



## THESIS / THÈSE

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#### The importance of the Energy Sector for the Conduct of Fiscal Policy in Emerging Countries

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The importance of the Energy Sector for the Conduct of Fiscal Policy in  
Emerging Countries

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**Abstract**

Governments in resource-rich countries should manage professionally by creating natural resource funds which are subject to clear and transparent objectives and mechanisms and involving all national actors in order to build up a national commitment. Despite their support in terms of huge financial savings, natural resource funds are not an ultimate solution for long-term growth and economic development. They are not sufficient enough to ensure long-term growth because they are primarily oriented to building up sufficient foreign reserves, and practically care more about short-term macroeconomic disequilibrium and long-term savings, and are limited in times of financial crisis. The fund could be invested in the non-natural resource fields to allow the diversification of exports in order to secure the tax base potentialities. As low-income countries exhibit huge gaps in infrastructure, the main part of the funds could be used to acquire public infrastructure and social sphere services such as education and health to help promote better technical skills, reduce the gap in human capital and acquire infrastructural capital necessary for long term socio-economic development; thus, addressing employment-related issues and achieving long-term fiscal sustainability.

## I. Introduction

The history of natural resources seems to be correlated with the “resource curse” phenomenon which points to the fact that the ownership of natural resource exposes the economy to patterns of domestic behavior that may be detrimental to long-run growth. Resource-rich countries tend to concentrate huge initial investments in resource-rich sectors. The huge commitment ensures that resources continue to flow to the areas where resource exploitation is concentrated. The resource based activity by itself has relatively little long-run linkages or external impacts that can stimulate more broad-based development. The sector generates large economic rents, the handling of which is both economically important and politically controversial.

Most resource producing economies are largely dependent on the resource-rich sector. The resource earnings, mostly for the majority of oil producing countries, constitute the main source of fiscal revenues especially because the non-resource tax base is relatively weak or inexistent. For instance, in Nigeria, the oil sector constitutes about 90% of exports and accounts for about 75% of the consolidated fiscal revenue (World Bank country overview of September 2015). The situation is typically the same in many other countries wherein Gabon, on average, over the past five years, the oil sector accounted for 80% of exports, 45% of GDP, and 60% of budget revenue (World Bank, 2016). During last 10 years, oil exports accounted on average for 97% of Angolan exports (World Bank, 2016).

Given this high dependence, oil price shocks appear to have important implications on the macroeconomic stability of oil-producing countries. Oil price volatility arising from shocks in supply or demand affect external earnings in the energy exporting country and impact its exports and imports. For instance, the rising price of oil increases the external earnings of an oil-rich country. The government affected by an income effect increases its current spending. X The volatility of oil price is then driven to the economy through large fluctuations in government revenues because in periods of prosperous terms of trade, the oil-dependent government can easily finance expansionary spending through oil revenue. According to X Liuksila, Garcia, and Bassett (1994), governments are pushed to raise expenditure for political reasons and growth pressures when revenue from natural resources rises.

However, the fluctuations in energy prices can be transitory and the variation in earnings X certainly affects negatively the economy through the real exchange rate and may lead to loss of competitiveness. In most resource-dependent countries, the fiscal revenue and government expenditures are also closely linked to the foreign market. The fact that domestic incomes are imported denotes that the establishment of public infrastructures and services may be affected by the fluctuations in tax income. As such, inefficient public spending during oil stance leads to wastes of revenues that could have been used to finance developmental projects and improve the welfare of the country. X

Resource prices are volatile and unpredictable. It is difficult for resource-dependent countries to adjust to such exogenous shocks. It has been proven that in resource-exporting countries, the government budget is highly dependent on the resource revenue and is extremely affected by various types of external shocks. According to Omojolaibi and Festus (2013), oil price shocks tend to be persistent and the oil price cycles are highly unpredictable and therefore government revenues tend to be highly volatile. In oil-dependent countries, oil price volatility is directly reflected through the large fluctuations in government revenues. An increase in oil revenues following the flow in oil price is accompanied by an increase in current government expenditures. Also, governments in resource-dependent countries are obstinate to high consumption during positive stance, but have no incentives to extend their fiscal basis, what lead to less developed fiscal systems and lower capacities to expand public investment and sometimes public furniture during the stance. The result is that large endowments in resources do not impact political institutions or affect positively long-term economic growth (Alexeev and Conrad, 2009).

Another fact is that oil discoveries may particularly push huge investments in the non-traded goods sectors of the economy while investments and profits in the traded sectors are compressed and as the non-traded goods sectors expand, the traded goods sectors shrink. The government as the custodian of the state's resources receives all the oil revenue. Excessive spending introduced into the economy may affect the real exchange rate especially regarding the behavior of the government and the population on external consumption goods. Given the instability of the revenue and the spill over into fiscal policy, the real exchange rate would be unstable and the natural resource blessing could become a curse, (Mohsen, 2006). At this stage, the results are most of the cases, the loss of competitiveness, instability in the real exchange rate, and high inflation nourished by the loss in domestic purchasing power.

The excessive spending of the government become a real challenge during the period of fall in the resource price and may imply adjustment costs. In periods of scarcity, the government would cut down non-productive spending to adjust to the size of the available revenues. However, it is not easy to spontaneously reduce the size of the government's activities to these fluctuations and sometimes, not even possible. As cutting government spending would imply giving up some projects and generate great social costs, the choice becomes to maintain higher spending at the cost of significant and willful budget deficits.

During negative oil income developments, budget deficits become persistent; the public debt grows larger and tends to lead public debt to a downward spiral. Growing public debt without a motivated objective to create additional wealth each year is not worth it. This may lead to such a level of indebtedness that the state cannot control and is unsustainable. At this stage, to repay debts and interests, the state could be obliged to borrow more and more every year as it would be already caught in a spiral if we do not mention that it may even fall into the inability to pay, known as the "snowball effect". One can imagine how difficult it is to manage fiscal policy challenged by the high indebtedness and the preceding welfare cost brought about by the needed strong adjustment at a given period and more when the resource depletes.

It is not easy to manage fiscal policy at this stage. Changes in oil prices leading to fluctuations in net revenue drive uncertainty into policymaking as the government cannot be sure when the shocks in oil prices may occur or how long they will last. Governments could reduce their high dependence on oil revenues cycles by developing other non-oil sources. To deal with this, rational governments could restrict their consumption and reserve excess earnings from oil exports during oil booming periods, such that at some point in the future, the capital loss is sustained when prices fall or grow below their normal level.

During the 2000s, many oil and gas rich countries experienced expansionary fiscal policies facilitated by the price upswings of the commodities while they were confronted with challenging fiscal management brought about by downswings that followed the 2008-09 global financial crisis. The experience of this period has demonstrated that excessive spending opportunities yet benefited during positive fiscal stances were nevertheless possible as governments in many of these countries were forced to cut their current and capital spending what hampers then their economies. Fiscal policy is likely to play a major role in transmitting commodity price volatility to the domestic economy. The resulting macroeconomic instability, in turn, damages the economic growth.

Most resource dependent countries have adopted different policies to deal with such situation, under different considerations. For instance, Kuwait and Norway introduced strategic oil funds respectively in the 1950s and 1970s, which carry oil earnings from restricted fiscal spending during oil price booms and therefore to constitute strategic savings. The funds are to prevent from vulnerability to falls in oil prices, from oil resource depletion, or to be invested in non resource economic sectors. Recently, other countries such as Azerbaijan, Algeria, Ecuador, Iran, Kazakhstan, Mexico, Nigeria, and Venezuela, have followed this strategy (Devlin and Lewin, 2004).

This study extends the existing literature by trying to establish the role that may be played by governments in resource-dependent countries in order to conduct efficient fiscal policies. We especially investigate the level at which the governments take into account developments in the resource sector in their fiscal policy and if the extra revenue from energy and commodities is used for the current government consumption or for long term investment. The case study on four countries, Algeria, Cameroon, Gabon, and Nigeria gives an idea on the behavior of governments behind unpredictable oil price shocks and helps to provide information about how fiscal policy could take into account the resource sector in the line of broad-based political reforms aimed at economic development.

The remainder of this paper is organized as follows. The next section presents a brief literature review. In section three, we present fiscal strategies used in resource-rich countries. Section four presents the recent fiscal developments in selected oil and gas exporting countries in Africa. Section five concludes.

## II. Literature review

The literature related to oil price fluctuation took birth with the first oil price shocks of the 1970s when the impact of fiscal revenue resulting from flows in oil price is explained through the “resource curse” phenomenon. It states that resource-rich countries tend to concentrate their production factors in resource-rich sectors diverting physical and human forces the rest of the economy.

Resource revenues are earned from the exports of these resources and are therefore highly affected by external fluctuations. The government affected by an income effect caused by positive flows of resource prices can easily increase its current spending, (Kilian, 2005). The rise in government spending following the positive flows of resource prices is most of the time explained by political reasons and growth pressures (Claire, Alejandro, and Sheila, 1994).

Moreover, the tendency of concentrating capital and labor inputs in the resource - rich sector drops most of the factors of production away from other productive sectors (such as the manufacturing or agricultural), raising their production costs. The result can be a decline in production of manufactured or agricultural goods, their exports and thus the rise of the cost of non-tradable goods. Benjamin, Devarajan, and Weiner (1989) find that agricultural sectors of some oil exporters often suffered in the period 1971-83 even if for the same period, Fardmanesh (1991) and Mikesell (1997) do not find a significant increase in labor and capital from manufacturing toward resource sectors in the case of resource-producing countries.

The impact to the economy is negative because of the loss of competitiveness. Some studies relate the weak performance of resource-rich economies to the high volatility of resource revenues associated with fluctuations in oil prices for example. The volatility of oil price is then transmitted to the economy through the large fluctuations in government revenues. The rise in oil price increases external earnings of an oil-rich country. Shocks in supply or demand affect external earnings in the resource-rich country and impact its exports and imports. This can lead to the appreciation of the domestic currency and the deterioration of the real exchange rate.

From the 1990s, several studies trying to establish the link between resource revenues and economic growth. Lane (2003), Afonso and Furceri (2008) focus on the impact of the volatility of public revenues and expenditures on economic growth. Talvi and Vegh (2000), found that most of the large surges in public capital spending during boom cycles are non-productive and typically have a very low return. Auty (2001), explains the governments’ inefficient management of public surpluses and concludes that current fiscal policies are procyclical and the use of funds is unproductive. In fact, the resource endowments can divert incentives to accumulate skills and invest in human capital (Auty, 2001), and to accumulate private capital (Stevens, 2003). Also, the concentration of the resource revenues in public services diverts efficient productive decisions via officials who target their individual objectives. Such situations delay decisions on economic reforms and thus reducing investment



efficiency and jeopardizing economic development while cumulate economic distortions and retard diversification (Auty and Gelb, 2001). According to Mohsen (2006), rapid growth in public spending, which often follows oil price shift up, reduces spending quality and introduces entitlements, including recurrent cost commitments, which are often not sustainable in the long run.

Through the same point of view, some of the recent studies identify the mechanisms through which oil price shocks transmit into the economy. Mohsen and Kamran, (2006), Mohammad, (2011), Omojolaibi, (2013) and Alessandro and Matteo, (2013) argue that exogenous oil shocks often affect negatively the economic stance of oil producing countries what make them suffer more from a weak and non-diversified fiscal base and their vulnerability on boom cycles worsen their stability. Alotaibi (2006) analyzes the interactions between oil price shocks, real exchange rate and price level in Persian Gulf Cooperation Council members and finds that real shocks do not affect oil price and nominal shocks do not affect both oil price and GDP. He concludes in a fact that oil price shocks affect directly price level while they have an inverse effect on real exchange rate.

Easterly and Levine (1997) and Karl (1997) argue that natural resource rents can be a source of conflict, political instability, corruption, weak institutions, and inequitable distribution of wealth and policy failure, especially in the case of factional political states that are associated with heterogeneous societies. Policymakers targeting to maximize resource rents may face barriers to change from non-transparent interest groups. Also, an important part of the conflicts in oil producing countries actually originates from the struggle between competing groups such as foreign investors or state officials to gain control over those resources and the rents they generate.

There are some studies which go far to focus on effects of resource rents and the quality of institutions and vice versa. Sala-i-Martin and Subramanian (2003) and Van der Ploeg and Arezki (2008) shows significant negative indirect effect of natural resources on the quality of institutions while Van der Ploeg and Arezki (2008) shows that natural resource curse is particularly severe for economic performance in countries less open to trade and bad trade policies are highly correlated with bad fiscal policies. Large endowments of oil and other non-renewable resources do not affect significantly political institutions and thus positive effects on long-term economic growth may never occur (Alexeev and Conrad, 2009).

We also recall recent studies trying to link oil prices shocks to fiscal policy in oil-exporting countries and propose policy solutions in order to substantially manage oil booms, diversify the economic base for sustainable growth and improve their capacities to resist on external oil shocks. Achille (2009), Manuel and Lorenzo (2008), Amany and Michael (2012), and Dina (2014), conclude that fiscal policy is procyclical. Resource-dependent countries suffer from a weak and undiversified fiscal base and lack institutional mechanisms that link fiscal government expenditure to oil revenue fluctuations leading to output fluctuations.

An appropriate design of fiscal policy can help to avoid the impact of high dependence on resource revenue and to structurally reform for growth improving and diversifying away from the resource-based production. Achille (2009) suggests the strengthening of windfall management mechanisms and institutions, and the implementation of good economic policies toward a sustained growth path, job creation and durable poverty reduction in Sub-Saharan African natural resource exporting countries.

