The Effect of Hydrocarbons Sector on Trade Openness and Foreign Direct Investment Indices in Algerian Economy

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Abstract:

This study aims to explain the poor performance of trade openness and foreign direct investment indices recorded in Algerian economy the last few years. To do so, the analysis has been based on the Dutch Disease phenomenon and other studies that explain the negative effect of natural resource dependence. SPSS software statistical analysis revealed several findings, essentially that there is a negative relationship between natural resource dependence and trade openness and foreign direct investment performances.

Key words: Dutch Disease, foreign direct investment, natural resource dependence, foreign Trade.

ملخص

تهدف هذه الدراسة إلى تفسير ضعف بعض المؤشرات الاقتصادية في الجزائر، كالاستثمار الأجنبي المباشر وانفتاح التجارة الخارجية خارج قطاع المحروقات، ومن أجل تحليل الظاهرة تعتمد الدراسة على ظاهرة العلة الهولندية وعلى دراسات سابقة حول الآثار السلبية لتبعية الاقتصاد لعوائد الموارد الطبيعية. أفرزت الدراسة عدة نتائج أهمها أن هناك علاقة سلبية ذات دلالة إحصائية بين التبعية الاقتصادية لعوائد قطاع المحروقات وبين الاستثمار الأجنبي المباشر وانفتاح التجارة الخارجية خارج قطاع المحروقات في الجزائر، حيث أن أي زيادة في التبعية لعوائد قطاع المحروقات تؤدي إلى انخفاض الانفتاح التجاري للقطاعات الأخر بإضافة إلى انخفاض الاستثمار الأجنبي المباشر.

الكلمات المفتاحية: العلة الهولندية، الاستثمار الأجنبي المباشر، التبعية الاقتصادية لعوائد المحروقات، التجارة الخارجية.

1- Introduction:

Algerian economy has long been characterized by a hydrocarbons sector domination, which defines the country as a rentier state and therefore highly dependent on oil sector's revenues and its performance. This characteristic of the Algerian economy has always been identified as a huge disadvantage by both economists and Algerian government officials. It means that the prosperity of the country is highly sensitive to oil prices and therefore vulnerable economy. Historically speaking, statistics showed that high oil prices have positive impact on economic performance of the country and growth. However, low prices however can have devastating effects on the economy and society. Back to the 80s, low oil prices have driven the country into a severe crisis, which resulted in a huge public debt and social problems. Therefore, the government has been trying for many years to diversify in terms of exports, in order to reduce dependence to oil and build a strong manufacturing sector by different means like the encouragement of foreign direct investment and trade openness. Thus, there are no significant results as oil revenues still constitute more than 90% of Algerian revenues. Therefore, the question that can be asked and which was asked by many economists, is why Algeria keep failing to deliver any significant results when it comes to boosting economic its performance besides the hydrocarbons sector and build strong manufacturing sector, despite all the measures taken by the government and despite all the wealth made by oil prices' boom? Furthermore, the focus of the study is based on two main important factors: foreign direct investment and trade openness. There are many study cases in literature which are similar to the Algerian case, most of the studies refer to the resource curse or the Dutch Disease syndrome in order to explain the poor economic performance, and this study also is based on the Dutch Disease and the resource curse theories.

2- Literature review:

2.1 Rentier states economy:

Rent can be defined as nature's reward for ownership of resources (1). Rent can be found within every country but at variant degrees, the country is considered as a rentier state if percentage of natural resource revenues is too high compared to other sources of the government's revenues. The economy of a country is considered as resource-based if natural resource revenues make 10% of GDP and 40% of exports (2).

Today, more and more economists consider natural resources abundance as a curse; this conclusion is justified by numerous researches

and studies which show that relying too much on natural resource revenues will slow down economic development, growth and has negative effects on the industry. Furthermore, as a matter of fact most rentier states are within the developing world (3). However, these revenues have a lot of positive effects for the country, it pay for social services, and helps create a middle class, increase per capita GDP and raise other measures of development (4).

2.2 The Dutch Disease phenomenon:

Originally the Dutch Disease term was used to designate an economic situation lived in Netherland in the late 50s and early 60s, after the discovery of a large source of natural gas in the North Sea. Following this discovery a large capital inflow resulted from increasing exports caused the appreciation of the Dutch currency which reduced significantly both profitability and competitiveness of the manufacturing and service sectors in the international market (5). Generally speaking, economists use the term Dutch Disease to describe a lack of profitability, competitiveness and overall performance of a country's exports and industry caused by a discovery of natural resource or a booming sector within the economy (6).

