

## **Diagnosing the Dutch disease in Algeria and methods of addressing it to achieve economic diversification during the period 2000-2023**

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**Abstract---**The aim of this study is to examine the symptoms of Dutch Disease in Algeria from 2000 to 2021 and try to find solutions capable of getting the country out of the cycle imposed by infection with this disease. The researchers relied on the descriptive analytical approach through a descriptive study of some previous international experiences that were addressed by research and studies, at the same time they share with Algeria the availability of resources and weak economic diversification. To understand this phenomenon, economic data were analyzed using several macroeconomic indicators. The study found clear evidence that the country's economy was affected by the Dutch Disease, which enabled the achievement of economic diversification, confirmed by high inflation rates and the exploitation of oil incomes to finance the non-reciprocal sector, which has made it flourish at the expense of the exchange sector. The value of the study lies in the fact that it spotlighting the symptoms that confirms the factors which affects the economy in general from the Dutch disease, Despite that there are other symptoms that deals otherwise with this phenomenon that does not exist.

**Keywords---**Dutch disease, impact of spending, impact of resource movement, economic diversification, Algerian economy.

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## 1 Introduction

The Dutch disease has ravaged the bodies of many global economies, especially those that have an abundance of natural resources, so they remain revolving in a vicious circle. They do not benefit from high revenues in the event of rising prices, nor do they learn a lesson from the badness of financial resources in the event of declining prices. Despite the fact that this disease has multiple symptoms, such as the high contribution of the non-exchange sector to the Gross Domestic Product, widespread unemployment, inflation, and the rise in the exchange rate, which in turn leads to a weak competitiveness of the exchange sector, these symptoms may not appear in many countries due to the policies adopted.

Algeria is among the countries that are endowed with huge natural resources such as gas and oil. However, it remains among the ranks of the developing countries, despite the efforts that have been made over several decades to diversify the economy and increase exports outside of hydrocarbons. Its economy is still stagnant in its place at best and from bad to worse in many cases. This is what leads us to pose the following problematic:

Is the Dutch disease really the reason behind Algeria's failure to achieve real economic diversification that would reinvest oil revenues in productive sectors?

Considering that Algeria did not succeed in reducing the dominance of the oil sector, we are led to the hypothesis that its economy is afflicted with Dutch disease, so we conducted this study with the aim of diagnosing the symptoms of the Dutch disease in Algeria and whether it prevents achieving economic diversification.

The study aimed to investigate the presence of Dutch disease in the Algerian economy from 2000 and 2021, using several macroeconomic indicators. These indicators include the internal trade rate, the relative significance of various economic sectors within GDP, the real effective exchange rate, inflation rates, and employment levels.

## 2 Literature review

In their quest to diagnose the Dutch disease and find possible solutions to recover from it, many economic researchers have tried to verify the presence of its symptoms in many resource-rich economies, for example. Their reference to economic indicators that most prominently exhibit symptoms such as the relative importance of sectors, exchange rates, inflation, and workforce has shown variability concerning the Algerian economy. Nonetheless, the expansion of the non-tradable sector points to its susceptibility to the disease, corroborated by observed high inflation rates. (Mohamed and others, 2023).

This study was not the only one to examine the impact of this disease on the economy and to show its symptoms on the national economy. Another study measured the impact of oil prices on macroeconomic indicators from 1980 to 2017 to find a significant impact of spending on the Dutch disease phenomenon in Algeria, as it is directed to non-productive sectors, which makes it not achieve The desired economic growth rates and the diversification of the economy were one of its most important recommendations for recovery from this disease, thus benefiting from precedent experiences such as the Norwegian and Malaysian experience. (Abdelkarim and Fatima Zohra, 2022).

Not far from Algeria, on the same continent, a study indicated that although Angola is the second largest oil exporter in Africa, it still lags behind in most macroeconomic indicators, to which the Dutch disease contributed in a large proportion, which is demonstrated by the clear link between high resource wealth and the lack of economic diversification through weak international competitiveness in sectors that do not depend on resources. Using a non-linear distributed autoregressive model, it was found that

there is a clear co-integration between global oil prices and the real exchange rate of the Kwana, indicating Angola's economy is afflicted with Dutch disease. The actual increase in currency value also leads to higher costs of domestically manufactured goods.

Which makes them lose their competitiveness in global markets, which leads to a decline in the manufacturing sector. (Zsuzsanna and others, 2023).

Among the experiments that are moving towards diversifying the economy to get rid of the Dutch disease, a study dealt with its impact on the growth and economic development of the Kingdom of Saudi Arabia during the period extending between 2005 and 2020 and the extent to which the economic reforms of the Kingdom's Vision 2030 affect reducing its pace by diversifying sources of income, relying on time series and Johansson methodology for Joint Integration, and the study concluded that the Saudi economy was negatively affected by this disease, but it began to recover and gradually transform from an income economy to a productive economy due to economic diversification (Ahmed, 2023).

