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Long-term impact of oil-boom on economic growth dynamics: Evidence from Azerbaijan

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Abstract

This analysis empirically investigates long-term impact of oil boom on the dynamics of economic growth in Azerbaijan for the post-Soviet period. Although that, oil boom allowed the government maintain macroeconomic stability and positive GDP growth in cases of falls of hydrocarbon production, through having access to large-scale revenues from oil export and creating strategic reserves, the results demonstrate that, in the long run, it has fallen short in terms of building the basis for sustainable development and led to adverse changes in structure of GDP growth. Additionally, utilizing oil revenues as the main financial source for development carries greater risk of a decline in GDP growth under scenarios of sharp decline in oil prices. Therefore, in order to ensure sustainable stability in economic growth patterns, creation of strategic reserves must be accompanied with expansion of potential of non-oil sector export within policy of diversification the economy and with the establishment of advanced financial and banking system.

Keywords: Azerbaijan, oil boom, GDP growth, long-term growth factors, the structure of growth, oil prices

Introduction

In oil economies the rapid rise in hydrocarbon production of short time period is an important factor that can affect on rates and the structure of growth also of the long-term. This effect can vary from country to country depending on the general state of the economy. In this regard, is of interest to investigate the long-term effects of the oil boom on dynamics of GDP in countries of the former socialist system, including the countries of the former USSR.

From the above-mentioned countries, in the first decade of the twenty-first century, there was a rapid increase in oil and gas production in Kazakhstan and Azerbaijan. Production of hydrocarbons (in oil equivalent) increased in 2001-2011 by 2.3 times in Kazakhstan, by 3.3 times in Azerbaijan in 2005-2010 .¹ In Azerbaijan production grew in larger scale, and course of rise of production to level of the "peak" has been more intense. In this regard, surely, for a detailed analysis of impact of the boom on GDP growth for the long-term study relevant data of Azerbaijan could open more opportunities.

Long-term aspects of the impact of the oil boom in Azerbaijan of the post-Soviet period on economic growth partially reviewed by Junko Koeda and Vitaly Kramerenko. They investigated fiscal scenarios of the decline, rapid expanding in boom period, public costs at the end of this period on the basis of historical experience review and neoclassical growth model. (Junko K., and Vitali K.).

We are studying the issue, highlighting the main factors and based on analysis of empirical materials. The main directions of impact on dynamics of GDP of factors such as, the results of the boom, a dominant position of the oil sector in the country's economy, large-scale use of obtained oil revenues, the formation of a strong one-sidedness in the structure of export are disclosed in the article.

The oil boom in Azerbaijan of the post-Soviet era

Azerbaijan in the period of incorporation into former Soviet Union, and before, in the period of Russian Empire was known as the oil-rich land. In the last half of the nineteenth century and early twentieth century a significant portion of the world's oil production accounted for territories of Azerbaijan (region of Baku).¹ In 1941 when production reached a peak Azerbaijan

gave three-quarters of the oil produced in the former Soviet Union. However, since the second half of the twentieth century due to the reduced production of mature oil fields, occurred the decline in production and a decline in the oil sector's role in the economy. On the eve of the collapse of the Soviet Union, the annual volume of oil production in Azerbaijan amounted to 11-12 million tons. This was equal to approximately 2% of total production of the former Soviet Union.²

After the restoration of state independence of Azerbaijan, start of process of integration into the global economy has opened opportunities for large-scale development of field resources in belonging to country sector of Caspian Sea. In 1994, was signed a production sharing agreement (PSA) with consortium created with the participation of the world's leading oil companies on develop fields "Azeri", "Chirag" and "Guneshli" in Azerbaijani sector of Caspian Sea. As a result of the work carried out within the framework of that agreement, which was named "Contract of Century", in 2005, with large-scale production in field Azeri-Chirag-Guneshli (ACG), in the country started new oil boom. In a relatively short period of time, or rather, in 2005-2010 the volume of oil and gas production (oil equivalent) was increased more than 3 times. (Figure1)

