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Article

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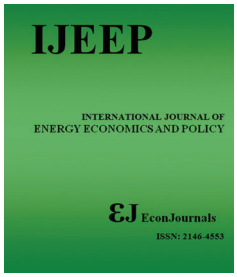

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The Impact of Azerbaijan's Oil Strategy on Economic Growth: Analysis and Diagnosis

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ABSTRACT

The article considers the balance of hydrocarbon resources controlled by Azerbaijan, which gained independence in the 1990s, the extent of their utilization, and the potential that can be harnessed within our country's existing capabilities, given the need to develop a qualitatively new oil strategy. In particular, in order to attract available resources into economic circulation, Azerbaijan signed the "Deal of the Century" with the world's leading foreign oil companies due to a lack of sufficient financial, scientific−technical, technical−technological, investment−innovation potential for extracting and transporting oil from the deep seabed. Further, it assesses and rates in light of global experience and country reality concerning the effective use of oil money, and the structure of revenues and expenditures of the State Oil Fund of Azerbaijan (SOFAZ) for 2001-2021 is examined using particular materials, taking into consideration the multiplier impact. The analysis is used to examine the role of transfers to the state budget in ensuring macroeconomic stability, strengthening financial provisions for economic growth, improving the national economy's structure, and regional development, and concludes that the oil strategy implemented in our country will ensure long−term, dynamic economic growth. Then, using quarterly data for 2003Q03-2021Q01, this article examines the impact of transfers from the State Oil Fund to the state budget on GDP, in other words, the long-term and short-term relationships between these variables. In this research, the ARDL model was used to assess co−integration and short−term relationships. In addition, this study used the FMOLS, DOLS, and CCR co−integration equations to explore long−term coefficients between variables. Granger causation tests were performed, Granger causation analysis was assessed using the Wald test (short−term or weak causation, long−term causation, and both short−term and long−term causation or strong causal relationship). The study put forward a hypothesis about the impact of transfers on GDP. This hypothesis was confirmed.

Keywords: Oil Fund, Oil Strategy, Sovereign Wealth Funds, Resource Potential, DOLS, FMOLS, Granger Causation
JEL Classifications: E62, H50, H60, Q40, Q48

1. INTRODUCTION

This analysis helps to determine the impact of transfers from the State Oil Fund to the state budget on GDP and economic development in general. When explaining the methodological basis of the research work, first of all, in the summary of literature, information was given and analyzed about foreign literature on the activities of the Oil Funds of individual oil exporting countries and other similar funds. Later, statistical data on the Fund's transfers to the state budget were analyzed. The statistics was collected from the reports of the State Oil Fund and the Central Bank. Extensive and detailed information is given on the methods, models and tests carried out. At the next stage, the results of econometric calculations were considered, general conclusions and recommendations are presented in the final section. This analysis helped to identify as the main factor.

H_0: Transfers from the State Oil Fund to the state budget make up the bulk of the budget revenues and have a positive impact on GDP.

The last few decades saw an increase in primary commodity prices after a downward trend in the 1970s until the beginning of the 21st century (Mohamed and Hameed, 2009, World Bank, 2007). World experience reveals that a country's resource potential is an important prerequisite and source of economic development in the formation and development of newly established national economies. Each situation must be evaluated on its own merits, taking into account the country's overall resource balance, the extent to which those resources are used, and the potential to be mobilized within the available opportunities. Azerbaijan's principal natural resource is recognized to be its oil and gas reserves. In this regard, the study of the impact of oil resources on our country's economic development has made developing and implementing an oil strategy that allows efficient, optimal use of these resources in accordance with economic development principles and requirements, as well as national interests, an objective necessity. Simultaneously, taking into account global experience and national realities, the development and successful implementation of an effective oil strategy in our country has become a critical factor in the formation of our country's economy, future sustainable development, and economic and political independence.

1.1. The Oil Strategy's Characteristics

As a young independent state, Azerbaijan's place in the world economy is strengthening and its role is increasing (Hajizade, 2018). During the 30 years of independence, Azerbaijan's economy has more than tripled, providing the material basis for our economic and political superiority in the region, rising to the status of the most reformist country, improving prosperity, and providing Azerbaijan with an important hub at the crossroads of East-West and North-South (Gasimli, 2021). It is well known that when Azerbaijan gained independence in the 1990s of the twentieth century, it had sufficient financial, scientific−technical, technical−technological, investment−innovation potential to bring its hydrocarbon resources into economic circulation, particularly to extract and transport oil from the deep seas. As a result, the Azerbaijani state was in desperate need of enormous quantities of foreign financial capital and investment in order to make the most use of its oil resources. It is indisputable that in those years, oil and gas production, refining, transportation, and production sharing in Azerbaijan could not be implemented without the signing of collaborative agreements with other countries and enterprises. Naturally, the most principled clause in the agreements was connected to the distribution and effective use of oil earnings, taking into account the interests of our country's current and future generations. This agreement, called the "Deal of the Century" and signed in 1994, allowed Azerbaijan to define its economic development priorities by laying the material and financial foundation for our country's dynamic and sustainable development in the twenty−first century. The implementation of the "Deal of the Century" and the evaluation of the State Oil Fund of Azerbaijan's (SOFAZ) conceptual foundation reveal that our country produced the most successful and optimal model of oil income management and utilization in international practice during those years. The most distinguishing aspect of this model was that all foreign exchange revenues from oil exports were gathered in a special oil fund and then used for socioeconomic development goals via a budgetary process, in full conformance with the principle of centralized transparency. Today, there are 78 Sovereign Wealth Funds in 50 countries in total.

According to the findings, our country's excellent oil strategy should be considered a crucial component in ensuring Azerbaijan's resistance to global financial crises and ranking among the countries with the fewest losses. At the same time, the role of the financial potential produced in our nation as a result of the implementation of the oil strategy is undeniable, alongside the military−technical and army construction that assured victory in the Second Karabakh War. Azerbaijan's oil resources, on the other hand, play a vital part in guaranteeing Europe's energy security today.

The current oil strategy in Azerbaijan has permitted the conversion of oil and gas capital into human capital, as well as the rapid development and diversification of the non−oil sector and the construction of large infrastructural projects. As a result, the revenues from the implementation of the National Oil Strategy are used to fund a variety of social, particularly regional, programs that improve the well−being of all citizens.

Because of the increased inflows, the identification of the non−oil sector as a priority, and the assessment of entrepreneurship as a strategic resource for economic development, the country's financial opportunities have significantly expanded as a result of the successful implementation of the oil strategy. It is well known that the existing system of regulation for the use of profits from oil resources in the globe is traditionally separated into two models, namely "America and Europe". The following are some of their similarities and distinctions. As a result, the "American" model is distinguished by the fact that the government's role is mostly limited to the principles of legislation and economic regulation. The state's "direct participation" in the mineral resources sector, as well as a substantial portion of the tasks of administering and regulating the use of oil resources, is given to a single governing body in the "European" model. Despite certain variations, the principles of establishment and utilization of the Oil Fund's revenues are more in line with the Norwegian model (Bhopal, 2021).

