Tax audit in innovative development of the energy sector of the economy: Global trends

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Abstract

As part of the study, world fuel and energy were analysed. A model for the development of state tax audit in the framework of innovative economic development is proposed. As a methodological base, general scientific research methods were used, first of all, systems and integrated analysis methods to substantiate the essence of the state tax audit, to develop approaches to the analysis of its results, and also to determine development trends. The importance of modernizing the system based on the identified relationship between the level of innovative development and the volume of tax revenues is substantiated. The developed model is based on the assumption that the tax gap will be minimized by encouraging tax-payers to voluntarily fulfil their tax obligations. The necessity of creating a supranational body of state audit within the framework of integration processes is substantiated. The prospects for the development of Supreme Audit Institutions (SAIs) in the context of globalization have been outlined, including the creation of territorial standards for a state audit of the Eurasian Economic Union (EAEU) countries.

Key words: *fuel energy, innovative development, institutional features, integration process, state tax audit, tax administration*

INTRODUCTION

Recently, shareholders of large international companies are increasingly demanding to set targets for reducing greenhouse gas emissions in production and operations in general, as well as to disclose such information, namely, to show in the reports how compliance with agreements to combat climate change is reflected in their balance sheets [PINGALE *et al*. 2015]. In this regard, companies are increasingly focusing on diversification and cost-effectiveness rather than inventory building, partnering with large technology firms to introduce high-performance innovations (such as big data systems, cloud computing, or artificial intelligence) to reduce costs and improve productivity [KORABLEVA *et al.* 2020].

The presence of problems with the imperfection of the tax audit and control system is confirmed in the data of the international Doing Business rating "Taxation", where Kazakhstan occupies 50th place among 190 countries. In turn, the time spent on the preparation and submission of reports by taxpayers is 182 hours per year, which significantly exceeds the similar indicators of developed countries of the Organization for Economic Cooperation and Development (OECD). Under relatively favourable taxation conditions and the capacity of the national economy, the tax administration process remains at a satisfactory level and implies a significant change in tax relations.

These reforms should be accompanied by the accelerated transformation of the state tax audit system as part of innovative development. Innovative tools, unlike tradition-

al approaches, are more effective and guarantee a cumulative stable effect aimed at achieving strategic goals [AKHMADEEV *et al*. 2019; KOSOV *et al*. 2016; PETRENKO *et al*. 2019; PURYAEV 2020; PURYAEV, PURYAEV 2020; VALENTIM *et al*. 2019]. The transformation of the state tax audit system is not a measure of the impact on a certain range of problems of the state tax authorities, but a comprehensive system aimed at minimizing the loss of state revenues and creating a transparent mechanism for the functioning of the tax system [PRODANOVA *et al*. 2019; VERTAKOVA *et al*. 2019; VLASOV *et al.* 2019; ZEIBOTE *et al*. 2019].

A high degree of information interaction between the taxpayer and the executive branch should be a key factor in improving the efficiency of the tax administration [KORSAKOVA *et al*. 2017; MOROZOVA *et al*. 2020; PANFILOVA *et al*. 2020]. To date, such interaction should be carried out electronically using modern telecommunications. Improving the functioning of the tax system through the introduction of new information technologies, modern process management systems and operational controls will lead to an improvement in the accounting system taxpayers, ensuring the operational control of the activities of all tax entities, as well as the creation of a single information system of tax authorities, taking into account the security of information [AKHMETSHIN *et al*. 2019; LEHOUX *et al*. 2019].

Analysis of scientific research has revealed the main areas for determining innovations in government control and governance. Consider the following approaches in the world scientific literature.

Many countries are undergoing efforts to modernize administration during the transformation, focused on improving the efficiency of the government's internal operations, communication with citizens by providing the information and public services available in the electronic form.

RUSAW [2007] notes in her work that transformation in the public sector is a complex process characterized more by changes in the political and legislative sphere than by market shifts.

DUTTON *et al.* [2017] argue that innovation plays a central role in modernizing and transforming government, requiring the creation not only of the introduction of information services but citizens.

Analysis by CARTON *et al*. [2016] has identified four types of innovation for the transformation of public administration: aggregation, syndication, consumption and partnership.

MAGELSSEN *et al*. [2015] believe that innovation can improve the quality of public services, as well as empower government organizations to address social problems through a well-established governance system. Such reforms have been accompanied by the introduction and development of a new government, e-government, and more recent discussions about the transition from government to "Big Society".

According to ALLEN *et al*. [2018], the public sector should be guided by economic efficiency principles: minimizing costs and maximizing budget revenues. The emergence of dysfunctional state regulators in relation to the private innovation sector, the changing forms of public-private partnerships.

HALE *et al*. [2018] emphasize that the advent of new technologies is accompanied by the entry into the new digital era of governance (DEG). DEG is characterized by the reorganization of public relations, the priority of which is the interests of citizens. Changes in the digital age inevitably affect state governments. The advent of social networks, cloud technologies, application development is pushing developed industrial societies in the direction of online civilization. DEG acts as a channel for citizen-government interaction.

According to POLLITT [2013], the public sector can be improved by importing concepts and business method, focusing on the efficiency of results, the replacement of hierarchical contractual relationships and the widespread introduction of market-type mechanisms.

BROWN *et al*. [2017] highlight three areas of innovation in the public sector: reintegration, holism and data digitization. Reintegration, contrary to the notion of unified management, involves outsourcing and simplified service chains. The second direction, holism, is to reorganize services for citizens and includes a "single" system of services supported by data storage, simplification and integration of processes, as well as auditing by citizens and evaluating services based on social networks. The third area, digitization, includes the "100% online channels" strategy, in which services are provided by automatic default processes, open information, the government "cloud web services", the government of the open book (the maximum possible openness in the provision of information about the formation of revenue and expenditures of the state), the sharing of services.

