

Artificial Intelligence and Tax Security: Between Efficiency and Vulnerability

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Abstract: In the context of rapid digital transformation, the tax system is becoming not only a fiscal but also a technological institution, directly impacting the state's economic security. This article examines the impact of artificial intelligence (AI) technologies on the sustainability, fairness, and legitimacy of tax administration in Russia. Based on an analysis of official Federal Tax Service statistics for 2019–2024, it shows how the implementation of systems such as ASK VAT-2 reduces the number of audits while simultaneously increasing their effectiveness and the volume of additional assessments. The authors reveal the dual nature of AI: on the one hand, it increases the effectiveness of the fight against tax evasion and the shadow economy, but on the other, it creates new risks—centralization of control, decreased taxpayer trust, and dependence on foreign solutions. Particular attention is paid to the institutional and strategic aspects of ensuring economic security in the era of algorithmic governance.

1 INTRODUCTION

The tax system has traditionally been viewed as a key institution for ensuring the state's economic security, fulfilling the functions of resource mobilization, income redistribution, and economic stabilization. In the context of global technological transformation, its ability to adapt to new challenges while maintaining sustainability, fairness, and efficiency is particularly important. At the current stage of digital economy development, the role of artificial intelligence as a tool for modernizing tax administration is becoming increasingly prominent. Automating audit processes, forecasting tax revenues, identifying anomalies in tax returns, and optimizing audit activities are just some of the opportunities AI offers tax authorities.


However, the rapid implementation of AI technologies in the tax sphere also gives rise to new risks that could undermine the state's economic security. These include the vulnerability of algorithmic solutions to manipulation, reduced transparency of tax controls, a growing digital divide between large corporations and small businesses, as well as ethical and legal conflicts associated with the


processing of large amounts of personal and financial data. Thus, a contradiction arises between the potential effectiveness of AI and the systemic threats it can pose if regulatory and institutional maturity is insufficient.

2 MATERIALS AND METHODS

The study utilized official statistical data from the Federal Tax Service of the Russian Federation for 2019–2024, including the dynamics of the number and effectiveness of desk and on-site tax audits, as well as indicators for monitoring the validity of VAT refunds.

The methodological basis of the study included tabular and comparative analysis, an economic-institutional approach, systems analysis, and a qualitative analysis of regulatory and policy documents.

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3 RESULTS AND DISCUSSION

Fiscal security is a fundamental component of the state's economic security system. It represents a set of conditions that ensure a stable and balanced financial position of budgets at all levels of the budgetary system, as well as the state's ability to promptly and fully meet the financial needs of both its administrative structure and society as a whole. Within the economic security system, fiscal security occupies a central position, as it serves as the basis for the smooth functioning of the national financial system, helps reduce the economy's vulnerability to external and internal economic and financial threats, and plays a key role in ensuring the stability of macroeconomic indicators and achieving socio-economic development goals (Shaikhrazieva, 2025).

In scientific and economic literature, tax security is understood as a state of the national economy in which the current tax system guarantees a stable and predictable flow of tax revenues to budgets at all levels in amounts sufficient for the state to implement its economic, social, defense, and other public functions, enshrined in strategic and regulatory acts. (Lazareva, Zueva, 2016).

A number of risks and threats affect the tax security of the state. Authors conducting research on this topic note the diversity of threats depending on the source of classification. Thus, Maslov K.V., depending on the elements of public administration, divides tax risks into external and internal; Depending on the object, it distinguishes between the risks of taxpayer groups and the risks of the activities of individual taxpayers; depending on the number of economic sectors whose functioning is affected by the risks, they are divided into sectoral, inter-sectoral and general sectoral (Maslov, 2025).

In another study, Maslov K.V. categorizes threats based on their source as public and private; based on their location, as internal and external; and based on their duration, as short-term, long-term, and permanent (Maslov, 2022).

Analyzing the work of other authors (Koroleva, Rodina, Ermoshina, Plekhotin, 2022; Molodykh, 2015; Maslov, 2024; Fyodorova, 2016), we can conclude that the main threats to tax security can be divided into three groups (Fig. 1).

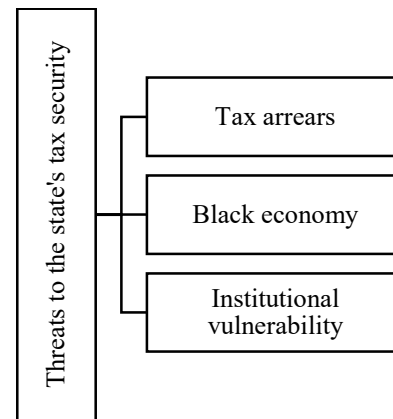


Figure 1: Main Threats to State Tax Security.

