Tullock (1967) used the figure below to explain the theory, with the triangle between **c, d** and **e** being deadweight loss, while the area of **a, b, c** and **e** is a monopoly rent.



Tullock (2003) discusses the monopolies and tariffs in developed states such as the USA, while Krueger (1974) focuses on the quantitative import restrictions in developing states, such as India and Turkey, with the quota was his reference point. Tullock (2003) refers to a quota as a company profit that may import at low world price and sell at higher domestic price. These competing companies make profits due to the limited rights to import, which are controlled by the government. Krueger (1974) argues that governments control this competition by licensing regimes. Therefore, the rents benefit the licence receiver or the government administrators who receives bribes in order to grant the licences. Increasing rent-seeking depends on the amount of investment in bribes according to the amount of expected rent.

Krueger's (1974) rent-seeking hypothesis criticises government economic intervention. Krueger (1974, p. 159) notes that "In many market-oriented economies, government restrictions upon economic activity are a pervasive fact of life". This restricts rents and entrepreneurs start competing for these rents. However, in a market with no restrictions, entrepreneurs start creating new wealth, and pursue new technology. In contrast, with perfect restrictions, regulations would be all-pervasive and therefore rent-seeking would be the only path to follow. She claims that competition for rents is caused government

economic intervention that leads to social loss. Therefore, the government should reduce economic intervention.

Krueger (1990) further notes that the majority of governments in developing states implement unsatisfactory economic policies due to market failure or other causes. She states that governments develop many groups: politicians who must seek political support from various groups, bureaucrats and technocrats. Policy formulation and implementation are affected by highly disproportionate influence. Allocation of investment and import licences and awards of government contracts involve corruption and favouritism.

Hausmann and Rigbon (2002) point out that natural resource exporting countries render entrepreneurship less effective in society. Therefore, businesses are less innovative and less competitive, and the citizen doese not benefit from social welfare. Bruno and Sachs (1982) suggest that rent-seeking activities in natural resource-exporting countries are caused by imprudence and inadequate management consciousness of the government, which weaken economic activities instead of creating wealth. They add that insecure property rights are also associated with the rent-seeking issue (Hausmann and Rigbon, 2002).

Lam and Wantchekon (2002) state that rent-seeking could be a choice associated with people's motivation and ambitions in developing countries. Woolcock et al. (2001) argue that countries exporting point source natural resources such as oil and diamonds appear to have a greater tendency towards rent seeking and unproductive activities compared with those possessing diffuse resources such as fertile soil and fisheries.

Many justifications can be offered as to why rent seeking is greater in countries that are dependent on oil and gas, mineral revenues. Lane and Tornell, (1995) suggest that the discovery of natural resource wealth leads to a number of interest groups fighting for a natural resource rents, which has negative consequences for the public good.

Bhagwati (1982) argues that rent-seeking behaviour has a negative effect on the economy. Auty (1998) suggests that the behaviour of the rent-seeker does not focus on the objective of long-term development plan, but rather on rent creation and capture. In this vein, Sachs and Warner (1997, p. 9) state that rent seeking will "lower steady state income and therefore growth along the steady state". Auty (1990) and Gelb (1998) support the contention that rent seeking leads to very powerful lobbyists who harm economic development.

Mahdavy (1970) claims that many political leaders and their bureaucratic management are concerned about extending their survival in office; therefore, they are potentially involved in trade in order to gain political loyalty and support. Sambayiti (1994) mentions that state actors, politicians, and bureaucrats are intentionally involved in a redistribution policy to gather and keep their political support base. They also change the institutional framework for their own benefit. This leads to further explanation about resistance against institutional framework reform. Chaudhry (1989) argues that each part of society is separated by it; they are divided into ethnic, religious, and regional groups and are prone to rent seeking. Robinson et al. (2006) argue that social groups and interest groups begin by looking for bureaucratic ways to pursue rent seeking effectively. According to the Joint Economic Committee Report (1996), the essential fact about rent seeking is that natural resources that are used to influence a political elite are wasted for society, and benefit only few groups. Boldrin and Levine (2004) contend that competition is restricted by rent seeking, which reduces innovation. Ikeda (2003) concludes that rent seeking does not bring wealth; it is only transferred from political elite to another.

According to Kolstad, Søreide, and Williams (2008), when the resource rent is high and the quality of the institution is low, many entrepreneurs will seek rents. Rent seeking makes the size of the cake smaller and reduces economic growth. In addition,, increasing natural resource rent gives governments more chance to pay off their voters to stay longer in power. More power means access to resource rents. Leaders spend more today in order to be in office tomorrow (Kolstad, Søreide, and Williams, 2008).

Lane and Tornell (1996) discovered that the economies of Venezuela and Nigeria are associated with rent-seeking terms by the political elite, which is responsible for the resource curse. After oil prices increased between 1979 and 1981, the Venezuelan government started to spend considerably on infrastructure and industrial policy, which would benefit only the political elite. Therefore, spending led to a huge current account deficit (Lane and Tornell, 1996).

In Nigeria, where the oil is the main income in the county's economy, after the oil price rose in 1970 and early 2000, the share of the income was controlled by the richest 2 % of the population, while 55% of the population was poor in 2000, compared to the 2% of the population and 17% respectively in 1970. Van der Ploeg (2011) reports that in that time, the Nigerian population surviving on US$1 per day or less and increased from 26 % to 70 %. In

contrast, there are countries with good institutions that discourage rent-seeking activities, such as Norway and Botswana.

Murphy et al (1991) tested the impact of the allocation of human talent between rent seeking and entrepreneurship on economic growth by using data from 91 countries. The data on college enrolment in engineering were used a measure of talent allocated to entrepreneurship, and those on lawyers as a measure of talent allocated to rent seeking. They found that when talented people become entrepreneurs, this will support economic growth, but when resources are allocated to rent seeking activities, this will slow economic growth. Laband and Sophocleus (1998) used U.S time series data from 1974 to 1983 on the number of lawyer as a proxy for rent-seeking activities and cross-sectional data on the number of state law firms per capita. They discovered that rent-seeking had a negative effect on GDP per capita and state per capita income (Laband and Sophocleus, 1998).

Rama (1993) used an endogenous growth model to analyse the relationship between rent seeking and economic growth. In the model, firms suffer from investment and lobbying expenditure that affect the capital stock and the number of restrictive regulations in force, respectively. He found that restrictive regulations had a negative effect on competition and economic growth. Grossman (1998) found that rent seeking negatively affected growth of natural output from 1929 to 1982.

2.2.2.4 The Rentier State and Authoritarian Effect

Political science explains the resource curse theory by the correlation between natural resources, political regimes and authoritarianism. One of the most salient aspects of this correlation is the concept of rentier states (Ross, 2001). The rentier state theory was introduced by Middle East economic experts to examine the political economy of petro-states, particularly the states where democracy is absent. Mahdavi (1970) defines rentier state as countries that receive substantial amount of rents from foreign individuals, concerns and governments. Beblawi (1990) points out that the rents are received from abroad and paid directly to the government; few are involved in the production of this wealth and a few others distribute or utilise it. Oil-exporting countries frequently have authoritarian regimes to consolidate their systems in order to avoid greater accountability to citizen who are exempt from tax payments (Lam and Wantchekon, 2002). This policy leads to poor economic performance.

Ross (2001, 2008) posits four aspects of the correlation between the rentier state and oil rents. First, the taxation effect shows that taxation in natural resource-rich countries is low or even non-existent so that the government can avoid accountability to the population and representation of it. Second, the spending effect holds that natural resource-rich countries spend considerably on patronage to reduce the demand for democracy. Third, there is the repression effect: natural resource-rich countries spend heavily on the military and internal security to prevent the population from protesting against the government and for democratic change. Fourth, the modernisation effect refers to natural resource- rich countries holding back social changes such as upgrading human capital, political rights, civil liberties, and urbanisation that are considered key factors in democracy (Ross, 2001, 2008).

Eifert et al. (2003) classified the political regime of oil-exporting countries into four groups: mature democracies, faction democracies, paternalistic autocracies, and predatory autocracies. These groups are very different in terms of government stability, party system, and degree of social consensus, institution quality, and economic performance. A discussion of the classifications by Eifert et al. (2003) follows below.

Mature Democracies

This type of political regime is more stable and has more social consensus. A few parties dominate the political system, which support long-horizon behaviour, as effects on party reputation and economic performance become central to the competition for political power. The political regime is based on transparency and protection of property rights. This type of regime supports equality of wealth distribution and the bureaucratic structure of such a regime is also comparatively efficient. The rule of law supports the market system. Another feature of this type of political regime is that it encourages private sector investment. These features support the state in using natural resources more efficiently and preventing rent-seeking behaviour. The economic implication of this regime is easy saving, expenditure smoothing, stabilisation, and citizens receiving the rents through the government and the provision of social services and insurance. Norway, the State of Alaska, and the Province of Alberta can be viewed as falling into this type of classification and they have escaped the resource curse.

Factional Democracies

Factional democracies are different from mature democracies. This category has unequal wealth distribution and the social consensus is injustice. Political parties are weak and ruled by leaders, while the military is involved in the political regime. Governments and parties are unstable. This type of regime has a short-horizon policy of power competition and the resources are controlled by a government that causes to unstable policy, supports clientelistim, encourages rent-seeking behaviour, no transparency of wealth distribution. Therefore, the natural resources are affected by this political regime. Governments try to spend money on the society very rapidly because this makes it easier for the political elite, the public sector, and the military to control the state. These interest groups are more powerful than political parties or governments and try to capture the rents. The economic implication of this regime is pro-cyclical expenditure, little saving, and economic instability. The rents are transferred to different interests through subsidies, policy distortion and public employment. The best examples of this category are Venezuela, Ecuador, and Colombia, and they tend to be affected by the resource curse.

Paternalistic Autocracies

Saudi Arabia, Kuwait, and some of the other Gulf countries are the best examples of this classification. These states derive their legitimacy from traditional and religious authority. Paternalistic states have stable governments and longer horizons and they seek consensus. The expenditure policies of these states encourage the support of the political regime. These policies include subsidies, high levels of public employment in low capacity, an inefficient private sector and a poor bureaucratic structure. The economic features of this regime are pro-cyclical expenditure and mixed success with stabilisation. The economic policy causes political crisis due to risk being unsustainable in the long term. Moreover, the economy rarely relies on economic diversification.

