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"Economic Determinants of Public Budgets: The Case of Main Oil Exporters"

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Abstract

This paper aims to investigate the determinants of oil exporting countries' public budgets by utilizing fixed and random effects techniques across a panel of fourteen oil exporter nations in a sixteen-year time-period spanning from 1990-2015. The model analyzes the influence of certain economic country characteristics on fiscal components of the public budget. The findings of the study indicate that not all government expenditures support growth in their respective oil exporting host countries. Public consumption and transfers, which are supposed to be growth enhancing expenditures, register a significant negative correlation to growth. Hence, public spending on consumption and transfers do not actually increase in GDP per Capita in oil exporting countries, and instead constrain growth. That being said, on the other hand those same two components, consumption and transfer expenditures, showcase a significant and positive effect on the overall size of the economy and actually expand the economy. This expansion in the size of the economy but lack of all-inclusive sustained economic growth signals a distortionary effect.

Introduction:

The public sector is considered the backbone of any economy. The public budget is not merely a plan of action that the government must follow when it comes to spending. The government- through its public budget- can influence the growth path of the economy, overall development, citizens' welfare and even engrave societal incentives and values. Hence, the public budget structure is a critical component of any nation's development plans, and economic objectives. Structures of public budgets are not only influenced by cyclical components- determined by the business climate- but also by several key characteristics that are unique to each nation. Those characteristics in turn differentiate each nation's budget constraints and behavior of the public budget in response to them as well as the business cycle locally and on an international level.

Economics and politics go hand in hand, resources-especially oil due to its high export value- can transform and influence the host country's political structure, social intuitions, fiscal

policy and its development and growth path. In all nations around the world, except the United States of America, oil rents are viewed as the property of the nation and more specifically the government. Hence, oil rents are under the total control of the public sector; which in turn regulates how oil rents are collected, used, and distributed.

Oil as a commodity export is a key income stream upon which a government implements its fiscal policies and in rare cases one that supports its legitimacy. The more dependent the nation is on oil, the more susceptible it is to fluctuations in demand and prices in the oil market.

It's not called a "resource curse" for nothing; an inverse correlation does exist between economic growth and natural resource abundance in developing countries. It has been proven time and time again that oil exporters, who are resource dependent themselves- although equipped with a profitable exportable natural resource that is highly in demand- perform worse off than other countries that are not blessed with commodities or oil. This is dubbed the "Paradox of Plenty"- in which those resources, although abundant and profitable hinder host nations from reaching their full potential. (Gelb et. Al., 2002).

For it's not all smooth sailing when you've been endowed with oil, oil exporters, on the contrary, are faced with many challenges that they must keep in mind and strategize for. Examples are how to effectively manage and allocate this oil revenue for the betterment of their economy and society and how to insulate their economies from the effects of oil booms and busts. Prior planning must be high on the agenda for oil exporters as oil prices vary greatly and oil as a commodity is not sustainable; supplies can dwindle and run out, or worse yet alternative energy can wipe out the demand for oil all together in the long run as people embrace clean more efficient and better yet cheaper energy alternatives to oil. Hence the need for governments to implement and plan for different strategies that can prop up their progress and support a sustainable growth path in the face of all those hurdles. They must think of the future generations and instigate a plan of action that allows for a steady flow of revenue to keep up with the demands of the future. Hence, 'Rentier States,'[1] must manage their fiscal policy carefully, for oil can flaw even the most thought up plans.

[1] A state that is highly dependent on its oil sector and derives most of its revenues from exports of this commodity.

The reality for most oil exporter nations is that their fiscal systems are very politicized. They have highly opaque budget processes that lack transparency and are often flawed with corruption. Oil income makes it hard to sustain a political institution that has a sound and long-term economic vision and strategy to manage this revenue stream. It weakens incentives and gives birth to corrupt agents and rent-seeking parties in the host nation that all work hard to oppose and clash with any strategy that safeguards those profits from theft and private gain; hence encouraging agents to attempt to take a piece of the pie.

Secondly, oil negatively impacts oil exporting countries' motivation to develop other resource sectors. In return, this generates high volatility in the public budget, and external balance of most oil exporters making them move in parallel to oil prices. Sadly, when oil prices drop, government not following a sound fiscal strategy and plan finds themselves facing a deficit- which is either financed by external burrowing or puts a damper and stalls all prior unfinished investment, projects and spending commitments done when oil prices were profitable. Hence, slowing the growth of those oil exporters and moving them towards "stagflation"[2] (Gelb et. Al., 2002).

Thirdly, there is often no backup strategy to cushion oil price blows or allows for fiscal flexibility when things go wrong. Instead, many nations engage in the false predicament of growing their expenditures too quickly thinking that this would push the economy toward a higher growth path. The reality is that this high spending is sometimes fruitless, ineffective and also unsustainable when oil rents fall especially since those nations do not even have fiscal adjustment or consolidation processes in their budgetary plans. Instead, they only consolidate their budgets when faced by a crisis. All this makes it critical for resource rich nations to be prudent and wary when setting their fiscal plans and positions.

Finally, unfortunately for oil rich nations, oil has brought forth and rooted strong and overpowering entitlement claims and demands by their populations- who after years of welfare spending and having the government handing them everything on a "silver platter"- have developed skewed incentives and a false hope of having this oil income last forever. Live

[2] A situation when the inflation rate is high, this would lead to a fall in economic growth, increase in unemployment and decline in GDP.

examples are those of Gulf states such as Saudi Arabia and Kuwait. Instead of giving into welfare spending, those nations must reshape work ethics, and remold domestic incentives towards a strategy that emulates Alaska and Norway's successful experiences with their respective oil funds which have allowed them to make their populations stakeholders and active participants in this wealth by distributing active dividend payouts from the oil revenue. Not only have those funds allowed the population to have a stake in this revenue stream, they have also been able to insulate the economy from oil market booms and busts, give those nations deep pockets of funds to tap into when needed and saved a portion of this revenue for the future generations.

Those fund strategies have been so successful that scholars such as Sandbu (2006) are calling for a new unique idea of wiping out the government income stream that is oil rents and instead diverting it into the citizens' hands through "Natural Wealth Accounts". By diverting the money into citizens' pockets and then taxing them on it, Sandbu (2006) explains that this will give a halt to any rent-seeking or corruption, and instead make the citizens and governments, alike, accountable. By taxing citizens, they will be more active in government plans, and give their opinion on where the money should be going towards in the fiscal budget because they are essentially paying the government directly from their own pockets. Also, this will assure that resources are allocated towards the greater good and will destroy any negative externalities that come with this natural resource.

Seeing as to oil rents are a leading determinant that shapes and can sometimes break the public budget structure and process of their respective oil-endowed nations, this paper aims to analyze the effect of oil rents, as well as other country-specific characteristics on the public budget components of a panel of oil exporting nations. The objective is to to pinpoint if other country structure characteristics- other than oil rents- affect the public budget and ultimately fiscal policy.

This research paper closely follows the work of Qu and Raei (2015). The study of Qu and Raei (2015) utilizes a pooled OLS technique to compare the budget components and country characteristics of CESEE nations over two years- pre and post the financial crisis of 2008. Our research paper, on the other hand, is different in the sense that it specifies a cross-section panel

time-series that includes a selection of fourteen of the top twenty-five oil exporting nations of whom ample data is available over a time span of twenty six years, from 1990-2015. The estimated model used analyzes this niche panel group of oil exporters' budget components.

Literature Review:

Public Expenditure and Economic Growth

This link between the government's inputs and services in the economy, largely done through public expenditure, and economic growth falls under the economic field of endogenous growth. Public expenditure is an important factor to private production and ultimately can adjust and pave the path of productivity. Barro (1990) suggests that not all fiscal policy decisions are the same; there are different types of public expenditures, those that affect the production function, and those that affect overall utility. Both types of expenditures are financed by taxation yet not equal in effectiveness. Investment is viewed as productive and fruitful to the production function, whilst consumption is welfare enhancing to household utilities but sterile when it comes to the production aspect of the economy.

Government consumption expenditure is found to be growth-hindering in many empirical models and papers. Grier and Tullock (1989) test a panel model of 113 nations and found that government consumption had a significant negative relationship with growth. According to Grier and Tullock, this is due to the need to finance this expenditure through a tax burden; this essentially "reduces returns on investments and the incentive to invest."

Barro (1991) confirms this hypothesis and examines a panel of 98 countries' growth rates and major budget components in a time span of 25 years from 1960-1985. He finds that growth is inversely correlated to government consumption, and positively related to public investment however not on a significant level; and concurs with Grier and Tullock (1989) suggesting that consumption is negatively correlated to growth, because this expense is financed through taxation which has distortionary effects, and lowers savings thereby curbing growth. Barro

(1991) also estimates that an increase in public consumption expenditure yields lower GDP per-capita growth.

Landau (1983) tests the relationship between public consumption as a proxy for government expenditure and the growth rate of real per capita GDP in over 100 countries. Findings show a negative relationship between growth and public consumption.

Bose et. Al (2007), in their panel study of thirty developing nations from the 1970s-1980s, find a positive and statistically significant relationship between investment, in the form of capital expenditures, and economic growth-proxied by GDP per Capita. They state that in order to stimulate growth, aggregate capital expenditures- in the form of investment- should be favored over current expenditures- in the form of public spending as they are more effective in the long run.

Barro (1991) find that public investment is initially positively related to growth, but not on a significant level. Public investment, however, when entered into the model alongside total investment (private and public alike), scored an insignificant and essentially neutral score; meaning that no effects were significant enough to spur growth. He explains that this neutral score is due to the fact that the government once again creates distortions whilst attempting to finance this investment through a higher tax rate. This investment hence fails to "provide an offsetting stimulus" to further boost and drive up investment and growth post taxation and delivers naught.