Thus, in modern conditions, the institution of state tax audit as the highest degree of tax control plays a key role in the economic development of the state and requires further theoretical reflection, development of appropriate methodological support, methodological and practical recommendations for its solution, which determines the relevance of the research.

In the context of innovative economic development, the use of information technology, the logistics of tax authorities and the increasing skills of tax service workers are of particular importance.

MATERIALS AND METHODS

As a methodological base, general scientific research methods were used, first of all, systems and integrated analysis methods to substantiate the essence of the state tax audit, to develop approaches to the analysis of its results, and also to determine development trends. In addition, the thesis used such methods and techniques as scientific abstraction, methods of deduction and induction, comparative analysis and synthesis, methods of applied mathematics and econometrics, modelling, etc. Also, the results of the study were obtained using the method of graphical analysis and comparative target analysis.

The empirical information base of the study was the statistical data of authorized departments of Kazakhstan,

international financial organizations (OECD, World Bank, etc.), methods for assessing the results of tax authorities, public reports on the results of the activities of the Supreme Audit Institutions (SAI), expert assessments, as well as research and calculation results performed personally by authors.

The working hypothesis of the study is based on the assumption that the basis for the transformation of state audit is innovative development as the only effective tool for improvement. In the context of the author's justified concept, it is expected to achieve maximum growth in tax revenues while minimizing resources for conducting a state audit.

RESULTS

ANALYSIS OF THE GLOBAL AND KAZAKHSTAN FUEL AND ENERGY BALANCE

According to the analysis, the share of natural gas in the global indicator of growth in demand for energy resources was almost 40% in 2018. More than a quarter of the world's gas production and production is currently in North America (Canada, Mexico, and the United States), where the shale boom has led to a rapid increase in both gas production and demand. Within the gas industry, liquefied natural gas consumption is expected to grow much faster than gas in general.

There have been a number of significant achievements in renewable energy. In particular, the cost of the cheapest solar and wind power supply has fallen below $ 25 per megawatt-hour, which in many cases is competitive with the price of fossil-fuel electricity.

Despite the measures taken in the world to curtail coal production and consumption in order to reduce greenhouse gas emissions, both indicators increased in 2017 and 2018. The undisputed leader of these trends was the Asia-Pacific region (home to the world's two largest coal consumers, China and India), which accounted for three-quarters of global coal consumption in 2018.

The volume of oil supply on the world market primarily depends on the level of demand, but it is also influenced by technological progress and price levels. In the longer term, the "Big five" countries of the Persian Gulf will play a significant role in global supply growth.

Real GDP growth in the global market in 2018 was 3.2%, while, according to IHS Markit forecasts, its rate will decrease to 2.9% in the future and to 2.8% in 2020 and 2021. Nevertheless, despite the fact that the global economy has not seen the most optimistic prospects, in 2017 and 2018, primary energy consumption increased significantly, by more than 300 mln t of oil equivalent, for the first time since 2010 (Fig. 1).

Energy production is very unevenly distributed between non-OECD Europe and Eurasia. Kazakhstan is the eighth largest net coal exporter. In recent years, Kazakhstan has taken serious measures to streamline legislation and regulations affecting mining investment. In particular, the introduction in 2016 of a clear formula for calculating oil export duties on a progressive scale with reference to
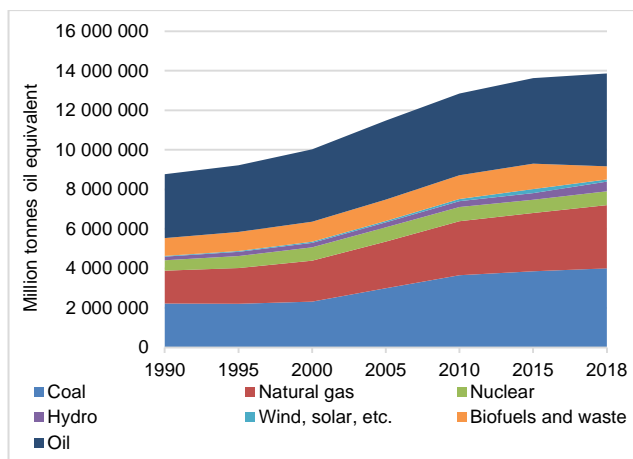

Fig. 1. World fuel consumption for 1990–2018 (in million tonnes oil equivalent); source: own elaboration

world oil prices helped to increase the predictability of the tax system as a whole (the previously applied approach to adjusting export duty rates was unsystematic and non-transparent).

The fuel and energy balance of Kazakhstan is made up of the most important commodity markets of fuel and energy resources, the most basic of which are natural resources. Natural resources make up 74.3% of the total volume of fuel and energy resources. As part of the natural resources, 40.3% is oil, including gas condensate, 32.8% is coal, and 26.9% is natural gas (Fig. 2).

Among the remaining shortcomings of the standard taxation regime for the Kazakh oil and gas industry, it should be noted that the total tax burden is relatively high (by international standards).

According to research in this area, the best option for Kazakhstan is a broader transition from the current system of taxation of the extractive industry, based primarily on total gross revenues or production volumes, to a system generally based on profit. Profit-based taxation allows for automatic adjustments to take into account changes in production costs and prices and thus provides fairly effective incentives even for the relatively expensive development of hard-to-recover reserves.