Reformist Autocracies

The features of this regime are stable government, long horizon, self-governance, and politically insulated technocratic elites. The regime legitimacy is supported by reducing poverty through the encouragement of the private sector and the efficient utilisation of natural resources to promote economic diversification and growth, despite the fact that reformist autocracies have a low level of transparency. The economic growth policy of this regime is

to increase investment, employment, and income in the labour intensive non-oil trading sector. Indonesia is example of such an oil exporting country, while Taiwan, Singapore, Korea, and China are examples of such non-oil exporting countries.

Predatory Autocracies

Predatory autocratic regimes are not stable compared to the types of previous classifications. These states are run by military strength. Such a regime has a short-horizon policy, low transparency, and suffers from rent-seeking behaviour and a high level of corruption. The economic implication of such a regime is that it suffers from saving, high pro-cyclical expenditure, and very high government consumption. Nigeria is one example of such as regime which is affected by the resource curse and has low economic growth.

Ross (2001) examined the correlation between natural resource exporting countries and democracy. He found a negative correlation between oil and mineral wealth and democratic states, including the rentier states hypothesis and the repression effect. He shows that natural resources may hamper democracy, but that Norway and the USA escaped this effect. In contrast, Haber and Manaldo (2011) applied panel data from 1800 to 2006, using total oil income per capita as the main natural resource variable. They found that the oil and mineral sector do not support dictatorship over the long run. Liou and Musgrave (2013) examined the oil price shock in 1973 and found that large natural resources revenues do not affect democratic regimes.

However, Andersen and Ross (2014) criticise the method of Haber and Menaldo (2011). They state that Haber and Menaldo's (2011) study lacked a control group. Their suggestion that oil countries moved toward democratic transaction over the long period appeared less impressive after Andersen and Ross (2014) presented evidence that non-oil countries made democratic movement relative to oil countries. Moreover, they discovered that the correlation between oil wealth and democratic transaction changed from the 1960s to the 1980s, as the rents shifted from the private sector to the state.

2.2.2.5 **Violent Conflicts**

Natural resource exporting countries are affected by violent conflict worldwide due to the greed and the grievance theory. Collier and Hoeffler (2005) developed the greed theory, which posits that natural resources lead to the potential onset of civil war onset by supporting and motivating armed rebel activities. Looting provides the rebels with the wherewithal to

buy weapons and encourages them to continue fighting for the resources. Moreover, international greed could lead to military intervention or rebels being supported by forces outside the country in order to benefit from productive resources, just as Rwanda and Uganda intervened in the second Congo war.

Collier and Hoeffler (2005) point out that the grievance theory explains that if many people are suffering from poverty and lacking the benefits of natural resources, this causes uprisings which could lead to secessionist movements. Therefore, living in a region where a large quantity of natural resources is located gives an incentive for people there to form a separate state. Most natural resource exporting countries seem to have different ethnic, linguistic, and religious groups which separate from the majority of the population. Therefore, they become as deprived. This is the reason behind secessionism in natural resource-exporting regions of Aceh in Indonesia, the oil enclave of Cabinda in Angola, oil-rich Biafra, and natural gas-rich Southern Sudan.

Ross (2004) argues that there is a correlation between natural resource exporting countries and violent conflict, as Collier and Hoeffler (2005) discussed in general form. Ross (2004) pointed out that the relationship between natural resources and violent conflict can be divided into in three categories. The first category, oil and natural gas, are correlated with the onset of civil war, particularly secessionist conflict (Ross, 2006; Lujala et al 2005). The second category is resources that can be looted, including drugs, timber and gemstones, which create longer violent conflicts (Snyder and Bhavani 2005). Agricultural products, the third category, are not associated with onset and duration of violent conflict (De Soysa and Neumayer, 2007).

Ross (2002) points out that there is another way in which natural resources affect civil war, and that is by exacerbating the decline in economic growth. He found that the Democratic Republic of Congo, Sierra Leone, and Liberia had civil wars due to a greater fall in GDP per capita. In addition, Ross (2002) adds that rebels are financed by natural resources. For example, Angola used diamond revenues to support military expenditure; the Khmer Rouge of Cambodia used timber and gemstones to finance military expenditure, and the revolutionary Marxist group, FARC, traffic cocaine in Colombia.

Ross (2006) discovered that a positive association between natural resources, mainly oil and diamonds, and the onset of civil war. Hodler (2006) confirms that ethnic fractionalisation is the most important factor that determines whether natural resource-rich

countries are affected by the resource curse or not. He explained that natural resource-rich countries are likely to be affected by the resource curse if the society is based on ethnic grouping. As a result, the different ethnic groups will weaken the property rights, which will then hinder the whole economy (Hodler, 2006).

Collier and Hoeffler (2004) analysed 79 civil wars from 1960 to 1999; they found little evidence for the grievance theory while they found more evidence for the greed theory. Their finding was that resource dependence measured as the ratio of primary commodity over GDP including fuel, mineral, and agricultural products leads to greater possibility of civil war.

Reynal-Querol (2002) used data from a sample of 138 countries between 1960 and 1995 to analyse the correlation between natural resources and the onset of ethnic and non-ethnic civil war. She discovered that natural resources were a significant variable in explaining the incidence of non-ethnic civil war and other forms of political violence. Doyle and Sambanis (2000) found that natural resources are negatively associated with the success of peace-building initiatives. Fearon (2005) suggested that countries exporting natural resources such as cocoa and diamonds seemed to have longer civil wars. Similarly, Ballantine (2003) found that civil war was prevalent in natural resources exporting developing countries.

Schollaert and Van de Gaer (2009) suggest that countries that depend on natural resources for their main income are subject to conflict. Reuveny, Maxwell, and Davis (2011) found that a high level of natural resources production leads to high expectation of conflict.

2.2.2.6 **Trade and Industrial Policy**

Stevens (2003) states that trade and industrial policy explains why countries rich in natural resources have very poor performances, while natural resource-poor countries which are highly industrialised, such as Taiwan and Singapore, perform well. Auty (1993) calls certain countries as ‘autarchic’, while Ross (1999) calls them ‘societal’. Mako (2010), notes that the majority of developing countries which are rich in natural resources followed the statist approach to development putting emphasis on economic planning, import substitution, industrialisation, price controls, state-owned enterprises, and have an agricultural market controlled by the government. Urrutia (1998) argues that these policies impede growth, while resource booms support political rentiers’ interests and prevent neoliberal market reform. Auty (1995) points out that Latin America adopted import substitution and industrialisation, but South Korea, Taiwan, and Singapore adopted export-promoting industrialisation. In Latin

America, the government provided subsidies to workers and manufacturers; however, when the resource boom began, the subsidies started to fall because natural resources were distract to the industrial sector. In contrast, the Asian states had only a little support from subsidies; thus, they push forward with export promotion.

However, when the oil revenue is decreased, subsidies become unstable. In addition, subsidy creation and the subsequent rent seeking lead to the creation of powerful groups who against are their removal (Sarraf and Jiwanji, 2001). As a result, the policy is rarely changed due to the interest and power of the group's belief and a powerful interest in rent seeking behaviour (Auty, 1994a). However, subsidies sometimes have positive effects, as in the case of Malaysia, a natural resource exporting state. In Malaysia, the subsidy takes the form of infrastructural support services and tax exemption that attract foreign companies (Steven, 2003).

Lal and Myint (1996) found that protectionism is the most essential factor for a trade regime. Sachs and Warner (1995) found a positive association between a closed trade regime and primary product dependency. In addition, they found that Saudi Arabia had started opening up trade policy. Sachs and Warner (1997) looked at two periods, 1970-80 and 1980-89, and discovered that open trade countries grew faster than closed economies in both periods.

There is evidence to suggest that natural resource exporting countries have failed to support manufacturing sector (Mikesell, 1997; Sachs and Warner, 1995).

Arezki and Van der Ploeg (2009) support the idea that the policy of export promotion is intended to beat foreign competition, transfer technology, marginal skills, and know-how from abroad. This policy might turn the natural resource curse into a blessing. According to their analysis of the effect of natural resources on income per capita, they found evidence of a negative association between natural resources and income per capita by using income per capita type regressions and instrument for institutional quality and openness. The evidence of a negative correlation between natural resources and income per capita is evident even after geography, openness, and institutional quality are controlled. They also found that trade policies directed toward openness lead to natural resource underutilisation and could turn into a blessing. In addition, the resource curses maybe overcome if states pursue more liberal trade policies. They found that poor policies are associated with poor fiscal policy. These policies include the resource boom increasing public sector employment, investment, and subsidies geared toward import institutions in order to receive more votes and satisfy the

government's interest group. Thus, this affects economic growth (Arezki and Van der Ploeg 2009).

Ross (1999) disagrees with the trade and industrial policy discussion. He chose South Korea, Taiwan, Mexico, Colombia, and Brazil as case studies and found that these states are different in many respects regarding resource wealth. Many reasons can slow growth. Second, the existence of a trade barrier leads to poor economic performance (Ross, 1999).

2.2.2.7 Property Rights

Wenar (2007) claims that the resource curse can results from weak institutions, particularly when there has been a failure is to secure property rights. The wealth of country is owned by its people. The blessing of resources turns into a curse when they are sold by tyrants and rebellious forces without permission of the people, and the capital is used in ways that make people poor (Wenar, 2007).

According to Wener (2007), a country's natural resources are the property of its people and no evidence is required for this because it is enshrined in international law. America's resources belong to the American people; Canada's resources belong to the Canadian people. For example, Article 1 of the major human rights treaty on civil and political rights begins with these words; "All people may, for their own ends, freely dispose of their natural wealth and resources" (Wenar, 2007, page 15).

Luong and Weinthal (2006) suggest that ownership category and the legal structure of natural resource development are the main causes of the natural resource curse. In addition, the strengths or weaknesses of institutions are influence government control and legal ownership, and can cause negative or positive political and economic consequences in underdeveloped states.

Luong and Weinthal (2006) list four types of ownership regimes,

1- ***State ownership with control****:* the state owns the right to utilise natural reserves and controls the majority of shares (51% +) in the production, refining, and servicing of exports. Foreign investors in the oil sector are limited in terms of partnership agreements and it is not allowed for their manager and operational control to share profit or to be subcontractors.
2- ***State ownership without control***: the state owns the right to utilise natural resources and controls the majority of shares (51% +) in the production, refining, and servicing

of exports. However, foreign investors have permission to share profits, which allows them to have significant managerial and operation control.