Tax evasion, especially in its systematic and organized form, leads to significant losses of budget revenue, distorts the competitive environment, and undermines the principles of tax fairness. It weakens the state's fiscal capacity, limiting its ability to perform public functions and fulfill socio-economic obligations. This problem is particularly acute in the context of economic globalization and digitalization, when cross-border tax minimization schemes and the use of low-tax jurisdictions are becoming increasingly complex and less visible.

The shadow economy, as a collection of unregistered or incompletely declared economic activity, increases tax security risks by depriving public finances of a significant portion of potentially collectible resources. In addition to fiscal losses, the shadow sector contributes to the degradation of the tax culture, creates unequal conditions of competition between legal and illegal economic entities, and complicates macroeconomic planning by distorting the statistical base. Institutional vulnerability of the tax system manifests itself in the ineffectiveness of tax administration, weak law enforcement, corruption risks, and the inability of institutions to adapt to new economic realities, including digital transformation and changes in the structure of economic activity. This vulnerability reduces taxpayers' trust in the state, contributes to the growth of informal tax evasion practices, and weakens the regulatory capacity of fiscal policy.

Taken together, these threats create a systemic risk to tax security, undermining its three key characteristics:

- sustainability – the ability to ensure a continuous flow of revenue;
- fairness – equality of the tax burden and adherence to the principles of vertical and horizontal equity;

— legitimacy – social recognition of the tax system as fair and effective.

Minimizing these threats requires a comprehensive approach combining improved legal regulation, modernization of tax administration, and strengthening institutional trust between the state and society.

Technological progress opens new opportunities for increasing the transparency and adaptability of fiscal systems. In this context, artificial intelligence is becoming a strategic tool capable of transforming approaches to identifying tax risks, monitoring transactions in real time, predicting taxpayer behavior, and optimizing control functions. The relevance of AI technologies stems not only from their potential to increase tax collection but also from

their ability to reduce the tax system's vulnerability to threats such as systemic tax evasion and concealment of economic activity.

Qualitative shifts in the tax control system, brought about by automation, are reflected in the reorientation of its functions from repressive measures to preventive support and advisory support for taxpayers. Thanks to automation, tax authorities are able to optimize the allocation of administrative resources, focusing on identifying and supporting high-risk entities while minimizing interference in the activities of bona fide business agents (Figure 2). This approach not only reduces the administrative burden on law-abiding taxpayers but also significantly improves the overall effectiveness and focus of tax administration (Bardakhchyan, 2025).

