REGIONAL ECONOMIES

GOVERNMENT BUDGET REVENUES IN AZERBAIJAN: THE TAX BURDEN AND THE ROLE OF THE OIL FACTOR

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ABSTRACT

This article examines the two main sources of the state budget in Azerbaijan: taxes and oil revenues.

In particular, it analyzes variously measured indicators of the tax burden on the Azerbaijan economy compared to other countries in the region and the world, assesses, based on a regression model, the role of the oil factor in generating revenue for the budget, and explores various scenarios for evaluating the sustainability of government budget revenues in the medium term.

Based on his assessments, the author shows that steady growth of the non-oil sector by 7%-9% per year is a major condition for maintaining the stability of government revenues in the medium term.

KEYWORDS: ***government budget, tax burden, oil factor, scenario analysis.***

Introduction

Depending on the range of functions assumed by the state, its fiscal policy can have a significant effect on the allocation of resources in the economy. On the one hand, the state uses taxes and government budget spending for active intervention in the distribution of income and thus performs its social function in reducing income inequality between different groups of the population,[1] and on the other, it ensures the production of public goods through government spending[2] and is thus able to play an important role in maintaining economic stability,[3] fighting the crisis,[4] and supporting economic growth.[5]

In recent years, an important factor behind the high rates of economic growth in Azerbaijan, along with the "oil boom," has been the dynamic development of the non-oil sector driven by this very "boom" and sustained by fiscal expansion. The most favorable conditions for expanding the state's financial capacity were created by the rapid increase in oil production in 2004-2010 (in that period, annual oil production rose from 15.5 million tons to 51 million tons) and the jump in oil prices in the world market (in 2004-2008, oil prices tripled, and despite a drop under the impact of the global financial crisis, they subsequently recovered in line with the global economic recovery.

Financial resources that increased without an increase (but, on the contrary, with a reduction) in the tax burden expanded government spending and enabled the state to implement large infrastructure projects, which helped, on the one hand, to create the basic conditions for the development of the economy as a whole, and on the other, to maintain aggregate demand at the necessary level, thus paving the way for rapid growth of the non-oil sector and for ensuring the country's stability in the face of global economic fluctuations.

At the same time, all these processes have made it necessary to study the problems of government revenue sources and their stability in the medium and long term.

Government Revenue Dynamics

In recent years, the dynamic development of the Azerbaijan economy has also had a positive effect on the state budget. In 2000-2013, government revenues grew rapidly, a process which found its reflection in a 12.2-fold increase in the country's economy. During that period, with the exception of the year of the financial crisis (in 2009, government revenues fell by 4.1%), the average rate of revenue growth was 34.5% per year, so that the revenue side of the budget increased from 714.6 million manats (AZN) in 2000 to AZN 19.5 billion in 2013 (or 27.3-fold).

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[1] See: International Monetary Fund *Fiscal Policy and Income Inequality*, IMF Policy Paper, 23 January, 2014, available at [http://www.imf.org/external/np/pp/eng/2014/012314.pdf].

[2] See: J. Stiglitz, *Economics of the Public Sector*, 3rd ed., W.W. Norton & Company, New York, 2000.

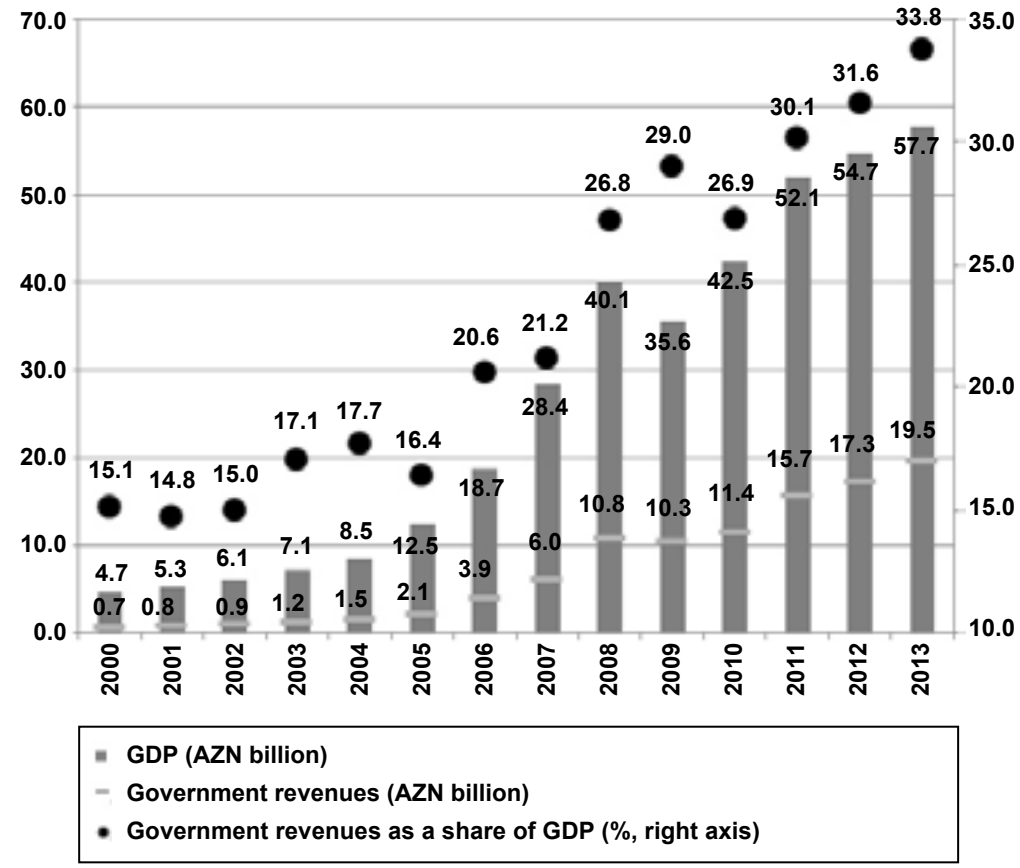
[3] See: A.J. Auerbach, *The Effectiveness of Fiscal Policy as Stabilization Policy*, July 2005, available at [http://eml.berkeley.edu/~auerbach/effective.pdf].

[4] See: A. Spilimbergo, St. Symansky, O. Blanchard, C. Cottarelli, *Fiscal Policy for the Crisis,* IMF Staff Position Note, SPN 08/01, 29 December, 2008 [https://www.imf.org/external/pubs/ft/spn/2008/spn0801.pdf].

[5] See: W. Easterly, S. Rebelo, *Fiscal Policy and Economic Growth: An Empirical Investigation*, NBER Working Paper Series, Working Paper No. 4499, October 1993, available at [http://www.nber.org/papers/w4499.pdf].

Figure 1

The Dynamics of Government Revenues in Azerbaijan



Source: Compiled based on data from the State Statistical Committee of the Azerbaijan Republic [www.stat.gov.az].

