

Measuring the Mediating Role of Digital Transformation in Enhancing the Effectiveness of Fiscal Policy in Reducing Tax Evasion and Tax Fraud in Algeria

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Summary:

This study explores the influence of digital transformation in tax administration as a mediating factor in enhancing the effectiveness of fiscal policy to reduce tax evasion and fraud in Algeria. The research seeks to evaluate how integrating digital tools can support fiscal mechanisms in addressing persistent tax violations. Based on a sample of 360 responses from tax officials, quantitative data were collected using a structured questionnaire and analyzed through structural equation modeling with the support of SPSS and AMOS software. The analysis demonstrates that digital transformation has both a direct and indirect impact on limiting tax evasion and fraud, while fiscal policy itself exerts a significant role in addressing these issues. The mediation of digital transformation also reinforces the positive influence of fiscal policy on tax compliance. The results underscore the importance of adopting advanced digital strategies to modernize tax administration processes, increase operational transparency, and improve policy outcomes. The study concludes by recommending the development of integrated digital infrastructures, the reinforcement of staff competencies in digital systems, and the revision of regulatory frameworks to minimize legal loopholes.

Keywords: Digital Transformation; Fiscal Policy; Tax Evasion; Tax Fraud; Algeria.

Jel Classification Codes : H26 ; H30 ; H83.

I- Introduction :

Tax policy constitutes one of the fundamental pillars of modern fiscal governance, serving not merely as a means of revenue generation but as a strategic instrument for shaping economic behavior, redistributing income, and sustaining macroeconomic equilibrium. By defining the principles of taxation, structuring incentives, and regulating public expenditure, fiscal policy directly influences both social justice and economic development. In this regard, an effective tax system represents the cornerstone of a state's financial sovereignty and a vital mechanism for achieving sustainable development goals.

Yet, despite its centrality, tax policy in many developing economies including Algeria remains hindered by structural and operational challenges. Tax evasion and fraud, in particular, have emerged as persistent threats undermining the credibility and efficiency of fiscal systems. These practices not only distort the allocation of public resources and erode citizens' trust in governmental institutions but also weaken the overall capacity of the state to finance development and maintain fiscal stability.

Amid these challenges, digital transformation has increasingly been recognized as a transformative lever capable of redefining the efficiency and transparency of tax administration. The adoption of digital technologies such as electronic filing platforms, automated auditing tools, integrated databases, and advanced analytics offers new opportunities to minimize human error, enhance compliance, and restrict avenues for manipulation or concealment. For countries striving to modernize their public finance infrastructure, digitalization represents not a mere administrative reform but a paradigm shift toward data-driven fiscal governance.

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In Algeria, despite ongoing reforms aimed at strengthening tax policy and improving administrative performance, tax evasion and fraud continue to impose heavy constraints on fiscal discipline and equity. This persistent gap between policy intent and fiscal reality underscores the urgent need to assess how digital transformation may reinforce the operational effectiveness of fiscal policy. Accordingly, the present study seeks to address the following central research question: **Does the digital transformation of tax administration enhance the effectiveness of fiscal policy in reducing tax evasion and fraud in Algeria?**

From this question emerges the main hypothesis: Digital transformation contributes directly and indirectly to enhancing the effectiveness of fiscal policy in curbing tax evasion and fraud.

A review of prior research reveals that while several studies have examined fiscal policy efficiency or tax fraud independently, few have integrated these domains within a unified analytical framework. For instance, (Fallah, 2006) highlighted the structural limitations of fiscal policy in Algeria, emphasizing weak institutional coordination and the absence of long-term strategic vision. (Khalasi, 2008) identified low tax awareness and inadequate enforcement as enduring sources of tax fraud between 1991 and 2002. Similarly, (Bkriiti & Yousfi, 2015) warned of the socio-economic repercussions of continued tax evasion on public revenues. (Massmesh et al., 2020) underscored the dominance of informal activities and the limited capacity of fiscal tools to deter evasion, while (Ben Balash, 2021) demonstrated the legal and procedural deficiencies in implementing anti-fraud measures. More recently, (Salmi & Mouloud, 2023) observed that administrative detection mechanisms in Ghardaia remain outdated and insufficiently integrated with digital systems.