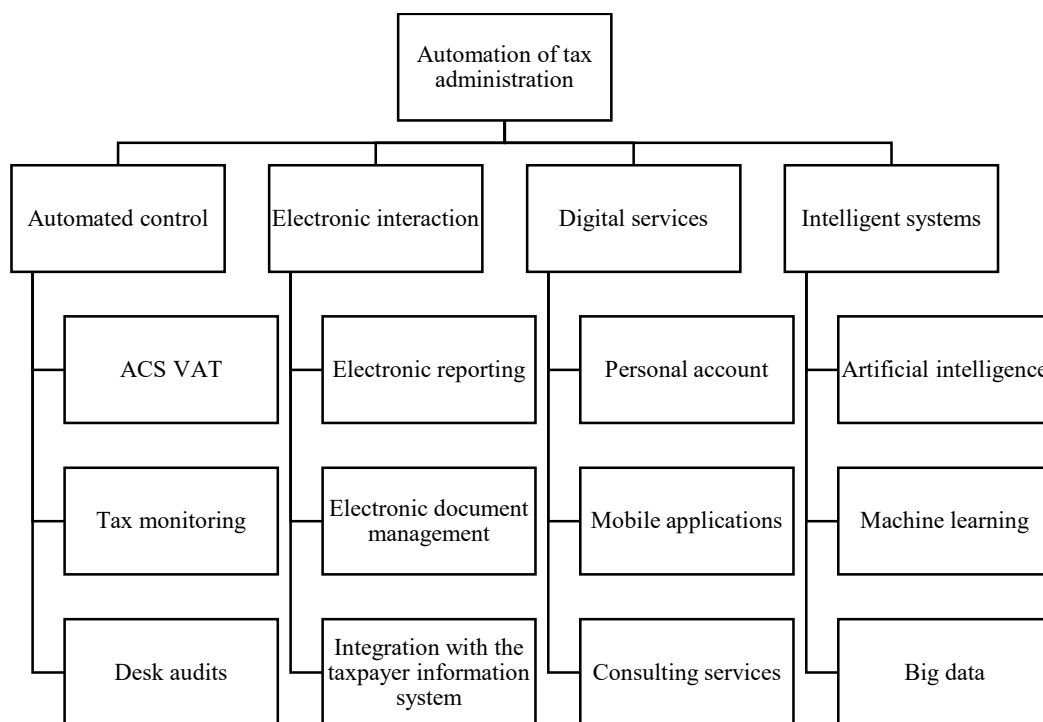


Figure 2: Structure of automated tax administration processes in the Russian Federation (Bardakhchyan, 2025).

Since 2015, the Federal Tax Service of the Russian Federation has consistently implemented a set of measures aimed at integrating artificial intelligence technologies into the analytical and control functions of tax administration. This process gained additional impetus in the context of the global crisis caused by the COVID-19 pandemic and the subsequent macroeconomic and structural shocks in 2020–2021. During this period, the Federal Tax

Service of Russia intensified its digital transformation efforts, significantly expanding the use of digital services and government information systems as key tools for ensuring the continuity and effectiveness of tax control in an environment of increased uncertainty and limitations in traditional forms of interaction with taxpayers. This transformation is reflected in quantitative indicators of tax administration performance (Table 1, Table 2).

Table 1: Performance indicators of desk tax audits for 2019–2024.

Number of conducted DAs, thousand units								
Number of DAs that identified violations, thousand units								
D								
Amount of additionally assessed taxes, million rubles.								

Source: https://www.nalog.gov.ru/rn77/related_activities/statistics_and_analytics/forms/

Data for 2019–2024 demonstrate a steady downward trend in the total number of desk tax audits conducted: from 62,843,700 in 2019 to 54,087,300 in 2024, a decrease of 13.93%. At the same time, the volume of additional taxes assessed following DAs increased more than 4.5-fold, from 21.5 billion rubles to 97.0 billion rubles. A particularly sharp increase was observed in 2021–2022, when the number of additional assessments nearly tripled.

The dynamics of the share of successful DAs—that is, audits that identified violations—is particularly significant. While in 2019–2020 this indicator fluctuated between 3.8–3.9% in 2019, it has consistently exceeded 4.4% since 2021, peaking at 5.07% in 2021 and maintaining elevated levels in subsequent years. This trend indicates a shift from mass, formal control to a targeted, risk-based approach. A likely reason for this shift is the active implementation of AI tools by the Federal Tax Service, in particular:

— the Comprehensive Tax Monitoring System (CTMS), based on big data analysis and machine learning to create a "tax profile" for each taxpayer;

— risk-based selection algorithms that identify anomalies in taxpayer behavior by comparing multiple external and internal sources (e.g., data from the Unified State Automated Information System (EGAIS), the Social Insurance Fund (FSS), the Pension Fund (PFR), the State Information System for Housing and Public Utilities (GIS Housing and Public Utilities), etc.);

— Automated models for identifying tax evasion schemes, including those involving "technical" firms and cross-border structures.

These technologies reduce the number of routine audits while simultaneously increasing the accuracy of identifying truly high-risk cases, which explains the increased effectiveness of DAs while reducing their number.

Table 2: Performance indicators for on-site tax audits for 2019–2024.

Number of conducted GNPs, thousand units								
Number of GNPs that identified violations, thousand units								
Share of effective GNPs, %								
Amount of additionally assessed taxes, million rubles.								

Source: https://www.nalog.gov.ru/rn77/related_activities/statistics_and_analytics/forms/

Unlike desk audits, on-site tax audits are inherently selective and resource-intensive. Over the analyzed period, their number decreased almost by half—from 9,400 in 2019 to 4,900 in 2024. However, despite volatility, the amount of additional taxes assessed following on-site audits increased by

40.16%—from 210.9 billion rubles to 295.6 billion rubles.

Most telling is the high and consistent effectiveness of on-site audits: the share of audits that identified violations remained at 95–98% throughout the entire period, reaching a record 97.96% in 2024.

This indicates an extremely high accuracy in target selection for on-site audits.

