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Measuring the impact of the non-oil sectors on Gross Domestic Product in ALGERIA

قياس أثر القطاعات غير النفطية على الناتج المحلي الإجمالي في الجزائر

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Abstract:

This paper aims to present the general framework of economic diversification policies, and the economic diversification index, through this study we estimate two models using the ordinary least squares method during the period 2000-2020 to show the impact of the non-oil economic sectors on GDP, The study indicated that one of the conditions for the success of economic diversification is the encouragement of private investment and the availability of transparency and economic openness as the empirical study showed that the profitability of labor and capital is weak and that the Algerian economy depends in production on labor more than it depends on capital manufacturing industries and services sector contribute effectively to the formation of the GDP.

Keywords: GDP; oil sector; economic diversification index; OLS Method; agriculture

JEL Classification Codes : B22, Q35, C10, Q18

ملخص:

تهدف هذه الورقة البحثية إلى عرض الاطار العام لسياسات التنويع الاقتصادي، و مؤشرات قياس استراتيجية التنويع الاقتصادي، بالإضافة إلى ذلك فقد تم تقدير نموذجين بطريقة المربعات الصغرى العادية خلال الفترة 2000-2020 لتبيان أثر القطاعات الاقتصادية غير النفطية على الناتج المحلي الإجمالي ، و قد بينت الدراسة على أن من شروط نجاح التنويع الاقتصادي هو تشجيع الاستثمار الخاص و توفر الشفافية و الانفتاح الاقتصادي، كما بينت الدراسة القياسية على أن مردودية العمل و رأس المال ضعيفة و أن الاقتصاد الجزائري يعتمد في الانتاج على كثافة العمل أكثر مما يعتمد على رأس المال، و أثبت النموذج الثاني المقدر على أن كلا من القطاع الفلاحي و الصناعات التحويلية و الخدمات تساهم مساهمة فعالة في تكوين الناتج المحلي الإجمالي،

كلمات مفتاحية: الناتج المحلي الإجمالي، القطاع النفطي، مؤشرات التنويع الاقتصاديةة، طريقة المربعات الصغرى العادية ، الفلاحة

تصنيفات JEL : B22، Q35، C10،Q18

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INTRODUCTION

The economies of most developing countries are limited to oil because it is the only natural resource as a major source of gross domestic product (GDP) and a single product in the export process, as well as relying on it to finance the budget, and that reliance on a single resource as an engine of economic growth can impede or stop the development process Due to its dependence on the volatile international price of oil in global markets (Dif & Azouz, 2018, p. 21), it is noticeable that when world oil prices are high, most of these countries know a rise in their incomes that allow for higher imports, investment and consumption, and lower inflation rates.

Here, the country is carrying out the distribution process without the rational use of this strategic resource, sectorally and strategically, and we find that these countries suffer from difficult economic and social problems with the decline in international oil prices, which shows the fragility of their economies in the face of external shocks. The situation becomes more complicated for countries that suffer from high rates of population growth, as their national production, which depends on hydrocarbons, becomes unable to meet the growing and multiple needs of the population, especially in light of the decrease in their imports of goods and services, as we find them suffering from high rates Inflation, unemployment, and a decrease in the volume of real investment. On this basis, the reasons for the fragility of the economies of these countries are due to the absence of economic diversification in them. Algeria has witnessed a collapse in oil prices since mid-2014 (Messaoudi, 2018, p. 225), and it was infected with the “single-state - single resource” syndrome, or what is called in the economic literature as: “Dutch disease”.

Algeria until today has not been able to disengage the organic, structural link of its economy with oil and decode the economic diversification practically and realistically, except for initiatives and strategies in the right direction, but to some extent it has not reached full maturity. The oil sector represented in industry, agriculture, services and other sectors... keep asking "?" Unless it contributes to the industry of the internal product and the promotion of exports outside the oil sector. On this basis, the following research problem was raised:

What is the impact of the non-oil sectors to made-up the gross domestic product in Algeria and permit to it achieve real economic diversification?

for the answer to this problematical we rely on the following sub-questions:

1- What are the strategies used in economic diversification?

2- What are the indicators used to measure economic diversification?

