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The Impact of Tax Administration Modernization on Tax Performance in Algeria: An Econometric Study at the Directorate of Large Enterprises

benmhamed rabeh [*1]

[1]el arbi tbessi university ,Algeria, rabah.benmahamed@univ-tebessa.dz

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Abstract :

This study aims to identify the effect of tax administration modernization on tax performance in Algeria. The study was divided into two parts. The first part presents the theoretical framework, with a focus on tax modernization and tax performance. The second part is a field study conducted on a sample of employees of the Directorate of Large Enterprises using a questionnaire. The findings were analyzed by means of statistical methods.

The study reached several results. The most important finding is that tax administration modernization has a positive and statistically significant effect on tax performance. In particular, electronic tax administration had a major role in improving tax collection and enhancing the efficiency of tax services. This, in turn, contributed to reducing tax evasion and increasing the level of trust between the tax administration and taxpayers.

Keywords : tax modernization, tax performance, tax collection, digitalization, electronic tax administration.

JEL Classification Codes: H26, H21, H83

* Corresponding author

1. Introduction:

The modernization of tax administration has become an essential necessity for improving managerial efficiency and enhancing the quality and effectiveness of tax collection. Algeria, like many other countries, has sought to adopt a set of major reforms aimed at modernizing its tax structures, simplifying its procedures, and improving the quality of its services. These reforms rely on information and communication technology in order to establish a modern tax administration that responds to the requirements of economic development and improves tax performance. This is expected to strengthen tax compliance, reduce tax evasion, and increase taxpayer satisfaction.

Research Problem

The problem of this study revolves around the following main question: To what extent does the modernization of tax administration, in its various dimensions, affect tax performance?

This main question gives rise to the following sub-questions:

- How has the modernization of tax administration been implemented in Algeria?
- How has the modernization of tax administration affected tax performance in Algeria?

Research Hypotheses To address the research problem, the following main hypothesis is proposed:

There is a positive and statistically significant effect of tax administration modernization on tax performance.

The following sub-hypotheses stem from the main hypothesis:

- There is a positive effect of tax administration modernization on tax collection.
- There is a positive effect of tax administration modernization on improving the performance of tax services.
- There is a positive effect of tax administration modernization on tax collection.

Objectives of the Study This study aims to achieve a number of objectives, the most important of which are the following:

- To identify the concept of tax administration modernization and its dimensions.
- To analyze the concept of tax performance and its indicators.
- To highlight the importance of tax modernization in improving tax collection.
- To highlight the importance of tax modernization in improving the performance of tax services.
- To determine the degree of influence of tax administration modernization on tax performance.

Significance of the Study This study is of considerable importance from both the theoretical and the practical perspectives, as it seeks to:

- Highlight the importance of tax administration modernization as a mechanism for improving the efficiency of the tax system.
- Contribute to a better understanding of the relationship between modernization and tax performance.
- Provide an analytical framework that may be used in future studies.

Research Methodology In order to achieve the objective of the study, answer the research problem, and test the validity of the hypotheses, the descriptive and analytical method was adopted. This was done, on the one hand, by defining the study variables, and on the other hand, by analyzing the responses of the study sample to the statements included in the field research instrument, namely the questionnaire, and processing them statistically.

Theoretical Framework of the Study

In this section, we address the main basic concepts related to the two variables of the study, namely tax modernization and tax performance. Both concepts are among the most relevant contemporary topics because of their major and effective role in supporting national economies.

2. Tax Modernization:

2.1. The Concept of Tax Modernization Below are the main definitions of tax administration modernization.

Tax administration modernization is defined as: "the development of the means placed at the disposal of the tax administration in order to achieve the objectives expected of it. This includes reforming the organization of the tax administration, coordinating and simplifying tax procedures and practices, and improving the information systems used in tax management. The aim is to establish an efficient and rational tax administration system that provides quality service to taxpayers and other stakeholders, while also ensuring the collection of taxes established by law to finance public services. This development must also include the human dimension of the tax administration by changing the way taxpayers are treated, since employees constitute an important part of the modernization process" (Leroy, 2008, p. 5).

It is also defined as: "part of tax renewal, modernization, and reform. It seeks to keep pace with developments in various fields and to address the challenges of the third millennium in order to achieve greater effectiveness in managing taxpayers' tax files and simplifying administrative procedures" (Zine & Qannas, 2021, p. 18).

Based on the two previous definitions, tax modernization may be expressed as follows: "It is the modernization of the way the tax administration operates through the use of information and communication technology and modern techniques, with the aim of achieving the highest level of efficiency in managing tax files and simplifying tax procedures

2.2. Objectives of Tax Administration Modernization in Algeria Through the modernization process, the tax administration seeks to increase management efficiency by achieving the following objectives (Information Bulletin, 2023):

- Breaking down barriers between the tax administration and taxpayers, and strengthening mutual trust.
- Improving the level of tax compliance.
- Improving the services provided to taxpayers through the efficient and effective use of information and communication technologies.
- Relying on electronic filing and electronic payment methods, which greatly reduce the effort required.
- Making optimal use of the material and human resources available within the tax administration in order to achieve the highest possible rate of tax collection at the lowest possible cost.

- Providing a suitable working environment for all tax administration agents, thereby improving their level of performance.

2.3 Drivers of Tax Administration Modernization in Algeria Algeria initiated the reform and modernization of its tax system in order to increase efficiency and improve services. This process was driven by a number of factors, which may be summarized as follows:

- Increasing the efficiency of administrative structures.
- Keeping pace with rapid developments in information and communication technology and employing them in the tax field.
- Reducing the costs of tax administrations through reliance on digitalization and through improving the efficiency of human resources.
- Combating tax evasion and tax fraud.
- Keeping pace with modern methods adopted in all fields of activity, including trade and services.
- Enhancing tax transparency and reducing bureaucracy.
- Broadening the tax base and improving tax collection.
- Improving the quality of tax information and the accuracy of data.
- Strengthening tax control mechanisms and improving their effectiveness.
- Ensuring alignment with international standards in tax administration.