This effective selection was made possible by the use of AI technologies integrated into the Federal Tax Service's unified digital system. In particular, the following play a critical role:

- Predictive analytics models built on historical data on violations and tax schemes;
- Cross-checking algorithms that identify discrepancies between counterparties' declarations and their behavior in other segments of the economy;
- Visualization tools that reveal hidden shell companies and circular chains of offsets.

The decline in the amount of GNP, while the amount of additional assessments remains unchanged, and in some years even increased, indicates that the Federal Tax Service is focusing on the most risky and large taxpayers whose violations can cause significant damage to the budget system. The introduction of AI not only improves the quality of selection but also reduces administrative costs associated with excessive audits. The automated control system "ACS VAT-2" is a key element of the Federal Tax Service's digital infrastructure, aimed at increasing the transparency of goods and services in value chains. Commissioned in 2015 and consistently upgraded, the system provides end-to-end control over issued and deductible invoices based on real-time data analysis. Integration of ACS VAT-2 with other components of the Federal Tax Service's unified digital infrastructure, including artificial intelligence and machine learning systems, enables not only the identification of formal discrepancies but also the diagnosis of complex schemes for artificially understating the tax base, including those involving shell companies and transit structures. The implementation of this system has become an important step in the transition from retrospective to preventive tax control, significantly strengthening the tax system's resilience to the risks associated with manipulation in the area of VAT—one of the most vulnerable and revenue-generating taxes in the Russian budget (Table 3) (Osipov, Gulyaev, 2025).

Table 3: Dynamics of indicators for tax audits conducted to check the validity of VAT refunds for 2023–2024.

Number of VAT refund validity audits, units			
Number of audits resulting in VAT refunds			

deemed unjustified, units			
VAT amounts for which refunds were deemed unjustified by tax authorities, based on audit results, RUB thousands			

Source:

https://www.nalog.gov.ru/rn77/related_activities/statistics_and_analytics/forms/

Despite a slight decrease in the total number of VAT refund audits conducted—from 68,101 in 2023 to 65,702 in 2024 (a decrease of 3.5%)—the share of successful audits, i.e., those resulting in refunds deemed unjustified, remained high: 8.44% in 2023 and 8.25% in 2024. This demonstrates the consistently high accuracy of taxpayer selection for audits, demonstrating the maturity of the analytical tools used.

Most notable is the trend in VAT refund amounts deemed unjustified: in 2024, this figure amounted to 15.99 billion rubles, a 28.2% decrease compared to 2023. The decrease in the absolute number of additional assessments, coupled with the continued high success rate of audits, can be interpreted in two ways. On the one hand, this may reflect the preventative effect of AI-based systems such as the VAT-2 automated system, which identifies risky transactions in real time and prevents the submission of dubious refund claims. On the other hand, the decline in the volume of detected violations may indicate that fraudsters are shifting to more complex, difficult-to-detect schemes—for example, using legitimate companies as "screens" or cross-border chains.

As noted above, the VAT-2 automated system, which is actively integrated into the Federal Tax Service's unified digital system, uses machine learning and big data analysis to identify anomalies in invoice chains, discrepancies between counterparty declarations, and deviations from economically sound behavior. The system not only records existing violations but also prevents them by blocking risky transactions at the declaration submission stage. It is this preventative nature of control that likely explains the relative stability of the share of successful audits, despite a decline in both the number of audits and the volume of unjustified refunds identified.

The implementation of artificial intelligence technologies in tax administration significantly improves the technological efficiency of fiscal authorities by automating routine processes, enhancing analytical capabilities, and transitioning to a preventive, risk-based control model. Systems such as "SKNO," "ACS VAT-2," and predictive analytics modules enable the detection of anomalies in taxpayer behavior with high accuracy, reducing the number of untargeted audits and focusing resources on real threats. However, technological efficiency alone does not guarantee the stability of the tax system as an institution. Institutional stability presupposes not only technical reliability but also legitimacy, transparency, predictability of law enforcement, and the maintenance of a balance between the interests of the state and taxpayers. Overreliance on algorithmic decisions without adequate legal and ethical review mechanisms can lead to the dehumanization of tax control, undermine the presumption of good faith, and weaken trust in the fiscal system. In this context, the sustainability of the tax system is determined not so much by the level of automation as by the ability of institutions to adapt technologies to legal, social, and economic realities, ensuring their accountability and proportionality (Osipov, Gulyaev, 2025).