**Table 1: Related empirical results, a survey**

Author	Subject and used variables	Approach and scope of the study	Findings and policy implication
Farzanegan (2011)	Oil revenue shocks and government spending behavior in Iran.	Unrestricted VAR model; Impulse Response Functions (IRF) and Variance Decomposition Annual data: 1959 to 2007.	Unexpected shocks in oil revenues affect significantly and positively government spending.
Amany and Michael (2012)	Oil prices and fiscal policy response in oil-exporting countries.  <u>Four classes of variables affecting the size of the government spending:</u> Specific effects expressed by the differential between private sector and government discount rates; Set of variables associated with oil prices; Policy implications expressing institutional qualities.	GARCH (1,1) model  Dynamic panel GMM approach  16 oil-exporting countries: Algeria, Bahrain, Cameroon, Colombia, Egypt, Indonesia, Iran, Kuwait, Malaysia, Mexico, Nigeria, Norway, Oman, Syria, UAE, and Venezuela. <u>Annual data:</u> 1972-2007	<ul style="list-style-type: none"> <li>- Fiscal policy is procyclical in oil producing countries: a rise in oil prices stimulates both GDP and government expenditure;</li> <li>- Fiscal policy start focusing on the long-run sustainability to prepare the economy for oil reserves depletion periods;</li> <li>- Higher dependence on the oil sector is positively correlated to higher expenditure shifting current price.</li> </ul> <p><b>Policy implication</b></p> <p>Under a fixed exchange rate regime, oil price volatility is associated with fiscal prudence.</p>
Dina (2014)	Effect of fiscal policy on oil revenue fund: The case of Kazakhstan	Taxation of resources is a combination of per unit, per revenue and lump sum taxes.  An increase in tax has negative effect on oil exploration and	<ul style="list-style-type: none"> <li>- Fiscal oil revenue and other non-fiscal revenues constitute national funds;</li> <li>- Effective management of National fund is significantly affected by Fiscal policy</li> </ul>

		extraction.	<p><b>Policy implication</b></p> <p>An appropriate design of fiscal policy is significant in avoiding high volatility of oil revenue.</p>
Reyes-Loya and Blanco (2008)	<p>Importance of oil-related revenues in total fiscal income</p> <p>4 variables used: Government spending, Tax revenues, Fiscal policy, Oil revenues, Non-Oil tax revenue and Industrial Production Index</p>	<p>ARIMA model</p> <p>Monthly data: 1990 -2005</p> <p>Country: Mexico</p>	<p>Inverse relationship between oil related revenues and non-oil-related income.</p> <p><b>Policy implication</b></p> <p>Diversification of tax base is likely to increase fiscal income and reduce dependence on high oil prices.</p>
Mohsen and Kamran (2006)	<p>Sources of macroeconomic fluctuations in oil exporting countries</p> <p><u>4 variables</u>: Real oil price, Output, Real exchange rate and Consumer price index and four price shocks scope for the studied countries.</p>	<p>Structural Vector Autoregressive model and long run restrictions</p> <p>Period of 1970-2002</p> <p>4 countries: Iran, Indonesia, Kuwait and Saudi Arabia.</p>	<p>Lack of institutional mechanisms in heavily oil dependent countries such as Iran and Saudi Arabia leads to excessive fiscal expenditure from current oil revenue shocks.</p> <p><b>Policy implication</b></p> <p>An efficient allocation of natural resource rents could limit the macroeconomic instability and promote economic diversification away from resource-based production and growth.</p>
Alessandro and Matteo (2011)	<p>Exogenous oil shocks, fiscal policies and sector reallocations in oil producing countries (of the Gulf Cooperating Council, GCC).</p>	<p>Real Business Cycle (RBC)</p> <p>Data on economic structure of GCC countries, from 1994 to 2009.</p>	<ul style="list-style-type: none"> <li>- Private investments are crowded-out by the net wealth effect induced by flows in oil revenues.</li> <li>- Fiscal policy is procyclical flows oil revenues cause overall output to expand.</li> <li>-</li> </ul>

			<p><b>Policy implication</b></p> <ul style="list-style-type: none"> <li>- Reducing restriction on domestic trade and support to privatizations of domestic sectors could promote competition;</li> <li>- Well-functioning and competitive market system, a proper definition of property rights and the development of a more efficient regulatory framework are possible measures to open financial markets to foreign investors.</li> </ul>
Omojolaibi and Egwaikhide(2013)	<p>Oil Price Dynamics, Fiscal Stance and Macroeconomic Effects</p> <p><u>5 variables</u> : Fiscal policy represented by fiscal deficit or surplus, Gross investment representing investment expenditure, Gross domestic product as real output growth in the economy, Monetary policy equal to money supply and Oil price volatility as exogenous factors affecting output growth.</p>	<p>GARCH Model applied to a Panel Vector Autoregressive (PVAR);</p> <p>Impulse Response Function of PVAR</p> <p>Period of 1990:q1 to 2010:q4.</p> <p>African Oil Producing Countries.</p>	<ul style="list-style-type: none"> <li>- Fiscal deficit is the channel through which oil price volatility transmits to the economies of Algeria and Libya;</li> <li>- Real gross domestic product is the channel through which oil price volatility transmits to Angola and Nigeria economies; and</li> <li>- Monetary policy is channel through which oil price volatility affects the Egypt economy;</li> </ul> <p><b>Policy implication</b></p> <p>Gross Investment as a potent macroeconomic stabilizer in an oil African exporting economy can speed up economic development even in the presence of oil price volatility because of its multiplier effects.</p>

Mauricio and Pablo (2010)	<p>Fiscal policy in oil producing countries during the recent oil price cycle</p> <p><u>Variables:</u> fiscal balance, non-oil primary balance, expenditure growth, composition of expenditure, and oil revenue use.</p>	<p>Evolutions analysis and discussion;</p> <p>Period: 2001-2009</p>	<ul style="list-style-type: none"> <li>- Non-oil primary balances have been worsened during 2003–2008 due to increase in primary spending but the reversed trend was seen till 2009 when oil prices went down;</li> <li>- Fiscal policy has been procyclical and has exacerbated the fluctuations in economic activity: current spending plays an important role especially in low-income OPCs;</li> <li>- However, the degree of procyclicality of fiscal policy is negatively related to income level in these countries.</li> <li>- Long-term fiscal sustainability positions in OPCs have worsened: a small reduction in oil prices could lead to very large financing needs in the near future.</li> </ul>
Omojolaibi (2013)	<p>Volatility in Crude Oil Price and Macroeconomic Performance</p> <p><u>4 Variables:</u> domestic price level, economic output, money supply and oil price</p>	<p>Structural vector autoregressive Impulse Response Functions (IRFs) Forecast Error Variance Decompositions (FEVDs)</p> <p>Data: 1985:q1 to 2010:q4. Country: Nigeria</p>	<ul style="list-style-type: none"> <li>- Oil shocks have significant positive impacts on economic output but money shocks are the main cause of GDP fluctuations: money supply driven by its own shocks and oil price changes are the main cause of macroeconomic fluctuations in Nigeria;</li> <li>- Oil sector has very important indirect impact on the economy and the monetary policy is the channel through which this indirect impact transmits;</li> <li>- Domestic policy should avoid inflation.</li> </ul>

Alessandro and Matteo (2006)	<p>Oil prices, inflation and interest rates</p> <p><u>Variables:</u> short-term interest rates expressed by lending rate, monetary aggregate-M1, consumer price index, real gross domestic product, world price of oil, exchange rate.</p>	<p>Structural cointegrated VAR model (SCVAR);</p> <p>Long-run and short-run relationships analysis;</p> <p>Countries: of G-7</p> <p>Period of 20 years</p>	<ul style="list-style-type: none"> <li>- Inflation rate shocks are transmitted to the real economy by increasing interest rates;</li> <li>- Oil price innovations effect on prices are instantaneous temporary;</li> <li>- Monetary policy reactions to inflationary and growth shocks;</li> <li>- During the 1990 oil price shock for example, a significant part of the effects of the oil price shock is due to the monetary policy reaction function for some countries such U.S. while for other countries such as Canada, France and Italy, the total impact is offset, in part, by an easing of monetary conditions.</li> </ul>
Gisser and Goodwin (1986)	<p>Tests of some popular notions on Crude Oil and the macroeconomy.</p> <p><u>Variables:</u> Real GNP, General price level, Unemployment rate, Real Investment, Money supply, Fiscal activity and Nominal oil price.</p>	<p>St. Louis model;</p> <p>Quarterly data;</p> <p>Sample period : 1960.II to 1981.IV;</p> <p>Country: USA</p>	<p>Oil prices shocks have both real effects but weak direct price effects;</p> <p>Inflation does not predict future course of oil prices;</p> <p>Fiscal policy is a weak demand shifter and has no long-run effect of on demand.</p>

**Source:** author, survey.

### **III. Fiscal strategies for resource rich countries**

Resource-exporting countries are highly dependent on the resource revenue and are extremely affected by diverse types of internal and external shocks, including rising exchange rates, loss of competitiveness, crowding out of domestic investment, weak tax efforts, and so on. These imbalances are associated with challenging macroeconomic and fiscal management, have raised an attention of resource rich countries which led them to focus on how to limit their high dependence on the availability of the revenue from natural resources.

Many resource dependent countries have adopted different tools to deal with such situation, under different considerations either for short, medium and long-term objectives depending on countries. Tools established under the short term considerations pursue to magnify the revenue volatility and curb the inflation, to enable the social welfare through redistribution of the windfall revenue, and economic transformation while the long term considerations focus on prevention against the resource depletion ensuring the long term fiscal sustainability and the preservation of the resource wealth for the future generations. Under the different considerations, mechanisms put in place to help manage the resource wealth, took the form of sovereign wealth funds and fiscal rules or fiscal provisions. Sovereign Wealth Funds work as investment vehicles that manage part of government wealth and may take various forms distinguished on the basis of functions; stabilization funds (aimed to offsetting cyclical shocks), Saving Funds (intended to transform natural resources wealth into financial assets), Reserve investment funds (pursuing the acquisition of interests in various entities) and Development funds (established with objective to support the domestic economy) and fiscal rules or fiscal provisions which are fiscal anchors and guidelines, often applied in coordination with resource funds, or on their own in some cases.

#### **III.1. Short term considerations**

The uncertainty brought about by the weak predictive capacity of the future resource prices complicate the government fiscal management in resource dependent countries, especially when their resource is based on energy commodities. Most resource owners accumulated financial savings and invested them to produce returns. The returns on those assets provide them larger and durable buffers necessary to narrow the commodity revenue shortfall. Some resource dependent countries also use them as counter-cyclical instruments to prevent the effects of inflation resulting from the government expansionary fiscal policies during booming periods. The procedure helps to reduce the tendency of the government to spend during revenue booms and provide countercyclical relief during downturns. They can help stabilize aggregate demand and mitigate the appreciation of the real exchange rate. Investing the resource earnings in financial assets help constitute external reserves necessary to overcome the needs for foreign exchange inflows.

Others may ease the resource income for other targets in downswings, especially to stimulate the economic activity. Although in similar situations, such buffers are attributed a stabilization function, some resource dependent countries went beyond during the 2008-2009



crisis and spent the resource savings in supporting their banking sectors through banking recapitalization. Most of the case, resource dependent countries with stabilization buffers have created a separate account within the central bank or increased foreign reserves or combined the two portfolios as it is the case for Saudi Arabia, while others put in place specific funds to manage the assets saved in upswings. The Saudi Arabia Monetary Authority manages foreign exchange reserves and an undetermined amount of non-reserve riskier holdings (Heuty and Aristi, 2010). Stabilization funds are likely liquid assets of great liquidity potentially accessible during crisis. They help to smooth shocks to resource revenue undermining directly the budget stability.

The case of developing countries is very different. These countries are characterized by a relatively low level of social, economic, institutional development. They choose to use the available resource revenue in order to fill the gap in social infrastructure such as education and health which are generally primordial areas for economic development. Most of this countries enjoyed the financial means in the last past years (Hendrix, 2017), in expanding their physical and social infrastructure and to address the needs of an increasing population. However, their choice poses significant risks and leads to highly volatile spending. This complicate fiscal policy adjustment because it deals with exhaustible and volatile revenue, strongly exposed to external shocks. Most of the time, these countries engaged in these spending only with a social and distribution purpose without any associated development perspective. One would ask if it be will possible to reach an economic emergence through higher non productive expenditure. At a certain point in the future, it might be in practice difficult to de-link such expenditure from this direct consumption. The fact is that governments will not resist the temptation or political pressure to spend in booms, what will often be followed by borrowing more to finance social and infrastructure spending during busts, exacerbating the adjustment process and debt repayment incapacity.

### **III.2. Long term considerations for resource wealth management**

Resource dependent countries may want to prevent from the exhaustibility of the resource revenue and manage the reserves in the view to sustain the long term fiscal sustainability. The design of the fiscal framework is drawn to ensure the permanent income in the light of an intertemporal budget constraint, where the yearly spending for example in the non-resource primary deficit is limited to the perpetuity value of resource wealth (See Barnett and Ossowski (2003)). Such considerations may be also used to help find response to reasons of political economy allowing an accumulation of financial savings for future generations. Three major assumptions are used for long-term management of natural resources (Davis, Ossowski, and Fedelino (2003)).

Under an intergenerational consideration, a number of resource dependent countries choose to save all or a part of the earnings from the resource in form of financial assets, in order to prevent from the depletion of the resource. To do this, countries proceed by an approach most known as the "bird-in-hand" (BIH), under which countries save all the resource revenue in the form of income generating financial assets that allow the present and the future generations to

enjoy only the yield from the returns accumulated from the available stock of assets. The idea behind this approach is to put in place investment assets ready to provide financing means today and leave a substantial share of the resource wealth to future generations even when the reserves are depleted. Norway is considered as a pioneer in this kind of strategic tools. For developing countries, this option might be an unachievable dream at the beginning.

Resource dependent countries may also opt for fiscal rules jogged to the return on the overall net government wealth. The governments would consume then, a constant share of the net government wealth every year. This approach may not be an appropriate framework for developing countries especially when there are large needs of infrastructure. It can escape the objective of preserving financial wealth over time and bring financial assets down for a few years during higher capital expenditure. This approach needs to be accompanied by fiscal adjustments in the future in order to rebuild financial assets aimed at offsetting the withdrawal led by the expended spending. With a long run point of view, the rule will take into account the expected impact of higher investment on growth and non-resource revenues. This means that the fiscal rule determines the threshold under which the government withdraws the available resource wealth. The lower financial wealth will generate a lower stream of income to the budget, but it would be compensated for by fiscal returns in the form of larger non resource revenues. Qatar and Kuwait are examples of countries which undertook such kind of strategy.

Some resource-rich countries experiencing a strong need for human capital and infrastructure devote all the available resource revenue of the period to the current budget. This is justified by the fact that their social spending in health, education, infrastructure, etc. and may be more valued than the return on setting financial asset. The positive external effects of public spending on productivity and consumption make spending the oil wealth upfront is a better option Takizawa et al. (2004). This is only the case if the country is engaged in a long term perspective of socio economic development. Investment in education and health allow acquiring human capita while building infrastructure help provide capital necessary for production. The experience shows that in this group of countries, savings from natural resource revenue are not most of the envisaged and budget expenditure depends on production and the world resource price. Such countries should accumulate public and private capital to accelerate their development and, only if the windfall is large relative to initial foreign debt, is it optimal to build a SWF (Heuty and Aristi, 2010). However, as argued by Collier and Gunning (2005), the reality of some countries does not allow confirm that they are in position to allocate the entire windfall domestically in investments with returns above the world interest rate.

### **III.3. Short to medium term fiscal considerations**

Resource dependent countries may use also other special instruments including fiscal anchors and guidelines, often applied in coordination with resource funds, but also on their own in some cases. These institutional mechanisms are intended to permanently shape fiscal policy design and implementation. In some cases they lay out procedural, transparency or

accountability requirements. In other instances, they might set numerical benchmarks that limit the amount a government is allowed to spend at any given time, typically the resource price based rules, the non-resource balance/deficit rules, the ratio of government spending or a similar fiscal parameter. Both sets of rules help deal well with the demand in the short to medium term. The non-resource primary balance rule offers the added feature of directly tying the short/medium-term to the long-term sustainability benchmark (Baunsgaard, Villafuerte, Poplawski-Ribeiro, and Richmond (2012)).