As for the Azerbaijani economy, the impact of the Dutch disease on industrial employment was analyzed using the standard unrestricted autoregressive VAR technique. The results of the study showed that non-oil tradable sectors such as manufacturing did not achieve an increase in production, employment, and exports as a result of the rise in the real effective exchange rate and local prices. Although industrial employment is positively affected by the oil sector, increased employment in the services sector results in a decrease in industrial employment, and the latter is also negatively affected by oil prices as a result of the rise in the real exchange rate. (Ibrahim, 2022).

Returning to the Algerian economy, a study touched on the impact of the movement of resources for the Dutch disease in Algeria for the period 2000-2017. This study adopted the impact of the movement of resources as an indicator through which the presence of this disease can be tracked in what is known as the dissolution of direct or indirect manufacturing, depending on the nature and direction of the movement of resources between sectors, to reach the point that the phenomenon of Dutch disease actually exists in Algeria, which is demonstrated by the movement of labor from the exchange sector to the non-exchange sector, which confirms the hypothesis of the dissolution of indirect manufacturing.

According to the researcher's observations, the thriving sector does not seem to attract the available workforce from the non-interchangeable sector. Which refutes the hypothesis of the dissolution of direct manufacturing, and this is due to the nature of the thriving sector due to its specificity, and the high rates of unemployment make tracking the movement of resources between sectors somewhat difficult. . The prosperous sector in Algeria is also responsible for the occurrence of the Dutch disease phenomenon, yet it could be the solution to recover from it if the focus was on the oil manufacturing industry instead of exporting it in its crude form. (Mohamed and Abdelkader, 2021).

Developing countries have suffered from the Dutch disease resulting from strong capital flows as a result of globalization and economic openness. In a study conducted on a sample of 39 developing countries distributed on five continents during the period between 1960 and 2017, the causes and effects of the phenomenon of early deindustrialization were analyzed. The researcher used a model of panel data regression. This study concluded that an overestimation of the currency's real value undermines the competitiveness of the manufacturing sector in these countries, leading to a decline in the sector's contribution to the gross domestic product. Alongside the need for implementing a comprehensive industrial policy, capital flows must be subject to controls that will not raise the cost of local production in order to maintain competitiveness in global markets. . (Muhammet & Resul, 2022)

### 3 Data and Methodology

In this study, a dual methodology was relied on that includes the descriptive approach to review and analyze previous literature and studies related to the phenomenon of Dutch disease in several economies that share with Algeria as developing economies, although it abounds with huge natural resources, and the analytical approach to analyzing several economic indicators to understand and analyze this phenomenon in the Algerian economy from 2000 to 2021, using macroeconomic data from this 22-year period to assess the impact of the phenomenon, drawing on sources such as WDI, the National Bureau of Statistics (NSO), the Bank of Algeria, and OPEC.

### 4 Results and analysis:

In this part, we will try to present several economic indicators that allow us to diagnose the symptoms of the Dutch disease in the Algerian economy, and they have been arranged according to the amount of importance and the extent of its impact on other indicators, as well as analysis of the results reached as follows:

#### 4.1. Internal Trade Rate Index:

The results of this indicator can be relied upon closely to verify that the Algerian economy is infected with the Dutch disease. The process of calculating it is summed up by dividing the consumer price index numbers for non-exchangeable goods, such as services, by the consumer price index numbers for exchangeable goods, such as food and clothing. Thus, it shows the percentage increase in the prices of non-exchangeable goods compared to the prices of exchanged goods, and it can be used by comparing it to the absolute one. The greater it is, the more symptoms of Dutch disease appear, and vice versa.

When this indicator is greater than one, it indicates the impact of spending on the economy, which in turn leads to an increase in commodity prices, and because the prices of exchanged goods are linked to competition, they do not exceed their prices in foreign markets, which limit the ability of local commodities to compete, which greatly disrupts the export process and leads to reliance on imports. As for non-exchangeable goods, their prices are not subject to the international competitiveness to which their predecessors were subject, which leads to an excessive rise in their prices, and thus the internal trade rate is higher than the absolute one. (Youssef and Maitham, 2014, p. 43).

Although it is considered one of the most important tools that we can rely on in tracking the effects of the Dutch disease, the researcher faces several difficulties while relying on this indicator, and we will mention the most important of them below:

The assumption that other factors are constant cannot be relied upon, as commodity prices may be affected by factors other than changes in the volume of spending resulting from fluctuations in the prices of raw materials, such as changes in demand for certain commodities for circumstantial reasons such as periods of war, waves of epidemics, and climate fluctuations. Many developing countries resort to restricting the prices of some commodities that they consider strategic, which constitutes a real obstacle to tracking the effects of the Dutch disease through the internal exchange rate.

The lack of objective criteria for separating between exchanged and non-exchanged goods, as exchanged goods may be an essential component of non-exchanged goods, such as the prices of building materials in relation to real estate prices. (Mayah, 2010, p. 22).

