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TAX REVENUES ESTIMATION AND FORECAST FOR STATE TAX AUDIT

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Abstract. The forecast model analysis of dependence of tax revenues of the state budget on macroeconomic indicators is presented. For example, the hypothesis of the impact of total retail trade on domestic taxes on goods, works and services through correlation and regression analysis is studied. Moreover, the influence of nominal income per capita, the volume of industrial products (goods and services), and investments in fixed capital on income tax was assessed. In the course of the study, the indicator of crude oil and natural gas production was selected and its impact on tax revenues from international trade and foreign operations of the country was analyzed. Thus, the importance of methods of forecasting tax revenues in the context of state tax audit and budget planning is substantiated.

1. Introduction

In the context of the implementation of the state audit, special requirements are presented in order to improve the activities of the tax authorities, the introduction of priority standards for the provision of public services, as well as improving the accuracy of forecasting budget revenues through modern information technologies. One of the most important tasks of the state tax audit of the system of tax administration and tax system of the country as a whole are the efficiency and effectiveness of the tax authority activities on planning and forecasting as well as completeness and timeliness of tax revenues. The formation and transition to the market economy required the change in the tax system of emerging economies. Tax forecasting is one of the most difficult areas of reform. This

particular difficulty is due to the fact that the forecasting of tax revenues is directly related to the function of economic planning, the essence of which has been radically revised in recent years. In all spheres of social activity, planning "from the achieved" gradually give to strategic planning. Strategic planning fundamentally changes the nature of the tasks of each stage in the process of tax forecasting and assessment. Responsibility for the calculation of certain reporting indicators changes to the responsibility for the creation of an intermediate result for a common interdepartmental project designed to solve a specific management problem (for example, finding ways to cover the budget deficit, reducing the tax burden, etc.). Thus, modern tax forecasting and assessment are impossible without coordination of efforts between departments, including in such aspects as data exchange, harmonization of methodologies, General setting of tasks, as well as internal and external tax audit. The main general conclusion in the analysis of the experience of tax forecasting of countries with economies in transition can be considered as the extreme non-study of this topic and the extreme difficulties of such international analysis. This conclusion is supported by a special comparative study of income forecasting methods in lower-income countries of the International Monetary Fund. According to this report, there is a tendency to adjust formally obtained macroeconomic indicators in the direction of optimistic rather than conservative scenarios (which was also noted by the IMF "with surprise"). In most countries with economies in transition, tax forecasting is the responsibility of one body (usually the Ministry of Finance), but in fact it involves a large number of other institutions, with which coordination is often difficult. The International Monetary Fund study found that 85% of the lower incomes countries in their sample as forecasting methods used a combination of subjective estimates and methods of the simplest extrapolation of current values for future periods. Moreover, the official tax forecast is drawn up not earlier than three months before the corresponding budget period. Such a short period of time usually does not allow tax forecasts to play a significant role in the discussion of the budget. The International Monetary Fund explains this problem by the low technical formalization of forecasting procedures. The organization for economic cooperation and development recommends that countries with economies in transition adopt the forecast budget no later than 6-8 months before the start of the relevant budget period. Most organizations involved in fiscal forecasting in OECD countries use the so-called "bottom-up" approach in their models. This means that tax forecasting is carried out separately in the context of separate tax and non-tax sources.

The results of these specific projections are subsequently summarized for the analysis of aggregated financial indicators. This approach has many obvious advantages. This allows you to get a detailed forecast of the sources, as well as to analyze the contribution of various taxes in the structure of total revenues and budget deficits. In addition, government agencies usually apply the most detailed models, which contain forecasts not only for sources, but also for separate fund, levels of government and extra-budgetary funds. The only limitation to this approach is its high requirements for the availability of statistical data, as well as the technical difficulties of consistency providing between such complex models and macroeconomic and expenditure projections. For these reasons, many countries have started to use cause-and-effect forecasting techniques, in particular by combining regression and modelling techniques in tax analysis. Thus, on the basis of systematization and generalization of existing methods of forecasting in the course of the study, possible scenarios of tax revenues are proposed by constructing forecast models depending on macroeconomic indicators.

The objects of the study are tax revenues to the state budget and macroeconomic indicators of the Republic of Kazakhstan.