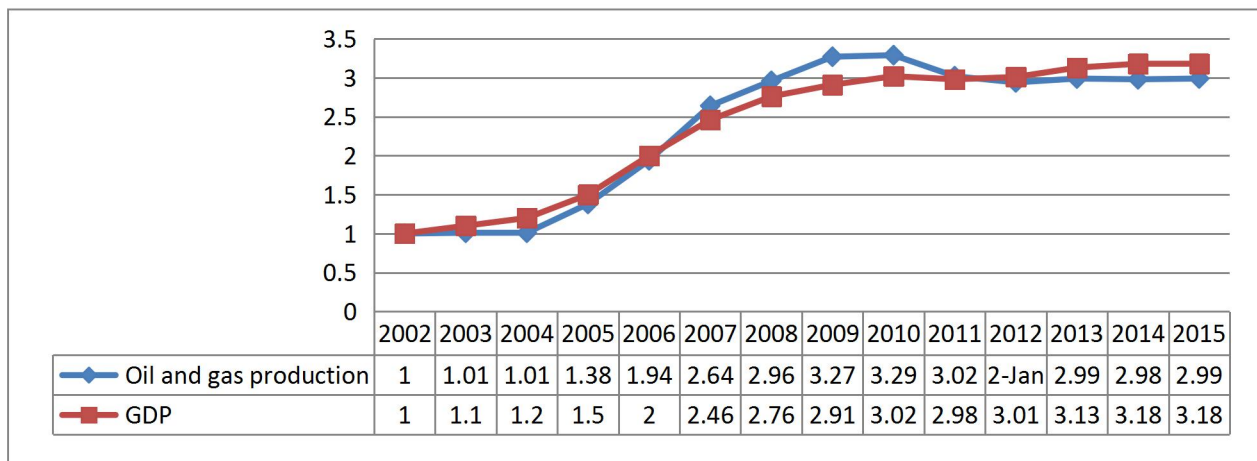


Figure 1. Dynamics of oil and gas production and the physical volume of GDP per capita (relative to indicator base year, times)

Sources: BP Statistical Review of World Energy; The State Statistical Committee of the Republic of Azerbaijan; calculations by author.

During the same period, the average annual growth rate of production was 22%. On this indicator Azerbaijan came to the forefront among the oil countries. The volume of oil

production in the range of peak reached of 50.8 million tons, natural gas of 26.3 billion cubic meters. In 2010 crude oil exports was of 31.9 million tons, and country's revenues from oil export US \$ 19.6 million and was equal to 37.1% to GDP of that year.³

The oil boom, substantially affected the Azerbaijan economy, weakened the result of the crisis related with the system transformation processes.⁴

The rapid increase in the production has increased scale of the oil sector in the economy in several times. On the other hand, the use of large volumes of oil revenues for the purposes of economic and social development, also stimulated development of other sectors of the economy, a direct and through multiplication effects. As a result, the country's GDP has grown by 2.7 times in 2005-2010.

The increase in production, as shown in the chart 1, 2005-2010, led to formation of the high growth rates in relevant sections of economy.

