# Development of the tax administration in Russia: Results and prospects

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**ABSTRACT**

The study aims to identify the milestone events in the development of the tax administration in post-Soviet Russia and to offer recommendations for its further improvement. We tested the hypothesis about the relationship between the development of the tax system and tax administration, which, once established, can play a role in the improvement of the tax administration's efficiency. The study relies on quantitative (regression and correlation analysis, factor analysis, principal component analysis) and qualitative methods (classification, thesaurus analysis, SWOT-analysis, critical points method). We also analyzed the legal acts describing the goals (target indicators) for the development of the tax system and tax administration and propose a set of integral indices characterizing these processes. The key events (factors) for the period starting from the 1990s to the present were identified and ranked in order of importance. Their impact was investigated with the help of SWOT-analysis and factor analysis methods. We found that in the given period, there was an increase in the correspondence between the goals of the tax administration and the goals of the tax system. This means that the tax administration's management and staff have become more motivated to upscale their priorities and to orient their activities towards public good. The analysis of indices for the given periods has shown improved performance of the tax system and tax administration. The index of tax administration development is based on four indicators. Between the 1990s and 2010s, the index grew by 13% mainly because of the expanded scope of functions of the tax administration, staff downsizing and optimization of the remuneration system. We found that there is a significant statistical relationship between the indices of development of the tax system and tax administration.

**KEYWORDS**

tax system, tax service, tax authorities, tax administration, civil service, reform, SWOT-analysis

**JEL** E62; H30; K34

# Итоги и перспективы развития налоговых органов России

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**АННОТАЦИЯ**

Цель статьи состоит в выявлении критических точек в развитии налоговых органов в постсоветский период и выработке предложений по дальнейшему совершенствованию налоговых органов. Была выдвинута гипотеза о наличии взаимосвязи между развитием налоговой системы и налоговых органов, которая может быть использована для повышения эффективности налоговых органов. Использованы количественные (регрессионно-корреляционный анализ, факторный анализ, метод главных компонент) и качественные методы (классификация, тезаурусный анализ, SWOT-анализ, метод критических точек). Изучены нормативные правовые акты, содержащие цели (целевые показатели) развития налоговой системы и налоговых органов. Предложены интегральные индексы, характеризующие динамику развития налоговых органов и налоговой системы. Выявлены ключевые события (факторы) с начала 1990-х гг. до настоящего времени, осуществлено их ранжирование по уровню значимости, проведен SWOT-анализ и факторный анализ влияния ключевых событий на развитие налоговых органов и налоговой системы. Исследование показало, что усиливается взаимосвязь целевых показателей деятельности налоговых органов и целей развития налоговой системы. Это ориентирует руководство и служащих налоговых органов на реализацию приоритетов более высокого уровня и достижению общественно значимых результатов. За анализируемые годы значение индексов развития налоговой системы и налоговых органов улучшилось. Индекс развития налоговых органов построен по четырем показателям, и его значение за 1990-е – 2010-е гг. увеличилось на 13%, главным образом, за счет увеличения объема функций при сокращении численности и оптимизации материального обеспечения налоговых служащих. Между индексами развития налоговой системы и развития налоговых органов выявлена значимая статистическая связь.

**КЛЮЧЕВЫЕ СЛОВА**

налоговая система, налоговая служба, налоговые органы, налоговое администрирование, государственная служба, реформа, SWOT-анализ

## 1. Introduction

From the structural point of view, the tax system enables the government to meet its national and international liabilities, therefore, an efficient tax system is of great importance in the politics of any country. In its turn, the efficiency of a tax system is determined by the quality of tax administration, that is, how well the com-putation and collection of taxes and other mandatory payments is organized. This process involves multiple actors, but the main role is played by the tax authorities.

In post-Soviet Russia, the tax administration evolved together with other spheres of economic and social life. At present, the ongoing digital transformation of the Russian state affects all spheres of public

administration, the tax administration being no exception.

The study focuses on the Russian tax system, more specifically, the development of tax administration bodies in the context of the tax system's transformations in the post-Soviet period.

The study aims to identify the milestone events in the development of the tax administration in the post-Soviet period and to offer recommendations for its further improvement.

Our initial hypothesis is that the development of the tax system and tax administration are intertwined processes and that once established, the relationship between them can play a role in the improvement of the tax administration's efficiency.

In line with the research problem and purpose, we addressed the following objectives in a successive manner:

1. To compare the official indicators characterizing the development of the tax system and tax administration in the 1990s, 2000s and 2010s and find to what extent the indicators of the tax administration's efficiency are connected to the goals of the tax system's development.

2. To build integral indices characterizing the development of the tax system and administration.

3. To identify the key events (factors) in the development of the tax system and tax administration for the given period and rank them in order of importance; to conduct a SWOT analysis and factor analysis of their impact on the development of the tax system and tax administration.

The structure of this paper is determined by the above-described research tasks. The final section discusses the prospects of the tax system's development and contains recommendations for further improvement of the tax administration in Russia. Thus, our research has both theoretical significance and practical implications because it can help gain a better understanding of the theoretical and practical aspects of tax administration.

## 2. Literature review

There is a vast body of research discussing the efficiency of tax administration and ways of assessing it. According to the classical approach formulated by H. Strauss et al. [1] and V. Tanzi et al. [2], tax administration is effective as long as it provides tax compliance. Another popular approach (see, for example, O. Farny et al. [3]) associates the efficiency of tax administration with lower expenditures in comparison with the revenues collected from taxes. The third approach was formulated by D. Frampton [4], who distinguishes between the notions of efficiency (achieving the best cost-quality balance) and productivity (the degree of goal attainment).

P. Bejaković [5] defines the performance of a tax system as a balance between efficiency (maximization of tax revenue) and equity (distribution of resources). In general, the quality of tax services and people's trust in tax authority, according to A. Augustine et al. [6], determine the efficiency of tax systems in developed and developing countries.

The methodological considerations discussed by D. Mookherjee [7] are of particular interest in this regard:

a) the expected value of the government's net revenues is given by the difference between expected tax revenues and the wage bill for tax collectors.

b) the government sets the lowest possible level of tax collectors' wages that induces them to agree to work in the bureaucracy.

c) halfhearted, piecemeal reforms contribute to increasing corruption; only a large-scale discrete reform can eliminate corruption.

d) the type of corruption in tax administration is captured by the Nash bargaining solution.

Mookherjee [7] proposes the model of the expected utility of the tax collector (1):

$$W + r\,(t + q \cdot f)\,d - l \cdot c \cdot e + B - E(p), \quad (1)$$

where $W$ is the tax collector's salary; $r$ is the fraction of additional revenues generated; $t$ is the tax rate; $q$ is the time discount factor; $f$ is the constant

rate of penalties on the amount of income concealed; *d* is the expected present value; *l* is the likelihood of penalties imposed on the tax collector for underassessment; *e* is the amount of the taxpayer's underreported income; *B* is the expected value of the bribe; *p* is the probability that the tax collector will detect tax evasion; and *E(p)* is the amount of effort devoted to inspection.

