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Oil rents and institutional quality: empirical evidence from Algeria

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Abstract

This paper examines the interaction between natural resource abundance and institutional quality in Algeria, using two measures of institutional quality (corruption and democratic accountability), and a measures for resource endowment (oil rents as a percentage of GDP). Our results indicate that an increase in oil rents significantly increase corruption in Algeria, while the interaction effect between oil rents and democratic accountability is positive and statistically significant, which means that enhancing democratic institutions can reduce corruption. It is also revealed that the manufactures exports significantly decline in the aftermath of oil rents shock, a pattern consistent with the Dutch Disease phenomenon. On the one hand, these findings confirms that Algeria's institutional framework demonstrates a high degree of perceived weakness, and on the other hand, enhancing these institutional environment would reduce corruption, and increase the impact of resource abundance on economic development.

Keywords: Resource Curse, Oil rents, Corruption, Institutional Quality, Algeria.

JEL Classification: Q26, Q20, O13

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1. Introduction

Many natural resource exporters, and specifically oil countries are suffering from the Resource Curse, and are thus unable to develop sectors outside the production and the export of raw materials. In fact, both Economists and political scientists have agreed that the fundamental cause of poor economic performance and hence resource curse, in resource abundant countries (including oil countries) has been poor quality of domestic institutions. Moreover, the idea about the decisive role of institutions in determining whether the abundant of natural resource are a blessing or a curse has found more support in numerous studies (e.g., Acemoglu, 2001; Tornell and Lane, 1999; Acemoglu et al., 2005; Mehlum, Moene and Torvik, 2006; Boschini et al.2007; Robinson, Torvik, and Verdier,2006; Ross, 2012), also, the experience of several resource-rich countries confirms this. Experiences show, however, that resource-rich countries that have successfully escaped the curse problem, are those countries that have implemented a good institutions such as Botswana and Norway. Whereas other unsuccessful resource-rich countries like Nigeria, Angola and Algeria, have completely failed to address the curse, as well as they share especially a common weak institutional environments.

Algeria is an excellent example of a country that has an abundance of and depend heavily on revenues from hydrocarbon exports in particular; and, on the other hand, has failed to use their revenues to diversify their economic base. Algeria is one of the major exporters of oil and gas in Africa. It is the 14th largest world exporter of oil, and is the sixth-largest gas producer.

Algeria's government revenues has increased greatly over recent years, due to the sustained surge in oil price that began in 1999. It has invested more than US\$ 500 billion of these revenues since 2000, an amount greater of that used by the Marshall plan in rebuilding Europe after World War Two. However, these resource revenues have enabled Algeria to achieve macroeconomic stability, to reimburse their external debt, to reduce unemployment through employment young population in the public sector, and to buy a sort of social peace through rent distribution to citizens. On the other hand, this massive inflows of revenues have caused a number of negative effects on the Algerian economy, for instance, a dramatic decline in the production and exports of other economic sectors (caused by the Dutch Disease effect), waste and mismanagement of resource revenues, and consistent with the focus of this study, weak and corrupt institutions.

In this paper, we study the interplay between natural resource abundance and institutional quality in Algeria. Our analysis show that Algeria's institutional framework

demonstrates a high degree of perceived weakness, and that it is the failure of the institutional framework that constitute the most important challenge facing Algerian economy. That is why it is important for Algeria to implement major reforms of their institutions to insure effective and transparent management of oil revenues.

This paper is organized in six sections in addition to the introduction. Section Two summarizes the theoretical framework of the resource curse and its main explanations, by focussing mainly on political and institutional explanations that have been advanced to this phenomenon, and reviews very briefly some existing economic literature reliant resources and institutions. Section three offers an overview of key characteristic of the Algerian economy, in addition to a detailed analysis of Algeria's institutional framework. Section four describes the data and methodology employed in the empirical estimation. Section five presents the results and discussions. Section six discusses the importance of building strong institutional framework in escaping problems related to the curse, and evaluates the experience of Algeria in this context. Section seven concludes.

2. The Resource Curse, theory and literature review

Natural resource abundance has traditionally viewed as a positive determinant of economic development. The empirical support of this view dates back to the late of nineteenth century, where a number of advanced nations endowed with natural resources such as the United States, Britain, Canada, and Australia, experienced particularly rapid industrial development. But, since the 1960s, the experiences of numerous countries that have well-endowed show that the abundance of natural resources do not always lead to increased economic development.

Most recent studies have shown that developing countries with more natural resources tend to have lower rates of growth and underperforms economically and socially compared with resource poor countries. For example, many resource abundant countries in Africa, the Middle East, and Latin America are experiencing less economic performance compared with resource deficient countries such as Japan, Korea, Singapore, Taiwan, and Hong Kong. This puzzling phenomenon became known as the Natural Resource Curse. In fact, The so-called "Natural Resource Curse" suggests that there exists a negative relationship between endowment with natural resources and social and economic development (e.g., Auty, 1993; Sachs and Warner, 1995,1997, 2001).

The concern about the resource curse concept dates back to the middle of sixteenth century. In 1576 the French political philosopher Jean Bodin (1576) claimed that: "*men of a*

fat and fertile soil, are most commonly effeminate and cowards; whereas contrariwise a barren country make men temperate by necessity, and by consequence careful, vigilant, and industrious (As cited in Sachs and Warner (1995))”, means that laziness and sloth is concomitant with resource-abundance. In the eighteenth century, Adam Smith (1776) in his “Wealth of Nations” also showed that projects of mining was a bad use of capital, and should be discouraged: “Projects of mining, instead of replacing the capital employed in them, together with the ordinary profits of stock, commonly absorb both capital and stock. They are the projects, therefore, to which of all others a prudent law-giver, who desired to increase the capital of his nation, would least chuse to give any extraordinary encouragement...” (2005, p. 453).

In the 1970s after the first oil price shocks, scholars in development economics have devoted considerable attention to the impact of massive inflow of resource revenues on petroleum-producing countries. However, the term “Resource Curse” was first used by Richard M. Auty (1993, 2001) to describe this paradoxical phenomenon of negative association between natural resource abundance and economic growth. Moreover, Auty found that countries with substantial resource not only failed to use their abundant natural resources to foster economic and social development, but they also have exhibited a tendency to perform worse than those not similarly endowed. In a seminal research first published in 1995, Sachs and Warner analysed the association between resource abundance and economic growth, where they have shown that “*Economies with a high ration of natural resource exports to GDP in 1971 tended to have low growth rates during the subsequent period 1971-89* “. In their paper Sachs and Warner found that resource abundance is negatively correlated with growth. They demonstrated empirically that an increase of one standard deviation in natural resource intensity leads to a reduction of about 1% per year in growth, even after controlling for other determinant variables of growth, such as initial per capita income, trade policy, government efficiency, and investment rates.

