An econometric study of the relationship between total natural resource revenues and the financial performance of the general budget in Algeria during the period 2000/2022.

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Abstract :
This paper aims to clarify the relationship between the total revenues of natural resources and the financial performance of the public budget in Algeria, The results of the econometric study showed that the fluctuations in natural resource revenues are one of the main déterminants of the state of the national economy. Any increase or decrease in natural resource revenues by one unit will lead to an increase or decrease in the balance of the general budget by 26.27 units, which reflets the dépendance of the Algérien economy on Natural ressource revenues.

Mots clés:
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Resumé :
Cet article vise à clarifier la relation entre les revenus totaux des ressources naturelles et la performance financière du budget public en Algérie. Les résultats de l'étude économétrique ont montré que les fluctuations des revenus des ressources naturelles sont l'un des principaux déterminants de l'état du pays. économie nationale. Toute augmentation ou diminution des revenus des ressources naturelles d'une unité entraînera une augmentation ou une diminution du solde du budget général de 26,27 unités, ce qui reflète la dépendance de l'économie algérienne aux revenus des ressources naturelles.

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1. INTRODUCTION

It Is self-évident to Say That higher Natural revenues are in the interest of producing and exporting countries. The basis of its financial revenues, which has a positive impact on the préparation of its général budgets, and on the other hand, this increase is not in the interest of the consuming countries. Most récent studies have confirmed that countries that possess huge wealth of natural resources usually have bad economic performance than countries that do not own this huge amount of resources. Also, in many cases, the abundance of resources is one of the most important determinants of economic failure in these countries.

And in this case most countries rich in natural resources seek to avoid this problem through planning financial and economic policies. It is self-evident that the prices of natural resources, especially oil, are characterized by stability and high fluctuations as a result of it being affected by many factors, but this situation does not include All countries have a surplus in resources. There are some of these countries that have better economic performance than the performance of other countries, such as Indonesia, for example, which depends on oil, and Botswana, which is rich in diamonds.

Algeria is considered one of the oil economies that rely heavily on oil revenues to finance a larger proportion of the volume of publicexpdenture. This almost total dependence has effects that make macroeconomic indicators dependent on fluctuations in natural resource revenues, which also had a direct impact on the volume of Public revenues and the volume of publicexpdenture have become difficult to reduce. Which resulted in an imbalance in the state's public finances, adding to the inability to incur the burdens and the deficit in public budgets.

To address the issue, the study poses the following problem:

What is the relationship between natural resource revenues and the financial performance of the general budget in Algeria?

We have made the following hypotheses:

1- Differences in theoretical trends regarding the abundance of natural resources and financial performance.

2- There is an inverse relationship between the abundance of natural resource revenues and the financial performance of the general budget

To answer this problem, the study relies on the following plan:

1- A literary review of the abundance of Natural ressources and the financial

performance of the général budget.
2- A statistical view on public finances in Alegria
3- The econometric study of the Relationship between the abundance of Natural ressources and the financial performance of the général budget in Alegria.

2. A literary review of the abundance of natural resources and the financial performance of the general budget.

As a result of excessive reliance on natural resource revenues to finance the general budget, various renter economies began to witness a decline in growth rates and levels of economic well-being at the end of the seventies and the beginning of the eighties, as a result of the decline in prices of primary resources, especially oil prices, and this economic situation became known as the Dutch disease. While this phenomenon is considered a barrier that obstructs the path of public budgets, here two theoretical directions can be clarified (benatia, 2015).

Pessimistic trend: The results of development based on oil exports have been negative during the past forty years. It has been observed that some natural resources such as oil, natural gas, or other precious mineral deposits do not necessarily lead to economic success and economic development (frankel, 2010). The negative results include: slow economic growth, weak economic diversification, declining social welfare indicators, budget deficits, and high levels of poverty (Wikipédia, 2024).

In terms of determining rentier incomes or the rentier state, there are several points of view, but there is general agreement to consider oil revenues as rentier returns. From this standpoint, rentier states are those countries in which the contribution of external rentier returns constitutes a percentage of more than 30% of the gross domestic product. It is noted that the Arab oil countries that depend on external rents did not depend on local production to achieve income, and it had negative effects in not building an integrated

production base, and this is the result of the state's role changing from a developmental role to a role controlled by rentier returns and thus controlling jobs and the labor market. And investments, which increased the distortion of the market in general, which had negative effects on the economic structure (gray, 2011).