Since government revenues have increased faster than the size of the economy, they have also increased as a share of GDP, with the result that this relative measure of public finance has risen by 18.7 percentage points (from 15.1% in 2000 to 33.8% in 2013).

Like many other economic indicators, this ratio helps to get a better idea of the problem if we use comparative analysis. An analysis of the distribution density of government revenues (excluding grants) as a percentage of GDP (see Table 1) based on World Bank data for 116 countries shows that about a third of them (39 out of 116) have government revenues in the range of 20%-30% of GDP. The world average for this indicator (24%) also falls within this range.

The 30-40 percent range group, which includes Azerbaijan, is the second largest group in terms of the number of countries. It includes both developed countries such as Sweden (31.9), Ireland (32.0), New Zealand (36.1), Austria (36.9), United Kingdom (38.3), Italy (38.5) and Finland (38.7), and developing countries such as Poland (30.7), Rumania (30.7), Estonia (33.3), Croatia (34.1), Turkey (34.6), Serbia (37.4) and Slovenia (38.7)—a total of 32 countries. The average indicator for the European Union (35.6) is also within this range.

Table 1

Government Revenues as a Percentage of GDP: Density Distribution across Countries of the World

Percent Range	Number of Countries	Percent of Total	Cumulative Number of Countries	Cumulative Percent of Total
[0, 10)	4	3.45	4	3.45
[10, 20)	28	24.14	32	27.59
[20, 30)	39	33.62	71	61.21
[30, 40)	32	27.59	103	88.79
[40, 50)	11	9.48	114	98.28
[60, 70)	2	1.72	116	100.00
Всего	116	100.00	116	100.00

Source: Based on World Bank data (2012).

A comparative analysis shows that the amount of government budget revenues in Azerbaijan in relation to the size of its economy is significantly higher than the world average (by 13.4 percentage points). This result can be interpreted in different ways: as an indicator of the scale of government intervention in the economy (with the state assuming even greater functions), on the one hand, and as an indicator of its increased financial capacity, on the other.

The Structure of Government Revenues, Transfers and Taxes

Under Art 5.1 of the Law on the State Budget of the Azerbaijan Republic, "state budget revenues shall include taxes, duties, tariffs and other income as established by the legislation of the Azerbaijan Republic."[6]

If we look at the structure and dynamics of government revenues in Azerbaijan, we will find significant changes in this area, especially since 2008. Starting in 2008, against the background of growing transfers to the budget from the State Oil Fund of Azerbaijan, there was a rapid reduction in the share of tax receipts, the main source of government revenues in 2000-2007 (in that period, taxes accounted, on average, for 76.6% of these revenues). In 2008, due to transfers from the State Oil Fund in the amount of AZN 3.8 billion, the share of taxes in the budget fell from 80.8% to 57.4%.

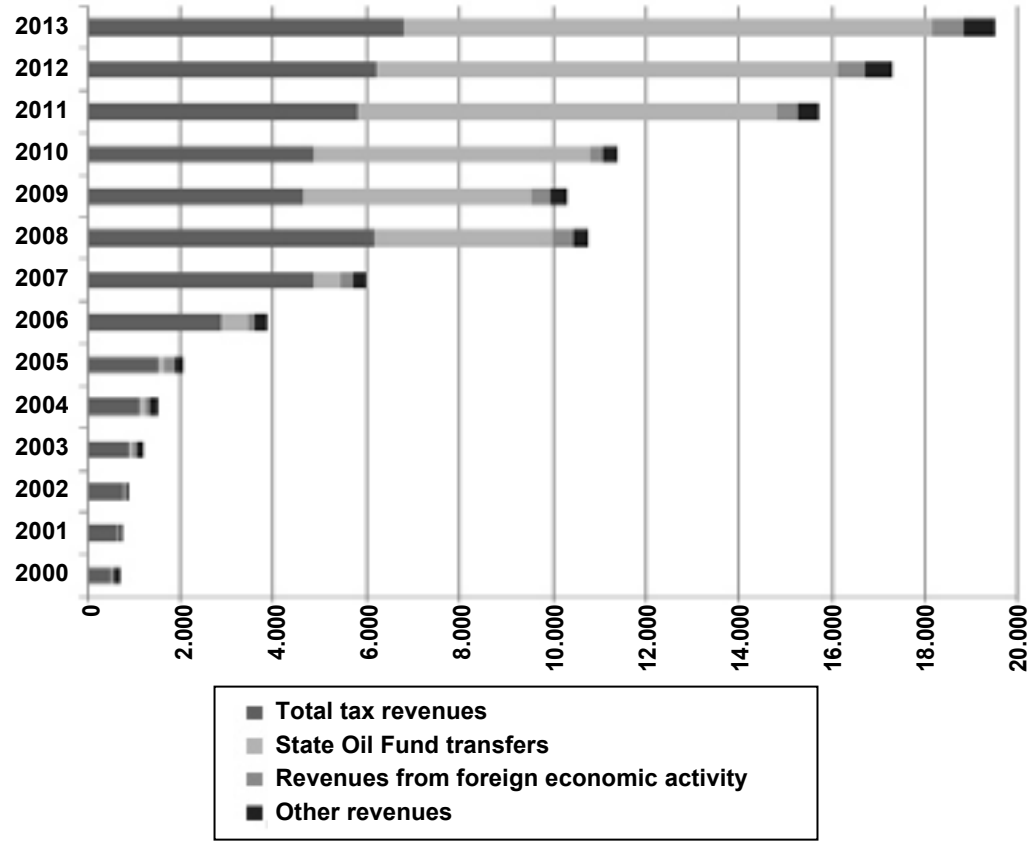
The global financial crisis that began in 2008 continued to influence the Azerbaijan economy in 2009 as well, so that the amount of tax revenues that year fell by 25.2%. Since transfers from the State Oil Fund (AZN 4.9 billion in 2009) continued to increase, the share of tax revenues in the budget fell

[6] See: Law of the Azerbaijan Republic on the State Budget of the Azerbaijan Republic, available at [http://e-qanun.az/files/framework/data/4/f_4756.htm] (in Azeri).

to 44.8%. Although in the following few years tax revenues began to recover, they increased slower than transfers from the State Oil Fund, with the result that in 2013 the budget share of tax revenues was down to 35%.

Figure 2

The Structure and Dynamics of the Government Budget in Azerbaijan (AZN million)



Source: Compiled based on data from the State Statistical Committee of the Azerbaijan Republic [www.stat.gov.az] and the State Oil Fund of the Azerbaijan Republic [www.oilfund.az].

In the ten years from 2003, when the State Oil Fund made its first transfer to the country's budget, the amount of such transfers multiplied 113.5-fold, so that the budget share of revenue from this source increased by 50 percentage points. At present, State Oil Fund transfers are the main source of government revenues. In 2013, the State Oil Fund transferred AZN 11.35 billion to the government budget, which amounted to 58.2% of total government revenues.