Since then, sufficiently large body of theoretical and empirical work on these question, such as Gelb(1989), Sachs and Waner (1999, 2001), Gylfason, (2001), Ross (2001), Sala-i-Martin and Subramanian (2003), Paul Stevens (2003), Karl Terry Lynn (1997), and others, have confirmed the inverse correlation between economic growth and the presence of abundant deposits of natural resources. Further, much of these works have indicated that weak

social and economic development, poverty and inequality, political problems, and civil conflict are particularly evident in almost resource rich countries.

Theoretical literature and empirical studies have proposed a wide number of explanations for these puzzling phenomenon that affect countries with great natural resource wealth, and undermines their abilities to achieve sustainable growth and development. In this section, we briefly review the main explanations for the resource curse:

(i) The earlier explanation of the resource curse and the most famous one was the Dutch Disease Theory (Corden and Neary, 1982; Corden, 1984; van Wijnbergen, 1984 ; Neary and van Wijnbergen, 1986). As is well known in the literature, the Dutch Disease phenomenon was first observed in the Netherland in the 1960s, when the discovery and exploitation of large reserves of natural gas in the North Sea led real exchange rate to rise, negatively affecting the Dutch agricultural and manufacturing exporting sectors, and thus lowering overall economic growth.

As Corden (1984) suggests, Dutch Disease adversely affect economic growth through two channels. First, the appreciation of a country's real exchange rate (as the relative price of non-tradables to tradables) caused by a rise in the world price of resource; and second, the shift of mobile factors (capital and labor) out of country's manufacturing and agricultural sectors toward booming resource sector, declining manufacturing exports as a result. As a consequences, together these effects hinder the manufacturing sector, assumed as the main driving force of economic growth, because, as shown by Sachs and Warner (1997) the manufacturing is characterising by larger positive externalities in production than other forms of economic activity, and the shrinkage of this sector caused by the Dutch Disease can lead to decline in growth.

Indeed, the evidence for the Dutch disease as promising explanations for the resource curse is mixed. A numerous empirical studies (Gelb, 1989; Auty, 1990; Fardmanesh, 1991; Sala-i-Martin and Subramanian, 2003) have shown that developing countries rich in natural resource do not necessarily suffer from the symptoms of Dutch Disease, especially the moving of labor and capital from manufacturing sector to booming resource sector. Since then other variables and mechanisms have been identified as alternative channels that abundance of natural resources cause reduction of economic growth via them.

(ii) The emerging consensus is that resource wealth itself is not necessarily harmful for growth and development, but it is the matter of the volatility existing in the prices of oil and other minerals products. Several studies, such as, Auty (2001), Arezki and Gylfason (2011), Van der Ploeg and Poelhekk (2008), and Jeffry Frankel (2012) argue that the high volatility of

natural resources prices represent an important transmission mechanism for the “resource curse”, and that volatility increases the volatility of both government expenditures and exchange rate in high rent countries.

(iii) Other studies (Gelb, 1989; Auty and Gelb, 2001) suggest that Pro-cyclical of government expenditures have been among the importance economical factor suggested to explain the weak economic performance and lower economic growth of many oil centred economies. In this sense, Lane (2003) and Bleany and Halland (2009) consider that the high volatility of public revenues - as oil revenues in oil exporting countries – and hence pro-cyclical government expenditures represent an important transmission mechanism for the “resource curse”.

(iv) According to several authors among them Gylfason (2001b), natural resources reduce public spending on education and crowd out human capital, which then jeopardise the pace of economic development. For, Birdsall, Pinckney and Sabot (2004) the abundance of natural resources break the virtuous cycle between reduced inequalities, human capital accumulation and economic growth.

(v) A number of studies (Mc Mahon, 1997; Sala-i-Martin and Subramanian, 2003) have shown that mineral and oil rich countries tend to favor military project and unproductive and inefficient investments, or what are often called the famous White Elephants that is expensive but unnecessary projects, undertaken because they are politically beneficial to those who promote them. There is evidence that resource abundance economies make significant investments in infrastructure and the domestic economy even in the presence of corruption and mismanagement, which reduce investment efficiency and retard diversification (Auty and Gelb, 2001).

(vi) A large number of studies have presented evidence to suggest that the major problems created by the abundance of particular resources, referred to as the resource curse, are mostly related to the quality of institutions (e.g., Tornell and Lane, 1999; Acemoglu et al., 2005; Mehlum, Moene, and Torvik , 2006; Ross, 2012).

Many researchers relate the curse to the negative effect of resources on the quality of political institutions, particularly that of democracy, and that constrain the executive and secure political accountability. For instance, Fernanda Brollo and others (2010) argue that the windfall of natural resources can have further adverse effects on economic performance in resource rich developing countries, because they worsen the functioning of institutions, and deteriorate the quality of political elites. Ross (2001b) and Lam and Wantchekon (2003),

suggest that natural resource wealth hinders democracy by enabling political elites to use windfalls from a resource boom to lengthen their stay in power, which means, more limited scope for democratic change. According to Robinson, Torvik, and Verdier (2006) politicians tend to over-extract natural resources because they only care about the future stock of resources if they remain in power, moreover, they use resource income to influence election outcomes by offering employment in the public sector, which is relatively inefficient. Mehlum, Moene, and Torvik (2006), and Boschini et al. (2012) argue that the resource abundance in general are helpful for growth only if the quality of a country's institutional framework is high enough to curb the rent seeking behaviour of political and economic actors and, to counter corruption, which are the determining the adverse effects of the resource abundance.

Moreover, other strand in the literature of resources and institutions finds that the type of resources matters. For example Bulte, Damania, and Deacon (2005) find that the so-called "Point-Source" or concentrated resources such as oil and some particular minerals undermine institutional quality, rather than diffuse resources such as agricultural resources. In his examination on the impact of natural resources on democracy (measured by electoral rights and civil liberties), Barro (1999) found that oil has a negative impact on democracy, but non-fuel minerals did not. Like Barro (1999), Leite and Weidmann (1999) demonstrated that resource abundance, particularly fuel and ores increase rent seeking measured by the level of corruption, and that corruption in turn hamper economic growth. Isham and others (2005) also find that "point source" natural resources like oil and minerals, in addition to plantation crops such as coffee and cocoa, are damaging for a country's institutional capacities, while diffuse resources do not. Sala-i-Martin and Subramanian (2003) found that the abundance of point sources natural resources have an indirect negative impact on growth through the quality of institutions. Further, the authors also argued that the abundance of oil has a negative and significant effect in the rule of law as a measure of institutions.