3- ***Private domestic ownership:*** private domestic companies own the right to utilise natural resources reserves and control a majority of shares (51% +) in the production, refining, and servicing of exports.
4- ***Private foreign ownership***: private foreign companies own the right to utilise natural resource reserves and control a majority of shares (51% +) in the production, refining, and servicing of exports.

The authors conclude that state ownership with control of natural resources reserves encourage business-state relations that are unclear and asymmetrical because the principle of agents' participation is not identified clearly. For example, we can see many developing countries such as Venezuela, Mexico, Indonesia, and Nigeria, whose natural resource reserves are controlled by state oil companies. The relationship between the government elite and bureaucrats who are allocated to establish domestic oil firm has become a 'state within state'. For example managers, use their authority to hide capital and waste company revenue on useless projects (Luong and Weinthal, 2006).

In the case of private domestic ownership, business-state relations are clear and symmetrical. Government elite and domestic ownership are distinct because the principal is identified and the management structure is also clear. There are specific criteria for the assessment of manager performance. Therefore, the management of the private firms will be motivated to reduce costs, increase profit and expand market share. Local people have the right to benefit from natural resources exploitation. Thus is a critical source of taxes revenue for the state. Government elite authorities avoid the allocation of property rights and decrease revenue streams by imposing high taxation (Luong and Weinthal, 2006).

Finally, there is a clear distinction between contractors of state ownership, without any control, and of private foreign ownership, as there are an identifiable principal and agent and the control structure is well defined. As a result, Luong and Weinth (2006) claim that private domestic ownership is the best type of ownership structure to escape the resource curse in natural resource-rich developing states.

2.2.3 Social Explanations

2. 2.3.1 **Human Capital**

The resource curse is related to many aspects of the economy and it is also linked with human capital. Education is a very important factor for development. It increases labour efficiency, improves the quality of life, increases productivity, and encourages entrepreneurship and technological advancement (Ozturk, 2001), and encourages societal participation (Barro 1997). Education enhances economic growth and it is an important factor for people's life improvement via many channels: by rising the efficiently of the labour force, by encouraging democracy (Barro, 1997) thus creating better condition for good governance and by improving health (Aghion, Caroli, and Garcia-Penalosa ,1999).

Some natural resource-rich countries have decided not to invest in education, believing that they do not need it immediately. This could explain why "high skill labour and high quality capital are less common in primary production then elsewhere" (Gylfason 2001, p10). If countries focus on resources and neglect education, this will hinder the learning-by-doing process (Gylfason, 2001).

Gylfason (2001) defines natural resource-based industries as requiring lower skill labour and lower quality human capital relative to other industries. These industries result in few benefits compared to other industries. The labour market for primary industries including agriculture, fisheries, forestry, and mining is quite small, but offering relevant education can introduce new employees into other industries. Gylfason (2001) holds that natural resource abundance reduces the public and private incentive to accumulate human capital.

Papyrakis and Gelagh (2004) agree with Gylfason's (2001) definition, and expand it, pointing out that the schooling transmission channel is almost twice as important as the corruption channel. Natural resource booms lead to declines in the manufacturing sector due to human capital and human capital is considered to be a crucial essential production factor. Their result is based on the premise that schooling is a more significant transmission channel than corruption, in contrast to the empirical results of Sachs and Warner (1995).

According to such authors as Gylfason (2001) and Gylfason, Herbertsson and Zoega (1999), natural resources crowd out human capital. These authors maintain that natural capital is a curse in terms of human capital accumulation. However, Stjins (2006) holds that natural resources can promote education and Gylfason's (2001) results are not sufficiently

precise to ascertain that there is a negative effect of natural resource abundance on human capital accumulation.

In OPEC countries, secondary school enrolment is only 57 percent although the world average is 64 percent. In addition, the expenditure on education is less than 4 per cent of GNP in OPEC countries, whereas the world average is roughly 5 percent (Philppot, 2010). As a result, it can be inferred that oil exporting countries do not invest greatly in education sector. For example, Botswana is a diamond exporting country and is considered to be the country with the highest investment in education.

Birdsall, Pinckney, and Sabot (2001) support the contention that natural resource-rich developing countries invest less in education than resource-poor developing countries because resource revenues are controlled by political elites who have no motivation to invest in education, causing higher income inequalities. This may be why economies are poor in abundance natural resource countries. First, if the government does not know exactly how much money it will receive from revenue, it is hard to drive fiscal policy. If the oil price falls, they certainly will reduce spending on education sector. Secondly, if corruption exists in the government, bureaucrats take money away from education at each level, from the ministry of education to rural schools. Therefore, little remains to invest in the education sector. Finally, natural resources are related to political instability. If a country suffers from civil war, violence, and riots, young people are prevented from going to university (Birdsall et al., 2001).

Leamer, Maul, Rodriguez, and Schott (1999) in a comparative study between East Asia with Latin America, note that East Asian education in East Asia has a stronger association with manufacturing than it does in Latin America, which has an uneducated labour force in the agricultural sector. They suggest that there is a lesson to be learned from Scandinavian countries that have historically promoted education and attracted successful capital intensive industries. Norway is a good example, where education is an essential government policy in spite of the fact that Norway is an oil exporting country (Leamer et al., 1999).

Gylfason (2001) also observes that the negative consequences of natural resource on economic growth appeared in 1960 and is related to lack of human development. Gylfason and Zoega (2006) found a negative correlation between education and natural resource exporting countries and that this effect was due to the quality of social institution. Birdsall et

al (2001) used Auty's (1997) country categorisation, and found that natural resource exporting countries invested less in education and had lower adult literacy rates compared with resource-poor countries.

Glaester, La Porta, Lopez-de-Silanes and Shleifer (2004) used a comparative study to find out whether the institution or human capital accumulation was more strongly involved in economic growth. According to their empirical finding, it is the latter which is more strongly associated with institution and growth. The evidence is based on their conclusion which is that a political institution is not an extremely strong factor not more than human capital. In addition, primacy of human capital is critical for both growth and democratization. Indeed, Glaester et al. (2004) define economic development as human and physical capital accumulation. Finally, they conclude that states that reduce poverty and develop human and physical capital under dictatorships, can improve their institution appropriately after they become richer.

Kronenberg (2004) holds that investment in education is negatively affected by natural resources. In his research on the transition economies of the former Soviet Union, he discovered that neglect of basic education along with corruption leads to a decline in economic growth. Papyrakis and Gelagh (2004) suggest that one of the factors that lead low economic growth in natural resource-rich country is poor education. Wright and Czelusta (2002) reported that education was influential factor in leading the United States to its position in natural resource development technology. For example, by the late nineteenth century, the US had become one of world leaders in mining engineering education.

Blanco and Grier (2012) applied panel data analysis and discovered no relationship between natural resource dependence and human capital accumulation. When they divided the primary sector into minerals, petroleum, and agriculture, they found a negative correlation between the petroleum sector and human capital. Alexeev and Conrad (2009) found a positive correlation between natural resources proxies and the education sector; however, they discovered only a small effect on the school rate in a cross-country analysis.

Using a recursive model, Ding and Field (2005) found a negative correlation between high natural resources dependence and human capital and suggest that the curse derives from high natural resources dependency, which leads to that poor level of human capital development.

2.2.3.2 Welfare

Bulte, Damania, and Deacon (2005) suggest that point source resources negatively affect institutional quality, which in turn decrease the level of welfare. De Soysa and Gizelis (2013) point out that AIDS and HIV are widespread in oil rich countries. Cockx and Franken (2014) found a negative correlation between health expenditure and resource dependence. These findings appear to support De Soyasa and Gizelis (2013).

Besley and Kudamatsu (2006) found that the populations of mineral exporting countries have a comparatively low life expectancy. Bulte et al. (2005) suggest that there is negative correlation between human welfare and natural resource wealth.

2.3 Summary

The researcher discovered certain strengths and weaknesses in the review of literature on the resources curse study (Chapter Two). The strengths of the literature review are as follows: Most previous findings on the resource curse theory by Sachs and Warner (1995; 1997; 1999) were criticised by Manzano and Rigobon (2001, 2007) and Lederman and Maloney (2002) on the grounds that the findings were not robust due to the cross-sectional data suffering from an endogeneity issue. Endogeneity is a term used to describe the endogenous independent variables in a multiple regression model that are correlated with the error term due to omitted variable, measurement error, or reverse causality (Wooldridge, 2003). Brunnschweiler and Bulte (2008) and Alexeev and Conrad (2009) suggested that natural resources variable that was used by Sachs and Warner (1995; 1997; 1999) causes endogeneity problem in the regression results. Thus, the researcher will be aware of this issue and should use advanced econometric techniques to get robust results.

Brunnschweiler and Bulte (2008) made a clear distinction between natural resource variables: resource abundance (a stock measure in resource wealth), resource rents (the flow of income derived from the resource stock at some point in time), and resource dependence (the degree to which countries do or do not have access to alternative sources of income other than resource extraction, again at some point in time). They also revealed that natural resource dependence is an endogenous variable. The literature review has suggested to the researcher instrumental variables for natural resource dependence, which is a dummy variable for type of political regime to instrument natural resource dependence (Brunnschweiler and Bulte, 2008).

Steven (2003), Frankel (2010) and van der Ploeg (2010), on causes and explanation of resource curse issues including its economic, political, and social aspects was reviewed extensively. The main causes of the resource curse mentioned in the literature are economic including decline in terms of the trade, revenue volatility, and Dutch disease and political such as institutions, corruption and rent seeking, rentier states, and conflict and involve human capital. Steven (2003) and Rosser (2006) made useful suggestions for policy makers which could assist in reducing the problem of resource curse. These suggestions include economic, political and social aspects and could be useful for developing countries with natural resources in order to reduce the resource curse problem.

