MODELING THE IMPACT OF THE SECONDARY SECTOR OF THE ECONOMY ON THE GDP OF THE NATIONAL ECONOMY OF THE REPUBLIC OF THE CONGO (BRAZZAVILLE)

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The national economy of the Republic of the Congo is poorly diversified: the oil-extracting industry has received the greatest development, the sales of products of which in 2018 amounted to 39.81% of the country's GDP. In terms of oil production, the economy of the Republic of the Congo ranks 29th in the world. In terms of total oil reserves, Congo ranks 35th in the world. The modern export of the Republic of the Congo is 95% crude oil. Studying the current state of the national economy of the Republic of the Congo requires researching trends in the development of the national economy, its structural changes and modeling the impact of economic sectors on the volume of GDP in order to determine the optimal development paths in terms of ensuring economic security.

There are four sectors in the national economy of the Republic of the Congo: primary, secondary, tertiary and tax. The primary sector includes agriculture, animal husbandry and hunting, forestry and logging, fishing and fish farming. The secondary sector includes: mining of hydrocarbons, mining of stone, sand and clay, other mining activities, food processing, woodworking, fabric, wood products or wickerwork, chemical industry, production of non-metallic mineral products, manufacturing industry, production and distribution of electricity and water, construction. The tertiary sector includes: trade, hotels, bars and restaurants, transport and vehicles, post and telecommunications, banks and insurance, other market services, government activities, education, health and social activity. The tax sector includes taxes and taxes on products. According to the results of the analysis of changes in the volume of GDP due to the sectors of the economy for the period 2014-2018 the following is observed: an increase in the primary sector by 29.41%, a fall in the secondary sector by 27.50% and a drop in the tertiary sector by 3.03% [1,2].

The volume of GDP in the secondary sector decreased in 2014-2016 mainly due to a decrease in the growth rate of hydrocarbon production, the lowest level of production of which was noted in 2016.This is due to a sharp drop in oil prices in 2016 since 2017, there has been an increase in hydrocarbon production by 84.99% compared to 2016 and in 2018 by another 104.67% compared to 2017 for the period 2014-2018. The volume of hydrocarbon production in the Republic of the Congo decreased by 9.36%, which was caused by a decrease in the world price level by 25.94%. The rate of change in hydrocarbon production is comparable to the rate of change in the world oil price. The share of the secondary sector in the country's GDP amounted to 50.07% in 2018 and over the period 2014-2018 decreased by 13.84% [1,2]. It is necessary to note the significant share of the secondary sector in the formation of the GDP of the Republic of the Congo.

To carry out the research, the statistical data analysis program Statgraphics XVIII Centurion was used. The statistical package provides ample opportunities for a deep, visual analysis of the data of socio-economic systems, which are described by various features measured on metric and non-metric scales. Modern Statgraphics packages are advantageously distinguished from other similar programs by the convenience of the interface and their composition of data processing procedures, the successful combination of scientific methods of data processing with modern interactive graphics. The success of any method of data analysis depends on the relevance of the analyzed data to the research goal.

When studying the influence of the secondary sector of the economy on the GDP of the national economy of the Republic of the Congo, the following dependence was obtained (Fig. 1):

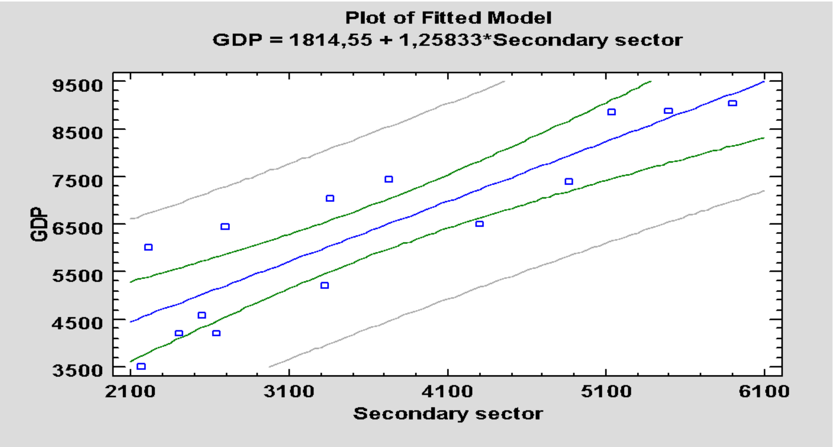

Figure: 1. Graphical interpretation of the study of the dependence of the GDP of the national economy of the Republic of the Congo on the secondary sector of the economy.

Source: authoring.