2. Methodology and/or theoretical framework

The main method of forecasting for the tax revenues dynamics model creation was paired by correlation-regression analysis, which consists of determining and describing the relationship between the observed and the explanatory variable.

At the first stage of the study, it is necessary to identify the tax revenues types that take the largest share in the structure of total tax revenues. At the next stage of the analysis, for each studied type of tax, we determine the presumptive factor that has the greatest impact on the resultant variable. Then we create a correlation chart of the dependence between indicators, where the factor indicator is located on the abscissus axis, and the influencing indicator is on the ordinate axis.

In order to explain the relationship tightness we model a correlation matrix of the relationship between the indicators. Next, there is defined the main characteristics of the identified relationship between the dependent variable and the explanatory variable quality. In case of a sufficient level of interrelation closeness detection, there is taken the obtained equation of the pair linear regression.

At the final stage, based on the scenario analysis, there is predicted the dynamics of the each type of tax revenues.
In the study the following methods were used:
- analysis of Kazakhstani tax revenue quarterly statistical data by the period of 2007–2017,
- synthesis,
- modeling based on a correlation-regression analysis between tax revenues and total retail trade, average monetary income per capita, the volume oil and natural gas production,
- forecasting tools (the scenario method).

3. Literature review

Research in the field of planning and forecasting tax revenues, carried out by modern authors, most often refers to the consideration of intergovernmental fiscal relations problems and regional tax revenues, as well as the opportunities for growth of these revenues through the largest taxpayers effective work. Meanwhile, the existing system of tax administration does not fully implement its inherent functions of eliminating tax asymmetry and improving the effectiveness of tax policy. It does not stimulate business performance, especially in the context of its consolidation. The analysis and evaluation methods underestimation narrows the boundaries of obtaining useful and relevant information by tax authorities and business entities. A number of scientists identifies theoretical and practical issues of monitoring and assessing tax revenues.

In Vaillancourt and Bird (2009), Ball and Foster (1982), Boadway and Flatters (1982), Brummerhoff (2017), Musgrave and Musgrave (1989), Stiglitz (2016), Sasongko et al. (2019) studies the problems of tax management are mainly considered through the influence of external factors on budget stability and balance. The issues of formation, efficiency and effectiveness of budget expenditures in Kazakhstan were investigated by Zeynelgabdin (2018), B.S. Utibaev et al. (2016), Kuchukova (2018) and others.

The transition to the market orientation economy and regional development, the cardinal changes in the sphere of budgetary relations have predetermined the need for new theoretical developments and bringing them to the level of applied use feasibility. The problems of institutional transformations in the region economies and the territorial finances development have been studied by Byrd and Smart (2017), Hagen and Hepp (2016), Ahmad and Stern (2015). The management system control problems were reflected by Andreev (2014), M.I. Bakanov et al. (2018), Belukha (2017), Kashin (2018). The research by Arens and Lobbeck (2015), Podolsky et al. (2016), Skobary (2018), Sheremet and Suits (2015), Dyusenbaev (2016), Ablenov (2017) was devoted to the formation of the conceptual bases of independent audit. Models and technologies of economic analysis and forecasting of the tax system functioning were studied by economists Seidl et al. (2013), Chatagny and Siliverstovs (2015), Krol (2013), Bayer (2015).

4. Empirical results

4.1 The revenues forecast of internal tax on goods, works and services

The most difficult among the possible tasks in tax forecasting is the fiscal and macroeconomic indicators forecast model integration. The aspiration to such integration is very reasonable. The indicators of these models are closely interrelated, and are subject to similar influences of other external factors. The level of income, expenditure and budget deficit directly affects the macroeconomic situation and all the components of the macroeconomic forecast. At the same time, macroeconomic indicators right affect the tax base and the forecast level of any taxes. However, the full integration of these processes is an extremely complex technical task, and therefore is not always acceptable, including by the OECD countries.

Thus, in case of these difficulties, an intermediate solution is applied (between the adoptions of the macroeconomic forecast and attempts to integrate the budget forecast into the macroeconomic model completely). That transitional solution is the "iterative" models, which first calculate the initial macroeconomic forecast, then use it to predict fiscal indicators using simplified methods (extrapolation of past trends, assessment of the effective tax rate, assessment of tax elasticity). After that, the errors are applied to adjust the macroeconomic forecast, and this procedure is repeated several times until the indicators of the two models reach full compliance. However, such econometric approaches are very demanding from a computational and statistical point of view. In Table 1, borrowed from Leal et al. (2018), an overview of the models used by some OECD countries and major international financial organizations are given.

