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THE IMPORTANCE OF INNOVATIVE TOOLS APPLICATION IN THE DEVELOPMENT OF STATE TAX AUDIT

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Abstract. The aim of the study is to develop theoretical and methodological approaches, implementation mechanism and scientific and practical recommendations for improving the state tax audit and tax administration in the conditions of innovative development. The main results are obtained and accurately reasoned using the methods of theoretical research, comparative analysis, statistical and econometric methods, methods of induction and deduction, tabular and graphical methods. The authors identify the interaction model between tax and innovation systems at the international level. In addition, during the study the evaluation methodology of the governmental tax audit effectiveness were developed and tested, using the example of the Republic of Kazakhstan. The main directions of innovation development of the state tax audit and analysis of the scenario of the consequences of implementation are determined. The scientific novelty of this study is to develop assessment methodology of the state tax audit efficiency and identify approaches to improvement based on innovative tools. The study results are valuable from the point of view of subsequent developments in the space of state financial control.

Keywords: state tax audit; efficiency; integral coefficient; scenario analysis; innovative development

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1. Introduction

Information technology and improvement of material and technical equipment and tax official qualification are important in innovative development of the economy.

A key factor in improvement of the tax administration efficiency is high degree of informational interaction between the taxpayer and tax services under modern conditions. This interaction is required to carry out in electronic form with application of modern telecommunication. Increasing of the tax system efficiency by the implementation of new informational technologies, equipping of technological processes with modern systems

and operational management tools will lead to an improvement in the entire taxpayer accounting system in countries with developing economies.

The study aim is formulation theoretical and methodological approaches, implementation mechanism and scientific and practical recommendations for the state tax audit and tax administration improvement in the condition of innovative development. In accordance with the goal, the following tasks are defined:

- research of modern scientific approaches of innovations in the tax administration system;
- identification the link between the tax burden and innovation development across countries;
- determination of the state tax audit efficiency applying a comprehensive assessment method in Kazakhstan context;
- analyze and substantiate the prospects of innovation in state tax audit system.

The main results are obtained and accurately reasoned using the methods of theoretical research, comparative analysis, statistical and econometric methods, induction and deduction, tabular and graphical methods.

The impact of innovative development on the tax burden at the international level is studied at the first stage of the research. The evaluation of the state tax audit effectiveness based on the integral coefficients method for the example of Kazakhstan is realized on the second stage. The main prospects of the state tax audit in the context of innovative development are presented in the third part of the study.

2. Methodology and/or theoretical framework

At the first stage of the study, the link between the level of innovation and the tax burden, using the graphical method of correlation analysis is investigated.

In order to use the graphical method of correlation analysis it is necessary to convert the results and display them on the percentage scale. In this method, a two-factor analysis was performed, in which the results of one factor are reflected on the abscissa scale, and the other on the ordinate scale.

After performing horizontal and vertical analysis along the selected levels, the matrix of graphical correlation analysis was obtained. The quadrants along the diagonal represented in this matrix at on the right above and on the left below, refer to a high level of direct correlation. The other two quadrants are diagonally related to the low level of correlation. The tax burden data of the studied countries are selected according to the World Bank database. Summary data for the analysis are presented in Appendix A (Table A1).

The data of the Global Innovation Index for 2017 is used for research. The correlation plot is designed depending on the resulting variable Y (the level of tax burden, % to GDP) from the argumentative X (Global innovation index). Then the median indicators of X and Y are determined which allow to identify the quadrants of the correlation plot characterizing the structure of the functional dependence.

At the next research phase the methodology for evaluation of the state tax audit efficiency was developed with integral indicator. Tax audit is considered as an effective mechanism to achieve certain goals. Achievement this goal requires elements of effective tax audit. In accordance to it, the model of tax audit efficiency consisting of the following stages is proposed:

1. Evaluation of the tax revenues planning and forecasting effectiveness;
2. Analysis of the tax revenues accounting and control;
3. Assessment of compliance tax regulation with tax legislation;
4. Monitoring the implementation of audit recommendations.

The proposed parameters represent only a part of the indicators characterizing the effectiveness of the state tax audit, and there is a possibility to supplement other statistical information for extended analysis.

The actual indicators of the governmental tax audit efficiency are calculated with the statistical data of the State Treasury of the Ministry of Finance and Accounts Committee for control over execution of the republican budget of the Republic of Kazakhstan for 2015-2017. Normative values of indicators are determined in accordance with the data of the Committee of statistics of the Republic of Kazakhstan and the decision of professional auditors. Therefore, the actual values to the normative indicators are determined by the following formula:

$$I_{tj} = \frac{x_{tj}^f}{x_{tj}^n} \quad (1)$$

where I_{tj} – the index of the level of compliance with normative indicators, in shares;

x_{tj}^f – actual value of specific coefficients of the corresponding period;

x_{tj}^n – normative of specific coefficients of the corresponding period.

The total integral indicator consists of the sum of the values of each indicator in points. In order to calculate the integral indicator of the efficiency of the state tax audit the following type of additive function was applied:

$$Y_t = \sum_{j=1}^n b_{tj} \quad (2)$$

where Y_t – integral indicator of the corresponding period;

b_{tj} – the value of the specific coefficients of the corresponding year in points.

At the final stage of scenario analysis, the amount of tax revenues is calculated upon the occurrence of each of the scenarios of the state tax audit according to the formula:

$$T_t^i = T_{t-1} * \left((1 + g) * p_u^i + 1 * p_s^i + (1 - g) * p_d^i \right), \quad (3)$$

where T – amount of tax revenue, billion tenge;

i – appropriate scenario of tax audit development;

t – corresponding forecast period;

g – the rate of short-term increase in tax revenues, %;

p_u^i – probability of economic recovery with the occurrence of the corresponding scenario, %;

p_s^i – probability of economic stagnation in the appropriate scenario, %;

p_d^i – probability of economic growth in the occasion of a corresponding scenario, %.