- Aspects of Tax Administration Modernization in Algeria

Within the framework of tax administration modernization, many new structures and services have been introduced. Modernization has reshaped the organizational structure of the tax administration and improved the quality of the services it provides. It has made both more flexible, more streamlined, and more efficient than before. The main structural changes can be summarized as follows:

- **Creation of the Directorate of Large Enterprises:** This directorate was established to ensure better control over the management of the most important tax files. These files represent only 0.3% of the tax population, yet they account for 70% of the State's total public revenues. It was also created to improve the efficiency of tax revenue collection and to enhance the services provided to taxpayers by bringing together the main tasks and functions within a single department. The Directorate of Large Enterprises officially began its activities in 2006 (Harrach, 2010, p. 117).
- **Creation of Tax Centers:** The Tax Center is one of the new structures created under the Directorate General of Taxes. It is exclusively responsible for the management, control, and collection of taxes, as well as for settling disputes related to the tax files of medium-sized taxpayers. These centers were established under the Finance Law of 2003, particularly Articles 31 and 32. They operate as unified management centers that combine the functions previously carried out by tax inspection offices, revenue collection offices, and provincial tax directorates, under the supervision of the head of the center (Qasimi, 2019, p. 213).
- **Creation of Local Tax Centers:** The establishment of Local Tax Centers represents the final stage of the structural component of the tax administration modernization program and of its management procedures. The Local Tax Center is a new operational unit within the Directorate General of Taxes. It is devoted exclusively to managing tax files and collecting taxes due from a broad category of taxpayers, mainly those subject to the single flat-rate tax regime. This includes, in particular, persons liable for total income tax based on place of residence, property tax, real estate tax, sanitation tax, and other related taxes (Beljilali & Benia, 2021, p. 206).

Modernization also brought important changes in the nature of the services provided by the tax administration. These changes may be presented as follows:

- **Activation of the Tax Information System:** Within the modernization program adopted by the Directorate General of Taxes, the information system is considered one of the most advanced and ambitious projects undertaken by the tax administration. Its purpose is to establish an electronic administration based on the use of modern information and communication technologies as a working tool and as a means of linking the tax administration to its wider environment. Investment in this area, as a basic instrument for strengthening competitiveness, makes it possible to improve productivity, reduce costs, reorganize services, and bring them closer to users. It also provides a better understanding of the surrounding environment, which facilitates decision-making. In addition, this system enables users to access a set of modern services that help bring the administration closer to its users (Lettre de la DGI, 2014, p. 08).
- **Creation of an Official Website for the Tax Administration:** The development of information and communication technology, together with the integration of digital systems and internet services into tax administration, led to the creation of an official website for the tax administration. This website provides taxpayers with all tax-related information, including tax laws, finance laws, practical guides for taxpayers, tax texts and circulars, and various instructions (Ramadlia & Gouidri, 2020, p. 475).
- **The Tax Ruling Mechanism:** The introduction of the tax ruling mechanism was one of the major measures included in the Finance Law of 2012. It was intended to strengthen the legal protection of taxpayers. This mechanism gives taxpayers the possibility to consult the tax administration on a matter related to the interpretation of a tax provision. Any response issued by the administration is considered final and binding, and it protects the taxpayer concerned from any subsequent tax reassessment.
- **Online Tax Identification Number (NIF):** Since 8 May 2016, economic operators have been able to obtain a Tax Identification Number online. This became possible through a dedicated website launched by the Directorate General of Taxes for this purpose.
- **Creation of Electronic Filing and Payment Portals:** As part of the digitalization of tax administration, taxpayers can now obtain all tax documents and declarations, calculate taxes, and submit returns through several portals and platforms, such as Jibayatik and Mousahamatik.

Thus, the modernization of tax administration introduced many important changes and improvements. These reforms enabled the Algerian tax system to improve its services, organize and facilitate its operations, and enhance its efficiency and effectiveness.

3. Tax Performance:

3.1. Definition of Tax Performance Tax performance is defined as “the ability of the tax system to generate financial revenues for the public treasury in an effective manner, in proportion to the available economic potential and the level of economic activity” (Mahrazi, 2003, p. 45).

It is also defined as “the degree of efficiency of taxation in generating financial resources for the State, and it reflects the effectiveness of the tax system in mobilizing revenue without harming economic activity” (Musgrave & Musgrave, 1989, p. 225).

Accordingly, tax performance may be defined as “the extent to which the tax system is able to generate effective revenue for the State efficiently through taxation.”

3.2. Objectives of Tax Performance Tax performance seeks to achieve a range of objectives, including the following:

- Mobilizing the financial resources necessary to finance public expenditure and ensure the continuity of public services.

- Achieving efficiency in tax collection by reducing tax evasion and by developing and activating collection mechanisms.
- Promoting tax equity through the fair and balanced distribution of the tax burden among different taxpayers.
- Stimulating economic activity through the adoption of a balanced tax system that encourages investment and production.
- Combating tax evasion and tax fraud in a way that contributes to increasing tax revenue.
- Supporting the effectiveness of the State's fiscal and economic policy, since taxation is a principal instrument of state economic intervention.

Tax performance may therefore be regarded as the clearest reflection of the effectiveness of the tax system, as it contributes to increasing tax revenue, encouraging investment, and supporting the fiscal policy of the State.

3.3 Indicators of Tax Performance

Tax performance is one of the most important criteria used to assess the effectiveness of the tax system. The role of the latter is not limited to the mere collection of revenue. It also includes its efficiency in mobilizing the financial resources needed to support national economies. In order to measure this type of performance, a set of indicators is commonly used. Some are traditional indicators, while others are qualitative and focus on the quality and efficiency of services. These are presented below (Stiglitz, 2000, p. 478; Musgrave & Musgrave, 1989, p. 230):

- **Ratio of tax revenues to gross domestic product:** an indicator that measures the extent to which tax revenues contribute to supporting the national economy.
- **Tax burden rate:** the ratio of total taxes and duties to gross domestic product, reflecting the size of the tax burden on the economy.
- **Actual collection rate:** the proportion of taxes actually collected in relation to taxes assessed.
- **Tax loss ratio (tax gap):** the difference between expected tax revenues and the revenues actually collected.
- **Cost of tax collection:** measured by comparing collection costs with the revenues collected.

In addition, the following qualitative indicators may be used:

- **Taxpayer satisfaction:** this relates to the measurement of the tax compliance rate, the time required to process tax files, the number of tax disputes and complaints, and the degree of clarity and simplicity of tax procedures.
- **Performance measurement from the perspective of tax officers:** this is assessed through the productivity of tax officers, the quality of tax control, the level of training and professional qualification, their ability to use technological tools, and the degree of job satisfaction and professional stability.