Table 1. Types of models for integrating fiscal forecasting and macroeconomic models
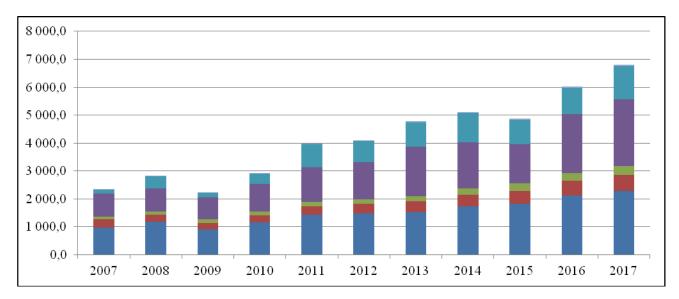
Country and organization	Model Type
United Kingdom (Ministry of Finance)	The fiscal block is integrated into the macroeconomic model
USA (Congressional Budget Service)	Iterative Model
Australia (Ministry of Finance)	Iterative Model
New Zealand (Ministry of Finance)	Iterative Model
Germany (Central Bank)	Reconciliation of models for compliance
Canada (Central Bank)	The fiscal block is integrated into the macroeconomic model
European Commission	The fiscal block is integrated into the macroeconomic model
European Central Bank	Iterative model and separate fiscal block
IMF	The fiscal block is integrated into the macroeconomic model
OECD	The fiscal block is integrated into the macroeconomic model

Source: compiled by authors

Existing methodologies differ mainly in depth and extent of econometric complexity, which determine how well these models are able to replicate the dependence of future tax revenues on various changes in the tax base. In addition, the important aspect is the correlation of the forecast of budget indicators with the prospect of macroeconomic indicators. Since the regions of Kazakhstan are extremely heterogeneous in terms of their economic potential, the republican authorities need a mechanism to assess the level of budgetary provision of the regions, including their tax opportunities. In view of this, it is important that the assessment of the tax potential is primarily related to the assessment of its tax resources. Moreover, tax resources are characterized by the economic structure of the regions. In order to assessing the tax potential, it is necessary to take into account the results of the analysis of actual tax revenues for the past periods, the assessment of performance for the calendar year in which the forecast is made, as well as data on the forecast of changes in macroeconomic indicators. In the studied problems the central position is that, the state budget of the Republic of Kazakhstan is the set of national and local budgets. The analysis of the macroeconomic indicators impact on the state budget tax revenues should begin from the analysis of the dynamics and structure of tax revenues, that to study the equability and to identify possible reserves of growth in the tax revenues collection.
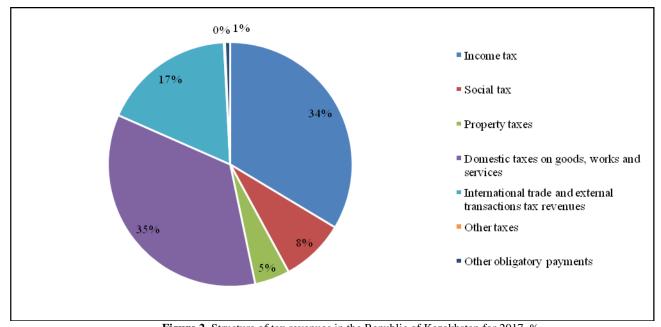
The analysis of tax revenues is based on statistical data of the state budget of the Republic of Kazakhstan. The results show stable positive dynamics of tax revenues for the last 11 years (2007-2017). The amount of tax revenue increased in absolute value for the period from 2007 to 2017 (see Figure 1).

Figure 1. Dynamics of tax revenues in Kazakhstan Republic for 2007-2017, in mln. tenge
Source: compiled by authors according to Official website of the Committee on Statistics of the Republic of Kazakhstan. http://stat.gov.kz/

However, the structure of their type in the relative expression has changed. During the period, there is a decrease in the share of basic taxes. So, in 2017 the share of income tax and internal taxes on goods, works and services decreased compared to the basic period by 35% and 34% respectively. The share of tax revenues on international trade and external transactions increased by 2.5 times and amounted to 17.57% (see Figure 2).