The Oil Fund of Azerbaijan (SOFAZ) was established in 1999 by the order of the President of the country and the main principles of its activity were determined. The State Oil Fund's objective is to collect earnings from non−renewable natural resources and turn them into a long−term source of income for Azerbaijan's current and future generations. In order to understand the impact of the Oil Fund on economic growth, it is enough to review at the functions it performs in Azerbaijan.

- To provide the circumstances for the country's oil resources to be managed efficiently and purposefully
- Maintaining macroeconomic stability in the country, ensuring financial and tax discipline, reducing dependence on oil revenues and ensuring the development of the non−oil sector
- Financing of important national projects for the socio−economic development of the country
- Sharing the money generated from oil and gas equitably across generations with reserves being built up for future generations as oil and gas are non−renewable natural resources.

2. ANALYSIS OF AZERBAIJAN STATE OIL FUND EXPENDITURES

Over the last few years, our country's national security has been improved, and sufficient financial potential has been developed for the long−term development of our economy, which has been met at the expense of the Oil Fund's profits. First, the Oil Fund paid for the construction of the Baku−Oghuz−Gabala water pipeline. The State Oil Fund spent a total of 1,069.4 million manat on the repair of the Samur−Absheron irrigation system, the joint construction of the Takhtakorpu reservoir with the Hydroelectric Power Station, the Takhtakorpu−Jeyranbatan canal, the Valvalachay−Takhtakorpu canal, and other projects. Among these projects, the Baku−Tbilisi−Kars transport corridor, which was funded by the Oil Fund, has been completed. This project was funded with $745.9 million from the Oil Fund from 2007 to 2018 (Samadzade, 2022).

It is worth noting that the oil element of modern economic and social development is also at the heart of the global energy carriers' dilemma. Variations in the amount and price of oil and gas to be produced have a substantial impact on the global economy in this regard. As a result, the risk of energy difficulties escalating into large−scale, global conflicts of interests remains high. Some scientists have rated the country's availability of resources and natural resources as having a beneficial impact on development, while others have rated it as having a detrimental impact. The "raw material theory," which proposed a positive link between resource and economic growth (Innis, 1956; North, 1955; Watkins, 1963), opened the possibility for diversification for resource−rich undeveloped countries (Altman, 2003). According to the Prebisch−Singer hypothesis, there is a negative relationship between resources and economic growth, and a resource−rich country's development is hampered since resource−dependent economies and raw material exports do not generate technical progress (Todaro and Smith, 2015).

The theory of "volatility" is another method for demonstrating that resource wealth has a detrimental impact on economic growth. According to this theory, the price of a resource is determined by volatility and external influences, making the macroeconomic environment riskier in the context of cyclical fiscal policy and posing a threat to growth and development (Corden and Neary, 1982, Guan et al., 2021). Our concern is not primarily with consumption but with output (Lewis, 1955). OPEC countries, which now play a leading role in long−term oil production, are believed to be attempting to reach an agreement on oil output and prices. Western countries, which are major oil consumers, as well as China and India, which are major oil producers, employ a variety of tactics and pressure tactics to weaken the position of Eastern countries. Large oil companies and other oil companies have a disproportionate amount of power in specific countries and regions, thereby monopolizing the global oil sector.

The price of crude oil is not monopolized by any central regulatory authority in the world. There is little doubt that historical events, economic interests, and particularly geopolitical realities have all played a role in the decline in oil prices. OPEC, on the other hand, is still a prominent participant in the formulation and price of crude oil prices, as well as in current international oil markets. Azerbaijan's oil policy, which is influenced by the global energy system, is also evolving in the country's best interests. It has resulted in a massive influx of investment into the country, as well as the implementation of cutting−edge technology systems, facilities, and management practices, as well as the creation of high−paying jobs. The oil strategy at the macroeconomic level, including budget, tax, monetary, tariff−price, structural, and investment policy, will remain Azerbaijan's key requirement for long−term socio−economic development in modern times, given the facts of the country (Altman, 2003).

Adoption of a number of laws and regulations pertaining to the successful implementation and regulation of the oil strategy has also been established as an objective. Thus, during these years, a number of degrees were passed, including "Declaring the Republic of Azerbaijan's national currency to be the exclusive means of payment on the republic's territory," "On additional measures to improve money circulation in the Republic of Azerbaijan," "On liberalization of national currency regulation in the Republic of Azerbaijan," and "On overcoming the situation in mutual settlements in the economy and strengthening financial discipline".

It should be emphasized that Azerbaijan's financial capabilities, particularly in the development of the national budget, have had a significant impact on global oil price changes over the last 20 years. The fact that profit oil and gas prices are higher than predicted in the budget has resulted in an increase in revenues under this heading. Thus, the selling price of crude oil in 2021 was $ 68.3, while the net income price was $65.1, which was $25.1 higher than the budgeted price per barrel (2021 of the Cabinet of Ministers). Taking this into account, the Azerbaijani government is working hard to improve our country's economic stability and mitigate the negative impacts of this process by implementing a sound monetary policy. The Azerbaijani government is attempting to apply the "Golden Rule" principle to the transfer of funds from the State Oil Fund to the budget, taking into account fluctuations in global crude oil prices. The use of the "Golden Rule", in other words, economic progress without diminishing supply and limiting demand. The implementation of the "Golden Rule" on the transfer of oil income to the budget, in particular, limits the transfer to the budget; the majority of funds are from a theoretical standpoint, involves distributing wealth in such a way as to secure future development transferred from the oil fund to the budget in accordance with the requirements of long−term development (Strategic Road Map, 2016).

A portion of the State Oil Fund's funds are utilized to fulfil expenses outlined in the state budget. It should be emphasized that transfers from the State Oil Fund to the State Budget have aided in the implementation of strategic projects as well as vital social programs critical to the country's economic development. The amount of money transferred from the State Oil Fund to the state budget has topped 20 billion manats in the last 15 years (SOFAZ). In precisely, 11350.0 million manats were sent to the Republic of Azerbaijan's state budget in 2021. In order to make the best use of these money, it is critical to improve cost−investment discipline, or, in other words, to ensure transparency.

It is important noting that the Peterson Institute for International Economics, which has been named the world's greatest Centre for Economic Research and the number one "Think Tank" in the United States for the past five years, compiled a table of transparency and accountability of sovereign wealth funds in 2019 based on 4 categories: Institutional Structure, Management, Transparency and Accountability, Risk Management, and 33 sub−categories, and the State Oil Fund has been mentioned the top five among 64 funds presented in this table (International Forum of Sovereign Wealth Funds). The share of state production in the distribution of shares can be represented as follows, based on global experience. The state is involved in the production process, project management, and profit oil distribution in the distribution of the state's share. As a result, in individual specialized projects, the mode of production distribution, as well as the kind and magnitude of income distribution among different entities, may differ.