Devarajan et. Al (1996) contend the status quo that investment is always best for growth and found a significant negative relationship between per capita growth and capital-based expenditures. They test a panel of 43 developing countries with a time span of 20 years, in order to find out if a change in the composition of expenditures in the public budget leads to higher growth rates for the economy. Devarajan et. Al (1996) find a positive and significant relationship between current expenditures (consumption) and growth; and conclude that productive expenditures in the form of investment if in excess become unproductive. They emphasize that this has been the case of many developing countries who have been misallocating public expenditures towards more capital-intensive expenditures as opposed to current expenditures in a

bid to progress and grow. This excessive spending on capital expenditures is burdensome, and unproductive.

Productive vs. Unproductive Public Budget Components

More recent studies and empirical work have added on to this stream of thought of productive vs. non-productive public spending components highlighted above and introduced new public budget components and variables to the models tested. Introduced public budget components include social transfers-the public safety nets and subsidized payments the government hands out to citizens through transfers. Another component is compensation to public sector employees, which many economists classify under consumption expenditure.

Cashin (1995) tests a panel model of 23 developing nations from 1971-1988, in a bid to investigate the influence of public investment, public transfers and distortionary taxation on the rate of economic growth. Cashin (1995) finds a positive and significant relationship between GDP per Capita and public transfers. This relationship further implies that government transfers, whether they are intergenerational (rich to poor) or intergenerational (young to old), stimulate economic growth.

Cashin (1995) also finds that current revenue as a percentage of GDP was surprisingly negatively related to the average annual rate of growth of Per Capita real GDP; which he concludes is due to the fact that revenue from taxation has a growth hindering effect.

Ormaechea and Morozumi (2013) attempt to capture the effects of the reallocation of government spending and its influence on growth but take it one step further by specifying which component of the public budget is used as the compensating factor to keep the level of spending the same. They use a Generalized Method of Moments (GMM) dynamic panel estimators on a panel of 56 countries during the period of 1970-2010. Ormaechea and Morozumi (2013) find a lack of robustness in the growth promoting effects of spending reallocations toward public infrastructure and investment. They elaborate that this may be due to the inefficiency of the public investments, or the simple reason that this reallocation may not be from an "unproductive" component; only when the spending shifts from an "unproductive" component will it push growth.

Ormaechea and Morozumi (2013) also delve into the social protection component of government expenditure, transfers; which is often assumed as an unproductive component of the public budget since it has a redistribution of wealth feeling. They find in their model that increased spending in social protection, offset by a decrease in another component, has no positive and statistically significant association to growth. Yet they conclude that although their paper focuses on growth, spending on social protection components, although not productive, helps promote income equality.

On the other hand, Ormaechea and Morozumi (2013) find that a rise in the share of spending in non-financial assets (investment), when compensated by a fall in expenses (which includes public wages), results in a significant increase in growth. Whilst an opposite increase in expenses, compensated by a decrease in investment spending, results in a negative effect. They explain that this again is probably due to the corresponding rise in tax revenues to finance this expenditure, which again creates a distortionary effect.

Country Structure Characteristics and the Public Budget

More recent economic views have started adding other non-budgetary components to the equation, such as country structure characteristics. Those variables are sometimes a blessing or a burden and can boost or drain the public budgets of those nations therefore indirectly either stimulating or restraining growth and development. Examples are openness and the size and intensity of trade, urbanization, ratio of dependents in society that are outside the labor force, the size of the economy, and resource rents that can provide much needed revenue and help finance public expenditure alongside taxation.

An example of the above is a recent model suggested by Qu and Raei (2015), they attempt to compare the budgets of the Central Eastern and South Eastern Europe nations with other similar nations and find that different country structural characteristics highly influenced the government budget.

For starters, Qu and Raei (2015) find a positive and significant correlation between GDP per Capita and total expenditures and revenues. This result is consistent with Wagner's Law, in which a higher GDP per capita is indicative of growth, since with growth comes a higher

demand for public services; which in turn must be financed by an even higher level of government revenue in the form of taxation or an exportable profitable resource.

Another finding by Qu and Raie (2015) shows a negative relationship between the size of the nation's economy (defined as Log GDP in their model) and public investment which they deem is reflective of the structural economic transformation that those countries were going through post the financial crisis of 2008. The Log GDP, on the other hand, is found to have a strong positive correlation with the revenue components of transfers and social contributions.

Results of Qu and Raie (2015) indicate that total revenue and the dependency ratio were significantly negatively related to each other; meaning that in nations where a large percentage of the population was found to be under the age of 16 and over the age of 64- basically over or under the working-class age-there were lower government revenues.

Although not many of the nations in their sample were resource rich, Qu and Raie (2015) find that the relationship between investment and resource rents was positive and significant in nations that were rich with resources or dependent on their resources.

Rodrik (1996), on the other hand, focuses on the trade balance and how open a nation is. He tests a panel of developing and developed nations spanning from the mid 80's to the early 90's and finds that openness and government expenditure in GDP (here meant to be a proxy for the scope of government) had a robust and positive relationship. Meaning that governments in open nations, that are highly engaged in trade, take on a "mitigating role", and provide the economy with "social insurance" that smooths out any external shocks incurred. He provides examples of governments who provide this social safety net to the economy and mentions the likes of Austria, Netherlands and Norway- who are all small and highly open nations- which also have the highest share of government expenditures as a percentage of GDP.

Rodrik (1996) also finds that in more open developing nations, government spend more on consumption expenditures; in which they pay to finance employment schemes, public work programs and other social insurance payments that safeguard the local economy from the

negative externalities of increased trade. Whilst, in developed more open nations, governments spend more in the public transfer category and fund social welfare programs.

But what stood out from his results and corroborates with our subject matter of oil exporting nations, is the fact that when Rodrik (1996) added in terms of trade and export risk variables into the equation, he finds that countries who export a few commodities or depend on a major export, like oil, were exposed to more external risk than countries with a diversified variety of exports. Those nations with product concentration of exports displayed a stronger correlation of openness on government consumption, since any external risk endured would have great effect on the government budget due to the high dependence on this sole export.

Rodrik (1996) also deduces that nations that exhibited low terms of trade scored even higher results, thereby corroborating the risk of a lop-sided trade balance in the sense that imports in are higher than exports; a fundamental aspect of the resource curse and Dutch Disease phenomena. This low score of terms of trade and export concentration, exactly what is exhibited by countries that are oil producers, were found to be negatively correlated with per capita GDP.

On the other hand, Fetahi-Vehapi et. Al (2015), through a Generalized Method of Moments model of a sample panel of 10 South East European Countries over a 16 year time-span (1996-2012), find that trade openness in fact does enhance growth and seems to favor countries with higher GDP per Capita. This eye-opening result runs in line with previous claims by a study by Irwin and Tervio (2000) that claims that there is a positive relationship between trade and income; suggesting that nations with higher incomes actually trade more, as opposed to the conventional idea that suggests that countries that engage in more trade have more income. Essentially, this means that trade openness encourages growth more in nations with higher GDP per Capita, or in other words richer countries.

Irwin and Tervio (2000) also find that in addition to higher initial income per capita, all else equal the empirical results seem to also suggest that trade also has a positive relationship and benefits countries that have higher gross fixed capital formation, and higher FDI more than others; in other words, openness and public investment go hand in hand. This makes sense and

runs parallel to the fact that international trade increases those two critical mechanisms thereby increasing the overall productivity of nations that engage in them.

Finally, Rodrik (1997) goes one step further and introduces globalization into the equation. He attempts to capture the effects of globalization on government spending, compensation of employees and tax burdens that arise in response in order to fund public social safety nets; in other words, transfers.

Rodrik (1997) through a panel regression of OECD countries spanning from 1971-90 finds that government spending on income transfers as well as consumption react negatively to both GDP per capita and lagged openness. He elaborates that this goes against Wagner's Law but is due to the fact that when an economy is open and there is substantial external risk, governments must raise taxes on labor all whilst decreasing taxes on capital. He explains that this is because labor is not as mobile as capital, which can easily take flight and be portable across borders. This forced behavior by the government is due to pressure from labor, who are exposed themselves to more external risk and competition with this globalization, and in return demand that the government provides social insurance in the form of welfare and "generous income transfer programs." This increased fiscal spending by the government to provide social insurance against external risk needs to be financed, and that is done by taxes. The government hence indirectly increases taxes on labor, all whilst reducing taxes on capital to avoid it from fleeing to more competitive and attractive economies.

Rodrik (1997) further introduces capital mobility into his regression models and finds that in countries or time periods in which there is no restriction on capital mobility and hence flight of capital is easy, the negative effects of increased trade and openness is stronger on public expenditure spending. He further explains that the relationship stated above between public compensation of employees and public consumption with economic growth depends on the volatility and the intensity of the terms of trade in the host countries; when countries have high levels of trade volatility government spending increases, and vice versa.

He emphasizes that with an increase in globalization, there is an increase in demand for public social insurance spending; yet this increased demand for the government to spend on this

expenditure due to higher globalization and openness reduces the efficiency of the public sector and its ability to perform an effective role in the economy. He concludes that once globalization intensifies, governments can no longer finance the pending income transfers because there is no more space for taxation; and hence a conflict occurs between being more open or maintaining the economy's social consensus.

The Public Budgets of Oil Exporters

Now when it comes to oil exporters, the target sample of this thesis, governments are faced with an added hurdle. The oil market is very volatile, with oil shocks being hard to anticipate. In fact, it's hard to single out long term oil shocks from temporary fluctuations in demand. Hence, oil exporters have constantly found their economies being shaken up by sudden surges and busts in oil prices. They, thus, need to finetune their fiscal budgets and plan their policies in a way that keeps them successfully afloat in the face of ever-changing oil price booms and busts.

Many oil exporters adopt pro-cyclical fiscal policies; when prices are high, and rents are aplenty, they tend to rapidly spend. Often this growth in expenditure is of low quality and therefore of low yield. This symmetrical spending behavior, if not planned right, is not sustainable in the long run and can cause instability. Other oil exporters on the contrary have been observed to adjust asymmetrically to prices and thus act accordingly.