Collier (2009) presented research on how natural resources can affect the economic performance of countries with different political systems. He concluded that there is a lower level of natural revenues in authoritarian regimes compared to democratic regimes by 80% of the gross domestic product (Collier, 2010). This indicates that there is an inverse relationship between the type of regimes and the distribution of natural resource wealth. Here, it can be said that the resource curse has taken on a more political than economic dimension.

While many economists went to clarify the relationship between the abundance of economic resources and economic performance, SACHS ET WARNER (1995) presented a statistical model in which it shows the existence of an inverse relationship between the abundance of natural resources and economic growth from the year 1970 until 1990 (saches.warner, 1995).

Optimistic trend: The theory of depleted resources is based on a basic hypothesis, which is that the owners of depleted resources, who aim to maximize wealth, try to produce the resource in a way that maximizes its current value. To achieve this, the present value of the net return of a unit of the depleted resource must be the same in all periods, otherwise it will be It is the interest of producers to shift their production from one period to another.

On this basis, it can be considered that about describing depleted resources means in essence the necessity of taking into account future generations in those resources when carrying out the processes of exploiting them, which is the theoretical basis from which the concept of sustainable development

was later launched, and in general economic growth that was adopted by the United Nations in the last decade. From the twentieth century.

The importance of natural resources increased with the Industrial Revolution and what accompanied it, as the relationship between growth and economic well-being on the one hand, and energy production and consumption on the other hand, became one of the basic goals of countries that depend on these resources. This relationship has developed over time, to confirm the strength of the link between energy consumption , economic growth, and reliable energy supplies at the local, national, and even international levels constitute an essential element of financial stability and sustainable growth, and therefore natural resources are fundamentally linked to the pillars of economic growth and sustainable development.

It is known that the prices of natural resources are characterized by continuous and permanent fluctuation and unpredictability in the future. This is due to the nature of economic activity, which is characterized by periodicity, i.e. periods of recession and periods of recovery. This is what leads public policy makers to change the approach to financial policies followed, and this is what is called Financial policies to confront cyclical fluctuations (Procyclical fiscal policy).

The latter are expansionary in periods of prosperity and contractionary in periods of recession, as these policies can cause damage. In this case, if they are not fully compensated for by expansionary fiscal policies in times of prosperity, times of recession, or crises, they may also produce a large deficit bias and lead to a lack of... Debt sustainability (Antonio, 2003).

Among the underlying reasons behind adopting a cyclical or pro-cyclical financial policy is the weakness of the financial markets: in this case, if the financial or credit markets are unable to keep pace with the requirements of the state in the event of a recession, governments are forced to reduce spending in difficult times or Critical situations, such as a decline in the prices of natural resources, for example oil. In this case, governments pursue a contractionary policy (Ahmed Saber Mahmud, 2014) Among its effects, it is noted that financial policy keeping pace with cyclical trends in countries leads to weak financial sustainability, which in many cases has been found to lead to deficit. In fact, whenever countries do not generate

surpluses in periods of prosperity as they should, they will be forced by the markets to find a way or to compensate by injecting financial values and reducing deficits by reducing expenditures during periods of recession. However, there are political and legal limits that limit the possibility of doing so in such cases.

Therefore, the pro-cyclical nature of fiscal policies ends up generating what amounts to unsustainable financial results over the course of the economic cycle. This has also been proven to be the solution in many countries in Europe, for example Italy and Spain, before the European Union's fiscal crisis, as happened during the financial crisis of 2008, which It affected major macroeconomics. This was the experience in many Latin American countries, most recently in Argentina, Ecuador and Colombia in the 1990s, where expansionary financial policies during the period that followed the boom period affected them and the overall economy in light of a financial crisis that resulted in a deep economic recession (Perry, 2003).