Most recently, empirical evidence shows that oil resource rents lead to more corruption. More specifically, Arezki and Bruckner (2009) examine the effects of oil rents on corruption for a panel of 30 oil-exporting countries between 1992 and 2005. They find that an increase in oil rents significantly increases corruption, particularly in countries with a high share of state participation in oil production. Similarly, Bhattacharyya and Hodler (2009) found that resource rents significantly increase corruption when the quality of democratic institutions is relatively poor. Arezki and Gylfason (2011) examine the effect of the

interaction between resource rents and democracy on corruption for a panel of 29 Sub-Saharan countries during the period from 1985 to 2007. They find that natural resource rents lead to more corruption, but only in less democratic countries.

The resource curse literature also contains a number of studies that suggest that natural resources wealth tend to favor civil conflict and influences their duration and intensity (Collier and Hoeffler, 1998).

As discussed above, it is clear that certain types of natural resources, particularly oil, have a negative impact on the quality of both economic and political institutions, and that institutions in turn are important determinant of growth and development. This implies that without effective institutional framework, resource rich countries may not be able to overcome the problems related to the resource curse.

Discussing institutions, Acemoglu et al. (2005, p.389) state that: *“Without property rights, individuals will not have the incentive to invest in physical or human capital or adopt more efficient technologies. Economic institutions are also important because they help to allocate resources to their most efficient uses, they determine who gets profits, revenues and residual rights of control..... Societies with economic institutions that facilitate and encourage factor accumulation, innovation and the efficient allocation of resources will prosper “.*

3. Algeria: oil dependence, failed diversification and the role of institutional framework

A large number of studies suggest that the great challenges facing by the most oil producing countries are: to overcome their dependency on oil and to diversify their economies. However, Algeria, like many other well-endowed countries, has totally failed to competitively diversify the economy away from the hydrocarbons, despite the multiplicity of economic reforms, and the substantial amount of revenues allocated to the economy. In fact, the resource curse literature links the failure of development in the majority of developing natural resource abundant states, like Algeria, to the weaknesses of their institutional and governance arena. Whether that be the fundamental reason or not, there is no doubt that Algeria’s institutional environment have several shortcomings.

3.1. Algeria: The structural dependence on hydrocarbons:

Algeria is one of the major exporters of oil and gas in Africa. It is the 14th largest world exporter of oil, and is the sixth-largest gas producer. Algeria’s proven crude oil reserves are estimated at 12.2 billion barrels, as of January, 1, 2013, which is equivalent to about 20 years of current production. Algeria’s proven natural gas reserves are estimated of about

159.1 trillion cubic feet (Tcf), as of January 2013, the ninth largest natural gas reserves in the world and the second largest in Africa. According to US Energy Information Administration Algeria also holds vast unexploited shale gas resources located in eastern Algeria in Ghadamas Basin.

The hydrocarbons sector is the locomotive of the Algerian economy, the contribution of oil sector in Gross Domestic Product has not ceased to rise, jumping from less than 15% in 1969 to more than 43.6 % in 2011, the share of hydrocarbon fiscal revenues in total government revenues rose from 21 percent in 1970 to more than 68 percent in 2013.

Furthermore, public investment has played an important role in economic development since Algeria's independence in 1962 and, more recently after the extraordinary oil windfall for the early 2000s.

As a result of the recent oil windfall, the Algerian government has implemented a series of substantial public investment programs (2001-2004, 2005-2009, and 2010-2014). Between 2001 and 2004, the government implemented the first public investment program (Economic Recovery Program), worth about DA 525 million (US\$7 billion), followed by a second program known as Complementary Plan for Growth Support (Programme Complémentaire de Soutien à la Croissance) for 2005-2009, with initial allocation of DA 4,203 billion (roughly US\$55 billion), which has increased to about DA 8,705 billion (approximately US\$114 billion) in the late June 2006 (World Bank 2005). On the mid 2010 the Algerian government has announced the third public investment program for 2010-2014 with an investment amounting to 21,214 billion Algerian dinars (around US\$286 billion).

However, the substantial public investment efforts lunched by the government, have enabled Algeria to maintain respectable levels of economic growth since 2002. In parallel, unemployment rate fell by half in five years, from 30 percent in 2001 to 15.3 percent in 2005 and 10 percent in 2012. Since 1996, annual inflation rate decrease from 22 percent to 4.5 percent in 1997 and 4 percent in 2012. Due to the significant accumulation of its foreign exchange reserves, at the end of 2006, acceleration of advance payments enabled the government to reimburse more than USD 10.5 billion of their external debt. These repayments brought a substantial reduction in Algeria's external debt from USD 17.19 billion in 2005 to less than USD 5 billion at the end of 2012 (see Table 1).

Table.1 Algeria: Selected Macroeconomic Indicators

	2000	2005	2010	2014	2015
Growth rate	2.2	5.1	3.3	3.8	2.9
Unemployment rate	29.5	15.2	10	10.6	11.4
Inflation rate	0.33	1.64	3.9	3.3	4.5
External debt (in USD billions)	25.2	17.2	5.16	5.28	4.86

Source: World Bank, *World Development Indicators (WDI)*

As shown in the Table 1 above, large public investment in all sectors of the economy has helped to get a significant growth rates, and contributed to reduction in unemployment during this decade, however, compared to the volume of investment during this same period, the contribution of public investment to economic growth seems low than expectations for the country. Algeria has invested an average annual rates of 10 percent of GDP to get less than 4.5 percent as an average annual rate of growth between 2001-2007. This poor contribution of public expenditure in economic growth confirms that not all the investments undertaken in Algeria in this period were productive, and confirms also that Algeria losses more than 5 percent of the value of their economy annually. Moreover, According to Albino-War and others (2014), Algeria's investment efficiency is weak compared to other oil exporters in the region and well below the global average. Algeria's investment efficiency score of 0.29 (in terms of investment quantity) suggests that, under ideal circumstances, Algeria could have built up to 71 percent more infrastructure with the same amount of investment.

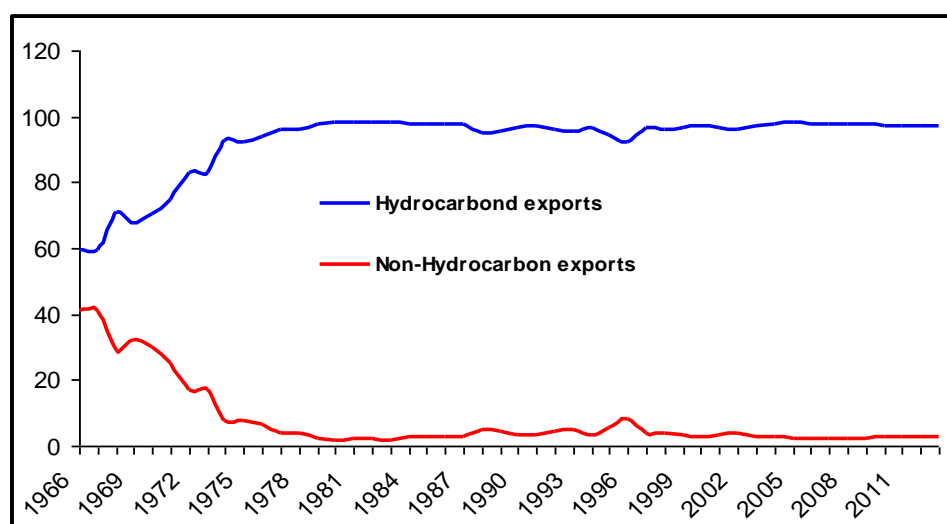
With regard to the enormous financial resources allocated to the different sectors of the economy under the public investment programs for 2001-2014, the Algerian economy is still poorly diversified, and the contribution of the non-oil sector in to total GDP remains weak, compared to the hydrocarbon sector.

