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Tax Audit Efficacy in Türkiye

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Türkiye'de Vergi Denetiminin Etkililiği

Abstract

This study uses descriptive, relationship, and forecast analysis methods to examine the efficacy of tax auditing in Türkiye from 1995-2020. The study aims to determine the impact of the audit effort on audit revenue collections and to help tax practitioners and policymakers better structure the tax audit organisation to bring more revenue to the government. The findings show that the state should increase the number of tax audit personnel. This determination was made by demonstrating the relationship between the increase in audit personnel and audit income using the MedCalc statistical program. Regression analysis shows a positive relationship between audit revenue collections and the number of tax audit personnel.

Keywords : Tax Audit, Tax Auditor, Audit Income, Risk Analysis System, Spearman's Correlation Coefficient, Regression Analysis.

JEL Classification Codes : H20, H21, H26, K34.

Öz

Bu çalışma, Türkiye'de 1995-2020 dönemi vergi denetiminin etkililiğini betimsel analiz, ilişki analizi ve tahmin analizi yöntemleri kullanarak incelemektedir. Çalışmada amaç, denetim çabasının denetim gelir tahsilatları üzerindeki etkisini belirlemek ve vergi uygulayıcılarının ve politika yapıcıların vergi denetim organizasyonunu devlete daha fazla gelir getirecek şekilde daha iyi yapılandırmalarına yardımcı olmaktır. Bu belirleme, denetim personel sayısındaki artış ile denetim geliri arasındaki ilişkinin MedCalc istatistik programı kullanılarak ortaya konulmasıyla yapılmıştır. Regresyon analizi, denetim geliri tahsilatları ile vergi denetim personeli sayısı arasında pozitif bir ilişki olduğunu göstermektedir. Bulgular, devletin vergi denetim personeli sayısını artırması gerektiğini göstermektedir.

Anahtar Sözcükler : Vergi Denetimi, Vergi Denetmeni, Denetim Geliri, Risk Analiz Sistemi, Spearman Korelasyon Katsayısı, Regresyon Analizi.

1. Introduction

The efficacy of tax audit depends on increasing tax morale and tax awareness in taxpayers, management and organisation capability of tax administration; tax legislation is easy to be understood by everyone, number and quality of tax auditors; use of effective risk analysis models in the selection of taxpayers to be audited, increasing the level of digital technology of tax administration and many other factors. In societies where tax morale and awareness need to be sufficiently developed, the efficacy of the declaration principle is intertwined with the efficacy of the audit mechanism.

The Revenue Administration, affiliated with the Ministry of Finance, was established in 2005 with Law No. 5345 and tax inspectors were attached to this unit. The provincial organisation was established as tax office directorates and tax office directorates directly affiliated with the centre. Thus, two different units continued to be responsible for tax auditing, which led to a need for coordination in tax auditing. In 2010, with Law No. 6009, the Tax Inspection and Audit Coordination Board were established within the Ministry of Finance. In 2011, the Tax Inspection Board (VDK), which operates directly under the Minister, was established within the Ministry of Finance with the Decree-Law No. 646 (Official Gazette dated 10 July 2011 and numbered 27990).

Law No. 6009 on 23/07/2010, Amending the Income Tax Law and Some Laws and Decrees, is the first significant reform in Türkiye to ensure the efficacy of tax auditing. With this law, the establishment of the Tax Inspection and Audit Coordination Board has been ensured. In addition, a method based on risk analysis has been used to select the taxpayer to be audited.

With the decree, as of 10/07/2011, those who were in the positions of Chief Finance Inspector, Chief Accountant, and Chief Controller of Revenues were assigned to the positions of Chief Tax Inspector; Those who were in the positions of Finance Inspector, Tax Inspector, Income Controller, and Tax Auditor were appointed to Tax Inspector positions; Those who were in the positions of Assistant Finance Inspector, Assistant Tax Inspector, Trainee Income Controller, and Assistant Tax Inspector were appointed to the positions of Assistant Tax Inspector.

The centre consists of the President, Vice Presidents, Group Heads and Tax Inspectors (Tax Chief Inspector, Tax Inspector and Deputy Tax Inspector); on the other hand, the province consists of the treasury and property directorates (VDK, 2012: 1-2).

The Large Taxpayers Tax Office was established in 2007, and with this, taxpayers paying higher tax rates were separated from other taxpayers and became more auditable (VDK, 2007). To register the economy, three-year Fight Against Informality Strategy Action Plans have been implemented since 2008, and efforts have been made to prevent informality (VDK, 2008). In 1998, the Tax Offices Full Automation Project (VEDOP) began to be implemented. In 2010, all tax offices switched to this system, providing full automation

(VDK, 2011). The Tax Communication Centre (VIMER) was established to prevent informality, which ensured information exchange, thus leading to a new era in tax auditing.

The VAT Return Risk Analysis (VAT) System started to be implemented in 2010 to work towards the inspection of the return by using the time spent by the VAT refund personnel more effectively, eliminating the errors that may occur in the inquiries made, saving the tax offices from paperwork, speeding up the refund and deduction transactions, bringing a minimum standard to VAT refund transactions and ensuring a national unity of practice.

To combat the informal economy and misleading documents (nylon invoices), Ba-Bs (the form for notifying the purchase and sale of goods and services) was introduced in 2006. This aim was to cross-check and match the invoices issued by the companies to each other (VDK, 2006).

The VDK-BIS (Tax Inspection Board Information Processing System) application, which was prepared to carry out all business processes required by the duties assigned to the Tax Inspection Board with the Decree-Law No. 646, was made available to all Tax Inspectors as of February 2012. Electronic Document Management System (EBYS) was integrated into the VDK-BIS system on 09.01.2017 (VDK, 2012).

In 2013, Tax Audit Standards were established to increase the efficacy and efficacy of the audit. With these standards, the aim was to reduce the number of proceedings before the judiciary and to conclude the proceedings before the court in favour of the administration. Standards express the main principles of auditing. In the same year, "Report Evaluation Commissions" were established within the VDK Group Presidencies to ensure that the reports complied with the tax legislation by evaluating the tax inspection reports by authorised commissions before they were processed. In addition, a "Central Report Evaluation Commission" was established under the Presidency of the Board (VDK, 2013).

In 2014, the Tax Inspection Board started working on creating risk mapping for Türkiye to take an important step to help prevent tax loss and leakage and informality. With the new software developed by the Risk Analysis Centre [VDK-RAMER] within the body of VDK, risk scoring of each taxpayer, each sector, and each province has started (VDK, 2014). An action plan was implemented in the 2016-2018 period for tax audits to increase tax awareness and voluntary compliance (VDK, 2018).