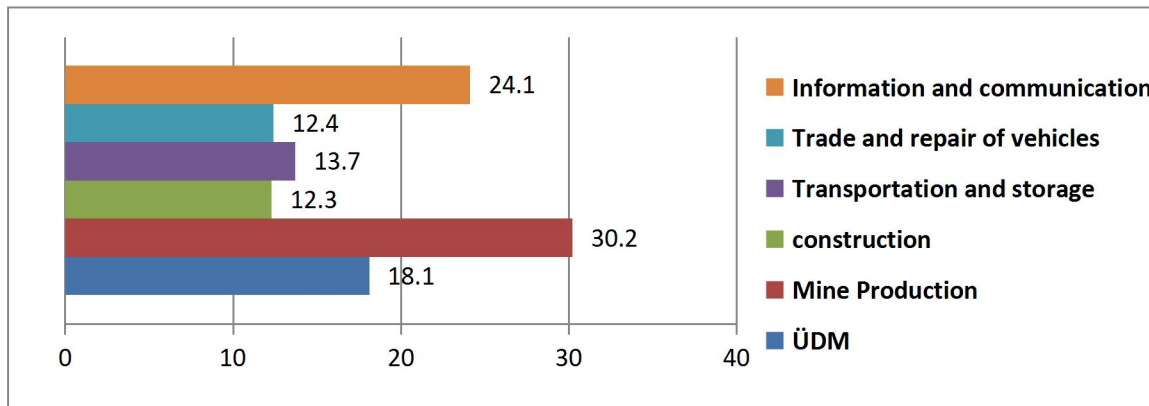


Figure 2. The average annual growth rate of GDP and of value added in the areas of activity in Azerbaijan in 2005-2010

Source: The State Statistical Committee of the Republic of Azerbaijan; calculations by author.

At the same time, we must take into account that the oil boom can affect economic growth also in long-term period. In other words, a boom causing factors which playing an important role in determining the dynamics of GDP after the end of the rapid increase in oil production. In terms of structural features of the impact, of them attract more attention, the gain a dominant position of the oil sector in the structure of the economy, the creation of a special fund at the expense of increased oil revenues and the use of its means in large volumes, as well as changes in the structure of export potential as a result of the boom.

The impact of dynamics of oil production on GDP growth rate

Before the boom period, oil and gas sector had important role in the economy of Azerbaijan. Share of mining industry in GDP amounted more than 1/4. In 2004 the share of crude oil and natural gas in industrial production was 53.4%.

The boom in the production of hydrocarbons has resulted in the acquisition of a dominant position of the oil sector in the economy. The share of oil and gas production industry in GDP in 2010 reached 45.8%. This situation, in fact, says on increase influence of the oil factor in the economy.⁵ Small changes in the dynamics of production will have power on important changes in the economic growth rate. In this regard, changes in the quantity of oil production acts as one of the main factors in the formation of the growth rate of GDP.

In 2011-2014, the average annual volume of oil and gas production decreased by 2.9%, while the average annual physical volume per capita GDP grew by 2.7%.⁶ According to our estimates, if the volume of oil and gas production in the same period remained stable, the average annual GDP growth rate would have been 4.4%. In this regard, it can be said that due to the boom formed conditions of high dependence of GDP dynamics from the oil production.

The role of oil revenues

The oil boom, on the basis of large-scale oil revenues, and the formation of strategic foreign exchange reserves provides funding source and a favorable macroeconomic conditions for duration of economic growth. It should be noted that in connection with the maintenance of high levels of production in period of commencement of the tendency of falling down (as a rule, the decline in production volume occurs on moderate pace) volume of oil revenues was high. Therefore, at that time, unless not occurs the sharp downturn in oil prices, volume of strategic foreign exchange reserves continued to increase. Azerbaijan's strategic currency reserves in 2010 increased for 1.7 times in comparison with 2014 and reached 50.9 billion US dollars, compared to the country's GDP of this year, was 67.7%.

In Azerbaijan tasks of improve infrastructure and public welfare stipulated the need to large use of oil revenues for the purposes of economic and social development also during the period of the rapid oil production growth.

As is clear from the information in the following table, the end of the rapid growth production phase and the next period of the amount of transfers from the State Oil Fund (SOFAZ)⁷ to the state budget has increased significantly.

	Indicators	2010	2011	2012	2013	2014	2015
1.	The assets:						
	a) bn USD	22.77	29.8	34.13	35.88	37.1	33.6
	b) to GDP ratio, %	42.8	45.0	48.9	48.4	49.4	61.8
2.	Fund transfers:						
	a)bn manats	5.9	9.0	9.9	11.3	9.3	8.1
	b) as a percentages of state budget revenues	51.9	57.3	57.3	58.2	50.7	46.3

Table 1. Use of assets of the SOFAZ for the purposes of economic and social development*

*Source: SOFAZ; calculations by author.