**Table 1. Development of the Internal Exchange rate index in Algeria during  
The period: 2002-2021**

(2001=100)

The Years	The consumer price index numbers		Internal Trade Rate Index*/**
	Exchange goods**	non-exchangeable goods*	
2002	409,53	405,46	0,99
2003	417,05	424,80	1,02
2004	427,14	439,28	1,03
2005	426,80	456,77	1,07
2006	433,21	461,92	1,07
2007	443,00	471,43	1,06
2008	458,69	485,63	1,06
2009	481,00	504,40	1,05
2010	507,65	513,38	1,01
2011	542,87	525,36	0,97
2012	594,19	546,89	0,92
2013	613,38	559,63	0,91
2014	634,84	576,26	0,91
2015	673,62	598,98	0,89
2016	729,14	635,97	0,87
2017	784,59	661,38	0,84
2018	827,68	686,88	0,83
2019	861,92	716,82	0,83
2020	900,78	738,15	0,82
2021	973,62	767,51	0,79

\*Housing services (rent) and social and personal development services

\*\* Food, drinks, tobacco, clothes, and shoes

Source: Prepared by the authors (2023) based on:

[https://www.ons.dz/img/pdf/note\\_annuelle\\_ipc2021.pdf](https://www.ons.dz/img/pdf/note_annuelle_ipc2021.pdf),ons,dz/img/pdf/note\_annuelle\_ipc2021,pdf, Consulted on: 05/11/2023, 20:23

[https://www.ons.dz/IMG/pdf/Collection\\_IPC\\_2011\\_N171.pdf](https://www.ons.dz/IMG/pdf/Collection_IPC_2011_N171.pdf), Consulted on: 05/11/2023, 22:24

From the above table, we note that:

In 2002, the difference between the consumer price index for exchangeable and non-exchangeable goods was slight, as it was estimated at 4.07, which made the internal exchange rate slightly less than one, 0.99, which suggests that the Algerian economy had relatively recovered from the Dutch disease.

The repercussions of the Dutch disease became evident between 2003 and 2010, primarily through the increased expenditure resulting from a surge in oil revenues. This boost in revenues was driven by the significant rise in oil prices from 2000 to 2008. These revenues were spent on the non-exchangeable goods sector, which led to a rise in its prices compared to interchangeable goods due to insufficient domestic production to cover internal demand, which makes it far from competitiveness in the global markets, which in turn leads to covering this difference in demand through imports, which is confirmed by the high exchange rate and continued to rise to reach a maximum of 1.07 during two consecutive years, 2005 and 2006.

Although it witnessed a decline during the period extending between the year 2007, when it reached 1.06, and the year 2010, which recorded a rate estimated at 1.01 as a result of the increase in the Consumer Price Index for exchangeable goods at a pace greater than the increase recorded in the Consumer Price Index for non-exchangeable goods. However, it remained greater than one, and this decline was explained by the decrease in the volume of spending as a result of the decline in oil prices

beginning in 2009 and affected by the global financial crisis that cast its shadow on countries that rely heavily on raw materials to finance their economies. On the other hand, the new industrial policies that Algeria adopted in early 2007 contributed—even slightly—to reducing the gap between the thriving sector and the industrial sector by supporting the national product and allocating a financial envelope of 13.5 billion dinars to the industrial sector in order to improve the competitiveness of national industrial institutions, which was stated in the supplementary program to support economic growth 2005-2009. (Karima, 2020, p. 86).

This rate witnessed a noticeable decline to below one starting in 2011 at a rate of 0.97, reaching its lowest value during the year 2021 at a rate of 0.79. **This drop is linked to reduced spending levels, which are a consequence of the ongoing decrease in oil prices.**

#### 4.2. Index of the relative importance of economic sectors in the formation of GDP:

According to the Corden model, Algeria's economy is divided into three main sectors: the first is a flourishing sector that includes hydrocarbons; the second is the exchangeable sector, which covers the industrial and agricultural sectors; and the third is the services sector, which comprises public administration services, non-public administration services, and the construction and public works sectors are within a third sector, which is known as the non-exchangeable sector.