3- What is the nature of the overall variables in the non-oil sectors in

Algerian economy?

To answer these questions, we propose the following hypotheses:

1-There are no specific strategies in economic diversification
2- The degree of economic diversification can be measured based on statistical indicators.
3- The non-oil sectors can contribute to building the domestic product and promoting exports.
4- The agricultural sector positively affects exports, while the impact of the sectors is positive The other is weak.

Methodology:

We used the descriptive-analytical approach due to the nature of this study that necessitates this, using economic measurement methods to explain the relationship between the dependent variables and the explanatory variables, based on the ordinary least squares method.

the importance of this study:

The importance of the study lies in knowing the most important economic sectors that can replace the oil sector, on which Algeria relies excessively on exports and the formation of the gross domestic product.

Aim of this study:

We aim through this study to measure the impact of the non-oil sectors on the gross domestic product by estimating the models in the ordinary least squares method during the period 2000-2020, in order to measure the relationship between the most important non-oil economic sectors with the gross domestic product, in addition to measuring the hand relationship Labor and investment with gross domestic product (GDP).

This research paper included three main themes:

1- Strategies for economic diversification and indicators for measuring it.
2- The reality of economic diversification in the Algerian economic environment
3- The empirical study of the impact of the non-oil sectors on the gross domestic product and exports during the period: 2000-2020.

1- Diversification strategies in the non-oil sectors and its measurement indicators:

Economic diversification can be defined as making the national economy and trade more diversified with the aim of increasing productivity, creating job opportunities and ensuring sustainable growth to reduce poverty. Economic diversification results in the transfer of production between sectors, industries and companies, and this reflects the dynamism of structural transformation, because effective diversification ensures the redistribution of resources within and between sectors, and the improvement of productivity. As for the transformation in trade, it is through exporting or importing new goods, or by exporting and importing goods to new markets, or by improving exported or imported goods.

And there are those who define economic diversification as “distributing investment over different sectors of the economy in order to reduce excessive dependence on one resource or one sector or very few sectors” (Aljbori, 2016). Economic diversification is also defined as “working to increase the contribution of the productive sectors to the gross domestic product, diversifying exports and activating taxes in a particular economy to reduce the risks that it may be exposed to if it is dependent on one sector, especially if it is rentier” (Dif & Azouz, 2018, p. 22); It is clear from these two definitions that economic diversification is the

adoption of a group of economic sectors to diversify sources of income, in addition to raising the degree of economic openness, and this is to achieve the following objectives:

- Encouraging private and foreign investment.
-Encouraging exports, achieving welfare for society and reducing unemployment rates.
-Encouraging innovation and introducing advanced industries.
-Integration into global markets.

Efforts focus primarily on companies, their characteristics and performance, and on reallocating resources between companies with low productivity and companies with high productivity. For example, we find companies in the same sector whose workers' wages are high and they have the ability to export. In the second place, we find technological development and lower transportation costs that allow lower production costs, improved product quality, and international competitiveness. In the third and last place, we find regulatory reforms and the reduction of communications costs, as some developing countries have been able to contribute more to international trade in services because they are characterized by higher productivity compared to agricultural and traditional activities.

We point out that choosing the appropriate strategy for economic diversification varies from one country to another and from one region to another, and this depends on its capabilities of natural and human resources, its social structures and its international relations, especially with developed countries. Underdeveloped countries to diversify their economies, which are predominantly dominated by raw materials and agricultural products in the composition of their national output.

1-1 Diversification strategies in the non-oil sectors:

The more developed the country, the higher its opportunity for economic diversification, and the best example of this is the Malaysian economy, which was dependent on the production and export of raw materials during the previous decades, but today it has become more integrated into the global economy with a group of sectors led by industry, where it has been able to develop products and entering new markets. Chile also chose to develop the natural resource export sector by developing services and logistical transport for copper exports, and diversifying its national production with the aim of exporting new agricultural products such as developing salmon farming. Investment and trade are the most important factors for the success of the economic diversification strategy in any country. Therefore, structural transformation and growth must be led by the private sector to expand economic activity, and no country can achieve lasting and sustainable growth without integrating into the global economy, and developed countries can be assisting developing countries by establishing the following basic elements:

- reforming the trade sector and providing an investment climate by removing obstacles and barriers that impede export operations while ensuring competition.
- Investments and political reforms to reduce trade costs, which allows efficient trade logistics services that have enabled East Asian countries to integrate more into the global economy and diversify their economies.
-reallocating resources to new activities and new investors, abandoning failed sectors and fighting the informal sector.
-Government intervention is only for the purpose of addressing imbalances in the market and controlling policies and institutions.

according to the World Bank (The World Bank, 2021), three interrelated factors affect economic diversification, namely, regulation of commercial activities, investment policy, trade policy, and competition policy.

1-1-1 Regulation of commercial activities and investment policy:

The rules of trade require transparency and equal opportunities for all investors, whether they are foreign or local, or large or small investors, to encourage investment and create new activities. The credit market must be regulated, easy to obtain a commercial registry, and equal employment opportunities...etc., but it cannot be to have economic diversification when conditions are not favorable for investment, due to the absence of suppliers and the weak efficiency of production factors. The investment and trade climate affects in three ways:
a - Reducing investment costs in new activities and allowing the flow of resources from failed companies and sectors to the profitable enterprise, as the duration and costs may constitute a real obstacle at the beginning of the project. Effective entry and exit enables competition between productive enterprises and innovation, in addition to this, this rule allows reallocation of resources in the most effective projects.

b- Influencing commercial activities and investment decisions, through tax systems, the labor market and credit systems. If these systems are applied to all dealers without any discrimination, then economic diversification is expected to succeed, but in the opposite case, economic diversification It is doomed to failure, because discriminatory rules allow the survival of the least productive companies at the expense of the more productive ones.
C - Provide transparency and clarity of the terms of activities for enterprises and reduce the risks associated with testing new products and markets, since respect for these rules in addition to guaranteeing intellectual property rights (such as patents), allows companies to encourage innovations and investments. It also results from these transparent systems that are characterized by non-discrimination, encouraging investment even in the riskiest projects with long-term gains.

1-1-2 Trade Policy:

The nature and policy of protecting foreign markets determines the ability of developing countries to diversify their exports, as if developed countries pursue a protectionist policy such as raising rights and customs duties on products that have a comparative advantage in developing countries, this would raise the costs of agricultural products and materials primary and light industries such as the clothing, leather and footwear industries, and thus this is what prevents these developing countries from developing other activities.

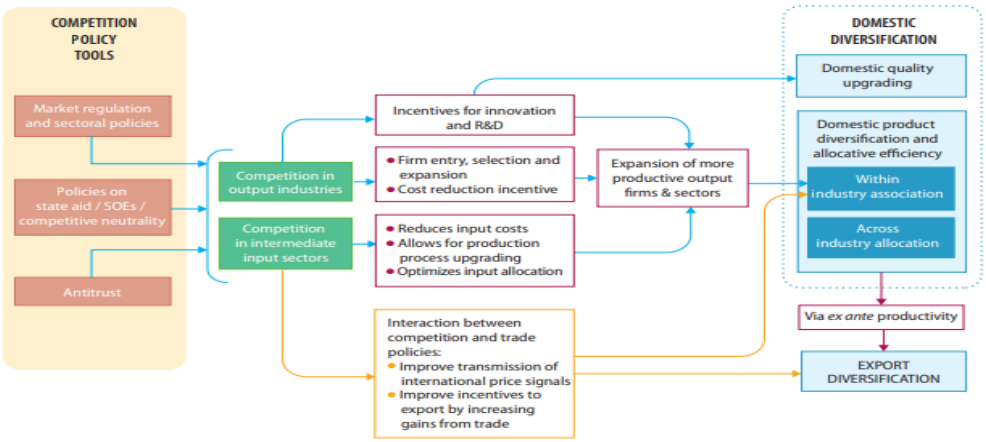
On this basis, import duties can constitute an obstacle for developing countries to diversify their exports, which affects the diversification of their national economies, and often these countries resort to what is known as reciprocity by raising customs duties on products imported from developed countries, but this can also negatively affect in production and investment operations in developing countries, through high rates of inflation and encouraging consumers to consume counterfeit and unauthorized (unofficial) goods, and this in the last negatively affects investment.

the economic bloc between developing countries (such as the Arab economic integration, the economic integration of the Arab Maghreb countries) can allow to raise export operations towards the developed countries, as these blocs allow the development of exported products in terms of quantity and quality on the one hand, and on the other hand the possibility of facing foreign protectionist policies. But the problem is related to respecting the safety and health standards imposed by developed countries on products imported from developing countries, and this, we believe, represents the biggest obstacle for these countries to diversify their exports.