The efficiency of tax administrators is related to the way they perform their functions. M. Grote [8], an expert of the IMF, identifies four key functions that a tax policy unit encompasses: a law-making function (participation in drafting of tax legislation); analytical function (revenue and economic impact analysis); explanatory function (explaining the economic rationale and intent behind changes in the tax policy and legislation); and controlling function (control over the application of the existing tax codes and regulations). As R. Bird justly observes [9], the distribution of taxing authority between the center and regions also has a considerable institutional significance. S. Jang and R.J. Eger [10] describe the effects (both positive and negative) of delegating tax collection to private agencies.

M. Klun [11] analyzes the case of Slovenia and reasonably argues that in transition countries, the performance of the tax administration is predominantly evaluated on the basis of the indicators used by the tax authorities themselves while other indicators and the evaluation made from the taxpayers' perspective are often ignored. H. Güler and H. Kaba [12], in their turn, focus on the case of Turkey to show that enhanced efficiency of the tax administration there was the result of reforms, which made the tax administration unable to allocate its own budget, increase its staff, hire or dismiss new employees and negotiate their wage levels.

In Russia, the research agenda evolved in parallel to the development of taxation. The resulting body of research is rich and diverse. For the purposes of this paper, we divided the most significant publications into two groups. The first group of deals with the stages in the tax system's transformations in the given period. For example, S. Vasiliev [13] describes the development of taxation from the Soviet era to the present day. N. Shibaeva and her colleagues [14] discuss the increasing centralization of the present-day tax system in comparison with the 1990s. S. Belev et al. [15] describe the transformation of the fiscal policy in 2008–2018. V. Gromov [16] outlines the stages of tax competition between 1991 and 2005. V. Vishnevsky and his colleagues [17] make a reasonable observation that 'it is important to assess the quality of a tax system not only according to a set of formal criteria but by taking into account the specific historical, technological and socio-cultural context'.

All of these studies, however, only briefly touch upon the matters related to the work of tax agencies as an institution of tax administration. The current stage in the history of the Federal Tax Service is discussed by D. Moloshnikova and K. Baytemirova in the light of digita-lization [18]. Signs of the tax system's inefficiency are justifiedly associated with the 'lack of coordination to balance the development of the legislation and the algorithms for the implementation of the institutional instruments of control'. [19] As far as is known, however, no attempts have been made in Russia to consider the connection between the development of the tax system and of the tax administration bodies. A. Pogorletsky and N. Bashkirova came close to exploring this topic: in their study they trace the tax system's evolution by looking at the changes in the forms and tools of tax administration [20].

Another group of studies deal with the methodology for assessment of the ef-ficiency of the tax system and tax adminis-tration. This research has been conducted in Russia since the late 1990s, when the first outcomes of the economic reforms became visible. For instance, G. Kartasho-va [21] argues that the efficiency of the tax system should be measured by looking at the amount of uncollected taxes and the efficiency of the tax administration, by

looking at the data on tax revenue collection. In the mid-2000s, S. Alekhin [22] introduced an indicator of tax potential calculated as a sum of tax accrued and tax revenue after subtracting uncollected tax. As more statistical data have been accumulated, more recent methodologies started to make use of a wider variety of indicators. For example, S. Boyko [23] suggests that the efficiency of a tax system should be assessed by using tax revenue, GDP per capita, administrative costs of taxation and inflation.

Since the 2000s, which saw some large-scale reforms of the Russian tax service, there has been a surge in studies addressing the topic of cost effectiveness of the tax administration. For instance, I. Kalashnikova [24] proposed to focus on the rate of tax collection calculated as the ratio of total revenue of the state budget to the sum of actual tax revenue and growth in tax debt. V. Moroz and S. Moroz [25] propose to measure the tax administration's efficiency as a ratio of tax revenue to the costs of tax administration. These are but a few of the studies and publications on this topic. The classification and discussion of the proposed approaches are given further in this article.

In general, it should be noted that, first, similar indicators are used to assess the performance of the tax system and tax administration, which, in our view, gives us a somewhat inaccurate picture. Second, the existing methodologies are mostly based on macro-economic indicators. There is only one study [26] that takes into account the factor of trust in the tax system. Russian researchers are obviously more oriented towards 'old' rather than 'new' institutionalism, which might be a result of the current state of affairs in the research field or in the institutional environment.

### 3. Data and methods

To address the first research task, we are going to consider the following hypothesis (*Hypothesis* 1 (*H*1)): institutional goals (target indicators) of the development of the tax administration

in the corresponding time period follow logically from the goals of the national tax system.

To test this hypothesis, we are going to apply the following methodology:

1. We searched through the legal reference systems and found the key normative acts setting the goals of development of the tax system and tax administration in the 1990s, 2000s, and 2010s.

Since 2014, the Federal Tax Service has been publishing its goals and reports on the official web-site. The range of sources used for this study also includes framework documents (legal, strategic) for the development of the tax system as an institution and methodologies for the evaluation of the tax administration. We also analyzed two normative acts of the 1990s describing the priorities of development of the tax system, three similar documents of the 2000s and five of the 2010s. Methodologies for the tax administration included one legal act of 1999, five acts of the 2000s and two departmental legal acts of the 2010s.

2. Based on these documents, we compiled lists of goals (indicators). If the documents were in force in the same period, the goals (indicators) that were repeated were regarded as the same.

3. The indicators specified in the strategic documents of the tax system were checked against those in the corresponding documents of the tax administration. We also identified the extent of the indicators' correspondence to each other.

4. If the indicators had similar names and measurement units, they were deemed correspondent to each other. If the indicators had different names and measurement units but were similar in meaning, they were deemed partially correspondent to each other. In other cases, a conclusion was made that no correspondence was detected.

5. We calculated the degree of mutual correspondence of the indicators in percentage for each decade. We conducted a pairwise comparison of the documents focusing on the correspondence between the goals they describe.

6. All of the above has led us to the conclusion that the results demonstrated by the tax administration are related to the institutional goals of the tax system. The second degree of correspondence signifies that the tax administration is orientated towards achieving the goals of the national tax system.

The study also aims to address the shortcomings of the existing methods and to develop a new methodological approach to assessing the efficiency of the tax system and tax administration. To this end, in accordance with the second research task, we built integral indices to test *Hypothesis* 2 (*H*2), which states that the development of the tax administration follows the general trends in the development of the natio-nal tax system.