Likewise, the establishment of sovereign wealth funds by the general government. Sovereign wealth funds are for purely economic purposes. They hold, employ, or manage assets to achieve financial goals, using investment strategies that include investing in foreign financial assets. Sovereign wealth funds are characterized by the diversity of their structures that regulate the legal and institutional aspects and government practices. It is a group with varying characteristics, including public finance stabilization funds, savings funds, reserve investment institutions, development funds, and reserve funds that are not associated with explicit pension obligations. (demarolle, 2008).

The justifications for establishing sovereign wealth funds varied as follows (Al-Munif, 2009):

a- Anticipating the natural depletion of the resource and the need to build other assets that generate income to compensate for the depletion of the current asset, and the exploitation of its revenues by the current generation, which is what is known as achieving justice between generations and in accordance with that consideration only, in countries where the time period of the depleted asset reserve is short, it is They have a greater incentive to save than those countries where the lifespan of their reserves is longer, such as the Gulf countries, for example, where at current production levels that age ranges from twenty to more than a hundred years, with an average of 75 years for the Gulf countries combined.

However, if we take a comprehensive look at depletion, that is, the contraction of demand for oil due to alternatives, regardless of depletion, and we add to that that the chronological age of the reserve is not fixed, as it can decrease with excessive exploitation, and it can increase with technical development and increased investment to develop the reserve, then the chronological age of the reserve then becomes unstable. It is important for the decision to establish a savings fund or not.

b-The second justification for establishing sovereign wealth funds relates to the absorptive capacity of the national economy and the potential to diversify its base, and these depend on the size of reserves and production, and thus the size of returns per capita, as well as the size of the economy compared to those returns, and other factors related to the current and potential capabilities of that economy. This means that economics Countries that are small in size, sparsely populated, and have limited diversification potential, have a greater incentive to create funds to save or invest oil revenues, but even these considerations may change over time.

3: A statistical view on public finances in Algeria

It was noted that during the oil glut of 2012, Algeria built reserves that reached 200 billion dollars. However, at the beginning of 2014, oil prices collapsed again by more than 50%. This greatly affected the oil revenues of the budget, which decreased to 1,578 billion dinars in 2014, compared to 3,980 billion dinars in 2011. Although revenues declined to the level of 79.22% of output in 2014, the volume of spending remained at high levels of around 60.40% during the same year (Mohamed Bouknadel, 2022).

Public revenues in Algeria have witnessed a continuous increase as a result of their reliance to a large degree on petroleum collection. The latter represented more than 60% of total revenues, but regular collection represents only 40% of total revenues, but it has improved in recent years, as a result of a number of tax reforms. As the rate of increase in revenues did not match the increase in the volume of public spending, this is what made the budget balance impotent in most cases, and thus the internal balance became imbalanced as a result of excessive reliance on the oil sector.

During the year 2015, the budget deficit was higher since 2009, and this is due to a decrease in the fiscal revenues for fuel by about 30% as a result of the decline in the average price of oil by approximately 47%. As

well as the noticeable increase in public expenditures, especially equipment expenses. The continuous decline in the price of oil also led to By 15.2% in 2016, fuel revenues continued to decline by about 25%. As a result of the contractionary policy, especially in public expenditures, especially equipment expenses, and in return, an increase in non-fuel revenues, the budget deficit declined somewhat in 2016 to 5.13% of the gross domestic product. Compared to 3.15% in 2015.

This led to a continuing deficit in the state's general budget Since 2018, financing the total treasury deficit has become a pressure on the public treasury, which led to resorting to internal borrowing through unconventional financing, which reached a debt level of 7,580 billion Algerian dinars, or 37.4% of the gross domestic product. During this period, it was known that Public finances recorded a structural financial deficit, so that this situation became more severe at the beginning of the year 2020 due to the decline in economic and social activity resulting from the health situation that the country witnessed.

Similar to the rest of the world's countries as a result of the Corona virus, the economic situation witnessed severe disturbances resulting from the decline in natural resource revenues, as a result of the decline in oil prices, as well as due to the decrease in the pace of regular collection collections. These data generated great pressures on the budget balance, especially with regard to covering Public expenses (Bouichaoui Mourad, 2021).