Nusair (2016), utilizes a cointegrating non-linear autoregressive distributed lag model (NARDL) to examine short run and long run effects of oil price shocks on real GDP in the Gulf States, and found that an increase in oil price increased real GDP in all the Gulf States. However, a fall in oil prices decreased real GDP and was only significant in the case of Kuwait and Qatar. When Nusair (2016) implemented the model using panel data, he found that positive oil prices increase real GDP and negative oil shocks decreased real GDP; thereby concluding that positive oil prices had a bigger influence on real GDP when it comes to the Gulf States.

Moshiri and Banijashem (2012) implement a VAR model data on six OPEC members which included Kuwait and Saudi Arabia with a timespan from 1979-2009 and surprisingly found no significant positive relationship between positive oil price shocks and economic

growth. Hence as prices rise, they do not cause sustainable economic growth. However, a significant relationship was found between negative prices and economic growth, in the sense that falling prices cause stagnation in the economy. When it comes to Kuwait and Saudi Arabia, they found that negative oil prices did not yield a significant effect on growth.

Alkhathlan (2013) finds, through an autoregressive distributed lag model (ARDL) tested on Saudi Arabia with a timespan of data from 1970-2010, that oil revenues had a significant and positive strong influence on the Kingdom's GDP in both the long and short terms.

A study by Emami and Adibpour (2012) examine the dynamic relationship between output, government expenditures, liquidity, oil revenue shocks and economic growth in Iran through a SVAR model that tests annual data from 1959-2008. They find that output, government expenditures, money supply and positive oil shocks all seem to have a positive effect on the economic growth of Iran. They also find that output shocks, unlike oil shocks, do not significantly affect economic growth, and emphasize that negative oil shocks significantly decrease economic growth. The co-efficient of the negative oil shock was found to be greater than that of the positive oil shock; and that positive oil shocks have limited impact on stimulating output growth, whilst negative oil shocks deeply cut output growth. This indicates that there are asymmetric effects of oil revenue shocks on economic growth.

Mehrara (2008) examines the asymmetric relationship between oil revenues and output growth in 13 oil exporting nations from 1965-2004 by applying a dynamic panel framework to measure the effect of oil shocks. He found that negative shocks have a much lasting, and greater influence on output. Positive shocks to oil revenue had a positive effect on output, but this effect was barely significant, and the influence was "trivial" in magnitude. Results also indicate that positive shocks had a transitory effect, in the sense that they reversed to a negative effect in the subsequent period (1 year in the case of his model). Hence, a positive oil revenue shock has an inverse U curve effect on output. This oil boom if accompanied by an appreciation of the real exchange rate can drive consumption up and deteriorate the competitiveness and growth of the non-oil exports and thereby reign in output growth in the following year. The negative oil revenue shock, however, showed significant and strong influence on output, and persisted for a

longer period and a higher magnitude. Negative oil revenue shocks were found to be more than twice as large as positive shocks and had longer lasting effects.

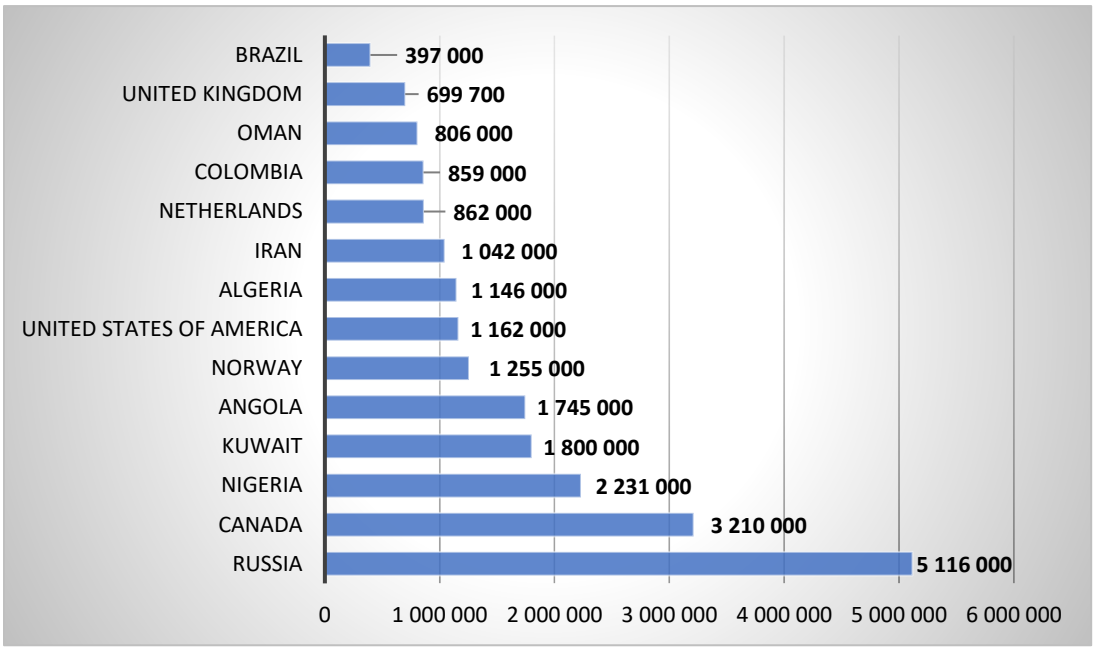
Data, Model and Methodology:

Description of Data:

The estimated model's panel consists of a sample of the top 25 oil exporter nations in the world of which ample data is available over a time horizon of 26 years. The selected nations include: in order of highest exports: Russia, Canada, Nigeria, Kuwait, Angola, Norway, the United States of America, Algeria, Iran, Netherlands, Colombia, Oman, the United Kingdom, and Brazil.

Figure 1, below, shows the respective nations' daily quantity of crude oil exports in barrels. As one can observe, the top exporters in our sample panel are Russia, Canada, Nigeria, and Kuwait. Also, one can observe the different regions which those oil exporters span from. Not only that, they also have substantially different political systems, demographics and growth paths. Hence, this is where the control variables introduced in the model and most specifically country-specific structure characteristics, prove to be most helpful in allowing us to capture the different characteristics those nations possess and how in turn they influence their fiscal policy, alongside oil rents, in their respective nations.

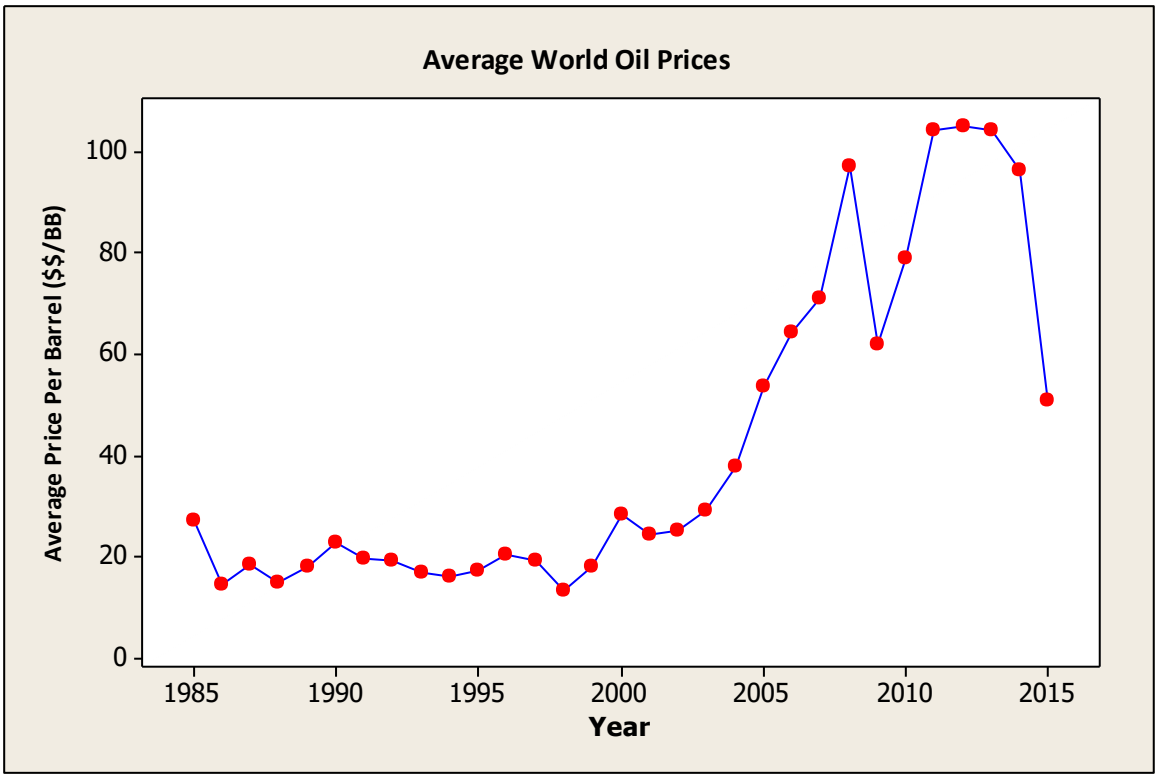
Figure 1. Panel of Oil Exporters Ranking Per Daily Exportable Barrels



Source: United States Central Intelligence Agency Factbook.

The timespan tested in this study is 26 years, spanning from 1990-2015. This selection proved to be the best time-span as there was ample information and data points for the sample panel of nations mentioned above. The time-span is also of great importance when it comes to the commodity markets, specifically oil, as it has played central stage to major political and financial events.

Figure 2. Average Nominal Prices of International Oil in US Dollar (1990-2015)



Source: World Bank Data.

Figure 2 shows a glimpse of oil market price volatility and the rise and fall of oil prices over the years and includes the time-span selected in this research paper's model. It shows the average world oil prices spanning from 1985-2015.