Previous study on the natural resource curse states that not all countries suffer from the resource curse, clearly identifying the countries that were affected by it. Even developed countries such as the Netherlands have not escaped from the resource curse; hence the term 'the Dutch disease'. However, Norway converted their natural resources rents into a blessing through investing the funds into securities to protect the economy from abrupt and large income increases so that a fair division of natural resources between generations is achieved (Papyrakis and Gerlagh, 2004). The Norwegian economy has grown in terms of manufacturing and the rest of the economy. In addition, Botswana and the United Arab Emirates are developing countries and have achieved rapid economic growth through utilising natural resource rents on expenditure on the education, health, and infrastructure sectors. However, other oil exporting countries, including Iran, Venezuela, Libya, Iraq, and Kuwait have experienced negative growth during the last few decades. OPEC countries saw an overall decline in GNP per capita while other countries with comparable GNP per capita enjoyed growth (Van der Ploeg, 2010).

The weaknesses of the literature review are as follows: the empirical study on the resource curse theory employed cross-sectional data and the empirical results were weak, as they were subject to an endogeneity problem. The weaknesses of the literature review are as follows: most of the econometric methods, such as cross-sectional data, used to test the resource curse theory empirically were weak and subject to the endogeneity problem. Even the theory of the Dutch disease was introduced using time series data rather than advanced econometrics techniques such as panel data fixed effect and General Method of Moment. This is the reason doubts that were cast on the accurate indication of the resource curse. Lederman and Maloeny (2002) applied the Generalised Method of Moments (GMM) to control the endogeneity problem and to produce accurate results, and found no sign of Sachs

and Warner's resource curse. Moreover, Dietz et al. (2007) found that a high standard of political institutions reduces economic growth through resource dependence. They applied panel data fixed affect and added Generalised Method Moments (GMM) estimation technique to support their findings and to resolve the endogeneity issue.

There is limited empirical evidence in the literature on the resource curse theory on rent-seeking, property rights, and health mechanisms. It may be that these variables suffer from data limitations. Thus, it cannot be said with certainty that these variables negatively affect economic growth though natural resources. For example, Tovrik (2002) introduced a theoretical model with rent seeking where a greater amount of natural resources increases the number of entrepreneurs engaged in rent seeking and reduces the number of entrepreneurs running productive firms. With a demand, externality, it is presented that income decreases in natural resource exporting countries rather than increasing due to the rent-seeking factor. Regarding property rights, Luong and Weinthal (2006) classified ownership regimes into state ownership with control, state ownership without control, private domestic ownership, and private foreign ownership; however, the literature review on the resource curse study did not compare empirical studies on classifications of ownership regimes. In addition, Sterck (2015) found no correlation between natural resources and the spread of HIV and tuberculosis (TB), although he confirmed his findings suffered from data availability and quality, and the short time dimension of the panel data implies that most stationarity, unit root and cointegration tests suffer from serious problems of size and power. HIV and TB series are estimated on the basis of epidemiological models and are hence subject to measurement errors. While measurement problems are expected to increase standard errors, they are unlikely to bias the estimates because HIV and TB series are used as left-hand side variables. He concluded that if a relationship between natural resources and the spread of epidemics exists, it is likely to be weak (Sterck, 2015).

Most empirical studies of the natural resource curse theory fail to distinguish between natural resource measurements. There is no consensus among scholars about the measurement. The share of natural resources in exports (or in GDP) has been the most frequently used measure of resource abundance since Sachs and Warner (1995). However, Brunnschweiler and Bulte (2008) suggest that resource share in exports (or in GDP) more precisely refers to resource dependence rather than to resource abundance. Brunnschweiler (2006) suggested natural resource exports do not refer to natural resource abundance measurements for two main reasons. First, it is worth noting that the resource export variable

is quite volatile, suggesting that the period average would in any case be a better measure than the beginning-of-period value employed in the literature (Ledermann and Maloney, 2003). Second, even if we were to assume that a positive relationship between natural resource abundance and natural resource exports such as in Australia and Germany, we could also plausibly argue that a dominant share of primary resource exports in GDP is an indication of an unbalanced economy. Declines in economic growth in countries with large share of primary exports could be due to general macroeconomic fluctuation instead of the resource curse. However, natural resourcs rent data presented both positive and negative growth effects (Stijns, 2001; Atkinson and Hamilton, 2003). Isham et al. (2005) showed that point source including oil, minerals, and plantations have a negative effect on economic growth where the economy depends on diverse sources such as fish and agriculture.

No qualitative approach was found in the literature review of the resource curse, although it would be interesting to compare between different research methods. Use of a qualitative method would support the researcher's detailed investigation of the research problem in detail. n addition, researchers on the resource curse study could use the qualitative method of interview to conduct a case study of historical dimensions of natural resource exporting countries' political, economic, and social factors. Further, the interviews could emphasise institutional and political accountability. Interviews are the most important source of information for any qualitative study (Sobh and Perry, 2006), particularly when a researcher will use the case study research design (Yin, 2009). Gronberg (2005) pointed out that interviews will support the researcher to obtain access for experience participation and views of the small size of the population of participants. Ghauri and Gronberg (2004) argue that interviews allow the researcher to set up personal mutual understanding with the interviewees, which offers many advantages, such as participants feeling comfortable and opening up as well as potentially obtaining access to new participants. Creswell (2013) states that mixed methods are used to combine the data in order to provide a comprehensive examination of the research problem. Kelle and Erzberger (2004), as cited by Flick (2006), claim that if the results of the mixed methods support each other, this confirms the conclusions, making the findings more robust. The results emphasise different dimension of the issue, such as subjectivity and perspective. Thomas (2003) notes that the benefit of using mixed methods is to support and confirm the theory, which a single research method would not do.

Chapter Three

The Effect of Natural Resource on Economic Growth: Panel Data Analysis

3.1 Introduction

Natural resources are considered to be one of the most significant factors driving economic growth around the world. However, experience shows that natural riches are neither necessary nor sufficient for economic prosperity and progress. Hong Kong, Japan, Singapore and Switzerland are rich countries and do not have a large quantity of natural resources; similarly, in the United States and the United Kingdom natural resources currently play only a minor role in the generation of national income (Gylfason and Zoega, 2006). However, a number of studies on the effect of natural resource exporting on economic growth found that there is a negative correlation between natural resource exporting countries and economic growth (Sachs and Warner, 1995, 1997, 1999). This theory is referred to as the Resource Curse.

The empirical findings of Sachs and Warner (1995, 1997, and 1999) deserve special attention and their findings are still influential, as they and their cross-sectional method are the basis for much of the literature examining the resource curse theory. Thus, the question here is not only whether the natural resource curse exists or not, but also what natural resource variable was used, how it was measured, and what econometric technique was used. To contribute to the argument in the literature of natural resources curse theory, this chapter will fill the research gap by revealing the effect of natural resources on economic growth using panel data fixed effect and two-stage least square estimators and the share of oil rents in GDP as a natural resource variable.

This chapter is organised as follows: Section 3.2 presents the method of the study, and Section 3.3, the empirical model. In Section 3.4, there is a review of natural resource proxies and measurement. Section 3.5 discusses the endogeneity issue, while Section 3.6 contains the results and discussion and a Summary is made in Section 3.7.

3.2 Method of the Study

This study investigates the Resource Curse Theory by analysing the impact of natural resources on economic growth through panel data fixed effect and two-stage least square

models of 142 countries from the period 1975 to 2013. Panel data is widely employed for econometric model estimation owing to its advantages in quantitative studies (Bond, 2002). Panel data refers to the pooling of observations on a cross-section of countries, firms, households, etc. over numerous time periods (Baltagi, 2005). There a number of features of using panel data instead of cross-sectional data or time series data. These are as follows:

Panel data panel has the advantage of including country-specific fixed effects, as these will effectively control for all unobservable time-invariant country characteristics, which reduces the problem of omitted variable bias (Collier and Goderis, 2007). The researcher can estimate a more complicated and more realistic model in the panel data than cross-sectional and time series data (Verbeek, 2012). The parameter can be more efficiently estimated through large variations in the panel data and the panel data provide a more reliable estimation, testing more sophisticated behavioural models with less restrictive assumptions (Baltagi, 2002). In addition, panel data provide more informative data, more variability, less collinearity between independent variables, greater efficiency, and a greater degree of freedom than do time series or cross-sectional data (Baltagi, 2005).

There are a number of criticisms of the Sachs and Warner's (1995) use of the cross-sectional econometric technique. Manzano and Rigobon, (2001, 2007) confirmed that Sachs and Warner's (1995, 1997) findings of the negative effect of natural resources on economic growth were not robust after they applied the fixed effect estimation technique. The difference in the findings is due to cross-sectional data failing to control the problems of omitted variable bias. Manzano and Rigobon (2008), Bravo-Ortega and De Gregorio (2008), and Lederman and Maloney (2002) investigated the resource curse theory by applying panel data fixed effect estimator to control the problem that is encountered by cross-sectional data such as unobservable time-invariant country characteristics, which would be a sign of omitted variable bias problem.

Wooldridge (2002) asserts that the fixed effect estimator has less omitted variables bias than pooled OLS regression. Van der Ploeg (2006, 2011) suggests that it is essential to use panel data instead of cross-country data in an investigation of resource curse theory and confirms that cross-country estimation causes omitted variable bias.

Cavalcanti et al. (2011) were concerned about cross-sectional regression suffering from endogeneity issues. Their findings were opposed to those of Sachs and Warner (1995) as they found that oil abundance has a positive level effect on real income. Brunnschweiler (2006)

argues that the findings of Sachs and Warner (1995) are subject to an endogeneity problem because they treated their natural resources variable as an exogenous explanatory variable in growth regression. Stijns (2005) noted the propensity in Sachs and Warner (1995) to encounter the issue of endogeneity.

3.3 Empirical Model

To investigate the impact of the share of oil rents in GDP on YG, unbalanced panel data fixed effects and two-stage least squares estimators are used from 1975 to 2013. There are 1197 observations of the fixed effect estimator and 1131 for two-stage least squares. The empirical growth model is as follows:

$$YG_{i,t} = \beta_0 + \beta_1 Invest_{i,t} + \beta_2 Open_{i,t} + \beta_3 G.Ex_{i,t} + \beta_4 Corrp_{i,t} + \beta_5 Con_{i,t} + \beta_6 Oil.GDP_{i,t} + \alpha_i + u_{i,t}$$

where i represents the country, t time, α the country fixed effect capturing all time-invariant, but country specific variables to solve the omitted variables bias problem, and u is the error term.