1-1-3 Competition Policy:

Competition policy plays an important and effective role in building a private sector characterized by high productivity and diversity in production, and this can only be achieved by establishing laws that control production processes, competition, employment and combating all forms of monopoly. economics and innovation.

Figure (01): competition policy and economic diversification



Source: (OECD & WTO, 2019, p. 148)

2- Indicators for measuring economic diversification:

There are several indicators to measure the extent to which no country is dependent on the oil sector (economic diversification), the most important of which are:

The rate and degree of structural change, as indicated by the percentage contribution of the dysfunctional sectors to the GDP. In addition to the increase or decrease in the contribution of these sectors over time, it is also useful to measure the real growth rates of GDP by sector.

The degree of instability of GDP and its relationship to the instability of the oil price. It is clear that this instability will diminish with time.

Developing oil and gas revenues as a percentage of the government's total revenues, and because one of the objectives of diversification is to reduce dependence on oil revenues, and from other indicators, the pace of expansion of the non-oil revenue base over time, as this indicates success in developing new sources of non-oil revenue oil.

The ratio of non-oil exports to total exports, and the components of non-oil exports, and in general, the continuous rise in non-oil exports indicates an increase in economic diversification, although short-term changes in this measure may be misleading, as they can result from price fluctuations. Oil and its exports.

Total employment as a whole by sector, and it is clear that this measure should reflect and enhance changes in the sectoral composition of GDP.

The relative contribution of the public and private sectors to the gross domestic product has changed, and this is an important indicator because economic diversification implies an increase in the private sector's contribution to the gross domestic activity.

Productivity measures, as these measures can be applied, especially to various activities in the private sector, to assess its rate of development and update.

2-1 **Statistical indicators of economic diversification:**

The previous indicators measure the extent of economic diversification in the country, but they do not give us the exact degree of diversification, due to the dispersion and difference of the indicators used in knowing the extent of diversification, and for the comparison process of economic diversification, whether it is related to the country itself or compared to many countries during different periods, It is necessary to rely on indicators that measure the degree of economic diversification, among the most important of which are:

2-1-1 Herfindal-Hirshman Index:

It measures the degree of economic diversification and was developed by the American economist Orris C. Herfindahl and the German economist Albert O. Hirschman, it is based on the following formula (Bondarenko, 2021); and it is expressed mathematically by the expression:

$$\mathrm{HHI} = s_1^2 + s_2^2 + \cdots + s_n^2$$

where S_n stands for the firm's n share of the market

he closer the market is to the oligopoly, the more concentrated the market is and the less its competition. For example, if there is one company in the industry, this company owns 100% of the market share. The Herfindal-Hirschmann index may equal 10,000 indicating oligopoly, and if there are thousands from the competing companies, each of them obtains approximately

0% of the market share, and the index of Herfindal-Hirschmann may approach zero, indicating perfect competition. Herfindal Hirschmann 1,500 to 2,500 medium-concentration markets, and over 2,500 highly concentrated markets, and as a rule. in general, mergers that increase the Herfindal-Hirschmann Index by more than 200 points in highly concentrated markets raise antitrust concerns, as they are supposed to enhance market power under Section 5.3 of the Horizontal Merger Guidelines issued by the Administration and the Federal Trade Commission. (https://trading-secrets.guru/, 2021).