All of this is reflected in our country's oil production sharing agreements with international businesses. In total, $91 billion has been invested in the growth of our country's oil sector as a result of the implementation of the oil strategy from 1994 to 2021. Today, ensuring the most efficient distribution, transparency, and use of oil earnings in the interests of current and future generations remains a critical condition. In accordance with Azerbaijan's oil policy, our country has invested oil profits in foreign countries on advantageous terms, extensively engaged in the development of the petrochemical industry, particularly the non−oil sector, global infrastructure, transportation, and logistics centres. In the long run, this will diminish the country's economic development's reliance on the oil sector (Aslanli, 2015).

Because Azerbaijan's oil policy was implemented successfully from the start, partner countries and businesses were able to extend the "New Century Agreement" signed in 2017 until 2050. If Azerbaijan's bonus in the 1994 oil contract was 300 million manats, it will be $ 3.6 billion in the current contract, which will also result in the creation of more than 10,000 new employment (6). As a result of the scope, depth, and quality of economic reforms adopted in recent years, our country has emerged as a global leader in this sector and has taken on a new quality − that of a reformist state. Thus, in the face of complex external threats and obstacles, our national economy has showed remarkable resilience and dynamic growth during the last 15 years (Statistical yearbook, 2022).

As a result, Azerbaijan's successful oil strategy should be considered a common basis for overcoming Azerbaijan's deep economic crisis, and, most importantly, overcoming the Karabakh war, economic security and stability, regional cooperation development, and, ultimately, stable and sustainable development.

3. LITERATURE REVIEW

The role of the oil factor in the economy has always been in the spotlight (Hamilton, 1983; Rogoff, 2006; Kilian, 2009; Hamilton, 2009; Mohammadi and Mohammadi, 2011; Yücesoy, 2013; Mukhtarov et al.,2020; Mikayilov et al., 2020; Onal-Kilicbeyli et al., 2021; Kilian and Park, 2009; Kilian and Xiaoqing, 2022). Although there is enough research on the oil factor in the economy as a whole, there is little research on the activities of oil funds established in oil exporting countries. However, despite this, the relevance of this topic is reflected in many articles. Most of the research is devoted to the activities of the Norwegian Petroleum Fund, which is the largest oil fund in the world.

In other words, oil funds are becoming more popular in oil exporting countries during the recent oil price surge. However, as mentioned above, the literature on contributions is sparse, these studies tend to focus on financial benefits and conclude that such funds are superior to fiscal management and policy comparison − in other words, well−designed tax management and policy is an adequate substitute. for oil funds (Shabsigh and Ilahi, 2007).

These studies began to take on a wider scope in the late 20th century. Claessens and Varangis (1994), in their paper on oil price volatility, *hedging,* and oil stabilization funds, argued that the use of financial instruments to correct oil price volatility could replace, or at least supplement, oil stabilization funds. Venezuela's best strategy would be to eliminate the short−term impact of oil prices through short−term hedging instruments and some long−term hedges. Fasano, (2000) in his study on the experience of oil stabilization and savings funds in individual countries, the main goal is to analyze the methods and practices of oil funds that currently exist in Norway, Chile (co), Alaska, Venezuela, Kuwait and Oman, and draw some preliminary conclusions about their contribution to improved financial management.

He pointed out that the results of his experience so far have been mixed, with differences between countries, the purpose of funds, compliance issues, institutional set−up, and the robustness of overall financial discipline in each country. Shabsigh and Ilahi (2007) argued that a broader focus is needed when evaluating the performance of such funds in studies examining whether oil funds lead to macroeconomic stability. To test whether oil funds help reduce macroeconomic volatility, the results of an econometric evaluation of a 15−year panel data set of 30 countries with and without an oil fund show that oil funds are associated with more money supply, lower price volatility, and lower inflation.

In an article examining the activities of the Oil Stabilization Fund (OSF), which was created in Russia to reduce the sensitivity of the budget to fluctuations in oil prices and to sterilize the impact of oil−related foreign exchange flows on the money supply. Astrov (2007) concluded that the OSF played an important role in achieving both goals: macroeconomic factors contributed to stability and helped decouple GDP growth from oil price developments. However, he said that further investment in the country's infrastructure is critical to counter the possible effects of the Dutch disease. Sorhun (2007) also explored the activities of the Oil Fund in a country in transition in an article aimed at determining the impact of the Oil Fund of Kazakhstan on the country's monetary budget and macroeconomic stability using time series regression analysis.

However, he said that further investment in the country's infrastructure is critical to counter the possible effects of the Dutch disease. In their paper, Merlevede et al. (2009) developed and evaluated a small

macroeconomic model of the Russian economy. This model is supposed to analyze the impact of the oil price, exchange rate, private sector confidence and fiscal policy on economic performance. The simulation results showed that the Russian economy is sensitive to oil price shocks. Two mechanisms are substantiated that mitigate the economic consequences of oil price fluctuations, namely the stabilization caused by the Oil Stabilization Fund and the Dutch disease effect. In particular, it was emphasized that the ongoing fiscal policy softened the economic fluctuations caused by rising oil prices. Hudson, (2011) in his articles on the activities of the Norwegian Petroleum Fund (Global Public Pension Fund) showed that the fund's investment in US, European and other stocks and bonds (as well as in real estate) was considered as a mutual fund, and more than 4 percent income was spent on this fund. It is said to prevent domestic inflation. But the experience of sovereign wealth funds in China, Singapore and elsewhere shows that investment in domestic infrastructure serves to lower the cost of living and doing business, making the domestic economy more competitive, not less. Ayadi and Adegbite (2018) to investigate the long−term equilibrium relationship and volatility between economic growth and terms of trade in commodities in Nigeria using the ARDL method and country data from 1984 to 2014, and to determine the impact of the quality of the Oil Fund and management on long−term growth performance. The results of their papers suggest that there is a long−term relationship between the terms of trade in commodities and economic growth.

The aim of the study by Pedram et al., (2019) was to study the impact of the National Development Fund on inflation and GDP stability and determine its optimal share. The main findings of this study using the BVAR model were that the current fixed share of the Fund contributes to the stability of inflation and GDP.