Thus, the combination of these indicators helps provide a comprehensive and accurate view of the effectiveness of tax policies in achieving the stated objectives and meeting the requirements of economic development.

4. **The Applied Side of the Study**

In this part of the study, the theoretical framework is examined in light of actual practice. This is done through the use of a questionnaire and the necessary statistical tools to analyze the relationship between the variables and to measure the strength of that relationship.

4.1 General Framework of the Study

4.1.1 Study Instrument

The researcher's adoption of the quantitative approach requires the use of the questionnaire as the main instrument for collecting the data necessary to test the study hypotheses. The questionnaire is defined as: "a set of previously formulated questions to which the respondent records answers by selecting one of the specified alternatives. It is considered an effective means of collecting data when the researcher has a precise understanding of what is required and of how to measure the variables intended for study" (Sarkan, 2006, p. 32).

4.1.2 Population and Sample of the Study

In this study, the sampling unit consisted of officers working at the Directorate of Large Enterprises. The sample size of the study was 50 officers.

4.1.3 Validity and Reliability of the Study Instrument

The validity and reliability of the study instrument were assessed by means of Cronbach's alpha coefficient, as shown below:

Table (01): Cronbach's Alpha Reliability Coefficient for the Study Instrument

Variables	Number of items	Cronbach's alpha
Tax legislation	07	0.765
New structures of the tax administration within the framework of modernization	06	0.782
Electronic tax administration	07	0.874
Modernization of tax administration	20	0.916
Tax collection within the framework of modernization	07	0.745
Improvement of tax service performance	06	0.851
Tax performance	13	0.897
Questionnaire as a whole	33	0.932

Source: Prepared by the researchers based on SPSS outputs.

The results shown in the table above indicate that Cronbach's alpha reached 0.916 for the independent variable represented by the modernization of tax administration. Its dimensions ranged from 0.765 to 0.874. The coefficient reached 0.897 for the dependent variable represented by tax performance, while the values for its dimensions ranged from 0.745 to 0.851. For the study instrument as a whole, the coefficient reached 0.932. This indicates that the instrument has a high level of reliability and is therefore capable of fulfilling the objectives of the study.

4.1.4 Normal Distribution

The results of the normality test for the study variables are presented below:

Table (02): Normality Test of the Study Variables

Study variables	Skewness coefficient	Kurtosis coefficient
Tax legislation	-0.29	-0.326
New structures of the tax administration within the framework of modernization	0.024	0.065
Electronic tax administration	-0.726	1.487
Modernization of tax administration	-0.640	1.329
Tax collection within the framework of modernization	-0.850	2.030
Improvement of tax service performance	-0.435	0.216
Tax performance	-0.617	0.918

Source: Prepared by the researchers based on SPSS outputs.

The results shown in the table above indicate that the values of the skewness coefficient ranged between 0.024 and -0.850, which fall within the interval [-1, 1]. As for kurtosis, its values ranged between -0.326 and 2.030, which fall within the interval [-3, 3]. This indicates that the study data follow a distribution close to the normal distribution, which allows the use of appropriate parametric testing methods.

4.2 Presentation of the Results Related to the Descriptive Data of the Study Sample

Below is the distribution of the study sample according to the personal and occupational characteristics of its members. Descriptive statistics were used by calculating frequencies and percentages in order to identify these characteristics.

Table (03): Distribution of the Study Sample by Gender

Variable	Categories of the variable	Frequency	Percentage
Gender	Male	27	64.3
	Female	15	35.7
	Total	42	100

Source: Prepared by the researchers based on SPSS outputs.

The table shows that 27 of the questionnaire respondents were male, representing 64.3%, while 15 respondents were female, representing 35.7%. This indicates diversity in the study sample in terms of gender. This may be explained by the relative equality of employment opportunities for both men and women within the institution under study.

Table (04): Age Distribution of the Study Sample

Variable	Categories of the variable	Frequency	Percentage
Age	Less than 30 years	02	4.8
	From 30 to 39 years	20	47.6
	From 40 to less than 49 years	14	33.3
	50 years and above	06	14.3
	Total	42	100

Source: Prepared by the researchers based on SPSS outputs.

The table also shows that respondents aged less than 30 years represented 4.8% of the sample. Respondents aged 30 to 39 years numbered 20, representing 47.6%, which is the highest proportion. Respondents aged 40 to 49 years numbered 14, representing 33.3%. Respondents aged 50 years and above numbered 6, representing 14.3%. It may therefore be said that the institution possesses a relatively young human resource base with knowledge and experience, as well as the ability to adapt to the requirements of modernization and to meet the demands of tax performance.

Table (05): Educational Qualification of the Study Sample

Variable	Categories of the variable	Frequency	Percentage
Educational qualification	Secondary education	4	9.5
	University degree	28	66.7
	Postgraduate studies	10	23.8
	Total	42	100

Source: Prepared by the researchers based on SPSS outputs.

The results in the table above show that, with regard to educational qualification, respondents with a secondary education numbered 4, representing 9.5%. Respondents with a university degree numbered 28, representing 66.7%, which is the highest proportion. Respondents with postgraduate studies numbered 10, representing 23.8%. These results confirm that the study sample enjoys a good educational level. This may be attributed to the fact that the tax administration now seeks to recruit individuals with competence and a high academic level.

Table (06): Years of Experience of the Study Sample

Variable	Categories of the variable	Frequency	Percentage
Years of experience	Less than 5 years	10	23.8
	From 5 to 9 years	3	7.1
	From 10 to 14 years	16	38.1
	15 years and above	13	31
	Total	42	100

Source: Prepared by the researchers based on SPSS outputs.

With regard to the level of experience of the study sample, the table shows that respondents with less than 5 years of experience numbered 10, representing 23.8%. Workers with 5 to 9 years of experience numbered 3, representing 7.1%. This was followed by workers with 10 to 14 years of experience, who numbered 16, representing 38.1%. Workers with 15 years of experience or more numbered 13, representing 31%. These results indicate that the institution under study possesses human resources with good and sufficient experience in the tax field, which enables it to respond to the requirements of the study objectives.

4.3 Presentation of the Views of the Study Sample on the Study Dimensions

This section examines the orientations of the respondents' views regarding the level of both tax administration modernization and tax performance.

4.3.1 Results Related to Tax Administration Modernization

Below are the views of the study sample concerning the first axis of the questionnaire.