Table 1 Model Description

Variable	Description
YG	Annual percentage real GDP growth rate (where real GDP is in USD with 2005 base year)
Invest	Gross fixed capital formation expressed as percentage of GDP
Open	Trade openness (expressed as percentage of GDP)
G.Ex	General government expenditure on education expressed as a percentage of total general government expenditure on all sectors
Corrp	Corruption (ranges between -2.5 from the most corruption and +2.5 the least corruption)
Con	Conflict (dummy variable).
Oil.GDP	Oil rents, expressed as a percentage of GDP

3.3.1 Variables and Data Description

Dependent Variable

YG is annual percentage real GDP growth rate in USD currency with 2005 being the base year. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources (The source of the data is the World Bank).

Independent Variables

Invest is gross fixed capital formation expressed as a percentage of GDP (gross domestic fixed investment) and consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. Fixed assets include land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. According to the 1993 SNA system of national account, net acquisitions of valuables are also considered capital formation. (The source of the data is the World Bank).

Open is trade openness and is the sum of exports and imports of goods and services measured as a share of GDP. (The source of the data is the World Bank).

G.Ex refers to general government expenditure on education (current, capital, and transfers) and is expressed as a percentage of total general government expenditure on all sectors (health, education, social services, etc.). It includes expenditure funded by transfers from international sources to the government. General government usually refers to local, regional and central governments. (The source of the data is the World Bank).

Corrp refers to control of corruption, and that measures the extent to which power is exercised for private gain, including both petty and grand forms of corruption, as well as the "capture" of the state by elites and private interests. It ranges between -2.5 (the most corruption) and +2.5 (the least corruption). (The source of the data is World Government Indicator).

Con is conflict and is a dummy variable. It refers to an internal conflict in which at least 1000 battle related deaths (civilian and military) occurred per year (Anyanwy, 2004).

Episodes may be of any general type: inter-state, or communal; they include all episodes of civil, ethnic, communal, and genocidal violence and warfare. Coding takes value 1 for a country experiencing civil war and 0 otherwise. (The source of the data is IV Project Polity).

Oil.GDP is oil rents share of GDP; the difference between the value of crude oil production at world prices and total costs of production. (The source of the data is World Bank).

3.4 Review of Natural Resource Proxies and Measurement

There has been debate about which natural resource proxies to employ in studies on the resource curse. The share of natural resources in exports (or in GDP) has been the most frequently used measure of resource abundance since Sachs and Warner (1995). Brunnschweiler and Bulte (2008) suggest that resource share in exports (or in GDP), more precisely refers to resource dependence and intensity and is also an imperfect proxy of natural resources abundance due to the possibility of re-exportation. They have made a distinction between types of natural resources: resource abundance includes subsoil wealth, resource rents covers flow of income, and resource dependence includes export intensity (Brunnschweiler and Bulte 2008).

Kolstad and Wiig (2009) propose that we should focus on the resource rents instead of resource abundance or resource dependence. (Resource abundance is not correlated with institution). Namely, who captures the rents? Even in the Dutch Disease Theory, the key is the shift of rents from manufacturing sector to oil sector.

Hassan (2013) defines the resource dependence as the amount of natural resource income that the economy depends on such as resources share of GDP. Resource abundance is described as the existence of subsoil wealth such as oil, gas, and minerals, which are limited resources. Moreover, it depends on the earth surface and technological improvements to find the location of the resources. Wright and Czelusta (2002) showed that mineral extraction is based on high technology and knowledge and found no evidence for a Resource Curse. Ding and Fiel (2005) discovered the existence of the Natural Resource Curse for export dependence but not for abundance in a single equation model.

Brückner (2009) reported that the main measure of natural resource dependence used by Sachs and Warner (1995, 1997, and 1999) and other empirical research on the resource

curse theory is the share of exports of primary products in GNP. Alexeev and Conrad (2009) measured natural resource dependence as the share of oil income (or export) in GDP, while Gylfason and Zoega (2006) measured it by the share of natural capital in national wealth. Kropf (2010) pointed out that resource dependence can be found in economies where the current consumption level relies on mainly on natural resource production and export. Measures such as share of resource exports in GDP or the share of natural resources in total exports fall into this category (Kropf, 2010). Wantchekon (2002) measured natural dependence by the ratio of primary export on GDP.

According to Pendergast, Clarke, and Kooten (2008), natural resource dependence refers to the degree to which the economy depends on natural resources for its economic livelihood. Blanco and Grier (2011) measured natural resources dependence by total export of primary commodities divided by total exports. A high degree of resource dependence measured as the share of mineral fuel exports in a country's total exports (De Rosa and Iootty, 2012). Ding and Field (2005) explained that with a different conceptual that United States is resource-abundant but not resource-dependent, since it has a relatively small primary-resource sector; in contrast, Tanzania and Burundi are heavily dependent on natural resources although they do not have abundant natural resources. Mavrotas, Murshed, and Torres (2011) defined natural resource dependence as dependence on exports including oil and minerals, as well as other products, such as agricultural products. Harvey (2014) suggested that a better measure of natural resource dependence might be the ratio of natural resource export to total imports, as this would reflect the purchasing power generated by commodity exports.

In this study, oil rents share of GDP have been chosen as a natural resource variable, following on Hassan (2013) measurement, as oil is the most important natural resource sector (Tsui, 2005), data on oil is reliable and easy accessible, oil is a commercial sector and internationally traded (Egorov et al., 2008), and it measures as oil dependence countries.

Table 2: Descriptive Statistics

Variables	(1) N	(2) Mean	(3) Sd	(4) Min	(5) Max
Oil.GDP	5,256	5.521	12.59	0	86.98
G.Ex	2,583	4.407	1.892	0	44.33
Corrp	2,112	-0.0524	1.023	-1.740	2.586
Invest	4,828	23.33	10.66142	-5.739	219.0694
Con	5,499	0.162	0.369	0	1
Open	4,904	79.62	55.11	0	531.7
YG	4,974	3.7694	6.8106	-64.0471	149.973

The descriptive statistics shown in Table 3 are important because they show the basic features of the variables that are applied in this research. The table lists the number of observations (N), mean, standard deviation (Sd), minimum (Min), and maximum (Max) values of the variables. The average score of corruption level is -0.0524. The mean value of conflict is 0.162 because the variable is measured as a dummy variable and coded 0 and 1, which means there are few conflicts in the datasets. The mean value of oil rents share of GDP and government expenditure of education are 5.521 percent and 4.407 percent, respectively. These are low values, which mean the countries have low average spending on education and low oil rents share of GDP. The mean value of trade openness is 79.62 percent, which means there is considerable trade openness among the countries. YG is 3.7694 percent on the mean level.

It was noted that the range set up for the measurement of the corruption was -2.5 and +2.5. In our analysis, the maximum value of corruption in the case study of Finland is 2.586. This value is slightly higher than the maximum value +2.5. The result obtained through the initial analysis is based on the available data of the study. The value of 2.587 indicates that the higher value indicates the low rate of corruption in Finland.

3.5 Endogeneity Issues

Endogeneity is a term used to describe the endogenous independent variables in a multiple regression model that are correlated with the error term due to omitted variable, measurement error, or reverse causality (Wooldridge, 2003). It is one of the main challenges identified in econometric techniques which cause biased estimates for coefficient and standard errors (Owusu, 2012).

The researcher discovered three important causes of endogeneity which may occur in correlation between independent variables and YG model are omitted variables, reverse causality, and measurement error (Wooldridge, 2002).

1- Omitted variables endogeneity is when we would like to control for one or more additional variables; however, usually due to the data limitation, we cannot include them in a regression model. However, Wooldridge (2002) stated that if control variables are correlated with the error term, then the control variables will be endogenous.
2- Reverse causality refers to independent variables affecting dependent variable and vice versa. In economic growth relationship studies, the YG variable and the right hand side variables may give rise to reverse causality.

Based on the previous literature, Ugur and Dasgupta (2011) were concerned about an endogeneity problem in their growth regression model and state that an increase in a country's growth level may support the country in investing more resources in institutional capacity building, therefore achieving a lower level of corruption over time. Regression growth on corruption as a possible predictor may yield biased results because measures of corruption that can be used as independent variable may not be exogenous to the level of growth (dependent variable) in a particular country or year. Sahlgren (2014) points out that there is a reverse causality problem between education and economic growth because economic growth causes an improvement in education rather than vice versa. Jensen and Gleditsch (2008) suggest that many theoretical arguments and empirical studies show that the impact of conflict on economic growth causes an endogeneity problem and this may be severe when assessing effect of economic growth on conflict. Andersen and Babula (2008) found that a higher level of economic activity in society leads to an increased exchange of goods and services, which supports trade volume. It is suggested in this present study that there could be endogeneity problem between trade openness and economic growth.

3- Measurement error endogeneity occurs if variables are imperfectly measured.

Overall, the effect of the issue of endogeneity problem is that the coefficients of the independent variables become inefficient and unreliable in affecting the robustness of some of independent variables and YG results (Owusu, 2012). Beyond the omitted variables, reverse causality, and measurement error, we should examine the potential issues of endogeneity in this research. However, most previous empirical resource curse studies, such as Auty (1986, 1993, 2001a, 2001b) Sachs and Warner (1995; 1997; 1999) have failed to address the endogeneity problem, which casts doubts on the accurate indication of the resource curse results.

Regarding to the possibility of an endogeneity problem between explanatory variables and YG in this research, the endogeneity issues are tested empirically based on the implantation of the Durbin-Wu-Hausman exogeneity test.

3.5.1 Durbin-Wu-Hausman Exogeneity Test

Most researchers usually suspect endogeneity problems based on the previous literature, without testing the endogeneity for the empirical evidence before addressing it. Thus, the researcher will use the Durbin-Wu-Hausman exogeneity test in this section to find out whether the main independent variables in the YG model are endogenous or exogenous (Wooldridge, 2012). The DWH is based on two steps. First, we run regression on the possibility of suspected endogenous variables on all other right-hand-side explanatory variables of the original YG model, plus a set of instrument variables. An instrumental variable Z is uncorrelated with the error term but is highly correlated with the endogenous variables (Wooldridge, 2007). Second, we include the residuals that derived from the first stage regression into second stage regression (Davidson and Mackinnon, 1993). If the statistic of the residuals is statistically significant, then we reject the null hypothesis and the endogeneity problems exists between YG and suspected endogeneity variables. Thus, the hypothesis of the DWH is based on the following:

$H0$: Explanatory variables are exogenous; we do not need instrumental variables.