The traditional processes, primarily paper-based, have been replaced by the Ministry of Finance's electronic tax applications that can be listed as "e-declaration, e-notification, ready declaration system, e-roll, e-book, e-invoice, e-ticket, e-statement -archive invoice, eclipse, etc." On 13.04.2017, the "Electronic Control Applications Branch Directorate" was established within the body of VDK (VDK, 2017).

For Electronic Tax Audit, VDK-RAS (Tax Inspection Board Presidency Risk Analysis System), VDK-VEDAS (Tax Inspection Board Presidency Tax Audit Analysis

System), VDK-SİGMA (Tax Inspection Board Presidency Continuous Surveillance and Audit Network), and E-Inspection were established. VDK-VEDAS, installed on 7,098 computers within the Presidency, received six different updates in 2021 and was upgraded from version 5.11 to version 5.21 (VDKİ, 2021).

1.1.8. According to the paragraph added with the numbered clause, "Documents issued as electronic documents within the scope of VUK will not be included in Form Ba and Form Bs notifications as of July 2021 (Erdem, 2021).

Looking at the literature, it can be seen that some of the researchers used the base difference per audit effort, while others considered the base difference found as a dependent variable. In this study, statistical analyses were made on audit income and the number of audit personnel, the number of inspections and the number of audit personnel, the relationship between the number of audit personnel and general budget tax revenues, and the income that the employment of additional audit personnel would bring to the state. In the analysis of the relationship between the number of personnel participating in the audit and the income obtained from the audit, the tax revenue proposed to be levied and collected as a result of the examinations made by the audit staff was taken as the audited income.

Some researchers have investigated the relationship between tax revenues collected and audit personnel. However, our country's vast organisational staff must be inspectors working in tax units, assistant income specialists, and other tax collectors. Therefore, in this study, it is considered more appropriate to consider the audited income earned by the audit staff to the treasury from the tax examinations.

According to the provisions of the Tax Procedure Law No. 213, Türkiye audits in three ways: polling, requesting information, and tax inspection. Tax inspections are an extremely important tax audit technique in determining the accuracy of the tax bases that are not paid or avoided by taking advantage of the gaps in the tax laws.

A tax audit is one of the most important tools of the state in reducing the informal economy. In tax systems based on the declaration, it is very important to determine this situation in case of incomplete or incorrect taxpayers' income statements. Taxpayers may choose to pay less tax or not pay tax at all, depending on their probability of being audited. For this reason, a tax audit is a deterrent that leads taxpayers to make correct statements. The inefficacy of tax audits may reduce the voluntary compliance of taxpayers over time. As a result, the probability of tax avoidance and tax evasion increases. An effective tax administration and audit process are extremely important in preventing informality.

2. Literature Review

The study by Feinstein in 1991 found that taxpayers with their businesses tend to evade tax more than other taxpayers. Hasseldine, in his research in 1993, revealed that tax audits are more effective in increasing voluntary compliance with tax if they focus on selected taxpayer groups rather than a random selection of people to be audited. In his

experimental study on undergraduate students in Malaysia in 2006, Loo stated that tax audits, tax rates, tax penalties, and tax structures impact taxpayer behaviour. He concluded that tax penalty rates are the most critical determinant of the voluntary compliance of taxpayers (Dumlupınar & Yanıoğlu, 2015: 6).

Yongzhi Niu used linear and nonlinear approaches to study tax audit efficacy in New York State from 2000 to 2008 in 2010. The linear approach showed a positive relationship between audit revenue and audit staff. Using an auditor's personnel definition that excludes senior auditors, he found that an additional auditor's impact on the treasury was $590,000. An auditor, including the senior level, found this effect to be 496 thousand dollars in the personnel definition. Using a non-linear approach, he stated that the marginal return for an extra direct staff member is $602,000. He also concluded that the government should increase the number of auditors to 1522 to maximise audit revenue, assuming the marginal cost of an additional auditor is fixed at $200,000 (Niu, 2010).

The Ernst & Young firm, in its research of 39 countries, found that in some countries, despite the decrease in the number of inspections, there are increases in the rate of extra tax levied per inspection. They have seen that using electronic systems and information-processing tools in tax auditing is effective in this result (Ernst & Young, 2013: 14-15).

In the study by Gangl et al. in 2015, the concepts of 'trust' and 'state power' were used to bring about voluntary tax compliance. It was stated that compliance would only be improved if both concepts were at a high level. It has been noted that the state's ability to increase taxpayers' compliance with taxation through auditing is ensured through the continuity of audits (Dumlupınar & Yarımoğlu, 2015: 6).

George Drogalas, Sorros Ioannis, Karagiorgou Dimitra, and Diavastis Ioannis investigated the efficacy of tax audits in companies and the perception of tax auditors in companies in Greece in 2015. They used factor analysis and multiple regression analysis in their research. They concluded that using information system tools depends on tax auditors' proper monitoring of tax violations and can contribute to increased tax audit efficacy. They also argued that constant changes in tax legislation prevent tax auditors from being effective in their work (Drogalas et al., 2015: 123-130).

Kwanchanok Hannimitkulchai and Phaprukbaramee Ussahawanitchakit investigated the effect of audit learning proficiency and innovation capability on audit survival in Thailand in 2016. As a result of their work, they found that supervisory learning competency and supervisory innovation ability have a positive effect on the mediator variable and supervision survival (Hannimitkulchai & Ussahawanitchakit, 2016: 487).

As a result of the statistical analysis of a survey study conducted by Henry Chalu and Hassan Mzee in Tanzania in 2018, five factors were found to determine the efficacy of tax auditing. The order of these factors is as follows; The implementation of the recommendations of the tax auditors by the management, the adequacy of the tax audit unit,

the attitude of the taxpayers, the existence and implementation of the tax audit regulations and standards, and the leadership and tax policies for tax audit (Mzee & Chalu, 2018: 35-63).

Brian Erard, Matthias Kasper, Erich Kirchler, and Jerome Olsen analysed the effect of tax audits on taxpayer attitudes in the USA in 2019 with their surveys. The study findings show that IRS audits can positively and negatively change taxpayer attitudes. While many taxpayers cannot recall the experience of a correspondence audit, such audits are still perceived as less fair than in-person reviews, suggesting that field and office audits may be more appropriate to deter smuggling. In addition, the audit result seems to affect the perceived risk of future reviews: Taxpayers with a positive tax adjustment perceive a higher audit risk than those who receive refunds or no tax changes (Erard et al., 2019: 78-130).

Beyene Yosef Nurebo, Deresse Mersha Lekaw, and Mathewos W/Mariam investigated the efficacy of tax audits in Ethiopia in 2019 by using descriptive statistics and multiple linear regression analysis through the Statistical Package for Social Sciences (SPSS) Version 20.0. Their studies show that management support, audit quality, taxpayer awareness, and a standardised integrated state tax administration system have a statistically significant positive effect on audit efficacy. In contrast, the complexity of tax law and tax accounting and reporting have a statistically significant negative impact on tax audit efficacy (Nurebo et al., 2019: 34-50).