Fiscal rules are sometimes embedded in constitutional or legal provisions, e.i. the Timor-Leste Petroleum Fund Act. In Chile and Mexico, as their resource funds were established under legislation governing fiscal or budget functions, the rules do not have appropriate legal status and are defined on the government side. Chile's Finance Ministry is responsible for defining how the funds are managed, drawing up investment policies and managers' supervision<sup>1</sup>. Similarly, the case of Botswana reveals the same situation, the Ministry of Finance and Economic Development also plays a key role in the allocation and the choice of investment policies related to the funds. Some countries succeeded in complying with the pre-established fiscal anchors thanks to strong political support and embedded flexibility (Norway, Chile i.e.) while others did not follow them and have even abandoned them (Nigeria, Azerbaijan i.e.).

Note that the sizes of these stabilization funds and the choice of anchor are country specific regarding the degree of resource dependence and risk tolerance. A country that already with significant amounts of savings for intergenerational motivations would not need the same schemes of stabilization as ones without any fund, especially countries still dealing with their gap in human and physical capital or those laying their spending plans to smoothing the resource revenue volatility.

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<sup>1</sup> <http://www.ifswf.org/trends-transparency-santiago-principle-self-assessments-2016>

**Table 2: Resource funds and fiscal rules**

	<b>Price based fiscal assumptions</b>	<b>Natural resource funds (stabilization fund, investment fund or savings fund)</b>	<b>Fiscal rules</b>	<b>Developments</b>
Algeria	USD17 (2000) USD37 (2009)	“Fonds de Régulation des Recettes” (since 2000) : 77.2 USD billion  Stabilization function	Excess oil revenues above the budgeted level are transferred to the oil fund.	
Chile	Structural fiscal balance objective.	Two sovereign funds established on resource earned from the world’s top copper industry.  The Pension Reserve Fund (PRF) since 2006: long-term savings to finance future pensions.  The Economic and Social Stabilization Fund (ESSF) replaced the Copper Income Stabilization Fund (CISF) since 2007:  The objective is to ensure structural fiscal surplus over the cycle.	Structural fiscal balance objectives equal to the balance that would have occurred in the absence of all temporary shocks on the budget, including copper price, production and others factors.  Objective in 2000: The government to attain a 1% structural surplus.  Objective in 2008: and 0.5% structural surplus.	Political commitment and good institutions played more for the success of the funds and the implementation of the rule (IMF, 2007).  The rule has been countercyclical. During the crisis, Chilean government has been able to finance stimulus spending by tapping into the ESSF (Heuty and Aristi, 2010).
Gabon	Not clear	“Fonds Souverain de la République Gabonaise (FSRG)” : 1 billion of capital.  Objectives: saving future generations from	10 percent of the total amount of the oil revenues and the 1/4 of the revenues generated by its investments.	During favorable oil prices, the government has financed important projects, including transport and energy

		the oil rents and finance of development purposes for diversification of the economy.		infrastructure, etc.
Nigeria	USD 59 (2008) USD 45 (2009) USD 65 (2013)  Non-oil primary deficit.	“Excess Crude Oil account” (since 2004)  Stabilization function  An independent fiscal responsibility commission conducts the peer-monitoring of fiscal policy.	Surplus oil revenues above the budgeted level are transferred to the oil fund. Under the constitution, all tiers of government (federal, state, and local) share oil revenues. A MTFS <sup>2</sup> includes targets for the non-oil primary deficit.	A fiscal responsibility law (FRL) (since 2007) includes numerical targets:  Capital outlays at the federal level, was budgeted to fall to 2.8 percent of GDP in 2011, from 3.6 percent in 2010 <sup>3</sup> .
Russia	USD 74 (2008) USD 41 (2009)	The fund established in 2004 was split in two in February 2008 1) “Reserve Fund”: stabilization purposes: 86.4 USD billion 2)“Future Generations Fund”: saving function: 88 USD billion.	Surplus oil revenues above the budgeted level are transferred to the oil fund.	
Saudi Arabia	USD 50 (2008) USD 45 (2009)	“Saudi Arabian Investment Co.”(since 2008)  Savings function (USD 5.3 billion).  The bulk of foreign assets that are not foreign exchange reserves in the narrow sense are managed by the Saudi Arabian	Not clearly set up	Saudi first began to diversify its economy to reduce dependency on oil in the 1970s.  The government allocated the petroleum income to transform its oil-based

<sup>2</sup> Medium Term Fiscal Strategy

<sup>3</sup> IMF Country Report No. 11/57

		Monetary Authority, SAMA Foreign Holdings (USD 675.9 billion).		economy into a modern industrial state.  Industrial progress has helped to improve the agriculture which now account for a larger share of the economic activity.
Peru	Structural deficit target for non financial public sector	Law on Fiscal Prudence and Transparent fiscal framework introduced in 1999 with the enactment of the Law on Fiscal Prudence and Transparency (LPTF).  Operational since 2015 budget	Multiyear macro-economic framework based one three-year projections for the main macroeconomic and fiscal variables.	Government to use the fiscal stabilization fund if revenue declines below the average of the past three years.  A fiscal council to provide independent analyses of macro-fiscal projections, the evolution of public finances, and compliance with fiscal laws and rules.

Norway	Inflation targeting framework.	<p>Government Pension Fund-Global, GPF-G, (since 1990): 838 USD billion</p> <p>Under the management of the central bank</p> <p>Saving function explicitly:</p> <ul style="list-style-type: none"> <li>- to sustain public finances, in particular in view of future pension payments.</li> <li>- invest resource earnings for future generations.</li> </ul>	<p>Surplus oil revenues above the budgeted level are transferred to the oil fund.</p> <p>Keep the central government structural non-oil deficit at 4% of the assets of the GPF-G.</p>	<p>Success in promoting fiscal discipline, transparency, enhancing effectiveness of fiscal policy by adoption of countercyclical fiscal stance and thus ensuring macroeconomic stability.</p> <p>This is attributed not only to fiscal rules and the oil fund, but also to their successful implementation and the relatively high degree of fiscal restraint over the years. Mature institutions and a high level of governance.</p>
Botswana		<p>Pula Fund”, Diamond mining revenues fund (since 1966), USD 6.8 billion at the end 2007.</p> <p>1- The 80% are invested in long-term assets.</p> <p>2- A traditional “Liquidity Fund”, for 20% comprised in foreign exchange reserves, invested in the money market and short-term bonds. The liquidity fund is under the management of the Central Bank.</p>	<p>Implicit rule whereby diamond revenue is used to finance “investment expenditure”</p> <p>Prudent fiscal management</p>	<p>Diamond revenues are transformed into capital investment, used in a transparent way in infrastructure, education and health.</p> <p>Good policies promote investment and socially efficient exploitation of resource rents (Acemoglu et al, 2001).</p>

Azerbaijan	Not applied	<p>The State Oil/gaz Fund of the Republic of Azerbaijan (SOFAZ) since 1999: 34.1 USD billion. Extra budgetary institution.</p> <p>Main objective: professional management of oil and gas revenue for the benefits of the country and future generations.</p>	<p>The fund receives all the government revenues arising from oil/gas production.</p> <p>Current rules prohibit spending in excess of inflows in any given year.</p>	<p>The introduction of the fund has had a positive impact on fiscal discipline and contributed to better transparency and accountability of the resource revenue management.</p>
Kuwait	Not applied	<p>Kuwait Investment Authority (KIA), Sovereign wealth fund (since 1953): 410 USD billion It was split into:</p> <ul style="list-style-type: none"> <li>- The General Reserve Fund (GRF): is the main treasure for the government;</li> <li>- The Future Generations Fund (FGF) (since 1976): was created with 50% of GRF.</li> </ul> <p>Objective: preserve savings for future generations.</p>	<p>The GRF receives all state revenues and all national are paid through the fund.</p> <p>The FGF originally received 10% of all state revenues, including investment income, from the General Reserve Fund each year. With the beginning fiscal year 2012-2013, the Council of Ministers raised the deposit amount to 25 percent.</p>	<p>Transfers to the fund are made independently of budget or the energy price developments.</p> <p>Nearly all assets are managed offshore and accumulated sizeable assets helped cover government expenditure during the 1990-91 regional crisis that damaged oil and gas facilities and helped finance a large part of reconstruction effort.</p>



Qatar	USD 45 (2017)	<p>Qatar Investment Funds (since 2005): 170 USD billion.</p> <p>Primarily achieve long term capital growth based on equities</p> <p>Long-term sustainability framework aimed at diversifying away from non renewable reserves and intergenerational equity purposes.</p>	<p>Surpluses in oil revenues above the budgeted level are transferred to the fund to be invested in financial assets.</p> <p>A MTBF<sup>4</sup> includes targets to accumulate non-oil primary surpluses, to achieve macro-fiscal stability, and ensure efficient execution of large infrastructure projects.</p>	<p>Nearly 70 percent of Qatar's GDP is non-hydrocarbon and the non-hydrocarbon sectors continue to grow nearly twice as fast, at 4.7 percent pa<sup>5</sup>.</p> <p>Massive long-term infrastructure investment encourages development of the financial, leisure, healthcare and transport sectors.</p> <p>The 2017 government budget was drawn on expectations of a world oil price for fiscal prudence.</p>
Timor-Leste	Not applied	<p>Petroleum fund (since 2005), established under the "petroleum fund law" as the repository for all petroleum revenues, specifies how the fund is integrated in the state budget.</p> <p>The PF was equal to US \$15.7 billion at the end of the first quarter of 2014.</p> <p>Intergenerational equity objectives.</p>	<p>No ceiling on withdrawals, only a procedural threshold, the fund follows guidelines but not strict fiscal rules.</p> <p>The total fund is invested abroad.</p> <p>90 percent invested in government bonds (80%) and</p>	<p>The country relies more on energy exports, the production in non-oil sector is weaker.</p> <p>The design of the fund aims to strengthen of budgetary processes democratic accountability.</p>

<sup>4</sup>Medium-Term Budget Framework

<sup>5</sup> The wealth net on <https://www.qatarinvestmentfund.com/media/article/qatars-transforming-economy-2058/>

		Guidelines emphasize a conservative low risk approach to the placement and management of the fund assets.	sovereign and supranational bonds (10%), while USD 1 billion is invested through an external manager, the BIS <sup>6</sup> .	Strong legislative protection including its major institutional arrangements for custody and management.
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***Source:** author, survey from different IMF working papers.*

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<sup>6</sup> IMF Country Report No. 10/340.

Natural resource funds can be a powerful instrument of protection against foreign influences and market forces (Amar, 2016). They can also help countries in preventing them from the absorption of higher incomes in present period led mostly by the increasing budget spending upswings. Sovereign wealth funds can provide an engine to institutional solutions at the disposal of the governments' political economic incentives, if political actors are constrained to increase transparency or decrease their short-term spending in current, among other options. Their establishment needs to be enlightened with clear and transparent objectives. This can help governments to build public consensus to save some of the revenue from natural resources. The abuse or mismanagement of the fund by the authorities may result in challenging situations. The lack of transparency in operations and the poor quality of management could further aggravate economic performance. Fasano (2000) argues that savings funds contributed to the creation of significant assets to meet the needs of future generations in Norway, Azerbaijan and Kuwait while some stabilization funds increased incentives to reduce fiscal policy based on the availability of income. Acemoglu et al (2001) finds that good policies promote investment and socially efficient exploitation of resource rents. The case of Norway and Chile demonstrate successful sovereign funds recorded due to the strong quality of the institutions in place. Oman and Venezuela are typically examples where Stabilization funds less succeeded due to weak fiscal management resulting in frequent changes of rules and low engagement in the planned target.

However, there are concerns that natural resource funds do not offer a technical "fix" to revenue management in resource rich countries (Davis, 2001). The rationale behind these instruments is not associated purely economic motivations. Their objectives are not to identify and prescribe socially optimum expenditure and saving patterns, but to realign political actors to those optimum patterns (Humphreys and Sandbu, 2007). Sovereign wealth funds are not always established for public interest or nationalist ones. Sometimes, they act as privates and pursue interests guided only by choices of some ruling groups. As mentioned in Shai, Lerner, and Schoar (2013), sovereign wealth funds have emerged as major investors in corporate and real resources worldwide. Also, the great involvement of political leaders in fund management process reveals investment plans favoring short-term economic goals than long-term maximization of economic returns.

The background of resource-rich countries shows that in some authoritarian regimes, natural resource funds have been used to exclude certain projects from public scrutiny or to circumvent official control mechanisms (Amar, 2016). This has allowed officials to act in the darkness for the benefit of particular groups or the interest their relatives. The typical example is the case of the Libyan Investment Authority (LIA) under the Gaddafi regime. Some of the members of the leader's family were attributed discretionary power to manage the resource fund at their own favor or intimacy. Another problem is related to the lack of transparency and the under-evaluation of the resource exports resulting especially to weak capacity of officials appointed in contracts negotiations with international oil corporations. The evaluation methods used in oil contracts presents also weaknesses which call for an analysis how damaging or good deal should be the resource exploitation contracts to a country (a point that will not be addressed in this paper).

### III.4. Guidelines for the success of natural resource funds X

The establishment of natural resource funds needs to be enlightened with clear, transparent and accountable objectives and mechanisms for good management and success. It has to provide a baseline of minimum predictable funding to be used in the national budget and be integrated into the budget process as well involving both, executive, legislature and civil society to help build up the national consensus on the use of resource fund. The parliament could ensure the fund in place to be an appropriate instrument to solve domestic challenges and regularly verify if rules and investment strategies are drawn in line with the objectives of the fund and if revenues are spent on development projects, if the fund spending respect approvals of the parliament and the government does engage public money in risky activities with respect to their own interests.

More specifically, a correct implementation of a resource fund could emphasize a clear division of responsibilities, strong internal capacity, and political independence, and be subject to regular extensive disclosures and audits.

**i.** Separation of responsibilities and limitation of conflict of interest: Legal and regulatory framework must be well defined and set up in law, regulation or a government policy document in a way roles and responsibilities of governing bodies and/or internal structure of the operational manager are clearly separated. For instance, the role of manager and operational manager are ensured respectively by the Minister of Finance and the central bank in Norway and the fund is ultimately accountable to the parliament. It is important to set clear fund objectives, establish fiscal rules and investment rules and have a clear institutional structure.

**ii.** Setting strong independent supervisory bodies to monitor fund behavior: it is necessary to put in place effective internal control mechanisms in order to ensure compliance with governance rules of natural resource funds for the public interest. With this regard, regular follow-up of the legislature or its assigned committee to the role or an independent supervision body which is accountable to the legislature and the justice such as national or international independent formal supervisory bodies should help to exert external pressure on policymakers and fund managers. The Natural Resource Governance Institute states that an independent external oversight promotes compliance with the rules and managers of Natural Resource Funds should be accountable to the legislature, the comptroller, auditor-general or other independent formal supervisory body, the judiciary, external independent auditors, fiscal councils, civil society and the press, and even the IMF or other international organizations.