Akhambayeva and Nurbatchanova (2020) in the case of Kazakhstan and Norway, the purpose of their study of the impact of oil prices on the reserves of the national fund was to increase the profitability of the National Fund of the Republic of Kazakhstan, as well as to prepare proposals on the possibility of using its resources based on international experience. The study used a linear regression analysis model. Ahmadov (2021) examined Azerbaijan's recent experience in dealing with the COVID−19 pandemic and the use of the State Oil Fund for emergency response. In his study, Kuliyev (2015) considered the importance of the oil strategy of Azerbaijan, the role and place of the State Oil Fund of the Republic in the formation of the state budget, the implementation of international projects, and the implementation of a wide network of social infrastructure, the formation of currency and gold funds based on long−term statistical and reporting data. Merza, (2011) stated the importance of the existence and sound management of an oil (savings/stabilization) fund to increase sustainable public spending and living standards, social reconciliation and rational distribution of oil revenues, and to reduce rentierism and improve governance. Adapting the ways and means of its use, emphasized the importance of direction. Morozko et al. (2021) reviewed the main trends and perspectives of government energy policy and applied the VAR and VECM models to test hypotheses by examining the relationship between an increase in the Sovereign Wealth Fund and a decrease in consumption in the article. Taking two important elements of the population's income − social payments and wages, he said that the innovative distribution of oil and gas revenues can change the current social policy, put forward ideas about the lack of social finance and the need to increase the level of real incomes of the population.

4. DATA AND METHODOLOGY

4.1. Data

In the study, time series (2003Q2−2021Q1) were used to study the dependence of GDP on transfers made by the State Oil Fund

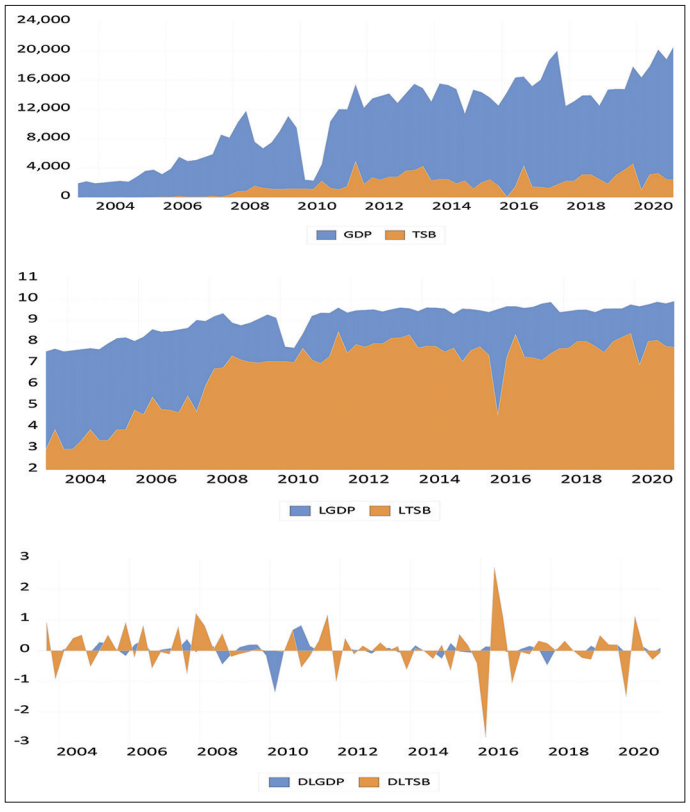
Table 1: Data and internet resource

TSB	Transfers to the state budget (thousand manats)	www.oilfund.az
GDP	Gross domestic product (thousand manats)	www.cbar.az

Table 2: Descriptive statistics for the variables

İndicators	*GDP*	*TSB*
Mean	10946.95	1671.068
Median	12561.00	1512.500
Maximum	20993.50	4979.000
Minimum	1970.000	20.00000
SD	5487.586	1316.788
Skewness	−0.292334	0.464329
Kurtosis	1.900938	2.452957
Jarque−Bera	4.649324	3.484987
Probability	0.097816	0.175083
Sum	788180.2	120316.9
Sum Sq. Dev.	2.14E+09	1.23E+08
Observations	72	72

Graph 1: Dynamics of indicators



to the state budget. All indicators are given in Azerbaijani manats and taken from the reports of the State Oil Fund and the Central Bank (Table 1 and Graph 1).

Descriptive statistics of the variables (data) are given in Table 2. Here, all variable is normally distributed according to the Jarque–Bera criterion. Kurtosis (excess) range variables − transfers to the state budget and Gross domestic product are not more than 0.5. The standard deviation less in transfers to the state budget and Gross Domestic Product. Negative asymmetry is present in all variations, depending on their fluctuations (changes).

4.2. Methodology

The following equations were used to study the impact of transfers to the state budget on Gross Domestic Product.

Logarithmically			
$GDP=f(TSB)$	(1)	$LGDP=\psi_0+\psi_1 LTSB+\varepsilon$	(2)

4.3. URT − Stationary Time Series

Before evaluating regression equations, it is important to check the stability of the variables by checking the unit root. Because when evaluating the relationship between two or more variables using regression analysis, it is important to maintain stability between variables. However, to be stationary, the probability distribution for each time series must be the same. However, it is not always desirable for the variables to be stationary.

In most methods used for long–term or co–integrating relationships and estimates, the variables must be non–stationary. The first difference must also be stationary or I(1). It should be noted that if the true, real values of any variable in the time series are stationary, then I(0) can be considered. If the variable is not equal to I(0), then the first difference is calculated and its stationarity is checked. In this case, if the variable is constant, then I(1) is considered. The variable sometimes also changes with respect to the probability distribution. In this case, the variable becomes stationary in the trend. To get more reliable results from stationary tests, we can analyze them by applying three different traditional unit root tests: Augmented Dickey Fuller —ADF (Dickey and Fuller, 1981), Phillips–Perron — PP (Phillips and Perron, 1988) and Kwiatkowski–Phillips– Schmidt–Sheen KPSS (Kwiatkowski et al., 1992). The evaluation of these tests and in general all calculations and other evaluations are performed using E–Views 12. It should be noted that in the ADF and PP tests with a single root, the null hypothesis "single root problem" or "variable is unstable" is tested and the null hypothesis is rejected, and in the test The KPSS null hypothesis "variable stationarity" is tested and stationarity is taken as the null hypothesis. If a variable is not stationary without a trend and becomes stationary with the addition of a trend, the test variable is said to be "stationary with a trend".

4.4. VAR Lag Order Selection Criteria

The selection of lag lengths in AR and ADL models can sometimes be guided by economic theory. However, there are statistical methods that are helpful to determine how many lags should be included as regressors. In general, too many lags inflate the standard errors of coefficient estimates and thus imply an increase in the forecast error while omitting lags that should be included in the model may result in an estimation bias (14-6-llsuic, 2019). Information Criteria are used to compare and choose among different models with the same dependent variable. The most common strategy in empirical studies is to select the lag-order by some pre-specified criterion (Kilian and Ivanov, 2005). Much of what we know about macroeconomic dynamics is based on summary statistics calculated from estimates of vector autoregressive VAR models (Kilian, 1990). Akaike Information Criterion (AIC) and Schwarz or Bayesian Information Criterion (SIC or BIC) are most commonly used for model selection. These criteria measure how well the models fit the given data (criteria-aic-sic-and-model-selection,2019). The most common approach for lag order selection is to inspect among different information criteria and choose the model that minimizes these indicators. There are several Information Criterion alternatives, and they vary on the weight they put on prediction error and parameters. For instance, Schwarz-Bayes (SC or BIC) over penalized big models (several estimated parameters) in comparison to Akaike (AIC) (Calderón, 2019).