International research literature provides a range of methods and in-dicators that can be used for diagnos-tics of tax administration efficiency[1]. In theory, these indicators can be used to evaluate the performance of national tax agencies in accordance with the interna-tional standards of efficiency and cost effectiveness. In Russia, however, these approaches are not always practically possible due to the lack of data, which is why we chose to develop our own methodology.

1. We identified the goals (target in-dicators) specified in federal planning documents and evaluated them accord-ing to the criteria of measurability, objec-tivity, relevance, independence (absence of repetitions), comparability (continuity of observation) and data availability.

2. We collected the values of the in-dicators for the period between 1992 and 2019 from the materials of the Ministry of Economic Development, Ministry of Finance, Accounts Chamber of the Fe-deral Tax Service and the official statisti-cal data.

¹ OECD Comparative Series; USAID Col-lecting Taxes Database; Tax performance as-sessment (GDI/DIE); PEFA framework (tax administration indicators); EU Fiscal Blueprints; Tax simplification handbook (WB); Diagnostic framework for Revenue Administration (WB); Diagnostic missions (IMF).

3. The significance and mutual in-fluence of the indicators were evaluated with the help of the principal component method.

4. The indicators were aggregated according to formula (2) and the index of tax system development was built ($I_a$):

$$I_a = \frac{\sum_{i=1}^{N} \left( \frac{X_{r,i}}{X_{b,i}} - 1 \right) \cdot 100}{N}, \qquad (2)$$

where $X_{b,i}$ is the value of indicator $i$ in the base (first analyzed) year; $X_{r,i}$ is the value of indicator in the accounting (last) year; and $N$ is the number of indicators.

5. We selected the indicators charac-terizing the development of the tax ad-ministration in the same years, identified and summarized their values. We decided against using expert evaluations due to their subjective nature as well as the in-dicators whose impact is hard to measure such as age, length of service and level of education of tax officers. In taxation, the educational and staffing trends of the last decades have been quite ambiguous and the formal indicators do not always reflect the real state of things. Students at the universities specializing in taxation and sponsored by the Federal Tax Service of-ten demonstrate a poor quality of educa-tion [27].

6. We evaluated the mutual influence of indicators through the method of principal component analysis and built the index of tax administration development ($I_{pa}$) according to formula (3):

$$I_{pa} = \frac{1}{T} \sum_{t}^{n} \frac{1}{I} \sum_{i}^{n} \frac{\sum_{i=1}^{n} X_{t,i}}{\sum_{i}^{n} X_{t,i}}, \qquad (3)$$

where $i$ is the number of indicators; $X_{t,i}$ is the value of indicator $i$ for year $t$; and $T$ is the total number of years.

7. We evaluated the statistical rela-tionship between the two indices over the given period and built a panel data regression to forecast further development of the tax system.

If the connection between the deve-lopment of the tax system and tax admin-istration is detected, it will make sense to look at the factors shaping these pro-

cesses. Therefore, we are also going to test *Hypothesis* 3 (*H*3), stating the existence of certain milestone events (factors) that had an institutional impact on the tax system and tax administration.

To test this hypothesis, we applied the following methodology:

1. First, we selected the events in the evolution of the tax system and tax administration in the given period. To this end, we used normative acts and academic publications.

2. Next, we compiled two separate chronological tables showing the development of the tax system and tax administration.

3. The events were ranked by assigning them the following weights:

'3' signifies a milestone event that had a crucial and lengthy influence on the given sphere (10% of all the events or less);

'2' means an important event that had a considerable and lengthy influence on the given sphere (25% of all the events or less);

'1' stands for a remarkable event that had a certain limited impact on the given sphere.

The events that failed to meet the above-described criteria were filtered out.

4. We also used visualization of the key events and their impact by superimposing them upon a graph showing the dynamics of the corresponding indices.

5. Finally, we conducted a SWOT-analysis to identify the key events in the development of the tax system and tax administration in the given period and to make recommendations for further improvements in this sphere.

## 4. Results

The first research task was addressed by comparing the key indicators of tax administration development in Russia (as specified by the official documents) with the indicators used by tax administrators themselves. The results are shown in Table 1.

We found that in each of the given periods at least a half of the goals (target indicators) set for tax administrators completely or partially corresponded to the goals of the tax system.

In the 2000s, most of the priorities set for the tax system (strengthening of tax federalism, elimination of internal offshores, increase in voluntary contributions, improvement of the quality of taxpayer services, staff optimization, promoting compliance for timely declaration submission, online filing services, tax audit, etc.) were not included in the tools for the tax administration assessment. As a result, some of the important priorities remained on paper.

In the 2010s, the degree of correspondence grew and most of the goals of the tax administration were aligned with the institutional priorities. This period saw the introduction of taxpayer satisfaction indicators. At the same the tax administration's role in stimulating business activity also came to the spotlight. Tax dispute resolutions were evaluated. Nevertheless, the evaluation methodologies still failed to include the indicators that would reflect the authority of the Federal Tax Service to administer revenue from alcohol taxes and social contributions, to conduct tax

Table 1

**Correspondence between the goals of the tax system and tax administration in Russia**

| Period | Sphere | Indicators Total | Correspondence | | |
|---|---|---|---|---|---|
| | | | complete | partial | no correspondence |
| 1990s | Tax system | 14 | 3 | 4 | 7 |
| | Tax administration | 21 | 3 | 9 | 19 |
| 2000s | Tax system | 21 | 0 | 5 | 16 |
| | Tax administration | 18 | 0 | 9 | 10 |
| 2010s | Tax system | 30 | 8 | 10 | 12 |
| | Tax administration | 25 | 8 | 9 | 8 |

*Source*: hereinafter the tables are compiled by the authors based on their own calculations

audit and work with SMEs and there was still a perceived lack of indicators related to digitalization.

In further analysis, we used sets of indicators corresponding to the key indicators specified in strategic documents of the tax system and tax administration that can be evaluated statistically (see Tables 2 and 3).

What distinguishes our methodology is that it relies on different sets of indicators to evaluate the tax system and tax administration. All indicators are statistically measurable, relevant (included into official documents), comparable in time, independent and can be used to calculate the integral index.

To assess the informative value of our indicator sets, we used the method of principal components. The difference be-

tween the values of the tax burden indicator from those provided by the Federal Tax Service can be explained by the fact that in Table 4 we used the data of the Federal State Statistics Service while the Federal Tax Service uses its own data.

The first, second and third principal components have eigenvalues greater than 1. Together they cover about 89% of all the data variations. However, when we calculated the correlation with the index of tax administration development (see below), we found that other components also had a positive impact on the index's informative value.