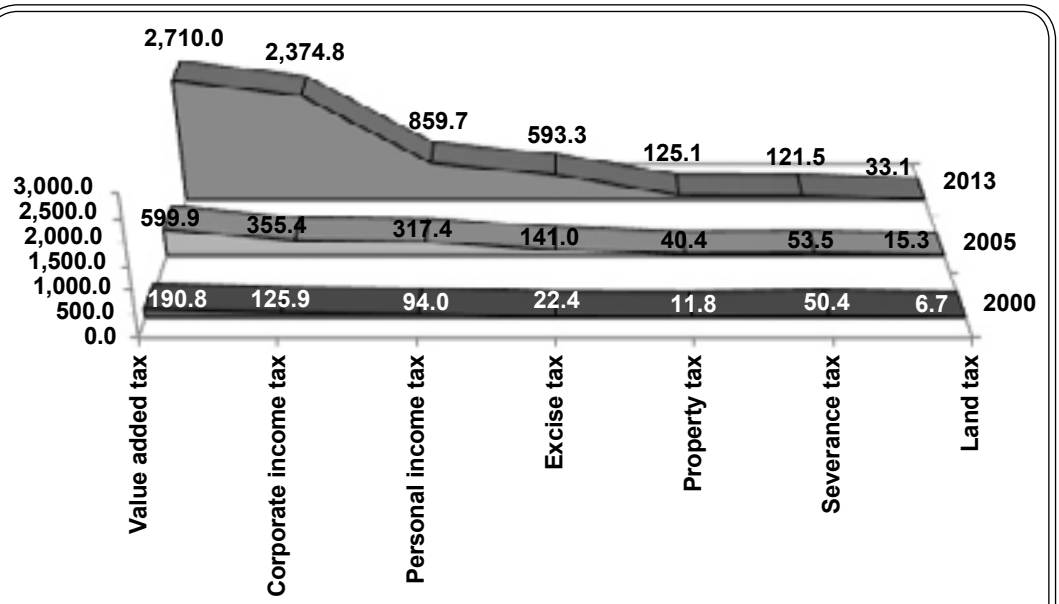
Together with all taxes, money transfers from the Fund made up 93.2% of total government revenues. If we look at the dynamics of tax receipts, we will see high rates of their nominal growth, especially prior to 2009: in 2000-2008 (base year 1999), their average nominal growth rate was 37.3%, with a resulting 15.5-fold increase in this type of financial receipts. As noted above, in 2009—

at the height of the global financial crisis—government tax revenues fell significantly, and although their growth resumed in 2010, it was now slower than before.

Despite all that, in the period under review there was an increase in government tax revenues from virtually all sources. Significant growth of revenue was recorded, in particular, for taxes on value added, corporate profits, personal income, excises and property (real estate). From 2000 to 2013, revenue from value added tax (VAT) increased 14.2-fold, personal income tax (Azerbaijani term "income tax") 18.9-fold, corporate income tax ("profit tax") 9.1-fold, excise tax 26.5-fold, property tax 10.6-fold, severance tax ("mineral extraction tax") 2.4-fold, and land tax 4.9-fold.

Figure 3

The Structure and Dynamics of Government Tax Revenues in Azerbaijan (AZN million)



Source: Compiled based on data from the State Statistical Committee of the Azerbaijan Republic [www.stat.gov.az].

Today, VAT is the main source of tax revenues in the budget structure: it accounts for 40% (AZN 2,710 million) of total tax revenues. It is followed by corporate income tax with a share of 35% (AZN 2,374.8 million), personal income tax with 12% (AZN 859.7 million) and excise tax with 9% (AZN 593.3 million). The overall share of revenue from taxes on property, mineral extraction and land is only 4.1% (AZN 279.7 million).

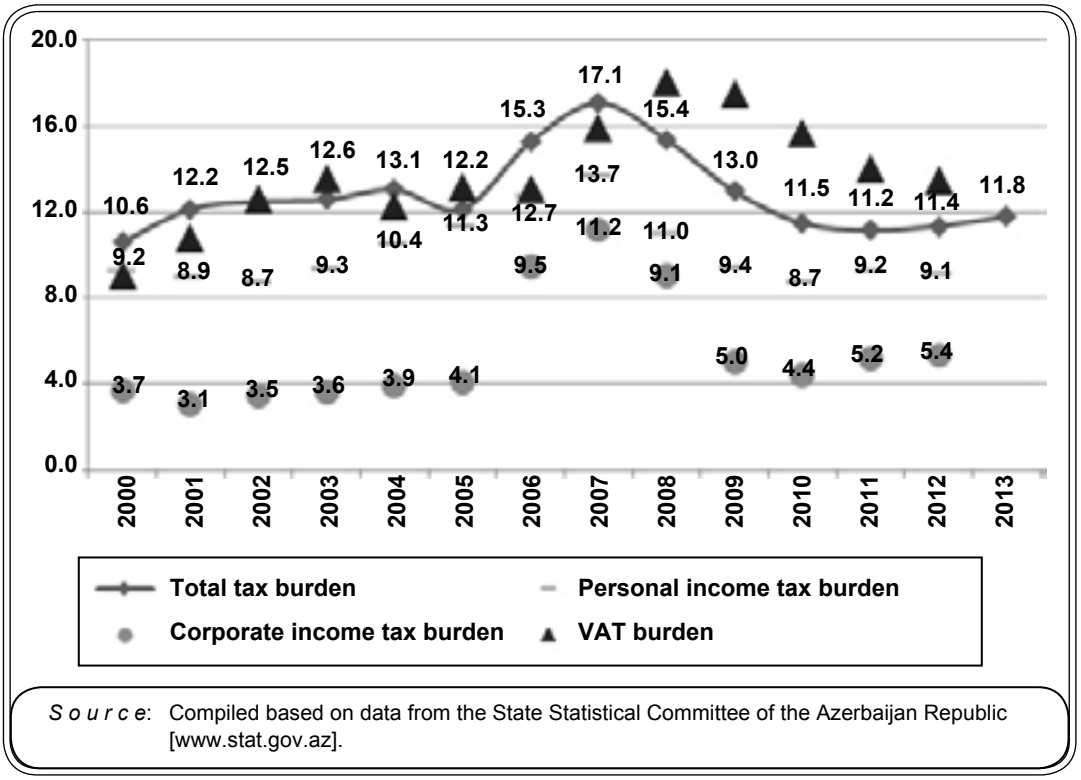
The Tax Burden in Azerbaijan: A Comparative Analysis

After 2009, the slowdown in the growth of tax revenues was also caused by tax reform in the country, including an optimization of tax rates and a reduction in the tax burden. In 2010, for example,

the highest rate of personal income tax—the third largest source of tax revenue—was reduced from 35% to 30%, and in 2013 from 30% to 25%; the highest rate of corporate tax—the second largest source of tax revenue—was also reduced: from 22% in 2010 to 20% in 2013. These changes led to a reduction in the tax burden.

Figure 4

The Tax Burden: Dynamics and Components (%)



Source: Compiled based on data from the State Statistical Committee of the Azerbaijan Republic [www.stat.gov.az].