**Table 2. Contribution percentages of different sectors to the Gross Domestic Product composition for the period 2001-2021.**

(Unit: %)

Sector Years	The Prosperous Sector	The Exchange sector			Non- Exchange sector			Rights and fees On imports
		Agriculture Sector	Industry Sector	The total	Services Sector	C.P.W Sector *	The total	
2001	34,2	9,7	7,5	17,2	33	8,5	41,5	7,2
2002	32,7	9,2	7,5	16,7	33,2	9,1	42,3	8,3
2003	35,6	9,8	6,8	16,6	31,7	8,5	40,2	7,7
2004	37,7	9,4	6,3	15,7	31	8,3	39,3	7,3
2005	44,3	7,7	5,6	13,3	28,5	7,5	36,0	6,5
2006	45,6	7,5	5,2	12,7	27,9	7,9	35,8	5,8
2007	43,5	7,5	5,1	12,6	29,6	8,8	38,4	5,7
2008	45,3	6,4	4,7	11,1	29,5	8,7	38,2	5,5
2009	31,2	9,3	5,7	15,0	35,6	11,0	46,6	7,2
2010	34,9	8,5	5,1	13,6	34,8	10,5	45,3	6,2
2011	34,9	8,5	5,1	13,6	34,8	10,5	45,3	6,2
2012	35,8	8,1	4,5	12,6	36,6	9,1	45,7	5,8
2013	34,1	8,7	4,5	13,2	36,9	9,2	46,1	6,6
2014	27,0	10,3	4,9	15,2	40,2	10,4	50,6	7,2
2015	18,8	11,6	5,5	17,1	44,6	11,5	56,1	8,1
2016	17,3	12,2	5,6	17,8	45,1	11,8	56,9	8,0
2017	19,6	11,8	5,5	17,3	43,7	11,7	55,4	7,8
2018	22,4	12,0	5,6	17,6	41,0	11,6	52,6	7,4
2019	19,3	12,0	5,9	17,9	42,9	12,2	55,1	7,7
2020	13,9	13,8	6,2	20,0	45,2	12,8	58,0	8,0
2021	22,2	12,2	5,6	17,8	41,1	11,7	52,8	7,3
<b>Average Duration</b>	31,0	15,5			46,6			7,0

\* The Construction and Public Works

**Source:** Compiled by the analysts using data from the Central Bank of Algeria's statistical bulletins: 10, 32, 56, and 61.

Based on the data in Table No. (02), it is clear that:

#### **4.2.1. Thriving (Prosperous) sector:**

Despite the variation in its contribution to creating added value throughout the period between 2001 and 2021, the hydrocarbons sector remains equal with the services sector, recording high percentages ranging between 13.9% in 2020, which is considered the lowest recorded value, and 45.6% during 2006, which is the maximum value throughout the study period, with an average of 31.0%. It should be noted that its value is directly affected by oil prices, which indicates the isolation of this sector from the rest of the other productive sectors. That is confirmed by the percentage recorded during the year 2009, which declined by more than 14% due to the repercussions of the global financial crisis. The sharp decline during the period from 2014 to 2016 is due to the excessive and continuous decline in oil prices, which led Algeria to reduce its production more than once, and the economic crisis resulting from the COVID-19 epidemic led to a decline in global demand for oil, which in turn led to a decline in its prices. This explains the lowest level recorded in 2020.

Despite Algeria's many attempts to diversify its economy by adopting multiple economic policies, its performance remains short of achieving the set goals of making the latter record lower levels than other sectors, such as the industrial and agricultural sectors.

#### **4.2.2. The Exchange Sector:**

The exchange sector recorded a weak contribution to the formation of the gross domestic product. It recorded a decline in both its industrial and agricultural parts, as it did not exceed 7.5% and 13.8%, respectively, throughout the study period, as it is inversely proportional to the thriving sector, which remains below the level of available capabilities and efforts made by the state. Algeria has allocated significant financial allocations within the framework of various development programs, which have not achieved at least growth rates equivalent to the percentages allocated from the Gross Domestic Product. The exchange sector continued to decline from 17.2% in 2001 to 11.1% during 2008, despite Algeria's adoption of a new industrial strategy since 2007, due to the structural imbalances recorded as a result of the ineffectiveness of previous policies and the weakness of the national industrial structure and its failure to reach the required level.

In 2009, the excessive decline in oil prices, following the Global Financial Crisis, encouraged in Algeria the exports outside the hydrocarbons sector, which led to a relative improvement in the contribution of the exchange sector. However, it declined again in the following period until 2014, where it began to improve simultaneously with the decline. The significant increase in oil prices and the efforts made by Algeria to diversify the production base, improve the investment climate, and encourage the national product by following a protectionist trade policy to reduce the import bill. It recorded a rate of 20% in 2020, which is the highest rate achieved by Algeria over the period of twenty-one years.

#### **4.2.3. Non- Exchange Sector:**

By reading the data presented in the previous table, it appears to us that the contribution of the non-exchange sector reaches high levels that mostly exceed the thriving sector, let alone the exchange sector. However, looking at this sector from the inside, we find absolute dominance of the services sector, reaching in some years nearly 4 times, as was the case in 2014, where the non-exchange sector recorded a contribution exceeding 50% of the gross domestic product, exceeding the general average recorded during the period extending between 2001 and 2021, which is estimated at 46.6%, of which 40.2% is the share of the services sector and 10.4% for the construction and public works sector. And within the

framework of development programs, especially the program to support economic recovery, the increased spending of oil revenues on this sector has led to its growth at the expense of the exchange sector, and it has recorded very high rates, as is the case in the year 2020, with the latter's contribution reaching more than 58%, knowing that it does not produce added value and does not directly contribute to creating economic diversification. This confirms to us the emergence of the Dutch disease symptoms in Algeria through the impact of spending.