The main indicators indicate the macroeconomic and financial framing of the preliminary project for the corrective finance law for the year 2023, which included economic growth, foreign trade, and the state budget, as economic growth records 5.3% in the year 2023, compared to 1.4% according to the estimates of the preliminary finance law for the year 2023 and 3.2% registered in 2022,Regarding the state budget, it is expected that the total treasury deficit will witness a slight decline by 1.23% of the gross domestic product, as a result of the noticeable development in revenues by 13% and budget expenditures by 6.7%. Budget revenues also increased from 9.7901 billion dinars in the initial Finance Law to 8.926 billion dinars of the same year. This increase is mainly due to the improvement in petroleum collection, which is supposed to reach 3.3856 billion dinars (minister-of-finance, 2024).

4.The econometric study of the relationship between the abundance of natural resources and the financial performance of the general budget in Algeria.

Through the econometric study, we are trying to clarify the relationship between the abundance of natural resources and the financial performance of the general budget in Algeria during the period extending from 2000 to 2022, so that many indications indicate that relying on natural resources, countries will not be able to continue their sustainable and comprehensive economic growth, and will not be It has qualified financial strength, which requires a high level in the future to promote structural economic transformation and achieve high levels of economic growth.

4.1-Description of the econometric model

A- Method: In this research, we used the descriptive analytical method, which describes the study variables for us, in addition to using standard analysis, by following the following method: The analysis includes four basic steps, which are testing the stability of the variables, descriptive statistics, estimating the correlation matrix, and testing significance, as well as estimating the regression model. Simple, and finally test the soundness of the estimated model.

B - Determine the study variables: For the purposes of this study, we used a linear regression model to estimate the relationship between the abundance of natural resources and the financial performance of the general budget in Algeria according to the following:

C- Sources of variables: the data of variable was collected from the World Bank and the Bank of Algeria

D- Formulating the general model for the study: After determining the independent variable and the dependent variable, the model used is as follows:

$$RG= F(SG)\text{……..}(1)$$

Where:

RG_t: total natural resource revenues

SG: The total balance of the general budget

By inserting the logarithm to the side of equation (1) until all model variables become homogeneous in terms of structure, we obtain the following new equation:

$$RG_t = a_0(SG)^{\alpha 1} \ldots\ldots\ldots\

meaning that the increase in natural resource revenues and reliance on them will lead to The general budget deficit increased during the study period.

D-2 Estimating simple regression using the OLS method:

Table No (03): Estimating simple regression using the OLS method

Method Least Squares **Dependent Variable: RG** **Includedobservations: 23**				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
SG	0.005485	0.000586	9.357084	0.0000
C	26.27171	0.617289	42.55982	0.0000
INDEX				
R-squared	0.806550	Meandependent var		23.89509
Adjusted R-squared	0.797338	S.D. dependent var		5.993601
S.E. of regression	2.698201	Akaike info criterion		4.905989
Sumsquaredresid	152.8860	Schwarz criterion		5.004727
F-statistic	87.55502	Hannan-Quinn criter.		4.930821
Prob(F-statistic)	0.000000	Durbin-Watson stat		1.124484

Source: prepared by the researcher based on the outputs eviews 9

Through the model estimation results in Table (3), we obtain:

$$\widehat{RG} = 26.27 + 0.005SG$$

$$prob_{\hat{\beta}}: \quad (0{,}0000)(0{,}0000)$$

$$R^2 = 0{,}8065 \qquad \overline{R^2} = 0.7973$$

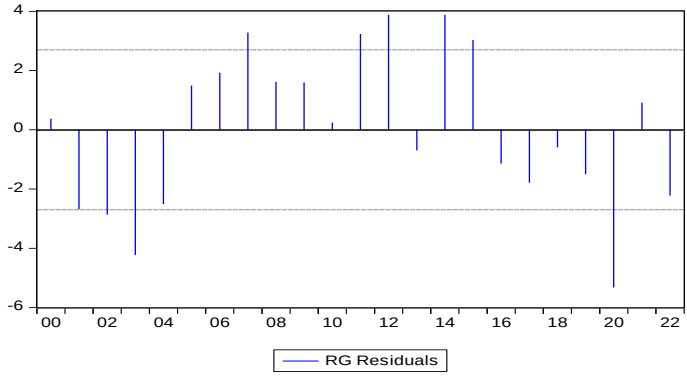
$$n = 23 \;\; Fc = 87.55 \quad prob_F = 0{,}0000$$