Corden and Neary (7) define Dutch Disease as the coexistence of a booming and a declining sub-sectors within the traded goods sector of a country, in many cases the booming sub-sector is of an extractive kind while the declining one is the manufacturing sector, which causes de-industrialization of the country.

2.3 The effects of Dutch Disease:

In order to explain the Dutch Disease phenomenon, Corden and Neary highlighted two major effects of the booming sector, the spending and the resource movement effects which cause both direct and indirect de-industrialization (8). In order to explain the Dutch Disease effects a number of hypotheses have been set, most importantly that monetary considerations are ignored, all goods are used for final consumption only, full employment reached and trade is always balanced (9).

The core model of the Dutch Disease theory's structure consists of a small open economy composed of three sectors, two of them produce tradable goods which prices are fixed on an international level, and the third is a non-tradable goods sector which prices are flexible to meet demand fluctuations. The booming sector is assumed to be energy, the second tradable goods sector is manufacturing and the non-tradable goods sector is services(10).

The spending effect occurs from the extra spending on non tradable goods, resulted from higher income caused by the boom (11). This spending

may be direct from factor owners or indirect by the government after tax collection. Eventually, this income leads to higher demand for non tradable goods, therefore, the prices of these goods shall rise and move mobile production factors from the manufacturing sector toward the non tradable goods sector in order to increase output and meet the new demand level, this effect is considered as an indirect de-industrialization (12).

The resource movement effect is a direct result of the boom. The boom increases demand for production factors in order to achieve higher output. Therefore, the booming sector attract and absorb mobile production factors such as labor and capital from the other two sectors of the economy, which causes an output fall in both service and manufacturing sectors and this is considered as a direct de-industrialization(13). In other words, the spending effect has positive consequences on the service sector and negative consequences on manufacturing, this effect cause indirect de-industrialization. The resource movement effect has negative consequences on both service and manufacturing, this effect causes direct de-industrialization. It is worth noting that eventually the non-tradable goods sector's output maybe higher or lower than the initial level before the boom, depending on the intensity of the spending and resource movement effects(14).

Beside Corden and neary's work, many empirical studies(15) have provided evidence that natural resource reliance has a negative impact on economic growth of the country in the long term. Other recent studies(16) show that there is no direct impact of natural resources on poor industrial performance. Thus, these studies provide empirical evidence that there is indirect impact, if natural resource abundance increases this will encourages corruption which then will have a significant negative impact on economic growth. The main symptoms of Dutch Disease found in literature are the lack of export diversity, overvalued currency, poor industrial performance, high level of corruption, low foreign investment and low human capital investment. Furthermore, there is no consensus in literature about the mechanism of the Dutch Disease and the way natural resource dependence affects economic growth on the long term. Thorvaldur(17) pointed four main approaches explaining the effect of natural resource abundance on economic growth basing on literature and previous studies. First, over-evaluated currency is caused by the natural resources price fluctuations on both fixed and floating exchange rates, which leads to low export performance, low trade openness and low foreign investment. Considering that these variables are good for economic growth means that natural resource abundance has a negative effect on economic growth of the country. The second way to explain

the resource curse is that weak markets and legal structures enhance rent seeking behavior, this behavior deprives resource allocation to other valuable sectors and social activities. Furthermore, rent seeking behavior leads to power concentration in the hands of few people who then use rent money for personal interests and to preserve their power, in some severe cases this behavior may end up with a civil war. Also, corruption which is another result of the rent seeking behavior is a significant variable when explaining the resource curse. Studies have found that there is a significant correlation between natural resource dependence and corruption index, in the other hand there is a significant correlation between corruption and economic growth and therefore natural resource abundance indirectly affects economic growth.

The third approach used to explain the Dutch Disease mechanism is based on human capital and education. According to this approach education and human capital investment is negatively correlated to natural resource abundance, which can be extremely harmful to the economy considering that education and human capital accumulation are essential for economic growth. Finally, natural resource abundance lowers domestic investment and saving and may weaken financial institutions of the country, which also can severely harm economic growth.