Figure 2. Structure of tax revenues in the Republic of Kazakhstan for 2017, %
Source: compiled by authors according to Official website of the Ministry of Energy of the Republic of Kazakhstan. http://energo.gov.kz/.

As can be seen from the results, the share of the three main tax revenues (income tax, domestic taxes on goods, works and services, taxes on international trade and foreign operations) for 2017 amounted to 86.01%, and the sample uniformity coefficient is 1.15. The initial data for the analysis of the dynamics and structure of tax revenues are presented in table A1, and the calculation of the equilibrium coefficient of the sample is given in Table 2.

Table 2. Calculation of the equability ratio of tax revenues in Kazakhstan Republic's state budget for 2007-2017

Index	Value
The range of variation	3794,58
Mean Arithmetic Deviation	1069,77
Mean square deviation	1226,57
The ratio of the uniformity of tax revenues	1,15

Source: compiled by authors according to Official portal of State Revenue Committee of the Ministry of Finance of the Republic of Kazakhstan. http://kgd.gov.kz/

According to the above analysis, it can be concluded that the assessment of Kazakhstan state budget and the forecasting of its tax revenues can be carried out in three main types of taxes: income tax, domestic taxes on goods, work and services, taxes on international trade and external transactions. The correlation-regression analysis should be conducted to build a tax revenues volume and macroeconomic factors dependence model. First, the Kazakhstan state budget revenues from internal taxes on goods, works and services is considered. The tax revenues amount increases for the period of 2007-2017 (see Figure 3). The hypothesis about the existence of the dependence between domestic taxes on goods, work and services and the total volume of retail trade is considered.
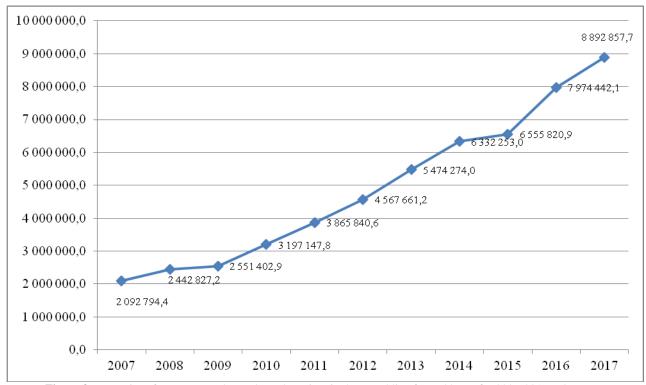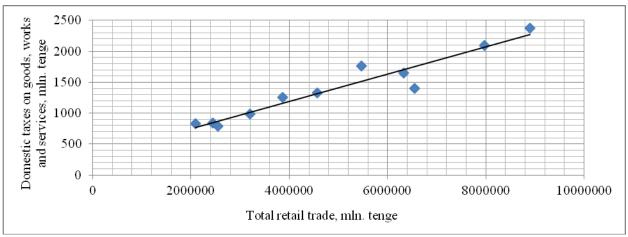

Figure 3. Dynamics of taxes on goods, works and services in the Republic of Kazakhstan for 2007-2017, mln. tenge

Source: compiled by authors Official portal of State Revenue Committee of the Ministry of Finance of the Republic of Kazakhstan.
http://kgd.gov.kz/

The initial data for the regression analysis are the quarterly volume of internal taxes on goods, work and services and the total volume of retail trade in Kazakhstan during 2007-2017. The correlation chart between the internal taxes on goods, work and services, and the total amount of retail trade was constructed to visualize the regression analysis (see Figure 4).

Figure 4. Correlation dependence chart of taxes on goods, works and services from total retail trade in the Republic of Kazakhstan
Source: compiled by authors

Visual analysis of the graph shows the presence of a linear relationship between the studied parameters. In the next stage of the study, it is necessary to construct a matrix of paired correlation coefficients (see Table 3).

Table 3. Matrix of paired correlation coefficients

	Y	X
Y	1	
X	0,93	1

Source: compiled by authors

The correlation coefficient (double R) is close to 1 (0.93), which indicates a strong relationship between the indicators studied. The results of the regression analysis are given in Table 4.