The coefficient of determination R^2 was estimated = 0.9773. This indicates that the model has the ability to explain more than 80% of the changes in the dependent variable, which is the total revenues of natural resources, and the rest are the result of other changes that were not included in the standard model. The constant term parameter was also statistically significant. Because the probability associated with it is smaller than 0.05, which leads us to reject the null hypothesis and accept the alternative hypothesis which states that the parameter is statistically significant, As for the F-statistic for

testing the significance of the model as a whole, it is estimated at 80.65, with a probability estimated at (0.0000), which is less than P=0.01. This leads us to reject the null hypothesis, meaning that the model's coefficients are non-null at a 1% significance level, and therefore the model has statistical significance.

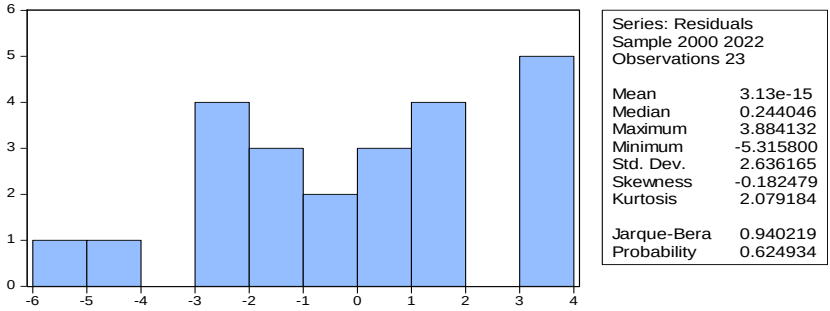
The financial performance index of the general budget was statistically significant because the probability associated with it was smaller than 0.05, and the significance associated with it was estimated at 0.005. This means that an increase in natural resource revenues by one unit will lead to an increase in the balance of the general budget, whether positive or negative, by 26.27 at the level The moral is 5%, and this reflects the dependence of the Algerian economy on natural resource revenues and from the perspective of economic theory, which confirms that dependence on one resource weakens economic growth.

Figure No (04): Spread of Estimate Residuals



Source: prepared by the researcher based on the outputs eviews 9

Figure No (05): Test of normal distribution of residuals

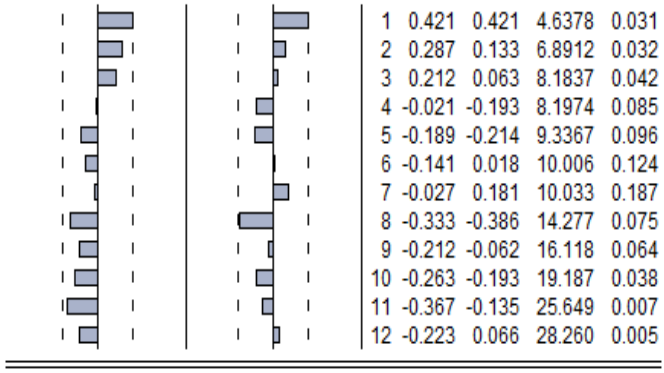


Source: prepared by the researcher based on the outputs eviews 9

The normal distribution test is limited to studying the symmetry coefficient and the oblateness coefficient in addition to the JARQUE-BERA probability and the results are summarized in Figure No. (05), where through this test it is clear that the JARQUE-BERA probability = 0.94 > 0.05, which indicates that the residuals follow the standard normal distribution. On the other hand, the results of testing the autocorrelation function for the remainders of the model. We note that the statistical probability value, Chi-Square, is greater than 0.05. This is what leads us to accept the null hypothesis, meaning that the remainders of the model are stable and have a constant variance.