In fact, Algerian government must ensure the good quality and efficiency of public expenditure which plays a key role in the Algerian economy, By Assuring greater transparency in government finance which are essential for controlling the rapid increase of expenditures. Moreover the government must ensure sound selection of projects to improve the overall effectiveness of public investment program.

3.2. Algeria: The failed economic diversification:

The most important challenge facing the Algerian economy since independence has been its excessive and increasing dependence on the hydrocarbon sector. Despite the multiplicity of economic reforms pursued by successive Algerian governments - since independence - to diversify the economy away from the oil and gas sectors, the Algerian economy maintains the same characteristics of an economy depending primarily on the production and export of oil, and consequently all these efforts have failed to establish a sustainable economy, and to promote private sector-led, non-hydrocarbon growth. Today, Algerian economy is among the least diversified in the world. In the late of 1960 and early 1970s Algeria's non-hydrocarbon exports represented 40 percent of total exports; in recent years, they barely exceeded the symbol level of 3 percent, and remain too weak (Figure 1).

Figure 1. Algerian Exports 1966-2013 (Percent of Total Exports)



Source: World Development Indicator database

In Algeria, the structural dependence on hydrocarbons is the result of the failures of reform policies, notably in terms of post-independence agricultural reforms, the vast industrialization program launched by the government in the 1970s and early 1980s, and the privatization process for government-owned enterprises under the structural adjustment reforms in the 1990s. The failure of these attempts at integrated the Algerian economy into the world economy, can be attributed in large part to the political opposition to economic reforms, bad governance and rent seeking behaviour (Auty, 2003, Hakim Darbouche, 2011).

3.3. The institutional environment in Algeria:

The analysis of Algeria’s institutional framework demonstrates a high degree of perceived weakness. A comparison based on the World Bank’s governance indicators for Algeria with other successful resource-rich countries like Norway, Chile, Malaysia and Botswana, indicates that Algeria is placed well below the level of governance in these successful mineral-rich countries in all six governance indicators (Voice and Accountability, Political Stability, Government Effectiveness, Regulatory Quality, Rule of Law and Control of Corruption) (see Table 2 below).

Table 2. Comparison of governance indicators in Algeria with some successful mineral-rich countries, year 2014

	Voice and accountability	Political stability	Government effectiveness	Regulatory quality	Rule of law	Control of corruption
Algeria	-0.93	-1.17	-0.51	-1.21	-0.73	-0.61
Successful mineral-rich countries						
Botswana	0.44	1.02	0.32	0.64	0.63	0.80
Chile	1.06	0.49	1.14	1.50	1.43	1.48
Norway	1.71	1.13	1.81	1.64	2.05	2.23
Malaysia	-0.33	0.34	1.14	0.84	0.64	0.48

Source: World Bank (2014), Governance Research Indicators dataset.

Note: All scores lie between -2.5(weak) and 2.5(strong) governance performance.

In addition, a study by the World Bank (2005) about the legal framework for business and private sector development in Algeria, concludes that the Algeria’s institutional framework is largely underdeveloped. This report notes that : “ *The Algeria’s legal framework is still characterized by partial inadequacies in standards and regulations applicable to business, notably those related to: a) the creation and operation of commercial firms; b) competition rules and transparency rules in commercial transactions; c) guarantees; d) property rights; and e) rules governing bankruptcy and liquidation* “(World Bank , 2005, *Algerie , Le Droit des Affaires et le Developpement du Secteur Privé en Algerie*, P.i)

Furthermore, this negative assessment of economic and political institutional framework in Algeria is corroborated by a variety of international nongovernmental organizations (INGOs). In a report published in 2013, Economic Freedom of the World (EFW) point out that: “*Institutional weaknesses continue to undermine prospects for sustained long-term economic development in Algeria*”. According to the 2013 index of

Economic Freedom of the World (Heritage Foundation), Algeria ranks 145nd out of 179 countries. In regional comparison, Algeria ranked only 14th among the 15 countries in the Middle East and North Africa region, its economic freedom score is 49.6, remains the lower than the regional and world averages, also, this report attributes this mediocre ranking particularly to widespread corruption and inefficient judicial system which is vulnerable to political inference. In essence, Economic Freedom of the World (EFW) notes, “*Algeria’s political institutions are largely undemocratic and military involvement in politics is common*”. Freedom House categorizes Algeria as “not free” in its political rights and civil liberties measure (Terry 2013).

A large body of empirical international research shows that high level of corruption is more likely in countries with weak institutional environment. As Algeria is a country with rich endowment of natural resource, characterized by a major institutional and governance weaknesses, the level of corruption in Algeria has reached epidemic proportions at the state level and different levels of the administration. According to Transparency International’s Corruption Perceptions Index (CPI, which measures the perceived level of public sector corruption) Algeria ranked 100th out of 175 countries in transparency in 2014. As a result, Algeria is still listed as one of the most corrupt places in the world. For instance, Freedom House comments, “*high levels of corruption plague Algeria’s business and public sectors*”. In this sense, Limam M. (2012) shows that the major corruption and scandals have been linked to officials branches and persons of the state, which means that corruption in Algeria is de facto political. In fact inefficient government bureaucracy (18.4 %), corruption (16.0 %) and access to financing (19.2%) are the most problematic factors that severely hamper Algeria’s economy competitiveness according to the 2011 – 2012 Global Competitiveness Report (World Economic Forum).

Furthermore, the World Bank’s Business Enterprise Surveys (2002-2008) demonstrates that courts system, corruption and bribery are the biggest obstacles experienced by the private sector firms in Algeria. As can be seen in the Table below, around 66.6 percent of respondents in Algeria report that they expect to have to make informal payments to public officials to get things done, compared to an average of 35.8 percent for the MENA region and 24 percent for all countries (The survey covered 100,000 businesses in over 100 countries). About 64.3 – 30 percent of firms in Algeria also identifying corruption and courts system as a major constraint faced their business, compared to an average of 35.8 – 18 percent for all countries.