3. Literature review

The improvement of the tax system occurs in the context of the acceptance of the state audit institute into the financial control system that imposes requirements to optimize the activities of public authorities, developing state standards and the formation of the effective functioning within the innovative development framework. Moreover, the governmental tax system is responsible for provide completeness and timeliness of tax revenues in the business activity growth and economic liberty condition.

State tax audit is one of the key directions of improvement of the state audit and tax control quality. Furthermore state tax audit is aimed to determine the tax administration efficiency and subsequent monitoring of the audit recommendations implementation.

In addition, the main directions of innovative activity in the sphere of state control and management are revealed in the analysis of scientific research.

In many countries, attempts to modernize public administration are focused on higher efficiency of internal public operations, interaction with citizens by providing information and public services available in electronic form (Bekkers, 2017; Foley and Alfonso, 2018).

According to the studied research, transformation in the public sector is the complex process, characterized by changes in political and legislative sphere rather than market shifts (Rusaw, 2017).

Dutton and Eynon (2016) argued that innovations perform an important part in the governmental modernization and transformation, requiring the launch of information services and new types of interaction between public sector entities and taxpayers.

The analysis carried out by Feller, Finnegan and Nilsson (2018) identified four types of innovations for the government transformation: aggregation, syndication, consumption, and partnership. Moreover, that the studied innovations have the impact on the regional budgets revenues by increasing revenues as a result of regional co-branding and expanding the small and medium business sector.

Damanpour and Schneider (2018) consider that innovation contribute to increase of public services quality and public organizations capacity in order to solve social problems by formation of regulated governance system. Such reforms are accompanied by the implementation and development of new government, e-government, and more recently discussions about the transition from government to the 'Big Society'.

According to Potts and Kastle (2010), the public sector is required the economic principles of efficiency, that directed to the reduced costs and budget revenues growth. Furthermore, the application of innovation in the public sector contributes to the efficiency of public and market systems. In addition, the following conditions may lead to the necessity for innovation: economic growth, inefficient management structure, lack of competition in the public sector, the occurrence of dysfunctional governmental regulators in respect of the private innovation sector, changing forms of public-private partnership.

Dunleavy, Patrick and Margetts (2010) emphasize that the new technologies emergence is accompanied by the entry into the new Digital Era Governance (DEG). DEG is characterized by the social relationships reorganization, the priority of that in the interests of citizens. The change of the digital age is bound to affect to the government. Advanced industrial societies are being led towards online civilization by the formation of social networks, cloud technology and application development. Therefore, DEG operates as the channel of interaction between citizens and governments.

According Pollitt Ch. (2009), the public sector could be improved by importing business concepts and methods with the focus on effectiveness of results, replacement of hierarchical links by contractual and widespread implementations of market mechanisms.

Fishenden and Thompson (2012) identifies three areas of innovation in the public sector: reintegration, holism and digitization. Backward integration, as opposed to integrated management, includes outsourcing and simplified service of delivery chains. The next direction of holism is the reorganization of services, includes the "unified" services system, supported by data storage, simplification and integration of processes, and the audit of citizens and services evaluation based on social networks. For its part, digitization includes the strategy of "100% online channels", in that services are provided by automatic processes, open information data, public "cloud web services", open book (the maximum possible openness in providing information about the formation of state revenues and expenditures), exchange of services.

As part of the analysis, the review of the Eurasian economic Union countries researches in the area of the public sector innovation was conducted.

In according to Islamutdinov V.F. (2018), Lobanov V.V. (2017), Mishustin M.B. (2014) viewpoints, the certain algorithm of modernization of the public administration system exists in international practice, while in the post-socialist countries at the first stage, the focus is on regulatory legal acts and legislation. Subsequently, there is a transition to the creation of stable functioning institutions and organizations in the public administration system. Consequently, the following activity is aimed to the efficiency improvement of the whole system based on the analysis of current problems and development of "ideal" model of public service. Furthermore, apply of modern information technologies contributes to the tax service transition to a qualitatively new level of tax administration. The key effects are high resistance to economic shocks, and maintaining stable incomes of all budget levels as well as increasing transparency through remote interaction of taxpayers and tax authorities.

Thus, the analysis of various approaches to the state tax audit innovative tools development showed that there are significant differences between advanced and emerging markets. Moreover, most scientists in developed countries assume that the stability of the innovation system depends on market instruments due to the business sphere that initiates the development and implementation of innovations. On the other hand, the approach of economists in developing countries is R&D support and funding stimulates the innovation environment by government in order to develop of entire economic system. This distinction is due to the specification of public administration and political structure of these countries.

3.1 Innovations as the factor of the state tax audit development: international scope

As part of the analysis, the dependence of tax revenue collection on the level of innovation activity in Kazakhstan, OECD (The Organization for Economic Co-operation and Development) countries and neighboring countries is considered. According to the «Global innovation index» report, Switzerland, Sweden and the Netherlands are the leading innovation countries in 2017. Kazakhstan is on the 78th place in the ranking. (Figure 1).

Developed European countries and developed OECD countries represent the first quadrant: Canada, Israel and New Zealand. In this area of the correlation is the direct link that the high degree of innovation corresponds to the high degree of tax burden. This circumstance is explained by the high participation of the state in the creation of conditions for innovative activity in order to expand the tax base. The state accumulates tax revenues in order to direct them to innovative industries launches, thereby increasing the level of the national gross domestic product. Consequently, the innovative activities of these countries are supported through public tax administration, redistributing high tax revenues in support of high-tech business initiatives.

The second quadrant is represented by countries with developed innovation economies, such as Switzerland, USA, Germany, Ireland, South Korea, Singapore, Japan, Hong Kong, China and Australia. In this sector, the inverse dependence is revealed by the high level of innovation with the low tax burden. The state, reducing tax rates, increases the net profit of companies, thereby stimulating innovative activity in conditions of high market competition. The distinctive feature of this system is decentralized structure of innovation regulation. The government creates favorable conditions for economic activity, and business, in its turn, generates innovative projects. For instance, experience of China in the area of tax incentives for innovative development is remarkable in due to the state provides tax breaks for companies that use its own financial resources to invest in innovative technologies, and offers preferential tax status for high-tech mini-and micro-enterprises.