A significant portion of the assets of the Fund, as well as allocated for the financing investment and social projects, are not taken into account in the state budget. In 2015, funds for these purposes has been 12.3% compared to the level of the amount of transfers to the state budget. In connection with, the above-mentioned, the use of oil revenues is acting as an important source of GDP growth. This source, as is evident also from the comparison a reflected in the first diagram of the appropriate trends was the main factor to maintain, in generally, of positive dynamics of growth GDP in 2011-2015, in conditions of pressure a significant reduction in the production of hydrocarbons on economic expansion.

In the impact of the increase in oil revenues on economic growth was certain structural features. First of all, in conditions widespread use of oil resources, in the increasing public expenditure an advantage was given to finance public investment and social protection measures. In 2011-2014, the average annual amount of budget funds directed to investments of main capital was 2.7 times more than appropriate indicator on 2006-2010.

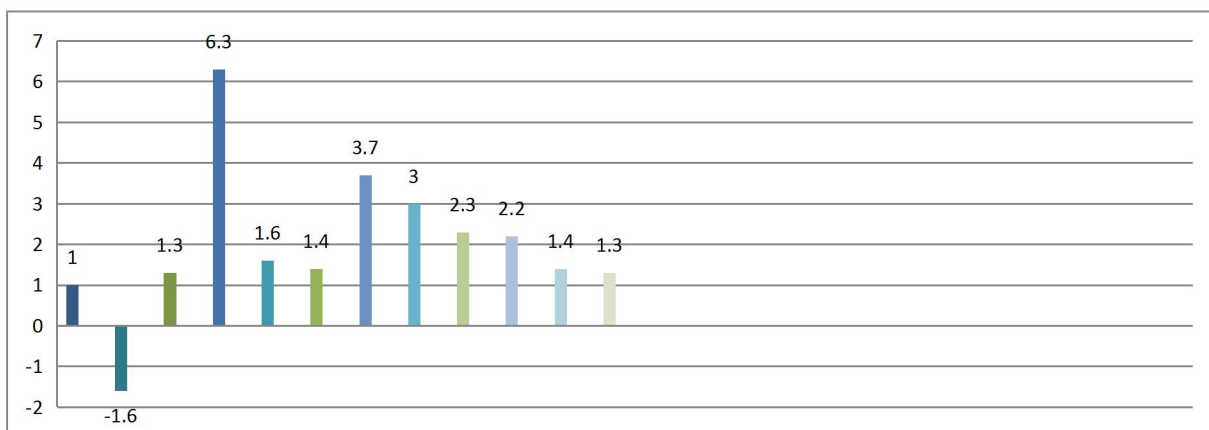


Figure 3. The relative growth rates of the physical volume added value in the in 2011-2014 in separate activity areas

Source: The State Statistical Committee of the Republic of Azerbaijan; calculations by author.

During this period, directed to fixed capital of budget funds was equal to 2/3 portion of the amount of transfers from the State Oil Fund. In 2014, costs of social security increased by 1.8 times compared to 2010. The public funding in the post-boom period provides high growth rates in the construction sector and in the areas related with consumption such as trade, catering, communication. As is clear from the chart 2 data, in these sectors the relative quantities of the average annual growth rates (ratio the relevant sector performance, to GDP growth rate) were very high.

In connection, we can say that in conditions of large-scale use of the proceeds SOFAZ for the purposes of economic and social development played an important role in turning of drive GDP growth of construction, trade, public catering sector. The increase in the use of oil revenues contributed to an important place of these sectors in the structure growth. (Figure 3)

These sectors has owned the role of the main drivers of growth, as mining industries directly in the boom conditions.⁸ Large-scale use of oil revenues in conditions of the post-boom, gave opportunity to take an important place in the GDP growth as well as information and communications in "non-tradable" sector. However, as in the stage of rapidly increase of oil production, the share in growth of the education as well as of public health, that form the ground for development of human capital and, therefore, for development in long-term, was relatively low. In conditions widespread use of oil revenues the government spending of the development of education and health care was quickly grown. In addition, for the purposes of conversion of oil capital into human capital, with financing from the SOFAZ as part of a special program covering the period of 2007-2015, was provided education of citizens in abroad. However, accounting factor raising the level of government borrowing due to the implementation of social obligations in conditions of the decline in oil revenues, is required constraints in financing of the above-mentioned areas.