Table (07): Responses of the Respondents on the Axis of Tax Administration Modernization

No.	Statement	Mean	Standard Deviation	Level of Acceptance
Tax legislation		**3.5226**	**0.57995**	**High**
1	Tax modernization, in its legislative aspect, contributed to reducing tax burden rates.	3.61	0.945	High
2	Tax legislation has been changed and amended in line with structural and digital transformation.	4.00	0.541	High
3	Tax legislation is clear and simple in its application by tax officers.	2.81	0.994	Moderate
4	The continuous changes in tax laws have helped tax officers confront attempts at tax evasion.	3.33	0.874	Moderate
5	Since their issuance, tax laws have contributed to safeguarding the rights of the tax administration and defining its functions.	3.74	0.989	High
6	The enacted tax legislation has encouraged the establishment of a relationship of trust and dialogue between the taxpayer and the tax administration.	3.40	0.939	High
7	Tax legislation encourages tax officers to deal with taxpayers politely and respectfully, while presuming their good faith.	3.81	0.943	High
New tax administration structures within the framework of modernization		**3.7897**	**0.58673**	**High**
1	The classification of taxpayers according to the newly established structures, based on their degree of importance, has helped ensure proper handling of their cases.	3.67	0.874	High
2	The division of tax services within the newly established structures has	3.71	0.970	High

	reduced complexity and achieved better performance.			
3	Tax officers are assigned to work in the new structures according to their competence and experience, in line with the type of tax structure.	3.64	0.821	High
4	Working within the newly established tax structures has made the tasks of tax officers easier, more accurate, and clearer.	3.95	0.795	High
5	The classification of taxpayers according to the newly established structures has enabled real proximity between taxpayers and tax officers.	3.76	0.759	High
6	Bringing tax services together within a single structure has improved coordination among them and reduced errors in tax processing.	4.00	0.855	High
Electronic tax administration		**3.4218**	**0.74995**	**High**
1	All electronic means required by tax officers to perform their duties electronically are available.	2.69	1.070	Moderate
2	Tax digitalization facilitates access to information and therefore helps settle different tax situations more easily.	3.64	0.983	High
3	The existence of an intranet network allows communication between tax officers and taxpayers through information exchange and consultation.	3.12	0.993	Moderate
4	The application of digitalization in tax administration has transformed it from a traditional administration into a modern one characterized by speed of implementation.	3.67	1.097	High

5	Tax digitalization provides electronic security for tax documents and protects archives from risk and loss.	3.50	0.944	High
6	Tax digitalization contributes to reducing tax evasion among taxpayers.	3.67	0.902	High
7	The information system (SAP) facilitates the various tax operations, their processing, and their transfer among users.	3.67	0.954	High
Tax administration modernization		**3.5809**	**0.56883**	**High**

Source: Prepared by the researchers based on SPSS outputs.

The table above shows that the mean value for the axis as a whole reached 3.5809, which falls within the high level, with a standard deviation of 0.56883. This reflects the respondents' agreement with all the statements included in this axis.

With regard to the detailed description of the descriptive analysis results for each dimension of tax administration modernization, they may be presented as follows:

First Dimension: Tax Legislation

It may be noted that the mean score for the dimension of tax legislation reached 3.5226, with a standard deviation of 0.57995. This reflects a high level of agreement among the tax officers included in the study. The mean scores for the statements in this dimension ranged from 2.81 to 4.00. The third and fourth statements recorded a moderate level of agreement, whereas the remaining statements recorded a high level of agreement. This indicates that changes in tax legislation in line with the requirements of modernization have had a positive effect on the conduct of tax officers by safeguarding their rights. It also suggests that modernization has contributed to reducing tax burden rates, thereby strengthening the relationship of trust between taxpayers and the tax administration. In addition, it has helped simplify tax procedures and address tax evasion.

Second Dimension: New Tax Administration Structures within the Framework of Modernization

The table shows that the mean score for the dimension of new tax administration structures within the framework of modernization reached 3.7897, with a standard deviation of 0.58673. This value falls within the range [3.4–4.2[, which reflects a high degree of agreement among tax officers. The mean scores for the statements in this dimension ranged from 3.64 to 4.00, and all statements recorded a high level of agreement. This indicates that the modern restructuring of the tax administration has significantly improved the quality of the services provided. It has also made it easier for tax officers to perform their duties. This effect was reinforced by the classification of taxpayers according to the newly established structures, from the most complex cases to the simplest. As a result, the services provided became better and more accurate, and the relationship between the taxpayer and the tax administration improved. The administration has thus come to rely on the principle of placing the right officer in the right position.

Third Dimension: Electronic Tax Administration

The table further shows that the mean score for the dimension of electronic tax administration reached 3.4218, with a standard deviation of 0.74995. This value also falls within the range [3.4–4.2[, which reflects a high level of agreement among tax officers. The mean scores for the statements in this dimension ranged from 2.69 to 3.67. The first and third statements recorded a moderate level of agreement, while the remaining statements recorded a high level of agreement. These results may be explained by the fact that digitalization represents the core driver of tax administration modernization. It has contributed substantially to reducing tax evasion. The SAP information system has also greatly facilitated tax operations. Digitalization supports the tax administration's information system and makes it easier to settle various tax situations. It also provides the electronic security required for all information. At present, all the tasks of tax officers are carried out electronically

5. Results Related to Tax Performance

Below are the views of the study sample regarding the second axis of the questionnaire.

Table (08): Responses of the Respondents on the Axis of Tax Performance

No.	Statement	Mean	Standard Deviation	Level of Agreement
Tax collection within the framework of modernization		**3.6969**	**0.49610**	**High**
1	Tax modernization, through its various techniques, has enabled greater control over the tax collection process and has significantly increased it.	3.60	0.885	High
2	Electronic auditing improves tax declarations and ensures the transparency and accuracy of tax-related outputs.	3.69	0.780	High
3	Remote filing and payment through the Jibayatik portal have facilitated taxpayers' compliance with their obligations on time.	4.07	0.677	High
4	The website of the Directorate General of Taxes has helped increase taxpayer awareness, which has encouraged filing and reduced evasion.	3.90	0.821	High
5	The Tax Identification Number has helped reduce fraud and evasion and has therefore improved control over the tax audit process.	3.76	0.656	High
6	Securing tax information electronically has led to a noticeable increase in tax revenue.	3.51	0.637	High
7	Providing incentives to tax	3.33	0.979	Moderate