Table 3. Corruption constraints

<i>Obstacle for firms</i>	<i>Algeria</i>	<i>MENA</i>	<i>All countries</i>
<i>Percent of firms expected to give gifts to secure government contract</i>	34.8	32.4	22.6
<i>Percent of firms expected to give gifts to get an import license</i>	34.9	34.1	13.5
<i>Percent of firms expected to give gifts to public officials "to get things done"</i>	66.6	35.8	24.0
<i>Percent of firms identifying corruption as a major constraint</i>	64.3	60.0	35.9
<i>Percent of firms identifying the courts system as a major constraint</i>	29.3	23.4	18.0

Source: World Bank Business Enterprise Survey Database, the data are available online at <http://www.entreprisesurveys.org.data> (accessed 12. 01. 2016)

www.entreprisesurveys.org.data (accessed 12. 01. 2016)

As discussed above, Algeria's institutional framework has several shortcomings. Algeria's current political and economic institutions are rooted in its history, specifically with that of French colonialism. The Algerian post-colonial socialist and collectivist ideology, and the political economy of oil rents management are two other factors that have profound effects on the current institutional environment of Algeria.

➤ Algeria was one of the French colonies, it gained its independence in 1962, after 130 years of occupation. In general, the French colonial rule in Algeria was an authoritarian military regime, relied primarily on land confiscation, the exclusion and the marginalization of the great majority of Algerians. The French rule dispossessed the Algerian populations of its freedom and wealth (Shabafrouz, 2010). Thus, Algeria's political institutions under French rule (1830-1962) were highly undemocratic (Terranova, 2011). Consequently, the post-colonial Algerian state inherited a narrow institutions from the colonial era. The Algerian regime after independence was essentially authoritarian in character and there was no democratic institutions. Rather, the strategy of politico-military elites of Algeria's post-colonial ruling party, the National Liberation Front imitated oppressive French military rule. In addition, state elites suffer from the effects of the "gangrene of corruption" even under the leadership of president Houari Boumediene (1965-1978) who exercised a relatively tough hand against corrupt practices (Whlie and Taylor, 2001).

➤ The management of the Algerian economy under socialist orientation for more than two decades has generated many dysfunctions in the behaviours of the population, and in the management of the public sector enterprises. In this context, the nomination process for managers of the enterprises and other responsibilities were chosen according to the relationship with the politicians, not with regard to the professional qualifications. Furthermore, rent-seeking behaviour has been encouraged, and become a part of the common

characteristics of the behaviour of Algerian society. Werenfels (2002) shows that, before economic liberalisation “many state owned enterprises became traders and intermediaries more than producer”, this reflects the extent to which Algeria’s economic sector was particularly affected by rent seeking behaviour. Further, corruption practices constituted major rules of the game in both political and economic sectors. This situation has been exacerbated during the phase of transition toward market economy, with the privatization process for government-owned corporations and trade regime liberalization, which were officially launched in the early 1990s. For instance, trade liberalization was at the origin of the emergence of a powerful import lobby (interest groups) close to the state elites, who benefits from import monopolies, which represents a better source of rents for them, and that those profiting from such rents, that distorted the reform process (privatisation process). Because a successful privatisation and efficient enterprise poses a threat to those receiving rents from import monopolies (Werenfels, 2002). In addition, the process of privatization of state-owned companies favoured larger businessmen with government connections and those in the upper echelons of the state who set regulations to facilitate their entry. This increased corruption, which worsened the business environment and curb private smaller firms that lacked political support (Auty, 2008).

➤ Moreover, the easy access of the country to the oil resources that become the main resources of the export sector has exacerbated institutional weaknesses. As a rentier state in hydrocarbons, Algeria’s ruling clans are the major beneficial from the oil revenues, which distribute the rents to their cronies, thus creating a system characterized by a various interest group compete with each other over the possession of the oil rents and the distribution of political power and patronage. With internal struggles between various powerful groups, no one clan able to control the system alone, so, most policy undertaken are shaped to balance these interests. Moreover, these conflict within the ruling regime extended to the political elites and other responsible at the regional and local levels, leading to a large distortion in state institutions. This in turn inhibits any real attempt to build effective institutions to make success reform process such as privatisation and economic diversification policies, in order to resolve the dependence on hydrocarbons in Algeria.

4. Data and methodology:

4.1. Model and data:

In the resource curse literature, the institutional quality channel has frequently been considered as an important cause of the curse in many countries, especially where growth has

been concentrated on the extraction of natural resources. This study examine the association between institutional quality and natural resource rents for the Algerian economy. We examine this relationship using Corruption index as a measure of institutional quality. According to Sachs and Warner, 1997; Papyrakis and Gerlagh, 2004, institutional quality is often simply controlled for by using a measure of corruption. The time series data used in this study is annual data spanning the period from 1984 to 2013.

Our empirical model is based on Arezki and Bruckner (2009), in which the empirical linkage between natural resource rents and institutional quality (corruption) use the following model:

$$Corruption_t = \alpha + \beta Oil\ rents_t + \Gamma X_t + u_t, \dots\dots(1)$$

In this equation, institutional quality variable is proxy by corruption index taken from the dataset constructed by Political Risk Services (International Country Risk Guide governance indicators, 2013). According to ICRG's definition, corruption index intends to measure corruption " *within the political system* ", and, " *is more concerned with actual or potential corruption in the form of excessive patronage, nepotism, job reservations, 'favor-for favors', secret party funding, and suspiciously close ties between politics and business* ". The ICRG corruption score ranges from 1 to 6, with higher values indicating less corruption, and lower score means higher corruption.

A measure of natural resource abundance: the natural resource rents was proxy by oil rents as a percentage of GDP (Oil rents), which measures the difference between world prices of oil and the average unit extraction costs. The oil rents aggregate covers oil and gas. The data were extracted from 2013 World Development Indicators of the World Bank.

The other control variables (X_t) that we include in our empirical analysis, are : the interaction term (Interaction) between institutions and resource abundance : oil rents \times Democratic accountability , the interaction of natural resource abundance with institutions was used by Mehlum and al.(2006) , and Arezki and Bruckner (2009) to argue that high-quality democratic institutions could reduce corruption ; the manufactures exports as a percentage of total exports (Manexp), which controls for the change in income unrelated to the oil sector. The data on manufactures exports is taken from World Bank (World Development Indicators database,2013), while the data on democratic accountability score is obtained from the PRS group on governance.