Table 4. Regression statistics of the studied indicators

Regression statistics	
Double R	0,93
R-square	0,87
The normalized R-square	1,29
Standard Error	170,24
Observations	10,00

Source: compiled by authors

2425

The study presents that in 93% of cases the variability of the performance indicator (income from internal taxes on goods, works and services) can be explained by forecasted value of the total retail trade in Kazakhstan. A forecasted value was determined through analytical equalization. The standardized R-square does not significantly differ from the coefficient of determination. It indicates the quality of the proposed hypothesis. During the analysis of the coefficients of Student t-statistics ($t = 170.24 > t = 2.36$), which estimate the ratio of the linear correlation coefficient to the mean square deviation, it is concluded that there is a correlation between the studied variables and the found correlation coefficient is significant. Consider the Fisher's F-criteria coefficients for evaluating the significance of the investigated connection (see Table 5).

Table 5. Evaluation of the significance of the obtained statistical connection

	df	SS	MS	F	Relevance F
Regression	9	1350439	150049	46,60	2,36
Balance	7	202870	28981,4		
Total	16	1553309			

Source: compiled by authors

The equation estimation statistical significance was made by Fisher's F-test. The F-test value table (for significance level $\alpha = 0.05$) is 5.32, which is less than $F = 46.6$. Hence, the statistical significance of the regression equation follows. Consequently, the relationship of income from internal taxes on goods, work and services with the factor included in the analysis is significant. Thus, the following equation describes the forecast of revenues of internal tax on goods, works and services:
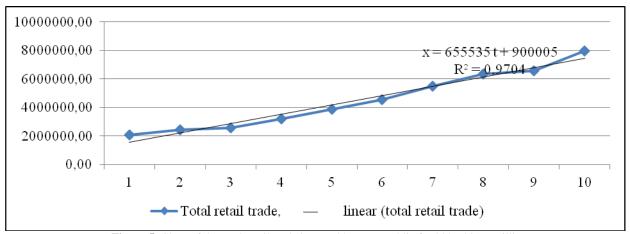
$$y = 0,0002x + 354,27 \tag{1}$$

where
y - internal taxes on goods, works and services, mln. tenge,
x - total amount of retail trade, mln. tenge

The correlation between the values (x) and time (t) is illustrated graphically, which determines the kind of the relationship, deriving the trend equation and estimating the value of the R-square. The results of the analysis are shown in Figure 5.

Figure 5. Chart of the total retail trade in Kazakhstan Republic for 2007-2017, million tenge
Source: compiled by authors

Thus, the following equation describing a trend of the retail trade volume in Kazakhstan Republic is obtained:

$$y = 655535t + 900005 \tag{2}$$

The forecast of internal taxes on the goods, works and services revenues on the basis of the resulted dependences are presented in Table 6.
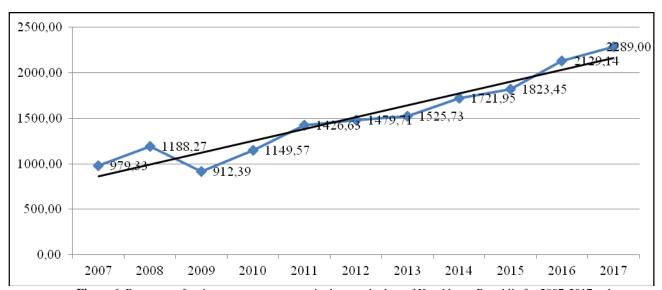
Table 6. The results of the forecast analysis

Scenario	Indicators	2018	2019	2020
Inertial	Total volume of retail trade, mln.tenge	8766425	9421960	10077495
	Domestic taxes on goods, works and services	2107,56	2238,66	2369,77
Optimistic	Total volume of retail trade, mln. tenge	9204746	9893058	10581370
	Domestic taxes on goods, works and services	2195,22	2332,88	2470,54
Pessimistic	Total volume of retail trade, mln. tenge	8328104	8950862	9573620
	Domestic taxes on goods, works and services	2019,89	2144,44	2268,99

Source: compiled by authors

4.2 The revenues forecast of income tax

Secondly, a similar study for the revenues of tax on income was conducted. As can be seen from Figure 6, the revenues of this type of tax have a stable positive tendency to increase. In addition, the linear nature of the variability of this indicator over time is appeared. The null hypothesis of the research was the following: amount of income tax revenues are influenced by such indicators as per capita nominal monetary incomes per capita, output of industrial products (goods and services), and investments in fixed assets. The hypothesis was tested on the basis of correlation-regression analysis. Quarterly indicators of the income tax revenues, average per capita nominal monetary incomes, the volume of industrial products production (goods, services), and investments for fixed capital are the initial data for regression analysis.