#### 4.3. Real Effective Exchange Rate index:

The real exchange rate is an effective indicator to confirm the spread of the Dutch disease phenomenon in the economies of countries. It is theoretically assumed that the rise in the country's real effective exchange rate resulting from foreign flows of revenues from natural resources such as oil is due to spending these revenues on non-productive sectors, which increases the demand for foreign goods and makes local products lose their competitiveness. It is reflected in a significant decline in the manufacturing sector (Hadi, 2019, p. 20). To project this theory onto the Algerian economy, we exploited the data of the annual average price of a barrel of crude oil as presented by the Organization of Petroleum Exporting Countries in parallel with the real effective exchange rate of the Algerian dinar during the period extending between 2000 and 2021, which has been paved and organized in the following table:

**Table 3. The development of OPEC crude oil prices and the Real Effective Exchange Rate in Algeria during the period 2000-2021**  
(2010=100)

The Years	The Real Effective Exchange Rate	CrudeOil Price
2000	119,41	27,60
2001	123,20	23,12
2002	114,23	24,36
2003	103,08	28,10
2004	103,51	36,05
2005	101,74	50,59
2006	101,31	61,00
2007	99,92	69,04
2008	102,24	94,10
2009	100,28	60,86
2010	100,00	77,38
2011	99,12	107,46
2012	103,91	109,45
2013	101,80	105,87
2014	102,90	96,29
2015	96,57	49,49
2016	95,59	40,76
2017	97,80	52,51
2018	93,50	69,78
2019	95,45	64,04
2020	91,20	41,40
2021	86,80	69,89

**Source :**Prepared by the researchers based

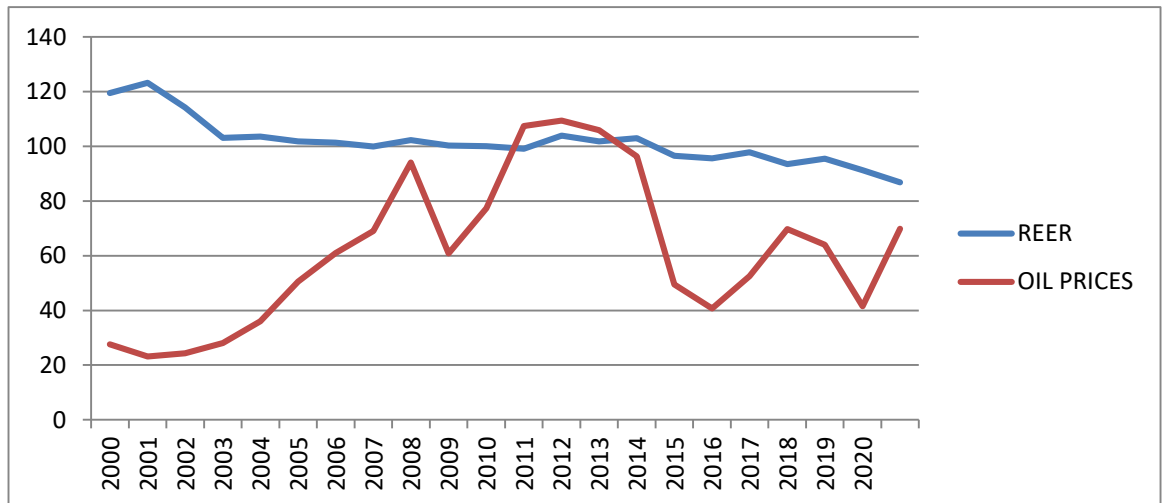
on:<https://api.worldbank.org/v2/en/country/DZA?downloadformat=excel>, Consulted

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OPEC crude oil price statistics annually 1960-2024 | Statista, consulted on:25/05/2024, 16:24

To facilitate reading the data from Table 3, it has been projected into the graph above, where the first curve in blue displays the development of the real effective exchange rate during the period 2000–2021, while the second curve in red shows the changes in the price of crude oil during the same period.

**Fig 1. Evolution of oil prices and the Real Effective Exchange Rate of the Algerian Dinars during the period 2000-2021**



**Source:** Prepared by the researchers based on data from Table 3

At first glance, it appears that the real effective exchange rate of the Algerian dinar is inversely proportional to oil prices. However, by delving into the data and analyzing it, we can distinguish several stages based on their division on the change in oil prices as an influencing factor. In the period extending between the years 2000 and 2001, we notice that a decline in the price of a barrel from \$27.6 to \$23.2 led to an increase in the real effective exchange rate by more than two dinars to reach 123.2 DZD per dollar in 2001 after it had been 119.41 DZD. The rise in oil prices during the period between 2002 and 2007, in turn, led to a decrease in the real effective exchange rate, which leads us to confirm the inverse proportionality between the two variables.