Model Specifications

The model, discussed in this paper, exploits the same control variables as Qu and Raei (2015) which consists of economic growth, economy size, population density, urbanization and openness. However, the estimated model is extended to include oil rents, as opposed to natural resource rents which is specified in the Qu and Raei (2015). Including those control variables in the analysis may provide ample insight into the importance of those characteristics and the interplay and influence they have on fiscal budget components of their host nations.

Most of the previously conducted studies in this field of study are similar to our estimated model in the sense that they incorporate specific factors identical to the ones included in our paper's estimated model. But no other study includes all the factors specified by Qu and Raei (2015) and our paper's estimated model. For example, Grier and Tullock (1989), Barro (1991),

Cashin (1995), and Devarjan et al. (1996) all test certain public budget expenditures against economic growth in the form of per capita GDP. Bose et al. (2007), on the other hand, incorporate different spending categories of expenditures as dependent variables and test them against a selection of control variables that include public budget components and country characteristics. A study by Ormachea, and Morozumi (2013) goes one step further and adds a compensating factor to capture the effects of the reallocation of government spending and its influence on GDP per capita growth.

The studies mentioned above are all conducted on either OECD nations, certain geographic regions or a comparative study between developing and developed nations. Studies that have included oil exporters, such as Nusair (2016), Moshiri and Banijashem (2012), Alkhathlan (2013), Emami and Adibpour (2012) and Mehrara (2008), on the other hand do not test similar country economic characteristics against public budget components. They merely focus on the pending economic growth following oil exportation and certain interplay of this oil led growth with the expenditure and revenue components of the public budget. They include oil prices as opposed to oil rents as a control variable and instead test the interaction between certain fiscal policy vehicles, in the form of public budget components, and oil price shocks to analyze how oil exporters responded fiscally after an oil market shock, and whether that shock stimulated or hindered growth afterwards.

Hence, none of models implemented before have taken the comprehensive approach executed by Qu and Raei (2015)- which this research paper emulates in the estimated model- and test all components of the fiscal budget, excluding taxation, against a certain set of controlled country characteristic variables.

Although this study emulates Qu and Raei (2015) in the sense that the same independent and dependent variable mix is included, the modelling techniques implemented differ. Fixed and random effects modelling approaches are utilized, as opposed to the sole pooled OLS approach applied by Qu and Raei (2015). Hubert White robust standard errors are selected to attain robust results.

The choice to add the fixed and random effects modeling techniques is because those panel modelling approaches allow for better analysis of the dataset. The fixed effects approach

unlike the pooled ordinary least squares approach is more accurate in the sense that it removes the "time-invariant" characteristics and considers the net effect of the dependent variables on the independent variable. Whilst the random effects model technique is an alternative approach used when the fixed effects approach is not applicable due to a situation in which the individual effects of each country in the sample appear to be correlated. Hence, a random effects model is the best method to use when there are exogenous factors that are present in the data sample and which ultimately affect the countries in the model being tested. In other words, the variation across countries is determined to be of a random nature and are not fixed.

In the process, this study discovers that the selected variables are not all stationary, and hence a procedure to correct for stationarity is utilized, after which the fixed and random effects model techniques are run again using Hubert White standard errors to achieve robust results.

Estimated Model:

The estimated models in this study aim to analyze the effect of certain country economic characteristics on government budget components and investigate how those economic characteristics essentially influence the sample of oil exporting nations' fiscal policy behavior and public budget structure. The six public budget components tested and estimated are total expenditure, compensation of employees (public sector), public consumption (use of goods and services), public investment (net gross investment in non-financial assets), transfers (subsidies), and total revenues. The data for the respective public budget variables are retrieved from the International Monetary Fund's "Government Finance Statistics" Database and quoted as a percentage of the respective country's gross domestic product.

The estimated models which closely follow the work of Qu and Raei (2015) are:

$$\text{Total Expenditure}_{it}=\beta_0+\beta_1\ \text{Log (GDP per capita)}_{it}+\beta_2\ \text{Log (GDP)}_{it}+\beta_3\ (\text{Dependency Ratio})_{it}+\beta_4\ (\text{Openness})_{it}+\beta_5\ (\text{Population density})_{it}+\beta_6\ (\text{Oil Rents})_{it}+\varepsilon_{it} \quad (1)$$

According to the estimated model (1), i =1-14 nations, and t=1990-2015 (26 years) are respectively country- and time-indicators. GDP per capita quoted in current US dollar price levels and is the gross domestic product divided by the population and estimated in log form and

in current US Dollars.[3] GDP is the gross domestic product in current US Dollars estimated in log form. Dependency ratio is the ratio of dependents in the economy, people younger than 15 and older than 64- divided on to the working age labor force, those between ages 15-64.[4] Trade openness is the sum of exports and imports of goods and services measured as a share of GDP. Population density is essentially a proxy for urbanization, this is the number of population per square kilometer of land area.[5] Oil Rents is essentially the revenue gained from oil production/exports, the difference between the value of the crude oil at world prices and the total cost of production. All independent control variables are retrieved from World Bank Database.

Estimated model (1) aims to evaluate the influence of the above mentioned independent country-specific economic variables and their influence on the oil exporting nations' total expenditures. Total expenditures are a crucial aspect of the public budget and a component which the government utilizes to control inflation and influence the economy's expansion and growth.

$$\text{Compensation Of Employees}_{it}=\beta_0+\beta_1\ \text{Log (GDP per capita)}_{it}+\beta_2\ \text{Log (GDP)}_{it}+\beta_3\ (\text{Dependency Ratio})_{it}+\beta_4\ (\text{Openness})_{it}+\beta_5\ (\text{Population density})_{it}+\beta_6\ (\text{Oil Rents})_{it}+\varepsilon_{it} \quad (2)$$

Estimated model (2) includes same specifications and independent variables as was designated in model (1). Estimated model (2) aims to evaluate the influence of those independent country specific economic characteristics on the compensation of public employees. As the public sector is a chief supplier of jobs, and one which is highly influenced by oil countries' economic situations and oil market volatility, one would expect this critical public budget component to be highly affected by those independent economic characteristics. Thus, estimated model (2) aims to investigate the effect of those independent and specific economic country characteristics on public wages in the selected panel of oil exporting countries.

[3] Estimated on midyear population.

[4] According to the World Bank MetaData, this ratio is shown as the proportion of dependents per 100 working-age population.

[5] It is calculated mid-year and counts all residents regardless if they are citizens or not; land area here according to the World Bank MetaData is the country's total area excluding bodies of water that are located inland (rivers, and lakes).

$$\text{Public Consumption}_{it}=\beta_0+\beta_1\ \text{Log (GDP per capita)}_{it}+\beta_2\ \text{Log (GDP)}_{it}+\beta_3\ \text{(Dependency Ratio)}_{it}+\beta_4\ \text{(Openness)}_{it}+\beta_5\ \text{(Population density)}_{it}+\beta_6\ \text{(Oil Rents)}_{it}+\varepsilon_{it} \quad (3)$$

Estimated model (3) follows the same specifications and independent variable mix as the previous models. In estimated model (3), the public consumption component of the public budget is tested. Public consumption, often seen as a welfare increasing aspect of the public budget, is the overall consumption of goods and services from the economy by the government. The government through this expenditure component of the public budget can increase demand locally, supply crucial inputs to production, and increase overall productivity. Estimated model (3) aims to evaluate the influence of those independent country specific economic characteristics on the public consumption component of the public budget.

$$\text{Public Investment}_{it}=\beta_0+\beta_1\ \text{Log (GDP per capita)}_{it}+\beta_2\ \text{Log (GDP)}_{it}+\beta_3\ \text{(Dependency Ratio)}_{it}+\beta_4\ \text{(Openness)}_{it}+\beta_5\ \text{(Population density)}_{it}+\beta_6\ \text{(Oil Rents)}_{it}+\varepsilon_{it} \quad (4)$$

In Estimated model (4), the public investment component of the public budget is examined against the same economic country characteristics specified in the previous models. Public investment, often deemed a progressive and growth enhancing component of the fiscal budget, is essentially funds the government allocates towards capital investment in the economy. Examples of public investment spending are infrastructure projects by the government.

$$\text{Public Transfers}_{it}=\beta_0+\beta_1\ \text{Log (GDP per capita)}_{it}+\beta_2\ \text{Log (GDP)}_{it}+\beta_3\ \text{(Dependency Ratio)}_{it}+\beta_4\ \text{(Openness)}_{it}+\beta_5\ \text{(Population density)}_{it}+\beta_6\ \text{(Oil Rents)}_{it}+\varepsilon_{it} \quad (5)$$

Estimated model (5) follows the same structure and specifications of the previous models but instead tests public transfers against the independent variable mix of country-specific economic characteristics. Public transfers, viewed to be welfare enhancing but inhibiting of economic growth, are essentially transfers made in cash or kind to the economy by the government. Examples are subsidies to producers, subsidies to consumers, or cash handouts to citizens. This component is highly influenced by the country economic characteristics and oil market volatility that oil exporting countries face.

$$\text{Total Revenue}_{it} = \beta_0 + \beta_1 \text{ Log (GDP per capita)}_{it} + \beta_2 \text{ Log (GDP)}_{it} + \beta_3 \text{ (Dependency Ratio)}_{it} + \beta_4 \text{ (Openness)}_{it} + \beta_5 \text{ (Population density)}_{it} + \beta_6 \text{ (Oil Rents)}_{it} + \varepsilon_{it} \quad (6)$$

Total revenue is analyzed in estimated model (6), which again follows the above models in specification and independent variable mix. As the main source of income for most of the oil exporting countries is essentially oil rents, it's interesting to see if oil rents do in fact affect total revenue and what other of the earlier mentioned independent economic characteristics affect the total revenue component.

Model Modifications:

Since our sample panel is oil exporters, in this study the variable 'natural resources rents' that was included in Qu and Raei (2015)'s control variable mix is exchanged to 'oil rents.' This amendment is done to better reflect oil exporters' dependence on oil as an export and revenue sector.