The third block includes countries with developing markets, such as Latvia, Lithuania, Turkey, Chile, Armenia, Mexico, India, Kazakhstan, Azerbaijan, Kyrgyzstan. This quadrant is characterized by a direct relationship: the low level of innovation and, as a result is the low tax burden. The market potential of these economies impedes to the innovational development in order to expand the tax base. High dependence on natural resources and weak

innovation support lead to low levels of tax collection. According to the report «The global innovation index», these countries are able to achieve significant tax effect with the active support of innovation or the creation of competitive business environment. It is important to note, that Kazakhstan and the Eurasian Economic Union (EAEU) member countries are represented in this group. As the results, this reflects to the common economic and innovative development within the framework of the integration processes of the Union.

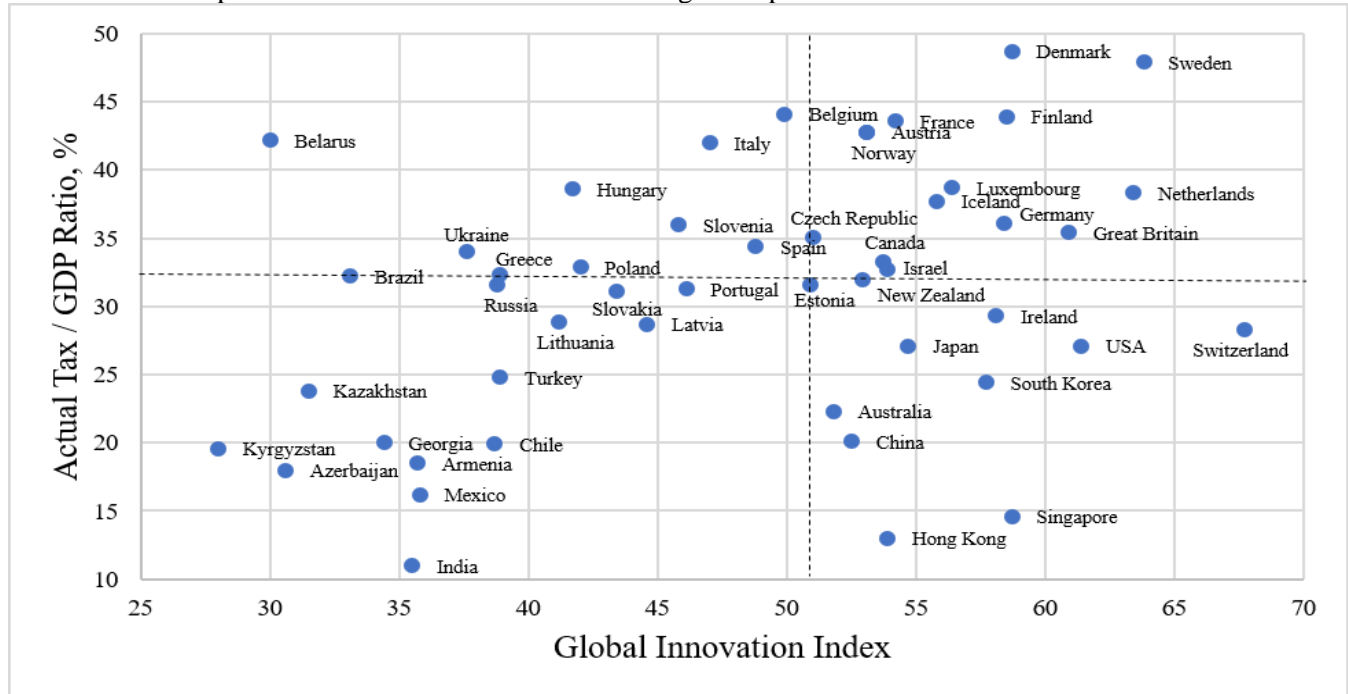


Figure 1. Correlation of tax burden from innovation activity by country in 2017

Source: compiled by authors

The fourth quadrant is represented by Eastern European countries (Slovenia, Hungary, Slovakia, Poland), OECD countries (Greece, Portugal, Italy), Commonwealth of independent States (CIS) countries (Russia, Belarus, Ukraine) and Brazil. This block is characterized by the high level of tax burden with insufficient innovative development. Consequently, governments with the high level of tax revenues does not contribute to the funding and implementation of innovative projects. On the other hand, encouragement policy high-tech and knowledge-intensive industries would contribute to the transition to the higher quality level in the analogy of the countries of the first group.

According to the game theory of Nobel Prize winner John Forbes Nash (1951), 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. According to reports, the average tax burden is 34% in OECD countries. The comparative analysis of the situation in the OECD countries and Kazakhstan shows that the OECD has higher tax rates, less blurring of the tax base due to privileges and technological tax administration.

Comprehensive measures are essential by the competent authorities of the Ministry of national economy (MNE RK) and the Ministry of Finance (MF RK) in order to achieve the average level of tax collection in accordance with the OECD. The issue of MNE RK is gradual increase in tax rates to the OECD average that would increase

the tax burden by 9%. As regards to the Ministry of Finance of the Republic of Kazakhstan, the elimination of tax breaks differing from international standards and increase of tax administration efficiency would provide the tax burden rise to 1.5% and 13.6% respectively (Figure 2).