Indices of five out of seven indicators showed positive dynamics over the given period: there was an increase in the tax-to-GDP ratio, a reduction in the tax burden on business, improved tax collection,

Table 2

**Indicators of the development of the tax system**

| No | Indicator | Unit | Description | Optimal dynamics | Statistical forms used for data collection |
|----|-----------|------|-------------|------------------|--------------------------------------------|
| 1 | Share of tax revenue in the consolidated budget revenue | % | Contribution of the tax system to economic development. Used worldwide | Growth | Tax revenue of the consolidated budget GDP |
| 2 | Tax to GDP ratio | % | Fiscal function of the tax system | Growth | Consolidated budget Tax revenue of the consolidated budget of the Russian Federation |
| 3 | Actual tax burden on business | % | Regulatory function of the tax system. Calculated as the ratio of the sum of taxes and levies to the financial results of organizations | Decline | Pre-tax profit (loss) of organizations Tax revenue of the consolidated budget |
| 4 | Tax collection rate | % | Controlling function of taxes. Calculated as the quotient of two figures – the sum of tax collected and the tax debt in the accounting period. | Growth | Tax debt Tax revenue of the consolidated budget |
| 5 | Number of individual entrepreneurs, incl. farm businesses | mln | The regulatory function of taxes is measured as the size of the tax base. Most accurately describes the macro-economic and fiscal climate in the country | Growth | Key indicators of individual entrepreneurs' performance by type of economic activity Number of peasant (farming) enterprises |
| 6 | Number of enterprises and organizations | mln | Regulatory function of taxes. Calculations do not cover the number of branches | Growth | Number of enterprises and organizations by type of economic activity |
| 7 | Types of taxes, levies, excises, and contributions | mln | Degree of complexity of the tax system. All levels of taxes are considered | Decline | Tax Code of the Russian Federation |

Table 3

### Indicators of the development of the tax administration

| No | Indicator | Unit | Description | Desired dynamics | Sources of data |
|----|-----------|------|-------------|------------------|-----------------|
| 1 | Number of functions of the tax administration | units | Workload of the tax administration. All functions of the tax administration are considered equally important | Growth | Regulations concerning the tax administration |
| 2 | Tax staff as a percentage of total civil service | % | The task of staff reduction is described in the Personnel Policy Concept of the Federal Tax Service. A more objective approach is to compare the number of tax officers with the overall number of civil servants rather than consider this indicator alone | Decline | Number of federal employees and their wage level (statistical data form) |
| 3 | Ratio of average salary of the tax staff to the average salary in civil service | % | Characterizes the adequacy of the wage level of tax staff | Growth | Number of federal employees and their wage level (statistical data form) |
| 4 | Costs of the tax administration as a percentage of total federal expenditures | % | Economic efficiency of the tax administration. Takes into account public spending on tax staff wages | Decline | Execution of the expenditure part of the federal budget |

Table 4

### Principal components of the tax system indicators

| No | Indicators | Median | Standard deviation | Minimum | Maximum | Variation | Share of explained variation | Eigenvalue | Explained variation | Rate of indicator growth by period (%) | | | |
|----|-----------|--------|--------------------|---------|---------|-----------|------------------------------|------------|---------------------|------|------|------|------|
| | | | | | | | | | | 1990s | 2000s | 2010s | Entire period |
| 1 | Share of tax revenue in the consolidated budget revenue, % | 58.7 | 8.4 | 49.4 | 77.7 | 71.4 | 0.498 | 3.487 | 0.498 | 97.4 | 70.3 | 84.7 | 85.1 |
| 2 | Tax to GDP ratio, % | 32.8 | 4.0 | 25.2 | 40.2 | 16.1 | 0.241 | 1.69 | 0.74 | 85.9 | 122.1 | 96.5 | 122.6 |
| 3 | Actual tax burden on business, % | 0.9 | 0.8 | -2.8 | 2.2 | 0.7 | 0.145 | 1.018 | 0.885 | 120.2 | 113.3 | 94.1 | 127.2 |
| 4 | Tax collection, % | 0.9 | 0.1 | 0.4 | 1.0 | 0.0 | 0.056 | 0.395 | 0.941 | 127.2 | 113.1 | 97.9 | 151.3 |
| 5 | Number of individual entrepreneurs, incl. farm businesses, mln | 3.1 | 0.8 | 1.7 | 4.6 | 0.6 | 0.034 | 0.237 | 0.975 | 211.3 | 68.9 | 93.8 | 161.1 |
| 6 | Number of enterprises and organizations (branches not included), mln | 3.7 | 1.3 | 0.9 | 5.0 | 1.7 | 0.019 | 0.13 | 0.994 | 322.4 | 158.0 | 128.8 | 416.1 |
| 7 | Types of taxes, levies, excises and contributions, units | 27.0 | 12.4 | 16.0 | 49.0 | 154 | 0.0003 | 0.002 | 1 | 125.6 | 37.8 | 94.1 | 43.6 |

and a growth in the number of registered legal entities. The index of tax system development calculated according to formula (2) in the given period rose by 15.4%. The index reached its minimum in 1994, 1998, 2002, 2008, 2014, and 2017.

The first and second principal components have eigenvalues greater than 1 (Table 5). Together they explain 55% of all data variations but to increase the informative value of the index, we are going to provide the calculations for all the principal components of the set.

The index of tax administration development calculated according to formula (3) increased by 13% in the given period, which was achieved primarily through the expansion of the tax administration's functions (almost threefold) combined with staff downsizing and optimization of the remuneration scheme.

There is a statistical relationship between the indices for tax system and tax administration (the correlation coefficient is 0.79 at $p < 0,001$), which means that we can build a dual regression on panel data where the index of tax system development is a dependent variable ($Y$) and the number of observations corresponds to the number of years (Table 6).

The equation with the calculated regression coefficients shows the relationship between the development of the tax system and tax administration and looks the following way:

$$y = 27.5 + 0.72x. \qquad (4)$$

The sample coefficient of determination $R^2$ equals 0.62, which means that the model explains almost two-thirds of the variations of the dependent variable.

The coefficient of multiple correlation (0.79) indicates a high degree of association between the factors.

The approximation error $2,9 \cdot 10^{-16}$ signifies high accuracy of the model.

The significance of the model was evaluated with the help of the *F*-test.