Our model also omits an important component in the public budget component: taxation. Consumption taxes, personal income tax, and corporate income taxes are all excluded; all of which were included as dependent variables in Qu and Raei (2015)'s model. This is because some of the oil exporters included in the sample panel do not actually have similar comparable tax systems or the fact that there is no sufficient available data; for example, Kuwait, a major oil exporter, in our panel does not have personal income or consumption taxes.

This decision to omit taxation is supported by the findings of Qu and Raei (2015) for resource rich nations in their panel. They found that when compared to other nations in their sample, resource rich nations had different budget structures and essentially collected less revenue from personal income, and consumption tax. However, they collected more profit from corporate taxes and more specifically from those corporations working in the natural resource sector. Also, since this research paper is based on the resource curse and the risk associated with the dependence on one resource- oil- taxation is omitted from the picture as it is, economically speaking, a major revenue stream and base which influences government fiscal policy. Hence, omitting taxation from the model might not be short sighted, and will allow for a clearer

visualization of the relationship of oil rents and their interplay and pending effects on the public budget.

Finally, the estimated model in this study also differs than the model implemented by Qu and Raei (2015), in the sense that ours is a panel time-series model spanning 26 years and is tested using a fixed and random effects modeling technique as mentioned earlier. Whilst the latter model is only a cross-sectional comparison of two years, pre- and post the financial crisis of 2008 tested through a pooled OLS approach.

Why utilize a panel data modeling? According to Afonso and Jalles (2001), two main advantages of panel data modeling and integration-which make it more powerful than normal time-series- are that it reduces the "probability of spurious regression," and enables researchers to avoid complications and errors related to time series methods especially those with short time-spans as ours.

Naturally as is the norm in panel data modeling, utilizing fixed and random effects techniques help better analyze the data. The fixed effects approach has the ability to take into account country-specific characteristics; unlike the pooled OLS method which "may bias the country estimates" (Devarajan et al., 1996). Fixed effects modeling removes "time-invariant" characteristics unique to the countries in the sample and analyzes the net effect of the dependent variables on the independent variable; hence it determines the cause of change within a country (Torres-Reyna, 2007). Thus, the individual effects of each country in the sample should not be correlated to others in the sample.

If the individual effects of each country are in fact correlated, a Fixed effects approach is no longer suitable, and therefore a Random effects approach would be more adequate. The Random effects approach, unlike Fixed effects, focuses on and analyzes the undetermined exogenous factors that are present in the data sample and which ultimately affect t the countries in the model being tested. Thus, this variation across countries is determined to be of a random nature and is not absorbed by the intercept as is the case with the fixed effects modelling technique (Torres-Reyna, 2007).

Unit Root Testing

Prior to applying the fixed and random effects modeling techniques, a test for unit roots is utilized to find out whether the model variables are stationary, in the sense that they do not contain any unit roots. Since the dataset used in this panel is unbalanced, then the most efficient unit root test to employ is the Fisher-type tests based on the augmented Dicky-Fuller tests. It is suggested by Choi (2001), that the inverse normal Z statistic is the best test to utilize as it "offers the best trade-off between size and power." The null hypothesis assumes that a unit root is present, and hence the judgment will be based on a p-value of 5% (StataCorp, 2017). Preliminary testing yields results that indicate that many variables in the model are non-stationary.

To have a robust model, there is a need to alleviate the issue of non-stationary variables and correct to achieve stationarity. As is emphasized by Nelson and Plosser (1982), to correct for non-stationarity in macroeconomic variables, one needs to transform the non-stationary variables to their first difference as they are more likely to be stationary at this order. Following those steps, the unit root test is run again, findings indicate that those variables eventually become stationary at their first difference

This paper emulates the actions of Haque (2003), whom applies this same process of controlling for non-stationarity to data whilst he was re-evaluating the models of Deverajan et. Al (1996) and Gupta, et. Al. (2002); whom both do not consider the issue of non-stationarity in their models. Prior to controlling for stationarity, the model by Haque (2003) yielded unusual results, but after transformation to the first difference, his results supported conventional wisdom. Hence, to have robust results one needs to ensure that the variables are stationary. This research paper's variables are all converted to their first difference form prior to applying the fixed and random effects modelling techniques.

Hausman Test

The decision to use either fixed or random effects technique is ultimately dependent on the Hausman test, which compares both fixed and random effects models of the data at hand and deduces the best option to use. Basically, the Hausman specification test is run after both random and fixed effects approaches are modeled on the data on hand and stored. The Hausman test is then is applied to compare both models. The tests' null hypothesis states that "individual effects

are uncorrelated with other regressors," if this is rejected than a random model is applicable; and vice versa (Park, 2011). Hence, any probability ratio below 0.05% is indicative that a a fixed effects model is suitable, and anything above the 0.05% level is indicative of the need to utilize a random effects model.

Sometimes the Hausman diagnostic test comes across results that fail to meet asymptotic assumptions or are not positive definite. To remedy this error, the Hausman test add-on options of Sigmamore and Sigmaless Hausman tests have been utilized and applied. Those two options remedy the test and give more adequate results. They both "specify the two covariance matrices that are used in the test to be based on a common estimate of disturbance variance (σ^2)," and are recommended when one encounters the "non-positive-definite-difference covariance matrix (StataCorp, 2017)."

Based on the results of both the Sigmamore and Sigmaless Hausman tests, the adequate model is then applied, either fixed or random effects model, with the robust standard errors specification. The Robust Standard Errors specification, otherwise known as Hubert/White estimators, alleviates heteroskedasticity, serial correlation and normality issues within the sample data panel and hence gives robust results (Williams, 2015).

Breush-Pagan Lagrange Multiplier (LM) test

Should the Hausman test specify a random effects model as the best approach, this paper goes further and utilizes the Breusch-Pagan Lagrange Multiplier (LM) test. This LM test is run on random effect models and allows one to compare which model is a better fit for the panel- a random effects model or a simple OLS regression. The LM test measures the variances across the entities in the panel to find a "panel effect;" if the variances are zero this means there is "no significant difference across units" in other words there is no panel effect, and hence a Pooled OLS model is the best fit. If there is a panel effect, then the random effects model is essentially the best fit (Torres-Reyna, 2007).

Empirical Results: Determinants of Oil Exporter Public Budgets

Table 1, in the Appendix, reveals the summary statistics for the dataset tested in the model. Note that all variables in the model are transformed to their first difference to ensure stationarity.

Unit Root Test Results are shown in Table 2, in the Appendix. As noted earlier since the data sample has gaps, the most efficient unit root test to employ is the Fisher-type test based on the augmented Dicky-Fuller test. The inverse normal Z statistic test is specified to find whether the variable has a unit root, ultimately making it non-stationary, or does not include a unit root hence is stationary. The test results indicate that many variables in the model are non-stationary at first but become stationary at their first difference. Hence the need to convert all variables to their first difference before applying pooled OLS, or fixed/random effects modeling techniques.

As discussed earlier, this paper utilizes panel modelling techniques and incorporates the fixed and random effects approach to further analyze the determinants of oil exporters public budgets. The effects of the estimated coefficients, which are the country specific economic variables, and their effects on the selected public budget components of the panel of oil exporting countries are shown in Table 3 below. As different modeling approaches were used- fixed and random effects models- the table designated what kind of approach was utilized and the results thereafter. Results of the total expenditure fixed effects model are omitted due to the lack of significance found between the estimated coefficients and the public budget component.

For starters, for the total expenditure model, estimated model (1) in Table 3, the Hausman test showed no positive definite result, hence the need to utilize the Sigmamore and Sigmaless Hausman tests. Both test results, showcased in Table 4 in the appendix, pointed towards a fixed effects model. The total expenditure fixed effects model's results showed no statistically significant relationships between the estimated coefficient of total expenditures and the control variables.

Second, as for the compensation of public employees, estimated model (2) in Table 3, the Hausman test showcased in Table 5 in the appendix, found that the fixed effects approach was the most suitable approach. Compensation of public employees is statistically significant at the 1% significance level to both population density and oil rents. The relationship is positively

Table 3. Main Findings:

	Government Budget Structure and Country Characteristics					
Model:	(1) Fixed	(2) Fixed	(3) Fixed	(4) Random	(5) Random	(6) Fixed
	Total Expenditure	Compensation of Employees	Public Consumption	Public Investment	Transfers	Total Revenue
GDP Per Capita (Log)	540.9565 (526.0599)	-39.9616 (31.55224)	-52.1635*** (14.47451)	3.849483 (16.29754)	-27.75727*** (6.668582)	-306.4712 (238.3276)
LOG GDP	-552.4656 (522.9509)	37.48785 (31.72191)	50.00683*** (13.26417)	-1.941975 (16.67843)	27.15014*** (6.421895)	312.63 (237.3206)
Dependency Ratio	-1.47715 (1.418391)	0.129276 (0.1508216)	0.2019711* (0.0944345)	-0.0062363 (0.1223534)	0.0087871 (0.0283963)	0.6230253 (0.451225)
Openness	0.6412414 (0.4256155)	-0.0243468 (0.0171409)	-0.0207286 (0.0431082)	0.0617148 (0.0818106)	0.0204434* (0.0110497)	-0.1418554 (0.1148793)
Population Density	-1.756109 (1.694824)	0.2289007*** (0.0675755)	0.2053507*** (0.0605769)	0.0467157** (0.0230246)	-0.0385478** (0.015351)	-0.0186455 (0.6790305)
Oil Rents	-0.626272 (0.3688278)	-0.046457*** (0.0103118)	0.0319926* (0.0164053)	-0.0265101 (0.0505501)	0.0348677*** (0.0091402)	0.506582*** (0.1077694)
Constant	5.112757*** (0.9522441)	-0.3244683 (0.1303193)	-0.4358387 (0.0769948)	-0.1352014 (0.1450198)	-0.0734331 (0.0392886)	-1.664633 (0.7432721)
Observations	272	270	272	272	272	272
R-Squared	0.2225	0.1573	0.0300	0.0257	0.0844	0.2964

Notes: The table reports the robust standard errors (White test) in parentheses. *Significant at 10 percent; ** Significant at 5 percent; *** Significant at 1 percent.

correlated for population density which is attributed to the rising costs of living that accompany higher urbanization; with higher urbanization, more people are constrained in central locations, hence the salaries are reflective of those high costs of living endured by people that are now living in the cities and more urban areas. On the other hand, public compensation of employees is negatively correlated to oil rents which seems to be an indicative of counter-cyclical public spending stance taken by nations in the sample; as oil prices fall they spend more (with public wages, being a key expenditure category); and vice versa.