As a result of the 2008 Global Financial Crisis, the excessive rise in the average price of a barrel of oil led to a rise in the real exchange rate of the Algerian dinar, despite the monetary authority's efforts to stabilize the currency and enhance the competitiveness of non-hydrocarbon goods. This situation, however, indicates a mismatch with the floating exchange rate system implemented over the past eight years. Which suggests that the Real Exchange Rate index proves the presence of a symptom of the Dutch disease.

However, the next period refutes this suggestion, as the rise in the price of oil during the period 2009-2012 did not lead to an increase in the Real Exchange Rate of the Algerian Dinar, nor to a decrease in it, but rather it remained fluctuating, which indicates that the latter is not affected by oil prices as much as it is affected by other factors, such as the Exchange Rate system followed. .

As for the period 2013-2016, oil prices recorded a noticeable deterioration, as they decreased by more than half between these two years. This period began at a price of 105.87 dollars, then fell to a record level not exceeding 40.76 dollars, affected by the increase in supply as a result of the exploitation of American shale gas as well as the policies adopted by the OPEC. However, the real effective exchange rate continued to decline within a range not exceeding six dinars. This is if we exclude the slight increase during the year 2014, which does not constitute a difference given the general context of its

change, which leads us to say that the Real Exchange Rate index does not explain the effect on the Algerian economy, whether or not by symptoms of Dutch disease.

The real exchange rate remained not far from the arithmetic average for the study period, as it reached 97.80 dinars per dollar, i.e., a difference of no more than 4 dinars from the latter. Despite the increase in the price of oil by more than 32%, the real exchange rate did not remain in place and decreased at a small rate that did not reach 5%, and this is between 2017 and 2018.

After the health crisis, oil prices decreased as a result of the decline in demand for it, especially between 2019 and 2020, to achieve a kind of stability during the last year of the study period. However, the real exchange rate continued to decline to reach its lowest level throughout the study period with an estimated value of 86.80 DZD in the year 2021 as a result of the state's orientation to deep economic reforms that led to the creation of a kind of economic diversification, as Algeria's exports outside of hydrocarbons this year amounted to 5 billion dollars.

As a result, the Real Effective Exchange Rate index in Algeria is murky and does not provide a real indication of the spread of the Dutch economic disease, and therefore it cannot be relied upon as the Dutch disease theory states. Therefore, other economic indicators must be studied that would remove this ambiguity. Algeria is not the only one suffering from this phenomenon. In a study of the economy of Cameroon and Congo, Koutassila concluded that these symptoms are less apparent in developing countries than in developed countries, and the bad thing is that the symptoms of the Dutch disease do not appear, making them appear later in a more severe form, which is what Ndoumtara Nakoumdé concluded in a study he conducted on the Tchadian economy (Charifa, 2016, p. 254).

This is because this disease may manifest itself in the neglect of non-oil sectors, which leads to a decline in the competitiveness of local products in light of the weak economic diversification of the state's dependence on oil as the main source of revenues and the concentration of spending on non-productive sectors.

#### 4.4. Inflation index:

Inflation rates rise in countries rich in natural resources as a symptom of the Dutch disease. The source of these inflationary pressures is usually the non-exchangeable goods sector, as is the case with real estate prices in Algeria. Therefore, we will try to find out the effect of the inflation index on the Algerian economy and determine whether it has a relationship to the Dutch disease symptoms during the period 2000-2021.

**Table 4. Development of the inflation rate in Algeria during the period 2000-2021**

(Unit: %)

The Years	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Inflation rate	0,34	4,23	1,42	4,27	3,96	1,38	2,31	3,68	4,86	5,74	3,91
The Years	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Inflation rate	4,52	8,89	3,25	2,92	4,78	6,40	5,59	4,27	1,95	2,42	7,22

Source: <https://api.worldbank.org/v2/en/country/DZA?downloadformat=excel>, consulted on: 26/05/2024, 15:00

Based on the data in the table above, we note that the average annual inflation rate measured by the consumer price index reached 4.01% during the twenty-two-year period (2000-2021), which recorded varying inflation rates. In the period extending from 2000-2012, the inflation rate continued to rise to reach 8.89% in 2012 after it was at its lowest level since independence (Iman, 2021, p. 85), estimated at