	administration officers and training them has raised the level of tax collection.			
Improvement of the performance of tax services		**3.6032**	**0.68070**	**High**
1	Tax modernization has helped reduce the gap between the tax officer and the taxpayer through greater accuracy in performance and the opening of channels for dialogue.	3.55	0.942	High
2	Tax officers are satisfied with electronic tax transactions because they are easy and simple to use.	3.45	0.861	High
3	Training tax officers in the use of software has improved their performance and increased the level of tax collection.	3.40	0.912	High
4	Tax modernization, in its different dimensions, helps reduce costs, which contributes to the effectiveness of the tax system.	3.55	0.942	High
5	Tax modernization, through its various techniques, has removed barriers between the tax officer and the taxpayer. This has made the task assigned to employees easier and has increased taxpayer satisfaction, which in turn has reduced disputes and increased tax revenue.	3.86	0.899	High
6	Tax processing under digitalization has become more accurate and faster as a result of the use of information systems and software.	3.81	0.833	High
Tax performance		**3.6452**	**0.57324**	**High**

Source: Prepared by the researchers based on SPSS outputs.

The table above shows that the mean score of the respondents' answers on the axis of tax performance, across its various dimensions, reached **3.6452**. This value falls within the high level according to the analytical scale adopted in the study.

A more detailed description of the results of the descriptive analysis for each dimension of tax performance may be presented as follows:

5.1 First Dimension: Tax Collection

The table shows that the mean score for the dimension of tax collection within the framework of modernization reached 3.6969, with a standard deviation of 0.49610. This value falls within the range [3.4–4.2[, which reflects a high degree of agreement among tax administration officers. The mean scores for the statements in this dimension ranged from 3.33 to 4.07. The seventh statement

recorded a moderate level of agreement, while all the remaining statements recorded a high level of agreement.

These results suggest that the Jibayatik portal has improved tax collection by making it easier for taxpayers to meet their obligations. The official website of the tax administration has also provided taxpayers with the necessary information and guidance, which has increased their awareness regarding tax compliance. In addition, the Tax Identification Number has helped reduce tax evasion and improve the effectiveness of tax control, especially electronic control. It may therefore be said that modernization has enhanced tax collection by making tax information more available. Moreover, motivating tax administration officers has encouraged them to perform better and has contributed to raising the level of tax collection.

5.2 Second Dimension: Improvement of the Performance of Tax Services within the Framework of Modernization

The table further shows that the mean score for the dimension of improving the performance of tax services reached 3.6032, with a standard deviation of 0.68070. This value also falls within the range [3.4–4.2[, which reflects a high degree of agreement among tax administration officers. The mean scores for the statements in this dimension ranged from 3.40 to 3.86, and all statements recorded a high level of agreement.

These results may be interpreted as showing that modernization has significantly improved the performance of tax administration officers and has strengthened their relationship with taxpayers. Tax processing under digitalization has become more accurate, while risks and costs have decreased. This has helped narrow the gap between the tax administration and taxpayers and has increased the effectiveness of the tax system. The findings also show that tax officers are largely satisfied with electronic tax transactions. In addition, training in information and communication technology has improved their performance and has contributed to better tax collection.

5.3 Testing the Effect of Tax Administration Modernization on Tax Performance

5.3.1. Testing the Effect of Tax Administration Modernization on Tax Collection

In what follows, the following sub-hypothesis is tested: “Tax administration modernization has a positive effect on tax collection.” The following table presents the results obtained.

Table (09): Simple Linear Regression Between Tax Administration Modernization and Tax Collection Within the Framework of Modernization

Model Summary

Model	Multiple Correlation Coefficient	Coefficient of Determination	Adjusted Coefficient of Determination	Standard Error of the Estimate
	0.547	0.300	0.282	0.42046

ANOVA

Model	Sum of Squares	Degrees of Freedom	Mean Square	F	Significance Level
Regression	2.950	1	2.950	16.687	0.001

Residual	6.895	39	0.177		
Total	9.845	40			

Coefficients

Model	Unstandardized Coefficients B	Standard Error	Standardized Coefficients	T	Significance Level
Constant	1.987	0.424		4.691	0.001
Tax administration modernization	0.477	0.117	0.547	4.085	0.001

Source: Prepared by the researchers based on SPSS outputs.

The table above presents the results of the statistical analysis of the simple linear regression test between the independent variable, namely tax administration modernization, and the dependent variable, namely tax collection within the framework of modernization. The results show that the correlation coefficient between the two variables reached 0.547, which indicates a moderate relationship and confirms the existence of an association between them at the 0.05 significance level. The coefficient of determination reached 0.300, which means that tax administration modernization explains 30% of the variation in tax collection, while the remaining proportion is attributable to other factors.

The table also shows that the value of the statistical test F reached 16.687, which is statistically significant, since the corresponding probability value is 0.001, which is lower than the significance level of 0.05 adopted in the study. This indicates the adequacy of the model representing the relationship between tax administration modernization and tax collection, and therefore supports reliance on the model results in representing the linear relationship between the two variables.

The table further shows that the coefficient B carries a positive sign, which indicates a positive direct relationship between tax administration modernization and tax collection. The calculated T value reached 4.085, with a probability value of 0.001, which is lower than the significance level adopted in the study. This means that coefficient B is statistically and economically significant. It therefore appears that tax administration modernization has a positive effect on tax collection. A one-unit change in the level of tax administration modernization is associated with a change of 0.477 in the dependent variable, namely tax collection.

The following equation may therefore be derived:

Tax collection = 1.987 + 0.477 (tax administration modernization)

Based on the foregoing, the hypothesis stating that tax administration modernization has a positive effect on tax collection within the framework of modernization is confirmed.

The previous analysis has shown that tax administration modernization has a positive effect on tax collection. However, in order to identify how tax administration modernization contributes to this effect, it is necessary to determine the contribution of each of its dimensions to tax collection within the framework of modernization. The following table summarizes the results of the stepwise multiple regression analysis of the dimensions of tax administration modernization on tax collection.