On the other hand, in fact, the widespread use of oil revenues, significantly increasing public investments and consumption, in turn, stimulated the production of the products used in these directions. In addition, oil revenues made it possible to expand the activities of institutions on state support to the development of production, as well as for the creation of new such institutions. As a result, in the processing industry the production of construction materials increased by greater speeds, in agriculture production of food (fruit, vegetables, meat, milk, eggs) observed significant growth.

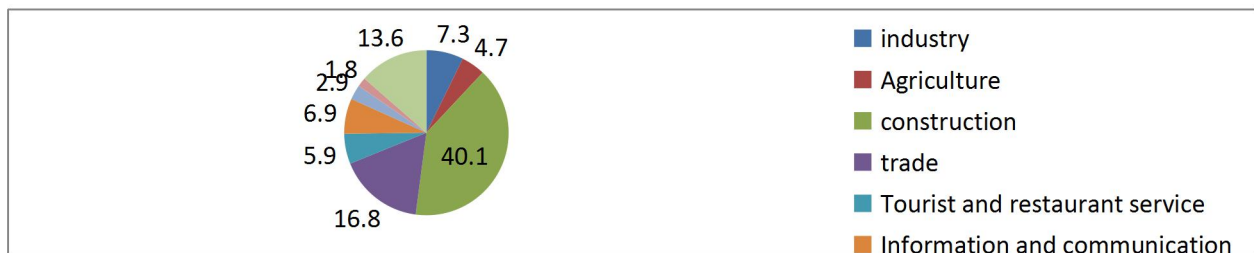


Figure 4 The share of the activities areas in the increase of physical volume of added value,%

Source: The State Statistical Committee of the Republic of Azerbaijan; calculations by author.

Against the background of the above, as well as from Figure 3, in sectors of production the growth rates in 2011-2014 was higher than the GDP growth rate.

However, taking into account the formation of the low level GDP growth in overall, in the structure formed by the impact of extensive use the oil revenues of growth, the position of "tradable" sectors has been weak. A significant part of the demand generated from the public investment and consumption growth was offset by imports.

Development model, based on the wide use of oil revenues in Azerbaijan has unfavorable effect on structure of production sectors. In conditions of the larger use of The State Oil Fund's funds for economic and social development goals, conversion of foreign currency revenues from oil exports had continued to exert high pressure on the exchange rate of the national currency. In fact, the strengthening of manat lasted until 2015. (Figure 5)

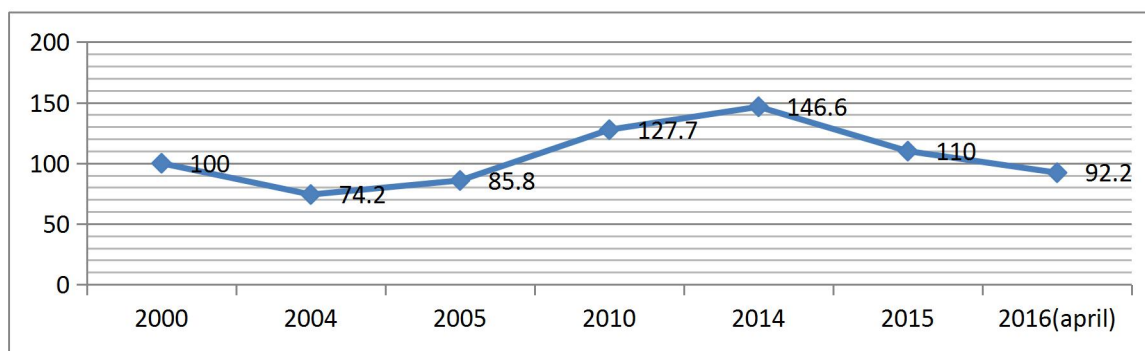


Figure 5 The real effective exchange rate of manat compared to foreign currencies,% (December 2000 = 100)