Figure 6. Revenues of an income tax on revenue in the state budget of Kazakhstan Republic for 2007-2017, mln. tenge
Source: compiled by authors

The dependence degree of factors was estimated with the help of correlation analysis. The values obtained are presented in the matrix of paired correlation coefficients (see Table 7).
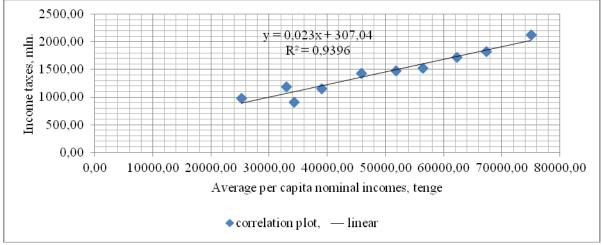
Table 7. Matrix of pair correlation coefficients of the investigated connection

	Y	X1	X2	X3
Y	1			
X1	0,96932	1		
X2	0,86768	0,88659	1	
X3	0,94988	0,99271	0,84579	1

Source: compiled by authors

The value of the pair correlation coefficients is about 1 (one) and indicates a strong link with the resulting factor, that demonstrates the hypothesis under study is significant. However, as can be seen from the above table, the most link with the resultant factor in parameter X1 (average per capita nominal income). In this regard, we have concluded that it is more appropriate to hold the analysis with factor X1. Correlation chart the revenues of income tax and average per capita nominal income is presented (Figure 7).

Figure 7. Correlation chart of income tax and per capita nominal income in Kazakhstan for 2007-2017
Source: compiled by authors

Visual analysis of the graph shows the presence of a linear dependence between the studied parameters. Furthermore, in order to evaluate the quality of the hypothesis regression analysis of initial data was performed (table 8).

Table 8. Regression statistics

Regression statistics	
R- paired	0,97
R-square	0,94
The normalized R-square	0,93
Standard Error	100,91
Observations	10,00

Source: compiled by authors

The correlation coefficient (R - paired) is about 1, that assumes strong link between parameters. The coefficient of determination (R-square) shows that in 97% of cases the variability of Y (income tax) due to the predicted value

of nominal per capita income affects. The normed R-square almost equal determination coefficient, which indicates the quality of the proposed hypothesis. According to data, the calculated values of indicators deviate from the actual values by 4.6%. Since the error is less than 7%, this equation is applicable as the regression. The quality of the model was analyzed in the study (Table 9).

Table 9. Analysis of the relation quality

	Coefficients	Standard Error	t-statistics
Y-intersection	307,04	105,92	2,90
X1	0,02	0,00	11,15

Source: compiled by authors

The result of the Student T-test analysis (t = 2.90> t = 0.15) indicates that the dependence between the parameter is significant and the correlation coefficient is significant. Moreover, the P-value was less than 0.05; this also indicates the importance of the resulting equation.

The statistical significance of the estimation equation applying the F-test. The table value of the F-test is 10.1(for the significance level α = 0.05), it is less than F = 124.42. Thus, the statistical significance of the regression equation is confirmed. Therefore, the dependence between income tax revenues and the factor included in the analysis is significant. As a result of which, the following equation describing the forecast of income tax revenues is provided:

$$y = 0{,}023x + 307{,}04 \qquad (3)$$

where
y - income tax revenues, mln. tenge,
x - average nominal per capita incomes, tenge.

According to the regression analysis results, the forecast of income tax revenues until 2020 is presented (Table 10).