An effective independent supervision is possible when the team of supervisors has enough expertise in the topic under investigation, possesses the power or capacity to investigate, has access to information, holds enforcement powers, and is integrated with the institutional environment. Independent supervisory bodies can enhance good financial management by praising compliance with the rules and good fund governance or discourage poor behavior through judiciary measures and sanctions.

iii. Regular extensive disclosures and audits: Good fund governance requires a strong degree of transparency through regular disclosures of periodic reports on the fund activities to the public, which would be set up in an accessible format clearly and freely readable by the public. This would be highlighted by an access of the public to all regulations, policy documents, quarterly financial statements, internal controls and independent external audits, and all in line with international standards. According to the Natural Resource Governance Institute, an easy public access to comprehensible regular reports would also include information about governance rules, financial flows in and out, the size of funds specific assets, returns on investments, investment strategy and names of fund managers. Also, the internal and external audits may be disclosed to the public. Transparency helps provide adequate information and improve the data quality needed in the monitoring of the fund's operations and scrutinizing of its performance, what allows oversight teams, regulatory agencies, parliaments to do an efficient follow-up. This can encourage compliance with fiscal rules and investment rules to public expectations and government objectives. Transparency constitutes one of the fundamentals of accountability and a critical step towards more effective management. Transparency may also help to put in place a strong institutional system that will limit the discretionary behavior of governments or small groups of decision-makers over the use of resource revenues. Briefly, it can finally help to enhance incentives of public officials to manage efficiently the resource fund and respond to the need of the population.

### **III.5. Role of natural resource funds during crises**

These paragraphs report the performances recorded by existing fiscal instruments in secure economic stability in resource rich countries through counter-cyclical fiscal policies. The experience lived by resource dependent countries during the 2008-09 crises and the persistent commodity price fall beginning in 2014 shows the challenging management of existing fiscal instruments during crisis. The power of external shocks to threaten the risk management capacity of existing savings and stabilization instruments also highlights the need for increased domestic investment (public and private) of resource windfalls, and better coordination between fiscal mechanisms and monetary policies (Heuty and Aristi, 2010).

The 2008-09 crisis has been a hard blow for resource dependent countries. The crisis followed the period characterized by higher energy prices enjoyed from the beginning of the decade, the booming period during which many resource producing countries experienced expansionary fiscal policies. The end of upswings followed by sharp decline in energy prices challenged the fiscal management in resource dependent countries. The oil price per barrel fell down by 68.7 percent in the second semester of 2008 only, jumping from USD 132.6 per barrel in July 2008 to USD 41.5 by the end of the year. The same situation occurred on the level of the natural gas price which declined by 47.3 over the same period, from USD 11.1 to USD 5.8 per barrel over the same period. However, this crisis did not last, the energy prices recovered rapidly by the end of 2009; crude oil had already reached USD 71.6 per barrel by august 2009 but the price of natural gas weakened and as of the end 2015, it did not catch up even the price level of the end 2008.

During this difficult period, countries with stabilization funds punctured them to cover the fiscal deficit and curb the effects of the crisis. Countries like Kazakhstan and Russia used the assets amassed during the boom to preserve the banking sector and stimulate the economy<sup>7</sup>. Others have been able to conduct countercyclical fiscal policy and other flexible tactics thanks to their resource boom reserves. The example of Chile and Botswana suits well with resources-rich countries which have demonstrated the capacity of stabilization funds to counter the effects of the global crisis. The Chilean government invested USD 20 billion from its Economic and Social Stabilization Fund in spurring credit to middle-income families and small and medium-sized businesses and increasing public capital expenditure to put in place new investment in the national copper company. When, the downturn weakened the revenue from diamond, Botswana has used also the resource fund to finance infrastructural project and to boost the economic activity.

However, although the length of the crisis was not large, it has demonstrated limitations of the existing fiscal instrument set up in different resource exporting countries and these would have been high in the case of a lasting crisis. According to Heuty and Aristi (2010), even the resource rich countries that only nominally followed their fiscal rules or fund guidelines, and possessed small stabilization cushions at the end of the boom, saw the benefit of the rapid commodity price recovery, without suffering any deeper impact on their public finances. Indeed, countries with a part of the funds exposed to abroad because placed in riskier holdings such long term investments as in the Saudi Arabia strategy, saw the values of their assets triggered by the global decline. Also, countries with stabilization funds invested in government bonds for budgetary support did not escape to damages brought by in by this crisis. Countries used most of their financial assets to tackle banking crises but even in the present of cushions, many countries would not have been able to rescue their economies from the damages of the crisis if it was to last because in many cases, parts of their wealth funds were converted in financial assets and were exposed to exhaustion. This put into question the capacity of natural resource funds to stabilize the economy in such kind of situations.

The success of the existing fiscal instruments in crisis can be disputable, especially in developing countries with less diversified assets and weakly diversified production. The temptation on the effectiveness of stabilization funds in resource-rich countries was experienced during banking crises in Kazakhstan, Kuwait, Qatar, Nigeria, and Russia and revealed that the assignment of stabilization and wealth saving as the primordial objectives of the existing fiscal instruments remains insufficient to address cyclical challenges or to ensure long-term fiscal sustainability in resource-rich economies. The higher exposure of these countries to the crisis was the result of higher transaction costs and greater vulnerability leading to greater exposure to financial risks and call for a new look at domestic investment to finance economic diversification And the development strategy of resource-rich countries (Heuty and Aristi, 2010).

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<sup>7</sup> In 2008, the Kazakhstan government engaged USD 10 billion to recapitalize the banking sector and support the production. Russian government injected 500 billion rubles (USD16 billion) in the banking sector.

### III.6. A need for economic diversification

Resource dependent developing countries experience a strong need for human capital and infrastructure. Given these needs, their budget is likely to be spent in order cover the gap in capital and physical assets. This reality links the availability of natural resources to the economic growth. The accumulation of physical and human capital through an efficient resource allocation, acquisition and application of modern technology can be the key motivation of policy makers in resource rich countries. We base our mind from a basic neoclassical model of economic growth presented in Idrisov, Kazakova and Polbin (2015) which confirms a positive correlation between the real GDP and oil prices and argues that an increase in oil prices can lead to an acceleration of economic growth in the short term. This would mean that higher oil prices can help to achieve growth in short term but not in long term. The resource income only cannot lead to long-term economic growth; the best allocation of the resource into accumulation of physical and human capital, complemented by the use of modern technology can help to achieve long term growth.

Conservative fiscal policies put in place in resource dependent countries did not sufficiently protect the economies during the hard-financial crisis periods. One of the explanations may be that the design of these funds is primarily oriented to building up sufficient foreign reserves, and practically cares more about short term macroeconomic stabilization and long-term saving than achieving sustainable economic growth and human development. Indeed, most resource rich countries had implemented procyclical fiscal policy during the booming period of the 2000s and relied on classic conservative fiscal tools. However, experience shows that although these countries were growing fiscal surpluses, the non-resource fiscal balance<sup>8</sup> weakened considerably and this increased their exposition on diverse external shocks with consequences such unstable exchange rates, loss of competitiveness, weak domestic investment, non-resource fiscal basis contraction, etc. All these woes explain well the necessity for resource dependent countries to restructure their fiscal instrument in order to diversify the economy and curb the challenges resulting in the high resource dependency.

Policy-makers would be engaged in scaling up their source of production in order to de-link the economy from the resource income which is more volatile, exhaustive and imported from abroad. With this light, the conduct of fiscal policy would target public investment and especially in the non-natural resource fields. This reduction in dependence on the mining sector would be done without undermining private initiatives, but rather, the fiscal policy implemented must work in such a way as to encourage investment in the private sector. In this perspective, the resources at the disposal of the State will not be allocated to current consumption; to mean not in recurrent expenditure of the government, but in growth promoting sectors or projects.

This may constitute a key to progressive substitution of the resource dominance by non-natural resource production in the medium term and expand the employment at same time. Diversifying

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<sup>8</sup> The non-resource deficit is the deficit the country would have if commodity revenues did not exist. Commodity reserves are, by definition, finite and therefore one should not include commodity revenues as income when assessing long-term sustainability.

into manufacturing is considered highly desirable from a policy perspective, as manufactures tend to employ more workers and are highly tradable and could thus help lessen export concentration (IMF 2016a). The success in diversification of the exports will provide increasing opportunities to address employment-related issues and ensure tax base diversification. This will help to delink the economy from the challenging availability of the resource income and even help to achieve long term sustainability.

Government spending should be allocated to acquisition of infrastructure and invested social sphere such as education and health. The education can help to promote better technical skills. This may help reduce the gap in human capita and acquire infrastructure capital necessary for long term socio economic development. Also, resource dependent countries may accumulate public and private capital in order to extend production sphere and accelerate the development. The windfall in saving accumulated in funds can help to finance these great ambitions at the first time and in subsequent periods; investment made can help scaling up the fiscal basis and compensate the role that would be played by resource fund in long run, even after the depletion of the resource.

Today, some countries are taking part at this perspective especially with a view to address the resource revenue exhaustion. Ecuador has laid its fiscal rule at the reduction by at least 0.2 percent of GDP per year in the non-resource deficit of the central government. In Norway, the pioneer in the implementation of funds, fiscal policy target is that the non-oil deficit averages 4 percent of the oil wealth fund. The Russian fiscal policy targets the non-oil deficit to not exceed 4.7 percent of GDP. In Azerbaijan the triennial medium-term planning include the government priorities and the public investment plan, updated annually.

Moreover, some Middle-East countries engaged in strategies aimed at decoupling their economies from natural resource income. Malaysia has diversified its exports since the early 1990s and has succeeded to far overtake oil and gas exports with electronics and construction equipment (Hendrix, 2017). Qatar has began its plan to diversify away from hydrocarbons for years, and this is bearing good results. The Qatar National Vision (QNV) 2030 focuses transformation of the economy away from its hydrocarbon production. According to Edison Report (2016) on Qatar's Investment Fund, the non-hydrocarbon nominal GDP has increased from 41.0% of total GDP in 2011 to 62.6% by the end of 2015. In 2016, more than 45% of budgeted expenditure is allocated in infrastructure project related to health and education.

The following section tries to address different developments of some macroeconomic indicators in four developing countries, Algeria, Cameroon, Gabon, and Nigeria. For more concreteness, we specifically try to link oil and gas resources to other macroeconomic indicators including the GDP growth and the gross capital formation to help understand the behavior of governments in these countries with respect to different stance in energy earnings whether the sights developed in this paper may be extended to many other forms of natural resources. The selection of these countries is based on the fact that they are all relatively dependent on natural resource revenues, especially on external oil earnings. The global look to these countries provides an idea that the downside in oil prices is likely to hamper their financing capacity with



respect to their current spending. Countries which put in place sovereign resource funds, may have avoid absorption of higher incomes in present period led mostly by the increasing budget spending upswings while those which did not are exposed to diverse internal and external risks damaging their fiscal sustainability either in present period or in the long-term period.

A look on different fiscal strategies and tools put in place in those countries would help to get an idea about how these countries have been managing their resource income during the period 2005-2015 and the implications of these instrument son the long and medium-term fiscal sustainability in order to propose an adequate choice of fiscal policy particularly for those selected countries and for developing resource-rich countries in general. X

#### **IV. Recent fiscal developments in the selected energy exporting countries**

We try to look at how some indicators such as GDP, Gross capital formation evolved as a result of the fiscal policies established by governments in the recent developments of oil prices. Public sector expenditure can be used by the government to curb some socio-economic problems such as inequality, unemployment, inflation, etc., or to stimulate economic growth, especially when the government spending is oriented at improving available infrastructure, access to food, health, housing, education, good roads etc. An increase in government spending could be relatively associated to a certain level of economic growth as higher spending may impact positively the economic activities and therefore a better standard of living of the population. The gross capital formation measures the increase in real productive assets in the economy. We suppose a certain level of gross capital formation to be linked to production as it increases the national wealth to be used in further production.

We would have been able to make an empirical study but our analyses would have been limited by our inability to interpret the results obtained due to the fact that we could not control for the effect of donor support such as the World Bank, IMF, African Development Bank and many others indicators to attribute the changes to the energy resource developments alone. Based on this, we have merely a descriptive analysis, relying mainly on the comments contained in the IMF articles for consultations related especially to the selected countries. The case study on these countries gives an idea on the behavior of governments behind unpredictable oil price shocks and the type of fiscal policy put in place.

##### **IV.1. Algeria**

Algeria set up in June 2000 an oil fund, the “Fonds de Régulation des Recettes, (FRR)”, using the surplus from excess tax revenues generated during oil prices windfalls. The fund was established with an aim to cushion the external reserves decline, to service the public debt and to smooth the longer-run stance of the government expenditure. The fiscal rule is based on a conservative oil price assumption used in determining the resources to be transferred into the fund.

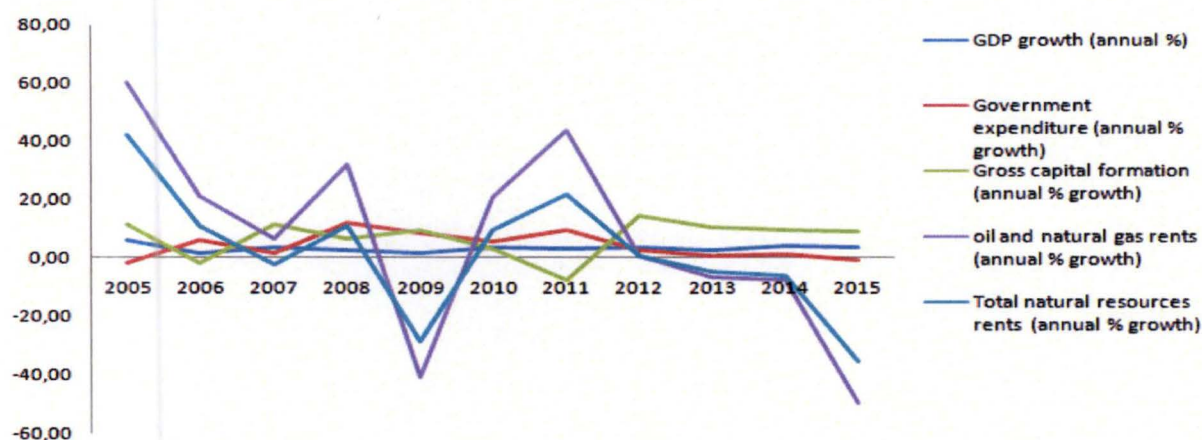
The regulation fund is held into an account of the Central Bank and receives the excess oil revenues, which is the difference between the ruled oil price and the current market oil price. However, The Central Bank of Algeria, by virtue of its status as an autonomous institution, has no right of control over the management and operation of the fund, its governance is more a prerogative of the Ministry of Finance and the Minister of Finance is the chief authorizing officer of this account (Zakia, 2015). The fund is allocated to the budget by parliamentary authorization which is carried out each year with the vote of the law of the finances for the budget of the following year.