Digitalization and the implementation of AI contribute to a high degree of centralization of tax control: key decisions on selecting taxpayers for audit, identifying risks, and assessing their behavior are increasingly being made at the federal level based on uniform algorithms. This centralization increases consistency and reduces regional disparities in the application of tax legislation, but also carries significant risks:

- First, it limits the flexibility of local interactions between tax authorities and businesses, especially in highly sensitive sectors;

- Second, the opacity of machine learning algorithms and the taxpayer's inability to challenge the "risk assessment" as such can generate a sense of arbitrariness and unfairness.

In the long term, this leads to a decline in institutional trust, weakening tax discipline, and increasing hidden resistance—including through a shift to the shadow economy. Therefore, technological centralization must be accompanied by the development of feedback mechanisms, administrative appeals, and open decision-making, so as not to undermine the foundations of the social contract in the tax sphere.

The strategic importance of the tax system as an element of economic security makes the issue of

technological sovereignty critically important. The use of foreign artificial intelligence platforms, cloud services, or ready-made analytical solutions in the tax sphere carries risks that go beyond technical vulnerability:

- First, dependence on foreign software and algorithm providers creates the risk of losing control over key elements of the tax infrastructure in the face of geopolitical instability or sanctions pressure;

- Second, training AI models on data processed outside of national jurisdictions may violate personal and financial data protection laws and lead to the leakage of sensitive information about the structure of the economy and the behavior of market participants;

- Third, the implementation of "black boxes"—closed commercial algorithms whose logic is inaccessible to audit—complicates decision verification and makes the tax system vulnerable to manipulation by third parties.

Under these circumstances, ensuring technological independence, developing domestic AI solutions, and strictly regulating the use of foreign components are essential for maintaining national economic security.

To strengthen economic security in the context of the active implementation of artificial intelligence in the tax sphere, it is necessary to move from the fragmented use of technologies to a systemic policy in which economic effects and risks are assessed equally with technical functionality. Economically oriented standards for evaluating AI systems should be developed and implemented, including quantitative metrics for the cost of errors, calculations of the return on investment from implementing algorithms, and a macroeconomic analysis of the consequences—including the impact on GDP, employment structure, and the competitive environment. Such standards will not only justify budget allocations for digitalization but also minimize the negative side effects of automation, such as the displacement of small businesses or increased administrative pressure (Pomulev, 2022).

Specialized institutional mechanisms must be created to ensure transparency, accountability, and the scientific validity of AI solutions in the tax sphere. These should include independent economic audits of algorithms conducted by expert organizations with the participation of representatives from the academic community, business, and civil society, as well as regulatory sandboxes—controlled environments for pilot testing new AI tools and assessing their impact on taxpayers, budget efficiency, and market competition. Such mechanisms will identify systemic

biases, excessive aggressiveness, or discriminatory algorithms before their widespread implementation, reducing institutional and reputational risks for the state (Golodnikova, Efremov, Sobol, 2018).

Finally, it is necessary to ensure the strategic integration of economic security principles into national documents regulating the development of artificial intelligence and the digital transformation of public administration. This entails incorporating provisions aimed at protecting fiscal sovereignty, preventing technological dependence on foreign solutions, ensuring the sustainability of the tax base, and maintaining trust in institutions into the national AI strategy and the tax service's sectoral roadmaps. Only with such a systematic approach can the use of AI in the tax sphere become not just a tool for improving administrative efficiency, but also a sustainable factor in ensuring the long-term economic security of the state.

4 CONCLUSION

The study's results confirm that the implementation of artificial intelligence technologies in tax administration has a significant impact on the sustainability of the tax system and, more broadly, on the economic security of the state. Analysis of statistical data for 2019–2024 demonstrates a clear trend toward a decrease in the volume of routine audits, while simultaneously increasing their effectiveness and the amount of additional taxes assessed. This indicates a shift from mass audits to a preventive, risk-based model based on big data analytics and machine learning algorithms.

However, technological efficiency cannot be considered in isolation from institutional and macroeconomic consequences. Without proper regulation, independent auditing, and ensuring technological sovereignty, the use of AI carries the risks of centralization, reduced trust in fiscal institutions, and dependence on foreign decisions. Thus, to ensure sustainable tax and economic security, it is necessary not only to develop AI tools but also to integrate economic security principles into national digital transformation policies, create economically sound standards for evaluating AI systems, and strengthen institutional mechanisms for their accountability. Only such a comprehensive approach will transform artificial intelligence from a tool for administrative efficiency into a sustainable factor in national economic security.

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