From 2008, tax revenues as a share of GDP—one of the most general indicators of the tax burden—began to decline. From 2007 to 2013, the tax burden calculated by this method fell by 5.3 percentage points to 11.8% of GDP. Starting in 2008, there was also a decline in the similarly measured personal income tax burden (ratio of personal income tax revenues to total wage income) and the corporate income tax burden (ratio of corporate income tax revenues to total profit generated in the economy). As a result, from 2007 to 2013 the tax burden on corporate income fell from 11.2% to 5.4%, and the burden on personal income, from 13.7% to 9.1%. The VAT burden (government revenue from VAT as a percentage of total retail trade) began to decline in 2009, falling by 4.6 percentage points to 13.5% in 2013.

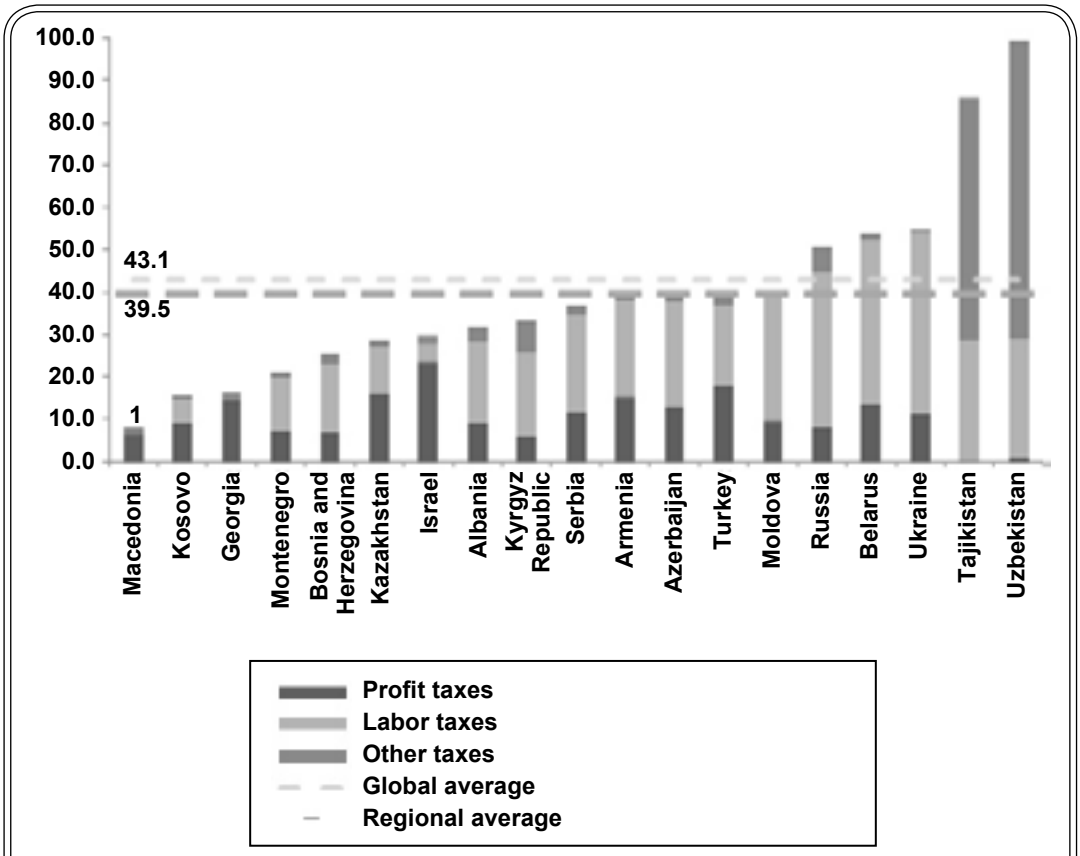
Along with an analysis of tax burden dynamics, international comparisons in this area are of particular importance. Figure 5 shows the tax burden (total tax rate split by type of tax) in the countries of Eastern Europe and Central Asia (including Azerbaijan) calculated using a methodology[7]

[7] See: PwC and World Bank/IFC *Paying Taxes 2014: The Global Picture*, pp. 139-145, available at [http://www.doingbusiness.org/~/media/GIAWB/Doing%20Business/Documents/Special-Reports/Paying-Taxes-2014.pdf].

based on the microeconomic approach and applied by PwC and World Bank experts in international comparisons of the tax burden.

Figure 5

The Tax Burden in Eastern Europe and Central Asia (Total Tax Rate, %)



Source: Compiled based on data from Paying Taxes 2014 report.

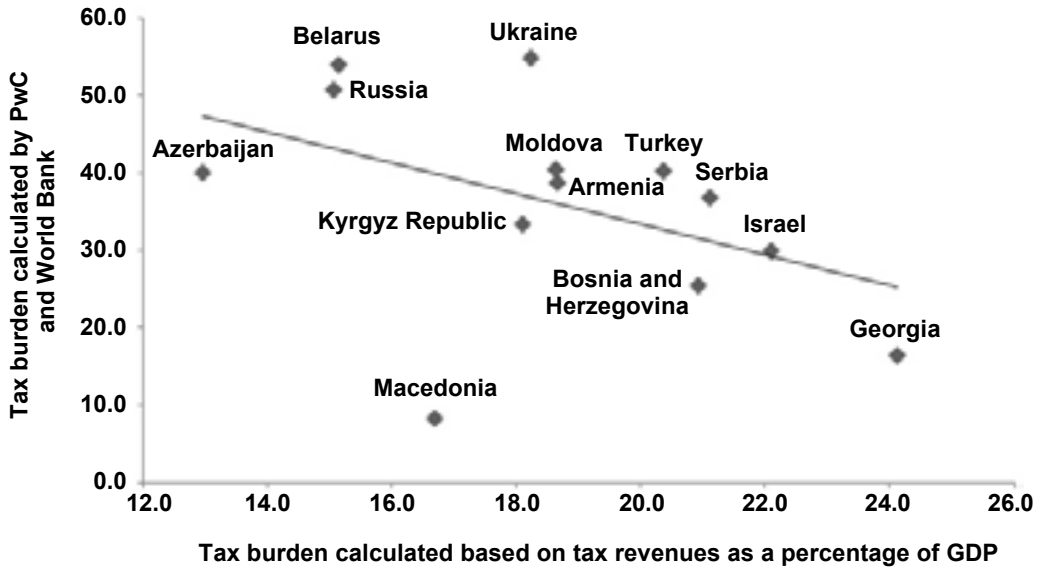
In the region of Eastern Europe and Central Asia, which includes 19 countries, the lowest tax burden is in Macedonia (8.2%) and the highest in Uzbekistan (99.3%). Azerbaijan is 12th with a total tax rate of 40%, which is slightly above the average for the region (39.5%) and below the global average (43.1%).