Table (10): Multiple Linear Regression Between the Dimensions of Tax Administration Modernization and Tax Collection

Model Summary

Model	Multiple Correlation Coefficient	Coefficient of Determination	Adjusted Coefficient of Determination	Standard Error of the Estimate
	0.610	0.372	0.356	0.39807

ANOVA

Model	Sum of Squares	Degrees of Freedom	Mean Square	F	Significance Level
Regression	3.665	1	3.665	23.127	0.001
Residual	6.180	39	0.158		
Total	9.845	40			

Coefficients

Model	Unstandardized Coefficients B	Standard Error	Standardized Coefficients	T	Significance Level
Constant	2.317	0.293		7.896	0.001
Electronic tax administration	0.402	0.083	0.610	4.809	0.001

Source: Prepared by the researchers based on SPSS outputs.

The table presents the results of the statistical analysis of the stepwise multiple linear regression between the dimensions of tax administration modernization and the dependent variable, namely tax collection. The results show that the correlation coefficient between them reached 0.610, which indicates a moderate relationship at the 0.05 significance level. The coefficient of determination reached 0.372, which means that the dimensions of tax administration modernization explain 37.2% of the variation in tax collection, while the remaining proportion is due to other factors.

The table also shows that the statistical test value F reached 23.127, which is statistically significant, since the corresponding probability value is 0.001, which is lower than the significance level of 0.05 adopted in the study. This indicates the strength of the model representing the relationship between the dimensions of tax administration modernization and tax collection, and therefore confirms the validity of relying on the model results to represent the linear relationship between the two variables.

As for the coefficients of the dimensions of tax administration modernization, the dimension of electronic tax administration carried a positive sign, which indicates a direct positive relationship with tax collection. A one-unit change in the level of electronic tax administration corresponds to a change of 0.402 in the dependent variable, namely tax collection. This is a positive and important effect. The probability value associated with the T test was 0.001, which is lower than the significance level of 0.05 adopted in the study. This means that the coefficient of this dimension is statistically significant. It therefore appears that electronic tax administration has a positive effect on tax collection within the framework of modernization.

The multiple linear regression equation may therefore be derived as follows:

Tax collection within the framework of modernization = 2.317 + 0.402 (electronic tax administration)

Based on the results obtained, it appears that the dimension that exerts an effect on tax collection is the dimension of electronic tax administration.

5.3.2 Testing the Effect of Tax Administration Modernization on Improving the Performance of Tax Services

The second sub-hypothesis is tested as follows: "Tax administration modernization has a positive effect on improving the performance of tax services." The following table presents the results obtained.

Table (11): Simple Linear Regression Between Tax Administration Modernization and the Improvement of Tax Service Performance

Model Summary

Model	Multiple Correlation Coefficient	Coefficient of Determination	Adjusted Coefficient of Determination	Standard Error of the Estimate
	0.475	0.226	0.206	0.61151

ANOVA

Model	Sum of Squares	Degrees of Freedom	Mean Square	F	Significance Level
Regression	4.252	1	4.252	11.372	0.002
Residual	14.584	39	0.374		
Total	18.836	40			

Coefficients

Model	Unstandardized Coefficients B	Standard Error	Standardized Coefficients	T	Significance Level
Constant	1.541	0.616		2.501	0.017
Tax administration modernization	0.573	0.170	0.475	3.372	0.002

Source: Prepared by the researchers based on SPSS outputs.

The table above presents the results of the statistical analysis of the simple linear regression test between the independent variable, namely tax administration modernization, and the dependent variable, namely the improvement of tax service performance. The results show that the correlation coefficient between the two variables reached 0.475, which indicates a moderate relationship and confirms the existence of an association between them at the 0.05 significance level. The coefficient of determination reached 0.226, which means that tax administration modernization explains 22.6% of the variation in the improvement of tax service performance, while the remaining proportion is attributable to other factors.

The table also shows that the value of the statistical test F reached 11.372, which is statistically significant, since the corresponding probability value is 0.002, which is lower than the significance level of 0.05 adopted in the study. This indicates the adequacy of the model representing the relationship between tax administration modernization and the improvement of tax service performance. It also confirms the validity of relying on the model results in representing the linear relationship between the two variables.

The table further shows that the coefficient B for tax administration modernization carries a positive sign, which indicates a positive direct relationship between tax administration modernization and the improvement of tax service performance. The calculated T value reached 3.372, with a probability value of 0.002, which is lower than the significance level adopted in the study. This means that coefficient B is statistically and economically significant. It therefore appears that tax administration modernization has a positive effect on improving the performance of tax services. A one-unit change in the level of tax administration modernization is associated with a change of 0.573 in the dependent variable, namely the improvement of tax service performance.

The following equation may therefore be derived:

Improvement of tax service performance = 1.541 + 0.573 (tax administration modernization)

Based on the foregoing, the second sub-hypothesis is confirmed, namely that tax administration modernization has a positive effect on improving the performance of tax services.

The previous analysis has shown that tax administration modernization has a positive effect on improving the performance of tax services. However, in order to determine how tax administration modernization contributes to this effect, it is necessary to identify the contribution of each of its dimensions to the improvement of tax service performance. The following table summarizes the results of the stepwise multiple regression analysis of the dimensions of tax administration modernization on the improvement of tax service performance.

Table (12): Multiple Linear Regression Between the Dimensions of Tax Administration Modernization and the Improvement of Tax Service Performance

Model Summary

Model	Multiple Correlation Coefficient	Coefficient of Determination	Adjusted Coefficient of Determination	Standard Error of the Estimate
	0.561	0.315	0.298	0.57513

ANOVA

Model	Sum of Squares	Degrees of Freedom	Mean Square	F	Significance Level
Regression	5.936	1	5.936	17.945	0.001
Residual	12.900	39	0.331		
Total	18.836	40			

Coefficients

Model	Unstandardized	Standard	Standardized	T	Significance

	Coefficients B	Error	Coefficients		Level
Constant	1.838	0.424		4.334	0.001
Electronic tax administration	0.511	0.121	0.531	4.236	0.001

Source: Prepared by the researchers based on SPSS outputs.

The table presents the results of the statistical analysis of the stepwise multiple linear regression between the dimensions of tax administration modernization and the dependent variable, namely the improvement of tax service performance. The results show that the correlation coefficient between them reached 0.561, which indicates a moderate relationship at the 0.05 significance level. The coefficient of determination reached 0.315, which means that the dimensions of tax administration modernization explain 31.5% of the variation in the improvement of tax service performance, while the remaining proportion is attributable to other factors.

The table also shows that the value of the statistical test F reached 17.945, which is statistically significant, since the corresponding probability value is 0.001, which is lower than the significance level of 0.05 adopted in the study. This indicates the strength of the model representing the relationship between the dimensions of tax administration modernization and the improvement of tax service performance. It also confirms the validity of relying on the model results in representing the linear relationship between the two variables.