Kay Blaufus, Jens Robert Schöndube, and Stefan Wielenberg, in their work in Germany in 2020, examined whether tax audit regimes become more efficient if financial statements are audited and tax auditors have access to internal statutory audit reports that provide information on statutory audit adjustments. As a result, their studies found that the productivity effects of this additional information depend on the strength of tax auditor incentives and the weight it gives to the book income of firms (Blaufus et al., 2020: 24-27).

Madina Serikova, Lyazzat Sembiyeva, Maryna Karpitskaya, Lyazzat Beisenova, Balsheker Alibekova and Aigerim Zhussupova in their work to offer practical suggestions for improving the state tax audit and tax administration in the innovation conditions in Kazakhstan in 2020, they said that three indicators affect the efficacy of tax auditing. They found that the efficacy of the state's tax audit is sufficient in Türkiye (Serikova et al., 2020: 2779).

Nicholas Karyeija investigated the factors determining the efficacy of tax auditing using a qualitative approach in Uganda in 2021. The auditee identified five factors: the organisational environment, senior management support, organisational independence, and the effects of audit quality on tax audit efficacy and revenue department. According to Karyeija, the corporate environment has a negative impact on the efficacy of tax auditing. These five independent variables account for 81% of the contribution to the efficacy of tax auditing in revenue departments (Karyeija, 2021).

Kay Blaufus, Jens Robert Schöndube & Stefan Wielenberg, in their work in Germany in 2022, examined whether tax audits are more efficient if tax auditors have access to information about statutory audit arrangements. They concluded that granting access to statutory audit arrangements sometimes increases tax revenues but reduces the frequency of tax audits. They also said that growing information sharing between statutory and tax auditors could be a policy tool that reduces tax evasion and increases the efficacy of tax auditing (Blaufus et al., 2022: 21-22).

Shemelis Zewdie Mersha, Amsalu Bedemo Belaye, and Lemessa Bayissa Gobena, in their study in Ethiopia in 2022, investigated the determinants of tax audit quality using simultaneous triangulation and mixed research approaches. As a result, their work found that audit input factors, audit process, and contextual factors have a positive and significant effect on tax audit quality (Mersha et al., 2022: 181).

3. Data

As data sources in the study, the official statistics of the Ministry of Treasury and Finance for 1995-2020 are taken as a basis. The annual reports, corporate financial situation and expectations reports, budget realisation reports and statistics of the Ministry of Treasury and Finance, the Tax Inspection Board, the Revenue Administration and the Strategy Budget Department were discussed.

Many factors affect the efficacy of tax auditing. However, the most important of these is the number of supervisors. The length of service is as important as the number of supervisors. However, this issue has yet to be brought to the fore in this study since the inspectors are recruited after very good training in the country.

3.1. Audit Output: Audit Revenue

For the audit output data, the tax amount proposed to be levied and collected as a result of the audit for 1995-2020 is considered audit income. The amount of the proposed fines are not included in the total income to reduce the possibility of error since data is only available for part of the period, and penalties are generally agreed upon. According to research, considering only tax amounts will enable us to reach a healthier result since only a small part of the proposed tax amount is agreed upon. In addition, the total tax revenues in the general budget were taken as the audit output for a second correlation.

The number of personnel participating in the audit for the effort is considered collectively. Working hours have yet to be discussed here, as all staff has specific official working hours. The title of the personnel in charge of tax audit changed in the period under consideration and became a tax inspector. Tax inspectors are assigned as chief tax inspectors, tax inspectors, and assistant tax inspectors. These three titles are named tax auditor for convenience in statistics.

The relationships between the audit staff and the number of reviews, audit income, and tax revenues were analysed by regression and correlation analyses using the MedCalc statistical program.

Economic conditions affect tax audit revenue collections. In this study, net data on the salaries given to tax audit personnel could not be reached in the examined period. For this reason, the optimal number of tax auditors that the state should employ could not be calculated.

3.2. Summary Statistical Data and Results on Tax Audit

Tax Inspection Board Presidency was established in 2011. The units responsible for tax auditing were combined, and the Tax Inspectorate staff was formed.

In fulfilling the duties assigned to the Presidency, it is stated in Article 228 of Presidential Decree No. 1 that Departments may be established directly subordinate to the Presidency with the approval of the Minister where deemed appropriate to provide sectoral and functional specialisation and division of labour.

In this context, with the Ministry's Approval dated 21.09.2020, the Presidency;

a) Audit Department,
b) Tax Evasion Inspection Department,
c) Tax Refunds Audit Department,
d) Department of Sectoral Audit

has been organised in this form.

The Presidency carries out its activities at the centre through the President, 5 Vice Presidents, 11 Heads of Departments, and 22 Branch Offices. To ensure specialisation and division of labour in fulfilling the duties assigned to the Presidency and efficient use of the workforce, 22 Departments were established in 9 provinces directly affiliated with the Presidency. A Head of Department and a sufficient number of Deputy Heads were assigned to each Department with the approval of the Minister. In this context, 22 Department Heads and 117 Deputy Heads serve in the Departments (VDK, 2021: 12).

Chief tax inspector, tax inspectors, and their assistants; were distributed to the tax evasion audit department, tax refunds audit department, and sectoral audit departments with the Tax Inspection Board Regulation published on 07.04.2021 (Official Gazette dated 07.04.2021 and numbered 31447).

The organisational structure of the Tax Inspection Board is as follows:

Table: 1
Development of Tax Audit Staff over the Years

Years	VBM (Empty)*	VM (Empty)	VMY (Empty)	TOTAL (Empty)	Annual Increase Rate of Total VM and VMY (%)**
1995	-	1.912 (N/A)	105 (N/A)	2.017 (N/A)	N/A
1996	-	1.890 (N/A)	147 (N/A)	2.037 (N/A)	1,0
1997	-	1.825 (N/A)	126 (N/A)	1.951 (N/A)	-4,2
1998	-	1.733 (N/A)	141 (N/A)	1.874 (N/A)	-3,9
1999	-	1.630 (2019)	175 (3125)	1.805 (5.144)	-3,7
2000	-	1.675 (N/A)	221 (N/A)	1.896 (N/A)	5,0
2001	-	1.678 (1971)	244 (3056)	1.922 (5.027)	1,4
2002	-	1.678 (1971)	422 (2878)	2.100 (4.849)	9,3
2003	-	1.756 (1893)	686 (2614)	2.442 (4.507)	16,3
2004	-	1.712 (1937)	1.010 (2290)	2.722 (4.227)	11,5
2005	-	1.707 (N/A)	990 (N/A)	2.697 (N/A)	-0,9
2006	-	1.768 (N/A)	907 (N/A)	2.675 (N/A)	-0,8
2007	-	1.761 (N/A)	1.112 (N/A)	2.873 (N/A)	7,4
2008	-	1.778 (N/A)	939 (N/A)	2.717 (N/A)	-5,4
2009	-	1.879 (N/A)	917 (N/A)	2.796 (N/A)	2,9
2010	-	2.073 (N/A)	1.184 (N/A)	3.257 (N/A)	16,5
2011	-	(N/A)	(N/A)	(N/A)	(N/A)
2012	367 (622)	2.257 (6094)	1.889 (5266)	523(11.982)	21,0
2013	326(565)	2.714 (2.730)	2.508 (5.397)	5.550 (8.697)	22,7
2014	295(596)	3.121 (2.323)	5.796 (2.109)	9.214 (5.033)	66,01
2015	288(1.601)	3.556 (2.188)	5.360 (1.245)	9.205 (5.040)	-0,09
2016	391 (1.650)	3.018 (3.226)	5.244 (861)	8.502 (5.743)	-7,63
2017	219(1670)	2868 (3626)	5.156 (699)	8.244 (6001)	-3,034
2018	220(1.669)	2.822 (3.672)	5.220 (1.635)	8.263 (6.982)	0,23
2019	205 (1684)	4.260 (3929)	3.677 (1483)	8142 (7096)	-0,13
2020	203 (1.889)	6.053 (11132)	1.691(2217)	7947 (15238)	-2,39
2021	1.164(725)	5.588 (5.544)	981(1.236)	7733 (7505)	-2,69

Source: Relevant Years General Directorate of Revenues, Revenue Administration and Tax Inspection Board Activity Reports.
VM: Tax Inspector
VMY: Assistant Tax Inspector
N/A: No data found.
** Data in parentheses refer to vacancies.*
***Calculated by the author.*

As seen from Table 1, although there are fluctuations in the audit staff for some periods, there is a clear increasing trend. The most important issue is the existence of vacancies in numbers that are close to the current number of personnel. While there were 11982 vacancies in 2012, there are 7505 vacancies as of the end of 2021. In 2017, 6001 vacancies existed. The fact that tax audit staff have resigned from their professions, especially in recent years, and have the opportunity to work with high wages in financial consultancy, in particular, is an important reason for the vacancies of the positions (Günaydın, 2022).

The first point that draws attention in Table 2 is that, especially after 2008, the Turkish Tax Administration made an audit move. The number of taxpayers audited by years, apart from the crisis period of 2000-2003, oscillates but consists of figures close to each other, as seen. On the other hand, the number of inspectors participating in the audit gradually increased. After 1995 (386 inspectors), audit participants jumped (1,167 in 2008 and 8,252 in 2020). Authorised civil servants who weren't inspectors were also used a lot in inspections (while only 4390 civil servants were employed in 1995, this figure increased to 47,190 in 2008 and closed 2012 with 47,556 civil servants). As a natural result of this, there has been a significant decrease both in the number of taxpayers audited per inspector (from

10,692 in 1995 to 364 in 2020) and in the number of audited taxpayers per total audit staff (which decreased from 864 in 1995 to 364 in 2020).

On the other hand, the number of inspections per inspector increased steadily, rather than jumping, from 47,649 in 1995 to 73,283 in 2007, closing the year 2020 with 145,202 inspections. As a result, the number of taxpayers per inspector has decreased in the country, but the number of investigations increased with increased staff. This leads to the expectation of an increase in audit quality.

Table: 2
Tax Audit Activity, Key Variables Related to Tax Audits

Years	Number of Tax Inspectors Participating in the Audit ****	Number of Authorised Polling Officers Participating in the Audit *	Number of Inspections Performed by Tax Inspectors (thousand people) **	Number of Audited Taxpayers	Number of Audited Taxpayers per Inspector ***	Number of Inspected Taxpayers per Total Inspector ***
1995	386	4.390	47.649	4.127.233	10.692	864
1996	450	4.487	46.406	4.647.853	10.329	941
1997	542	4.066	58.256	3.898.920	7.194	846
1998	307	3.841	61.635	4.460.098	14.528	1.075
1999	192	3.915	47.428	4.731.624	24.644	1.152
2000	452	3.138	55.310	5.029.339	11.127	1.401
2001	160	3.637	46.013	3.448.523	21.553	908
2002	131	2.963	56.864	2.866.037	21.878	926
2003	187	4.320	47.886	2.903.111	15.525	644
2004	295	4.554	50.292	3.176.412	10.767	655
2005	208	3.571	50.700	3.342.798	16.071	885
2006	219	3.720	67.282	3.778.146	17.252	959
2007	211	6.109	73.283	4.513.740	21.392	714
2008	1.167	47.190	68.089	4.313.620	3.696	89
2009	918	46.452	67.105	3.811.489	4.152	80
2010	828	45.108	N/A	3.753.669	4.533	82
2011	N/A	45.634	N/A	3.462.338	N/ A	N/A
2012	3.890	47.566	105.761	2.422.975	622	47
2013	4.509	N/A	163.367	2.460.281	622	545
2014	933	N/A	149.047	2.472.658	628	628
2015	4.051	N/A	159.500	2.527.084	623	623
2016	5.994	N/A	185.462	2.541.016	423	423
2017	6.449	N/A	119.026	2.636.370	320	320
2018	6.528	N/A	135.103	2.727.208	330	330
2019	6.553	N/A	128.420	2.813.452	346	346
2020	6.730	N/A	145.202	3.004.329	364	364

Source: Relevant Years General Directorate of Revenues, Revenue Administration and Tax Inspection Board Activity Reports.
N/A: No data found.
** Widespread and intensive control throughout Türkiye.*
*** If more than one period of a taxpayer is examined while finding the total number of inspections, each period is considered a separate inspection.*
**** Calculated by the author.*
***** Excluding administrative duties inside and outside the Board, unpaid and other leave, RDK (Report Evaluation Commission), İİTDK (Committees for Evaluation of Notification and Investigation Requests) and tax auditors who do not actively conduct tax inspections without authorisation.*

Table 3 shows the expenditures made on the audit personnel and the collection of general budget tax revenues over the years. Since the Tax Inspection Board started operating in 2012 and published annual activity reports this year, the expenditure data for the audit personnel before 2012 could not be reached. Expenditures on audit personnel and collection of tax revenues have gradually increased.