Table 5

**Principal components of the tax administration indicators**

| No | Indicators | Me-dian | Stan-dard devia-tion | Mini-mum | Maxi-mum | Varia-tion | Share of exp-lai-ned varia-tion | Ei-gen-value | Exp-lai-ned varia-tion | Rate of indicator growth by period (%) | | | |
|----|-----------|---------|------------|----------|----------|-----------|-----------|-----------|-----------|--------|-------|-------|------|
| | | | | | | | | | | 1990s | 2000s | 2010s | En-tire pe-riod |
| 1 | Number of functions of the tax ad-ministration, units | 83.0 | 21.1 | 56.0 | 130 | 447.0 | 0.566 | 3.396 | 0.566 | 112.5 | 125 | 151.8 | 225 |
| 2 | Tax staff as a percentage of total civil service, % | 39.8 | 11.0 | 26.6 | 66.2 | 120.5 | 0.183 | 1.099 | 0.549 | 215.3 | 63.6 | 107.6 | 126.6 |
| 3 | Ratio of the average sala-ry of tax staff to the average salary in civil service, % | 115.4 | 19.2 | 74.4 | 151.6 | 368.2 | 0.016 | 0.095 | 0.991 | 69.3 | 110.0 | 115.4 | 87.5 |
| 4 | Costs of the tax admin-istration as a percentage of total fed-eral expendi-tures, % | 0.6 | 0.2 | 0.2 | 0.9 | 0.0 | 0.0002 | 0.002 | 1 | 280.7 | 61.5 | 126.1 | 401.5 |

Table 6

**Protocol of regression analysis**

| Regression statistics | | Analysis of variance | | | | | |
|---|---|---|---|---|---|---|---|
| Multiple $R$ | 0.79 | | *Df* | *SS* | *MS* | *F* | Significance *F* |
| $R^2$ | 0.63 | Regression | 1 | 3446.3 | 3445.3 | 44.6 | $4.4 \cdot 10^{-7}$ |
| Normalized $R^2$ | 0.762 | Residual | 26 | 2009.6 | 77.3 | | |
| Standard error | 8.79 | Total | 27 | 5454.9 | | | – |
| Observations | 28 | | | | | | |

| | Coefficients | Standard error | *t*-statistic | *P*-value | Lower 95% | Higher 95% |
|---|---|---|---|---|---|---|
| *Y*-intersection | 27.5 | 11.2 | 2.45 | 0.02 | 4.45 | 50.6 |
| *X* | 0.72 | 0.11 | 6.68 | $4.4 \cdot 10^{-7}$ | 0.49 | 0.94 |

The calculated significance level of the coefficient (44.5) exceeds the tabular *F*-value (0.004) at $\alpha = 0.05$, that is, the regression equation is significant at $\alpha = 0.05$ and it can be used for analysis and forecasting.

We conducted a pairwise comparison of the coefficients and their standard errors and came to the conclusion that the calculated coefficients are statistically significant. This conclusion is supported by the *p*-values of the coefficient (0.02), which are below the significance level $\alpha = 0.05$. Confidence intervals with the confidence level 95% do not include zero, which also confirms the significance of the regression coefficients.

The significance of the coefficient of the regression equation was tested by using the Student's *t*-test. The calculated value of the coefficient (6.92) is higher than the tabular value (2.06), that is, the values of the coefficient are significant.

Testing of the significance of the regression coefficients for the factorial analysis confirms the adequacy of the equation. By calculating the coefficient of elasticity (*E*) we can give an economic interpretation of this equation:

$$E = 102.8 \cdot \frac{0.72}{101.7} = 0.73. \tag{5}$$

The coefficient shows an increase in the index of development of the tax system by 0.73% while the index of development of the tax administration increases by 1%.

It makes sense to forecast further development of the tax system by using the regression model since we have already shown its high significance.

Let us now create a point forecast for a 2-year interval. To this end, we are going to calculate the mean absolute growth (MAG) in the index of tax administration development:

$$MAG = \frac{114.9 - 99.5}{28 - 1} = 0.57. \tag{6}$$

For Step 1:

$$x_1 = x + MAG \cdot 1 = \\ = 114.9 + 0.57 = 115.47. \tag{7}$$

For Step 2:

$$x_2 = x + MAG \cdot 2 = \\ = 114.9 + 0.57 \cdot 2 = 116.04, \tag{8}$$

where $x_1$ is the value of the independent variable in the first year of projection; $x_2$ is the value of the independent variable in the second year of projection; and x is the value in the last year for which empirical data are available.

To get point forecast estimates of the dependent variable, we will substitute the values obtained into regression equation $y = 27.5 + 0.72x$:

$$y_1 = 27.5 + 0.72 \cdot 115.47 = 110.64, \tag{9}$$

$$y_2 = 27.5 + 0.72 \cdot 116.04 = 111.05, \tag{10}$$

where $y_1$ is the value of the dependent variable in the first year of projection and $x_2$ is the value of the dependent variable in the second year of projection.

For the point forecast we obtained we are now going to calculate an interval forecast containing possible deviations from the predicted value.

For Step 1, the confidence interval of the prediction has the following bounds:

upper bound: $y_1 + U_1 = 110.64 + 2.6 = 113.24$;

lower bound: $y_1 - U_1 = 110.64 - 2.6 = 108.04$.

$$U_1 = \sigma \cdot t_a \cdot \sqrt{1 + \frac{1}{n} + \frac{(x_1 - x_{cp})^2}{\sum_{i=1}^{n}(x_i - x_{cp})^2}} =$$
$$= 11.23 \cdot 2.055 \times \qquad (11)$$
$$\times \sqrt{1 + \frac{1}{30} + \frac{(115.47 - 102.77)^2}{6614.717}} = 2.6.$$

For Step 2, the confidence interval of the prediction has the following bounds:

upper bound: $y_2 + U_2 = 111.05 + 2.6 = 113.65$;

lower bound: $y_2 - U_2 = 111.05 - 2.6 = 108.45$.

$$U_2 = 11.23 \cdot 2.055 \times$$
$$\times \sqrt{1 + \frac{1}{30} + \frac{(116.04 - 102.77)^2}{6614.717}} = 2.6. \qquad (12)$$

Thus, the regression model is significant and is suitable for forecasting the development of the tax system (Fig. 1).

Forecast of the development of the tax system based on the regression model of the tax administration has *R*-squared value of 0.79. In its turn, a forecast built for the same interval with the help of the trend extrapolation method and based on empirical data has the accuracy of 0.81. Regression models have a higher predictive power since they take into account the impact of hidden variables (regressors).

As Fig. 1 illustrates, the predictive models form a confidence interval from

108.45 to 113.65 with the most precise value 111.05. This is the value that appears to be the most likely in the light of the current trends after the two years of implementation of the current tax policy and tax administration system.

To analyze the development of the tax system and tax administration, we need to identify the key factors that influenced these processes in different periods. Therefore, we selected the main events in the development of the tax system and tax administration, putting them into chronological tables comprising about 200 events in the period of 1991–2020. After that, the events were ranked by their significance. For the sake of brevity, the tables are not included in this article and we are going to limit ourselves to the major milestone events and the changes in the corresponding indices (see Fig. 2 and 3).