Table 10. Forecast values of average nominal monetary per capita incomes of the population and income tax revenues in Kazakhstan for 2018-2020
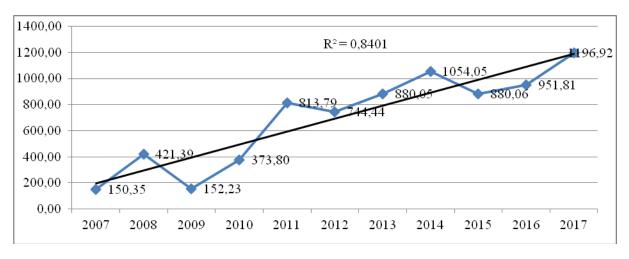
Scenario	Index	2018	2019	2020
Inertial	Average nominal per capita incomes, tenge.	83968,60	89342,90	94717,20
	Income tax revenues, mln. tenge,	2238,32	2361,93	2485,54
Optimistic	Average nominal per capita incomes, tenge.	88167,03	93810,05	99453,06
	Income tax revenues, mln. tenge,	2334,88	2464,67	2594,46
Pessimistic	Average nominal per capita incomes, tenge.	79770,17	84875,76	89981,34
	Income tax revenues, mln. tenge,	2141,75	2259,18	2376,61

4.3 The forecast of international trade and external transactions tax revenues

Third, revenues from international trade and foreign operations are the next most important tax revenues to the budget. In order to determine sensitivity degree of the factors, correlation and regression analysis and forecast for these tax revenues until 2020 have been performed. There is widespread fact that the main part of domestic export is crude oil. The working hypothesis for the analysis is that there is a dependence between international trade and external transactions tax revenues and value of crude oil and natural gas production. Thus, the initial data for the analysis are the quarterly amount of international trade tax revenues and volume of crude oil and natural gas extraction.
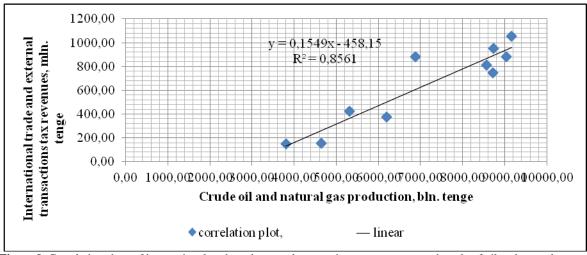
In order to visualize the international trade and external transactions tax revenues data are presented graphically (Figure 8). The trend is highlighted using analytical equalization.

Figure 8. Graphs on international trade and external transactions tax revenues in Kazakhstan for 2007-2017, mln. tenge
Source: compiled by authors

Moreover, the correlation chart between the international trade and external transactions tax revenues and the crude oil and natural gas extraction is presented. (Figure 9).

Figure 9. Correlation chart of international trade and external transactions tax revenues and crude of oil and natural gas production in Kazakhstan Republic for 2007-2017
Source: compiled by authors

Graph analysis indicates the presence of the linear dependence between the studied parameters. The regression analysis of the hypothesis is performed (Table 11).

Table 11. Regression statistics of the investigated relation

Regression statistics	
R -paired	0,90
R-square	0,81
The normalized R-square	0,78
Standard Error	144,60
Observations	40

Source: compiled by authors

The correlation coefficient (R -paired) is nearly 1, it means a strong relation between the studied variables. The coefficient of determination (R-square) shows that in 81% of the cases, the variability of Y (international trade and external transactions tax revenues) due to the forecast amount of the oil and natural gas production. The normalized R-square is practically not significantly different from the coefficient of determination. It reveals the quality of the proposed hypothesis. The significance of the hypothesis under investigation was determined by using the coefficient of t-statistics (see Table 12).

Table 12. Evaluation of the studied connection significance

	Coefficients	Standard Error	t-statistics	P-Value
Y-intersection	-482,49	224,27	2,15	0,04
Variable X	0,16	0,03	5,38	0,00

Source: compiled by authors

Based on results of Student's t-statistics analysis, the dependence between the variables and found correlation coefficient is significant. The P-value is less than 0.05, which indicates the significance of the equations. Statistical evaluation of the equation significance was carried out by Fisher's F-criterion.