Source: Central Bank of Azerbaijan

This situation, in turn, in conditions the availability of cheap and skilled labor force, as well as application of energy subsidies for industries, stimulated the organization of production based on the use of imported raw materials and semi-finished products. Strengthening the dependence on imports while, in terms of provision of sustainability in the course of industrialization in medium and long-term, spawned the following deficiencies:

- a) In conditions of a sharp decline in oil prices, as a result of devaluation of the national currency reduced competitiveness of products manufactured on the basis of imported raw materials and semi-finished products for domestic market also for export;
- b) Advantages of the processing of imported raw materials caused the decline in the production of local raw materials (tea, tobacco, cotton, silk raw materials, etc.), also has blocked restoration of production (based on local raw aluminum production, potassium fertilizer) or prevented the formation of new areas (of production sugar beet) in connection with structural changes.

c) The structure of the industry was deformed. In the sector the level of added value dropped down. The opportunities of industry on higher role to provide employment can not be realized.

In connection with above-mentioned, of widespread use of oil revenues would not have a significant impact on the formation of a permanent sources of economic growth.

Widespread use of oil revenues, also brings to instability in GDP growth. The "breakages" in oil prices, i.e., sharp drop of prices had led to a decline of revenues of oil fund. In this situation, also taking into account the need to protect the country's strategic reserves, there is a need for the reduction of the amount of funds allocated for the use in current period. Amid a sharp drop in oil prices,⁹ transfers from SOFAZ to the state budget in the national currency decreased in 2014 compared by in 2013 on 17.7% , and on 28.3% in 2015. Respectively, in dollar equivalent reduction in transfers was 17.4 and 45.2%. In such circumstances, the average annual growth rate of GDP from 5.8 in 2013 dropped to 2.8% in 2014, and to 1.1% in 2015.

The impact of structural change in export potential

The boom leads to a rapid increase in the volume of oil exports. In value terms of Azerbaijan's exports of oil and oil products in 2005-2010 increased by 6.8 times. This, in turn, thoroughly affected the total export volume and structure.

Exports of goods and services has increased from 3.6 billion dollars in 2004 to 21.4 billion dollars in 2010, to 30.3 billion dollars in 2013. This situation, first of all, paved the way for the formation of a surplus in the balance of current accounts. In connection with relatively high volumes of oil exports, even in period after rapid growth production was continued to maintain a large surplus current account balance. This indicator in a ratio to GDP was 27.3% in 2011, 22.8% in 2012, 22.1% in 2013 and 16.8% in 2014. Such case, had a positive role in terms of ensuring macroeconomic stability.

At the same time, we must take into account, the rapid growth of oil exports has created a strong one-sidedness in the structure of exports.

The share of oil and oil products in the country's exports reached 94.1% in 2010. Due to the fact that there not occurred a great changes in the economic diversification, the one-sidedness in the structure of exports in period after of the production growth continues. So, share of oil and oil

products in exports was 92.7% in 2013 and 92.4% in 2014. Weakness of the export potential of the non-oil sector, formed in the course of the crisis in regard the transformation of the economic system and reforming the structure of the national economy in condition of independence, was not overcome. In this regard, the following aspects directly tied to the effects of the oil boom attract attention:

First, the rise in the exchange rate of the national currency had not stimulated the expansion of non-oil sector products for export. As already mentioned, the production sectors in period of rapidly increasing oil production, demonstrated positive growth dynamics also after the peak period. During that period, the volume of non-oil products export in terms of value rose to a certain extent (the volume of non-oil exports per capita was in 2005 118 US \$ in 2005, , US \$ 137 in 2010, 172 US \$ in 2014), but this, did not have a significant impact on elimination of one-sided of the structure of exports . In period of rapid increase in the production, as well as in a subsequent period in the development of non-oil production, export orientation was slow. The value of exported of non-oil products compared to value added created in agriculture and processing industry was 32.5% in 2005, the 21.3% in 2010 and 22.8% in 2014.