As for the public consumption estimated model, exhibited in table 3 as model (3), The Hausman test results, which can be found in Table 6 in the appendix, find that the fixed effects approach is the most suitable. Public consumption was found to be negatively statistically

significant to GDP per capita at the 1% significance level; this relationship highlights a distortionary effect of increased welfare spending on economic growth. This result runs parallel to findings by Grier and Tullock (1989), Barro (1991), Landau (1983), and Rodrik (1997) all of whom corroborate that government consumption is a non-productive expenditure component that is merely welfare-promoting and has no positive effect on growth. It has a distortionary affect due to the need to finance this consumption expenditure through a tax burden, which in its true sense diverts key funds from savings to the government's pockets thereby hindering growth.

Both the estimated coefficients of Log GDP and oil rents display positive correlations to public consumption. Oil rents are statistically significant and positively related to public consumption at the 10% significance level. This makes economic sense as oil rents are a key source of income to the government and thus finance public consumption expenditure. As mentioned earlier, this is the strategy that welfare states have taken with their oil revenues and 'spreading the wealth' thereby creating 'income equality' and increasing social welfare in their populations. They have been able to increase expenditure on government goods and services in the face of rising oil prices and rents, thereby boosting the private sector with lucrative contracts; which in turn boosted overall productivity and lead to overall development. This is further supported by the positive and significant relationship found between the size of the economy and public consumption (at the 1% level); as public consumption of goods and services increase, the size of the economy increases as the government pumps in money and increases overall demand in the economy.

The estimated coefficients of dependency and population density, two key demographic variables, displayed positive and statistically significant relationships with public consumption. The first at the 10% significance level, and the latter at the 1% significance level. The higher the number of dependents, the higher the expenditure on consumption and thus services by the government; it's a welfare increasing component of the public budget so economically this relationship is expected. Also, the more urban a nation is, in other words the more people are constrained in cities, the more it spends on public consumption and services. Economically this is viable, but opposes the results found by Qu and Raei (2015) which they deem is because higher urbanization helps improve the effectiveness of the public sector and make the government more efficient in its operations. Hence this result can be driven by data from the

developing oil exporter nations in our sample, who are not as urban or developed as the sample of Central and Eastern European Nations that Qu and Raei (2015) tested. Hence, this result of higher spending on consumption when there is more urbanization.

Both of the public investment model (4) and public transfer model (5) in Table 3 favored a random effects modelling approach. The results of the respective Hausman test results can be found in Table 7, and Table 8 in the appendix. Due to their random effects modeling approach, a further LM test is applied to check the adequacy of the random effects model for those public budget components. Results of the LM test, found in Tables 10 and 11 in the appendix, confirm the adequacy of the random effects modelling approach when testing both the public transfers and investment regression.

The results of the public investment estimated model, showcased under model (4) in table 3, showed a positively statistically significant relationship at the 5% significance level to population density. This significant and positive relationship opposes results by Qu and Raei (2015) in which they find that higher urbanization makes governments more efficient in their operations and actions, hence the higher the urbanization the less likely the government has to invest in infrastructure and other expenses in more rural areas; because people already live in cities, and in modern dwellings as opposed to far flung locations. In our case, population density makes the government spend more and invest more, which as mentioned earlier might be driven by data from developing countries in the data sample. This higher investment spending might be a bid by those nations to be more urban and develop their cities and infrastructure further as their populations become more urban.

Whilst the public transfers estimated model's results, which can be found under model (5) in table 3, demonstrated several significant correlations. The public transfers component of the public budget of those oil exporting countries was found to be negatively correlated to GDP per capita, the correlation was statistically significant at the 1% significance level. This runs contradictory to Wagner's Law, but recalls the economic debate of productive vs. unproductive government spending; in which transfers are classified as unproductive components of the public budget that are merely welfare enhancing and not fruitful. This result, on the other hand, runs

parallel to the results of Afonso and Jalles (2001); in their model they test government expenditures in the form of consumption, transfers and subsidies against growth and find that size of government has a negative effect on growth. They explain that unnecessary government intervention leads to ineffective allocation of resources, in this case as transfers and subsidies, that merely distribute the wealth and do not help achieve productivity or growth. Slemrod (1995) and Tanzi and Zee (1997) believe that this excess intervention is fruitless, and instead governments should route those resources towards private sector productivity.

On the other hand, both the size of the economy and oil rents showed a statistically significant and positive relationship to public transfers at the 1% significance level. Although public transfers were negatively correlated to economic growth, it did increase the size of the economy; as transfers from the government include subsidies that can be directed to producers, which thereby make them more competitive and decrease their production costs. Essentially, this props up productivity and encourages more industrialization thereby opening key export markets. This result corroborates with the results of Qu and Raei (2015) in their model.

Also, when it comes to oil rents, the higher the oil rents, the more disposable income is routed towards transfers and spreading the wealth. This makes total economic sense as those nations spread the wealth through transfers and subsidies from this profitable resource sector and income stream.

Openness also was statistically significantly and positively correlated to public transfers, but at the 10% significance level, further proving that increased trade activity makes the government increase its social insurance spending in the form of transfers and subsidies to insulate its local economy from the negative externalities of globalization. This social protection spending cushions the local economy from risks and make it more able to compete internationally. This result conforms Rodrik (1996)'s results.

On the other hand, population density showed a negative and statistically significant effect on public transfers at the 5% significance level; higher urbanization allows for higher optimization and efficiency of public transfers; hence governments spend less. This is an indication that the government becomes more efficient in its spending which is consistent with findings of Qu and Raei (2015).

Finally, the total revenue estimated model's findings, exhibited under model (6) in table 3 showed that a fixed effects model approach was more adequate. The Hausman test results which can be found in Table 9, in the appendix, shows the Hausman test results for total revenue was not positive definite; hence the need to utilize a Hausman Sigmamore and Sigmaless tests. Both tests pointed towards fixed effects model to be more applicable.

The total revenue estimated model yielded only one statistically significant relationship. Total revenue was found to be positively statistically significant to oil rents at the 1% significance level, which again can be attributed to the fact that oil rents are a major income stream of all nations in the sample, many of which depend solely on oil as a source of revenue.

Conclusion

Oil revenue is a double edge sword. Oil exporter nations, although endowed by oil which brings in great gains, like other resource-rich nations around the world have been performing worse than non-resource abundant nations. This is due to all the negative externalities that come with these lucrative resources, and which seem to be hindering growth and overall development thus capping those nations from reaching their full potential.

Nations must avoid going through "Petromania," fueled by this excess influx of disposable cash that can allow nations to take a "live beyond their means" approach to fiscal policy. To combat that, oil exporters have to implement transparent and accountable political processes and intuitions as well as a long run economic plan of action to whether the risks and uncertainty in the oil markets; be it price or demand shocks. Oil exporters should ensure social consensus and unanimous support towards steering those rents away from corrupt pockets and towards development plans that benefit all. They must instigate austerity measures to ensure that those ambitious plans are achievable, and that any extra disposable income can be profited from and used in the future by either saving or investing those extra foreign reserves to achieve extra fiscal space in the future and have pockets of funding to tap into when needed. Oil exporter nations that fail to take pre-cautionary measures end up stricken with the "Dutch Disease" and find themselves spiraling into decline.

As this paper's main objective is to analyze the determinants of the public fiscal budget of a panel of fourteen top oil exporting countries, fixed and random effects modelling is

implemented on a dataset that spans a sixteen-year time period from 1990-2015. The estimated model's findings allow for an evaluation and close analysis of the influence and effect of certain economic country characteristics on the fiscal policies and public budget structure of this selected oil exporting countries panel.

It's worthy to mention that not all expenditures by the government is growth-enhancing, our model results signal that expenditure in the form of public consumption and public transfers is negatively correlated to economic growth. Yes, this form of spending had a significant positive effect on the size of the economy and pushed consumption and thus overall demand up, but ultimately it reined in overall economic growth. This is due to the distortionary effect that those fiscal components put on the economy, as they need to be financed, and financing of those fiscal policies is done through increasing taxation, or oil rents. This creates an opportunity cost, in which the government increases taxation, thereby decreasing savings and thereby investment in the private sector-which is a focal source of productivity and growth of the economy. The government also encounters another opportunity cost when it uses the oil rents and foregoes the benefits and opportunities associated with investing this oil rent in more productive and profitable ventures and instead uses it to fund the public budget.

Demographics wise, population density and the dependency rate interplayed with fiscal policy components thus emphasizing the role of citizens' demands and its effect on a nation's fiscal budget. The rate of urbanization in a nation- population density- registered a positive and significant correlation with public compensation of employees, and consumption; indicating that the more centralized and developed a nation's urban dwellings are, the more demand there is for public sector jobs, and consumption in the form of services by the government be it free schooling, free health services, etc. This can be due to higher costs of living in those more urban areas, and the collective bargaining of those centralized populations who can better sound and mobilize their demands for more services and welfare increasing inputs by the government.

As for the dependency rate, it showed a significant and positive effect on public transfers; essentially a welfare enhancing component. The government utilizes transfers expenditures to increase the wellbeing of its citizens and help alleviate some of the high costs of living be it through subsidizes or in-cash payments. Thus, the number of dependents in the society which are

classified as people under the age of 15, and over the retirement age of 64 has a great influence on government transfers. As this population segment is out of the labor force hence ultimately not active participants anymore in the labor and productivity equations, they are a burden on the government. In context, the higher the dependency ratio, the higher the government spending on transfers to help this segment of society; which is exactly what our model results displayed.