The key events include the following legislative changes: adoption of the Tax Code; introduction and elimination of some taxes, for instance, the Unified Social Tax (UST), mineral extraction tax, and the personal income tax (PIT). Other events include the introduction of taxpayer registration systems (Taxpayer Identification Number – INN, Unified State Register of Taxpayers, and the Unified State Register of Legal Entities).
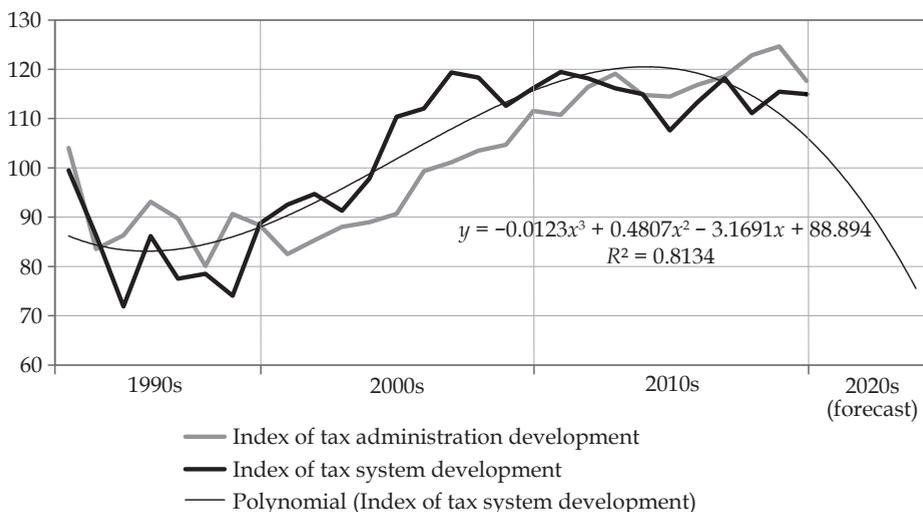


$$y = -0.0123x^3 + 0.4807x^2 - 3.1691x + 88.894$$
$$R^2 = 0.8134$$

Index of tax administration development

Index of tax system development

Polynomial (Index of tax system development)

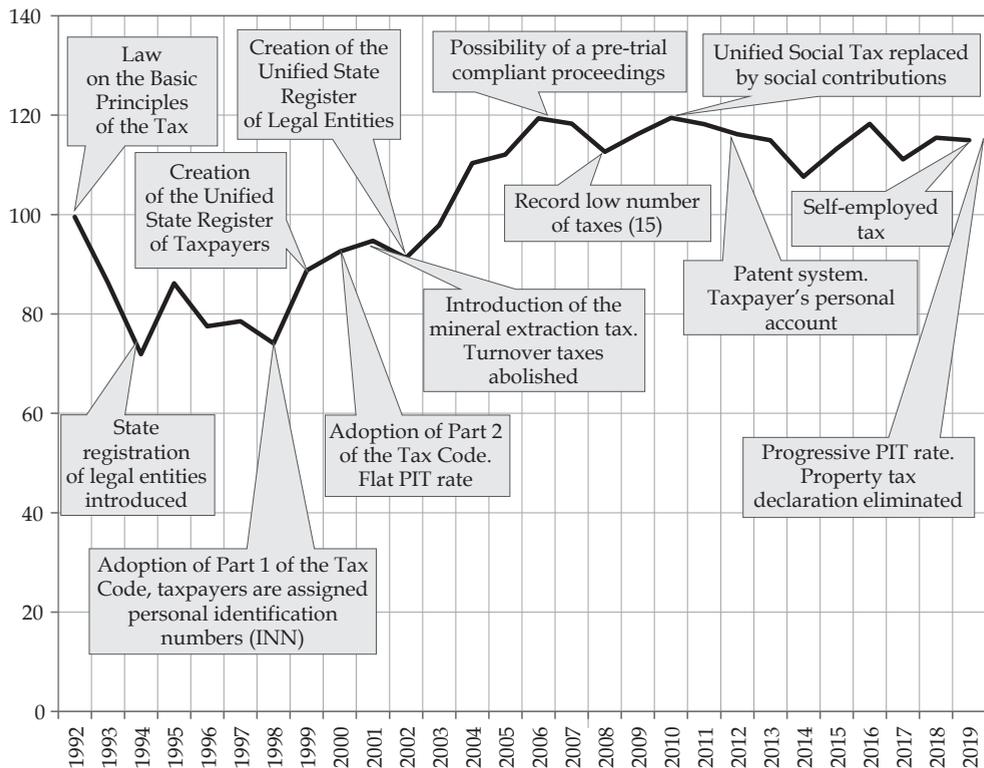**Fig. 1. Dynamics and projected development of the tax system, %**

*Fig. 2.* **Key events in the development of the tax system**

A more detailed analysis of the dynamics of the indicators included in the index of tax system development shows that after a long-lasting decline in tax revenue, in 2014 the government's tax revenue started to grow. It is in this period that the individual property tax and sales tax were introduced, and some changes were made into the corporate property tax computation procedure. The tax-to-GDP ratio hit its record high by 2008. Afterwards there was a decrease, which in all likelihood was caused by the economic recession. The reduction in the number of taxes in 2008 and a series of subsequent reforms slowed this process. In the following years, the tax-to-GDP ratio rose again. The tax burden on businesses was quite volatile. The burden was minimal in 1998, when the bankruptcy law was adopted, and enterprises' tax debt was written off. After a sharp fall in tax collection in the 1990s, this indicator recovered in the following

period. Since 2008, however, it has been stagnant, possibly because the effect of the previously taken measures has worn off. The number of individual entrepreneurs and farm businesses has been declining steadily since 2014 and the number of registered legal entities, since 2015. This decline can be explained by the changing market conditions rather than by the changes in the tax system. Finally, the number of taxes and levies increased after 2018, when the excess-profits tax and the self-employment tax were introduced.

Regarding the dynamics of the index of tax administration development, it is worth taking a look at one of its indicators – the number of functions performed by the tax administration. This indicator was rising steadily between 2008 and 2018, which, among other things, could have been a result of the government's efforts to create better conditions for business, to give the Federal Tax Service the authority to control the use of cash registers and

so on. In 1998–2013, there were staff reductions in the tax administration due to the centralization of staffing procedures (introduction of assessment criteria, standard structure and staff schedules for territorial tax offices) and to the creation of automated information systems (*AIS*) and data processing centers (*DPC*).

In 2004, the wage level of tax professionals hit the record low – in this year no bonuses were paid because the *Ministry of Taxes and Levies* transformed into the *Federal Tax Service*. The record high was achieved in 2007 due to the introduction of an incentive payment system. Spending on tax administration was at its minimum in 2006 and maximum, in 2017. In the former case this could be explained by the accelerated

growth in the government's expenditures in the pre-crisis period and in the latter, the opposite process of budget shrinkage during the crisis. The cost of tax administration in both cases was relatively stable.