$H1$: Explanatory variables are endogenous; we do need instrumental variables.

Thus, the researcher found that t-statistics of the residuals of investment, government expenditure on education, corruption, and oil rents share of GDP variables are statistically

significant, which means the null hypothesis of DWH was rejected. It is concluded that these variables are endogenous to the YG variable. However, t-statistics of the residuals of openness and conflict are statistically insignificant. We fail to reject the null hypothesis, which means openness and conflict are exogenous to the YG variable. The results of the DWH are shown in appendix I.

3.5.2 Choice of Good Instrumental Variables

To reduce the endogeneity problems, we should apply the instrumental variables. As mentioned earlier, an instrumental variable Z is uncorrelated with the error term but is highly correlated with the endogenous variable. Sometime, it is very difficult to find a suitable instrument for right-hand-side variables in the YG model.

Since I was not able to find good instrument for investment, I therefore constructed an investment first lag order. Franekl and Romer (1999) suggested that instrumental variable for trade openness is land area. This variable is an important to determine trade openness. Regarding instrumental variables for government expenditure on education, Cock (2002) constructed an instrument based on the demographic of the population. Therefore, I suggest population growth as an instrument for government expenditure on education.

Following Aidt (2010) and Esarey (2015), I used ethnicity and freedom of press as instrument variables for corruption. Aidt (2010) stated that democratic countries have established checks and balances and the rule of law, among other things, for effective monitoring of corruption and punishment of concept officials, particularly in the public sector. In addition, a number of different ethnic groups in a society can increase the corruption level because public official groups favour their own groups at the expense of others (Gupta et al, 2001). Following Collier and Hoeffler (2005), we use military expenditure as percentage of GDP is to instrument conflict.

Brunnschweiler (2008) used type of regime (presidential or parliamentary) to instrument resources dependence. Thus, I will use a dummy variable for type of political regime to instrument oil rents share of GDP.

Thus, we found that all instrumental variables are highly correlated with the suspected endogenous variables on the right hand side of the YG model. The results of good instrument variables are presented in appendix II.

Table 3 Summary of Instrumental Variables for Right-Hand-Side Variables in the YG Model

Variable	Description
Invest.Lag	Investment first lag period
LD.area	Land area is a country's total area
Pop	Population growth expressed as a percentage annually
FP	Freedom of press (index of 0-30 Free, 31-60 Partly Free, and 61-100 Not Free).
Ethnic	Ethnic fractionalisation (ranges between 0 and 100) from complete ethnic homogeneity and complete ethnic heterogeneity
M.Ex	Military expenditure expressed as a percentage of GDP
Presid	Presidential regime (Dummy Variable)
V2hat	Residuals for each suspected endogenous right-hand-side variables in the YG model

Instrumental Variables

Invest.Lag is first period lag of investment. (The source of the data is the Researcher Calculation).

LD.area is land area (sq.km), which is a country's total area, excluding area under inland water bodies, national claims to continental shelf, and exclusive economic zones. In most cases, the definition of inland water bodies includes major rivers and lakes. (The source of the data is the World Bank).

Pop is annual population growth rate for year; t is the exponential rate of growth of mid-year population from year t-1 to t, expressed as a percentage. Population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship except for refugees not permanently settled in the country of asylum, who are generally considered part of the population of the country of origin. (The source of the data is the World Bank).

FP is a freedom press, an annual report on media independence around the world, assesses the degree of print, broadcast, and digital media freedom in 199 countries and territories. It provides numerical scores and country narratives evaluating the legal environment for the media, political pressures that influence reporting, and economic factors that affect access to news and information. Free: 0-30. Partly Free: 31-60, Not Free; 61-100. (The source of the is data Freedom House).

Ethnic is ethnic fractionalisation, represented by the commonly used ELF index of ethnolinguistic fractionalisation, which ranges from 0 (complete ethnic homogeneity) to 100 (complete ethnic heterogeneity) by measuring the probability that two randomly chosen individuals belong to different ethno-linguistic groups. (The source of the data is Fearon and Laitin, 2003).

M.Ex is military expenditures expressed as percentage of GDP data from (Stockholm International Pease Research Institute) are derived from the North Atlantic Treaty Organization (NATO) definition, which includes all current and capital expenditures on the armed forces, including peacekeeping forces; defence ministries and other government agencies engaged in defence projects; paramilitary forces, if these are judged to be trained and equipped for military operations; and military space activities. Such expenditures include military and civil personnel, including retirement pensions of military personnel and social services for personnel; operation and maintenance; procurement; military research and development; and military aid (in the military expenditures of the donor country). Excluded are civil defence and current expenditures for previous military activities, such as for veterans' benefits, demobilisation, conversion, and destruction of weapons. This definition cannot be applied for all countries, however, since that would require much more detailed information than is available about what is included in military budgets and off-budget military expenditure items. (For example, military budgets may or may not cover civil defence, reserves and auxiliary forces, police and paramilitary forces, dual-purpose forces such as military and civilian police, military grants in kind, pensions for military personnel, and social security contributions paid by one part of government to another. (The source of the data is the World Bank).

Presid is presidential regime and is a dummy variable. Coding takes value 1 for presidential regime and 0 for parliamentary regime. (The source of the data is Beck *et al.* 2001).

V2hat is residuals for each suspected endogenous right-hand-side variable in the YG model. (The source of the data is the researcher's calculations).

3.5.3 Two Stage Least Square

The method of two-least stage square is a common method to solve endogeneity problems and produces consistent estimates even in presence of endogeneity (Jones, 2008). It was introduced by Thiel (1953) and Basmann (1957). The main idea of behind two-stage square is that the endogenous explanatory variable, which is correlated with error term in the model replaced by variable which is not correlated with named instrumental variables. Through this process, the two-stage least square produces consistent estimators (Gujarati, 2006).

Gujarati and Porter (2009) suggest three advantages of using two-stage least square. Firstly, it might be used to single equation in the system without directly taking into account any other equations in the system. Secondly, it provides one estimate per parameter. Thirdly, it is simple use because all one needs to know is the total number of exogenous variables in the system without knowing any others in the system.

3.6 Results and Discussion

Table 4 presents the results of the different regression panel data country fixed effect and instrumental variables models for the effect of oil rents share of GDP on YG.

Table 4: Country Fixed Effect and Instrumental Variables Regressions for YG Over the Period 1975-2013

Independent Variables	(1) Fixed Effects	(2) Instrumental Variables
Invest	**0.184*****	**0.0623***
	(5.59)	(1.83)
Open	**0.0212*****	0.00380
	(2.73)	(1.22)
G.Ex	**-0.604*****	-0.788
	(-3.26)	(-1.30)
Corrp	**1.535*****	-0.0910
	(2.76)	(-0.23)
Con	**-1.604*****	-0.463
	(-2.75)	(-1.01)
Oil.GDP	**0.314*****	**0.192*****
	(4.36)	(3.70)
Constant	-0.520	**5.204***
	(-0.49)	(1.80)
Observations	1,197	1,131
R-squared	0.149	0.055
Number of country	133	
Country FE	Yes	
F-Statistic (P-Value)	0.0000	0.0000
Hansen's Test (P-Value)		0.5058

t statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Sachs and Warner (1995, 1997, and 1999) argue that there is a negative correlation between natural resource exporting countries and economic growth. This brings us to the following hypothesis:

$H0$: There is no correlation between oil rents share of GDP and YG.

$H1$: There is a correlation between oil rents share of GDP and YG.

Results of country fixed effect regression produced in the column 1. The sample includes results for 133 countries with 1,197 observations over the period 1975 to 2013. Holding all the other factors constant, it can be seen that the coefficient of oil rents share of GDP has a positive sign, indicating that a one percentage point increase in oil rents share of GDP, leads to higher YG by 0.314 percentage points. This suggests that oil rents share of GDP (which refers to oil dependence) has a positive impact on YG.

Regarding others variables that are included in the model, a government expenditure on education appear to reduces YG by around 0.604 percentage point while the negative impact of conflict is estimate to decrease YG by 1.604 percentage point. The coefficients of investment, openness and corruption are positive and statistically significant. The results suggest that increasing one percentage point in investment, openness, and corruption lead to higher YG by 0.184, 0.0212 and 1.535 percentages points respectively.

Column 2, we estimate the results of instrumental variables regression. Holding all other constant, oil rents share of GDP is positive and statistically significant, which suggests with that a 1 percentage point increases in the oil rents share of GDP, YG would increase by 0.192 percentage points.

Regarding other variables included in the model, the coefficients of openness, corruption and government expenditure on education, and conflict became statistically insignificant. The coefficient of investment implies that ten percentage point increase in investment leads to a 0.0623 percentage point increase in the YG.

The p-value of F-statistic in both columns is small and statistically significant, which means we reject the null hypothesis of the F-test, which is shown below:

$H0$: All explanatory variables except constant are jointly insignificant over the study period.

$H1$: All explanatory variables except constant are jointly significant over the study period.

The Hansen test was used to test the validity of instruments. The Hansen test failed to reject the null hypothesis, which means the joint instruments variables that we have applied for estimation are valid. The hypotheses of the Hansen test are based on the following:

$H0$: The instruments as a group are exogenous.

$H1$: The instruments as a group are endogenous.

3.7 Summary

A number of empirical studies have tested the effect of natural resource exporting on economic growth. However, these studies fail to provide evidence that natural resources support economic growth (Auty ,1986, 1993, 2001a, 2001b) and (Sachs and Warner ,1995; 1997; 1999). The main purpose of this chapter is examine the effect of natural resources on economic growth, mainly the effect of the share of oil rents in GDP on GDP growth rate for the period 1975-2013. This research applies panel data fixed effect and two-stage least square estimators.

The result of the panel data fixed effect estimator shows that the share of oil rents in GDP affects GDP growth rate positively. In contrast, the result of the two-stage least square suggest that the share of oil rents in GDP has a positive effect on GDP growth rate. Thus, these results provide conflicting evidence on the natural resource curse theory, which holds that there is a negative correlation between natural resource exporting and economic growth. Other results of this chapter are that gross domestic fixed investment, trade openness, and corruption are positively associated with economic growth. However, general government expenditure on education and conflict are negatively associated with economic growth.