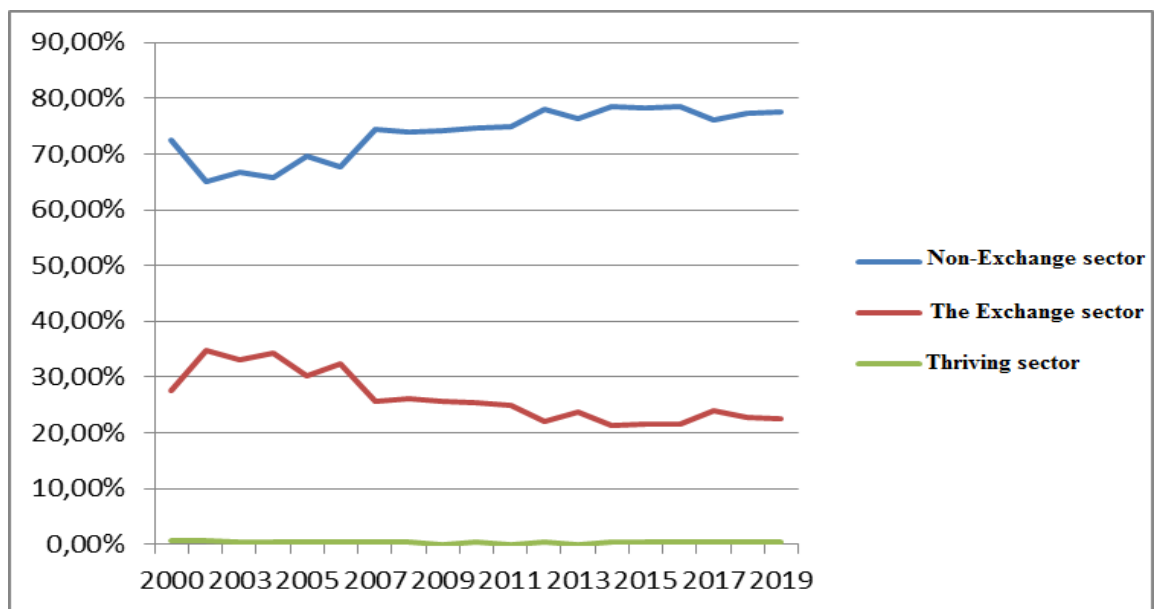
0.34% in the year 2000, as a result of the state's adoption of a concretionary financial policy and a strict monetary policy, following in its development the development of oil prices and supported by the steady increase in the monetary supply as a result of development programs through which a significant monetary mass was pumped. This if we exclude some special periods where the inflation rate recorded a decline during the year 2002, due to the decline in the real effective exchange rate of the Algerian dinar, while the payment of external debt in 2004 led to a decline in the monetary mass and exchange reserves. Its effects appeared in a decrease in the inflation rate in the following year, reaching 1.38% in 2005, then it gradually rose again with an arithmetic sequence based on a basis close to one until 2010, where it declined by two points, recording 3.91, as a result of the abolition of dealing with documentary collection and the restriction of imports to documentary credit in late 2009.

The inflation rate continued to rise, causing a big jump during the year 2012, which represented the peak, then took a new trend of decline during the period extending between 2013 and 2020, recording a minimum value of 1.27% in 2018. As a result of the rise in commodity prices in international markets, imported inflation appeared, which explains the increase in its rate to 7.22% in 2021, despite the Algerian economy recording better growth rates and the noticeable development in the volume of exports outside the hydrocarbons sector.

#### 4.5. Employment Index:

According to the Dutch disease hypothesis, labor is the only element that is transferred, as the displacement of labor from the exchange sector to the thriving sector and then the non-exchange sector is a symptom of the Dutch disease. To determine its impact on the Algerian economy, we relied on the following graph:

**Fig 2. Distribution of Employment according to different economic sectors in Algeria during the period: 2000-2019**



**Source:** Prepared by the researchers based on data from the National Office of Statistics and Various reports of Sonatrach

Through the figure above, we see an inverse proportion between employment in the exchange sector and the non-exchange sector, as the latter tends to increase, reinforced by individuals' confidence in the construction and public works sector due to it constituting a profitable investment portfolio with the highest percentage recorded during the year 2014, which was estimated at 78.62%. As for the services sector, it has the lion's share of the non-exchange sector due to the increasing government spending on administrative functions such as education and health, which attract large employment.

While we find that the exchange sector is in continuous decline, as 21.38% constituted its lowest percentage during the 2014 season, and this decline is due to the lack of a clearly defined industrial strategy that would advance the industrial sector as well as the agricultural sector, which still depends on primitive methods that make it in at the back of the sectors that play a role in creating wealth. Between this and that, we find the Thriving sector with employment that is negligible when compared to its predecessors, as it is limited to between 0.59% and 0.40% throughout the study period. This is because this sector needs specialized labor in addition to being characterized by isolation and does not attract a large number of workers, who are supposed to move to it from the exchange sector for a temporary period before moving back to the non-exchange sector as stipulated in the theory of the Dutch disease. Thus, the fact contradicts it, which puts us in the position of saying that the Algerian economy is exempt from this disease through the impact of resource movement.

## 5. Discussion of Results:

Developing countries continue to try to get rid of the Dutch disease, but they find themselves in fact treating the symptoms instead of treating the origins of the disease and taking measures that will eventually recover from oil dependency. These countries resort to circumstantial policies linked to oil prices in global markets to prevent the discovery of the symptoms of the disease at the right time, which leads to its aggravation.