4.5. ARDL Bounds Test of Cointegration

Granger (1969) argued that measures of correlation between variables are insufficient to understand the relationship between them due to the lack of an indirect relationship with the third variable in the structure. The ARDL co–integration method, which is becoming increasingly popular in economic research, was developed by Pesaran et al., (2001). This method has several advantages over previous co–integration methods (Pesaran and Shin, 1999). This can give reliable results even if the number of observations for the variables is small. There is no endogeneity problem in the econometric modeling of the ARDL method. The advantage of this method is that the number of equations is 1. Thus, short–term and long–term coefficients can be estimated within the model. In the ARDL model, variables can be computed without distinguishing whether they are I(0) or I(1) or mixed (Frimpong and Oteng-Abaye 2006; Muhammad and Suleiman, 2010; Aliyev et al., 2016). Obviously, when using I(0) and I(1), the variables of the series are known to the extent that they are stationary and are determined by a single–root criterion (ADF, PP, KPSS). The ARDL assessment consists of the following steps.

Unlimited Error Correction Model (UECM) is installed. The mathematical expression of the model is as follows.

$$\Delta Y_t = a_y + \sum_{i=1}^{n} \beta_{yi} \Delta Y_{t-1} + \sum_{j=0}^{n} \gamma_{yi} \Delta X_{t-j} + \theta_{y1} Y_{t-1} + \theta_{y2} X_{t-1} + \varepsilon_{yt} \quad (3)$$

Equation 1 show an *ECM* structure with two variables (one dependent and one independent). *Y* and *X* are both independent and dependent variables.

Here,

Δ-	Operator of the model,
α-	Free limit of the model,
ε-	White noise error,
θ-	Long–term correlation coefficient,
β and γ-	Short–term correlation coefficients,
t-	Time,
i and *j*-	lag, $(i, j = 1.2,...n)$

$Y = LGDP; X = LTSB$

$$\Delta LGDP_t = \alpha + \sum_{i=1}^{n} \beta_i \Delta LGDP_{t-1} + \sum_{j=0}^{n} \gamma_i \Delta LTSB_{t-j} + \theta_1 LGDP_{t-1} + \theta_2 LTSB_{t-1} + \varepsilon_t \quad (4)$$

By fitting the ECM to the ARDL, the presence of a co−integrating relationship between the variables is checked. To do this the null hypothesis (H_0:$\theta_y = \theta_x = ... = 0$) is tested using the Wald test (or F test) for the long−term correlation coefficient −θ. The proposed alternative hypothesis (H_0:$\theta_y \neq \theta_x \neq ... \neq 0$) is that there is a co−integration relation between the variables. After proving the existence of co−integrating relationships with the null hypothesis, the stability of this relationship is checked. If, θ the long−term correlation coefficient is statistically significant and negative, then the cointegration relationship is stable. This means that deviations from equilibrium and long−term relationships are temporary and are corrected towards long−term relationships. It is expected that it will be at the level $1 > \theta > 0$.

If the existence of co−integrating relationships is proved, we can estimate the long−term coefficients in the next step. Therefore, we can apply the Bewley transform (1979). In equation (1), we can solve by equating the long−term coefficients to (1) long−term coefficients in the equation 0 ($\alpha_y + \theta_{y1} Y_{t-1} + \theta_{y2} = 0$).

$$Y_t = -\frac{\alpha_x}{\theta_{y1}} - \frac{\theta_{y2}}{\theta_{y1}} X_t + \varepsilon_t \quad (5)$$

At this stage, the long−term period white noise error (ECT_{t-1}) is calculated and entered into the equation instead of the part with long−term coefficients ($\theta_{y1} Y_{t-1} + \theta_{y2}$). Then the stability of the co−integration relation is evaluated and rechecked. The mathematical function of the model evaluation is as follows:

$$\Delta Y_t = a_y + \sum_{i=1}^{n} \beta_{yi} \Delta Y_{t-1} + \sum_{j=0}^{n} \gamma_{yi} \Delta X_{t-j} + \mu ECT_{t-1} + \varepsilon_{yt} \quad (6)$$

$$ECT_{t-1} = -\frac{\alpha_x}{\theta_{y1}} - \frac{\theta_{y2}}{\theta_{y1}} X_t \quad (7)$$

Thus, Y_t or Xt is the true value of the dependent variable. If the calculated value (indicator) based on the long−term equation (equations 1) $(-\frac{\alpha_x}{\theta_{y1}} - \frac{\theta_{y2}}{\theta_{y1}} X_t)$ − in equations 5 and 7 is statistically significant, then the co−integration value (indicator) is constant. As mentioned above, the short−term deviation tends to correct towards the long−term correlation. In the absence of a serious error in the calculation, they approach the coefficient in equation 1, sometimes they get an equal value (indicator). Thus, the last stage is also considered as verification.

$$\Delta LGDP_t = \alpha + \sum_{i=1}^{n} \beta_i \Delta LGDP_{t-1} + \sum_{j=0}^{n} \gamma_i \Delta LTSB_{t-j} + \mu ECT_{t-1} + \varepsilon_t \quad (8)$$

4.6. The Long−run Model

$$Y_t = a + \sum_{i=1}^{n-1} \varphi_i \Delta Y_{t-1} + \sum_{i=0}^{m-1} \rho_i \Delta X_{t-i} + \mu_t \quad (9)$$

$$LGDP_t = a + \sum_{i=1}^{n-1} \varphi_i \Delta LGDP_{t-1} + \sum_{i=0}^{m-1} \rho_i \Delta LTSB_{t-i} + \mu_t \quad (10)$$

4.7. Error Correlation (Short−run) Model

$$Y_t = a + \sum_{i=1}^{n-1} \varphi_i \Delta Y_{t-1} + \sum_{i=0}^{m-1} \rho_i \Delta X_{t-i} + \sigma ECT_{t-1} + \omega_t \quad (11)$$

$$LGDP_t = a + \sum_{i=1}^{n-1} \varphi_i \Delta LGDP_{t-1} + \sum_{i=0}^{m-1} \rho_i \Delta LTSB_{t-i} + \sigma ECT_{t-1} + \omega_t \quad (12)$$

4.8. Diagnostics

This article uses the Breusch−Godfrey LM Test (null hypothesis: "no serial correlation") (Breusch, 1978; Godfrey, 1978) to test for serial correlation. Breusch−Pagan−Godfrey (null hypothesis: "no heteroscedasticity problem") (Breusch and Pagan, 1979) is used to test for the heteroscedasticity problem, and an Autoregressive Conditional Heteroscedasticity Test (ARCH) (Bollerslev, 1986), (Engle, 1982) is applied to get more robust results for the heteroscedasticity problem. During the ARCH test, the null hypothesis of the "no heteroscedasticity problem" theory is tested. However, the RESET Test (Ramsey, 1969, 1974) and the JB (Jarque−Bera) Normality Test (Jarque et al., 1980; 1981; 1987) are checked. Rejection of the null hypothesis is acceptable for all five cases.