As for the coefficients of the dimensions of tax administration modernization, the dimension of electronic tax administration carries a positive sign, which indicates a direct positive relationship with the improvement of tax service performance. A one-unit change in the level of electronic tax administration corresponds to a change of 0.511 in the dependent variable, namely the improvement of tax service performance. This is a positive effect. The probability value associated with the T test was 0.001, which is lower than the significance level of 0.05 adopted in the study. This means that the coefficient of this dimension is statistically significant. It therefore appears that electronic tax administration has a positive effect on improving the performance of tax services.

The multiple linear regression equation may therefore be derived as follows:

Improvement of tax service performance = 1.838 + 0.511 (electronic tax administration)

Based on the previous analysis, it appears that tax administration modernization has a positive effect on improving the performance of tax services, and that the dimension exerting the greatest effect on this improvement is electronic tax administration.

5.3.3 Analysis of the Relationships Between the Study Variables Using PLS-SEM

For decades, methods based on dividing hypotheses and testing them separately were dominant, such as difference tests, correlation, and regression. Later, new methods emerged and came to be known as **structural equation modeling**. These methods test the theoretical model as a whole, or as a set of relationships between the latent variable and its indicators, as well as among the latent variables themselves (Tigza, 2015, p. 111).

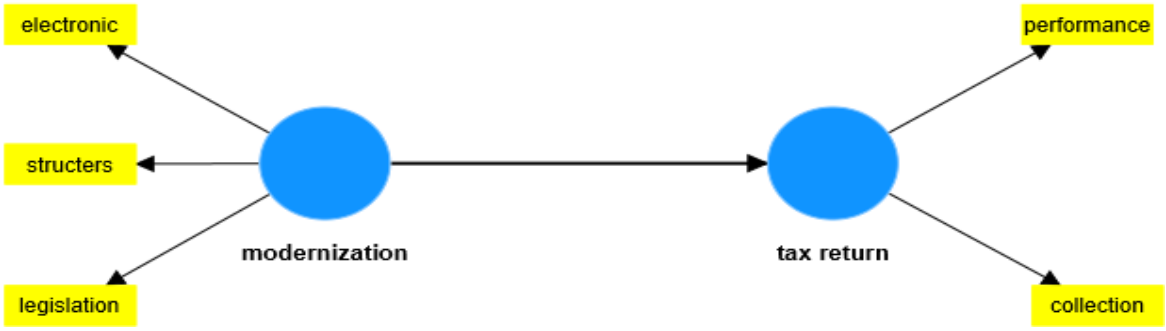
Partial Least Squares Structural Equation Modeling (PLS-SEM) is regarded as a method for modeling phenomena and for clearly identifying complex systems of interaction. It provides the researcher with greater flexibility in interpreting the relationship between theory and data. PLS-SEM is also described as a semi-parametric method because it does not require the variables to

follow a normal distribution. It is also highly effective with small samples. This makes it appropriate for the data used in the present study.

5.3.3 Study Model

The present study aimed to identify the effect of tax administration modernization (modernization) through its dimensions, namely tax legislation (legislation), new tax administration structures (structures), and electronic tax administration (electronic), on tax performance (tax return) through its dimensions, namely tax collection (collection) and improvement of tax service performance (performance). The following figure illustrates the study model.

Figure (01): Study Model



Source: Prepared by the researchers.

5.3.4: Evaluation of the Study Model

This was carried out by examining reliability, convergent validity, and discriminant validity. Reliability indicates the extent to which the dimensions represent a single concept. In other words, it shows the extent to which the dimensions of tax administration modernization reflect that construct, and the extent to which tax performance reflects its own construct.

a. Internal Consistency Reliability and Convergent Validity

Internal consistency reliability is assessed by means of Cronbach's alpha and composite reliability. The results are presented in the following table.

Table (13): Indicators of Internal Consistency Reliability and Convergent Validity

Construct	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
modernization	0.851	0.933	0.909	0.770
tax return	0.933	0.948	0.967	0.937

Source: Prepared by the researchers based on the outputs of the SmartPLS4 software.

The results in the table above show that all Cronbach's alpha values exceeded 0.70. The table also presents the results of the discriminant validity indicator, where both variables exceeded 90%, which is an excellent value confirming that the scale is appropriate and is not affected by changes in place or circumstances. As for the AVE indicator, both variables achieved the standard threshold,

which should exceed 50%. Accordingly, the indicators of the reflective constructs demonstrate high levels of convergent validity.

b. Discriminant Validity

Discriminant validity refers to the extent to which a construct is truly distinct from other constructs. The following table presents the results.

Table (14): Discriminant Validity Indicators

Construct	modernization	tax return
modernization	0.878	
tax return	0.536	0.968

Source: Prepared by the researchers based on the outputs of the SmartPLS4 software.

The table presents the results of the Fornell–Larcker criterion, together with the square root of the AVE values for the reflective constructs located on the diagonal, and the correlations between constructs located outside the diagonal. The square root of the AVE value for the construct tax administration modernization reached 0.878, which is greater than all the correlation values in the column of tax administration modernization. For tax performance, this indicator reached 0.968. These results indicate that all constructs have indicators with valid measurement of the distinct concept assigned to each one.

It should be noted that, in many scientific studies, the Fornell–Larcker criterion and cross-loadings do not always detect discriminant validity reliably. For this reason, a more reliable alternative criterion should be used, namely the HTMT ratio. The following table presents the results.

Table (15): Heterotrait–Monotrait Ratio (HTMT)

Construct	modernization	tax return
modernization		
tax return	0.577	

Source: Prepared by the researchers based on the outputs of the SmartPLS4 software.

The table above presents the HTMT values for all constructs in a pairwise matrix. The results show that the HTMT values are well below the threshold value of 0.85. Accordingly, the HTMT results support the adequacy of discriminant validity.

c: Evaluation of the Structural Model

After confirming that the measurement scale possesses validity and reliability, the next step is to evaluate the results of the structural model. This includes examining the predictive power of the model and the relationships among the constructs.

1. Assessing Collinearity Issues in the Structural Model

The variance inflation factor (VIF) is used to assess collinearity. A VIF value greater than or equal to 5 indicates the possible presence of collinearity problems. A VIF value of 5 means that 80% of the variance of an indicator is explained by the remaining formative indicators associated with the same construct. The following table presents the results obtained.