Openness, or in other words terms of trade, recorded a positive and significant correlation with public transfers as well. The more a nation is engaged in international trade, the more it is open and thus globalized. Globalization is again a double edge sword; it can benefit citizens but can also wreak havoc to local industry that can either succeed in exporting its products abroad or die under the toll of cheaper imports of the same products. Hence, this is where the government enters the equation, through transfers and essentially subsidies to producers through cheaper energy prices, or production inputs can help balance out the equation and enable this industrial sector to be able to better compete. This is social insurance spending by the government at it's finest.

Finally, as far as oil rents are concerned. Our model results yielded startling results oil rents were found to be negatively associated with total expenditures, public investment, and compensation of employees; although only public wages showed a significant relationship. This is a clear indication that governments of those panel of oil exporters engaged in counter-cyclical fiscal policy schemes in which they spend more when oil prices were down and vice versa. This can either indicative of maladministration of the government budget in which those nations are spending beyond their means and either taking their public budgets into a deficit, or on a positive thought are tapping into extra stashes of foreign currency or their oil fund revenues- as mentioned earlier- to cover this extra expenditure.

Oil rents however showed a positive effect on total revenue, public transfers and public consumption; all of which displayed robustly significant correlations. This further supports the fact that all those nations are dependent on oil as a revenue stream to fund their public budgets and sustain their fiscal policy actions. Hence, when oil rents are high, because oil prices are higher, or demand has increased, those oil exporter nations' total revenue increases; which thereby increases their ability to spend and thus their expenditures on transfers and public consumption services to their citizens. In other words, only when oil rents are high will those

nations pay out those services and transfers to their citizens; this spending pattern resembles the consumer spending on luxury items, in which they spend on those unnecessary add-ons when they have extra disposable income. This is not the case with other components of the public budget mentioned above, total expenditures, public investment and compensation of employees, which are resemble necessity spending. They are part of the government's obligations towards their citizens and thus governments must spend on those budget components regardless of oil prices; be they lower than usual and cause the nation to go into a deficit, or at the equilibrium point and balanced with the budget, or high enough to instigate a surplus.

Policy Implications

All in all, oil revenue is a double edge sword that is dependent on the political processes of the nation and its ability to manage this revenue in a long run economic and social path that is supported by all. They can be a positive influence and provide the nation with exports, and savings that allow for fiscal flexibility. Or they can have a negative effect and be destructive to the quality of the institutions, citizens' incentives, and the fiscal policy spending; thus, paving the path for economic decline and "Dutch Disease."

To conclude, the estimated model in this research paper, advises that governments should strive to limit the effects of the 'resource curse' and overdependence on oil by diversifying their nation's export basket of goods, investing in other sectors and implementing strategies to transform those non-profitable sectors to income streams. Governments should also work on making their budgets less opaque. They must educate their populations and have them on board when it comes to fiscal consolidation strategies as well as develop their local institutions.

Consumption spending should be focused on capitalizing on educational objectives and skillsets that are in demand globally such as science and technology. They should also invest in research and development and upgrade existing infrastructure to push their economies to compete internationally and position themselves to be an attractive destination for foreign direct investment and multinationals.

Governments should also set a strategic vision and plan towards increasing fiscal stability in the face of the risky oil market prices and demand by implementing strategies that insulate the economy from oil market variations such as oil price hedging, oil funds, and investing any extra revenue from oil income abroad in Sovereign Wealth Funds. A plus would be making citizens a part of the budget process by increasing transparency, ensuring there is absolutely no tolerance for corruption or rent-seeking, and making citizens stakeholders in the resource by instating a dividend program such as Alaska's oil fund to wipe out any entitlement demands or demands for excess government transfers and subsidies.

Governments should cooperate with the local labor force and unions to keep price levels and wage inflation in check and have them accept modest wage increases in return as a strategy for the greater good. Not only will this make the economy more competitive and thus boost local productivity and industrial sectors, it will also help combat externalities associated with the "resource curse" that exports oil and imports inflation in the form of weaker terms of trade, and thus stagflation. They should also support the local economy, labor unions, dependents and working labor force alike by investing in pro-welfare increasing strategies such as transfers and subsidies, alongside consumption services that can increase the development, welfare and skillset of their populations and overall advancement without making spending promises that are not sustainable in the future as oil prices fall, or which give birth to entitlements.

Strategies such as investing in the private sector and extending subsidies aimed to encourage more production, to diversify the exports base, create more job opportunities and achieve higher economic growth should be favored. As well as investing in more urbanization strategies to achieve a higher population density, and have people live in cities or centralized settlements to cut overall government consumption costs, increase government efficiency in spending and thus develop local infrastructure.

Governments should start cutting back on inefficient spending that has to be funded by increasing taxation, and thereby shaving off disposable income and lowering the savings and spending that citizens diverted towards the private sector be it to consume or to invest and eventually cutting the private sectors' credit lifeline and shrinking the economy through a distortionary effect. Whilst also developing local institutions, remolding local ethics and

incentives, and ensuring that everyone is on point and onboard the fiscal consolidation process, and strategy aimed to divert away from overdependence on oil and venture on a new path that develops new diversified and profitable export sectors, and pushes local the economy towards a sustainable growth path thereby adding on several new revenue sources to the public budget.

Finally, a solid vision should be adopted to ensure that the government budget run parallel to current oil prices, and thus be pro-cyclical and budget with a lower than expected oil price target annually to eventually have fiscal space and spend within budget as opposed to tapping into external financing schemes and, hence encountering a fiscal deficit.

Appendix

Table 1. Summary Statistics

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
Total Expenditures	279	0.0631542	12.95897	-124.83	158.57
Compensation of Employees	277	0.0351625	0.9039465	-5.18	4.3
Public Investment	279	-0.0134409	2.306428	-16.2	13.31
Public Consumption	279	-0.0629391	1.465218	-9.43	10.87
Public Transfers	260	0.0341154	0.889326	-3.65	5.09
Total Revenue	279	0.0348029	5.182034	-50.12	25.81
Growth (Log GDP per Capita)	343	0.0182981	0.0712312	-0.3429891	0.3263879
Log GDP: Economy Size	347	0.0261186	0.0721479	-0.3287764	0.3379774
Dependency Ratio	346	-0.6363064	1.101828	-4.328999	1.16983
Openness	348	0.3824899	10.77341	-47.9249	92.30769
Population Density	346	1.111296	1.924111	-3.588882	11.47615
Oil Rents	346	-0.3229209	5.860266	-29.94295	26.78321

Table 2. Fisher-Type Unit Root Test Results (based on the Augmented Dicky-Fuller)

Variables	Inverse Normal (Z) Statistic	P-Value	Stationary at which level.
Total Expenditure	-3.8524	0.0001	I (0)
Public Compensation of Employees	-11.6250	0.0000	I (1)
Public Consumption	-2.0998	0.0179	I (0)
Public Investment	-5.2853	0.0000	I (0)
Transfers	-14.2352	0.0000	I (1)
Total Revenue	-13.4338	0.0000	I (1)
GDP Per Capita	-8.7392	0.0000	I (1)

LOG GDP	-9.7235	0.0000	I (1)
Dependency Ratio	-4.2202	0.0000	I (0)
Openness	-2.6224	0.0044	I (0)
Population Density	-7.7815	0.0000	I (0)
Oil Rents	-5.2579	0.0000	I (0)

Table 4. Hausman Test Results for Total Expenditure

Dependent variable: Total Expenditure	Fixed effect	Random effect	Difference
Log GDP per capita	540.9565	249.2092	291.7473
Log GDP	-552.4656	-248.6065	-303.8591
Dependency Ratio	-1.47715	-0.8433021	-0.6338483
Openness	0.6412414	0.7212429	-0.0800014
Population Density	-1.756109	0.0596233	-1.815733
Oil Rents	-0.626272	-0.8467395	0.2204675
Chi^2 (6)	74.10		
Prob> Chi^2	0.0000 (not positive definite)		
	Hausman Sigmamore	Hausman Sigmaless	
Chi^2 (6)	52.62	63.76	
Prob> Chi^2	0.0000	0.0000	

Table 5. Hausman Test Results for Compensation of Employees

Dependent variable: Compensation of Employees	Fixed effect	Random effect	Difference
Log GDP per capita	-39.9616	-35.3584	-4.603056
Log GDP	37.46785	32.10084	5.367006

Dependency Ratio	0.129276	0.0834872	0.0457888
Openness	-0.0243468	-0.0366753	0.0123285
Population Density	0.2289007	0.0029375	0.2259632
Oil Rents	-0.046457	-0.0293129	-0.0171441
Chi² (6)	59.50		
Prob> Chi²	0.0000 (not positive definite)		

	Hausman Sigmamore	Hausman Sigmaless
Chi² (6)	44.66	51.67
Prob> Chi²	0.0000	0.0000

Table 6. Hausman Test Results for Public Consumption

Dependent variable: Public Consumption	Fixed effect	Random effect	Difference
Log GDP per capita	-52.1635	-30.01501	-22.14849
Log GDP	50.00683	26.80953	23.1973
Dependency Ratio	0.2019711	0.0783205	0.1236507
Openness	-0.0207286	-0.0323417	0.0166132
Population Density	0.2053507	-0.0067887	0.2121394
Oil Rents	0.0319926	0.0543353	-0.0223427
Chi² (6)	28.94		
Prob> Chi²	0.0001		

	Hausman Sigmamore	Hausman Sigmaless
Chi² (6)	25.78	27.53
Prob> Chi²	0.0000	0.0000

Table 7. Hausman test results for public investment

Dependent variable:	Fixed effect	Random effect	Difference

Public Investment			
Log GDP per capita	9.554143	3.849483	5.70466
Log GDP	-6.694684	-1.941975	-4.752709
Dependency Ratio	0.0812825	-0.0062363	0.0875188
Openness	0.0696779	0.0617148	0.0079631
Population Density	0.2705344	0.0467157	0.2238187
Oil Rents	-0.0448443	-0.0265101	-0.0183342
Chi^2 (6)	4.39		
Prob> Chi^2	0.6246		