To diagnose this phenomenon, we examined a set of indicators that economists use to diagnose this disease. The rate of internal trade exchange is one of the most important of these indicators. The higher it is, the more it indicates that the economy is infected with the Dutch disease and local products to compete in international markets. Thus the exploitation of this indicator causes difficulties to the researchers who relied upon the assumption that other factors are constant, but their effect on goods and services cannot be neglected. In addition, developing countries often resort to restricting or subsidizing goods at the expense of other goods due to the absence of precise criteria for separating between exchangeable and non-exchangeable goods.

Through our study of the internal exchange rate in Algeria, we found that it was characterized by an increase in the first stage from 2003 until 2010, only to decline again later, which refutes the Algerian economy being infected with the Dutch disease based on this indicator. While the indicator of the relative importance of economic sectors is clearer than the previous one and easier to read than it is, the expansion of the non-exchange sector and the contraction of the exchange sector constitute one of the most important symptoms of the Dutch disease. As for the Algerian economy, we notice a blatant expansion of the non-exchange sector, to the point that it surpassed the thriving sector in many periods. This confirms that the Algerian economy is infected with the Dutch disease, if we exclude that the contraction of the Exchange sector is due to the lack of a strong production system capable of competition that would create economic diversification and bring local products to international markets.

The rise in the real effective exchange rate is a prominent indicator in economies suffering from the Dutch disease because foreign exchange reserves constitute an important counterpart to the monetary mass. This matter would raise the value of the local currency, but the intervention of the Algerian state

to control the real effective exchange rate made it appear as if it was not affected by oil revenues, in other words, the absence of this disease affecting the Algerian economy.

Despite its intertwining with several other factors, the inflation rate constitutes a good criterion for detecting the Dutch disease. The higher the inflation rates, the more this leads us to verify that the economy is infected with the Dutch disease. Algeria has tried to control the inflation rate, but these attempts have failed for many reasons, including the weakness of the production base. The rise in commodity prices in global markets led to the occurrence of imported inflation, and its general level remained high, which confirms that the economy is infected with the Dutch disease.

As for the impact of Dutch disease on Employment (Labor), its symptoms are manifested in its temporary movement from the Exchange sector to the Prosperous sector and then to the Non-Exchange sector. Like many oil-producing countries, the Prosperous sector in Algeria is isolated from the rest of the sectors and does not absorb labor from the Exchange sector, both Industrial and Agricultural. On the other hand, the Labor force in this sector does not move to the Non-Exchange sector due to high wages and other incentives, and therefore this indicator cannot be relied upon in detecting symptoms of Dutch disease in Algeria.

The previous indicators can constitute symptoms of the Dutch disease only if As for the impact of Dutch disease on employment (labor), its symptoms are manifested in its temporary movement from the exchange sector to the prosperous sector and then to the non-exchange sector. Like many oil-producing countries, the prosperous sector in Algeria is isolated from the rest of the sectors and does not absorb labor from the exchange sector, both industrial and agricultural. On the other hand, the labor force in this sector does not move to the non-exchange sector due to high wages and other incentives, and therefore this indicator cannot be relied upon in detecting symptoms of Dutch disease in Algeria. They are independent of the factors related to the country's economic policies, which often make them not characterized by objectivity. However, the phenomenon of the Dutch disease cannot be obscured because it has clear manifestations, such as the country's economy's dependence almost entirely on oil (hydrocarbons) rents, as is the case in Algeria, as well as the weakness of the industrial sector, which contributes to the diversification of the economy, and Algeria in this field suffers greatly from the inability of the manufacturing industries to create job opportunities or products with international specifications due to the neglect of this sector. As for the agricultural sector, which would create real added value, Algeria is still far from investing in the available natural capabilities, and this confirms the hypothesis that the Algerian economy is infected with the Dutch disease, which is among the most important reasons that prevent the creation of real economic diversification.

## **6. Discussion conclusion:**

After the diagnosis confirmed that the Algerian economy was affected with the Dutch Disease, the study aimed to find methods for treating it by relying on developing the industrial sector, which would ensure economic diversification.

It is clear that the Dutch Disease is the main factor in Algerian strategy that made its economy fails because of relying on the non-productive sectors; so it does not reach the economic diversification. After analyzing the results of the study, index by index, the study concluded that it is necessary to exploit oil incomes at a time of high prices to build an industrial base capable of competing and creating economic diversification, instead of wasting them in unproductive sectors as one of the effective solutions to get rid of all the negative effects of the Dutch Disease.

The future prospects of this research are as follow:

- Adopting appropriate industrial policies as a mechanism to recover from Dutch Disease and achieve the desired economic diversification.

- Methods and strategies to reduce spending on unproductive sectors and stimulate productive sectors using oil resources.
- The real exchange rate was affected by the Dutch Disease in the context of Algeria's financial openness.

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