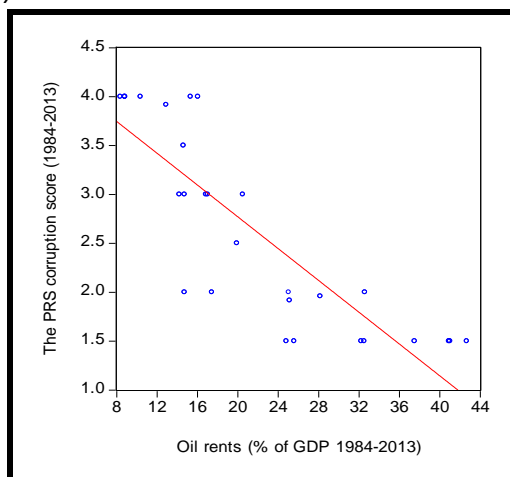
4.2. Methodology of the study:

In order to examine long run relationship and dynamic interaction among natural resource abundance and institutions, this study employs the cointegration analysis. The first step of our econometric methodology is to investigate the order of integration of each series, that is the stationarity of our variables. In this study two types of unit root tests are conducted: Augmented Dickey-Fuller (ADF) test, and the Phillips and Perron (1988) unit roots test. The Schwarz Bayesian Criterion (SBC) is used to select the order of the ADF regression. The second step is to test for cointegration. The cointegration procedure was used to test the existence of long-run equilibrium relationship among the variables. There are many possible tests for this purpose, but the most general of them is the multivariate test based on the vector autoregressive representation of Johansen's maximum likelihood estimation approach (Johansen and Juselius, 1990). Then, the short run analysis is examined through Generalized Impulse Response Function (GIRF) and Generalized variance decomposition analysis (VDC), which are invariant to the ordering of the variables. The GIRF allows us to examine the dynamic effects of shocks to a particular variable on the other variables. The Generalized Variance Decomposition Analysis (VDC) apportions the variance of forecast errors in a given variable to its own shocks and those of the other variables in the system.

5. Empirical Results and discussion:

Before delving into the analysis of estimation results, we analyze the partial correlation between corruption and oil rents. Partial correlation measures the degree of association between the two variables, with the exclusion of the effect of other controlling variables. The figure 2 below displays the simple correlations in the scatter plot.

Figure 2. Corruption versus oil rents, (partial relation).



However, a careful look at the scatter plot shows that corruption is associated negatively with oil rents (as a percentage of GDP), because lower PRS corruption score indicates high levels of corruption. To clarify this relationship, we resort to the cointegration analysis results.

5.1. Stationarity / Unit root:

Cointegration analysis necessities that the variables under consideration be integrated of the same order. Hence, it is necessary to investigate the order of integration of the individual time series before cointegration analysis. We employ ADF test, and Phillips-Perron test statistics. We run the test both in level and first differences. The results of unit root tests are reported in Table 4. In this study, these tests give the same results, namely that each of these series is I(1), that is they are integrated of order 1.

Table 4. Unit root tests

<i>Augmented Dickey Fuller unit roots test</i>									
<i>Variable</i>	<i>Level</i>				<i>First difference</i>				<i>Decision</i>
	<i>Intercept</i>		<i>Intercept and trend</i>		<i>Intercept</i>		<i>Intercept and trend</i>		
	<i>ADF</i>	<i>CV</i>	<i>ADF</i>	<i>CV</i>	<i>ADF</i>	<i>CV</i>	<i>ADF</i>	<i>CV</i>	
<i>Corruption</i>	-1.8639	-2.9385	-.72634	-3.5098	-3.4766	-3.0422	-4.5889	-3.5950	<i>I(1)</i>
<i>Oil rent</i>	-1.6590	-3.1472	-1.5994	-3.5692	-3.9750	-3.0449	-4.1925	-3.7128	<i>I(1)</i>
<i>Manexp</i>	-2.2355	-3.0422	-2.9590	-3.5950	-5.8003	-3.1472	-5.6457	-3.5692	<i>I(1)</i>
<i>Interaction</i>	-2.0018	-3.1472	-2.4464	-3.5692	-3.4929	-3.0449	-4.1079	-3.7638	<i>I(1)</i>
<i>Phillips- Perron unit roots test</i>									
<i>Variable</i>	<i>Level</i>				<i>First difference</i>				<i>Decision</i>

	Intercept		Intercept and trend		Intercept		Intercept and trend		
	ADF	CV	ADF	CV	ADF	CV	ADF	CV	
Corruption	-0.82675	-2.9447	-2.1780	-3.6101	-5.8423	-2.8452	-6.1737	-3.6278	I(1)
Oil rent	-1.3242	-2.9447	-2.4774	-3.5572	-5.6165	-2.9099	-5.5125	-3.6890	I(1)
Manexp	-2.7730	-2.8452	-2.9584	-3.6278	-6.5346	-2.9447	-6.5142	-3.5572	I(1)
Interaction	-1.7400	-2.9447	-2.4084	-3.5572	-4.5255	-2.9099	-4.4417	-3.6890	I(1)

Notes : The sample period runs from 1986 to 2013.CV gives the 95 percent simulated critical values.

5.2. Cointegration and long run analysis:

Since all series are integrated of order one, cointegration can be investigated using the Johansen cointegration approach. Johansen and Juselius (1990) develop two test statistics: Trace statistics (λ_{trace}) and maximum eigenvalue statistic (λ_{max}). However, before proceeding to the cointegration test of long run relationship, we have to determine the lag orders of the variables. For this purpose the Akaike Information Criterion (AIC) and the Schwarz Bayesian Criterion (SBC) are applied to the VAR model. Optimal lag for the VAR model of our study is two lag. The results are reported in table 5 followed by their interpretation.

Table 5. Johansen-Juselius test results based on the trace and the maximum eigenvalue statistic

(a) Maximal eigenvalue statistic				
Null	Alternative	Statistic	95% Critical Value	90% Critical Value
$r = 0$	$r = 1$	31.6435**	28.2700	25.8000
$r \leq 1$	$r = 2$	12.7473	22.0400	19.8600
$r \leq 2$	$r = 3$	9.3562	15.8700	13.8100
$r \leq 3$	$r = 4$	4.3465	9.1600	7.5300
(b) Trace statistic				
Null	Alternative	Statistic	95% Critical Value	90% Critical Value
$r = 0$	$r \geq 1$	58.0934 **	53.4800	49.9500
$r \leq 1$	$r \geq 2$	26.4500	34.8700	31.9300
$r \leq 2$	$r \geq 3$	13.7027	20.1800	17.8800
$r \leq 3$	$r = 4$	4.3465	9.1600	7.5300

Notes: ** and * denote rejection of the null hypothesis at the 95% and 90% confidence level respectively .

Both the trace and the maximum eigenvalue statistics indicate the presence of one cointegrating vector at 5 and 10 % significant level. We therefore conclude that there is a long run relationship between the independent variables, namely oil rents as a share of GDP (Oil rents), interaction terms (Oil rents*democratic accountability), manufactures exports (Manexp), and the dependent variable corruption (Corruption).

The results of estimated long run corruption equation (based on one cointegration relation) are reproduced in Table 6.