The table value of the F-test is less than F = 28.99. Consequently, the dependence between international trade and external transaction tax revenues and the included factor is significant. Thus, the following equation describes the international trade and external transactions tax revenues forecast:
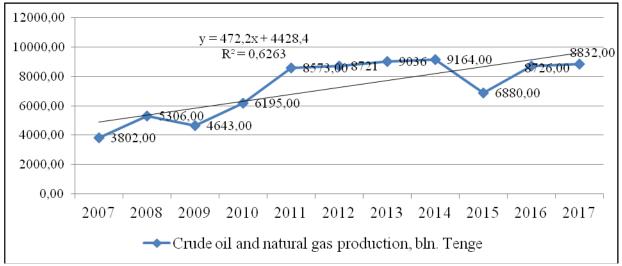
$$y = 0{,}1549x - 458,15 \tag{4}$$

where
y - international trade and external transactions tax revenues, mln. tenge.,
x - crude of oil and natural gas production, bln tenge.

In accordance with the regression equation, a forecast of tax revenues from international trade and external transaction and volumes of oil and natural gas production for 2017-2020 have been presented, using the analytical method of equalization. The graphical representation of the data and the linear trend are shown in Figure 10.

Figure 10. Crude oil and gas production in Kazakhstan Republic for 2007-2017, billion tenge
Source: compiled by authors

In addition, on the basis of the regression equation, the forecast analysis of the studied indicators until 2020 is presented in table 13.

Table 13. Forecast value of crude oil and natural gas production and international trade and external transactions tax revenues in Kazakhstan for 2018-2020

Scenario	Indicators	2018	2019	2020
Inertial	Crude oil and natural gas production, bln. tenge	10516,52	11041,43	11566,34
	International trade and external transactions tax revenues, mln. tenge	1170,86	1252,17	1333,48
Optimistic	Crude oil and natural gas production, bln. tenge	11042,35	11593,50	12144,66
	International trade and external transactions tax revenues, mln. tenge	1252,31	1337,68	1423,06
Pessimistic	Crude oil and natural gas production, bln. tenge	9990,69	10489,36	10988,02
	International trade and external transactions tax revenues, mln. tenge	1089,41	1166,65	1243,89

4.4 . Tax revenues forecast model of Kazakhstan

As the result, the forecast model of dependence of tax revenues on the main macroeconomic indicators is the tool for analysis and planning, as well as a method of subsequent monitoring of forecast data and control of budget replenishment.Moreover, analysis of tax revenues provide increasing information transparency, accountability and competence of tax authorities, rising of external and internal control and state tax audit level.

Table 14. The predictive model of tax revenues and total retail trade, nominal per capita income, oil and natural gas production dependence

Forecast value of tax revenues of the Republic of Kazakhstan
$y_1 = 0,0002x_1 + 354,27$, y_1 - internal taxes on goods, works and services, mln. tg., x_1- total amount of retail trade, mln. tenge.
$y_2 = 0,023x_2 + 307,04$, y_2 - income tax revenues, mln. tenge, x_2- average nominal per capita incomes, tenge
$y_3 = 0,1549x_3 - 458,15$, y_3 - international trade and external transactions tax revenues, mln. tenge., x_3 - crude of oil and natural gas production, bln tenge.

Source: compiled by authors

According to the game theory of Nobel Prize winner John Forbes Nash, no one participant can increase the gain by changing their strategy if other participants do not change their strategies. If this theory to the innovative development of regions were applied, the tax potential of the republic would achieve with steady pace of high technologies implementation in each separate sphere. Moreover, according to Deloitte research, stable tax system functioning requires the creation of the transparent structure, which on the basis of aggregation, confirmation and analysis of data will allow to identify deviations and avoid possible risks at the present stage.

Conclusions

Thus, the accurate tax revenues estimation is obtained by a detailed survey and tax audit of all economic activities, including the shadow economy. Among foreign methods the most optimal for budget planning practice in modern conditions of Kazakhstan is the forecast of tax revenues based on regression analysis. This method is especially relevant to develop medium-term plans in case an available sufficient information.

The tax revenues forecast model evaluates possible options for making decisions, to determine the compliance of the received data, also to adjust the potential revenues. The use of analytical tools will ensure an effective tax audit system, which is aimed at the proper functioning, stability and maximum development of tax system. Qualitative analysis and tax audit are necessary components for an assessing information of management decisions, in particular, regulation of tax legislation and further strategic budget planning.

A tax audit based on tax revenues analysis will provide preliminary monitoring; prevent under-limited deviations in a form of tax gap. It ensures the elimination of the adverse events possibility and trends in the state control activity.

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