Chapter Four: Conclusions

4.1 Key Findings

For natural resource exporting countries there seems to be a positive correlation between natural resources exporting and economic growth. The empirical evidence of the Resource Curse Theory is mainly based on Sachs and Warner's (1995, 1997, and 1999) cross-sectional data regression which was criticised by a number of authors as this method suffers from endogeneity bias. In addition, most of the previous empirical evidence for the existence of Natural Resource Curse Theory has used natural resource share of GDP as a variable. This measured natural resource abundance and not dependence.

This study presents an empirical investigation of the effect of natural resources on economic growth. We included 142 countries over the period 1975 to 2013. The empirical model was based on panel data fixed effects and two-stage least square estimators and emphasis were placed on GDP growth rate as dependent variable, with oil rents share of GDP as our natural resources explanatory variable. Others economic growth variables used are investment, openness, government expenditure on education, corruption, and conflict.

The key finding of this present research which contradicts the existing literature is that oil rents share of GDP is a blessing to economic growth. This finding is contrary to the findings of Sachs and Warner (1995), who applied a ratio of primary exports to GDP as a natural resource abundance variable. However, this is an incorrect measure, according to Brunnschweiler and Bulte (2008), who found that there is a negative effect between the ratio of primary export to GDP and economic growth.

From the results presented, the general conclusion is that there is no evidence to support the existence of the Resource Curse Theory. Panel data fixed effect and two-stage least squares estimators show that oil rents share of GDP is a blessing for economic growth.

4.2 Policy Implications

After the key findings on the resource curse in this chapter, the researcher makes some suggestions for policy-makers in natural resource-rich countries, specifically Libya and countries which suffer from the Natural Resource Curse more generally. Firstly, natural resource-rich countries should focus on the economic policy reform required to enable them to beat the Resource Curse. Natural resource-rich countries should implement sensible

macroeconomic policies such as avoiding excessive domestic and foreign debts, accumulating budget surpluses, controlling inflation, pursuing a competitive exchange rate for their domestic currency, supporting trade liberalisation, implementing economic diversification, and avoiding high capital spending on large-scale projects which is often a feature of an economy dependent on natural resource exports. High spending supports growth and other economic sectors such as construction, business, and tourism, while reinvesting in other sectors to sustain economic growth productivity such as human capital, technology development, the manufacturing and agricultural sector, and technology transfer, with view to supporting domestic sector capabilities These policies are essential to the support of natural resource-rich countries in order to avoid the resource curse, mainly the Dutch disease (Rosser, 2006; Steven et al., 2015; UNCYAD, 2007).

Natural resource exporting countries should set up Sovereign Wealth Funds (SWFs) into which the revenues derived from natural resources may be deposited. The main objective of these funds varies from state to state. The fund supports the natural resource economic dependence of the country when the oil price is fluctuating, providing an intergenerational saving mechanism, avoiding Dutch disease by stopping foreign exchange rate inflows into the economy, reducing the level of corruption, stabilising government capital spending and ensuring that the income from natural resources revenues does not exceed domestic absorption capacity (Steven et al, 2015).

Saving funds in Norway and the state of Alaska have supported the building of sizeable assets to meet future needs which may arise with a projected decline in petroleum earnings or an increase in social outlays in the case of Norway. Stabilisation funds have a positive effect on fiscal policy and results in less government spending from oil revenue. Some of these funds have reduced the spending pressure by channelling an important amount of oil revenue away from the budget, particularly when oil prices are increasing. In addition, the funds are used for investment abroad in order to decrease the real exchange rate appreciation in periods of rising oil revenue which may cause the Dutch disease. Further, the oil stabilisation fund supports the current needs for future generations (Fasano, 2000).

Natural resource exporting countries should follow a centralised wage negotiation system such as the one that Norway has established by making wages in the manufacturing sector quite high in the labour market relative to the oil sector's wages. Therefore, the production of the manufacturing sector labour market increases. Natural resource exporting countries should support large unions of employees in the non-oil sector to increase wages in order to obtain an appropriate income and to stop labour from moving from the non-oil sector

to the oil sector. Moreover, natural resource exporting countries should increase revenue through taxation. This is beneficial for the government and its citizens in resource-rich countries. In this way, society can account to the government for income received from natural resource revenues or the provision of public goods and services. Norway has a high tax rate but it is higher in the oil sector to reduce reliance on the sector (Elsgard, 2014).

Secondly, natural resource-rich countries should reform their political and social sectors to avoid the resource curse. It is likely that economic growth policy will not be successful unless reform has begun in the political and social environment in resource-rich countries. Governments in natural resource-rich countries are unlikely to pursue strategies that will reduce the resource curse until there is a shift from autocratic to democratic states. Natural resource-rich countries need to build capacity to develop institutional reform that includes political rights, free media, civil society, public participation in decision making, secure property rights, taking steps towards income equality considerations which are subject to social unrest, and implementing privatisation policies in order to prevent the issue of rent-seeking and corruption (Rosser, 2006).

Thirdly, natural resource-rich countries should bypass the state rather than trying to strengthen it and these countries should distribute all their natural resource revenues, or at least a substantial proportion of them, directly to citizens. This policy would reduce the opportunity for corruption because large revenues would be out of public hands and the pressure for high spending after fiscal crises and during downturns would be minimised due to the decrease of the financial resources available to the state during the booms. Natural resource-rich countries will obtain a significant amount of resource revenue from taxation if revenue is transferred to the citizen (Rosser, 2006). For instance, Alaska has a direct distribution of oil revenue to citizens and it has been a very successful way of reducing the resource curse (Goldsmith, 2011).

Fourthly, natural resource-rich countries should take action at international level to reduce the resource curse, through actions such as addressing the price of natural resource shock. For example, Organization for Economic Co-operation and Development (OECD) countries reduce their own subsidies to the agriculture sector; therefore, the subsidies cause an issue and have effects such as the fall in international prices in the producing developing countries. Natural resource-rich countries should apply for international certification process, such as the Kimberley Process for diamonds, which aim to decrease economic incentives for violent conflict by restricting international trade in various commodities which are traded illegally around the world (Rosser, 2006).

4.3 Research Limitations

This research has from three limitations, as follows. Firstly, there is a limitation of data, as for some variables obliged the researcher to reduce the number of countries in the research sample. Choice of countries for the sample was limited due to issues with the availability of data. All variables included in the research are annual data, which narrow the number of observation by country. Another limitation is the year when data begins for most countries sample. For example, the data on corruption used in this research were available from 1996. In addition, a control natural resources variable, oil reserve, was removed from the analysis because there was a great deal of missing data.

Secondly, multicollinearity between variables is a significant problem that has frequently been encountered by researchers. Our desire to include many economic growth determinant variables was often challenged by the issue of multicollineaity, which refers to a strong linear correlation between independent variables in the model and it can significantly affect the coefficient estimates. There are two types of multicollinearity: perfect multcollinearity refers to no independent variable being a perfect linear function of one or more other explanatory variables and imperfect multicollinearity indicates strong linear relationship between two or more explanatory variables. The effect of multicollinearity is that it is difficult to estimate the coefficients precisely, but it is still unbiased; the t-test will overstate the collinear variables, higher standard error the degree of fit R-squared will be mainly unaffected, the adjusted degree of fit R-squared may decrease slightly, and the F-statistics will be unaffected (Sandagdori, 2005). However, the correlation matrix between the explanatory variables, Variance Inflation Factor (VIF), and condition number is the most significant technique to examine multicollinearity.VIF is computed by the 1/(1-R2) ratio, in which R2 is the R squared of each subsidiary regression. According to the rule of thumb, if VIF is greater than five, severe multicollinearity may exist. Nevertheless, multicollinearity cannot be proved or disproved by the VIF test because the test is basedon the rule of thumb; therefore, theory is the most important guide (Sandagdori, 2005). The condition number of a data matrix is κ (X) and measures the sensitivity of the parameter estimates to small changes in the data matrix (Belsley, Kuh and Welsh 1980; Belsley 1982). It is calculated by taking the ratio of the largest to the smallest singular values from the singular value decomposition of X. A condition number above 30 is considered to be indicative of collinearity (Gatignon, 2013).

Thirdly, variables of natural resource studies are affected by measurement problems and thus the possibility of omitted variables bias arises, mainly in terms of the issue of endogeneity. In the natural resource curse literature, there many different measurements of natural resources and there is no agreement among scholars on one specific measurement. Thus, the researcher found some difficulty in choosing the most appropriate natural resource variables measurement. The share of natural resources in export (or in GDP) has been the most used measure of resources abundance since Sachs and Warner (1995). However, Bulte et al (2005) argued that it is imperfect proxy of a country s real stock, the most accurate measure of natural resources abundance in turn, stock measures have other limitation: they are hardly to measure, and the resource curse could be not predicted until the resources are extracted. Brunnschweiler and Bulte (2008) suggested that resource shares in exports (or in GDP), which more precisely refers to resource dependence and intensity and it is also imperfect proxy of natural resources abundance due to the possibility of re-exportation.

4.4 Areas for Future Research

Following this study, a number of useful areas for future research can be suggested, as follows. The natural resource curse has inspired a number of researchers and it is still holds a strong interest for researchers across disciplinary boundaries. While most of the literature focuses on the effect of natural resources on economic growth and other measure of economic performance, it has become clear that the natural resource curse extends beyond its economic dimension and has adverse implications for human development. In its 2013 Africa Health Forum Report, the World Bank notes that while many African countries have large quantities of natural resources, they do not have high government expenditure on the health sector (Cockx and Franken, 2014. Moreover, the 2013 African Progress Report notes that child malnutrition is endemic in African resource-rich countries and the levels of maternal mortality are well above the world average (Cockx and Franken, 2014). In addition, the spread of HIV/AIDS is a major public health and development challenge, particularly in Sub-Saharan Africa where public action to fight this deadly epidemic has been slow (De Soyasa and Gizelis, 2013). Thus, it is of great importance for future researchers to examine the impact of natural resources on health sector variables, including life expectancy, prevalence of anaemia among children, sanitation facilities, and infant mortality rates, using robust empirical estimators such as Generalised Method of Moments. The GMM estimator is used to

solve issues of endogeneity in variables, such as omitted variable bias, measurement error, and simultaneous equation bias (Kumar and Woo, 2010).