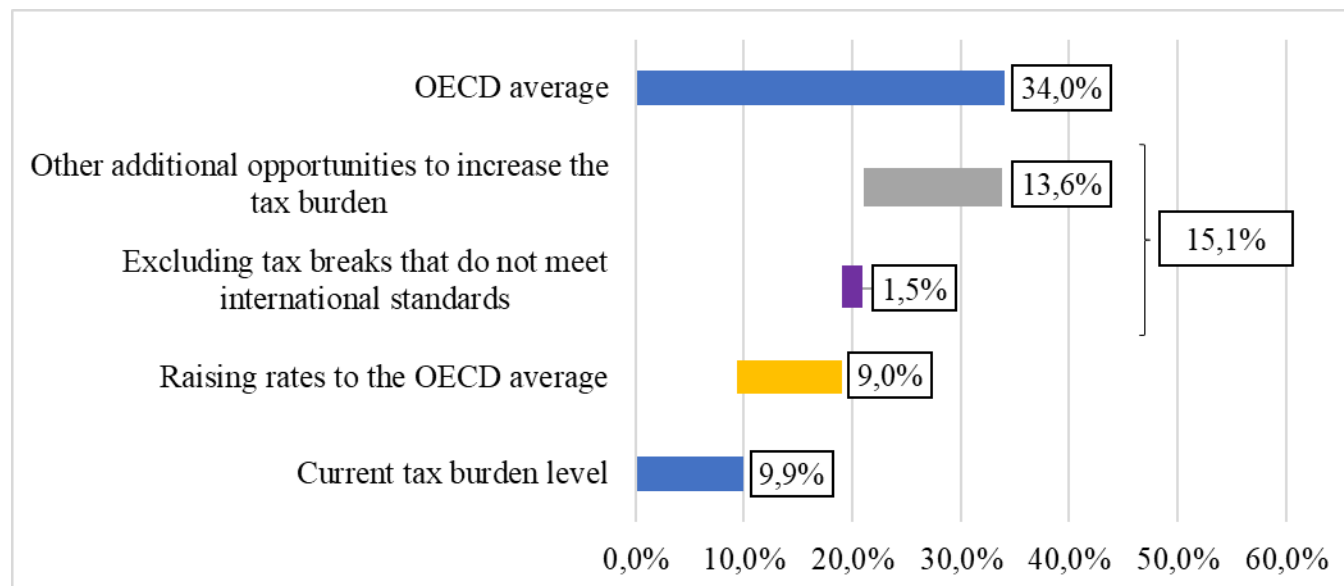


Figure 2. Prospects for achievement of the tax burden level (excluding transfers) of the Republic of Kazakhstan to OECD average level, (percentage to GDP)

Source: compiled by authors

According to the figure 2, in order to increase the tax burden of the Republic of Kazakhstan to the average level of OECD countries, it is necessary to launch innovation development mechanisms as additional opportunities to increase tax revenues.

Therefore, that the basis for the successful development of the state tax administration and audit system is the systematic implementation of innovative technologies into the overall structure of the tax system. Based on the above findings, it is necessary to consider the effectiveness of the state tax audit system as the priority for further improvement through the application of innovative tools.

3.2 Assessment of the integrated index of efficiency of the state tax audit on the example of Kazakhstan

The tax system improvement is hold in the context of the introduction of the state audit in the Republic of Kazakhstan that imposes requirements for the optimization of the activities of state authorities, development of state standards and formation of effective function within the framework of innovative development of the economy. The state tax system is responsible for completeness and timeliness of tax revenues execution in the context of increased business activity and economic freedom.

The state tax audit introduction is one of the key areas for the state audit quality and tax control improvement. The state tax audit is aimed to determine the level of performance and efficiency of tax administration and subsequent monitoring of the audit recommendations implementation.

According to the report of the Government of the Republic of Kazakhstan on the execution of the Republican budget for 2017, the criteria for assessment of the budget revenues execution and efficiency of tax administration relates to the tax revenue plan realization, tax potential and tax gap value, effectiveness of cameral control.

However, these criteria do not reflect the level of effectiveness of the tax audit, i.e. the form of subsequent tax control. The issues of determination of the tax audit effectiveness are rather complicated and insufficiently developed at present. The characteristics of the tax audit efficiency model are presented in Table 1.

Table 1. Characteristics of the tax audit efficiency

Parameter	Description
Definition	Compliance of the tax audit system and its results with the requirements and objectivity of the effectiveness assessment of the tax authorities
Purpose	Evaluation completeness and timeliness of tax revenues and monitoring of audit recommendations
Principle	Efficiency, economy, productivity, materiality
The main stages of the tax audit efficiency	Efficiency of planning, forecasting, accounting and control, regulation, subsequent monitoring of recommendations

Source: compiled by authors

The methodology for estimation of the tax audit efficiency is required to base on four consecutive stages that characterized by the group of indicators. In the current study, the efficiency of tax audit is determined by calculation of the integral indicator. This method consists of the combination of particular indicators and systematization into integrated assessment.

The first stage is based on the analysis of the efficiency of tax revenues planning and forecasting. This stage is characterized by the determination of tax planning indicators, grouped into the group “P -Indicators of planning and forecasting efficiency” (Table 2).

Table 2. Indicators of planning and forecasting efficiency

No.	Indicator	Equation	Standard
P1	Execution of tax revenues, in shares	$\text{Actual tax revenues} / \text{Tax revenues according to the budget plan}$	Full execution of the plan, i.e. 100% or 1
P2	The share of arrears to the tax revenue	$\text{The amount of the tax revenues arrears} / \text{the sum of the actual tax revenues}$	Lack of arrears, i.e. 0
P3	The ratio of the tax gap and tax revenues	$\text{Tax gap}^* / \text{Actual tax revenue}$	The share of the tax gap is permissible at a statistically acceptable margin of error, i.e. 5% or 0.05
P4	The ratio of the tax gap and amount of transfers	$\text{Tax gap}^* / \text{The amount of actual transfers}$	The share of tax gap is acceptable at the level of 1% of transfers, i.e. 0.01

Source: compiled by authors according to the Accounts Committee of the Republic of Kazakhstan

At the second stage, the methodology for evaluation of tax audit effectiveness includes indicators related to group C – “Indicators of the tax control quality”, characterizing the quality accounting of taxpayers and tax revenues control. This group of indicators should directly reflect of the tax authority effectiveness.