In conditions of an extremely high level of competition in the world market to attract new investments, of course, additional amendments to the regulatory requirements are required, first of all, the further development of the Tax Code and the development of state audit.

ANALYSIS OF THE DEVELOPMENT OF THE STATE TAX AUDIT AND MODELLING AN INNOVATIVE APPROACH

Consider the dependence of tax revenue collection on the level of innovation activity of Kazakhstan, OECD countries and neighbouring countries. According to the Global Innovation Index 2019, Switzerland, Sweden, and the USA are the leading countries in terms of innovation. In this ranking, Kazakhstan ranks 79th.

Data on the tax burden of the countries studied are selected according to the World Bank database (Tab. 1).
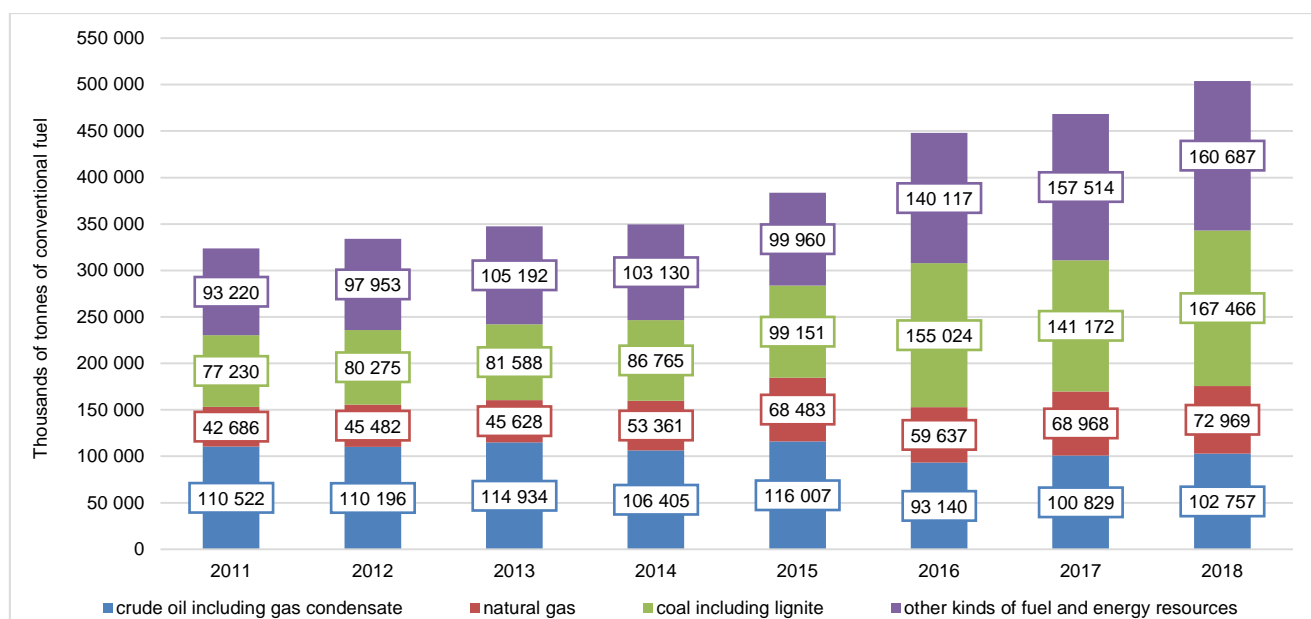
Fig. 2. Fuel and energy balance of Kazakhstan for 2011–2018 (in thousands of tonnes of conventional fuel); source: own elaboration

Table 1. Global Innovation Index and Tax Burden 2019

No.	Country	Global innovation index	Tax burden (%)
1	Armenia	34.0	20.8
2	Australia	50.3	22.1
3	Austria	50.9	25.4
4	Azerbaijan	30.2	13.2
5	Belarus	32.1	13.0
6	Belgium	50.2	23.7
7	Brazil	33.8	12.7
8	Canada	53.9	12.5
9	Chile	36.6	17.4
10	China	54.8	9.2
11	Czech Republic	49.4	14.9
12	Denmark	58.4	33.3
13	Estonia	50.0	21.1
14	Finland	59.8	20.9
15	France	54.3	23.8
16	Georgia	37.0	23.8
17	Germany	58.2	11.4
18	Greece	38.9	26.3
19	Hong Kong S.A.R	55.5	6.2
20	Hungary	44.5	23.2
21	Iceland	51.5	24.2
22	India	36.6	11.2
23	Ireland	56.1	18.6
24	Israel	57.4	24.6
25	Italy	46.3	23.2
26	Japan	54.7	11.6
27	Kazakhstan	31.0	10.6
28	Kyrgyzstan	28.4	17.0
29	Latvia	43.2	23.4
30	Lithuania	41.5	16.7
31	Luxembourg	53.5	26.0
32	Mexico	36.1	13.0
33	Netherlands	61.4	23.1
34	New Zealand	49.6	27.8
35	Norway	51.9	22.5
36	Poland	41.3	16.8
37	Portugal	44.7	22.6
38	Republic of Korea	56.6	15.4
39	Russia	37.6	10.3
40	Singapore	58.4	14.2
41	Slovakia	42.1	17.7
42	Slovenia	45.3	18.4
43	Spain	47.9	13.8
44	Sweden	63.7	27.9
45	Switzerland	67.2	10.5
46	Turkey	37.0	18.3
47	Ukraine	37.4	17.9
48	United Kingdom	61.3	25.7
49	United States	61.7	11.9
50	Median	49.6	18.3

Source: Dutta *et al.* (eds.) [2019] and own study.