Table (16): Variance Inflation Factor (VIF)

Variable	VIF
Collection	4.224
Electronic	3.537
Legislation	1.847
Performance	4.224
Structures	2.580

Source: Prepared by the researchers based on the outputs of the SmartPLS4 software.

The table presents the results of the variance inflation factor (VIF), which is used to assess collinearity. It may be observed that the values of this coefficient for all study variables did not exceed 5. This indicates that there are no collinearity problems among the variables of the study.

2. Assessing the R^2 Level

The R^2 value is the most widely used measure for evaluating the structural model. The results obtained are presented in the following table.

Table (17): Coefficient of Determination (R^2) Values

Variable	R-square	R-square adjusted
tax return	0.287	0.270

Source: Prepared by the researchers based on the outputs of the SmartPLS4 software.

The table shows that the R-square value is statistically significant and acceptable. It reached 0.287, which may be considered somewhat weak. This indicates that tax administration modernization explains about 28.7% of the dependent latent variable, namely tax performance. This result supports the adequacy and significance of the model.

3. Assessing the Effect Size (f^2)

This is determined through the following table.

Table (18): Effect Size (f^2)

Construct	modernization	tax return
Modernization		0.403
tax return		

Source: SmartPLS4 software outputs.

The table presents the f^2 values for all groups of internal constructs represented by the columns, and the related external constructs represented by the rows. It may be observed that tax administration modernization has a large effect size on tax performance, with a value of 0.403. This value is statistically significant because it exceeds 0.35. This indicates that tax administration modernization has a strong effect on tax performance.

4. Assessing Predictive Relevance (Q^2)

This is determined through the following table.

Table (19): Predictive Relevance (Q^2)

Construct	SSO	SSE	Q^2 (=1-SSE/SSO)
Modernization	126.000	126.000	0.000
tax return	84.000	69.095	0.177

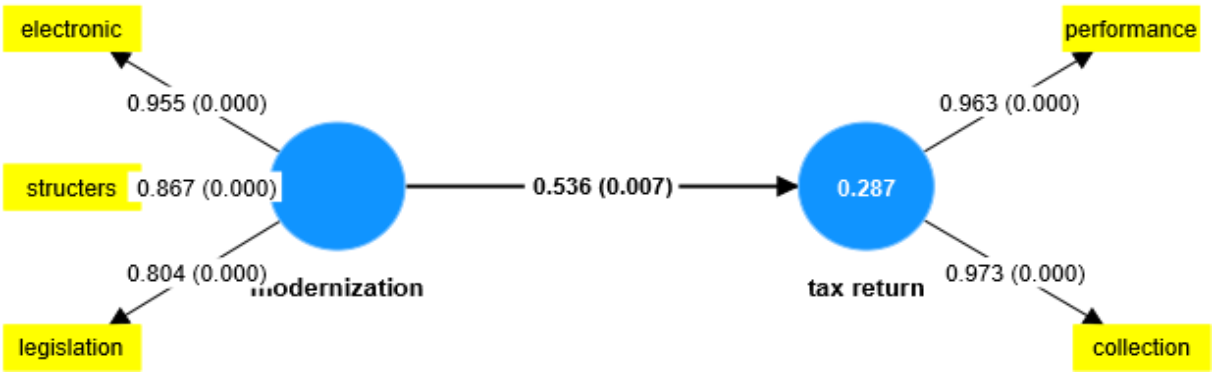
Source: Prepared by the researchers based on the outputs of the SmartPLS4 software.

The table above shows that all Q^2 coefficients are meaningful and economically acceptable because they are greater than zero. This indicates that the latent variables included in the study model have predictive ability.

5. Assessing the Fit and Significance of the Relationships in the Structural Model

This refers to the model that examines the relationship or effect between the latent variables, that is, the effect of tax administration modernization on tax performance, as shown in the following figure:

Figure (02): Structural Model of the Effect of Tax Administration Modernization on Tax Performance



Source: Prepared by the researchers based on the outputs of the SmartPLS4 software.

As can be seen from the figure above, tax administration modernization has a positive and statistically significant effect on tax performance. The value of this effect reached **0.536**. This means that a one-standard-deviation increase in tax administration modernization leads to a **0.536** standard-deviation increase in tax performance.

Table (20): The Effect of Tax Administration Modernization on Tax Performance

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
modernization -> tax return	0,536	0,526	0,199	2,688	0,007

Source: Prepared by the researchers based on the outputs of the SmartPLS4 software.

The table confirms the results shown in the previous figure. The effect of tax administration modernization on tax performance reached 0.536, with a P-value of 0.007, which is lower than 0.05. This indicates a positive and statistically significant effect of tax administration modernization on tax performance. In other words, each one-standard-deviation increase in tax administration modernization leads to a 0.536 standard-deviation increase in tax performance.

Accordingly, the main hypothesis is confirmed: tax administration modernization has a positive effect on tax performance in Algeria.

6. Conclusion

This study sought to highlight the effect of tax administration modernization, in its various dimensions, on tax performance. It combined theoretical analysis with a field study in order to identify and measure this effect. The main findings may be summarized as follows:

- Tax administration modernization has a positive and statistically significant effect on tax performance.
- Tax administration modernization has a positive effect on both tax collection and the improvement of tax service performance.
- Electronic tax administration is one of the most influential dimensions in enhancing tax performance.
- The performance of tax services has improved in terms of speed and accuracy in tax transactions.
- Digitalization has contributed significantly to improving service quality, reducing tax evasion, and strengthening the relationship between the administration and taxpayers.
- It is necessary to provide adequate technological means and to strengthen the training of tax officers in line with the requirements of modernization.
- There is a high level of implementation of tax administration modernization in Algeria.
- Electronic filing and payment portals, together with the website of the Directorate General of Taxes, have helped raise the level of tax compliance.
- Modernization has contributed to strengthening trust between the administration and taxpayers and to reducing tax disputes.

7. Recommendations

- Strengthen the use of information and communication technology in the various tax operations.
- Provide tax officers with the necessary electronic tools and intensify their training in their use in order to ensure the efficient performance of their duties.
- Promote digital tax awareness among taxpayers.
- Develop electronic tax control systems in order to reduce tax evasion.
- Work continuously to improve the quality of tax services in a way that strengthens taxpayers' trust in the administration.

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