If we look at each of the three components of the tax burden separately, it becomes clear that there are no significant changes in Azerbaijan's position: it ranks 13th in profit taxes, 13th in labor taxes, and 12th in other taxes. According to the estimates of the report's authors, the average rate of profit taxes paid by enterprises in Azerbaijan is 12.9% of their total profit. The average profit tax figure for the region is 11.7% (due to differences in tax systems, Tajikistan and Uzbekistan are a special case and were not included in our ranking). The average labor tax figure is 24.8% for Azerbaijan and 20.2% for the region, and the figures for other taxes (Tajikistan and Uzbekistan are not included for the same reason) are 2.3% and 2.34%, respectively.

According to these estimates, the tax burden in Azerbaijan is relatively higher than the average figure for the region in which it is located. But if we make a comparison based on the above-mentioned methodology (tax revenues as a share of GDP), we will get a totally different picture.[8] According to these results, Azerbaijan is the country with the lowest tax burden in the region: its ratio of tax revenues to GDP is only 13%.[9] For Georgia (the country with the third lowest tax burden—"total tax rate"—according to the World Bank's *Paying Taxes* report), the ratio of tax revenues to GDP is 24.1%. Macedonia, which topped the rankings in the *Paying Taxes* report, is fourth in terms of tax revenues to GDP, with Russia and Belarus well ahead of it.

Figure 6

The Tax Burden in Countries of Eastern Europe and Central Asia: Degree of Correspondence between Different Methodologies



Source: Compiled based on World Bank data.

The absence of equal (or even close) values can be considered normal because they were calculated using different approaches and indicators: either as the amount of taxes and mandatory contributions paid by hypothetical enterprises in relation to their commercial profit or as the actual total amount of taxes and mandatory contributions as a percentage of GDP. Although the figures differ, one would expect a positive correlation in the country rankings on the tax burden. But the results obtained show the opposite: the correlation coefficient between tax burdens is –0.45, and the rank correlation coefficient (Pearson's correlation coefficient) is –0.48. The results of similar calculations for 131 countries show that the average level of negative correlations has a random nature: the correlation coefficients both between tax burdens and between their rankings are actually equal to zero;

[8] Since data were available for only 13 countries, calculations were made only for these countries.

[9] The difference between the tax burden in Azerbaijan calculated at the beginning of this section (11.4% in 2012) and the figure given above (13%) is due to the fact that the World Bank takes into account not only tax revenues as a percentage of GDP, but also the entire range of state duties and other mandatory payments.

in other words, there is no correlation at all between the tax burden results obtained by these two methods of measurement.

It would be more appropriate to look for the source of this variance in the initial assumptions behind the calculations made by the World Bank together with PwC. According to these assumptions, they take into account the taxes and contributions paid by a standardized medium-sized company (60 employees), its form of ownership, length of time in business, start-up capital, turnover, gross margin, and other similar factors.[10] But all these conditions do not reflect the actual state of the economy in all countries of the world and apparently are unable to do so by their very nature. For example, medium-sized enterprises do not necessarily constitute the basis of the economy in all countries. Differences in the structure of the economies (from the perspective of the ratio between small, medium and large enterprises) lead to differences in the acceptance or non-acceptance of the above-listed hypothetical assumptions, and these in turn determine the degree of correspondence between the tax measured in this way and the actual state of affairs.

Considering the above, we will continue our analysis based on the tax burden calculated as the ratio of tax revenues to GDP. Azerbaijan, which in accordance with this indicator ranks first in Eastern Europe and Central Asia, has turned out to be 30th in the ranking of 131 countries.

The tax burden density distribution shows that for about a third of the 131 countries analyzed (43 countries) the tax burden is in the range of 15%-20% of GDP. In 37 countries (the second highest density), including Azerbaijan, the tax burden is in the range of 10%-15% (see Table 2).

Table 2

Tax Revenues as a Percentage of GDP:
Tax Burden Density Distribution across Countries of the World

Percent Range	Number of Countries	Percent of Total	Cumulative Number of Countries	Cumulative Percent of Total
[0, 5)	6	4.58	6	4.58
[5, 10)	5	3.82	11	8.40
[10, 15)	37	28.24	48	36.64
[15, 20)	43	32.82	91	69.47
[20, 25)	25	19.08	116	88.55
[25, 30)	11	8.40	127	96.95
[30, 35)	2	1.53	129	98.47
[35, 40)	2	1.53	131	100.00
Всего	131	100.00	131	100.00

Source: Based on World Bank data (2012).

Both a separate analysis of the tax burden in Azerbaijan and its comparison with other states allow us to say that at present the tax burden in the country is relatively low. Nevertheless, the tax system can be significantly improved if we determine the optimal level (Laffer points of the first and

[10] See: PwC and World Bank/IFC *Paying Taxes 2014: The Global Picture*, p. 140.

second type) of the tax burden, which can prove to be particularly useful for both different kinds of taxes and the economy as a whole.[11] But this is a subject of special investigation.

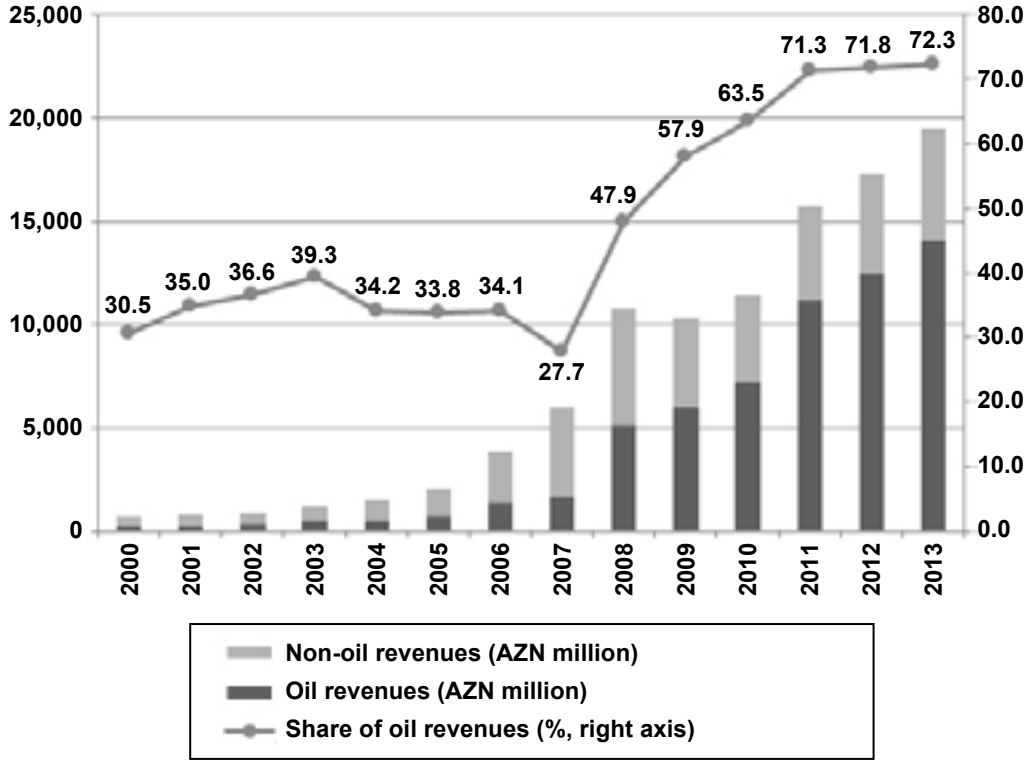
The Role of the Oil Factor in the Government Budget of Azerbaijan

Government Oil and Non-Oil Revenues

As already noted, transfers from the State Oil Fund are another major source of revenue for the state budget in Azerbaijan along with tax revenues. Today, these transfers amount to 58.2% of the

Figure 7

The Share of the Oil and Non-Oil Sectors in Government Revenues



Source: Compiled based on data from the State Statistical Committee, State Oil Fund, and State Oil Company of the Azerbaijan Republic.