Secondly, creation of export-oriented competitive petrochemical complex has been delayed. However, in the countries with large-scale production of hydrocarbons products of petrochemical industry occupies an important place in the export.

Third, at the time due to large positive current account balance, interest in expansion of non-oil exports was not high. Opportunity opened by oil revenues, has not been used for the application tools and mechanisms directly aimed at stimulating of non-oil export.

Export structure had caused risks in maintaining macroeconomic stability arising from volatility in oil prices. The ratio of supply and demand in the currency market the nascent in the conditions the drop in oil prices, which as noted, started in 2014, and accelerated in 2015, as well as of decline in oil production, caused the need for devaluation of national currency.¹⁰

We must bear in mind that the devaluation enabled the rapidly "melting" of country's strategic currency reserves as well as expansion of non-oil exports. At the same time, due to its large scale, as well as poorly developed financial system of the country caused negative effects on macroeconomic dynamics. In the conditions of a sharp devaluation, to provide macroeconomic stability suggests the reduction of money supply in circulation, and this will lead to the

weakening of business activity. Devaluation, as well as paved the way a decline to imports, consumption, as well as to the reduction of production based on imported raw materials.

In addition, sharp devaluation, due to the increase in instability, weakening of business activity, in conditions absence of sufficient production capacity in the appropriate direction, effectively not stimulated the export of non-oil products. Export of non-oil sector in 2015 was reduced 8.3%, downturn in the first quarter of 2016 compared to the same period of the previous year were 44.5%.

The recent sharp decline in oil prices and the devaluation of the national currency have led to increased interest in the development and implementation at the state level of strategies aimed at expanding exports products in the non-oil sector of economy. In this direction the return of a portion of the value of exported goods, and linking it with the role of local resources in the formation of the cost of the product, and also introduction of additional of measures to help producers some agricultural products (cotton, tobacco), which holds an important place in non-oil export capacity should be pay a big attention.

Conclusion

The Oil boom in Azerbaijan in the first decade of the twenty-first century led to substantial changes in a weakened by the crisis during system transformations, country's economy. The rapid growth of oil production in relatively short time, caused formation the rapid pace of GDP, as well as major changes in the structure of the growth.

Boom, as well as spawned of factors, which would can have a significant impact on GDP growth in long-term period. Boom has resulted oil sector dominant position in the economy, and on possession of changes of the parameters of this sector of force for a more significant influence in the economic dynamics.

In addition, the use of oil revenues, in the conditions of decrease of production, primarily, due to rapid growth of public investment and consumption, allowed the functioning of the economy in expansion mode.

However, the turning of oil revenues of the main financial source of the development, in turn, has led to adverse changes in structure of GDP growth, in terms of building the basis for

sustainable development in long-term period. Such provisions, as well as due to breakages in oil prices, acts as a carrier of the risk of a sharp decline in the GDP growth rate.

The mining boom, the sharp increasing of the volume of oil exports, had strengthened of one-sidedness in the structure of the export at weak potential of non-oil sector and a recent a sharp decline in oil prices, contributed to devaluation of the national currency. Strong devaluation, in turn, in the conditions reduced the use of oil revenues, led to the weakening of business activity and did not provide the necessary level for stimulation of the export of non-oil products.