Table 3. Indicators of the tax control quality

No.	Indicator	Equation	Standard
C1	Share of inspections carried out by visits	The number of inspections conducted by the visit / The total number of inspections	It should be half of the total number of checks, i.e. 0.5
C2	Share of unplanned inspections	Number of unplanned inspections / Total number of inspections	According to the Tax Code of the Republic of Kazakhstan, the number of grounds for conducting unscheduled inspections was reduced by 62%, i.e. standard value should be equal to 38% or 0.38
C3	The share of inspections of private business entities with high risk	Number of inspections of high-risk private enterprise entities / Total number of inspections of private enterprise entities	It should be half of the total number of checks, i.e. 0.5
C4	Share of administrative fine imposed on the result of unplanned inspections	The amount of the administrative fine imposed on the results of unplanned inspections / The total amount of the administrative fine imposed on the results of inspections	Share of unplanned inspections of the relevant year
C5	Tax control efficiency	The amount of funds directed from the all budget levels for the conduct of inspections / The total amount of the administrative fine imposed by the inspections	The minimum share of the inspection cost, i.e. 5% or 0.05
C6	The share of private businesses inspections	Number of inspections of private businesses / Total number of inspections	The share of private entrepreneurship of entrepreneurs total number, according to the Statistics Committee of the MNE RK
C7	Share of inspections of large business entities	Number of inspections of large business entities / Total number of inspections of private business entities	The share of large businesses in the total number of private businesses, according to the Statistics Committee of the MNE RK
C8	The share of state enterprises inspections	The number of inspections of state enterprises / The total number of subjects that are not subjects of private entrepreneurship	The share of state-owned enterprises in the total volume of entities that are not private entrepreneurs, according to the Statistics Committee of the MNE RK

Source: compiled by authors

At the third stage of the proposed methodology for evaluation of the tax audit efficiency, effectiveness degree of regulation of compliance with tax legislation is determined. Thus, in order to assess the regulation effectiveness, the indicators of group R - “Indicators of compliance regulation with tax legislation” is proposed (Table 4).

Table 4. Regulatory Compliance Indicators

No.	Indicator	Equation	Standard
R1	Percentage of inspections that are denied registration	Number of inspections that are denied registration / Total number of inspections	The lack of inspections that registration is denied, i.e. 0
R2	Proportion of complaints filed for infringement of the inspection procedure and their results	Number of complaints filed for infringement of the inspection procedure and their results / Total number of inspections	The proportion of complaints is permissible to 1% of the total number of inspections, i.e. 0.01
R3	Proportion of inspection for that infringement were revealed	Number of inspections for which for that infringement were found / total number of inspections	It should be half of the total number of inspections, i.e. 0.5

Source: compiled by authors

The initial data for the model structure are presented in table 5.

Table 5. System of actual and normative values of particular indicators

No.	Actual Values			Standard Values		
	2015	2016	2017	2015	2016	2017
P1	1,08	1,10	0,95	1,00	1,00	1,00
P2	0,02	0,02	0,03	0,01	0,01	0,01
P3	0,22	0,18	0,15	0,05	0,05	0,05
P4	0,26	0,12	0,10	0,01	0,01	0,01
C1	1,00	0,97	0,51	0,50	0,50	0,50
C2	1,00	0,99	0,98	0,38	0,38	0,38
C3	0,01	0,01	0,06	0,50	0,50	0,50
C4	1,00	0,93	0,57	1,00	0,99	0,98
C5	0,06	0,11	0,02	0,05	0,05	0,05
C6	0,97	0,97	0,95	0,88	0,88	0,88
C7	0,06	0,09	0,09	0,01	0,01	0,01
C8	0,42	0,47	0,23	0,57	0,57	0,57
R1	0,00	0,00	0,00	0,00	0,00	0,00
R2	0,01	0,01	0,10	0,01	0,01	0,01
R3	0,13	0,13	0,17	0,50	0,50	0,50

Source: compiled by authors

The final stage of evaluation of the tax audit efficiency in the framework of the proposed methodology is the calculation of the integral indicator. Each calculated indicator is assigned the certain number of points on the following score scale (Table 6).

Table 6. The rating scale of indicators of efficiency of tax audits

Values									
0-0,04	0,05-0,14	0,15-0,24	0,25-0,39	0,4-0,49	0,5-0,59	0,6-0,69	0,7-0,79	0,8-0,89	0,9-1
Score									
10	9	8	7	6	5	4	3	2	1

Source: compiled by authors

In addition, in order to determine the final integral indicator, actual and normative values are compared and the state tax audit efficiency expressed in points is determined (Table 7).

Table 7. The analysis result of the integral indicators of the state tax audit efficiency for 2015-2017

№	Actual value (in shares)			Normative value		
	2015	2016	2017	2015	2016	2017
P1	1,08	1,10	0,95	1	1	1
P2	0,53	0,42	0,32	5	6	7
P3	0,23	0,28	0,33	8	7	7
P4	0,04	0,08	0,10	10	9	9
C1	0,50	0,52	0,98	5	5	1
C2	0,38	0,37	0,37	7	7	7
C3	x	0,02	0,12	10	10	9
C4	1,00	0,94	0,58	1	1	5
C5	0,80	0,44	2,66	2	6	1
C6	0,91	0,91	0,93	1	1	1
C7	0,17	0,12	0,10	8	9	9
C8	0,73	0,81	0,40	3	2	6
R1	1,00	1,00	1,00	1	1	1
R2	1,18	0,73	0,10	1	3	9
R3	0,26	0,27	0,35	7	7	7
Total:				70	75	80
Average:				4,67	5,00	5,33

Source: compiled by authors

Analysis of the indicators of the “P” block shows that compared to the previous period, the indicators of P1 and P2 decreased by 0.15 and 0.1 sub-points respectively in 2017. Moreover, this indicates the decrease of the tax revenues execution plan and increase of overdue debts on tax revenues proportion of the state budget. Indicators P3 and P4 increased in 2017 by 0.05 and 0.02 respectively compared to 2016. These changes are explained by the tax gap decrease and increase in tax revenues in the reporting period. As the result analysis indicates the improvement methods necessity of planning and forecasting of the Republican budget revenues.