The fund receives for about all of its receipts, from exports of hydrocarbons and other raw materials (copper, diamonds, and phosphate). The State collects the income derived from it, either directly from the public operating companies or indirectly through taxes levied on raw materials or royalty licenses. The oil revenues are corrected as royalties (applicable to the value of production determined by regulation at 20% on the basis of international market prices), tax on production (the oil revenue tax) and tax on exploited surface (the superficial tax). Superficial tax is calculated on the basis of the area of the estate at the date of the annual maturity<sup>9</sup>. It is paid into the Consolidated Revenue Fund. The FRR is arbitrated by account No. 302-103 of the Public Treasury opened to the Algerian central bank, of which the balances are carried over each end of the current year. In 2004, the fund was split in two portfolios, a small liquid part and fixed income securities. The returns generated from income securities are used as a part of the budget in form of central bank dividends. The fund is not invested assets abroad in judicious opportunities to generate more wealth.

The government devotes the resource to finance public infrastructure investments and subsidies on basic consumption goods in order to smooth the higher world prices (Sturm, Gurtner and Gonzalez, 2013). Since 2008, budget was based on the reference price of USD 37 per barrel which rose from USD 17 that were established in 2000. However, the decline in the tax surplus, since the second half of 2014 has led the government to progressively use the fund in absorbing the budgetary deficit recorded. The fund which has increased excessively from DA billion 232.1 in 2000 to DA million in 5536.5 in 2013 fell down to DA billion 4408.8 by the end of 2014 as result of the decline in the world petroleum price. From then, the government set up a multiannual fiscal policy. The figure below plots the trends in the last 11 years, of government expenditure, oil and natural gas rents, natural resource rents, government expenditure, gross capital formation and GDP (in annual % growth) in Algeria.

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<sup>9</sup> « La nouvelle loi pétrolière algérienne : direction publique et économie de marché », available on <https://anneemaghreb.revues.org/103>

**Figure 1: Selected indicators in Algeria, 2005 - 2015.** ✕

*Source: author calculation, data from World Bank indicator, May 2017.*

During the period 2005 - 2015, the government has been able to conduct countercyclical fiscal policy. Natural resource rents were dominated by resources from oil and natural gas. The government has been stable except in the downturn of 2008 and 2014-15. In periods of crises, the resource rents are mitigated by the decline of the world commodity prices; this was the case in 2009 and during the period 2012-2015. The country's growth is positive but remained steady stagnant during the whole period of study. The level of capital formation straggled also during the energy prices decline, especially from 2012 to 2015. The oil stabilization fund plays its role mostly in crises: the growth level remained steady thanks to large injection of funds used to finance sizeable public expenditure and stimulate the economic activity in sound global slowdown. The stabilization oil fund has been very useful in this period, in supporting the budget, especially at 75.6 percent in 2015. Recently, the required blocked minimum balance of AD 740 billion has been removed by Budget Act 2017 in order to partially absorb the fiscal deficit in 2017. The higher reliance on hydrocarbon exports makes Algeria in position of vulnerabilities to shocks in demand for hydrocarbons.

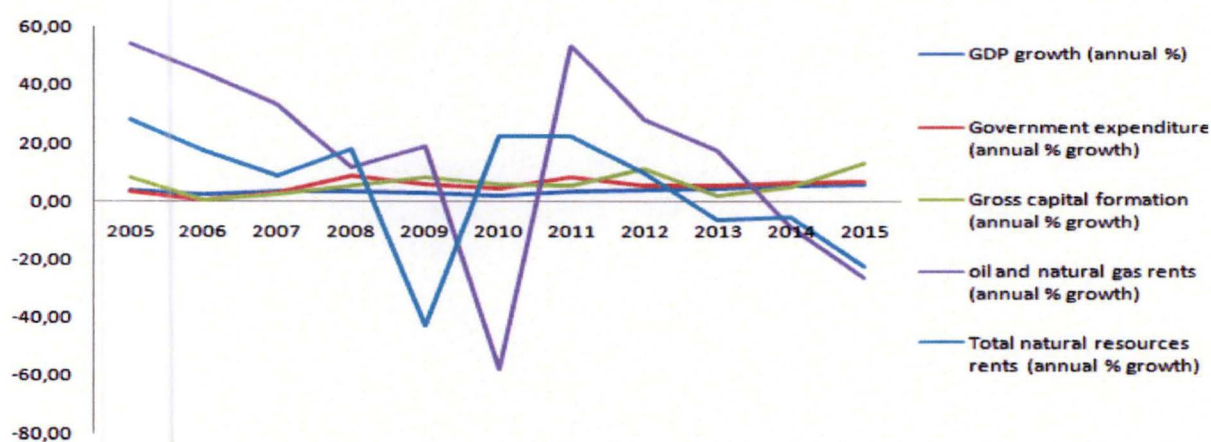
#### IV.2. Cameroon

In Cameroon, oil was discovered in 1977 and since it served as an engine of the economy which grew at an average rate of 9.4% between 1977 and 1986. Oil earnings are in the form of oil production sharing, and royalties and income taxes paid by foreign companies to the state. However, since 1977, oil revenues have never been budgeted; it is carried in an extra-budgetary account, the "Comptes Hors Budget". The management of oil wealth remains a top-secret subject and any information is published about the oil account. This is not a sovereign wealth fund as usually known in the case of the Gulf Cooperation Countries, Norway, Chile or other countries. Big amounts of oil earnings are managed in extra-budgetary accounts and unknown amount of financial investment expenditure are spent directly from this account. This context of opacity has favored the massive diversion of resources. According to Acemoglu and Robinson (2013), only 54% of the accrued oil rents to the Cameroonian government appeared being entered in the government budget whereas the rest "may have been looted".

The National Hydrocarbons Corporation (Société Nationale des Hydrocarbures, SNH), is a single government owned entity founded in 1980, oversees all companies operating in the oil sector and takes an active part in oil production and refined fuel distribution. SNH has an overall responsibility for management of the sector. Its mandate includes the management of the state interests in the oil sector, the promotion, development and monitoring of oil activities throughout the national territory and the commercialization of Cameroon's share of crude oil production (SNH, 2008). The President of the Republic exercises the direct control over SNH, appoints the director of the public corporation, while the General Secretary of the presidency acts as the president of SNH Executive Board.

The state controls 65 percent of oil production (IMF Country Report No. 14/213). Oil plays an important role for exports and government revenues. The royalties and taxes paid by oil companies constitute a big share of the budget affected directly in government expenditure. Natural resource rents account on average for 9.4 percent of GDP, 86.1 percent of the government revenue and 46.18 percent of exports during the period of study. However, the share of oil revenue in government revenue which was above 90 percent before 2009 has declined since to nearly 50 percent at the end of 2015. Oil revenues have been used for capital expenditure financing especially high investment projects such docks, an airport, hydroelectric dams and rural health facilities and settling of debts, and current spending such civil servants' salaries, and semi-public activity subsidies. This significant drop in the contribution of the oil sector to government revenues raises important fiscal concerns as also fiscal transparency remains an area for improvement (Akitoby et al. 2012). The figure 2 depicts the trends in the last 11 years, of government expenditure, oil and natural gas rents, natural resource rents, government expenditure, gross capital formation and GDP (in annual % growth) in Cameroon.

**Figure 2: Selected indicators in Cameroon, 2005 - 2016** ✕



*Source: author calculation, data from World Bank indicator database, May 2017.*

During the last eleven years, oil revenue was not stable in Cameroon but the non-oil revenue related to taxes payable by producers that relate to the production, sale, purchase or use of the goods and services has increased by 65.6 percent. Except in periods of global crisis, the rents from natural resources have been the engine of the economic activity.

Over this period of study, the country has been able to reach an average of growth of 4 percent; from 1.9 percent in 2005 to 4.1 percent in 2012 and 5.1 percent in 2015. The level of capital formation has been also positive with an average well above 5 percent. Before the 2008 financial crisis, the level of growth was low (on average 2 percent) and associated with a decrease in external debts stock from USD 7700.1 million in 2005 to USD 2838.4 million in 2008 as result of the debt forgiveness program benefited. However, the performances since 2009, with an average growth well above 6 percent may be associated with the increase in external debt stock which moved from USD 3240.3 million to USD 3739.4 in 2012 million and shifted to USD 6557.8 in 2015 million. The debt service also slowed at the end of the period compared to the beginning, but the period ends by a slight increase in the last three years as a result of the up shift in external debt stock.

By the way, the country has record progress on some social indicators (see table in annex); the life expectancy at birth has increased by 7.8 percent, from 51.9 in 2015 to 55.9 years in 2015. The Rate of infant, maternal and neonatal mortality have also declined respectively by 15.8 percent, 3.8 percent and 3.7 percent. Labor force has improved by 38 percent shifting from 7.4 million workers to 10.2 million workers. The rate of access to electricity has increased from 47.3 percent to 56.6 percent of the total population.

Although, some progresses have been experienced during the period of observation, there is no basis to expect long term fiscal sustainability because the government spends the overall government oil wealth and downturns in commodity prices may have severe consequences as the country did not put in place any fiscal policy in order to curb negative effects shocks in oil prices.

### **IV.3. Gabon**

The Gabonese economy is highly dependent on its abundant resource industry for an average of 50% of GDP and roughly 80% of the total exports and 60% of budget revenue during the last five years<sup>10</sup>. Instead of the high reliance of the country on the oil sector which was about 30-40% of GDP<sup>11</sup> before the 2008 crisis, other resource mining such as timber and manganese provide additional support. All this show how the economy suffers from the fluctuating prices of natural resources. Today, the government revenue and the economy are challenged by the low prices of primary commodities and the negative impact of the progressive decline of oil income now lasting for more than a decade due to the shrinkage in output which jumped from its peak of 0.37 million barrels per day in 1997 to 0.24 in 2012 and 0.21 million barrels per day in 2015.

<sup>10</sup> Country overview, accessed online on 26/03/2017 on <http://www.worldbank.org/en/country/gabon/overview>

<sup>11</sup> Oil rents (% of GDP) available on <http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators>

The “Fonds pour les Générations Futures, (FGF)” created in 1998, was to receive 10% of budgeted oil revenues, as well as 50% of unexpected income, did not succeed its mission because any deposit was made (NGODI, 2005)<sup>12</sup>. In 2012, the “Fonds pour les Generations Futures” was replaced by the “Fonds Souverain de la République Gabonaise (FSRG)” with an ambition to accumulate saving income for future generations from the oil rents, (Houessou and Wali Wali, 2016)<sup>13</sup> and finance development strategies (development function). The fund began with a billion dollars and receives per year, 10 percent of the total amount of the oil revenues additional to the quarter of the revenues generated by its investments (while the remainder of the returns on investments ( $\frac{3}{4}$ ) is injected in the government budget). The projects financed aim to enable the Gabonese economy, which for the time being, is largely dependent on oil, to diversify. The target is that in the short term, the fund ensures a stabilization function and participates in the budget of the Gabonese state.

The fund is managed by “Fonds Gabonais d'Investissements Stratégiques, (FGIS)”. FGIS invest the fund in different portfolios within and abroad the country through various participations. This help avoiding the concentration risk to the fund. The objective settled is that when the fund will attain a minimum capital of CFA francs 500 billion (approximately EUR 762 million), a part of the resources of the FSRG will be able to finance the state budget and thus invest heavily in the infrastructure projects necessary for growth, said Serge Mickoto Chavagne, head of the FGIS<sup>14</sup>. Note that there are no legal provisions that limit the discretionary power of the government regarding the use of oil revenues. Oil rents are managed in a way that strengthens the presidential control over oil-related revenues to the detriment of parliaments.

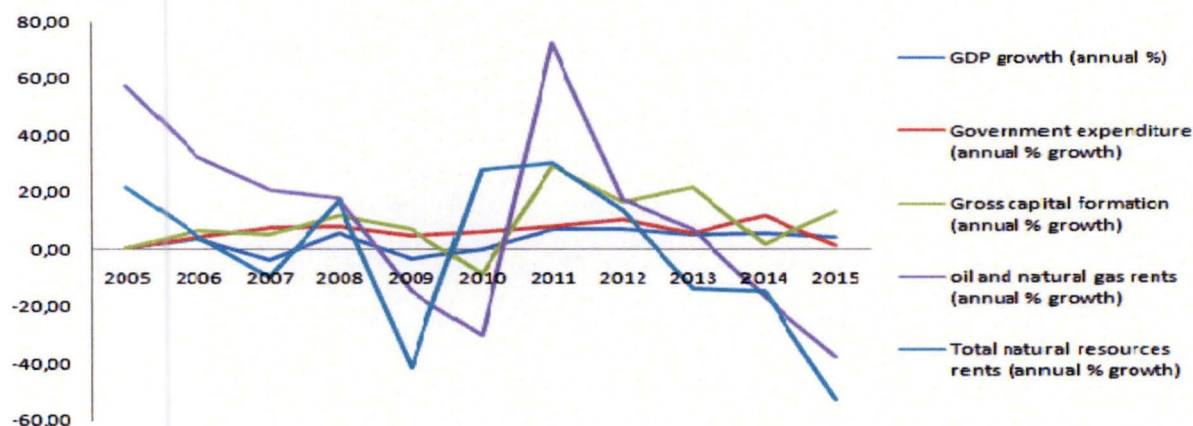
Gabon is reproached the incapacity to locally transform its primary materials. This is however reinforced by the lack of concern related to the lack of resources because the country regularly receives rents from its mineral wealth, also to a weak amount of people in the country (about 1.7 million<sup>15</sup>) leading to a thin internal market but enforced by the lack of entrepreneurial ability of the state and the Gabonese people to benefit from its integration in regional markets, but also to the higher dependence in French consumption goods. As such, the higher dependence in foreign for the exports and imports makes the country subject to worldwide price shocks. Only few prominent local investors are working in small processing and service sectors. The figure 3 shows the trends in the period 2005-2015, of government expenditure, oil and natural gas rents, natural resource rents, government expenditure, gross capital formation and GDP in Gabon.

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<sup>12</sup>Etanislav NGODI, 2005.