[11] For more details see: A.B. Laffer, "The Laffer Curve: Past, Present and Future," *Heritage Foundation*, No. 1765, 1 June, 2004 (see also: Iu. Ananiashvili, V. Papava, *Nalogi i makroekonomicheskoe ravnovesie: Laffera-Keinsianskiy sintez*, CA&CC Press®, Stockholm, 2010).

budget. Naturally, these are by no means the only oil revenues in the budget. The figure is even larger if we include taxes paid by companies engaged in oil and gas production in Azerbaijan.

Data on tax payments made by such companies to the state budget are available only for the State Oil Company of the Azerbaijan Republic (SOCAR): in 2013, it paid about AZN 1.6 billion. Together with transfers from the State Oil Fund, this constituted 66.4% (AZN 13 billion) of budget revenues.

Due to the lack of actual data on the amount of payments to the state budget of Azerbaijan from other oil and gas companies, they can be replaced with data on the minimum amount of corporate taxes set for the contractor by appropriate production sharing agreements (such data are available only for 2011-2013[12]). In this case, the share of oil revenues in the budget for 2011-2013 will exceed 70%.

In subsequent analysis, we will tentatively consider as government oil revenue the entire amount of transfers to the budget from the State Oil Fund and SOCAR payments (with the exception of 2011-2013). At the same time, there is no doubt that government oil revenues are actually several percentage points higher than the figures we use.

Analysis shows that while government revenues increased 27.3-fold from 2000 to 2013, government oil revenues multiplied 64.7-fold, so that their share of total revenues more than doubled: from 30.5% to 72.3%. This allows us to speak of the budget's high dependence on the oil factor.

Nevertheless, this share provides little information about the degree (form) of dependence of government revenue on the oil factor (the amount of oil produced and its market prices) and about the pattern of this dependence in the medium term.

To find out more about the budget's dependence on the oil factor and to have an opportunity to analyze different scenarios of revenue behavior in the medium term, below we provide an econometric analysis of the generation of government revenues.

An Econometric Analysis of Government Revenue Generation

Government Revenues in Relation to GDP: sensitivity Analysis

In order to measure the direct dependence of the amount of government budget revenues on the production of goods and services in the economy, primarily the sensitivity of revenues to changes in GDP, we will use a simple two-variable regression model. The results of calculations based on data for the period from 2000 to 2013 are presented below:

$$LnBg = 1.31*LnUDM - 4.55 - 0.15*FD, \quad (1)$$

where *LnBg* is the natural logarithm of government budget revenues;

LnUDM is the natural logarithm of GDP; and

FD is a dummy variable (included in the model to remove the effect of the structural shocks caused by the oil boom in 2006, 2007 and 2008).

[12] See: *Decrees of the President of the Republic of Azerbaijan on the Application of the Law of the Azerbaijan Republic on the State Budget of the Azerbaijan Republic for 2011, 2012, and 2013.*

Table 3

Dependence of Government Revenues on GDP: Results of Regression Analysis

Variable	Coefficient	Std. Error	*t-Statistic*	Prob.
LnUDM	***1.310340***	**0.014904**	**87.91634**	***0.0000***
C	***–4.551179***	**0.147338**	**–30.88943**	***0.0000***
FD	***–0.149049***	**0.033300**	**–4.475949**	***0.0009***
R-squared	***0.998582***	**Mean dependent var**		**8.302275**
Adjusted *R-squared*	**0.998324**	**S.D. dependent var**		**1.248807**
S.E. of regression	**0.051125**	**Akaike info criterion**		**–2.921691**
Sum squared resid	**0.028751**	**Schwarz criterion**		**–2.784750**
Log likelihood	**23.45183**	***F-statistic***		***3,872.816***
***Durbin-Watson* stat**	***2.500021***	***Prob(F-statistic)***		***0.000000***

Source: Results of calculations using EViews software package.

If we look at the qualitative characteristics of the model (see Table 3), we will find both reliable regression coefficients and a high coefficient of determination R-squared (at a significance level of 0.01). For its part, the Durbin-Watson statistic points to the absence of autocorrelation in the residuals: it should be in the range of 1.35-2.65 for 14 observations at a significance level of 0.05 (k = 1; n = 14; dU = 1.350)[13]; the DW statistic (2.50) for our regression falls within this range.

At the same time, according to the results of a cointegration test (the test used in this case was the Engle-Granger two-step test[14]), there is a statistically significant long-run relationship between the two variables.

Estimates show an elasticity of government revenues to GDP greater than one: assuming all other variables remain unchanged, an increase in GDP by 1% leads to an increase in government revenues by 1.3%. Moreover, the results of an assessment of revenue changes make it clear that almost all of them—99.9% (R^2 = 0.999) are explained by changes in GDP.

Similar calculations for other government revenues (excluding transfers from the State Oil Fund) produce the following results:

$$LnBg\_nfs = 0.95*LnUDM - 1.41 + 0.24*FD, \quad (2)$$

where *LnBg_nfs* is the natural logarithm of government budget revenues (excluding transfers from the State Oil Fund);

LnUDM is the natural logarithm of GDP; and

FD is a dummy variable (included in the model to remove the effect of the structural shocks caused by the oil boom in 2006, 2007 and 2008).

[13] See: D.N. Gujarati, *Basic Econometrics*, Fourth edition, McGraw-Hill, 2004, p. 970.

[14] See: J.G. MacKinnon, *Critical Values for Cointegration Tests*, Queen's Economics Department, Working Paper No. 1227, p. 2.

Table 4

Dependence of Government Revenues (Excluding Transfers from the State Oil Fund) on GDP: Results of Regression Analysis

Variable	Coefficient	Std. Error	*t-Statistic*	Prob.
LnUDM	***0.946785***	**0.016560**	**57.17431**	***0.0000***
C	***–1.409292***	**0.161911**	**–8.704141**	***0.0000***
FD	***0.37855***	**0.036998**	**6.428841**	***0.0000***
R-squared	***0.997007***	**Mean dependent var**		**7.952010**
Adjusted *R-squared*	**0.996462**	**S.D. dependent var**		**0.930290**
S.E. of regression	**0.055332**	**Akaike info criterion**		**–2.763513**
Sum squared resid	**0.033678**	**Schwarz criterion**		**–2.626572**
Log likelihood	**22.34459**	***F-statistic***		***1,831.857***
***Durbin-Watson* stat**	***2.052798***	***Prob(F-statistic)***		***0.000000***

Source: Results of calculations using EViews software package.