4.9. FMOLS, DOLS and CCR (Long−run elasticities)

The paper uses the fully modified ordinary least squares (FMOLS) method developed by Phillips and Hansen (1990), as well as the dynamic ordinary least squares (DOLS) estimator developed by Stock and Watson (1993), and the canonical co−integrating method. The regression method (CCR) developed by Park (1992) is used. In our study, long−term elasticity will be assessed using FMOLS, DOLS, and CCR. Further analysis of the results of the Engel−Granger analysis is also very useful in the research process (Musayev and Aliyev, 2017). Because the ARDLBT approach to collaborative integration allows for more robust analysis by reviewing the results multiple times. Angle−Granger and Phillips−Ouliaris (Phillips and Ouliaris, 1990) co−integration tests were used to test all regression equations estimated in the FMOLS, DOLS, and CCR models.

4.10. Engel−Granger (EG) Cointegration Test and Granger Causality

In addition, the Engel−Granger (EG) co−integration test is also used to test co−integration relationships between variables during econometric analysis. In addition to the presence of long−term relationships, it is possible to determine the direction of the relationship between variables and study short−term relationships (Aliyev et al., 2016). The EG co−integration test consists of the following criteria (Gujarati and Porter, 2009; Enders, 2010). In

Table 3: Results of unified root tests

Variable		Constant	Constant and Trend	None	
	ADF				
LTSB	Level	−2.580576*	−3.161625*	1.019078	
	Δ level	−7.913200***	−8.328512***	−9.281868***	I (1)
LGDP	Level	−2.118610	−3.841664**	1.196482	
	Δ level	−7.725577***	−7.735893***	−7.559789***	I (1)
	PP				
LTSB	Level	−2.364019	−2.752192	0.734784	
	Δ level	−15.85350***	−35.21215***	−12.47203***	I (1)
LGDP	Level	−1.903020	−2.744627	2.617146	
	Δ level	−11.76343***	−14.56707***	−6.995836***	I (1)
	KPSS				
LTSB	Level	0.828595***	0.25355281***	N/A	I (0)
	Δ level	0.334054	0.162255**	N/A	
LGDP	Level	0.960159***	0.203165**	N/A	I (0)
	Δ level	0.500000**	0.500000***	N/A	

ADF denotes the Augmented Dickey–Fuller single root system respectively. PP Phillips–Perron is single root system. KPSS denotes Kwiatkowski–Phillips–Schmidt–Shin single root system. ***, ** and * indicate rejection of the null hypotheses at the 1%, 5% and 10% significance levels respectively. The critical values are taken from MacKinnon (Mackinnon, 1996). Assessment period: 2003Q3−2021Q1. Legend: N/A–Not Applicable

Table 4: VAR lag order selection criteria

Models	Lag	AIC	SC
Model 1			
LGDP/LTSB	1		2.325213*
Model 2			
LGDP/LTSB	3	2.022077*	

*Indicates lag order selected by the criterion, AIC: Akaike Information Criterion, SC: Schwarz Information Criterion

Table 5: Models

Model 1	F_{LGDP} (*LGDP/LTSB*)	ARDL (2,0) C (AIC) (AS) C5
Model 2	F_{LGDP} (*LGDP/LTSB*)	ARDL (1,0) C (SC) (AS) C5

AS−Automatic selection C5−Case 5: Unrestricted Constant and Unrestricted Trend

the first step, the regression analysis is evaluated for non−original stationary but different stationary variables at the same level (I(1)).

$$Y_t = \alpha_0 + \alpha_1 X_t + \varepsilon_t \quad (13)$$

Thus, for a two−variable situation: α_0 and α_1 are regression coefficients, and Y_t are dependent and X_t are independent variables, ε_t– is the white noise error, t– is time. The next step after evaluating the regression analysis is to check if the white noise error is stationary. If stationary, there will be co−integrating relationships between these variables. In this regard, we will consider it as long−term equations. In the final step, the *ECM* is estimated from the lagged white noise error (ECT_{t-1}) and the causal relationships become stationary.

$$\Delta Y_t = a_y + \sum_{i=1}^{n} \beta_{yi} \Delta Y_{t-1} + \sum_{j=0}^{n} \gamma_{yi} \Delta X_{t-j} + \mu ECT_{t-1} + \varepsilon_{yt} \quad (14)$$

$$\Delta LGDP_t = a_y + \sum_{i=1}^{n} \beta_i \Delta LGDP_{t-1} + \sum_{j=0}^{n} \gamma_i \Delta LTSB_{t-j} + \mu ECT_{t-1} + \varepsilon_t \quad (15)$$

Using the above equations, Granger causality (first difference) can be estimated in three different ways.

Asafu-Adjaye (2000) suggested that short−term or weak causality can be detected using Granger statistics or the sum of lag coefficients equal to zero. Another long−term causation was identified by Masih and Masih (1996), who showed that *ECT* can be determined using *t* –statistical significance. The *ECT* coefficient must be between 0 and 1, negative and statistically significant. Asafu-Adjaye (2000), (Lee and Chang, 2008) demonstrated joint testing for both short−term and long−term causation or strong causality when variables in the system were swapped in the short and long term. relations after this short−term shock indicate that they have recovered (Haseeb et al., 2018, Menegaki, 2019, Menegaki, 2020).

5. RESULTS AND DISCUSSION

5.1. Unit Root Tests Results

According to ADF test, *LGDP* — Constant and Trend − I(0), *LTSB* – Constant − I (0), Constant and Trend − I(0) (Table 3). According to PP test, *LGDP* and *LTSB* − I(1). According to KPSS test, Constant, Constant and Trend − I(0). The ADF, PP, and KPSS unit root test evaluation results suggest that the ARDL method and the ARDL boundary − test approach can be used to evaluate the short−term and long−term associations between variables.

5.2. VAR Lag Order Selection Criteria

The VAR delay rule selection criteria was used to determine the optimal delay for the ARDL model, and we obtained the following results (Table 4).

According to Table 5, the optimal delay time 3 (AIC) (lag = 3) for model 1 and the optimal delay time 1 (SC) (lag = 1) for model 2 were taken.