Table 6: Cointegration equation normalized with respect to Corruption

Dependent variable is PRS Corruption score			
Variables	coefficient	Std-error	T-statistics
<i>Oil rents</i>	- 0.16485**	0.016506	- 9.987
<i>Manexp</i>	- 0.10649**	0.03893	- 2.789
<i>Oilrents*Demo.Accountability</i>	0.013613**	0.003415	3.985
<i>Constant</i>	6.1233**	0.46941	13.044

Notes: ** and * denote significant at 95% and 90% confidence level respectively. Asymptotic standard errors are reported in the parentheses. Vector 1 represents the cointegrating vector for corruption equation.

The cointegration test results show that the effect of oil rents (% of GDP) on corruption is highly negative and significant. Thus, this evidence suggests that an increase in oil rents rise levels of corruption in Algeria. This implies that a one percentage increase in the unit export value of oil increases corruption by about 0.16 percent. This finding is consistent with Arezki and Brucker's (2009) finding, who have provided evidence of the adverse link between oil rents and corruption (because lower PRS corruption scores indicates high corruption) for a panel of 31 oil-exporting countries during the period 1992 to 2005.

It can also be noticed from the results in table 6, that the coefficient of manufacturing exports is negative and statistically significant. This negative association reflect that even the non oil sector (the manufacturing sector) increase corruption in Algeria.

However, the interaction term between our measure of oil rents and democratic accountability score is quantitatively small, positive and statistically significant, which is in line with the empirical institutions literature findings Mehlum, Moene and Torvik ,2006b ;

Boschini et al.,2012); therefore, a positive coefficient of interaction term between resource abundance and institutional quality means that increasing democratic accountability of government could reduce widespread corruption in Algeria.

5.3. Short-Run Dynamics:

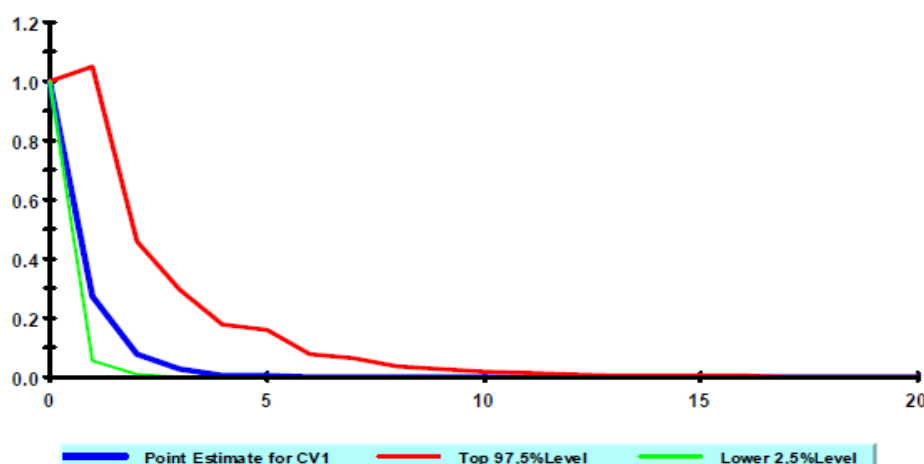
After finding the long run relationship between the variables of our model based on Johansen-Juseluis(1990) cointegration test, in what follows we examine the short run dynamics responses of both corruption and manufactures exports to shocks in oil rents.

5.3.1. Persistence Profile Analysis:

We use Generalized Impulse Response Functions (GIRFs), and Generalized Variance Decompositions Analysis (VDCs) as they are invariant to the ordering of the variables in the VAR model (Pesaran and Shin, 1998). However, before considering the impulse response analysis we consider the Persistence Profile analysis developed by Pesaran and Shin (1996). The value of this profile is equal to unity on impact, but must tend to zero as $N \rightarrow \infty$, if the long run relationship is cointegrating.

The persistence profile for the long run relation (Figure 3) indicates that if the whole cointegrating relationship is shocked, it will take about three years for the equilibrium to be restored.

Figure 3: Persistent Profile of the effect of a System-Wide Shocks to the cointegrating relation



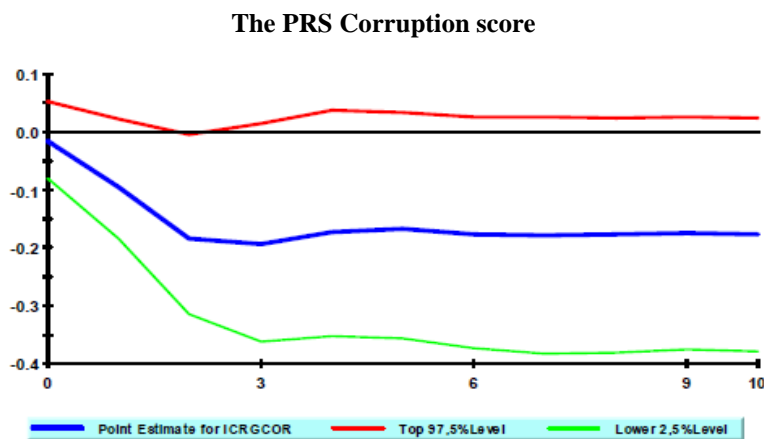
5.3.2. Generalized Impulse Responses:

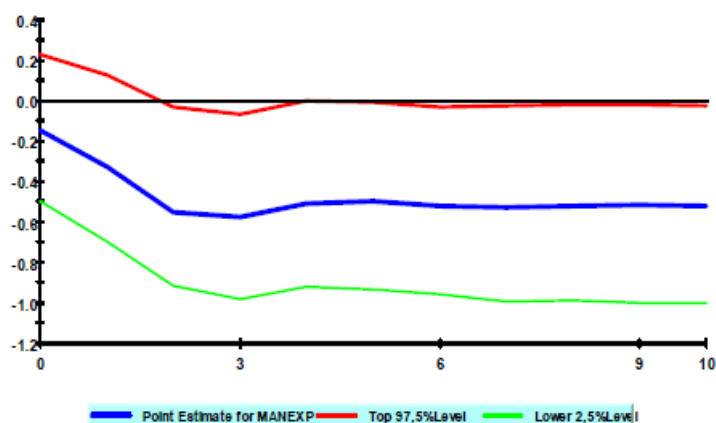
Figure 4 gives the GIRF's of the two variables, namely the PRS corruption score, and manufactures exports to a positive unit shock (equal to one standard error) to oil rents.

As can be seen, a shock to oil rents leads to a significant increase in corruption in Algeria by approximately 15 percent (lower PRS corruption scores indicates high corruption).

The manufactures exports significantly decline in the aftermath of oil rents shock, a pattern consistent with the Dutch Disease phenomenon, which refers to the appreciation of a state's real exchange rate due to a sharp increase in exports of oil. This appreciation, in turn diminishes the competitiveness of the manufacturing and other non resource sectors, results in a decline in non resource exports.