The correlation field of the dependence of effective variable *Y* (tax burden level, %) from argument *X* (global innovation index) was designed by 2019 (Fig. 3).

The first quadrant is represented by the developed countries of Western Europe: the Netherlands, Sweden, the United Kingdom, Finland, Denmark, Ireland, Luxembourg, France, Norway, Austria, Iceland, Belgium as well as the leading OECD countries: Israel, Australia, New Zealand and Estonia. There is a direct correlation in this section of the correlation field: the higher level of innovation and tax burden. This fact is explained by the high state participation in creating the conditions of innovation in order to expand the tax base. The state accumulates tax revenues, directing them in the subsequent to the creation of innovative productions, thereby increasing the level of the gross national product. Consequently, the innovative activity of these countries is supported by the state tax administration, which redistributes high tax revenues to support high-tech business initiatives.

The second quadrant is represented by countries with advanced innovation economies: Switzerland, USA, Germany, Singapore, Republic of Korea, Japan, Canada, China and Hong Kong. In this sector, the inverse dependence has been revealed: a high level of innovation with a low
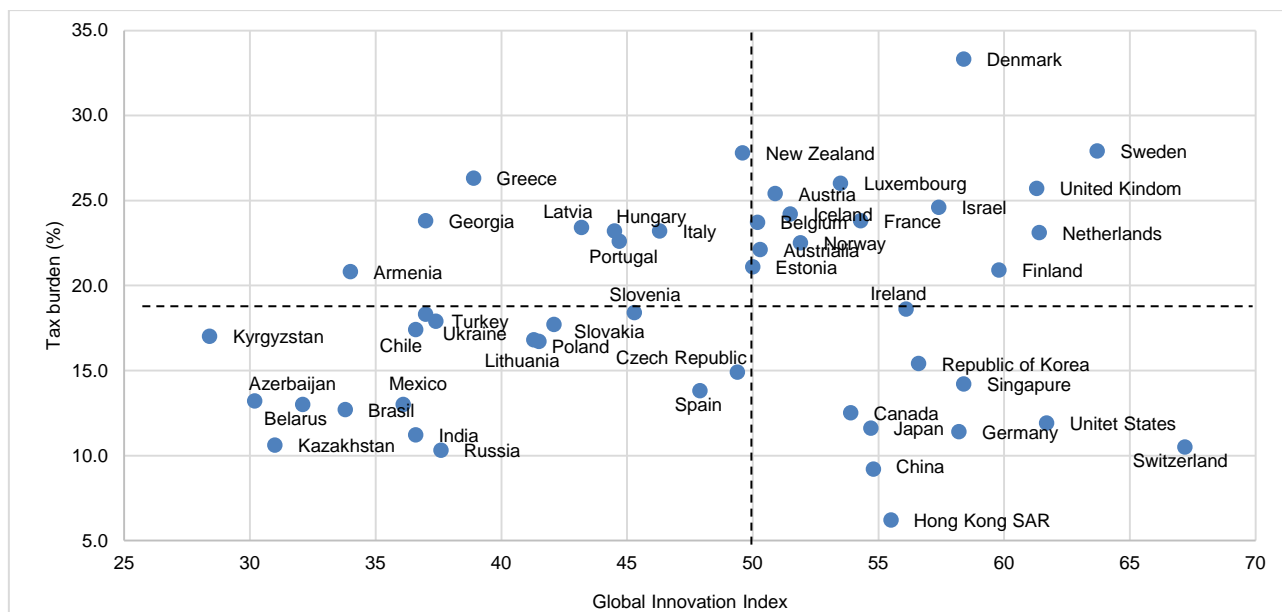
Fig. 3. Correlation field of tax interdependence from the level of innovation activity for 2019 by country; source: own study

tax burden. The state, by lowering tax rates, increases the net profit of companies, thereby stimulating innovation activity in the conditions of high competition in the market. A distinctive feature of these systems is the decentralized structure of innovation regulation. The state creates favourable conditions for economic activity, and business, in turn, generates advanced innovative projects. China's experience in tax promotion of innovation is noteworthy. The state provides tax breaks for companies that use their own financing to invest in innovative technologies and offers preferential tax status for high-tech mini-and micro-enterprises.

The third bloc includes emerging markets: the Czech Republic, Slovakia, Lithuania, Ukraine, Poland, Chile, Russia, Mexico, India, Brazil, Kazakhstan, Belarus, Azerbaijan and Kyrgyzstan, as well as advanced economies: Spain and Turkey. This quadrant is characterized by direct dependence: low level of innovation and, therefore, a low level of the tax burden. The market capacity of these economies does not allow for the accelerated pace to develop innovations, thereby expanding the tax base. High dependence on natural resources and poor support for innovation leads to low tax collection. According to the Global Innovation Index report [DUTTA *et al.* (eds.) 2019], these countries have achieved a significant tax effect with active support for innovation or the creation of a competitive business environment. Economic and innovative development within the union's integration processes.

The fourth quadrant is represented by Eastern European countries (Slovenia, Hungary), as well as part of OECD countries (Belgium, Greece, Latvia, Portugal, Italy, Turkey), and Transcaucasia's countries (Georgia, Armenia). This block is characterized by a high level of tax burden with insufficient development of innovation. The government, with a fairly high level of tax revenues, does not contribute to the financing and implementation of innovative projects. Strengthening the policy of support for high-tech and knowledge-intensive industries will ensure

a transition to a better level in the likeness of the countries of the first group.

According to the theory of games of Nobel prize winner John Forbes Nash, no participant can increase the winnings by changing their strategy, if other participants in their strategies do not change the theory to the innovative development of regions, we can conclude that the tax potential of the republic can be achieved only at an even pace of implementation of high technologies in each individual area.