GDP = 1814.55 + 1.25833 * Secondary sector (1)

The parameters of the compiled dependence are as follows: correlation coefficient = 0.882166; R-square = 77.82%; R-square (adjusted for d.f.) = 75.97%; estimated standard error = 905 303; mean absolute error = 758 736; Durbin-Watson statistics = 0.13102 (P = 0.0000); residual autocorrelation lag 1 = 0.83574. Since the P value in the ANOVA table is less than 0.05, there is a statistically significant relationship between GDP and the downstream sector at a 95.0% confidence level. R-Squared statistics show that the fitted model explains 77.82% of GDP volatility. The correlation coefficient is 0.882166, indicating a moderately strong relationship between the variables.

The most influential on the GDP of the national economy of the Republic of the Congo is the secondary sector of the economy, the degree of influence of which is 77.82%. To study the effect of changes in hydrocarbon production on the GDP of the national economy of the Republic of the Congo, as a function (Y), we chose the volume of GDP in value terms by years, and as an argument X1 - the volume of hydrocarbon production in value terms by years. When studying the influence of hydrocarbon production on the GDP of the national economy of the Republic of the Congo, the following dependence was obtained (Fig. 2):

GDP = 875 288 + 108939 * hydrocarbon production (2)

The parameters of the compiled dependence are as follows: correlation coefficient = 0.906419; R-square = 82.15%; R-square (corrected for d.f.) = 80.67%; estimated standard error = 569 233; mean absolute error = 467 783; Darbin-Watson statistic = 0.309977 (P = 0.0000); residual autocorrelation lag 1 = 0.764843. Since the P value in the ANOVA table is less than 0.05, there is a statistically significant relationship between GDP and hydrocarbon production with a 95.0% confidence level. R-Squared statistics show that the fitted model explains 82.15% of GDP volatility. The correlation coefficient is 0.906419, which indicates a relatively strong relationship between the variables.

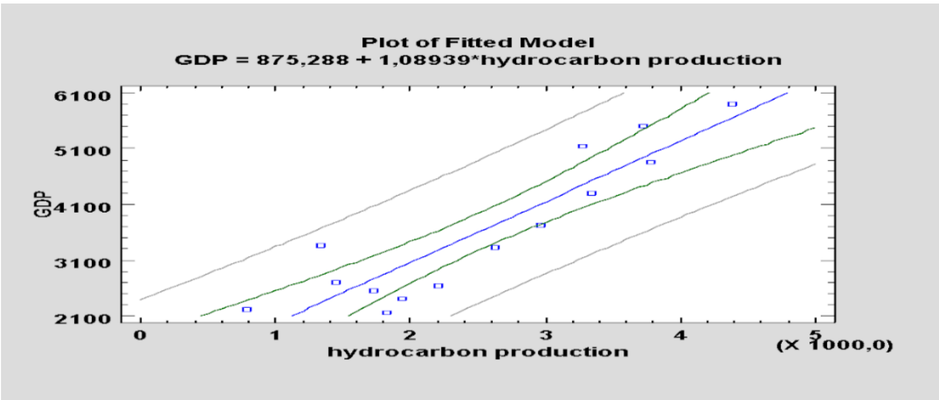

Figure: 2. Graphical interpretation of the study of the dependence of the GDP of the national economy of the Republic of the Congo on the volume of hydrocarbon production.

Source: authoring.

Based on the results of the studies carried out, we can conclude that the dependence of the GDP of the national economy of the Republic of the Congo on the volume of hydrocarbon production in the country is significant. This is confirmed by the calculations made by the degree of influence of this factor in the amount of 82.15%. In turn, the volume of hydrocarbon production in the Republic of the Congo depends on the level of changes in world oil prices, which is confirmed by the degree of influence of this factor in the amount of 84.13%. Crude oil accounts for up to 95% of the exports of the Republic of the Congo.

Based on the conducted studies of the impact of the economic sector on the GDP of the national economy of the Republic of the Congo and using the experience of economic reforms in Ukraine, the following directions for the development of the economy of the Republic of the Congo are recommended: the development of the industrial sector of the economy for the processing of crude oil, which will expand the country's export items from the raw material spectrum to products processing; development of the country's infrastructure, which will make it possible to improve the quality of the development of other minerals, in particular, potassium, iron, gold and timber, and to expand the range of exports. The experience of developing the economy of the advanced developed countries and Ukraine is advisable to use for the further development of the economy of the Republic of the Congo. The socio-economic essence of ensuring the economic security of the national economy of the Republic of the Congo is the ability to provide a decent level and high quality of life for the country's residents based on the development of all sectors of the economy.

References:

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