It is also possible to calculate the value of the Herfindal-Hirschmann index, whose value ranges between zero and one, so that the closer this indicator is to zero, this indicates the presence of economic diversification, and the closer this indicator is to one, this indicates the absence of economic diversity (that is, the presence of a concentration economic), using the relationship:

$$H = \frac{\sqrt{\sum (X_i / X)^2} - \sqrt{\frac{1}{N}}}{1 - \sqrt{\frac{1}{N}}}$$

So that indicates:
H: Herfendal-Hirschmann index
Xi: the GDP of sector i
X: GDP
N: the number of components of the output (number of sectors)

2-1-2 Diversity of exports index (UNICTAD index):

This indicator measures the deviation of the share of the exports of the main commodities of a particular country in its total exports from the share of the local exports of that commodity in world exports, and the value of this indicator ranges between 0 and 1, so that the closer this indicator is to zero, the higher the degree of diversification of exports. The index to zero corresponds to the structure of national exports with the structure of global exports, and is calculated according to the following formula:

$$S_j = \frac{\sum_{j-1} \left| h_{ij} - h_j \right|}{2}$$

So that indicates:
Sj: Export Diversity Index
hij: represents the share of exports of commodity i in the total exports of country j
hi: represents the share of exports of commodity i in the world's total exports

2-1-3 Vladimir Kosov Index:

This indicator measures the special changes in the structure of the economy. Whenever the value of cos=0 becomes, this means that structural changes have occurred in the concerned economy, and on the contrary, in the case of moving away from this value, this indicates the reversal of the changes and is calculated according to the following relationship:

$$\cos = \frac{\sum_{i=1}^{n} \alpha_i \times \beta_i}{\sqrt{\sum_{i=1}^{n} \alpha_i^2} \times \sqrt{\sum_{i=1}^{n} \beta_i^2}}$$

where:

Cos: Vladimir Kosov index

α_i: The relative importance of each sector in the gross domestic product in the base period.

β_i: The relative importance of each sector in the GDP in the comparison period.

3-The reality of economic diversification in the Algerian economic environment:

Algeria is one of the countries most affected by the drop in oil prices, given that the oil sector is the main source of income, which controls about 97% of total government revenues. The collapse of oil prices in 2014 prompted a call for a fundamental review aimed at increasing economic diversification.

The government has adopted a new economic model for growth by adopting a policy of diversifying sources of income, through investing in sectors outside of hydrocarbons, with the aim of diversifying the national product destined for export and the local market, and reconsidering the policy of preparing public budgets based on a less spending and more just policy. This new model aims to achieve a set of goals, the most important of which are:

-achieving a sustainable growth rate outside the hydrocarbon sector in the range of 6.5% during the period 2020-2030.

-double the per capita GDP.

-raising the contribution of the manufacturing industry to the GDP from 3.5% in 2015 to 10% in 2030.

-reducing the annual energy consumption growth rate from 6% to 3% in 2030.

-diversifying exports and developing the agricultural sector to achieve food security.

3-1 The contribution of the oil sector to the gross domestic product (GDP):

Algeria ranks fifth in the world in terms of natural gas reserves, and 14th in terms of oil reserves. It is the second largest natural gas exporter in the world, and the third largest oil exporter in Africa, where the national economy depends on 60% of petroleum taxation on development financing. Economic and oil exports represent 95% of the total Algeria's exports, however, 65% of public revenues depend on oil revenues, while hydrocarbon production occupies about 40% of GDP (kourtel, 2019). This can be shown by the following table:

Table (01): The contribution of the hydrocarbon sector to the GDP

Years	2011	2012	2013	2014	2015	2016	2017	2018	2019
Oil price	112.9	111	109	100.2	53.1	45.0	54.1	71.3	64.4
Oil exports (%)out of total exports	9671	97.14	97	75.4	94.0	95.25	94.0	93.0	99.0
The contribution of hydrocarbons on GDP (%)	36.1	34.2	29.8	27	18.8	17.4	19.68	21.00	19.27

Source: Prepared by the researcher based on the statistical publications of the Bank of Algeria 2011-2019 (bank-of-algeria, 2021)

Figure (02): Algerian GDP Growth Rate (2008-2017)

Source : ONS (Office National des Statistiques, 2018)

The oil shock had catastrophic repercussions on the oil-based economies, which was called the "resource curse", and these effects were represented A sharp drop in oil export revenues, as oil export income fell to about ½, where it recorded a decrease in 2015 of 33018 billion dollars, compared to 59,996 in 2014.