<sup>14</sup><http://www.gaboneconomie.net/ge/index.php/dossier/item/2362-fonds-gabonais-d-investissements-strategique-un-outil-au-service-du-developpement-economique>

<sup>15</sup>Country overview, accessed online on 26/03/2017 on <http://www.worldbank.org/en/country/gabon/overview>

**Figure 3: Selected indicators in Gabon, 2005 -2015**

*Source: author calculation, data from World Bank Indicator, May 2017.*

During the period 2005-2008, the Gabonese government has been conducting a procyclical fiscal policy. The large part of the oil revenue was used to repay and restructure its debt conditions, and rebuild external reserves. Public debt was brought down from 126 percent of non-oil GDP in 2003 to 32 percent in 2008, while deposits at the central bank rose to 7 percent of non-oil GDP in 2008. Capital spending was scaled up substantially when oil prices rose, but fell down in 2010 and 2014 as the result of the global crises which dropped down the world commodity prices. Capital spending grew from 8 percent of non-oil GDP in 2008 to about 20 percent in 2011-13, mainly due to financing engaged to improve the country's transport and energy infrastructure and to finance the infrastructure needed to host the 2012 Africa Cup of Nations football championship. Favorable oil prices and the growth in non-oil income have allowed the government to draw on external financing sources to finance part of the scale up. The non-oil annual growth averaged 5 percent during 2005-11 and the GDP growth has averaged about 6 percent in the last four years on the back of substantial scaling. However, Gabon faces many challenges to support and increase its non-oil growth, and the diversification of the economy. The very high level of capital spending challenged fiscal sustainability. Addressing the gap in infrastructures is one of the major tools for sustaining higher non-oil growth.

The “Plan Stratégique Gabon Emergent, (PSGE)” launched in 2010 by the government, which aims to diversify its economy by 2025 has produced improvement in scaling up public investment through construction and services, in its first phase (2010-14) as a result of higher oil revenues. By early 2014, the government started drawing on its deposits, accumulated significant domestic arrears (equivalent to 12 percent of non-oil GDP), and had to resort to central bank statutory advances at the maximum permissible level. In 2014, the government has been forced to undertake a fiscal adjustment and cut back its capital spending to about 10 percent of non-oil GDP to repay part of its arrears. In 2015, economic activity has significantly decelerated due to the oil price shock. Given the downside in oil prices, capital spending also declined and the non-oil revenue worsened<sup>16</sup>. This hampered the country's financing capacity

<sup>16</sup>IMF Country Report No. 16/86

with respect to its current growing public spending. The continued drawdown of fiscal buffers increases the risks to fiscal sustainability and the adequate financing of needed investment.

#### **IV.4. Nigeria**

The Nigerian economy increased its reliance on oil sector in the early 1970s. Crude oil sales income in foreign exchange earnings escalated from 2.5% to 58.1% in 1970, to 93.6% in 1975 and was greater than 98% in first half of the 1980s. Today, the oil sector itself represents more than 90% of nation's foreign exchange revenues and contributes for over 75% on the government revenues. However, the exports of more than 2 million barrels a day in 2010 shrank to 1,748 million barrels per day in 2015.

Nigeria has established in 2004 the Nigerian sovereign wealth fund which corrects a part of oil resources, held at the central bank (in the names of the various government entities) under the Excess Crude Oil account cumulating the surpluses gained from the excess oil reserves from the difference between the budgeted oil prices and the actual market oil prices or the oil production level. The provision of Excess Crude Oil account is that oil revenues above the budgeted level of prices and production are transferred to the Excess Crude Oil account. The funds is assigned a stabilization role aimed to close budget deficits due to oil price volatility, and potentially to fund domestic infrastructure investments needed to promote economic growth (Bala-Gbogbo, Elisha, 2012).

Nigeria is a Federal State comprising 36 States and 774 Local Governments, each level of government, States and local governments rely on the revenue from the federation account. The revenue allocation in Nigeria takes two fundamental components used for the disbursement of the Federation Account under vertical allocation formula (VAF) and horizontal allocation formula (HAF). The VAF attributes resources at each of the three tiers of government, at federal, states and local level while the HAF is applicable to the states and local level on the basis of the volume of revenue already allocated enbloc to the 36 States and 774 Local Governments (Bashir, 2008).

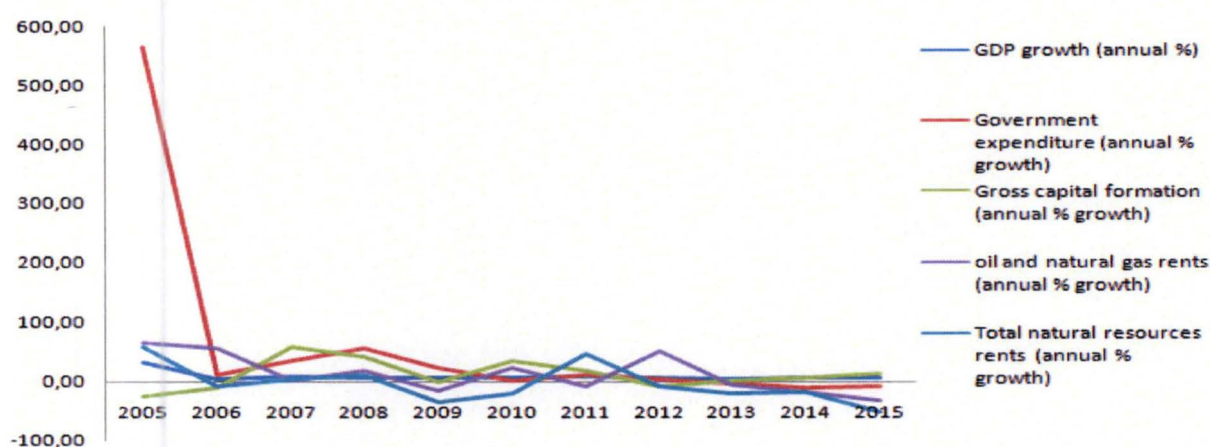
Oil receipts are a shared revenue source and, in recent years, oil revenue distributions were based on a budget oil price, with oil revenues above saved budgeted amounts. During the 1981 - 2002, more than 90 percent of the Excess oil funds were shared between the three tiers of government and about 4.5 to 8.5 percent comprised in special funds. Since 2004, the allocation operates only within the three tiers of government under an oil price based fiscal rule under the Fiscal Responsibility Act, institutionalized by the constitution through a medium term fiscal strategy targeting the non-oil primary deficit. The oil-price-based fiscal rule in place since 2004 is based on political agreement.

The agreement provided for an allocation of oil revenues, according to different shares, is based on a budget oil price and volume of production. Oil revenue is allocated to the three tiers of government, federal, state and local. Oil producing states receive 13% upfront and of the remaining 87% constitute the distributable portion between the federal governments at 52.7%,



the states at 26.7%, and local government 20.6% (see Okechukwu, 2015, p. 28). Oil revenues in excess of the budget oil price and production level are transferred into the “excess crude account” at the central bank in the names of the various government entities. The oil-price-based fiscal rule helps to contain the inflation resulting in expansionary spending during positive oil stances and cushion the effects of the volatile oil prices at macroeconomic level. It has also delinked fiscal spending at all tiers of government from oil revenue fluctuations<sup>17</sup>. The rule is instrumental in keeping spending in line with absorptive capacity and improving macroeconomic stability. The figure 4 shows the trends in the period 2005-2015, of government expenditure, oil and natural gas rents, natural resource rents, government expenditure, gross capital formation and GDP in Nigeria.

**Figure 4: Selected indicators in Nigeria, 2005-2015** X



*Source: author calculation, data from World Bank indicator, May 2017.*

Nigeria has been able to maintain its average growth rate well above 6 percent during the period 2004-2011 as a result of meaningful external reserves earned in higher priced oil exports recorded during 2004-08, which helped also to boost the stabilization fund. The country has benefited also important capital inflows since 2011 with the introduction of the domestic financial markets and its access to international capital markets; Nigeria issued its first sovereign Eurobond in 2011, and two more in 2013<sup>18</sup>. However, the trend was not maintained from 2012 to 2014 as a result of the decline in new investment straggled by the recent oil price busts beginning in 2009. The growth rate declined from 7.8 percent in 2011 to 4.8 and 4.2 percent in 2012 and 2014 before an increase of 5.3 percent and 6.3 percent respectively in 2014 and 2015. The government cut spending due to lower oil revenues hampered new capital expenditure. This may be explained also by the low non-oil revenue collection. Nigeria’s non-oil revenue is one of the lowest among major commodity producers. In 2014, non-oil tax revenue was estimated at only 4 percent of GDP, considerably below to the average of 15 percent of GDP for other oil exporters<sup>19</sup>. However, the lower growth rate of the Nigerian

<sup>17</sup> IMF Country Report No. 08/64.

<sup>18</sup> IMF Country Report No. 16/102

<sup>19</sup> IMF Country Report No. 16/101

economy has resulted in a renewed focus on economic diversification, promoting growth in the private sector, and driving job growth (World Bank country overview of April 2017).

## V. Conclusion

Resource-exporting countries are highly dependent on the resource revenue. Resource price cycles are volatile and unpredictable and even exhaustive and expose resource-owner economies to diverse types of internal and external shocks, including rising exchange rates, loss of competitiveness, crowding out of domestic investment, weak tax efforts, and so on. It is difficult for oil dependent countries to adjust to such exogenous shocks. These imbalances are associated with challenging macroeconomic and fiscal management and have raised an attention of resource rich countries to find how to limit their high dependence on the availability of the revenue from natural resources.

Many resource dependent countries have adopted different tools to deal with such situation, under different considerations, either for short, medium and long-term objectives depending on countries whether others chosen to spend the resource earning returns without any safeguard. Those tools can be a powerful instrument of protection against foreign influences and market forces as they prevent countries from the absorption of higher incomes in present period led mostly by the increasing budget spending upswings. They may also bring institutional solutions at the disposal of the governments' political economic incentives, if political actors are constrained to increase transparency or decrease their current short-term spending.

During the 2008-09 crisis, countries with stabilization funds punctured them to cover the fiscal deficit and curb the effects of the crisis. Others have been able to conduct countercyclical fiscal policy and other flexible tactics thanks to their resource boom reserves. The example of Chile and Botswana suits well with resources-rich countries which have demonstrated the capacity of stabilization funds to counter the effects of the global crisis. However, the case of some countries has proven that natural resource funds suit well with the short-term stabilization tools; in time of crises, their successfulness can be limited with the length of the crisis, as funds tend to deplete in short time during crises. Even countries with stabilization funds invested in government bonds for budgetary support did not escape to damages brought by in by this crisis. But, it has been damaging for countries with a part of their funds invested abroad, especially when funds are in riskier holdings such long term investments as in the Saudi Arabia strategy, in which case the values of their assets were triggered by the global decline.

Countries used most of their financial assets to tackle banking crises but even in the present of funds many countries would not have been able to rescue their economies from the damages of the crisis if it was for long time because in many cases their assets in financial assets were even on the brink of exhaustion. This put into question the capacity of natural resource funds to stabilize the economy in such kind of situations. The temptation on the effectiveness of stabilization funds in resource-rich countries was experienced during banking crises in some countries wherein Kazakhstan, Kuwait, Qatar, Nigeria, and Russia and leveled that the assignment of natural resource funds as the primordial objectives of the existing fiscal

instruments remains insufficient to address cyclical challenges or to ensure long-term fiscal sustainability in resource-rich economies. The higher exposition of these countries to the crisis resulted in higher transaction costs, more vulnerability and greater exposure to financial risks and call for a fresh look at domestic investment to finance economic diversification and development strategy of resource rich countries.

Conservative fiscal policies put in place in resource dependent countries did were not sufficient enough to protect economies during the hard-financial crisis periods. One of the explanations may be that the design of these funds is primarily oriented to building up sufficient foreign reserves, and practically cares more about short term macroeconomic disequilibrium and long-term savings. Policy-makers would be engaged in scaling up their source of production in order to de-link the economy from the resource income which is more volatile, exhaustive and imported from abroad. With this light, the conduct of fiscal policy would target public investment, especially in the non-natural resource fields. This reduction in dependence on the resource sector can be complemented with the promotion of private initiatives; the fiscal policy implemented must work in such a way as to encourage investment in the private sector. In this perspective, the resources at the disposal of the State will not be allocated to current consumption; to mean not in the recurrent expenditure of the government, but in growth promoting sectors or projects in order to achieve sustainable economic growth and human development.

The diversification of the exports would increase opportunities to address employment-related issues and ensure tax base capacities. This will help to delink the economy from the challenging availability of the resource income and even help to achieve long term sustainability. Government spending allocated to acquisition of infrastructure and invested in social sphere such as education and health will help to promote better technical skills, reduce the gap in human capita and acquire infrastructure capital necessary for long term socio economic development.

To help the government in this task, public and private capital may be accumulated in order to expand the production sphere and accelerate the development. The windfall in saving accumulated in funds can help to finance these great ambitions at the first time and in subsequent periods; investment made can help scaling up the fiscal basis and compensate the role that would be played by resource funds in long run, even after the depletion of the resource. For instance, some countries have chosen the diversification as the basis of their fiscal rules. Ecuador, Norway, Russian and others Middle-East countries have chosen the diversification as a choice model for their economies. The results seen today in Malaysia, Qatar and even in all the cases are evolving appreciably.

In the four selected developing countries, Algeria, Cameroon, Gabon, and Nigeria, the focus on different fiscal strategies and tools put in place, helped to get an idea about how these countries have been managing they resource income during the period 2005-2015 and the implications of their strategies on the long and medium term fiscal sustainability.

The Algeria's Fonds de Régulation des Recettes set up in June 2000, assigned to cushion the external reserves decline, to service the public debt and to smooth the longer-run stance in government expenditure, has played its attribution especially in the recent fall of oil prices. The fund is held in the Central Bank of Algeria and governance operations is more a prerogative of the Ministry of Finance and the Minister of Finance is the chief authorizing officer of this account. The fund is allocated to the budget by parliamentary authorization which is carried out each year with the vote of the law of the finances for the budget of the following year. At the same time, there exist legal provisions that limit the discretionary power of the government regarding the use of oil revenues.

The government the government has been able to stabilize fiscal policy. The higher reliance on hydrocarbon exports makes Algeria in position of vulnerabilities to shocks in demand for hydrocarbons. The buffers are nearly to deplete and the country would suffer from its weak non-oil production. This situation calls for the need to accelerate the economic diversification process.

In Cameroon, the resource earnings are managed in an extra-budgetary account without any fiscal instrument and in a top-secret way and this let a room for potential opacity, massive diversion, etc. The government depended on oil revenues for its overall expenditure. Any fiscal instrument is in place to help curb shock and other challenges. There is no basis to expect long term fiscal sustainability because the government spends the overall government oil wealth and downturns in commodity prices may drive severe consequences in the economy. The country should first put in place an oil wealth fund assigned stabilization and development functions at the beginning in order diversify the economy and delink it from the higher dependence in oil rents and establish in the last time a saving fund in order to preserve the resource for the future.

The Gabon's FSRG established in 2012 concentrated its activities development strategies. No legal provisions are fixed to limit the discretionary power of the government regarding the use of oil revenues. Oil rents are managed in a way that strengthens the presidential control over oil-related revenues to the detriment of parliaments. The "Plan Stratégique Gabon Emergent, (PSGE)" launched in 2010 by the government to diversify the economy by 2025 has produced improvement in scaling up public investment through construction and services, in its first phase (2010-14) as a result of higher oil revenues. The dropdown in oil prices affects capital spending, and substantially, worsen the non-oil revenue. The continued drawdown of fiscal buffers increases the risks to fiscal sustainability and the adequate financing of needed investment. Even engaged in a diversification perspective, the country needs to set up in first time a fund, determine its specific functions and let it work in a transparent way for its effectiveness.