As in the previous model, the qualitative characteristics of this model are highly reliable. The regression coefficients and the coefficient of determination remain significant at a significance level of 0.01 and there is no autocorrelation in the residuals ($DW = 2.05$, see Table 4).

Based on the results of regression analysis of the variables included in the model, changes in GDP explain 99.7% of changes in government revenues in the period under review. One can say that GDP growth of 10% (assuming all other variables remain constant) increases government revenues by almost as much: by 9.5%.

Government Revenues, Oil Production and Oil Prices: Scenario Analysis

After assessing the responsiveness of government revenues to changes in the economy as a whole (in GDP), we will try to measure how responsive they are to the main determinants of the oil sector—oil production and changes in oil prices— and also their sensitivity to changes in the non-oil sector. For this purpose, we will analyze the results obtained using a regression model of government revenue dependence on oil production, oil prices and non-oil GDP:

$$LnBG = 0.55*LnNH + 0.28*LnNQ + 0.995*LnQNUDM - 7.5, \quad (3)$$

where *LnBg* is the natural logarithm of government revenues;

LnQNUDM is the natural logarithm of non-oil GDP;

LnNH is the natural logarithm of oil production; and

LnNQ is the natural logarithm of oil prices.

Table 5

The Oil Factor in Government Revenue Generation: Results of Econometric Analysis

Variable	Coefficient	Std. Error	*t-Statistic*	Prob.
LnNH	***0.544582***	**0.093408**	**5.830154**	***0.0002***
LnNQ	***0.278864***	**0.099075**	**2.814683**	***0.0183***
LnQNUDM	***0.995025***	**0.074777**	**13.30653**	***0.0000***
C	***–7.502454***	**0.572222**	**–13.11109**	***0.0000***
R-squared	***0.998100***	**Mean dependent var**		**8.302275**
Adjusted *R-squared*	**0.997530**	**S.D. dependent var**		**1.248807**
S.E. of regression	**0.062062**	**Akaike info criterion**		**–2.486416**
Sum squared resid	**0.038517**	**Schwarz criterion**		**–2.303829**
Log likelihood	**21.40491**	***F-statistic***		***1,751.210***
***Durbin-Watson* stat**	***2.426517***	***Prob(F-statistic)***		***0.000000***

Source: Results of calculations using EViews software package.

As we see from Table 5, the qualitative characteristics of the model (the *t*, *F* and *DW* statistics) show that it is admissible to use the results obtained. The *LnNH* and *LnQNUDM* coefficients, the coefficient of determination (R^2), and *LnNQ* are significant at a significance level of 0.05. The *DW* statistic in the range of 1.35-2.65 shows the absence of autocorrelation in the residuals.

Our calculations show that 99.8% of the variations in government revenue are explained by the variables included in the model: variations in oil production, oil prices and non-oil GDP. At the same time, all other things being equal, a 10% increase in oil production will lead to an increase in government revenue by 5.4%, and a 10% increase in oil prices, by 2.8%. With non-oil GDP growth of 10%, government revenues will increase by 9.95% (assuming constant oil production and oil prices). Overall, a 10% change in the oil factor (by 10% in both oil production and oil prices) will lead to an 8.2% change in government revenues, which suggests a high level of dependence.

Since we have already constructed a regression model of government revenue dependence on oil production, oil prices and non-oil GDP, we can also analyze government revenues in the medium term based on certain scenarios. For this purpose, we will consider four scenarios that project government revenues over the medium term (2014-2020). Let us note that in these scenarios all unspecified factors (tax rates, duties, etc) are assumed to be constant.

- ***Scenario 1.*** The current level of oil production stabilizes at about 43 million tons (in 2013, it was 43.457 million tons). Oil prices fluctuate around $100 per barrel. Annual real growth in the non-oil sector is 7%,[15] and the annual inflation rate is 3%. Scenario 1 is taken as the baseline scenario in our calculations.

[15] Real growth rates in the non-oil sector are approximated to the annual average growth rates for the non-oil sector set as goals in the Development Concept "Azerbaijan 2020: Outlook for the Future" (See: Development Concept "Azerbaijan 2020: Outlook for the future," p. 11, available at [http://www.president.az/files/future_az.pdf] (in Azeri).

- ***Scenario 2.*** Starting in 2014, oil production decreases at a rate of 10% per year. The assumptions about growth in the non-oil sector and oil prices are the same as in Scenario 1. The purpose of Scenario 2 is to measure the medium-term effects of possible oil production shocks.
- ***Scenario 3.*** Oil prices fall to the level of 2009 (the most acute phase of the latest global crisis, when they were at $60 per barrel) and stay at that level. The assumptions about growth in the non-oil sector and oil prices are the same as in Scenario 1. The purpose of Scenario 3 is to measure the medium-term effects of possible oil price shocks.
- ***Scenario 4.*** Starting in 2014, oil production decreases at an annual rate of 10% while oil prices stay at about $60 per barrel. The assumptions about growth in the non-oil sector and oil prices are the same as in Scenario 1. The purpose of Scenario 4 is to measure the medium-term effects of possible oil production and oil price shocks.

Table 6 shows model-based scenarios of how oil production and oil price shocks (taken separately and together) can affect government revenues in the medium term.

Table 6

Government Revenues in the Medium Term:
Results of Scenario Analysis *(in nominal terms, AZN million)*

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
2013[f]	**19,496**	**19,496**	**19,496**	**19,496**
2014[h]	**20,863**	**19,813**	**18,093**	**17,182**
2015[h]	**22,982**	**20,608**	**19,930**	**17,872**
2016[h]	**25,316**	**21,436**	**21,955**	**18,590**
2017[h]	**27,887**	**22,296**	**24,184**	**19,336**
2018[h]	**30,719**	**23,191**	**26,641**	**20,112**
2019[h]	**33,839**	**24,122**	**29,347**	**20,919**
2020[h]	**37,276**	**25,090**	**32,327**	**21,759**

Note: The letter "f" in the year column means the actual figure for the year in question, and the letter "h" means the figure expected under a particular scenario.

Source: Author's calculations.

According to the baseline scenario, government revenues will reach AZN 37.3 billion by 2020 if the current level of oil production remains stable throughout this period, oil prices fluctuate around $100 per barrel, the inflation rate is 3%, and non-oil GDP grows at an annual rate of 7% in real terms. Compared to 2013, government revenues will increase 1.9-fold in nominal terms and by more than 55% in real terms (adjusted for inflation of 3%).