The assessment of the indicator group “C” reveals the sharp increase of indicator C5 and significant increase C1, C3, C6 by 2.22; 0.46; 0.1; 0.02 respectively sub-points compared to the previous period. In contrast, the values of indices C2, C4, C7 and C8 are being decreased during the study period. According to the analysis, those factors for efficiency improvement are the online monitoring development and tax inspection effectiveness; while the reasons for the decline in index values are the ineffective apply of the Risk Management System and the high proportion of unplanned inspections.

The study of the indicators of the “R” group revealed stability of the R1 indicator in 2017. There is sharp decrease of R2 index by 0.63 sub-points compared to 2016 and slight increase of R3 by 0.08 from the previous period. These changes are explained by significant decrease in complaints about tax inspection and improvement of their quality. In addition, the final values of the integral indicator is estimated on classification scale of efficiency level presented in Table 8.

Accordingly, the model on the results and integrated efficiency indicators and the following values for the analyzed period are demonstrated.

The integral indicator value was 70 points, which corresponds to the average level of efficiency audit on the scale of criteria in 2015.

Table 8. Calculated values scale of integral indicator

Table 8. Calculated values scale of integral indicator Intervals of calculated values, (in points)	Qualitative evaluation of tax audit efficiency
to 30	High efficiency
31 - 60	Average efficiency
61 - 90	Middle efficiency
91 -120	Low efficiency
more 120	Insufficient efficiency

Source: compiled by authors

On the other hand, there is a decrease of 5 points to the level of 75, which is also the average level of efficiency in 2016.

In addition, the figure is 80 points and by 5 below of the previous year level and 10 to the base period, which indicates satisfactory level of efficiency in 2017 (Figure 3).

As part of the study, there is a steady decline in the integral indicator of the tax audit efficiency within an acceptable value. The results of the analysis of the effectiveness indicate the necessity for targeted monitoring of recommendation implementation of previous periods as the main tool to improve of the state tax audit efficiency of authorities.

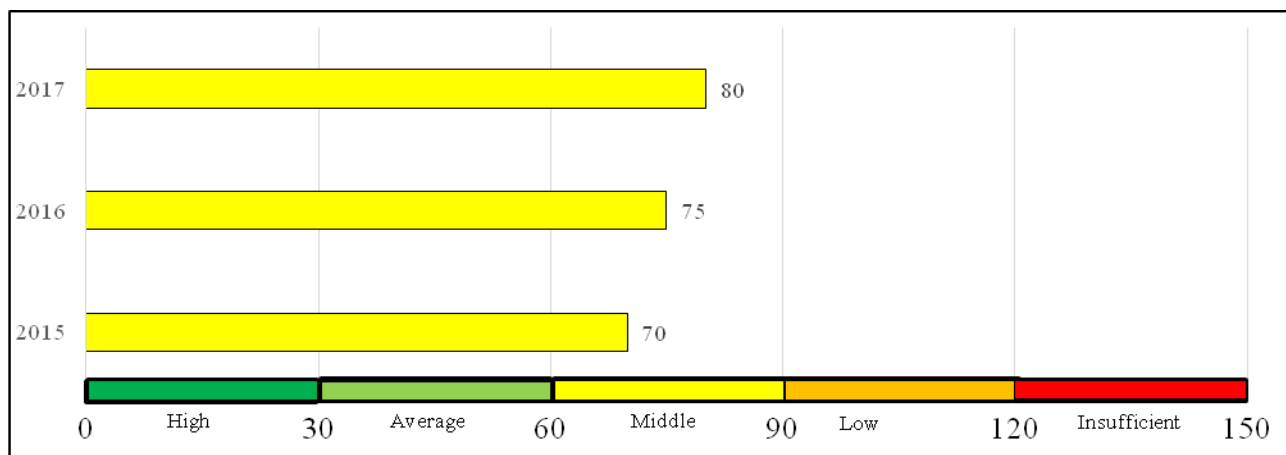


Figure 3. Dynamics of the level of efficiency of the state tax audit for 2015-2017

Source: compiled by authors

The proposed method is intended to determine of the tax audit effectiveness in the state audit system. It is necessary tool for the formation of improvement measures to tax authority activities in the context of modernization and innovative development.

3.3 Prospects of the state tax audit in the conditions of innovative development

Increasingly, new sources of information, such as social networks and other web-based communication platforms, provide public services with innovative ideas and new tools to connect with citizens and participate in social issues discussions. Thus, the use of extensive and diverse information contributes to opportunities for formation the innovative capacity of tax audits, including through providing of new knowledge, creativity and feedback.

In addition, the openness of tax audit results to external users of information is also related to new ways of information management. For instance, in foreign practice, citizens are given the opportunity to submit ideas or feedback to government agencies regularly. In addition, the intensive application of technologies such as crowdsourcing, BIG DATA and OPEN DATA provided to tax authorities contribute to high tax audit results. As part of the Strategic plan of the Ministry of Finance of the Republic of Kazakhstan, the technology of “BIG DATA” implementation in order to expand of modern digital solutions in the sphere of tax administration have been planned. Thus, the relevant system is aimed at required data formation for the transition to the Overall Declaration of Income.

In our opinion, the wide development of innovative technologies will allow to launch the mechanism of transformation of the state tax audit system through the introduction of advanced applied and technological tools.

Automatic methods of tax statements processing for audit purposes and sample selection based on the risk management system at the post-audit stage lead to timesaving, costs, and more accurate reflection of the tax report data. In spite of that the relevant types of information processing and risk management system reveal, but prevent of the facts of non-fulfillment of tax obligations by the taxpayer partially. For instance, in Singapore the Non-filing Service (NFS) is intended to eliminate the requirement to file personal tax declarations for taxpayers. NFS was tested in 2007 with 45,000 taxpayers and rose to 1.39 million in 2017. Taxpayers are able to view the assessment notification of tax obligations on the web portal using reliable data to automate the tax return process in order to reduce the risk of non-compliance with tax laws and contact to the tax authority.

The wide range of internal and external data sources is possible through the widespread use of BIG DATA and OPEN DATA technology. Moreover, information from public services partner with varied degrees of detalization provides the full range of input to the audit. In the practice of the Russian Federation, property taxes are assessed with information provided in the XML file format by the property registry, which contains descriptions of the properties and parameters of the tax base. Furthermore, the taxpayers receive tax information, regardless of their location through the personal secure account on the web portal of the tax administration.