- a large deficit in public revenues, forcing the government to resort to the Revenue Control Fund, whose resources also decreased to: 1714.6 Algerian dinars between 2014 and 2015 (33%).
- recording a deficit in the trade balance estimated at 7.7 billion dollars in the first half of 2015, and a deficit in covering imports.
- The decline in Algeria's income from hard currency, and this directly affected the major balances of the Algerian economy, which prompted the government to adopt a policy of austerity in public expenditures in the Finance and Public Budget Law.

From this point of view, the adoption of the strategy of diversification has become a major bet facing the Algerian economy in the coming years.

3-2 The reality of the agricultural sector in Algeria:

Algeria has many opportunities in the agricultural sector, because it is considered the gateway to the African continent and the hub of the Maghreb countries. That the exploited area is still weak compared to the total sectors, and this confirms the possibility of investing more in the agricultural sector to create food security and access to exports, so that this sector becomes one of the crucial alternatives to the hydrocarbon sector, and the following table shows the contribution of the agricultural sector to the GDP in Algeria Modern methods of measuring economic diversification in Arab countries and ways to sustain it.

Table (02): The contribution of the agricultural sector to the composition of the gross domestic product / unit: billion Algerian dinars

years	2013	2014	2015	2016	2017	2018	2019
GDP	16643.8	17205.1	16799.2	17514.6	18594.1	20189.6	20284.2
The share of the agricultural sector on GDP	1640	1771.5	2013.9	2140.3	2281.9	2491.1	2429.4
(%) of the agricultural sector on GDP	9.85	10.29	11.98	12.22	12.27	12.33	11.97

Source: Prepared by the researcher by referring to Bank of Algeria reports: 2013-2020 (bank-of-algeria, 2021)

The above table shows the small increase in the contribution of the agricultural sector to the GDP, even after years of the collapse of oil prices in the global market, where the highest contribution rate reached 12.33% in 2018. This reflects the Algerian government's lack of actual desire to diversify the economy with actual relations.

3-3 The reality of the industrial sector in Algeria:

the contribution of the industrial sector to the GDP was about 18% in the seventies of the last century, it has only contributed weakly in recent years (Sebbagh, 2020, p. 72). The following table shows the contribution of the industrial sector to the GDP:

Table (03): The contribution of the industrial sector to the composition of the gross domestic product / unit: billion Algerian dinars

Years	2013	2014	2015	2016	2017	2018	2019
GDP	16643.8	17205.1	16799.2	17514.6	18594.1	20189.6	20284.2
The share of the industrial sector in GDP	765.4	837	889.4	979.3	1062	1130.3	1198.5
The (%)of the industrial sector on GDP	4.59	4.86	5.29	5.59	5.71	5.59	5.90

Source: Prepared by the researcher by referring to Bank of Algeria reports: 2013-2020 (bank-of-algeria, 2021)

the above table, it becomes clear that there is a very small fluctuation in the contribution of the industrial sector to the GDP, even after years of the collapse of oil prices in the global market, where the highest contribution rate reached 5.90% in 2019. This reflects the Algerian government's lack of actual desire to diversify the economy with relations in a

way that actual. And a deteriorating industrial fabric, despite the Algerian government's adoption of an industrial strategy, the most important of which is summarized by the government:

Encouraging the establishment of start-up projects

- Promoting foreign direct investment and increasing the contribution of manufacturing industries to the gross domestic product
- Increasing the contribution of the private sector and protecting the local product by limiting random imports.

Promote investment in the industrial sector by issuing many laws and decrees and improving the investment environment by adopting the approach of supporting small and medium enterprises.

- Development of the banking system.
- Preserve to the environment, economic activity (reorganization of real estate, investment and tax law, ...); However, the reality of the situation is still waiting for the signs of that strategy.

3-4 The reality of the service sector in Algeria:

The services sector is the second sector that contributes to the national economy after the oil sector, due to the services it provides to other sectors of transport and trade, and in all the stages that companies carry out from production, distribution and services to the product and the human factor, and it seems that the term “services economy” has not It comes out of nowhere, but from a level of extreme importance.