Table: 3
Expenditures on Audit Staff, Tax Revenues

Years	Personnel Expense	General Budget Tax Revenues Collection
1995	N/A	1.084.350.504
1996	N/A	2.244.093.830
1997	N/A	4.745.484.021
1998	N/A	9.228.596.187
1999	N/A	14.802.279.916
2000	N/A	26.503.698.413
2001	N/A	39.735.928.150
2002	N/A	59.631.867.852
2003	N/A	84.316.168.756
2004	N/A	101.038.904.000
2005	N/A	119.250.807.000
2006	N/A	151.271.701.000
2007	N/A	171.098.466.000
2008	N/A	189.980.827.000
2009	N/A	196.313.308.000
2010	N/A	235.714.637.000
2011	N/A	284.490.017.000
2012	255.905.077	317.218.619.000
2013	258.039.722	367.517.727.000
2014	430.021.327	401.683.956.000
2015	559.270.720	465.229.389.397
2016	617.231.848	529.607.900.959
2017	636.152.620	626.082.414.676
2018	736.271.482	738.180.401.147
2019	806.256.109	819.603.098.822
2020	953.991.503	983.258.493.000
2021	1.120.672.541	1.395.545.673.000

Source: Annual reports of VDK and HMB for related years.

Table: 4
Review Rate of Taxpayers in Türkiye

Years	The Number of Real Taxation Taxpayers *	The Number of Taxpayers Examined **	The Review Rate ***
1995	2.149.693	56.096	2.61%
1996	2.173.144	54.536	2.51%
1997	2.253.041	63.198	2.81%
1998	2.415.771	68.748	2.85%
1999	2.548.418	51.731	2.03%
2000	2.388.850	60.335	2.52%
2001	2.334.209	68.132	2.91%
2002	2.315.241	113.244	4.89%
2003	2.340.742	68.251	2.91%
2004	2.406.661	153.881	6.39%
2005	2.284.665	104.578	4.57%
2006	2.321.700	110.442	4.75%
2007	2.358.935	135.847	5.75%
2008	2.342.544	113.073	4.82%
2009	2.324.094	92.752	2.06%
2010	2.345.325	8.524	0.36%
2011	2.367.721	28.937	1.22%
2012	2.422.975	46.845	1,93%
2013	2.460.281	71.352	2,90%
2014	2.472.658	55.284	2,24%
2015	2.527.084	58.676	2,32%
2016	2.541.016	49.817	1,96%
2017	2.636.370	44.182	1,68%
2018	2.727.208	44.376	1,63%
2019	2.813.452	40.763	1,45%
2020	3.004.329	47.597	1,58%

Source: It is compiled by the author from the reports of official institutions.
** Taken from the website of the Revenue Administration.*
*** Taken from 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, and 2020 Annual Reports of the Tax Inspection Board, the 2019 and 2020 Annual Reports of the Ministry of Treasury and Finance and GGM and GİB activity reports for the relevant years.*
**** Calculated by the author.*

Table 4 shows the percentage of active income and corporate taxpayers whose tax inspection is carried out. However, this ratio needs to relay the number of taxpayers audited. Thanks to the increasing technological possibilities and data sources, risk analyses are made before all active income and corporate taxpayers. Only those deemed risky are referred for tax inspection. In addition, taxpayers who do not feel the need to conduct a tax audit can use other audit tools.

The main reason the total number of examinations stated in Table 2 is higher than the number of taxpayers examined in Table 4 is that taxpayers are subject to tax examination of different tax types or that the accounts or transactions of taxpayers belonging to more than one period are subject to examination.

The tax inspection rate is an indicator calculated by dividing the total number of inspections by the total number of income and corporate taxpayers. The high rate of taxpayers subject to audit shows that the economic efficacy of auditing has increased by raising tax revenues by reducing tax losses and evasion. However, there are some criticisms regarding the achievement of this indicator. Differences in the scope and definition of tax inspection are among the main criticisms of this indicator. It has also been criticised for aspects such as the difficulty of monitoring audit techniques other than tax inspection in the context of technological developments, taxpayers' data can be monitored before they reach the audit stage and effective risk assessment systems. While the inspection rates were 2-3% until the 2000s, after 2004, they took values in the range of 4-6% (Besel, 2017: 85). After 2009, they decreased to 1-2%.

The fact that the number of taxpayers examined, and therefore the rate of examination, is so low shows the importance of the system based on risk analysis, that is, a system in which taxpayers should be given priority.

One factor affecting the number of taxpayers examined may be that the Tax Inspection Board reports directly to the minister. In this respect, it seems possible to use tax audits as a political alignment tool.

Table 5 shows tax audits, collections, collection costs, and the number of taxpayers audited. Theoretically, improving audit quality should improve tax collection and tax burden. As seen in Table 5, the decrease in collection costs, that is, the increase in productivity, indicates that the audit quality has increased. In 1995, 1.02 TL was spent for 100 TL tax collection; this figure reached 2.02 towards the 2000s but then entered a rapid downward trend and eventually closed the year 2020 with 0.46 TL. This decrease occurred despite the increase in audit personnel; naturally, the increase in personnel expenditures is positive. It can be concluded that VEDOP1-2-3 projects have impacted this effect.

VEDOP (Tax Office Automation Project) was started in 1995 as a pilot project for the automation of tax offices. As a result of the pilot project's success, the VEDOP-1 project began on November 25, 1998. Within two years, 155 tax offices and five tax offices in 22

provinces were automated, and the project was completed. The VEDOP-2 project, the second phase, was started and completed in 2004. The third phase of the project, VEDOP-3, began in July 2007 (Hepaksaz & Hayrullahoğlu, 2011: 113).

The steady increase in the variable of the number of inspections carried out by the tax inspectors was more or less reflected in the base difference found as a result of the inspections, the tax amount proposed to be levied, the amount of the proposed penalty, and tax revenues. A steady increase is observed despite the fluctuations.

Table: 5
Tax Audits, Tax Collection

Years	Expenditure Made to Collect 100 TL Tax (TL)	Number of Inspections Carried Out by Tax Inspector	Proposed Tax Amount (thousand TL)	Amount of Penalty Recommended (thousand TL)
1995	1,02	47.649	19.149	N/A
1996	0,93	46.406	34.708	N/A
1997	1,65	58.256	90.426	N/A
1998	1,38	61.635	264.580	N/A
1999	2,02	47.428	328.992	N/A
2000	1,58	55.310	538.050	N/A
2001	1,71	46.013	958.446	N/A
2002	0,72	56.864	1.803.750	N/A
2003	0,74	47.886	3.309.729	N/A
2004	0,83	50.292	2.836.615	N/A
2005	0,79	50.700	2.724.562	N/A
2006	0,76	67.282	4.212.648	N/A
2007	0,74	73.283	5.356.979	N/A
2008	0,75	68.089	7.803.234	N/A
2009	0,82	67.105	7.203.822	N/A
2010	0,69	N/A	N/A	N/A
2011	0,68	N/A	3.926.153.961	6.540.331.412
2012	0,69	46.845	4.535.523.091	8.776.095.415
2013	0,57	71.352	8.561.313.250	19.086.884.477
2014	0,58	55.284	7.939.389.423	16.582.633.968
2015	0,53	159.500	9.803.999.983	18.843.082.627
2016	0,54	185.462	7.234.873.130	15.904.492.736
2017	0,49	119.026	5.878.506.580	14.370.585.724
2018	0,46	135.103	8.722.800.218	19.862.613.528
2019	0,47	128.420	10.409.577.465	23.520.286.333
2020	0,46	145.202	24.921.860.064	40.258.714.890

Source: GGM, GİB and VDK activity reports for the relevant years; GİB tax statistics.
N/A: No data found.