The above-described trends are objective while their interpretations are more probabilistic in nature. Since the purpose of this paper is just to test the possibility of such factor analysis, we are not striving here for absolute precision.

The results of our analysis of the key events can now be used for a SWOT-analysis: we are going to build a SWOT matrix bringing to light the strengths and weaknesses, opportunities and threats in the development of the tax system and tax administration (see Table 7).
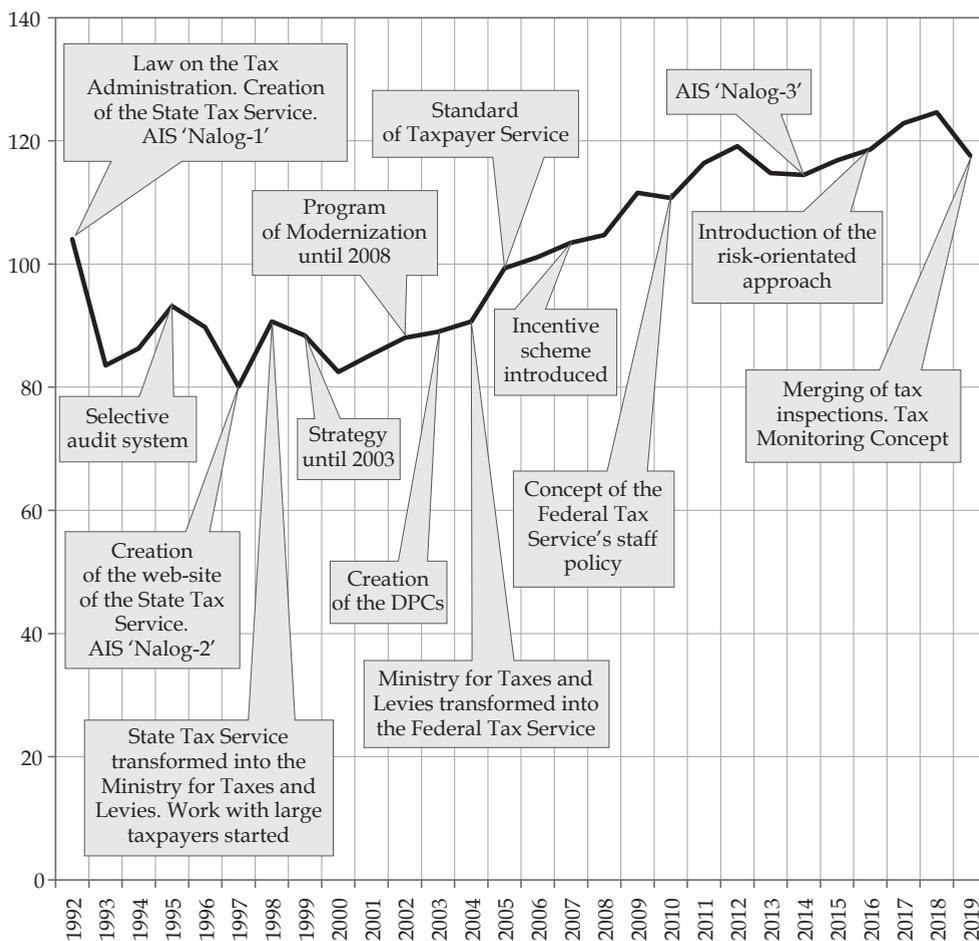


*Fig. 3.* **Key events in the development of the tax administration**

### SWOT matrix for the tax system and its agencies

| 1. Strengths | | 2. Weaknesses | |
|---|---|---|---|
| 1.1. Tax system | 1.1.1. Interactions with business<br>1.1.2. Reduction of the tax burden<br>1.1.3. Increase of the collection of mandatory payments | 2.1. Tax system | 2.1.1. Unstable legislation<br>2.1.2. Persisting corruption risks<br>2.1.3. Declining number of taxpayers |
| 1.2. Tax administration | 1.2.1. Concentration of functions<br>1.2.2. High percentage of young people<br>1.2.3. Competitive wage levels | 2.2. Tax administration | 2.2.1. Growing staff number<br>2.2.2. High staff turnover<br>2.2.3. Inadequate incentive schemes |
| **3. Opportunities** | | **4. Threats** | |
| 3.1. Tax system | 3.1.1. Digitalization<br>3.1.2. Increase in the share of tax revenue in the government's total revenue<br>3.1.3. Optimization of tax regimes, their flexibility | 4.1. Tax system | 4.1.1. New methods of tax evasion<br>4.1.2. Economic instability (COVID-19 pandemic, sanctions, etc.) |
| 3.2. Tax administration | 3.2.1 Stable staff costs<br>3.2.2. High education levels of the tax staff<br>3.2.3. Merging of tax offices in regions | 4.2. Tax administration | 4.2.1 Excessive staff in regional tax offices<br>4.2.2 Poor qualification of the graduates of specialized universities |

The analysis of the indicators included in the calculated indices has led us to align the key events with elements of the matrix. For example, the establishment of interregional inspections for data processing centers is considered an element of digitalization, which will open up new opportunities for the development of the tax system (factor 3.1.1). Changes in the structure and staff size of the Federal Tax Service are considered as one of the reasons behind the increased staff turnover (factor 2.2.1). As a result, all the key indicators and events were included in our matrix.

### 5. Discussion

Our findings agree with the previous research and can be used to formulate recommendations on how to enhance the tax administration's efficiency.

The digital transformation will inevitably lead to the death of paper-based reporting and will reduce the number of face-to-face interactions between tax officers and taxpayers (see, for example, Moloshnikova & Baytemirova [18]). Account statements are now sent by banks in an electronic form to the unified system of the Federal Tax Service. With the help of specially designed software, the tax authorities can now control the assessment of the value-added tax at each stage of the production process, reducing the risk of non-compliance (the so-called 'tax gaps'). It is also possible to automatically compare different indicators. The results of compliance control performed by individual tax officers are now available across the whole system. Digital technologies hold huge gains for tax administrators and enable them to practically exclude the possibility of prolonged non-compliance. By now, digital technologies have already started to contribute to the increased growth in tax revenue.

In future, the majority of the routine tasks of tax administration will be digitized and delegated to taxpayers themselves. The number of tax officers, who accounted for two-thirds of the total number of federal civil servants 20 years ago, now hardly exceeds one third. The majority of the staff have job security guarantees. Some of the tax officers are transferred to

other offices with new functions. In 2020, territorial tax inspections in 11 Russian regions were liquidated while in others the number of inspections was cut down. At the same time, however, new specialized units were established such as tax debt centers. The above-described changes are part of the state optimization initiative, which aims at eliminating the duplication of functions through downsizing of the public service and cost-cutting. In the light of the above, it would be advisable to develop a strategic approach to workforce reduction and retraining well in advance.