Table (04): The contribution of the services sector to the composition of the GDP / unit: billion Algerian dinars

Years	2013	2014	2015	2016	2017	2018	2019
GDP	16643.8	17205.1	16799.2	17514.6	18594.1	20189.6	20284.2
Services sector share of GDP	6400.8	6906.4	7393.5	7900.9	7931.6	8332	2158
of the services sector on GDP	38.45	40.14	44.01	45.11	42.65	41.26	10.63

Source: Prepared by the researcher by referring to Bank of Algeria reports: 2013-2020 (bank-of-algeria, 2021)

the services sector should occupy, we find that its contribution to the GDP reached its highest percentage: 45.11% in 2016, which is higher than the contribution of the agricultural and industrial sectors combined, but it remains less than the acceptable percentage compared to the horizontal extension of the sector with all The sectors, however, witnessed a catastrophic decline in 2019 by: 10.63%.

4-The Empirical study of the impact of the non-oil sectors on the gross domestic product and exports during the period: 2000-2020.

Based on the theoretical side and the data available to us, two models have been estimated using the Ordinary Least Squares (OLS) method, and the first model relates to estimating the function of national product in terms of employment and investment in order to know the effectiveness of these two variables on GDP, and the second model relates to estimating the national product Depending on the sectors outside hydrocarbons (agriculture, manufacturing and services) as explanatory variables.

4-1 Estimation of the Douglas Cobb function for Algeria 2000-2020:

We estimate the Cobb-Douglas production function:

$$gdp = AL^{\alpha}K^{\beta} \dots\dots\dots\dots (1)$$

After entering the logarithm, we have:

$$\ln(gdp) = A + \alpha \ln(L) + \beta \ln(K) \dots\dots\dots . (2)$$

gdp: real GDP in billions of dollars (base year 2015),

L :Employment in millions of workers

K :The real total investment volume in billion US dollars (base year 2015).

Data source: World Bank 2021.

After estimating the relationship (2) by the method of ordinary least squares (OLS) and eliminating the autocorrelation problem, we obtained the results shown in relationship (3), where we notice that if the volume of employed labor (L) increased by 1%, the volume of real output (GDP) would rise.) by 0.43% (output elasticity of labor), and the same is the case when the volume of investment (k) increases by 1%, the real output rises by 0.14% (output elasticity of capital), in addition to this we note that the two parameters are significant because the value of t-student Calculated is greater than scheduled$t_t = 2.08$) At a level of significance of 5% and a degree of freedom (n-k=19), which shows that work and investment have a significant effect on real output. But we note that the total flexibility of work and investment is less than one, which indicates that the productivity of labor and capital is decreasing, in addition to this, production in Algeria depends primarily on labor more than capital (investment), because production flexibility Labor is greater than the output elasticity of capital.

$$\ln(gdp) = 3.41 + 0.43 \ln(L) + 0.14 \ln(k) + [AR(1) = 0.85] \dots\dots . (3)$$

$$(12.16) \quad (2.39) \quad (2.75) \qquad (5.83)$$

$$R^2 = 0.95 \quad \bar{R}^2 = 0.95 \qquad F_C = 351.1 \qquad DW = 1.98$$

$$n = 20$$

We also notice from relationship (3) that the calculated Fisher value (Fc=351.1) is greater than the tabulated (F_t=3.52) at the 5% significance level and the degree of freedom (nk-1=19), which indicates that all the explanatory variables as a whole It has a significant effect on the

output, and the value of the coefficient of determination (R^2 = 0.95) shows that both labor and capital explain the output by 95%, and this ratio is equal to the corrected coefficient of determination ($\bar{R}^2$ = 0.95), which means The value of the coefficient of determination does not remain constant when adding other explanatory variables.
It can be said that this estimated model is acceptable from an economic and statistical point of view.

4-2 Estimation of real output in terms of variables outside the non-oil sectors 2000-2020:

$$gdp = c_0 + c_1 ava + c_2 mva + c_3 sva + u_t \dots\dots (4)$$

gdp: real GDP in billions of dollars (base year 2015), ava: volume of agricultural production,
ava: agricultural production

mva: manufacturing industries in billions of dollars (base year 2015):
sva: mount of services in billions of dollars (base year 2015).