As observed, there has been an increase in tax inspections and inspection income. In addition to VEDOP projects, the work of the VDK Presidency affects this. The works of the "Disguised Capital, Transfer Pricing and Foreign Earnings Group Presidencies" have impacted VDK's audits within the scope of risk analysis, which aimed to prevent tax evasion in the fuel and tobacco sector. In addition, it is thought that the tax inspection-oriented e-audit system (VEDAS) affects making effective and short-term analyses and determinations in the electronic environment.

Table 6 shows the share of tax revenues in general budget revenues and the tax burden. While the share of tax revenues in general budget revenues is increasing, the share of non-tax revenues is decreasing. Here, it can be seen that privatisation policies affect the public sector. A healthier structure based on tax revenues gaining weight in public finance is a positive move.

Table: 6
Tax Revenues, Tax Burden

Years	Share of Tax Revenues in General Budget Revenues (%)	Tax Burden / GDP (after 1999, based on 1998) (%)
1995	77,8	14,0
1996	83,0	15,2
1997	82,5	16,5
1998	78,8	17,7
1999	79,3	19,1
2000	80,2	21,3
2001	78,1	22,3
2002	79,9	17,0
2003	85,5	18,0
2004	84,1	18,0
2005	80,4	18,4
2006	82,9	18,1
2007	84,1	18,1
2008	84,3	17,7
2009	84,3	18,1
2010	86,6	19,2
2011	89,0	19,6
2012	87,5	19,7
2013	87,4	20,2
2014	87	19,5
2015	89	19,8
2016	87	20,2
2017	89	20,0
2018	87	19,6
2019	82	19,0
2020	85	19,5

Source: GGM, GİB and VDK activity reports for the relevant years; GİB tax statistics.

Table: 7
Number of Taxpayers

Years	Number of Income Tax Registered Taxpayers *	Number of Corporate Taxpayers *	Number of New Obligations Established as a Result of Audit **	The ratio of Undeclared Base to Potential Base *** (%)
1995	1.829.995	319.698	N/A	30
1996	1.766.314	406.830	N/A	21
1997	1.780.142	472.899	N/A	28
1998	1.882.489	533.282	N/A	28
1999	1.988.007	560.411	56.738	45
2000	1.846.294	581.574	50.107	35
2001	1.768.653	565.556	42.433	65
2002	1.729.260	585.981	42.262	37
2003	1.735.722	605.020	42.296	42
2004	1.774.568	632.093	51.611	46
2005	1.691.499	593.166	40.062	N/A
2006	1.712.719	608.981	40 248	N/A
2007	1.724.366	634.569	51.686	N/A
2008	1.701.865	640.679	39.629	N/A
2009	1.683.308	640.786	39.681	N/A
2010	1.693.316	652.009	37.965	N/A
2011	1.703.754	663.967	28.060	N/A
2012	1.760.785	664.025	45.068	N/A
2013	1.798.056	662.225	N/A	N/A
2014	1.798.738	673.920	N/A	N/A
2015	1.827.180	699.904	N/A	N/A
2016	1.819.492	721.524	N/A	N/A
2017	1.768.653	759.242	N/A	N/A
2018	1.920.586	806.622	N/A	N/A
2019	1.964.548	848.904	N/A	N/A
2020	2.086.100	918.229	N/A	N/A

Source: GGM, GİB, and VDK activity reports for the relevant years. N/A: No data found.
** Real taxed.*
*** Widespread and intensive control throughout Türkiye.*
****After 2005, the authorities passed to the GİB, and the GİB stopped publishing data on this variable, one of the most basic indicators of tax loss and evasion in Türkiye.*

The increase in the tax burden, albeit slightly upward, shows itself in the form of up-down oscillations rather than a steady increase.

Table 7 shows the number of income tax and corporate taxpayers, the number of new taxpayers established due to the audit, and the rate of the non-declaration base.

The number of income taxpayers remained at the same levels with slight fluctuations from the beginning to the end of the period, with up-down oscillations. The number of corporate taxpayers has increased significantly. Encouraging incorporation in financial legislation has a significant role in this.

We can't make a good comparison about the rate of the non-declared tax base, which can be considered the most critical indicator of informality in an economy since the Revenue Administration stopped publishing this data after 2000. Essentially, the undeclared base is one of the most critical indicators of informality in an economy. While the rate of the undeclared base was 30% in 1995, it became 46% at the end of 2004. The deep economic crisis experienced in the country between 2000-2001 had a significant impact on this. However, the reason for a country's disruption, relaxation or failure of tax audits is not only considered an economic crisis. A weakness of supervision is thought to be at work in this context.

Table: 8
Pre-Assessment Settlement Results

Years	Tax Amount Subject to Settlement Before Assessment	Amount of Tax Agreed Before Assessment	Penalty Subject to Pre-Assessment Settlement	Penalty as a result of the pre-assessment settlement
2012	578.870.442	443.628.715	971.494.358	56.223.245
2013	1.549.420.358	725.155.936	2.373.432.278	90.813.677
2014	1.742.391.255	529.738.390	1.841.132.397	60.234.417
2015	2.464.222.476	973.203.569	3.563.887.588	138.749.157
2016	402.224.048	384.614.612	821.598.182	160.720.602
2017	799.234.626	303.551.158	1.208.386.889	115.400.488
2018	717.071.698	225.035.135	1.057.680.762	78.272.795
2019	329.409.037	323.965.439	367.894.659	68.260.896
2020	635.546.965	626.804.215	721.310.376	129.819.286

Source: VDK annual reports for relevant years.

As seen in Table 8, the tax amount subject to the pre-assessment settlement has fluctuated from approximately 579 million TL at the beginning of the period to about 636 million TL at the end of 2020. The tax amounts agreed upon before the assessment is also very close to the amount subject to the settlement. The fines, which were the subject of reconciliation before the evaluation, decreased considerably. The fines have been reduced so much because the tax administration attaches importance to ensuring the survival of businesses. These changes in tax amounts and fines subject to reconciliation can indicate how suitable it is to consider the tax amounts levied and collected as audit income. The study's main hypothesis is that increasing tax audit staff will increase audit revenues.

4. Methodology

Answers to the following questions were sought in the study;

- Has the number of inspections increased as the number of auditors participating in the audits increased?
- Has audit income (the proposed tax amount) increased as the number of audit staff participating in the audit?
- Has the proposed tax amount increased as the number of inspections increased?
- If the number of audit staff participating in the audit increases, will the total tax revenues increase?
- What is the cost and contribution of an inspector to the state? So what is the optimal number of auditors the government should employ?