3- Empirical study:

3.1 Statement of the problem:

According to statistics it is evident that Algerian economy is dependant of the energy sector's revenues. Recent statistics showed that hydrocarbons constituted 98% of exports revenues in 2013 (18) and oil rent about 22% of GDP in 2013 (19). But, beside the good performance of the hydrocarbons sector due to high oil prices, there are other sectors and aspects of economic growth which are very important for long term prosperity and economic health. Though, despite the prosperity and positive economic growth statistics recorded lately, it is possible that Algerian dependence to natural resource revenues is harming the economic performance and may have destructive results on the long run. Algerian economy is performing poorly on several levels; such as trade openness and foreign direct investment which are two important elements for healthy economic growth on the long term. Thus, Algeria recorded poor performances on these two indices and they are still below the world average despite all the efforts and measures taken by the Algerian government.

The following table shows the trade openness (20) index of Algerian economy in the period between 2004 and 2013:

Table 01: ***Trade openness index 2004-2013***

Year	Trade openness index
2004	66%
2005	71%
2006	71%
2007	72%
2008	77%
2009	71%
2010	70%
2011	68%
2012	67%
2013	63%

Source: The World Bank database

Despite the tiny progress, Algerian trade openness index is still below the world's average according to the World Bank statistics especially comparing to the MENA region countries. In a recent study(21) about trade openness and liberation Algeria has been ranked 72 out of 75 countries with a score of 2.0, in 2013, while countries like, Malaysia was rank 30 with a score of 3.9, the UAE rank 7 with a score of 4.6 and Egypt was rank 56 with a score of 2.9.

The next table shows statistics about foreign direct investment in Algeria, which is the second point of focus in this study:

Table 02: ***Foreign direct investment (billion dollars) 2004-2013***

Year	FDI (billion dollar)
2004	0.881
2005	1.156
2006	1.841
2007	1.686
2008	2.638
2009	2.747
2010	2.3
2011	2.571
2012	1.5
2013	1.689

Source: The World Bank database

As shown in table two, foreign direct investment in Algeria averaged between 0.881 billion to 2.747 billion dollars in the period between 2004 and 2013, which is low comparing to other countries in the MENA region and the world, for example in 2013 Egypt recorded 4 billion dollars of FDI net inflows, Morocco 3.5 and the UAE 10.5 billion dollars, in the same year Indonesia recorded 23 billion dollars, Malaysia 11 and Brazil about 80 billion dollars(22). The next table shows percentage of foreign direct investment in Algeria of GDP:

Table 03: ***Foreign direct investment (% of GDP) 2004-2013***

Year	FDI (billion dollar)
2004	1%
2005	1.1%
2006	1.6%
2007	1.2%
2008	1.5%
2009	2%
2010	1.4%
2011	1.3%
2012	0.7%
2013	0.8%

Source: The World Bank database

As shown in table 03, the highest level of foreign direct investment in Algeria was about 2% of GDP recorded in 2009 and the lowest was 0.7% in 2012, which is also far behind most of MENA countries and many other countries in the world. For example in 2013 Tunisia's foreign direct investment percentage of GDP was 2.3%, Morocco 3.1% and the UAE 2.7%, in the same year Indonesia recorded 2.6%, Malaysia 3.5% and Brazil about 3.4%.

Starting from the statistics shown above, the problem we are trying to underline is the poor performance of trade openness and foreign direct

investment which can be harmful for Algerian economy in the future. In this study we are going to discuss the problem basing on the literature review, using the Dutch Disease theory and the resource curse approach, in order to provide empirical evidencethat resource dependence is harming Algerian economy, otherwise said natural resource dependence is the main cause of the poor performance recorded in the other levels of Algerian economy.

3.2 Hypotheses:

Basing on literature review the following hypotheses are set:

H1: There is a statistically significant negative relationship between the energy sector dependence and trade openness of the other sectors in Algeria.

H2: There is a statistically significant negative relationship between the energy sector dependence and foreign direct investment in Algeria.

3.3 Methodology:

In order to test the hypotheses, a simple linear regression model has been adopted in order to estimate parameters and correlation using time series data type. The study period extends from 2004 to 2013. The independent variable is economic dependence to natural resources measured by hydrocarbons percentage of total exports revenues, dependent variables are trade openness in other sectors measured by percentage of imports and exports value of GDP besides the hydrocarbons sector, and foreign direct investment measured by net inflows (billion dollars) and percentage of GDP. Statistical analysis has been performed using the statistical package for social science software (SPSS) version 19 for windows.

Data is collected using the online databases of the World Bank, the CIA world factbook, IMF, and Algerian governmental institutions.