A number of authors such as Auty (1986, 1993, 2001a, 2001b) and Sachs and Warner (1995; 1997; 1999) found a negative correlation between natural resource exporting countries and economic growth, which casts doubts on the accurate indication of the resource curse. This present study used panel data fixed effects and two-stage least square estimators and found a positive effect of the share of oil rent in GDP on annual GDP growth rate. Thus, it would be interesting for future researchers to follow Barro's (2013) long-run growth model and examine the effect of natural resources on average GDP per capita growth or average GDP growth rate. Average growth rate will remove annual fluctuations and will obtain a long-run effect that we can assume is detrended.

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Appendix I

Panel Data Pooled OLS Linear Regressions for YG Over the Period 1975-2013

Testing Endogeneity of Investment

Number of obs = 1197

F (7, 1189) = 16.74

Prob > F 0.0000

Independent Variables	Coef	Robust Std. Err	t-Statistic
Invest	.0768201	.0329669	2.33
Open	.0023213	.0021707	1.07
G.Ex	-.3657087	.0831973	-4.40
Corrp	-.3935137	.1133028	-3.47
Con	-.3787105	.2639222	-1.43
Oil.GDP	.0893948	.0193856	4.61
V2hat	**.1432778**	**.0787719**	**1. 82**
Cons	3.568419	.8719462	4.09

Panel Data Pooled OLS Linear Regressions for YG Over the Period 1975-2013

Testing Endogeneity of Openness

Number of obs = 1195

F (7, 1187) = 15.41

Prob > F 0.0000

Independent Variables	Coef	Robust Std. Err	t-Statistic
Invest	.1228281	.0269523	4.56
Open	-.0055074	.0055479	-0.99
G.Ex	-.3531608	.0861659	-4.10
Corrp	-.3301933	.1223446	-2.70
Con	-.5012767	.2827587	-1.77
Oil.GDP	.0862987	.0190275	4.54
V2hat	**.0068665**	**.0057909**	**1. 19**
Cons	3.146385	.8109918	3.88

Panel Data Pooled OLS Linear Regressions for YG Over the Period 1975-2013

Testing Endogeneity of Government Expenditure on Education % of GDP

Number of obs = 1197

F (7, 1189) = 17.48

Prob > F 0.0000

Independent Variables	Coef	Robust Std. Err	t-Statistic
Invest	.0618775	.028939	2.14
Open	-.000822	.0020344	-0.04
G.Ex	-3.894938	.9270219	-4.20
Corrp	1.769987	.5891092	3.00
Con	-2.338617	.5531996	-4.23
Oil.GDP	.0825275	.0193527	4.26
V2hat	**. 3.571291**	**.9207979**	**3.88**
Cons	20.00095	4.508974	4.44

Panel Data Pooled OLS Linear Regressions for YG Over the Period 1975-2013

Testing Endogeneity of Corruption

Number of obs = 1145

F (7, 1137) = 22.32

Prob > F 0.0000

Independent Variables	Coef	Robust Std. Err	t-Statistic
Invest	.1499637	.0208205	7.20
Open	.002542	.0025291	1.01
G.Ex	-.2394233	.1012966	-2.36
Corrp	-.8425328	.2210997	-3.81
Con	-.4951935	.2742655	-1.81
Oil.GDP	.0781688	.0214267	3.65
V2hat	**. 6786737**	**.3286454**	**2.07**
Cons	1.391974	.6670359	2.09

Panel Data Pooled OLS Linear Regressions for YG Over the Period 1975-2013

Testing Endogeneity of Conflict

Number of obs = 1113

F (7, 1105) = 20.20

Prob > F 0.0000

Independent Variables	Coef	Robust Std. Err	t-Statistic
Invest	.1441283	.0231502	6.23
Open	-.0019013	.0033694	-0.56
G.Ex	-.4385975	.1189302	-3.69
Corrp	-.6601685	.1975989	-3.34
Con	-2.900371	2.121864	-1.37
Oil.GDP	.0856808	.0182331	4.70
V2hat	**2.758865**	**2.167398**	**1.27**
Cons	3.145209	1.246567	2.52

Panel Data Pooled OLS Linear Regressions for YG Over the Period 1975-2013

Testing Endogeneity of Oil Rents Share of GDP

Number of obs = 1171

F (7, 1163) = 15.66

Prob > F 0.0000

Independent Variables	Coef	Robust Std. Err	t-Statistic
Invest	.085661	.0271206	3.16
Open	-.0014365	.0026447	-0.54
G.Ex	-.333116	.0873262	-3.81
Corrp	-.0277203	.1883246	-0.15
Con	-.0411325	.2968774	-0.14
Oil.GDP	.2339573	.0563889	4.15
V2hat	**-.1542657**	**.0558176**	**-2.76**
Cons	2. 815603	.7933844	3.55

Appendix II

Panel Data Pooled OLS Linear Regressions for Investment Over the Period 1975- 2013

Testing for Instrumental Variable of First Lag of Investment

Number of obs = 1202

F (6, 1195) = 50.07

Prob > F 0.0000

Independent Variables	Coef	Robust Std. Err	t-Statistic
Invest.Lag	**1.014703**	**.1187496**	**8.54**
Open	.008458	.004568	1.85
G.Ex	-.0798384	.07235	-1.10
Corrp	-.2094335	.1169214	-1.79
Con	.246698	.4356039	0.57
Oil.GDP	.0059382	.0239839	0.25
Cons	-.4500901	3.195453	-0.14

Panel Data Pooled OLS Linear Regressions for Openness Over the Period 1975- 2013

Testing for Instrumental Variable of Land area

Number of obs = 1202

F (6, 1195) = 33.47

Prob > F 0.0000

Independent Variables	Coef	Robust Std. Err	t-Statistic
Ld.area	**-.000064**	**8.52e-06**	**-7.51**
Invest	1.609031	.2709485	5.94
G.Ex	-.4888032	1.316846	-0.37
Corrp	11.69928	2.790779	4.19
Con	-14.55157	2.344655	-6.21
Oil.GDP	.3304174	.1023714	3.23
Cons	55.5984	9.159491	6.07

Panel Data Pooled OLS Linear Regressions for Government Expenditure on Education Over the Period 1975- 2013

Testing for Instrumental Variable of Population Growth

Number of obs = 1204

F (6, 1197) = 60. 81

Prob > F 0.0000

Independent Variables	Coef	Robust Std. Err	t-Statistic
Pop	**-.1053449**	**.031726**	-3.32
Invest	-.0144082	.0057471	-2.51
Open	-.0003515	.0009982	-0.35
Corrp	.5962027	.0405153	14.72
Con	-.4820266	.1120571	-4.30
Oil.GDP	.0021621	.0039661	0.55
Cons	4.968274	.172051	28.88

Panel Data Pooled OLS Linear Regressions for Corrp Over the Period 1975- 2013

Testing for Instrumental Variables of Freedom Press and Ethnicity

Number of obs = 1151

F (7, 1143) = 233.21

Prob > F 0.0000

Independent Variables	Coef	Robust Std. Err	t-Statistic
FP	**-.0234395**	**.00106**	**-22.11**
Ethnic	**-.7296202**	**.0719941**	**-10.13**
Invest	-.0052554	.003131	-1.68
Open	.0028098	.0008879	3.16
G.Ex	.1496715	.0129188	11.59
Con	-.1518481	.0380034	-4.00
Oil.GDP	-.0048064	.0022972	-2.09
Cons	.6757525	.1118663	6.04

Panel Data Probit Regressions for Conflict Over the Period 1975- 2013

Testing for Instrumental Variable of Military Expenditure % of GDP

Number of obs = 1119

Independent Variables	Coef	Robust Std. Err	Z-Statistic
M.Ex	**.1918661**	**.0340041**	**5.64**
Invest	-.0071684	.0085236	-0.84
Open	-.0107227	.0017727	-6.05
G.Ex	-.1079841	.0326807	-3.30
Corrp	-.679505	.069789	-9.74
Oil.GDP	-.0287579	.0071458	-4.02
Cons	-.0919189	.2582579	-0.36

Panel Data Pooled OLS Linear Regressions for Oil Rents Share of GDP Over the Period 1975- 2013

Testing for Instrumental Variable of Presidential Government

Number of obs = 1178

F (6, 1171) = 20.63

Prob > F 0.0000

Independent Variables	Coef	Robust Std. Err	t-Statistic
Presid	**4.698836**	**.6168905**	7.62
Invest	.1902603	.0629305	3.02
Open	.0177317	.0068202	2.60
G.Ex	-.1998069	.2032771	-0.98
Corrp	-1.454022	.3204141	-4.54
Con	-2.513671	.7886825	-3.19
Cons	-2.798562	1.836337	-1.52

Appendix III: **Country Sample**

Albania, Algeria, Angola, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahrain, Bangladesh, Belarus, Belgium, Benin, Bolivia, Botswana, Brazil, Bruin Darussalam, Bulgaria, Burkina Faso, Burundi , Cambodia, Cameroon, Canada, Central Africa, Chad, Chile, China, Colombia, Congo Republic, Costa Rica, Cote d'ivoire, Croatia, Cyprus, Cuba, Czech Republic, Denmark, Dominican Republic, Ecuador, Equatorial Guinea ,Egypt, El Salvador, Ethiopia , Fiji, Finland, France, Gabon, Gambia The, Georgia, Germany, Ghana, Greece, Guinea, Guyana, Guatemala, Guinea- Bissau, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iran, Iraq, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Korea Rep, Kuwait, Kyrgyz Republic, Latvia, Lebanon, Liberia, Libya, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malta, Malaysia, Maldives, Mali, Mauritania, Mauritius, Mexico, Morocco, Mongolia, Mozambique, Namibia, Nepal, Nigeria , New Zealand Netherland, Nicaragua, Niger, Norway, Oman, Pakistan, Panama, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russian, Rwanda, Saudi Arabia, Senegal, Singapore, Slovak Republic, Spain, Sri Lanka, Sweden, Swaziland, Syrian Arab Republic, Southern Africa, Sudan, Thailand, East Timor, Togo, Tunisia, Turkey, Turkmenistan, Trinidad and Tobago, Uruguay, Uganda, Ukraine, United Arab Emirate, United Kingdom, United States, Yemen, Venezuela, Vietnam, Zambia, Zimbabwe.