Study data were analysed with MedCalc. The relationship between the variables was determined by correlation and regression analysis. Since the variables did not fit the normal distribution, the correlation coefficient between the two groups was determined using Spearman's correlation analysis. Normality analysis was performed with the Shapiro-Wilk test. Regression analysis was performed using logarithmic transformation.

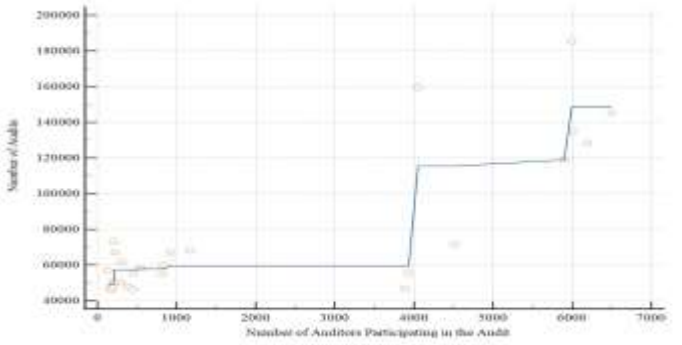
The regression equation is log (y) = -0,9923 + 2,8812 log (x). Y is the amount of tax proposed to be levied (audit income), and x is the number of audit staff participating in the audit.

5. Results

The findings of the study can be explained with the questions addressed and the statistical analyses made as follows:

- *Did the number of inspections increase as the number of auditors participating in the audit increased?*

Figure: 1
The Relationship Between the Number of Auditors Participating in the Audit and the Number of Audits



As the number of auditors participating in the audit increased, the number of examinations also increased. The correlation coefficient is 0.66, and the p-value is 0.00. In other words, there is a positive correlation, which is statistically significant.

- *Has the proposed tax amount increased as the number of auditors participating in the audit increased?*

Regression

Dependent Y Amount of tax proposed to be levied (audit income)

Independent X Number of audit staff participating in the audit

Figure: 2
Least Squares Regression

Sample size	26
Coefficient of determination R^2	0,7431
Residual standard deviation	1,0593

R^2 measures the model's goodness and may range between 0 and 1. The present regression equation has an R^2 of 0,74.

Figure: 3
Regression Equation

log(y) = -0,9923 + 2,8812 log(x)					
Parameter	Coefficient	Std. Error	95% CI	t	P
Intercept	-0,9923	1,0409	-3,1406 to 1,1561	-0,9533	0,3500
Slope	2,8812	0,3458	2,1675 to 3,5949	8,3320	<0,0001

Because the data does not have a normal distribution, the regression analysis used the logarithmic transformation of the dependent and independent variables. The dependent variable, depicted as Log(y), is the amount of the proposed tax levied. The independent variable is the number of audits that participated in the audit, depicted as log (x). Though the coefficient of x is the increase accounting for an increment of x as 1 unit, we cannot use this relation in this equation because of the logarithmic transformation. But it can be concluded that there is a positive relationship between the amount of the tax proposed to be levied and the number of auditors participating the in the audit.

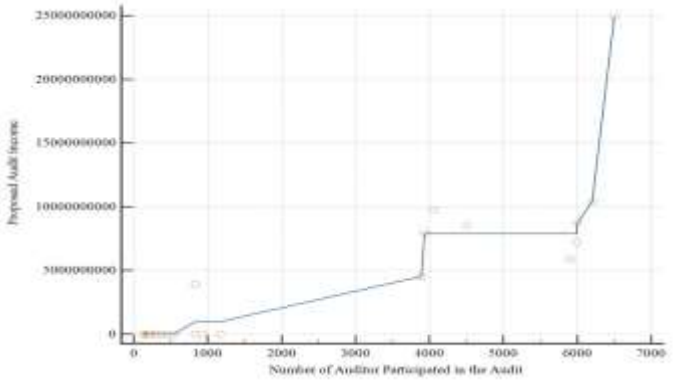
Figure: 4
Analysis of Variance

Source	DF	Sum of Squares	Mean Square
Regression	1	77,8945	77,8945
Residual	24	26,9290	1,1220
F-ratio		69,4220	
Significance level		P<0,00	

The p-value <0.00, obtained by analysis of variance, shows the hypothesis that no linear relationship can be rejected.

Between 1995-2020

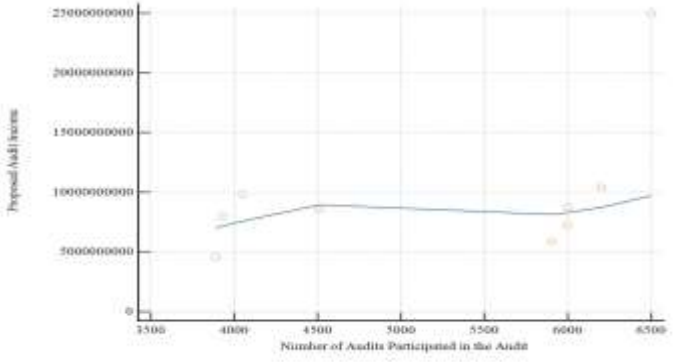
Figure: 5
Number of Auditors - Proposed Audit Income Relationship



As the number of audit staff participating in the audit increased, the tax amount proposed to be levied also increased. There is a positive correlation, the correlation coefficient is 0.79, and the p-value is 0.00. Therefore, this is statistically significant.

Between 2012-2020

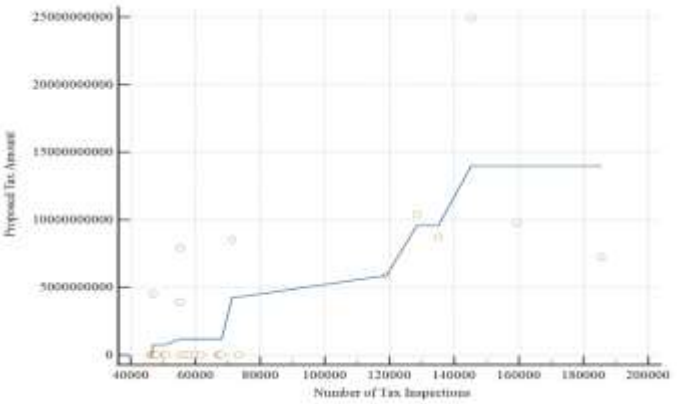
Figure: 6
Number of Auditors - Proposed Audit Income Relationship



Since 2012, the number of audit personnel participating in the audit has increased from 828 to 3890. The tax amount levied in 2020 is also abnormally high compared to other years.