Increasingly, new sources of information, such as social media and other web communication platforms, provide public services with innovative ideas and new tools to connect with citizens and engage in discussions on social issues, creativity and feedback.

There are many examples from foreign practices where citizens are given the opportunity to regularly submit ideas or feedback to government agencies information that will help to obtain better tax audit results. As part of the strategic plan of the Ministry of Finance of the Republic of Kazakhstan, it is planned to introduce the "Big Data" technology on the basis of which modern digital solutions in the field of tax administration will be applied.

According to Deloitte's research [Deloitte 2017], at the present stage, the stable functioning of the tax system requires the creation of a transparent structure, which, based on the aggregation, confirmation and analysis of the data, will reveal deviations and avoid possible risks.

In our opinion, the described structure is in line with the Deep Learning approach, which is one of the cutting-edge scientific approaches in modern science in the field of process modelling.

The main advantage of the proposed model is the ability: to link a variety of factors and the result in the form of probability of obtaining the desired result with different combinations of direct and indirect factors; track changes in the resulting metric by changing input online; make pre-

dictions of future periods. Automate the decision-making process and monitor the overall state of the system.

It is important that the model developed meets the requirements of the current idea of management on key performance indicators (KPI), widely covered in the professional literature. The possibilities of the proposed model allow us to implement a multi-variate approach to drawing up the appropriate tax policy necessary to make timely and effective decisions, based on the strategy of the tax system development. The laboriousness of tax audit decisions is reduced, and the quality and speed of their decision-making are improved.

In line with the OECD's recommendations, we will propose the environment. In our opinion, on the basis of the above analysis, as the system of state tax audit improves, two key indicators are achieved, namely the minimum level of the tax gap and the reduction of audit costs by increasing the responsibility of the taxpayer.

Currently, the tax audit system is based on checking annual tax statements, a third of which are still filed in paper form. In this regard, the function of the tax audit is to identify committed actions contrary to tax legislation. The process of processing and analysing tax information leads to the formation of a temporary lag, which is economically inefficient, according to the concept of the time value of money.

Based on the analysis, it was revealed that the post-audit phase is presented in the form of two levels: the immature post-audit phase and the mature post-audit phase.

Organoleptic assessment methods for audit purposes involve the control of actual compliance requiring the direct presence of auditors.

Internal data sources are limited in use by other government agencies, making it difficult to collect and analyse data for audit purposes.

The phase of mature post-audit is defined by the following distinguishing features:

Automatic methods for processing tax reporting for audit purposes and selective selection based on the risk management system during the post-audit phase. These methods result in savings in time, costs and more accurate reporting.

In Singapore, for example, the No-Filing Service (NFS) is designed to eliminate the need to file personal tax returns for taxpayers. The NFS was tested in 2007 with 45,000 taxpayers and rose to USD1.39 million can view their "Tax Assessment Notice" on the web portal.

A wide range of internal and external data sources will be possible through the ubiquitous use of Big Data and Open Data technologies which contains descriptions of properties and parameters of the taxable base. Tax information, regardless of their location, taxpayers can be obtained through a secure personal account on the tax administration's web portal.

Thus, the post-audit phase is characterized by the availability of technological tools for the audit process. However, the audit is carried out in relation to the committed facts of improper planning, control and regulation, as well as non-compliance with tax obligations.

The transformation phase requires the transformation not only of technical equipment but also of the appropriate legislative design of areas for improving tax auditing.

The stage of transformation, in our opinion, can be divided into two levels: the stage of development of external instruments and the stage of development of internal instruments. The first phase is characterized by the introduction of external tools capable of adapting existing systems and making more fundamental changes, adapting outdated systems and making more fundamental changes to the introduction of ready-made systems technological solutions. The transformation process also requires political and public support, given that it will include major tax administration reform programs, including privacy and data security issues. At the same time, the implementation of the digitization process for tax audit purposes at the state level facilitates the simplification and reuse of information.

External tools during the transformation phase include:
- legislative support and support for reducing the cost of tax auditing, which contribute to the legal consolidation of the principle of cost-effectiveness;
- support from other government agencies is accompanied by the issue of duplication of functions and powers of public bodies;
- the development of a coordinated digital government and information sharing involves the creation of a partner information platform linking various government agencies electronic forms from five in 2002 to one in 2017, respectively;
- intensive development of investment in digital services means obtaining more reliable audit results through the introduction of high-quality, innovative software products;
- the introduction of the institution of tax mediation will reduce temporary and financial resources for the processes of tax dispute settlement, thereby speeding up the process of recovering pre-accounted tax revenues to the state budget;
- changing the legal framework makes it possible to expand the rights of tax auditors to third-party information.

The internal tools of the transformational phase of the tax audit suggest:
- a complete database of legal entities and individuals and taxpayer identifiers to use third-party information in audits;
- the simplified tax return process;
- guarantee the correctness of tax reporting;
- high technological and qualification requirements for tax audit participants (external and internal recipients of information);
- electronic tax return systems.

To sum up the above, it should be noted that the phase of the transformation of the tax audit requires the creation of a favourable environment, both technological and legislative. Thus, these external and internal tools increase the level of trust in tax administrations on the part of taxpayers, thereby increasing the efficiency of the entire tax system.

The pre-audit phase is the most advanced level of the tax system, as it minimizes the time lag of detecting non-compliance with tax obligations, as well as preventing attempts at tax evasion.

The highest level of development of the preliminary audit is to form stable information flows of data from third parties, external and internal mechanisms to change the structure of the tax administration system.