4- Results:

4-1 The effect of hydrocarbons dependence on trade openness:

The following table summarizes the results of regression analysis and hypothesis testing:

Table 04: *Regression of trade openness on hydrocarbons dependence*

Model	Coefficients	R	Sig.
(constant)	105.203	-0.51	0.008
Hydrocarbons dependence	-0.362		

Basing on the table above the linear regression equation is: Y_{TO}= -0.362 X + 105.203. Considering that, Y_{TO} is the trade openness of the other sectors (dependent variable) and X is the hydrocarbons dependence (independent variable).

The linear regression analysis results show that there is a negative relationship between hydrocarbons dependence and trade openness of other sectors. This relationship is economically and statistically significant. Calculated Spearman correlation = -0.51. Regression shows that an increase of 10 % in hydrocarbons percentage of total exports revenues will result in a decrease of 3.62 % in trade openness in the other sectors basing on these results the null hypothesis is rejected and the alternative hypothesis is accepted. Therefore, there is a significant negative impact of natural resource dependence on trade openness in Algeria. Furthermore, these results support the results of previous studies shown in literature review.

4-2 The effect of hydrocarbons dependence on FDI:

The following tables summarize the results of regression analysis and the second hypothesis testing:

Table 05: *Régression of FDI net inflows on hydrocarbonés dépendance*

Model	Coefficients	R	Sig.
(constant)	71.443	-0.45	0.039
Hydrocarbonés dépendance	-0.707		

Table 06: *Regression of FDI percentage of GDP on hydrocarbons dependence*

Model	Coefficients	R	Sig.
(**constant)**	39.974	-0.64	0.043
Hydrocarbonés dépendance	-0.394		

Basing on the tables above the linear regression equations can be written as follows: Y_{FDI}= -0.707 X + 71.443. Considering that Y_{FDI} is the foreign direct investment net inflows (dependent variable) and X is the hydrocarbons dependence (independent variable), and: $Y_{FDI\%}$= -0.394 X + 39.974. Considering that $Y_{FDI\%}$ is the foreign direct investment percentage of GDP (dependent variable) and X is the hydrocarbons dependence (independent variable).

These results show that there is also a negative relationship between natural resource dependence and foreign direct investment. This relationship is economically and statistically significant. Thus, the null hypothesis is rejected and the alternative hypothesis is accepted. Spearman correlation level is -0.45 between natural resource dependence and foreign direct investment net inflows and -0.64 between natural resource dependence and foreign direct investment percentage of GDP. Regression shows that an increase of 10 % in hydrocarbons percentage of total exports revenues will result in a decrease of 7.07% in net inflows of foreign direct investment and will result in a decrease of about 3.94% in foreign direct investment percentage of GDP. These results also support the results of previous studies shown in literature review.

Conclusions:

Basing on the results pointed above, and considering that trade openness in other sectors and foreign direct investment are both essential for economic growth, it is then evident that natural resource dependence is harming the Algerian economy and this might be the major obstacle facing the government's efforts to encourage foreign direct investment and increase trade openness. Oil rent is certainly contributing to the country's prosperity, but this welfare is shallow, because the rent doesn't reinforce the economy

or the country's manufacturing sector. Actually, the rentier aspect of the Algerian economy is making it vulnerable and weak not just because of the sensitivity to oil price fluctuation but it also harms and obstructs the development of other sectors and most importantly manufacturing, this issue was discussed by many studies in literature and usually is referred to as the Dutch Disease or the resource curse. Therefore, it would be more profitable and efficient for Algeria to invest the oil rent into productive fields and not just consumable projects. It is also important to identify the barriers facing foreign direct investment and trade openness then find radical solutions to stop the negative influence of natural resource abundance. Furthermore, it would be beneficial to use the results of some successful experience like Netherlands and Norway for escaping the resource curse and learn how to exploit the oil rent in a positive way to boost manufacturing and other sectors. Furthermore, it is worth noting that the study does not explain the mechanism of Dutch Disease in Algeria and how does oil rent influence trade openness and foreign direct investment or whether the effect is direct through currency appreciation or indirect through corruption and rent seeking behavior. Therefore, it is important to follow with another study that aims to point the reason why natural resource dependence has a negative effect on the economy and determine the nature of this effect and furthermore determine to what extent do corruption and rent seeking behavior are involved in poor economical performance recorded in Algeria.

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