The Nigerian's Excess Crude Oil account established in 2014 with stabilization and development functions has helped to conduct countercyclical fiscal and contain the inflation at macroeconomic level. The fiscal rule has helped in keeping spending in line with absorptive capacity and improving macroeconomic stability and Nigerian economy is now engaged on a strategy of economic diversification, promoting growth in the private sector and job growth.

The choice taken by Nigeria corresponds to what has to be done when pursuing mid and long term fiscal sustainability. However, the country would avoid harmful consequences of non-productive allocation of the oil savings in distributing only a small share of the oil savings, encouraging state and local governments to adopt specific savings funds, and the participation of different states governments in infrastructure projects may allow to reach the diversification target in short time.

From the case of the four selected countries, governments should manage professionally by creating natural resource funds which are subject to clear and transparent objectives and mechanisms and involving all national actors in order to build up a national commitment. Only transparency may help to put in place a strong institutional system that will limit the discretionary behavior of governments or small groups of decision-makers over the use of resource revenues. Transparency is the main fundamental for accountability and the main step towards more effective management. With this view, natural resource funds may help developing countries to manage natural resources with a target to strengthening fiscal sustainability.

Despite their support in terms of huge financial savings, natural resource funds are not an ultimate solution for long-term growth and economic development. The fund would be invested in the non-natural resource fields to allow the diversification of exports with a view to scare up the tax base potentialities. As low-income countries exhibit huge gaps in infrastructure, the main part of the funds could be used to acquire public infrastructure and social sphere services such as education and health to help promote better technical skills, reduce the gap in human capital and acquire infrastructural capital necessary for long term socio-economic development. This may increase also opportunities to address employment-related issues and help to achieve long-term fiscal sustainability.

## Appendix

This appendix provides the definition of the indicators used in the paper. They are exactly as provided in the World Bank Indicator database.

1. Oil rents are the difference between the value of crude oil production at world prices and total costs of production.
2. Natural gas rents are the difference between the value of natural gas production at world prices and total costs of production.
3. Annual growth rate of gross capital formation based on constant local currency. Aggregates are based on constant 2010 U.S. dollars. Gross capital formation (formerly gross domestic investment) consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. Fixed assets include land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. Inventories are stocks of goods held by firms to meet temporary or unexpected fluctuations in production or sales, and "work in progress." According to the 1993 SNA, net acquisitions of valuables are also considered capital formation.
4. Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2010 U.S. dollars. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.
5. Total natural resources rents are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents.
6. Revenue is cash receipts from taxes, social contributions, and other revenues such as fines, fees, rent, and income from property or sales. Grants are also considered as revenue but are excluded here.

*the number of references have been extended*

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Annex 1. Evolution of selected indicators, 2005 - 2015

Country	Indicator	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Algeria	Oil rents (annual % growth)	92,4	-13,2	9,1	44,0	43,8	59,0	22,1	8,8	35,7	-47,2	35,8	43,1	-3,6	-7,2	-7,7	-55,2
	Natural gas rents (annual % growth)	81,8	25,4	-18,8	-2,7	-2,6	69,3	18,2	-4,8	7,9	6,9	-38,9	48,9	38,8	-2,2	-7,4	-19,5
	GDP per capita (annual % growth)	2,4	1,7	4,3	5,9	3,0	4,5	0,2	1,8	0,8	-0,1	1,8	1,0	1,4	0,8	1,8	1,9
	GDP growth (annual %)	3,8	3,0	5,6	7,2	4,3	5,9	1,7	3,4	2,4	1,6	3,6	2,9	3,4	2,8	3,8	3,8
	Government expenditure (annual %growth)	0,1	3,0	9,7	3,4	0,7	-1,9	6,2	1,7	12,1	8,5	5,8	9,8	2,8	0,8	1,1	-1,1
	Gross capital formation (annual % growth)	9,5	12,8	20,9	11,1	10,6	11,4	-1,8	11,2	6,6	9,6	2,9	-7,8	14,3	10,4	9,5	8,7
	Oil and natural gas rents (annual % growth)	89,5	-3,1	-0,4	31,1	34,3	60,5	21,5	6,7	31,9	-41,2	20,7	43,7	0,9	-6,5	-7,6	-49,8
	Total natural resources rents (annual % growth)	76,2	-5,0	5,2	24,2	16,4	42,0	10,6	-2,6	10,7	-28,8	9,3	21,4	0,7	-4,7	-6,1	-35,5
Cameroon	Oil rents (annual % growth)	1,6	-0,5	-0,2	-0,1	0,5	0,4	0,2	0,0	0,2	-0,6	0,4	0,3	0,1	-0,1	-0,1	-0,7
	Natural gas rents (annual % growth)	-	-	-	-	-	-	-	-	27,9	-37,7	-20,6	16,7	73,1	33,1	38,6	-24,6
	GDP per capita (annual % growth)	1,3	1,5	1,8	1,3	1,4	1,1	-0,3	0,6	0,7	0,3	-0,6	0,7	1,5	2,0	2,9	3,3
	GDP growth (annual %)	4,1	4,2	4,5	4,0	4,0	3,7	2,3	3,2	3,3	2,9	1,9	3,3	4,1	4,6	5,6	5,9
	Government expenditure (annual %growth)	6,7	6,4	5,5	3,5	3,4	3,9	0,7	3,0	9,1	6,3	4,6	8,4	5,5	5,5	6,5	7,2
	Gross capital formation (annual % growth)	4,6	9,2	25,2	-2,7	1,2	8,7	0,6	2,5	5,7	8,5	5,9	5,6	11,3	1,9	5,1	13,5
	Oil and natural gas rents (annual % growth)	32,1	160,0	-41,1	-0,2	0,1	54,2	44,1	33,1	11,6	18,9	-58,0	53,2	28,2	17,6	-8,7	-26,2
	Total natural resources rents (annual % growth)	102,5	-39,3	-7,5	7,3	15,2	28,3	17,7	8,9	17,8	-43,0	22,3	22,5	9,9	-6,4	-5,3	-22,6
Gabon	Oil rents (annual % growth)	0,5	0,5	-0,3	-0,1	0,0	0,3	0,3	-0,1	0,0	0,1	-0,4	0,5	0,3	0,1	-0,1	-0,2
	Natural gas rents (annual % growth)	172,1	32,4	-16,0	-14,8	1,2	34,4	47,7	-8,4	29,5	21,9	-12,8	68,5	60,2	-30,5	9,6	-16,2
	GDP per capita (annual % growth)	-11,2	-4,2	-0,2	-2,5	0,0	-1,5	1,6	-5,8	3,3	-5,5	-2,1	4,7	4,7	2,9	3,3	2,0
	GDP growth (annual %)	-8,9	-1,9	2,1	-0,3	2,3	0,7	3,9	-3,6	5,7	-3,3	0,1	7,1	7,1	5,3	5,6	4,3
	Government expenditure (annual %growth)	-16,9	-6,4	16,6	2,8	1,1	0,6	4,1	7,6	8,1	4,9	6,3	8,2	10,2	5,8	11,9	1,6
	Gross capital formation (annual % growth)	-38,8	-8,3	10,7	22,9	-17,4	0,7	6,5	5,3	11,9	7,2	-8,4	29,3	16,5	21,9	2,0	13,5
	Oil and natural gas rents (annual % growth)	78,2	49,9	-27,1	9,7	15,3	57,4	32,3	20,9	18,2	-14,5	-30,2	72,6	17,7	7,3	-16,3	-37,7
	Total natural resources rents (annual % growth)	32,0	-30,0	-10,3	6,5	17,5	21,8	4,8	-9,5	17,1	-41,4	27,9	30,3	14,0	-13,5	-14,6	-52,6
Nigeria	Oil rents (annual % growth)	63,2	61,3	-16,7	-30,2	14,1	74,1	25,8	-4,8	1,1	10,5	-37,8	-11,8	43,9	-10,2	-18,8	-18,8
	Natural gas rents (annual % growth)	350,2	68,2	-38,4	39,1	12,0	63,1	38,3	28,0	13,6	-32,2	-48,9	102,8	38,9	-30,5	6,8	-18,4
	GDP per capita (annual % growth)	-2,0	2,7	1,8	1,2	7,6	30,3	0,8	5,4	4,0	3,5	4,1	5,0	2,1	1,5	2,6	3,5
	GDP growth (annual %)	0,5	5,3	4,4	3,8	10,4	33,7	3,4	8,2	6,8	6,3	6,9	7,8	4,9	4,3	5,4	6,3
	Government expenditure (annual %growth)	1,7	1,6	-12,1	5,8	-23,9	565,5	10,5	35,8	56,8	24,0	0,7	11,9	4,6	-2,0	-10,3	-7,0
	Gross capital formation (annual % growth)	-2,9	17,0	-21,9	20,3	50,1	-24,0	-10,4	59,3	41,7	-0,7	34,8	18,3	-7,9	3,4	7,8	13,0
	Oil and natural gas rents (annual %growth)	115,0	46,7	4,6	-21,2	33,1	66,2	56,7	1,7	18,1	-16,1	23,2	-7,2	52,9	-5,0	-16,6	-31,6
	Total natural resources rents (annual % growth)	41,9	-13,3	-27,4	11,6	30,5	58,0	-8,7	4,7	10,9	-33,3	-19,4	46,0	-7,5	-19,1	-17,2	-50,1

Source: World Bank Indicators

Annex 2. Crude Oil (petroleum) Monthly Price - US Dollars per Barrel<sup>20</sup>

Month	Price	Monthly change	Month	Price	Monthly change	Month	Price	Monthly change
Apr 2007	65.10	-	Aug 2010	75.88	1.83 %	Dec 2013	105.49	2.84 %
May 2007	65.10	0.00 %	sept-10	76.11	0.30 %	janv-14	102.25	-3.07 %
juin-07	68.19	4.75 %	oct-10	81.72	7.37 %	Feb 2014	104.82	2.51 %
juil-07	73.67	8.04 %	nov-10	84.53	3.44 %	mars-14	104.04	-0.74 %
Aug 2007	70.13	-4.81 %	Dec 2010	90.07	6.55 %	Apr 2014	104.94	0.87 %
sept-07	76.91	9.67 %	janv-11	92.66	2.88 %	May 2014	105.73	0.75 %
oct-07	82.15	6.81 %	Feb 2011	97.73	5.47 %	juin-14	108.37	2.50 %
nov-07	91.27	11.10 %	mars-11	108.65	11.17 %	juil-14	105.22	-2.91 %
Dec 2007	89.43	-2.02 %	Apr 2011	116.32	7.06 %	Aug 2014	100.05	-4.91 %
janv-08	90.82	1.55 %	May 2011	108.18	-7.00 %	sept-14	95.89	-4.16 %
Feb 2008	93.75	3.23 %	juin-11	105.85	-2.15 %	oct-14	86.13	-10.18 %
mars-08	101.84	8.63 %	juil-11	107.88	1.92 %	nov-14	76.96	-10.65 %
Apr 2008	109.05	7.08 %	Aug 2011	100.45	-6.89 %	Dec 2014	60.55	-21.32 %
May 2008	122.77	12.58 %	sept-11	100.83	0.38 %	janv-15	47.45	-21.64 %
juin-08	131.52	7.13 %	oct-11	99.92	-0.90 %	Feb 2015	54.93	15.76 %
juil-08	132.55	0.78 %	nov-11	105.36	5.44 %	mars-15	52.83	-3.82 %
Aug 2008	114.57	-13.56 %	Dec 2011	104.26	-1.04 %	Apr 2015	57.42	8.69 %
sept-08	99.29	-13.34 %	janv-12	106.89	2.52 %	May 2015	62.50	8.85 %
oct-08	72.69	-26.79 %	Feb 2012	112.70	5.44 %	juin-15	61.30	-1.92 %
nov-08	54.04	-25.66 %	mars-12	117.79	4.52 %	juil-15	54.43	-11.21 %
Dec 2008	41.53	-23.15 %	Apr 2012	113.75	-3.43 %	Aug 2015	45.72	-16.00 %
janv-09	43.91	5.73 %	May 2012	104.16	-8.43 %	sept-15	46.29	1.25 %
Feb 2009	41.76	-4.90 %	juin-12	90.73	-12.89 %	oct-15	46.96	1.45 %
mars-09	46.95	12.43 %	juil-12	96.75	6.64 %	nov-15	43.13	-8.16 %
Apr 2009	50.28	7.09 %	Aug 2012	105.28	8.82 %	Dec 2015	36.56	-15.23 %
May 2009	58.10	15.55 %	sept-12	106.32	0.99 %	janv-16	29.92	-18.16 %
juin-09	69.13	18.98 %	oct-12	103.39	-2.76 %	Feb 2016	31.05	3.78 %
juil-09	64.65	-6.48 %	nov-12	101.17	-2.15 %	mars-16	37.34	20.26 %
Aug 2009	71.63	10.80 %	Dec 2012	101.17	0.00 %	Apr 2016	40.75	9.13 %
sept-09	68.38	-4.54 %	janv-13	105.04	3.83 %	May 2016	45.98	12.83 %
oct-09	74.08	8.34 %	Feb 2013	107.66	2.49 %	juin-16	47.69	3.72 %
nov-09	77.56	4.70 %	mars-13	102.61	-4.69 %	juil-16	44.22	-7.28 %
Dec 2009	74.88	-3.46 %	Apr 2013	98.85	-3.66 %	Aug 2016	44.84	1.40 %
janv-10	77.12	2.99 %	May 2013	99.35	0.51 %	sept-16	45.06	0.49 %
Feb 2010	74.72	-3.11 %	juin-13	99.74	0.39 %	oct-16	49.29	9.39 %
mars-10	79.30	6.13 %	juil-13	105.21	5.48 %	nov-16	45.28	-8.14 %
Apr 2010	84.14	6.10 %	Aug 2013	108.06	2.71 %	Dec 2016	52.61	16.19 %
May 2010	75.54	-10.22 %	sept-13	108.78	0.67 %	janv-17	53.63	1.94 %
juin-10	74.73	-1.07 %	oct-13	105.46	-3.05 %	Feb 2017	54.36	1.36 %
juil-10	74.52	-0.28 %	nov-13	102.58	-2.73 %	mars-17	50.91	-6.35 %

<sup>20</sup> <http://www.indexmundi.com/commodities/?commodity=crude-oil&months=120>

Annex 3. Natural Gas Monthly Price - US Dollars per Million Metric British Thermal Unit<sup>21</sup>