5.3. ARDL Cointegration Testing Long Run and Short Run Results

Table 6 shows the co−integration relationships between the variables. Thus, according to model 1, there is a co−integration relationship between transfers from the state oil fund to the budget and GDP. In other words, there are long−term relationships (Table 7). However, according to model 2, it is

Table 6: Results from bound tests

Estimated model	Significance										
			I (0) Bound				I (1) Bound				
	Model 1										
Dependant variable			10%	5%	2.5%	1%	10%	5%	2.5%	1%	
F−statistic	10.25927***	[1]Asymptotic: n=1000	5.59	6.56	7.46	8.74	6.26	7.3	8.27	9.63	Cointegration
		[2]Actual Sample Size 70 [2]Finite Sample: n=70	5.765	6.86	NA	9.37	6.455	7.645	NA	10.32	
t−statistic	−4.564452***		−3.13	−3.41	−3.65	−3.96	−3.4	−3.69	−3.96	−4.26	
	Model 2										
F−statistic	5.906294	[1]Asymptotic: n=1000	5.59	6.56	7.46	8.74	6.26	7.3	8.27	9.63	Indefinite
		[2]Actual Sample Size 71 [2]Finite Sample: n=70	5.765	6.86	NA	9.37	6.455	7.645	NA	10.32	
		[2]Finite Sample: n=75	5.765	6.88	NA	9.325	6.47	7.675	NA	10.325	
t−statistic	−3.398215		−3.13	−3.41	−3.65	−3.96	−3.4	−3.69	−3.96	−4.26	

***, ** and * indicate rejection of the null hypotheses at the 1%, 5% and 10% significance levels, respectively. [1]Pesaran et al., (2001), [2]Narayan, (2005)

Table 7: The long−run and short−run coefficients

Variable	Model 1.	Model 2.	Model 1.	Model 2.
	Coefficient			
	Long−run estimation		Short−run estimation	
$LGDP_{(-1)}$	−0.424930***	−0.306792***		
LTSB	0.074428*	−0.306792		
$\Delta LGDP_{(-1)}$	0.356803**		0.356803**	
@TREND	0.007307**	0.005173*	0.007307***	0.005173*
C	3.122447***	2.306948***	3.122447***	2.306948***
$CointEq_{(-1)}$			−0.424930***	−0.306792***
R^2			0.258765	0.153537
Adj–R^2			0.225073	0.128642
F–st.			7.680211	6.167166
Prob (*F–st.*)			0.000177	0.003457
Durbin-Watson st.			1.907555	1.513731

***, ** and * indicate rejection of the null hypotheses at the 1%, 5% and 10% significance levels, respectively

Table 8: Diagnostic test results

Statistical indicators	LM−Version					F−Version				CUSUM	CUSUMSQ
	RESET t−statistic	JB	H.BPG χ^2	H.ARCH χ^2	B−GSC LM χ^2	H.ARCH	H.BPG	B−GSC LM	RESET		
Statistic	2.525588	565.1811	2.659806	0.107247	1.020935	F (1,67) 0.104301	F (4,65) 0.641843	F (2,63) 0.466220	F (1,65) 6.378595	Stability	No Stability
Sig	0.0140	0.000000	0.6163	0.7433	0.6002	0.7477	0.6346	0.6295	0.0140		
Statistic	1.957083	607.9830	1.884588	0.340713	11.64263	F (1,68) 0.332597	F (3,67) 0.608969	F (6,61) 1.994138	F (1,66) 3.830175	Stability	No Stability
Sig	0.0546	0.000000	0.5967	0.5594	0.0704	0.5660	0.6115	0.0803	0.0546		

B−GSC LM χ^2– Breusch−Godfrey Serial Correlation LM Test: χ^2; RESET– Ramsey RESET Test; JB– Normality Test (Jarque−Bera); H.ARCH χ^2 – Heteroskedasticity Test: ARCH χ^2; H.BPG Test: χ^2– Heteroskedasticity Test: Breusch−Pagan−Godfrey; CUSUM−cumulative sum; CUSUMSQ−cumulative sum of squares

difficult to form an unambiguous opinion about the presence of a co−integration relationship between transfers from the state oil fund to the budget and GDP. However, as a result of the study, model 1 was adopted. Thus, according to the Pesaran et al. (2001) and Narayan (2005) tables, the F−statistic exceeds the minimum of 5%.

5.4. Diagnostic Test Results

ARDL model are 5% 1% and 0.1% significant. Regression equations are adequate. It also passes all the diagnostic tests against serial correlation (Durbin and Watson, 1971) and Breusch−Godfrey Serial Correlation LM Test), heteroscedasticity (Heteroskedasticity Test: Breusch−Pagan−Godfrey and Heteroskedasticity Test: ARCH). But it does not pass the diagnostic test for the normality of errors (Jarque−Bera test). The Ramsey RESET test also shows that the model is well detailed. All results of these tests are shown in Table 8. The stability of the long−term coefficient is tested by short−term dynamics. After evaluating the ECM model given by the equations (Tables 8 and 9), a cumulative sum of recursive residuals (CUSUM) and a quadratic measure (CUSUMSQ) are applied to assess parameter stability (Pesaran and Pesaran, 1997). According to the test results, the instability of the coefficients is observed. Thus, the CUSUM statistics plot is within the critical bands of the 5% parameter stability interval. The CUSUMSQ

Table 9: ARDL and ARDL_ECM models

Variable	ARDL model			
	Estimated primary		*ΔLGDP/ΔLTSB, LGDP, LTSB*	*ΔLGDP/ΔLTSB, ECT*
	Model 1	Model 2	Model 1 and Model 2	Model 1 and Model 2
LGDP			0.390492***	
	0.074428*	0.048966	−0.102917**	
$LGDP_{(-1)}$	0.931873***	0.693208***		
$LGDP_{(-2)}$	−0.356803**			
$\Delta LGDP_{(-1)}$			−0.113374	0.323670*
ΔLTSB			0.056847	0.083910
$ECT_{(-1)}$				−0.337616***
C	3.122447***	2.306948***	−2.641691***	−0.051071
@TREND	0.007307**	0.005173*	−0.005475	0.001826
R^2	0.892769	0.884698	0.205030	0.192490
Adj–R^2	0.886171	0.879535	0.142923	0.142798
F–st.	135.2927	171.3605	3.301236	3.873600
Prob (*F–st.*)	0.000000	0.000000	0.010280	0.006966
Durbin-Watson st.	1.907555	1.513731	1.353721	1.893031