The main mechanism of an effective system at this stage is the pre-filling of tax returns on the basis of expanded analytics. A number of tax administrations of advanced countries have already moved to pre-fill taxpayers' declarations, with which the taxpayer must then either agree (by reasonable agreement) or provide additional information, that could lead to adjustments to accrued tax liabilities.

The effective functioning of the system requires the introduction of taxpayer identification, the creation of its tax history, as well as information from financial institutions related to the reflection of operational flows.

For example, Australia's tax practice demonstrates a successful pre-audit system. The Australian Taxation Office (ATO) provides taxpayers with the opportunity to pre-fill out tax base information directly into individual tax returns, including payroll, remuneration interest and private health insurance data received from employers, banks and insurance companies. ATO's activities thus facilitate the process of fulfilling tax obligations. The expanded database of committed transactions, created in collaboration with taxpayers, allows data analytics and risk modelling to be carried out.

The advanced level of pre-audit development is:

− standardization of the rules for the provision of tax services and their strict compliance, which is the establishment of uniform rules for the implementation of state tax audits, designed to ensure the quality of audits;

− a mutually agreed and irretrievable approach to providing tax reporting and information implies the utmost accuracy and transparency in the tax assessment process.

This approach is most important for the Republic of Kazakhstan, as, according to the report of the Accounts Committee on the performance of the state budget for 2018, the amount of VAT refund for previous years increased by 113.7 bln, 142% compared to 2016.

Thus, the effective transformation of tax audit in the innovative development of the economy ensures the achievement of two main indicators: minimizing the tax gap with a high level of responsibility of taxpayers, which leads to an increase in the performance of tax authorities. In our opinion, the relevant key benchmarks should be used in the audit.

PERSPECTIVES FOR THE DEVELOPMENT OF THE STATE AUDIT OF THE REPUBLIC OF KAZAKHSTAN IN THE CONTEXT OF INTEGRATION PROCESSES

The need for integration processes is due to the complicating geopolitical situation in the world economy and the increasing opposition of the multipolar configuration achieving sustainable development in a multipolar transition using common capacity and practice.

Economic integration is the unification of economic policies between different states by partially or completely lifting tariff and non-tariff restrictions on trade that take place between them prior to their integration. This, in turn, leads to lower prices for consumers in order to improve their well-being, leading to the greater economic sustainability of participating countries.

These are the main advantages of economic integration include the law of one price (price alignment), a sharp increase in the volume of trade, an increase in productivity, migration of labour flows, equalization of domestic savings, the emergence of a single grid of tariffs at the borders of the economic association. Economic integration is considered to be the second-best option after the free trade regime in terms of acceptability and stimulating economic activity.

It is essential to increase the transparency, balance and quality of supranational regulation, as well as to develop institutional measures to improve the business climate, to enshrine a new domestic one in the Eurasian Economic Union (EAEU) Treaty procedures to assess the regulatory impact of budget projects within the Eurasian Economic Commission (EEC), which can have an impact on the economic development of each country.

The treaty defined the creation of single markets for goods and services in the EAEU space. They were based on a number of important principles, including harmonization and unification of the requirements of national legislation, ensuring the unity of mandatory requirements for the quality, efficiency and safety of goods and services, adoption of uniform rules for their appeals, etc.

The launch of the main mechanisms of single markets took place in May 2017, which became a socially significant event and allowed to eliminate unnecessary administrative barriers for the free movement of quality and affordable goods in the Union space.

The effective functioning of the EAEU cannot be imagined without a concerted fiscal policy, which involves the development and implementation of joint actions of the member states of the Union in order to achieve a balanced development of the economy. According to the EAEU Treaty, the main areas of the agreed budget policy are the formation of unified principles of the functioning of the economies of member states, ensuring their effective cooperation, developing common principles and guidelines for predicting the socio-economic development of the parties.

Let's consider the effectiveness of the state audit in the EAEU countries for 2018. In our view, the effectiveness of the institute can be described by analysing the following indicators (Tab. 2):

− the level of the shadow economy as an indicator of income that is completely or partially out of state control in order to obtain additional economic benefits (according to the IMF);

− gross government budget revenues as an indicator of the importance of the public sector in the economy in terms of available financial resources (according to the World Bank);

− gross expenditures of the state budget as an indicator of the social orientation of the economy (according to the

Table 2. Indicators of the effectiveness of the state audit in the Eurasian Economic Union (EAEU) member states for 2018

EAEU member country	Shadow economy	Gross state budget revenues	Gross expenditures of the state budget	Performance of the state audit (%)	Time to fulfil tax obligations (hours per year)
	% of GDP				
Kyrgyz Republic	30.8	24.3	25.5	13.4	225
Russian Federation	38.4	18.6	16.0	9.8	168
Kazakhstan	38.9	15.0	16.2	11.2	182
Armenia	42.6	22.3	24.1	6.9	262
Belarus	44.5	20.0	16.2	6.7	184
On average for the EAEU	39.0	20.1	19.6	9.6	204

Source: own elaboration based on Eurasian Economic Commission (EEC) Statistics Department data.

World Bank) The indicator is calculated by recalculating the gross expenditures of the state budget of the country concerned from the national currency to the U.S. dollars and dividing into real GDP, calculated in the same way in U.S. dollars;

− the percentage of violations identified as a percentage of the budget covered by the audit reflects the performance of SAI (according to the EAEU member states). The indicator is based on the annual reports of the activities of the WOFK of the appropriate country;

− time to fulfil tax obligations as an indicator of the degree of complexity of the tax system and the automated ness of public services (according to the World Bank).