Month	Price	Monthly change	Month	Price	Monthly change	Month	Price	Monthly change
Apr 2007	7.60	-	Aug 2010	4.31	-6.91 %	Dec 2013	4.24	17.13 %
May 2007	7.64	0.53 %	sept-10	3.89	-9.74 %	janv-14	4.70	10.85 %
juin-07	7.35	-3.80 %	oct-10	3.43	-11.83 %	Feb 2014	5.98	27.23 %
juil-07	6.22	-15.37 %	nov-10	3.71	8.16 %	mars-14	4.88	-18.39 %
Aug 2007	6.22	0.00 %	Dec 2010	4.25	14.56 %	Apr 2014	4.63	-5.12 %
sept-07	6.07	-2.41 %	janv-11	4.49	5.65 %	May 2014	4.56	-1.51 %
oct-07	6.74	11.04 %	Feb 2011	4.09	-8.91 %	juin-14	4.57	0.22 %
nov-07	7.11	5.49 %	mars-11	3.97	-2.93 %	juil-14	4.01	-12.25 %
Dec 2007	7.13	0.28 %	Apr 2011	4.24	6.80 %	Aug 2014	3.89	-2.99 %
janv-08	7.98	11.92 %	May 2011	4.31	1.65 %	sept-14	3.92	0.77 %
Feb 2008	8.54	7.02 %	juin-11	4.54	5.34 %	oct-14	3.77	-3.83 %
mars-08	9.41	10.19 %	juil-11	4.42	-2.64 %	nov-14	4.10	8.75 %
Apr 2008	10.18	8.18 %	Aug 2011	4.05	-8.37 %	Dec 2014	3.43	-16.34 %
May 2008	11.27	10.71 %	sept-11	3.89	-3.95 %	janv-15	2.97	-13.41 %
juin-08	12.68	12.51 %	oct-11	3.56	-8.48 %	Feb 2015	2.85	-4.04 %
juil-08	11.09	-12.54 %	nov-11	3.26	-8.43 %	mars-15	2.80	-1.75 %
Aug 2008	8.25	-25.61 %	Dec 2011	3.16	-3.07 %	Apr 2015	2.58	-7.86 %
sept-08	7.62	-7.64 %	janv-12	2.67	-15.51 %	May 2015	2.84	10.08 %
oct-08	6.74	-11.55 %	Feb 2012	2.53	-5.24 %	juin-15	2.77	-2.46 %
nov-08	6.70	-0.59 %	mars-12	2.16	-14.62 %	juil-15	2.83	2.17 %
Dec 2008	5.84	-12.84 %	Apr 2012	1.95	-9.72 %	Aug 2015	2.76	-2.47 %
janv-09	5.23	-10.45 %	May 2012	2.43	24.62 %	sept-15	2.65	-3.99 %
Feb 2009	4.49	-14.15 %	juin-12	2.45	0.82 %	oct-15	2.32	-12.45 %
mars-09	3.96	-11.80 %	juil-12	2.96	20.82 %	nov-15	2.08	-10.34 %
Apr 2009	3.49	-11.87 %	Aug 2012	2.84	-4.05 %	Dec 2015	1.92	-7.69 %
May 2009	3.83	9.74 %	sept-12	2.85	0.35 %	janv-16	2.27	18.23 %
juin-09	3.80	-0.78 %	oct-12	3.32	16.49 %	Feb 2016	1.96	-13.66 %
juil-09	3.39	-10.79 %	nov-12	3.54	6.63 %	mars-16	1.70	-13.27 %
Aug 2009	3.14	-7.37 %	Dec 2012	3.34	-5.65 %	Apr 2016	1.90	11.76 %
sept-09	2.99	-4.78 %	janv-13	3.33	-0.30 %	May 2016	1.92	1.05 %
oct-09	4.00	33.78 %	Feb 2013	3.33	0.00 %	juin-16	2.57	33.85 %
nov-09	3.68	-8.00 %	mars-13	3.81	14.41 %	juil-16	2.79	8.56 %
Dec 2009	5.35	45.38 %	Apr 2013	4.17	9.45 %	Aug 2016	2.79	0.00 %
janv-10	5.84	9.16 %	May 2013	4.04	-3.12 %	sept-16	2.97	6.45 %
Feb 2010	5.32	-8.90 %	juin-13	3.83	-5.20 %	oct-16	2.95	-0.67 %
mars-10	4.29	-19.36 %	juil-13	3.62	-5.48 %	nov-16	2.50	-15.25 %
Apr 2010	4.04	-5.83 %	Aug 2013	3.42	-5.52 %	Dec 2016	3.58	43.20 %
May 2010	4.15	2.72 %	sept-13	3.62	5.85 %	janv-17	3.26	-8.94 %
juin-10	4.80	15.66 %	oct-13	3.68	1.66 %	Feb 2017	2.82	-13.50 %
juil-10	4.63	-3.54 %	nov-13	3.62	-1.63 %	mars-17	2.87	1.77 %

<sup>21</sup> <http://www.indexmundi.com/commodities/?commodity=natural-gas&months=120>

## Annex 4: Social indicators of Algeria

Series name	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Net taxes on products (constant LCU)	346,5	325,3	349,6	389,5	424,3	440,7	441,2	519,8	591,1	618,2	652,1
Number of under-five deaths	21835	22336	23031	23742	24345	24683	24899	24980	24920	24676	24269
Number of infant deaths	18959	19565	20269	20972	21491	21820	21805	21801	21619	21375	20899
Number of maternal deaths	1000	1100	1100	1200	1300	1300	1300	1400	1400	1300	1300
Number of neonatal deaths	12811	13301	13949	14482	15013	15299	15474	15456	15340	15138	14773
Labor force, total	10	10,2	10,4	10,6	10,8	11,1	11,3	11,5	12	12,2	12,4
Life expectancy at birth, total (years)	72,2	72,6	72,9	73,2	73,5	73,8	74,1	74,3	74,6	74,8	75
Lifetime risk of maternal death (%)	0,4	0,4	0,4	0,4	0,4	0,4	0,4	0,4	0,4	0,4	0,4
Consumer price index (2010 = 100)	81,8	83,7	86,8	91	96,2	100	104,5	113,8	117,5	120,9	126,7
Debt forgiveness or reduction (current US\$)	0	0	0	0	0	0	0	-76,7	0	0	0
Debt forgiveness grants (current US\$)	38,1	24	0	0	0	0	0	0	0	0	0
Debt service on external debt, total (TDS, current US\$)	5987	13425	1368,5	1251,6	1055,4	676,2	639,3	864,8	539	294,8	691,1
Domestic credit to private sector (% of GDP)	11,9	12,1	13	12,8	16,3	15,2	13,7	14	16,5	18,3	21,9
External debt stocks, total (DOD, current US\$)	17092	5910,8	6134,5	6246,4	7420,9	7260,3	6064,7	5515,6	5245,6	5521,3	4677
School enrollment, primary (% gross)	107,7	108,3	109,6	109,3	112,4	115,5	116,7	118,3	119,8	118,7	116,2
School enrollment, secondary (% gross)	78,8	79,8	70,3	76,8	93,1	97,2	99,9	..	..	..	..
Access to electricity (% of population)	98,2	98,5	98,8	99,3	99,4	99,7	99,9	100	100	100	..
Access to electricity, rural (% of rural population)	96,5	96,8	97,1	97,9	97,8	98,1	98,5	98,9	99,2	99,6	..
Access to electricity, urban (% of urban population)	99,1	99,4	99,7	100	100	100	100	100	100	100	..

**Source:** World Bank Indicators

**Annex 5: Social indicators of Cameroon**

Series name	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
'Net taxes on products (constant LC billion)	579,4	621,7	639,8	678,1	711,0	714,0	762,1	790,2	848,6	923,0	959,3
Number of under-five deaths	87618	86221	84665	83054	81359	79323	77598	75910	74208	72574	71348
Number of infant deaths	55508	54610	53782	52768	51947	50648	49922	49046	48149	47365	46762
Number of maternal deaths	5300	5400	5400	5500	5500	5400	5300	5200	5100	5100	5100
Number of neonatal deaths	21890	21894	21773	21613	21521	21509	21329	21157	21143	21118	21071
Labor force, total million	7,4	7,7	7,9	8,2	8,5	8,8	9,1	9,3	9,6	9,9	10,2
Life expectancy at birth, total (years)	51,9	52,2	52,5	52,9	53,3	53,7	54,1	54,6	55,0	55,5	55,9
Consumer price index (2010 = 100)	85,7	90,1	91,0	95,8	98,7	100,0	102,9	106,0	108,0	110,1	113,1
Debt forgiveness or reduction (current USD million)	-227,0	-4503,5	-293,1	-33,6	-15,5	-63,7	0,0	-1,0	0,0	0,0	0,0
Debt forgiveness grants (current USD million)	208,1	2827,8	1382,0	511,5	36,5	21,7	4,5	2,7	0,7	0,7	0,3
Debt service on external debt, total (TDS, current USD million)	818,9	494,2	486,1	437,9	402,3	202,6	332,0	237,5	208,2	437,1	422,2
Domestic credit to private sector (% of GDP)	9,9	9,5	9,7	10,9	11,5	12,5	14,2	14,1	14,8	15,6	16,4
External debt stocks, total (DOD, current USD million)	7700,1	3418,6	3088,2	2838,4	3240,3	3191,0	3094,9	3739,4	4915,4	5162,3	6557,8
School enrollment, primary (% gross)	100,3	99,3	101,3	101,6	103,9	106,2	105,9	110,8	..	113,6	117,1
School enrollment, secondary (% gross)	26,6	23,2	31,8	35,9	39,6	..	47,3	50,5	52,3	56,4	58,1
Access to electricity (% of population)	47,3	49,0	48,2	50,7	51,8	53,0	53,7	55,3	56,5	56,8	..
Access to electricity, rural (% of rural population)	18,5	14,0	23,4	19,6	20,0	20,4	18,5	21,3	21,7	22,2	..
Access to electricity, urban (% of urban population)	77,9	85,2	73,3	81,4	82,5	83,6	86,1	85,9	86,9	86,5	..

**Source:** World Bank Indicators

## Annex 6: Social indicators of Gabon

Series name	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Net taxes on products (constant LCU)	342,7	329,8	381,6	373,2	463,7	450,5	478,4	502,5	527,1	557	574,1
Number of under-five deaths	3201	3165	3120	3062	3011	2951	2892	2811	2717	2630	2579
Number of infant deaths	2102	2096	2079	2060	2047	2032	2004	1965	1912	1885	1852
Number of maternal deaths	160	160	160	160	160	160	160	160	160	150	150
Number of neonatal deaths	1186	1194	1207	1222	1228	1235	1233	1228	1223	1218	1195
Labor force, total	494,9	489,2	482,4	474,8	466,5	457,4	470,3	483,9	498	512,5	529,6
Life expectancy at birth, total (years)	59,5	59,9	60,4	60,9	61,5	62,1	62,7	63,3	63,8	64,4	64,9
Lifetime risk of maternal death (%)	1,6	1,6	1,5	1,4	1,4	1,4	1,3	1,3	1,3	1,2	1,2
Consumer price index (2010 = 100)	88,7	87,5	91,9	96,7	98,6	100	101,3	104	104,5	109,3	110
Debt forgiveness or reduction (current US\$)	0	0	32,6	143,6	0	0	0	1,2	2,8	0	0,4
Debt forgiveness grants (current US\$)	3	0,1	0,1	0,1	30,4	10,1	8,5	8,8	2,6	2,8	2,2
Debt service on external debt, total (TDS, current US\$)	194,1	171,5	861,4	2633,9	403,4	424,5	387	390,7	1129,5	401,3	396,4
Domestic credit to private sector (% of GDP)	8,6	9,7	10	8,7	10,1	8,2	9,5	11,3	15	14,5	14,6
External debt stocks, total (DOD, current US\$)	3896,9	4203,3	4859,8	2152,8	2324,5	2523,9	2798,4	2869,7	4323,2	4303,4	5097,3
School enrollment, primary (% gross)	..	..	..	..	..	..	142	..	..	..	..
School enrollment, secondary (% gross)	..	..	..	..	..	..	..	..	..	..	..
Access to electricity (% of population)	81,6	81	82	83,1	84,1	85,2	86,3	89,3	86,4	89,5	..
Access to electricity, rural (% of rural population)	34,6	35,1	35,9	36,8	37,7	38,6	39,5	44,9	37,4	42,3	..
Access to electricity, urban (% of urban population)	90,9	89,8	90,5	91,3	92,1	93	93,8	96,3	93,9	96,6	..

**Source:** World Bank Indicators



## Annex 7: Social indicators of Nigeria

Series name	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Net taxes on products (constant LC billion)	-88,4	514,1	661,5	793,4	840,4	857,1	669,3	740,2	724,1	824,7	756,8
Number of under-five deaths	888926	875564	859543	843274	826798	811738	798817	786546	775020	762534	750111
Number of infant deaths	551799	544082	536041	528031	519884	513166	506889	501384	496561	490812	484368
Number of maternal deaths	56000	54000	55000	52000	57000	57000	55000	56000	57000	58000	58000
Number of neonatal deaths	244299	242743	242060	241224	241063	241117	241207	240810	241561	240955	240106
Labor force, total million	43,3	44,4	45,7	47,0	48,3	49,7	51,2	52,6	54,2	55,8	57,5
Life expectancy at birth, total (years)	48,7	49,2	49,8	50,4	50,9	51,3	51,7	52,1	52,4	52,8	53,0
Lifetime risk of maternal death (%)	5,5	5,1	5,1	4,8	5,1	4,9	4,7	4,6	4,6	4,6	4,5
Consumer price index (2010 = 100)	61,9	67,0	70,7	78,8	87,9	100,0	110,8	124,4	134,9	145,8	158,9
Debt forgiveness or reduction (current USD million)	7283,5	10887,0	0,0	0,0	0,0	0,0	0,0	0,0	23,0	0,0	0,0
Debt forgiveness grants (current USD million)	5547,9	9666,0	763,3	72,5	0,0	18,3	0,0	0,0	0,0	0,0	0,0
Debt service on external debt, total (TDS, current USD million)	8807,1	6710,1	1010,5	686,1	757,2	1256,9	525,2	1337,2	495,7	4545,9	1469,7
External debt stocks, short-term (DOD, current USD million)	3,1	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,5	0,2	0,2
External debt stocks, total (DOD, current USD million)	25755,0	9617,4	12145,0	13129,0	15942,0	15484,0	17663,0	18127,0	21144,0	24756,0	29029,0
School enrollment, primary (% gross)	100,9	101,7	92,9	83,8	85,0	84,7	90,2	91,7	93,7	..	..
School enrollment, secondary (% gross)	34,7	34,2	31,6	35,1	38,9	43,8	45,2	46,8	55,7	..	..
Access to electricity (% of population)	47,9	48,9	50,0	50,3	52,2	48,0	55,9	55,4	55,6	57,7	..
Access to electricity, rural (% of rural population)	29,4	30,5	31,5	31,4	33,7	34,9	35,5	37,0	34,4	39,3	..
Access to electricity, urban (% of urban population)	76,6	76,7	76,8	76,7	77,1	65,0	81,5	77,7	80,4	78,4	..

**Source:** World Bank Indicators