After estimating the relationship (4) by the method of ordinary least squares (OLS), we got the results as shown by the relationship (5), where we note that if agricultural production (ava) increases by one billion dollars, the real output increases by 0.95 billion US dollars, and when production increases Manufacturing (mva) by 1 dollar increases output by 1.56 US dollars, as is the case when services (sva) increase by 1 dollar increases output by 1.3 billion US dollars. The results also show that all parameters were significant because the calculated t-student value is greater than the tabulated t (t_{tab}=2.09) at the 5% level of significance and the degree of freedom (nk=19), and this shows that both agricultural production, manufacturing industries and services It has a significant effect on the real output.

$$gdp = -17.21 + 0.95 ava + 1.56 mva + 1.30 sva \dots\dots (5)$$

$$(6.07) \quad (2.81) \quad (27.45) \quad (15.49)$$

$$R^2 = 0.95 \quad \bar{R}^2 = 0.95 \quad F_C = 8771.42 \quad DW = 1.52$$

$$n = 20$$

Relationship (5) shows that the calculated Fisher value (Fc=2352.40) is greater than the tabulated (F_t=3.20) at the 5% significance level and the degree of freedom (nk-1=18), which indicates that all the explanatory variables as a whole have an effect. Significant on the output, and the value of the coefficient of determination (R^2 = 0.95) indicates that both agricultural production, the manufacturing industry and services explain the output by 98%, and this ratio is equal to the corrected determination coefficient ($\bar{R}^2$ = 0.95), and this is what It means that the value of the coefficient of determination does not remain constant when adding other explanatory variables.

This estimated model is also acceptable from an economic and statistical point of view, and it does not suffer from the problem of autocorrelation It can be said that this estimated model is acceptable from an economic and statistical point of view.

Conclusion:

Economic diversification of any country reflects the structural change in the national economy, which is related to directing investments to strategic sectors, especially industry, agriculture and services, in addition to the structural transformation in foreign trade, especially exports, through its promotion. Economic diversification strategies differ from one country to another, because this It depends on its capabilities of natural and human resources and its relations with the outside world, especially with developed countries. On this basis, there is no single pattern for countries to follow to diversify their economies. But there are conditions that must be met in all countries that relate to investment and trade in particular, where transparency and dependence on the private sector must prevail in the country, combating all forms of monopoly, and encouraging innovation, in addition to opening up more to the outside world by reducing restrictions on trade. foreign affairs, and the development of international logistics transport services to reduce costs.

And the Empirical study of the three models of the case of Algeria during the period 199-2020, which is estimated, showed that the overall profitability of labor and capital was decreasing, and this is what hinders the development of the growth rate of the gross domestic product, especially in light of the levels of large population growth that Algeria knows, and Algeria's GDP depends more on labor than on capital. The results of the third model estimation indicated both agricultural production, manufacturing industries, and Services positively and morally affect the GDP, that is, they play an active role in the formation of real output in order to meet the growing and multiple needs of the population. But the results showed in the third model estimated that the manufacturing sector is the only sector that had a positive and moral impact on exports, while the agriculture sector had a positive but not significant impact on exports, while the services sector had a negative and insignificant impact.

We conclude from here that the manufacturing sector, which includes the leather and textile industry, the food industry and the pharmaceutical industry, is the only sector outside of hydrocarbons that has made a contribution to the formation of the national product and the promotion of exports. On exports, this is probably due to weak competition abroad and technological backwardness. Finally, we recommend the following:

- pay more attention to the manufacturing sector, because it has benefits on GDP and exports
- work to develop the agricultural sector further and encourage exports, as this sector plays an important role in achieving self-sufficiency and its contribution to the development of the manufacturing industry more.
-rehabilitation of the workforce by encouraging foreign direct investment and opening centers to rehabilitate and recycle it.
- encouraging and facilitating private investment in the services sector, especially in tourism, maritime and air transport.

- raising the quality of local products by establishing fixed laws for local and foreign investment, establishing quality analysis centers for commodities, and fighting all forms of monopoly.
- develop the financial and monetary market in Algeria, which is still below the required level.

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