In terms of more efficient use of the opportunities of the oil boom for economic development in long-term period, lessons of Azerbaijan's experience can be noted as the following:

- in period of post rapid production growth, when there is need for large-scale use of the oil revenues for the economic and social development purposes, to ensure the efficiency of investments and the creation a basis for sustainable development, it is important to optimize the amount of used funds and improve its structure.
- taking into account the factors of long-term impact of boom, at the same time with the beginning of rapid growth of oil production, in order to strengthen growth potential, it was reasonable to supporte creation of favorable business environment, industrial policy on economic diversification, first towards the revival and development of manufacturing sectors, which has been subjected a deep transformational recession.
- in conditions of post rapid growth of production implementation of the programs on development the export potential of non-oil sectors required. A begin of stimulation of exports growth and development of production in conditions of formation of unfavorable oil prices in period after the completion of the accelerated production growth, is connected with a waste of time in the eliminate risky economy structure, also with the loss of more favorable moments for the reforms.
- Azerbaijan's experience also confirm that the establishment of reserves by the oil revenues, was not sufficient as means to protect the economy against adverse external influences. To ensure reliable stability in conditions of economic growth, is connected with accompaniment of creation of strategic reserves through oil revenues with diversification of economy, expansion export potential of non-oil sector, the establishment advanced financial and banking system.

1. Calculations based on data BP Statistical Review of World Energy 2016-data workbook .<http://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html>
2. According to historical records, in 1901, 48.8% of the world's oil production, fell on the share Baku oil. – Azerbaijan's oil ... p 3
3. Calculated on the basis The national economy ... p. 122.
4. Transformational recession covered all areas of the economy of Azerbaijan. According to the World Bank data, in 1990-2000 downturn of average annual volume of GDP was 6.3%. Downturn average annual volume of industry amounted 2.1%, including of manufacturing 15.7%, of agriculture 1.7%, of services 1.6%. In 2000, GDP per capita was US \$ 663. Growth in the early 2000s not was providing significant improvements. On the eve of the start of rapidly growth oil production the economy was continues to be weak. The physical volume of GDP per capita in 2004 has been at the level 75.8%, industrial production 33.5%, agricultural production 70.2% of relevant indicators in 1990. The systemic crisis, taking place in the process of economic transformation, hyperinflation resulted in a sharp decline in living standards of the population. According to our calculations in the years of 1990-2004, the volume of disposable real income per capita has decreased by 2.0 times. The number of people with incomes below the official poverty line in 2004 amounted about half of the population. The amount of annual incomes per capita was equivalent to US \$ 53(Calculated on the basis World Development Indicators ...)
5. Rapid growth of oil production in Kazakhstan in the early 2000s also resulted in increased dependence on oil of the economy, which is manifests itself in the form of an large share of oil in exports, in budget revenues and the economy. See:IMF Country Report ...
6. In formation relatively low level of the economic growth in the post-peak phase had also the role, arising from the rapid growth of production in the previous period, of effect of large base GDP. About the effect of large base GDP , see: Hamza Khalilov ...
7. In order to effectively use the windfall from the oil boom, has been established the State Oil Fund of Azerbaijan (SOFAZ).In accordance with the Fund's regulations the main responsibility of the Fund is to ensure the accumulation and effective management of foreign currency and

other assets generated from the implementation of oil and gas exploration and development agreements as well as from the Fund's own activities, in the best interest of citizens and future.

8. According to our calculations, in conditions of a rapid growth in production in 2005-2010 of the mining industry's share in the physical growth GDP was 71.4%

9. Spot crude prices Brent fell from 108.66 \$/bbl in 2013, up to 98.95 \$/bbl in 2014, and to 53.39 \$/bbl in 2015—See: BP Statistical Review of World Energy June 2016, p 14

10. Faced with a sharp drop in oil prices in 2009, the Republic of Azerbaijan, despite the adverse external influences caused by the global financial and economic crisis, using the strategic reserves accumulated during oil boom as "safety cushion" was possible to avoid the devaluation. However, in the conditions of deep and consistent of the downturn in oil prices during the period of 2014-2016, as well as due to decrease in production, the large scale of devaluation was inevitable. In January 2016 compared with the same period of 2014, the exchange rate of manat according to US dollar had been at a low level of about 2 times.

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