The Kyrgyz Republic (24.3%), the Republic of Armenia (22.3%), the Republic of Belarus (20%) show the highest level of state revenues in the GDP structure (18,6%). In general, this figure varies within the established corridor (20–25%), which indicates a similarity of tax policy.

Gross expenditures of the state budget in the structure of GDP are most prevalent in the Kyrgyz Republic (25.5%), the Republic of Armenia (24.1%), the Republic of Belarus and the Republic of Kazakhstan (by 16.2% respectively). Expenditures in the structure of GDP occupy in the Russian Federation (16%).

In terms of the complexity of the tax system, the average for the EAEU countries is 204.2 hours per year, equivalent to the value of the developing countries in Ivory Coast and Papua New Guinea.

We will analyse the level of the shadow economy and the effectiveness of the state audit in the context of the EAEU member states (Fig. 4).
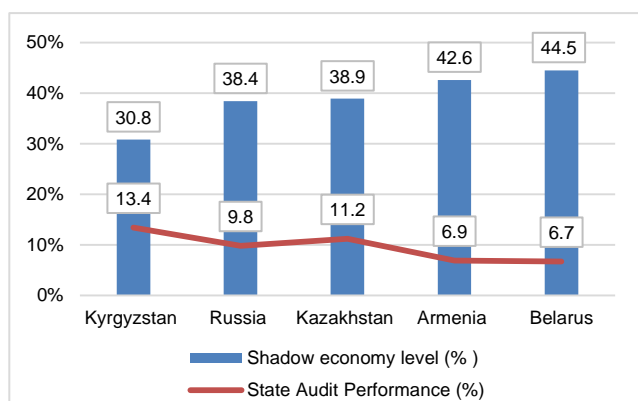

Fig. 4. Level of the shadow economy and state audit performance of Eurasian Economic Union member states in 2018; source: own elaboration based on Eurasian Economic Commission Statistics Department data

The highest level of the shadow economy is observed in the Republic of Belarus (44.5%) While the lowest level corresponds to the countries: The Republic of Kazakhstan (38.9%), the Kyrgyz Republic (24%), the Russian Federation (20%), annual GDP (e.g. in Germany, USA), enabling economic growth and mitigation of recessions and financial crises. Countries that far exceed or are underperforming to this bar have some socio-economic problems or risks.

The effectiveness of state audits in the countries of the Union was considered. Thus, the highest efficiency is demonstrated by the SAI of the Kyrgyz Republic (13.4%), the Republic of Kazakhstan (11.2%) and the Republic of Kazakhstan (11.2%), and 9.8%, the lowest efficiency is in the country's SAI (6.9%). However, in the area of Eurasian integration, the effectiveness of state audits remains at a fairly low level, according to the annual reports on the results of the state audit.

As the chart shows, indicators of the level of the shadow economy and the effectiveness of government auditing are inversely dependent. Thus, the country with the lowest shadow turnover (Kyrgyz Republic) demonstrates a high level of performance of state audit, and in the opposite case (Belarus). Thus, the indicators analysed are countercyclical, which indicates the need to reorient the mission of the state audit as a key tool to bring the economy out of the shadows.

The indicators of the level of the shadow economy and the performance of the state audit are inversely dependent. Thus, setting a benchmark for the future development of public audits, it is necessary to bring the current values of the level of shadow turnover to the target, the level of which in developed countries varies within 15%.

For the purposes of predicting the effectiveness of the state audit conditions of integration, we will calculate the multiplier, demonstrating the possible degree of growth in the performance of the SAI by reducing the level of the shadow economy theoretically. This numerical ratio is calculated according to the Equation (1):

$$M_{SE} = \frac{SE_{EAEU}}{SE_{OECD}} \qquad (1)$$

Where: M_{SE} = a shadow economy multiplier; SE_{EAEU} = the middle level of the shadow economy of the EAEU countries; SE_{OECD} = the average shadow economy of OECD countries.

In this case, the multiplier is presented as a delta coefficient (C_d), hence the target value of efficiency will be equal to the current value of the efficiency of the state au-

dit, and the growth rate (C_g) modified according to the generally accepted value ($C_g = 1 + C_d$), the growth rate on the current performance of the EAEU SAI under the Equation (2):

$$E_{GA}^f = (1 + M_{SE})E_{GA}^c \qquad (2)$$

Where: E_{GA}^f = the state audit effectiveness target indicator; M_{SE} = shadow economy multiplier; E_{GA}^c = the current value of the EAEU countries' state audit effectiveness.

Thus, the average level of the shadow economy of the EAEU countries is 39%, while the optimal value in OECD countries is 15%. Thus, the shadow economy multiplier will be 2.7. Multiply the multiplier by the current average performance of the state audit in the EAEU countries (9.6%), get a target of 40.1%.

Similarly, let's consider the targets of the state budget of the EAEU countries. Thus, on the assumption that the gross revenues of the state budget (as a percentage of GDP) in OECD countries are 20.1%, the multiplier of state revenues of the EAEU countries will be approximately 20.1%: 27.4% = 1.4. Then the average target value of government budget expenditures (as a percentage of GDP) will be 1.4·19.6% = 25.9%.

The time to fulfil tax liabilities is back -in proportion to the level of the shadow economy, as more transparent forms of payment of taxes reduce the time for their processing (3).

$$T_{tax}^f = (M_{SE} - 1)T_{tax}^c \qquad (3)$$

Where: T_{tax}^f = the target of the time for the implementation of the tax obligations of the EAEU countries, hours per year; M_{SE} = shadow economy multiplier; T_{tax}^c – the current value of time to fulfil tax obligations of EAEU countries, hours per year.