***, ** and * indicate rejection of the null hypotheses at the 1%, 5% and 10% significance levels, respectively

Table 10: FMOLS, DOLS, CCR results

Variable	Panel A. Model 1 and Model 2 (Coefficients and Cointegration test)					
	FMOLS	*DOLS*	*CCR*	Cointegration test		
LTSB	0.391998***	0.382629***	0.391785***	E–G	tau–st.	−4.158935**
C	6.491142***	6.548709***	6.493675***		z–st.	−28.68753**
R^2	0.680548	0.721203	0.680582	Ph–O	tau–st.	−4.106588**
Adj–R^2	0.675918	0.703778	0.675953		z–st.	−27.25187**
	Panel B. Unit Root test					
ADF						
t_m	−4.294881***	−4.377408***	−4.294028***			
t_T	−4.439843***	−4.586003***	−4.439935***			
t_0	−4.332113***	−4.413608***	−4.331696***			
PP						
t_m	−4.262482***	−3.172918**	−4.261437***			
t_T	−4.389999***	−3.268429*	−4.389838***			
t_0	−4.301184***	−3.203300***	−4.300482***			
KPSS						
t_m	0.312365	0.310088	0.313247			
t_T	0.111163	0.107474	0.111029			
t_0	N/A	N/A	N/A			

E–G−Engle–Granger; Ph–O−Phillips–Ouliaris; tau–st.− tau–statistic; z–st.− z–statistic. t_m−with intercept only, t_T−with intercept and Trend, t_0−No Intercept and No Trend, N/A–Not Applicable ADF denotes the Augmented Dickey–Fuller single root system respectively. The optimum lag order is selected based on the Shwarz criterion automatically;
***, ** and * indicate rejection of the null hypotheses at the 1%, 5% and 10% significance levels, respectively. The critical values are taken from MacKinnon (1996). Assessment period: 2003Q3−2021Q1

Table 11: Granger causation tests

Null Hypothesis	Obs	F−Statistic	Prob.	Result
LGDP does not Granger Cause LTSB	70	3.12476*	0.0506	*LGDP↔LTSB*
LTSB does not Granger Cause LGDP		3.35503*	0.0411	
TSB does not Granger Cause GDP	70	2.00701	0.1426	*LGDP↔LTSB*
GDP does not Granger Cause TSB		4.97516**	0.0098	

statistics plot is observed with deviations from the critical bands in 5% of the parameter stability interval.

5.5. FMOLS, DOLS, CCR and Engle–Granger Analysis Results

FMOLS, DOLS, CCR cointegration methods and analysis of the results of (Engle and Granger, 1987) analysis are very useful in our study (Table 10). This is because the revision of the results obtained with the ARDLBT co–integration approach with the application of these methods allows for a more reliable analysis. Another feature that indicates a cointegration relationship between the variables is that the white noise errors obtaine from the estimates are stationary. Table 10 shows the results of the stationary test by applying single root tests ADF, PP and KPSS on the white noise error of each long−run equation evaluated by FMOLS, DOLS and CCR. Based on these results, in models the white noise errors are stationary and thus again confirm the existence of a co−integrating interaction. This result does support the results of the Engle−Granger and Phillips−Ouliaris cointegration tests given above.

Table 12: Granger cause−and−effect analysis evaluation results. Wald Test

Variable	Panel A. Wald Test							
	Short−term period			Long−term period			Strong impact	
	$\Delta LTSB$			ECT_{-1}			ECT_{-1} and $\Delta LTSB$	
	Model 1 and Model 2							
	Chi–sq.	F–st.	t–st.	Chi–sq.	F–st.	t–st.	Chi–sq.	F–st.
$\Delta LGDP$	3.474770 (0.0623)	3.474770 (0.0668)	1.864074 (0.0668)	13.31154*** (0.0003)	13.31154 *** (0.0005)	−3.648498*** (0.0005)	13.49976*** (0.0012)	6.749880** (0.0022)
	ΔLGDP			ECT_1			ECT_1 and ΔLGDP	
$\Delta LTSB$	1.073144 (0.3002)	1.073144 (0.3041)	1.035927 (0.3041)	10.29510*** (0.0013)	10.29510** (0.0021)	−3.208598** (0.0021)	10.42938** (0.0054)	5.214688** (0.0079)
	Panel B. ADF Unit Root test							
	ECT_{-1}							
	t_m	t_T	t_0					
	−4.126730***	−4.476405***	−4.158935***					

t_m−with intercept only, t_T−with intercept and Trend and t_0−No Intercept and No Trend. A DF denotes the Augmented Dickey–Fuller single root system respectively. The optimum lag order is selected based on the Shwarz criterion automatically; ***, ** and * indicate rejection of the null hypotheses at the 1%, 5% and 10% significance levels, respectively. The critical values are taken from MacKinnon (1996). Assessment period: 2003Q3−2021Q1

Short−term and long−term cause−and−effect relationships can be more clearly analyzed using the Granger cause−and−effect relationship using the Engle−Granger cointegration method. It was confirmed that Short−term interaction no exists in models. Long−term and strong causality between variables exists in models (Tables 11 and 12).

6. CONCLUSION AND POLICY IMPLICATIONS

The results of the study confirm the correctness of our hypothesis. In other words, transfers from the state oil fund to the state budget have a (positive) impact on GDP growth. The selected models are adequate. The coefficients of the variables in the models are selected according to their economic and statistical significance. There is a co-integrating (long-term) relationship between transfers to the budget and GDP. In the model, the coefficient of deductions to the budget is significant at a positive value of 0.05%. The ECT coefficient is negative and significant at the level of 0.001%. Also, according to the analysis of models built by the method of co-integration FMOLS, DOLS, CCR, the coefficients are positive and significant at the level of 0.001%. Co-integration tests also confirm this. According to the Engle-Granger analysis, there is a long-term and strong relationship between variables. The Granger Causality Test states that there is mutual causality between variables.

On February 2, 2021, the President signed a decree titled "Azerbaijan 2030: National Priorities for Socio−Economic Development", taking into account the successful implementation of the Oil Strategy in recent years, as well as the new global and regional economic realities created by the liberation of our lands as a result of the Second Karabakh War. These priorities include:

- Sustainably growing competitive economy
- Society based on dynamic, inclusive and social justice
- Competitive human capital and space for modern innovations
- Great return to the liberated territories
- Clean environment and "green growth" country.

Simultaneously, a concrete strategic action plan for the years 2022−2026 has been developed. We would like to point out that the material and financial prospects provided as a result of our country's adoption of the oil strategy for the successful implementation of the 5 national goals are investigated and appraised in various portions of the text using concrete factual materials. Overall, the macroeconomic analysis of Azerbaijan's oil strategy leads to the conclusion that the oil strategy implemented over time is the primary guarantor of the country's economic independence and security, as well as macroeconomic stability, socioeconomic development, and non−oil sector diversification. It will lead to large−scale use of the global value chain in the near future, as well as sustained and dynamic economic growth for our country as a whole, as it is a vital factor in effective integration into the global economy. As a result, in the not−too−distant future, the function of the oil factor in assuring economic growth and enhancing efficiency in our country will be dramatically reduced.

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