The cloud technologies implementation in the system of state tax administration is able to provide the efficiency of collection, storage and management of information on tax liabilities. For example, cloud technologies under the tax system digitalization are integral part of large-scale IT projects in countries such as the United States, Mexico and the United Kingdom.

Thus, operational efficiency achievement of the tax authorities is one of the main goals set and published in the strategic documents of the government of the United States of America in 2010. One of the program points is aimed at the realization of Cloud First policy based on commercial cloud technologies for the implementation of state and local government policies. In addition, the Internal Revenue Service (IRS) applies the legal protection of the confidentiality of Federal tax information (FTI) through controls and guarantees.

However, practice shows that tax administration in most countries is traditionally conservative and distrustful of the external environment. Therefore, potential risks and problems should be sufficiently evaluated in the decision-making process in the cloud technologies direction.

The transformation of technical equipment and the corresponding legislative registration promotes system improvement of the state tax audit.

Thus, the effective transformation of tax audit into innovative development economic ensures the achievement of two main indicators: tax gap minimization with high level of the responsibility of taxpayers, which leads to the increase in the efficiency of the tax authorities. In our opinion, the strategic planning and legislative regulation of the state tax audit should use the relevant key guidelines.

Three scenarios for the further development of the state tax audit and its impact on the economic situation in order to predict the value of tax revenues in the short term are defined (Table 9).

1. Inertial - continuation of previous policy and maintenance achieved level of tax audit development without key priorities implementation.

2. Decisive modernization - rapid and sharp effect of innovation in the system of state tax audit.

3. Gradual development - systematic and comprehensive implementation of tax audit transformation tools.

According to expert survey, conducted by National research University Higher school of Economics, the probability of occurrence of each scenario over two forecast periods (2018-2020) is determined. The sum of probabilities for each period is 100%. The analysis shows that the most probable development scenario is gradual development (48%, 48.7% and 49.4% respectively), and the least possible is for "Decisive modernization" (6.7%, 7.3% and 8% respectively). Moreover, the probability of maintaining the current model of tax audit development is still high (45.3%, 44% and 42.7%, respectively).

Table 9. Scenario analysis of tax audit development and its consequences for the economy of the Republic of Kazakhstan for 2018-2020

№	The direction choice of tax audit development	Year	Option		
			Inertial	Decisive modernization	Gradual development
1	Probability, %	2018	45,3	6,7	48,0
		2019	44,0	7,3	48,7
		2020	42,7	8,0	49,4
2	Preferability, (points)	2018	14,7	40,1	45,2
		2019	9,5	41,0	49,5
		2020	6,1	41,9	54,2
Consequences for the economy, probability in %					
3	Growth	2018	11,2	52,9	47,3
	Stagnation		53,6	22,7	37,0
	Recession		12,4	24,4	15,7
	Growth	2019	11,8	59,1	46,1
	Stagnation		51,2	20,8	33,8
	Recession		37,0	20,1	20,4
	Growth	2020	12,4	66,0	44,9
	Stagnation		48,9	17,5	28,6
	Recession		38,7	16,6	26,5
4	Amount of tax revenue, (bln. tg.)	2018	7068,1	7255,9	7267,0
		2019	6979,1	7397,4	7382,2
		2020	6889,7	7583,6	7821,9

Source: compiled by authors

During the analysis, preferability in the development of these scenarios is estimated by experts in percentage and in the amount of 100%. The results of the survey show that the most preferred option is gradual development (45.2%, 49.5% and 54.2%, respectively). Furthermore, the least preferred is inertial development (14.7%, 9.5% and 42.7%, respectively). The level of preferability for the model of decisive modernization is also quite high and represents 40.1%, 41% and 41.9% for each period.

Variants of each of the scenarios consequences for the economy in the probabilities form of recovery, stagnation and recession are calculated. It can be seen from the table, if the inertial path of development is maintained, the most possible option is economic stagnation (53.6%, 51.2% and 48.9% for each period). Implementation of drastic modernization is probably to lead to economic recovery (52.9%, 59.1% and 66%, respectively), but the probability of recession and stagnation remains high. Moreover, for the gradual development scenario, economic growth is more probable (47.3%, 46.1% and 44.9%, respectively), at the same time, the probability of economic stagnation is quite high due to the short period of forecasting (37%, 33.8% and 28.6%, respectively).

Thus, based on the analysis, it was found that the preferred option of tax audit development through decisive modernization is less probable due to the scale of the necessary measures and the lack of resources for their implementation. At the same time, the inertial path of development is potential due to the short-term planning period, but the corresponding scenario is less preferable, as it is able to lead to the preservation and subsequent increase of barriers of economic system development as a whole. In our opinion, the third scenario of gradual

development of tax audit is the most balanced and its implementation probability is the highest and most appropriate.

At the final stage of scenario analysis, the amount of tax revenues at the each scenarios is calculated according to the formula:

$$T_t^i = T_{t-1} * ((1 + g) * p_u^i + 1 * p_s^i + (1 - g) * p_d^i),$$

T – the value of tax revenues, billion tenge;

i – appropriate scenario of development of tax audit;

t – relevant forecast period;

g – short-term growth rate of tax revenues, 5 (constant) %;

p_u^i – the probability of economic recovery under appropriate scenario, %;

p_s^i – the probability of economic stagnation under the appropriate scenario, %;

p_d^i – the probability of economic recession under the appropriate scenario, %.

According to the estimated values of tax revenues for the relevant forecast periods, it follows that unfavorable options arise in the inertial path of development. For instance, there is a decrease in the modelled indicator from 7068.1 billion tenge in 2018 to 6889.7 billion tenge in 2020 respectively.

If decisive modernization model is adopted, tax revenues will amount to 7255.9 billion tenge in 2018, 7397.4 billion tenge in 2019 and 7583.6 billion tenge in 2020 respectively. These figures show an acceptable level of tax revenue. However, according to the probability of examined scenario occurrence, the achievement of these indicators is improbable.