The pairing of member states' information systems, the implementation of a coherent policy on the digital economy, the development and implementation of joint projects to modernize public audit and budgetary process will provide multiplier economic effect in the near future. An integrated system of public audit can already help to level the level of economic development in member states by using unified tools for cross-border electronic data exchange. The accelerated innovation development of the Eurasian Integration Institute of Public Audit will provide an optimal level of efficiency compared to the OECD averages calculated according to the above methodology (Tab. 3).

In our view, a concerted public audit policy aimed at reducing shadow turnover in the territory of integration by adopting appropriate regulations and expanding information exchange in the area of government control will reduce the level of the shadow economy to 14.5%.

Reducing the shadow turnover will lead to an expansion of the tax base, and, consequently, an increase in the income part of the budget (up to 27.4%, respectively). The estimated level of gross government budget revenues in GDP is in line with the OECD average of developed countries, enabling both the free movement of goods, capital and labour and the systematic development of the OECD public sector.

As the state budget revenues increase, so does the expenditure part need for the implementation of the state strategy and socially significant projects. The need for accelerated economic growth leads to a minimal deficit in the state budget. Thus, as a consequence of the modernization of the Institution of public audit, the level of expenditures of the state budget will set the level of expenditures of the state budget within 26% of GDP (Fig. 5).
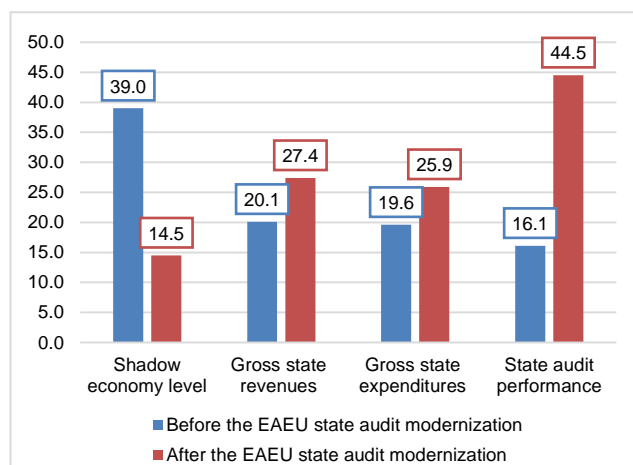

Fig. 5. Indicators of the effectiveness of the state audit before and after the modernization of the state audit of the Eurasian Economic Union (EAEU) member states (%); source: own study

The prospect of developing integration in the sphere of public audit in the EAEU within the framework of the modernization of the institutional framework is to achieve approximately equal conditions of operation of the SAI, ensuring the principles of legality, transparency, independence and professional competence, as well as the creation

Table 3. Targets for the effectiveness of public audits in the Eurasian Economic Union (EAEU) member states after modernization in the integration process

EAEU member country	Shadow economy	Gross state budget revenues	Gross expenditures of the state budget	Performance of the state audit (%)	Time to fulfil tax obligations (h·y⁻¹)
	% of GDP				
Kyrgyz Republic	11.4	33.2	34.8	49.5	133
Russian Federation	14.2	25.4	21.9	36.4	99
Kazakhstan	15.8	30.5	30.5	25.5	154
Armenia	14.4	20.4	20.4	51.3	107
Belarus	16.5	27.3	22.1	59.8	108
On average for the EAEU	14.5	27.4	25.9	44.5	120

Source: own study.

of an effective mechanism for sharing the necessary information to successfully implement key tasks. Analysing the above, we assume that the effectiveness of the state audit will reach 44.5% if the necessary conditions of transformation are met.

The digitization of tax administration processes and increased transparency of integration cooperation facilitates the simplification and optimization of the implementation of tax obligations, thereby reducing the time cost of fulfilling tax obligations to the level of 120 hours per year, which is equivalent to the same indicators of developed countries (Sweden, Netherlands).

Thus, in analysing the above, it should be noted that the development of the institution of public audit in the context of integration into the world community requires a number of reforms and measures to transform the existing system. Thus, a similar level of economic development and political conditions allows the EAEU member states to coordinate actions to improve the state audit as a significant tool to improve the transparency of economic interaction within the Eurasian community through the building of innovation development institutions and the generally progressive evolution of the digital platform.

DISCUSSION

In our opinion, the development of cooperation between the budget regulators will improve methodological approaches for assessing and identifying macroeconomic benchmarks in the EAEU countries, will determine the basic principles and approaches to use budgetary rules to reduce the dependence of economies on cyclical and external economic fluctuations and to improve the effectiveness of stabilizing macroeconomic policies. Further unification of the activities of the EAEU WOFK requires harmonization and smoothing of differences in budget processes in order to optimize the used labour, temporary and financial resources in conducting a state audit at the supranational level.

CONCLUSIONS

Energy companies are increasingly focusing on diversification and cost-effectiveness rather than stockpiling, working with large technology firms to introduce high-performance innovations to reduce costs and increase productivity. In this regard, based on the scenario analysis, the model of transformational of the state tax audit has been presented, the end result of which is to minimize the tax gap, build confidence in the national tax and to reduce the dialogue between taxpayers and tax administrations.

Coordination of concerted action calls for the creation of a central supranational public audit body at the Eurasian Economic Commission to address issues of the methodological and strategic nature integration process. We have proposed the structure of the proposed "Department of State Audit" that oversees the evaluation, analysis and control of the revenue and expenditure parts of the budget in the implementation of state initiatives. At the same time, we outline the prospects for the development of the institu-

tion of public audit within the EAEU in the context of innovative processes.

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