Under the second scenario, which is meant to measure the possible effect of a decline in oil production while all other factors remain constant (oil prices at $100 per barrel, real growth rate of non-oil GDP at 7%, and annual inflation at 3%), an annual decline in oil production by 10% in the period to 2020 will give a slow increase in government revenues to AZN 25.1 billion in 2020. Compared to 2013, government revenues will increase by 29% in nominal terms and only by 5% in real terms.

The third scenario, designed to measure the medium-term revenue effects of a sharp drop in annual average oil prices to $60 per barrel for the entire period to 2020, all other things being the same (annual oil production at 43 million tons, the real growth rate of non-oil GDP at 7%, and annual inflation at 3%), projects an increase in government revenues to AZN 32.3 billion. Compared to 2013, revenues will increase by 66% in nominal terms and by more than 35% in real terms.

According to the "worst-case" scenario (Scenario 4), which is designed to measure the negative effect on government revenues that will result from a possible sharp drop in both oil production and oil prices (with oil production falling by 10% per year and oil prices fluctuating around $60 per barrel), all other things being the same (real growth of non-oil GDP at 7% and annual inflation at 3%), government revenues in 2020 will total AZN 21.8 billion. This means that, compared to 2013, government revenues will increase by 12% in nominal terms and decrease by 9% in real terms.

As we see, although government revenues today are closely linked to the oil factor, in the medium term an annual growth rate of 7% in the non-oil sector will make it possible to restore the nominal amount of current government revenues already from 2017. But restoring government revenues (in different years) to their 2013 level in real terms will require totally different amounts of additional funds under different scenarios.

Table 7

The Recovery Rate of Real Government Revenues and the Amount of Additional Funds Needed to Maintain the 2013 Revenue Level under Different Scenarios
(2013 price level, AZN million)

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
2014	759	–260	–1,931	–2,814
2015	2,166	–71	–710	–2,650
2016	3,671	120	595	–2,484
2017	5,281	313	1,991	–2,317
2018	7,002	508	3,484	–2,148
2019	8,844	705	5,081	–1,977
2020	10,813	904	6,789	–1,804

Source: Author's calculations.

Our calculations show that real government revenues can return to their 2013 level by 2016 under the second and third scenarios (see Table 7). Before they do so, maintaining the 2013 revenue level will require additional funds in the amount of AZN 331 million under Scenario 2 and AZN 2.6 billion under Scenario 3. When the 2013 revenue level is restored, in 2016-2020 the budget will have at its disposal additional funds (compared to the real government revenues generated in 2013) totaling AZN 2.6 billion under Scenario 2 and AZN 18 billion under Scenario 3.

The situation projected under Scenario 4 is relatively complicated. According to this "worst-case" scenario, the actual amount of government revenues generated in 2013 will not be restored by 2020, and it will take AZN 16.1 billion of additional funds to maintain the 2013 revenue level for seven years through 2020. Estimates show that if these trends continue into the future, the actual amount of revenues generated in 2013 will be restored only by 2030, and maintaining real revenues at the 2013 level until that time will require AZN 24.4 billion.

Thus, if processes run according to the latter scenario, the amount of additional funds needed to maintain the stability of the budget will be quite large. But Azerbaijan's current foreign exchange reserves are 1.7 times larger than this required amount. Moreover, the maximum annual amount of required funds is less than 5% of 2013 GDP and tends to decline from year to year. And this is not regarded as a dangerous budget deficit level.

In Scenario 4, there is also another way to stabilize the situation, and it is apparently the best way: to ensure even higher rates of real growth in the non-oil sector. According to estimates, if we can ensure annual real growth of 9% in this sector, the real level of government revenues generated in 2013 can be restored in only five years (in 2019). In this case, the amount of additional funds for the period to 2019 is less than one third of the previous estimate (additional funds needed to restore revenue by 2030): about AZN 7.4 billion.

Naturally, current processes are more consistent with the baseline scenario. The purpose of the other scenarios is mainly to provide an opportunity for assessing the role of the oil factor in generating government budget revenue and for measuring the stability of government finance in the face of possible shocks in this area. Estimates for the baseline scenario show that there are opportunities for real growth of government revenues (with the exception of 2014) by about 7% per year, which means an opportunity for additional expenditures over seven years through 2020 totaling AZN 38.5 billion (at the 2013 price level).

Conclusion

An analysis of the formation of the state budget in Azerbaijan (government revenue generation) shows that transfers from the State Oil Fund are currently the main source of government revenues, constituting up to 60% of the total. Taxes, the second largest source of revenues, make up 35% of the total, with the most significant part of the taxes (about 40%) coming from the oil sector. And this means that more than 70% of total government revenue is generated by the oil sector. This figure, which points to the budget's close interdependence with the oil factor (including changes in oil production and oil prices), is evidence of its high sensitivity to changes in this factor in the medium and long term.

A regression analysis of the revenue side of the budget shows that a 10% change in the oil factor (10% changes in oil production and oil prices taken separately) results in an 8.2% change in revenues in the same direction. The elasticity of government revenues to changes in the non-oil sector is close to unity, which means that 10% growth in this sector of the economy will lead to an increase in government revenues by up to 10%.

In addition, based on the results of an analysis of the medium-term stability of government revenues in case of stresses associated with the oil factor (a sharp drop in oil production and oil prices), we find that faster growth in the non-oil sector (with real growth rates of 7%-9%) will allow the government budget to maintain its stability in the face of oil shocks. Moreover, Azerbaijan has sufficient financial resources to ensure the stability of its budget in the medium term, as well as to maintain high rates of growth in the non-oil sector.

Stability of government revenues and dynamic growth in the non-oil sector depend not only on an abundance of financial resources, but also to a large extent on an improvement in the business environment (however populist this may sound).

The first thing that comes to mind in this context is to reduce the tax burden on the economy. Our analysis shows that the tax burden in Azerbaijan is already quite low. In accordance with this analysis, based on the results of calculations made by the World Bank and PwC, Azerbaijan has a

40% ratio of tax payments to profit and is in the middle of a list of 131 countries (rank 72).[16] But the results obtained with this methodology, which has a number of shortcomings, differ significantly from the results obtained by ranking countries based on actual tax payments as a percentage of GDP. According to the latter methodology, the economy of Azerbaijan, considering its size, is at least 30th (among 131 countries) in the rankings for actual tax payments. In recent years, significant progress has been made in improving the country's tax system. Tax rates have been reduced and tax administration has improved. At the same time, it is important to continue focusing on a further expansion of tax incentives.

Important conditions of the business environment include protection of property rights, further reform of the country's legal and judicial system, efforts to create a competitive environment, simplification of foreign trade, primarily export conditions, continued work to improve both the sphere of production (power supply, etc.) and the transportation infrastructure, and measures to ensure high and steady growth rates in the non-oil sector. Along with the resources of the State Oil Fund, the main economic guarantee of budget stability is sustainable growth of the non-oil sector in the medium term.

[16] The *Paying Taxes 2014* report compares tax systems in 189 economies worldwide, but since data for an alternative indicator of the tax burden—tax revenues as a percentage of GDP—were available for only 131 countries, in order to verify the results we analyzed only this group of countries.