The ongoing organizational transformations involved in the transition of the tax system to a two-tiered structure of tax inspections can be taken further and include the transfer of taxpayer service functions to multifunctional centers of public services and the transfer of control functions to specialized institutions. International research describes cases of delegating tax functions to private institutions [10], however, such possibility has an inherent limitation due to the differences in the ways state and non-state subjects of the tax system negotiate moral imperatives [28]. We believe that this might also be true for Russia.

In line with the latest international trends, the new functions of the Federal Tax Service will deal primarily with law-making, data analytics and cybersecurity, public outreach and awareness raising [8]. All of the above will require fundamentally new staff competencies in comparison with the present-day qualification criteria. There is a good reason why within the new structure of the Federal Tax Service the creation of centers of competence is so widely discussed. In general, the staff working in tax administration are not quite prepared for the new tasks. It should be noted that until now, in the Russian tax administration, there is a prevalence of graduates of private universities (these usually have lower admission standards and are often associated with a lower quality of education) and some of the lagging state universities [27]. To attract more promising graduates, the tax administration needs to offer them

competitive pay. In other words, the remuneration system in taxation should be oriented towards development rather than stability. This confirms the theory that the government keeps the wage level for the tax administration staff as low as possible, just enough to retain them [7].

Staff rejuvenation does not change the current state of affairs since the majority of Russian universities cannot offer students opportunities to develop these competencies. In 2010, Mikhail Mishustin, the current Prime Minister of Russia, who was then the head of the tax service, called the tax administration a 'service company'. No matter how appealing this idea seems to those in the central tax office, however, they are having a hard time trying to sell it to the staff in regional offices, including young staff members. The lower levels of the system are often unable to catch up with the transformations initiated by managers at the upper levels although they are generally willing to follow the instructions. The culture of mutual trust and partnership with the taxpayers, which is seen as a foundation for the institutional transformation of the tax administration [6], has not been fully formed in Russia. One of the steps in this direction is the simplification of procedures for reporting and payment of taxes.

Quite illustrative in this respect is the self-employment or professional tax, which extends tax collection into the informal economy. Self-employed citizens can declare their income fast and easily and pay the tax at a low rate. Simplified procedures of tax accounting and reporting were also introduced for small businesses using online cash registers. The requirement to file transport tax and land tax declarations was abolished. Since 2021, the procedure for the personal income tax deduction for the acquisition or construction of an apartment or house has become faster since the Federal Tax Service now shares a common database with the banks. In the future, the amount of any tax could be calculated automatically, which will save the taxpayers time and effort but at a certain point will inevitably mean job losses for tax accountants.

The plans of the Federal Tax Service to introduce electronic document flow will spare the taxpayers the effort of having to regularly submit their documents for a tax inspection. A sharp drop in the number of field tax inspections in recent years stems from the 'soft enforcement' principle upheld by the Federal Tax Service, which means that compliant businesses should be less frequently subjected to the inconvenience of an audit. In the case of suspected non-compliance, companies would be requested to check their tax liabilities thus avoiding having to be subjected to a tax audit. All of the above enhances trust in the tax administration and the whole tax system. The same role is performed by tax monitoring. The new policy of the Federal Tax Service is based on the so-called soft law – the term coined by H. Gribnau [29]. This concept implies a shift away from the traditional deterrence approach to a more flexible strategy with an emphasis on justice, trust, and cooperation.

In general, however, such processes may be tricky and sensitive since an increase in tax transparency and automated tax computation may create the need for further downsizing of the tax administration and staff layoffs. There is a certain paradox in the fact that enhanced staff performance will make some of the jobs redundant.

Finally, we need to consider the limitations of this study and the future research avenues. As the empirical data accumulate, our findings could prove useful for cross-country analysis of the efficiency of the tax administration. In the Russian context, a promising avenue would be to consider the positive role played by the Bank of Russia in the development of the tax administration, more specifically, the 'cleaning up' of the banking sector in 2013–2014, which turned the banks into an important element of tax control. R. Hainsworth and W. Tompson [30] pointed out the potential role that the banks in Russia can play as agents of the state in the sphere of tax administration. It is also necessary to move gradually from studying formal processes, that is, from classical institutionalism, to evaluating the impact of such factors as trust and morality of tax subjects, in other words, to the neo-institutionalist approach. This shift in approaches is particularly relevant in the light of the ongoing transition to outsourcing some of the functions of tax administration.

## 6. Conclusions

As part of the first research task, we found an increase in the number of target indicators of the tax administration accompanied by their growing consistency with the institutional goals of the tax system. In the 2010s, there was a growth in the number of indicators for which comparable calculation methodologies were provided. Thus, our analysis has confirmed *Hypothesis* 1 (*H*1): there is an increasingly strong correspondence (relationship) between the key indicators of the tax administration and the goals of the national tax system, which means that the tax administration is now more orientated towards institutional priorities and, as a result, towards the provision of a public good.

To address the second task, we used indices reflecting the institutional development of the tax system and tax administration. The index for the tax system comprises seven indicators which meet the criteria of measurability, objectivity, relevance, comparability, independence and the accessibility of data. We have also outlined the drawbacks of the existing methodologies and ways of overcoming them. In general, in the given years, the index rose by 15.4%, which can be explained by the increasing tax-to-GDP ratio, reduction in the tax burden and improved tax collection processes. The index of tax administration development is based on four indicators. Between the 1990s and 2010s, the index grew by 13% mainly because of the expanded scope of functions of the tax administration accompanied by staff downsizing and optimization of the remuneration system. We found a significant statistical relationship between the indices of the tax system and tax administration, which supported *Hypothesis* 2 (*H*2)

that the development of the tax administration follows the general trends in the development of the country's tax system. The use of a regression model for predicting the development of the tax system has shown a moderate fall in the early 2020s but overall, the evidence fits into the general trends.

Our last research task was to identify the key events in the development of the tax system and tax administration. We compiled chronological tables and ranked the events in the order of importance. We showed the connection between the major milestone events and the dynamics of the corresponding indices. The analysis of these connections with a focus on selected indicators has confirmed *Hypothesis* 3 (*H3*) about the existence of the key events whose outcomes affected the development of the tax system and tax administration.

Thus, our analysis has confirmed the base hypothesis about the relationship between the development of the tax system and tax administration. There is, however, room for further research, both theoretical and practical, to see how this relationship can be used to enhance the efficiency of the tax administration.

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