- *Has the proposed tax amount increased as the number of reviews increased?*

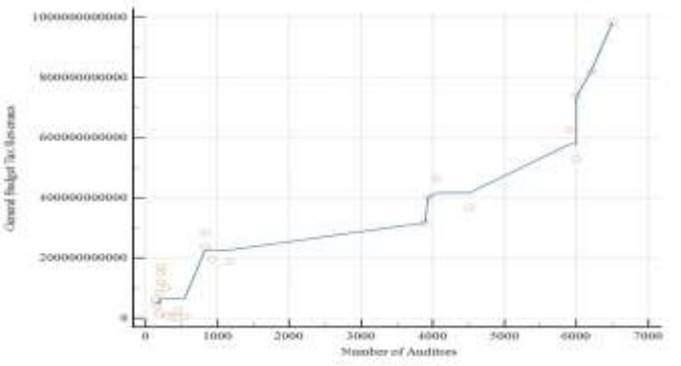
Figure: 7
Number of Tax Inspections - Proposed Tax Amount Relation



As the number of examinations increased, the tax amount proposed (audit income) being levied increased. The correlation coefficient is 0.68, and the p-value is 0.00, which is statistically significant.

- *If the number of audit staff participating in the audit increases, will tax revenues increase?*

Figure: 8
Number of Auditors - General Budget Tax Revenues Relationship



As the number of audit staff participating increases, the general budget's tax revenues also increase. There is a very strong positive correlation between them. The correlation coefficient is 0.8, and the p-value is 0.00. This is statistically significant as well.

- *What is the cost and contribution of an inspector to the state? So what is the optimal number of* auditors *the government should employ?*

Figure: 9
Rank Correlation

Variable Y	Personnel Expense
Variable X	Total Number of Controllers
Sample size	5
Spearman's coefficient of rank correlation (rho)	-0,900
Significance level	P=0,0374
95% Confidence interval for rho	-0,0993 to - 0,0861

Since the Tax Inspection Board started to publish tax inspection statistics in 2012, personnel expenditures for inspection personnel have been seen more clearly in these reports. Expenditures made to ministry personnel before 2012 and after 2018 are also included in the reports. Since these expenditures cover the entire organisation, the payments made only for the audit staff for these years cannot be seen clearly.

Personnel expenditure data after 2012 could be accessed. Therefore, correlation analysis could only be performed after this year. There was a negative but strong correlation between the supervisor and personnel expenses (correlation coefficient: -0.9) which is statistically quite significant. P-value 0.037. As can be seen, personnel costs decrease as supervisors increase. Regression analysis could not be performed because all the data of the review period could not be reached. Therefore, since the cost and contribution of audit staff to the state could not be calculated, the optimal number of audit staff that the state should employ could not be reached.

6. Conclusion

It is observed that the Turkish Tax Administration has embarked on an audit move, especially after 2008. With the legal regulations enacted in 2012, the units responsible for tax auditing were combined under the structure of the Tax Inspection Board. The main subject of the study, tax inspectors and their assistants, have been transferred to A Group Tax Inspector and assistant positions since 2012. With the Tax Inspection Board Regulation published in the Official Gazette dated 07.04.2021 and numbered 31447, they were distributed to the inspection department, tax evasion inspection department, tax returns inspection department, and sectoral inspection departments. The number of tax inspectors and inspections they conducted showed a general upward trend from 1995 to the end of 2020. Total tax and audit revenues have also been increasing over the years.

With the legal regulations regarding tax inspections and electronic auditing gradually spreading to all areas, a taxpayer-based approach has been adopted. A system has been established to ensure tax justice and effectively fight the informal economy. All these have increased the responsibilities of tax auditors. A risk-oriented approach has been adopted in selecting taxpayers to be examined. Thus, more objective criteria were determined.

The number of audit staff in 2017 in 1995 increased to 7,733 in 2021. While 47,649 taxpayers were examined in 1995, approximately 145,202 were examined in 2020. While the proposed tax amount was 19,149 TL in 1995, it became 24,921,860,064 TL in 2020. Collection costs have also decreased gradually. While the cost of tax collection of 100 TL in 1995 was 1.02 TL. This figure became 0.46 TL in 2020. This is also an indication of the increase in the quality of the audit.

In addition to the VEDOP1-2-3 projects, the introduction of the Inspector Information Report (MBR) prepared with the VDK-RAS infrastructure and the Tax Audit and Analysis System (VDK-VEDAS) used in e-audit, to the use of the audit staff contributed to this positive effect.

The tax inspection board in the country has developed standards for auditing. The board has adopted the completion of tax inspections within a certain period. It implemented the risk analysis system and developed a performance-based working approach. All these give rise to the expectation that the number of tax inspections and the efficacy of auditing will increase exponentially in the upcoming period. Tax auditing will attain an effective, efficient, high-quality, and modern system with standards in this process. Considering the tax inspection rates, it is seen that this rate is 1.58 as of the end of 2020. The review rate remained low throughout the period, but these are numerical data and do not reflect the nature of the audit. The VDK RAS system, that is, the risk analysis system, is the system that determines which taxpayers should be examined. The country continues improving efficacy in auditing with this system and integrating digital technology.

To reveal the relationship between the effort of tax audit personnel and audit income in increasing tax audit efficacy and to help policymakers and tax practitioners structure the audit organisation in a way that provides more revenue to the state, the study asked five questions demonstrating the effort of tax auditors. The data obtained from official sources were analysed with the MedCalc statistical program, and correlation and regression analysis determined the relationship between the variables. Spearman's correlation analysis determined the correlation coefficient between the two groups. The Shapiro-Wilk test was used for normality analysis.

The study's first finding is; As the number of auditors participating in the audit increases, the number of examinations increases. The second finding is; As the number of audit staff participating in the audit increases, the audited income increases. The third finding; As the number of reviews increases, the audit income increases. The fourth finding is; As the number of audit staff participating in the audit increases, the tax revenues within the general budget revenues increase. The last question of the study, "What is the cost and contribution of an audit staff to the state? So, what is the optimal number of supervisors the government should employ?" was unanswered. Regression analysis could not be performed because all the data from the examination period could not be reached.

As a result, there is a close relationship between the increase in the number of audit personnel in the audit and audit income. As of the end of 2021, there are 7505 vacancies in the Presidency of the Tax Inspection Board. Filling these positions will increase the efficacy of the audit and ensure sustainability. Our country's tax audit personnel are selected through yearly examinations, and the successful ones undergo a three-year training process. As practice has observed, only a third or fewer candidates successfully obtain this title at the end of three years. In addition, it is observed that tax inspectors who have completed ten years of service have moved to the private sector with intense financial concerns. It is crucially important to retain highly trained staff.

For this reason, what needs to be done is to double the number of cadres taken for internship in the exams opened every year, which may take this one-third rate to two-thirds and provide the employment of more audit staff. It is also important to improve salary and personal rights. The policymakers who carry out the tax audit policy must take decisions by considering all of these.

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