Figure 4. Generalized impulse responses of a positive unit shock to oil rents





5.3.3. Generalized Variance Decomposition Analysis:

In Table 7, the corruption variance decomposition analysis reveals that the variance in corruption is explained by its own variance, which accounts for approximately 85% in the first year period, and about 60% in the five year period. It can also be noticed from the table 7, that oil rents shocks explain for about 10% of changes in corruption for the first year after shock, increasing to about 25% in the five year after shock. However, the contribution of the non-oil manufacturing exports amounts to about 15% in the 5th year period. This finding therefore, confirms that oil rents shocks explains the largest proportion of the changes in corruption, while manufacturing exports play a minor role compared to oil rents in explaining the variance in corruption.

Table 7. Variance decomposition of corruption

<i>Horizon</i>	<i>Corruption</i>	<i>Oil rents</i>	<i>Manexp</i>	<i>oilrents*Dem.acc</i>
1	85.154	09.736	04.396	01.607
2	65.917	20.349	12.245	03.090
3	60.346	23.820	14.963	03.992
4	59.916	24.403	15.442	03.907
5	59.826	24.634	15.550	03.738

6. Policy options:

The major findings of this study pose significant challenges to policy makers in Algeria.

1. These results indicate that increase in oil rents tends to exhibit significant large adverse effects on the level of corruption in Algeria.

2. The high levels of corruption in combination with oil rents exacerbated institutional weaknesses that weaken the manufacturing and other non-resource sectors in Algeria, and rendered the Algerian economy increasingly vulnerable to the resource curse.

In light of the forgoing findings, and as seen from the experiences of some resource abundant countries that have successfully escaped the curse, such as Norway, Chile, Botswana and Malaysia, several policy options are responsible for such success, but the most important one being the need to build strong institutional framework. Cross countries studies also suggest that sound institutional frameworks seem to help overcoming the resource curse, these literature, therefore argues that political and institutional reforms towards democratic and good governance in resource abundant countries must precede economic policy reform (Rosser 2007). Most recently, the International Monetary Fund (IMF) documented that countries rich in oil resources and poor in political governance and institution pay a substantial costs for their lack of transparency and accountability. One example of these countries is Angola. More than US\$1 billion of Angola's state oil revenues are reported to have missed from government's accounts each year due to corruption (Global Witness, 2002). Moreover, Arezki, Hamilton, and Kazimov (2011) argue that transparency and accountability, are a critical component for improving the quality of institutions responsible for the management of natural resources.

In the last ten years, the IMF, the World Bank and a number of International Nongovernmental Organizations (such as Global Witness, Human Rights Watch, and the Revenue Watch Institute) have contributed heavily to promote transparency, accountability and civil society participation in the management of revenues of resource abundant economies, through many international transparency initiatives (the Extractive Industries Transparency Initiative – EITI - is one of such initiatives).

In Algeria, in order to improve the institutional environment, the government has launched many procedures. For fighting corruption more effectively, in 2006, the public authorities adopted an anti-corruption law (Law No. 06-01 on the Prevention and the Fight against Corruption) for moralizing political and economic practices, reinforcing existing anti-corruption legislation, and establishing conformity of domestic legislation to the United Nation convention against corruption (which Algeria ratified in 2004), as well as facilitating international cooperation with Interpol against this scourge. The new law aimed at enhancing

transparency in government and public procurement, represses the illicit enrichment of public official, under the obligation for all public agent to declare their patrimony. Also, the new law highlight the important role of the civil society, including the media, through informing and increasing public awareness, and promoting civil society participation in public affairs management. Moreover, the new law called for the creation of a special anti-corruption agency. In August 2010, the Government of Algeria created the National Commission for the prevention and fight against corruption as part of an overall national strategy to battle corruption.

More recently, the commitment reiterated by President of the republic Abdelaziz Bouteflika to fight corruption was concretised in the draft revision of the constitution. To this end, the draft revision of the constitutions called for the establishment of a national body of prevention and fight against corruption. This body enjoys administrative and financial autonomy.

The article 173-5 of the draft revision of the Constitution states “*a national body of prevention and fight against corruption will be instituted, an independent administrative authority under the President of the Republic.*”

Despite the creation of this anti-corruption commission, and the passing of several commitments and laws, there are still serious shortcomings in enforcing such measures, due to the high inefficient of Algeria’s judicial system. According to some NGO’s such as the world Economic Forum global competitiveness and human rights watch, the Algerian judicial system is subject to political inference and the influence of officials and influential individuals. The global competitiveness report 2012-2013 ranked Algeria 126th out of 139 countries on the independence of the judiciary, below neighbouring countries in North Africa. In addition, transparency is another important recommendation to overcome the curse, which Algeria has largely failed to achieve it. According to the Open Budget survey, which assesses whether governments give information access to the public, Algeria’s OBI 2012 was 13 out of 100, which is well below the average score of 43 for all the 100 countries surveyed, this score indicates that Algeria’s government provides the public with scant information on the government budget and financial activities, which makes it difficult for public to overseeing government management of the public’s money.

7. Conclusion:

The main purpose of this paper was to study the association between natural resource rent and institutional quality in Algeria. Following the natural resource curse literature, we use

oil rents as a proxy for natural resource abundance. Institutional quality is measured by two indicators, extracted from the Political Risk Services (International Country Risk Guide) corruption and democratic accountability. Our empirical results indicate that an increase in oil rents significantly increase corruption in Algeria, while the interaction effect between oil rents and democratic accountability is positive and statistically significant, which means that enhancing democratic institutions can reduce corruption.

Indeed, two conclusions can be drawn from the above results. First, in Algeria the abundance of oil resources has exacerbated institutional weaknesses, and corruption. Second, coupled with weak institutional constraints, oil abundance leads to a heavy dependence of the Algerian economy on hydrocarbons revenues.

Thus, it is important for Algeria to enhance their economic and political institutions if it wants to diversify their economy away from hydrocarbon sector. In fact, diversifying Algeria's economy is not an impossible task with regard to the huge potential that has the country. However, before becoming an oil exporting country Algeria had an important agricultural sector, it was the "Breadbasket" for the Roman empire during the Roman times, and was supplying many Mediterranean countries of agricultural goods, even during French colonial period Algeria's agricultural exports contributed to large shares of total exports ; for example, in 1959, agricultural exports represented nearly 61% of total exports, while petroleum and mineral exports reached only 12% of total exports (World Bank, 1964). Furthermore, the scope of diversification of the Algerian economy should include: the development of the manufacturing industries, financial sector, in addition to the service and tourism sectors which play a positive role in export diversification. However, the development of these sectors of the economy requires the existence of a strong institutions. Thus, the institutional environment in Algeria should have more focus from the policy maker, this means that Algerian government should accept the reform of the country's institutional framework. Specifically, this means fighting corruption, cronyism, increasing the state's efficacy, and reforming justice.

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