Table 8. Hausman Test Results for Public Transfers

Dependent variable: Public Transfers	Fixed effect	Random effect	Difference
Log GDP per capita	-38.6895	-27.75727	-10.93224
Log GDP	37.76678	27.15014	10.61663
Dependency Ratio	-0.0421105	0.0087871	-0.0508976
Openness	0.0233616	0.0204434	0.0029182
Population Density	-0.0328352	-0.0385478	0.0057126
Oil Rents	0.0350993	0.0002315	0.0002315
Chi^2 (6)	2.54		
Prob> Chi^2	0.8636		

Table 9. Hausman Test Results for Total Revenue:

Dependent variable: Total Revenue	Fixed effect	Random effect	Difference
Log GDP per capita	-306.4712	-114.8161	-191.6551

Log GDP	312.63	116.7463	195.8837
Dependency Ratio	0.6230253	0.2195058	0.4035195
Openness	-0.1418554	-0.1442239	0.0023685
Population Density	-0.0186455	-0.166889	0.1482435
Oil Rents	0.506582	0.5736002	-0.0670183
Chi^2 (6)	28.78		
Prob> Chi^2	0.0001 (not positive definite)		

	Hausman Sigmamore	Hausman Sigmaless
Chi^2 (6)	25.39	26.87
Prob> Chi^2	0.0000	0.0000

Table 10. LM Test Results for Public Investment

Estimated Results:	Var	Sd=sqrt(Var)
Investment	5.368853	2.317079
E	5.514988	2.348401
U	0	0
Test: Var(u) = 0		
Chi^2 (01)	0.00	
Prob>chi^2	1.00	

Table 11. LM Test Results for Public Transfers

Estimated Results:	Var	Sd=sqrt(Var)
Transfers	.7727517	.879063
E	.752936	.8677188
U	0	0
Test: Var(u) = 0		
Chi^2 (01)	0.00	
Prob>chi^2	1.00	

References

Afonso, A., & Jalles, J. T. (2011). Economic performance and government size.

Alesina, A., & Perotti, R. (1994). *The political economy of budget deficits* (No. w4637). National Bureau of Economic Research.

Ali, I., & Harvie, C. (2013). Oil and economic development: Libya in the post-Gaddafi era. Economic Modelling, 32, 273-285.

Alkhathlan, K. A. (2013). Contribution of oil in economic growth of Saudi Arabia. *Applied Economics Letters*, *20*(4), 343-348.

Apergis, N., & Payne, J. E. (2014). The oil curse, institutional quality, and growth in MENA countries: Evidence from time-varying cointegration. *Energy Economics*, *46*, 1-9.

Arrow, K. J., & Kurz, M. (1970). Public investment, the rate of return, and optimal fiscal policy (Johns Hopkins, Baltimore, MD).

Aschauer, D. A. (1989). Is public expenditure productive?. *Journal of monetary economics*, *23*(2), 177-200.

Barro, R. J. (1991). Economic growth in a cross section of countries. *The quarterly journal of economics*, *106*(2), 407-443.

Bjorvatn, K., Farzanegan, M. R., & Schneider, F. (2012). Resource curse and power balance: Evidence from oil-rich countries. *World Development*, *40*(7), 1308-1316.

Bose, N., Haque, M. E., & Osborn, D. R. (2007). Public Expenditure and Economic growth: A disaggregated analysis for developing countries*. *The Manchester School*, *75*(5), 533-556.

Cashin, P. (1995). Government spending, taxes, and economic growth. *Staff Papers-International Monetary Fund*, 237-269.

Central, Eastern and Southeastern Europe: Regional Economic Issues; November 2015. (n.d.). Retrieved April 17, 2016, from http://www.imf.org/external/pubs/ft/reo/2015/eur/eng/erei1115.htm

Choi, I. (2001). Unit root tests for panel data. *Journal of international money and Finance*, *20*(2), 249-272.

Coutinho, L. (2011). The resource curse and fiscal policy. *Cyprus Economic Policy Review*, *5*(1), 43-70.

Devarajan, S., Swaroop, V., & Zou, H. F. (1996). The composition of public expenditure and economic growth. *Journal of monetary economics*, *37*(2), 313-344.

Easterly, W., & Rebelo, S. (1993). Fiscal policy and economic growth. *Journal of monetary economics*, *32*(3), 417-458.

Emami, K., & Adibpour, M. (2012). Oil income shocks and economic growth in Iran. *Economic Modelling*, *29*(5), 1774-1779.

Fasano, U. (2000). Review of the experience with oil stabilization and savings funds in selected countries.

Fattouh, Bassam, and Laura El-Katiri. "Energy subsidies in the Middle East and North Africa." *Energy Strategy Reviews* 2.1 (2013): 108-115.

Fetahi-Vehapi, M., Sadiku, L., & Petkovski, M. (2015). Empirical Analysis of the Effects of Trade Openness on Economic Growth: An Evidence for South East European Countries. *Procedia Economics and Finance*, *19*, 17-26.

Gelb, A., Eifert, B., & Tallroth, N. B. (2002). The political economy of fiscal policy and economic management in oil-exporting countries.

Ghali, K. H. (1997). Government spending and economic growth in Saudi Arabia. *Journal of Economic Development*, *22*(2), 165-172.

Gylfason, T. (2001). Natural resources, education, and economic development. *European economic review*, *45*(4-6), 847-859.

Grier, K. B., & Tullock, G. (1989). An empirical analysis of cross-national economic growth, 1951–1980. *Journal of monetary economics*, *24*(2), 259-276.

Grossman, P. J. (1990). Government and growth: cross-sectional evidence. Public Choice, 65(3), 217-227.

Irwin, A. Douglas and Tervio, M., (2002), "Does Trade Raise Income? Evidence from the Twentieth Century", Journal of Development Economics, 58:1.1-18.

Koitsiwe, K., & Adachi, T. (2015). Relationship between mining revenue, government consumption, exchange rate and economic growth in Botswana. *Contaduría y Administración*, *60*, 133-148.

Kormendi, R. C., & Meguire, P. G. (1985). Macroeconomic determinants of growth: cross-country evidence. Journal of Monetary economics, 16(2), 141-163.

Landau, D. (1983). Government expenditure and economic growth: a cross-country study. Southern Economic Journal, 783-792.

Lawler, A. (2014, November 28). Inside OPEC room, Naimi declares price war on U.S. shale oil. Retrieved from https://www.reuters.com/article/us-opec-meeting-shale/inside-opec-room-naimi-declares-price-war-on-u-s-shale-oil-idUSKCN0JC1GK20141128

Mehlum, H., Moene, K. O., & Torvik, R. (2002). Plunder & Protection Inc. *Journal of Peace Research*, *39*(4), 447-459.

Mehrara, M. (2008). The asymmetric relationship between oil revenues and economic activities: The case of oil-exporting countries. *Energy Policy*, *36*(3), 1164-1168.

Moshiri, S., & Banihashem, A. (2012). Asymmetric effects of oil price shocks on economic growth of oil-exporting countries.

Munnell, A. H. (1992). Policy watch: infrastructure investment and economic growth. *The Journal of Economic Perspectives*, *6*(4), 189-198.

Nelson, C. R., & Plosser, C. R. (1982). Trends and random walks in macroeconmic time series: some evidence and implications. *Journal of monetary economics*, *10*(2), 139-162.

Nili, M., & Rastad, M. (2007). Addressing the growth failure of the oil economies: The role of financial development. *The Quarterly Review of Economics and Finance*, *46*(5), 726-740.

Nusair, S. A. (2016). The effects of oil price shocks on the economies of the Gulf Co-operation Council countries: Nonlinear analysis. *Energy Policy*, *91*, 256-267.

Ormaechea, M. S. A., & Morozumi, A. (2013). *Can a government enhance long-run growth by changing the composition of public expenditure?* (No. 13-162). International Monetary Fund.

Park, H. M. (2011). Practical guides to panel data modeling: A step by step analysis using Stata. *Public Management and Policy Analysis Program, Graduate School of International Relations, International University of Japan*.

Rodrik, D. (1997). *Trade, social insurance, and the limits to globalization* (No. w5905). National bureau of economic research.

Rodrik, D. (1996). Why do more open economies have bigger governments? (No. w5537). National Bureau of Economic Research.

Roubini, Nouriel, and Jeffrey D. Sachs. "Government spending and budget deficits in the industrial economies." (1989).

Sandbu, M. E. (2006). Natural wealth accounts: A proposal for alleviating the natural resource curse. *World Development*, *34*(7), 1153-1170.

Slemrod, J., Gale, W. G., & Easterly, W. (1995). What do cross-country studies teach about government involvement, prosperity, and economic growth?. *Brookings papers on economic activity*, *1995*(2), 373-431.

StataCorp. 2017. *Stata Statistical Software: Release 15*. College Station, TX: StataCorp LLC

Takizawa, M. H., Gardner, M. E., & Ueda, K. (2004). *Are developing countries better off spending their oil wealth upfront?* (No. 4-141). International Monetary Fund.

Tanzi, V., & Zee, H. H. (1997). Fiscal policy and long-run growth. *Staff Papers*, *44*(2), 179-209.

Torres-Reyna, O. (2007). Panel Data Analysis Fixed and Random Effects using Stata (v. 4.2).

Williams, R. (2015, January 30). Heteroskedasticity. Retrieved from https://www3.nd.edu/~rwilliam/stats2/l25.pdf

Wylie, P. J. (1996). Infrastructure and Canadian economic growth 1946-1991. *The Canadian Journal of Economics/Revue canadienne d'Economique*, *29*, S350-S355.

Yanikkaya, H. (2003). Trade openness and economic growth: a cross-country empirical investigation. *Journal of Development economics*, *72*(1), 57-89.