Table No (08): Test of the residual correlation function

Date: 04/13/24 Time: 20:47
Sample: 2000 2022
Included observations: 23



Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.421	0.421	4.6378	0.031
		2	0.287	0.133	6.8912	0.032
		3	0.212	0.063	8.1837	0.042
		4	-0.021	-0.193	8.1974	0.085
		5	-0.189	-0.214	9.3367	0.096
		6	-0.141	0.018	10.006	0.124
		7	-0.027	0.181	10.033	0.187
		8	-0.333	-0.386	14.277	0.075
		9	-0.212	-0.062	16.118	0.064
		10	-0.263	-0.193	19.187	0.038
		11	-0.367	-0.135	25.649	0.007
		12	-0.223	0.066	28.260	0.005

Source: prepared by the researcher based on the outputs eviews 9

Table No (09): Test of correlation of residuals

Breusch-Godfrey Serial Correlation LM Test	
F-statistic	2.522365
Obs*R-squared	4.825539
Prob. F(2,19)	0.1068
Prob. Chi-Square(2)	0.0896

Source: prepared by the researcher based on the outputs eviews 9

The correlation of errors can be tested using the correlogram method, as the following statement shows through the results of Table No. (09). The correlation function of the residuals for the autoregressive model shows the absence of correlation of errors given that the P-value is greater than 0.05. This result confirms the acceptability of the model from the point of view. Statistics. By testing the LM results as in Table No (09), it becomes clear to us that the model does not suffer from the problem of autocorrelation of the residuals.

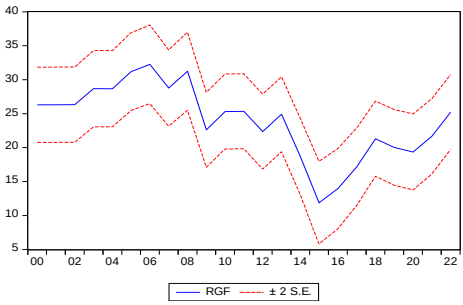
Table No. (10): Testing the causal relationship between the abundance of natural resources and the financial performance of the public budget

Pairwise Granger Causality Tests			
Date: 04/13/24 Time: 19:40			
Sample: 2000 2022			
Lags: 2			
NullHypothesis:	Obs	F-Statistic	Prob.
SG does not Granger Cause RG	21	3.41739	0.0581
RG does not Granger Cause SG		2.03414	0.1633

Source: prepared by the researcher based on the outputs eviews 9

Through the table shown above, it is clear to us that there is a causal relationship at a 5% significance level from the increase in natural resource revenues to the financial performance of the general budget. This result supports the hypothesis of the negative role of the Algerian economy's dependence on the abundance of natural resources and its effects on the overall performance of the general budget.

Table No. (06): Prediction evaluation of the estimated model



Forecast: RGF	
Actual: RG	
Forecast sample: 2000 2022	
Included observations: 23	
Root Mean Squared Error	2.578220
Mean Absolute Error	2.216279
Mean Abs. Percent Error	10.17728
Theil Inequality Coefficient	0.052540
Bias Proportion	0.000000
Variance Proportion	0.053696
Covariance Proportion	0.946304

Source: prepared by the researcher based on the outputs eviews 9

From the figure shown above, we notice that the model has the ability to predict from the theil criterion.

5. CONCLUSION

The aim of our research is to study the relationship between total natural resource revenues and the financial performance of the general budget in Algeria, where, by addressing various explanations related to reliance on natural resource revenues, this results in an increase in the real exchange rate and wage levels, which causes a decrease in exports. Industrial sector, A slowdown in economic growth, and thus revenues from the export of natural resources, which negatively affects economic growth through the cyclicality of public spending policy, that is, an expansionary financial policy, which often led to a deficit in the general budget and weak financial sustainability, and through the standard study that was about The relationship between total natural resource revenues and the financial performance of the general budget shows that the fluctuations that affect natural resource revenues are among the most important major determinants of the state of the national economy.

Any increase or decrease in natural resource revenues by one unit will lead to an increase or decrease in the balance of the general budget By 26,27 units This reflects the dependence of the Algerian economy on natural resource revenues and from the perspective of economic theory, which confirms that dependence on a single resource weakens economic growth. This situation moves many indicators from a state of surplus or balance to a state of deficit. These results show us that the financial policies pursued in Algeria exert some kind of negative effects through the emergence of the effects of deficits in public budgets, and this gives the characteristic of the relative ability of the fiscal policy adopted to influence economic variables.

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