According to statistics, revenue amounted to 7153.9 billion tenge in 2017. If gradually development of tax audit is chosen, the tax revenues in the forecast periods will be 7267 billion tenge in 2018, 7382.2 billion tenge in 2019 and 7821.9 billion tenge in 2020 respectively. Since the probability of occurrence of the respective scenario is rather high, achievement of the revealed indicators is possible and acceptable. The development of this model of state tax audit has a cumulative effect and will serve as key factor in advanced level achievement with the designated strategic guidelines in the long term.

Thus, according to the analysis the following conclusions are formed:

1. The place of Kazakhstan in the Global innovation development reflected to the dependence between the modernization level and amount of tax revenues. Thus, Kazakhstan belongs to the group of countries with low level of taxation and innovation activity. At the same time, it is proposed to accelerate of innovative technologies development and their implementation in all areas of state regulation, in particular, in the state tax audit.

2. The transformation of the institute of state tax audit in innovative development framework requires the creation of an effective tax control system, which is directed to modern tools intensify to economy transparency improvement and accelerate the information data exchange.

3. Proposed method implementation of state tax audit transformation through three forms, which are inertial, decisive modernization and gradual development. In our opinion, the choice of the strategy for the phased development of tax audit is the most rational due to criteria of economic effect (result maximization while cost minimization) and avoiding of negative consequences of its implementation.

Conclusions

The study is dedicated to the implementation of innovations as the basis for improvement of the state tax audit. At the first stage, foreign and domestic scientists' research in innovative development of tax administration are studied. Significant differences in approaches to the assessment of the modernization beginning of the tax administration system are revealed. Thus, foreign researchers conclude that the main source of innovative development and further implementation in the tax system are market and business community and competitive environment contributes to the creation of advanced technologies. Furthermore, Russian scientists suggest that measures to tax system modernization and digitalized are possible only with the government participation. The state in this case is the main moderator of innovative development, having the required resources and powers. The next step in the study is analyze of tax burden dependence on innovative development degree of OECD countries and emerging markets. According to the results of the analysis, four types of interaction between innovation and tax systems are identified.

At the second stage of the study, the effectiveness of the state tax control by integrated methods for indicator determination on the example of Kazakhstan was evaluated. Due to the lack of research on this issue, evaluation method of effectiveness of the tax authority's activity is determined through three groups of indicators. According to calculation, that efficiency level of the state tax audit in the Republic of Kazakhstan is satisfactory and requires further improvement, in particular through the implementation of advanced innovative technologies. The proposed methodology has given objective results and can be used to assess of public audit efficiency in other countries.

At the final stage of the study, prospective areas for state tax audit in the context of innovative development were identified. In our opinion, in order to the successful tax system function requires operational activity monitoring, based on modern information technologies that match to high requirements of modern tax audits. Consequently, determined tools will allow generating required tax information and identifying reserves for tax revenues growth by comparing data from third parties. The digitization of the tax audit system and the timely implementation of innovative infrastructure will provide significant time and material costs reduction of monitoring, thereby freeing up reserves for further strategic purposes.

The scientific novelty of this study is development of efficiency evaluation methodology for state tax control and determination of improvement approach based on innovative tools. The results of the study are valuable from the point of view of subsequent developments in direction of state financial control and definition of approaches in order to solve existed issues of state audit.

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Appendix A

Table A1. Global Innovation Index and Tax Burden Indicators by Country for 2017

No	Country	Global Innovation Index	Actual Tax / GDP Ratio, %	Tax Gap, % of actual tax
1	Armenia	35,7	18,5	22,0
2	Australia	51,8	22,3	19,3
3	Austria	53,1	42,8	8,7
4	Azerbaijan	30,6	18,0	19,1
5	Belarus	30,0	42,2	-28,3
6	Belgium	49,9	44,1	40,7
7	Brazil	33,1	32,2	-16,4
8	Canada	53,7	33,3	12,5
9	Chile	38,7	19,9	44,9
10	China	52,5	20,1	53,6
11	Czech Republic	51,0	35,1	3,0
12	Denmark	58,7	48,7	41,9
13	Estonia	50,9	31,6	8,9
14	Finland	58,5	43,9	10,7
15	France	54,2	43,6	9,9
16	Georgia	34,4	20,0	62,0
17	Germany	58,4	36,1	15,4
18	Great Britain	60,9	35,4	12,0
19	Greece	38,9	32,3	38,3
20	Hong Kong	53,9	13,0	57,0
21	Hungary	41,7	38,6	21,0
22	Iceland	55,8	37,7	18,0
23	India	35,5	11,0	25,0
24	Ireland	58,1	29,3	-0,1
25	Israel	53,9	32,7	34,7
26	Italy	47,0	42,0	3,7
27	Japan	54,7	27,1	1,7

28	Kazakhstan	31,5	23,8	27,0
29	Kyrgyzstan	28,0	19,6	15,8
30	Latvia	44,6	28,7	2,0
31	Lithuania	41,2	28,9	0,8
32	Luxembourg	56,4	38,7	55,6
33	Mexico	35,8	16,2	33,3
34	Netherlands	63,4	38,3	29,1
35	New Zealand	52,9	32,0	5,0
36	Norway	53,1	42,8	39,7
37	Poland	42,0	32,9	54,3
38	Portugal	46,1	31,3	3,8
39	Russia	38,8	31,6	60,7
40	Singapore	58,7	14,6	-29,1
41	Slovakia	43,4	31,1	-14,0
42	Slovenia	45,8	36,0	-19,7
43	South Korea	57,7	24,4	2,7
44	Spain	48,8	34,4	23,0
45	Sweden	63,8	47,9	-3,5
46	Switzerland	67,7	28,3	-10,8
47	Turkey	38,9	24,8	5,4
48	Ukraine	37,6	34,0	8,1
49	USA	61,4	27,1	6,5
50	<i>Median</i>	<i>48,0</i>	<i>31,0</i>	<i>18,3</i>

Source: compiled by authors

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