In contrast, recent international evidence, such as the work of (Chen & al, 2024) on Chinese listed firms, has shown that corporate digitalization significantly mitigates tax avoidance by enhancing transparency, reducing agency costs, and increasing external oversight. Their findings suggest that digital transformation not only improves fiscal accountability but also contributes to a more stable and equitable tax base insights that bear direct relevance to developing economies like Algeria.

Despite these valuable contributions, the interplay between digital transformation and fiscal policy effectiveness remains underexplored in Algerian research. Therefore, this study seeks to fill this gap through an empirical analysis employing Structural Equation Modeling (SEM) using AMOS and SPSS software. By examining both direct and mediating effects of digital transformation on fiscal efficiency, the study aims to generate evidence-based insights capable of informing future tax governance strategies and supporting Algeria's transition toward a more transparent, digitally empowered fiscal system.

I.1. Digital Transformation in Tax Administration

Digital transformation in tax administration signifies a comprehensive shift from traditional tax management systems to innovative, technology-driven models. This transition leverages cutting-edge advancements of the Fourth Industrial Revolution, including artificial intelligence, big data analytics, cloud computing, and the Internet of Things, to reengineer tax-related processes and interactions (Hamed, 2024, p. 110). At its core, digital transformation enables tax authorities to deliver services such as electronic tax registration, online filing and payment of taxes, and digital issuance of tax clearance certificates. Such technological integration requires robust information and communication infrastructure that supports seamless operation, monitoring, and management of tax activities (Akpubi & Igbekoyi, 2019, p. 54).

Governments globally recognize digital transformation as a strategic imperative to enhance public sector efficiency, improve service quality, and ensure timely delivery of tax services (Chijioke & Al, 2018, pp. 20, 21). In the context of Algeria, the objectives of digital transformation within the tax administration include:

- Strengthening compliance with tax laws and regulations through digitization;
- Safeguarding taxpayer information and ensuring data security across tax systems;
- Facilitating flexible and efficient access for taxpayers to meet their fiscal obligations;
- Implementing continuous audit mechanisms to improve system effectiveness and performance;
- Promoting awareness and adoption of advanced governance frameworks to sustain modernization efforts (Laariba & Sahnoun, 2021, pp. 519, 520).

To realize these goals, Algeria has developed several digital platforms pivotal to its tax transformation journey. These include:

-Tax Services Portal: A centralized digital gateway for taxpayers to access declarations, regulatory information, and direct communication with tax authorities (Bouzkri, 2021, p. 462).

- Service Quality Reference System: Established to continuously elevate tax service standards and improve taxpayer engagement by focusing on both internal process optimization and external service delivery (Ben Chehra & Qaman, 2020, p. 266).

Electronic Declaration and Payment Platforms: Portals such as "Jibaya'tic" and "Mousahama'tic" facilitate streamlined, user-friendly electronic tax declarations and payments, with "Jibaya'tic" primarily serving large enterprises and "Mousahama'tic" focusing on simplifying processes at tax collection points (Toumi & Ben Amara, 2019, p. 247) (Miftah & Ben Halima, 2022).

These dimensions collectively embody a paradigm shift, positioning the Algerian tax administration toward greater transparency, efficiency, and taxpayer-centric services.

I.2. Fiscal Policy and Tax Compliance Challenges

Fiscal policy encompasses the government's strategic use of financial instruments to allocate resources and execute functions that serve broader economic, social, and political objectives. It transcends mere revenue collection by actively engaging in economic stabilization, correcting imbalances in payments, and curbing inflationary trends (Ghrine, 2016). Fundamentally, fiscal policy represents an integrated framework of programs that utilize current and forecasted financial resources to generate socioeconomic value and safeguard societal welfare (Afif, 2014, p. 235).

Key determinants shaping fiscal policy effectiveness include: (Bkriiti, B & Yousfi, 2015, p. 166):

- Prioritization of tax system objectives aligned with the nation's prevailing economic, social, and political conditions;
- Calibration of direct and indirect tax mechanisms and rates to optimize revenue generation without compromising economic vitality;
- Harmonization of fiscal objectives to ensure exemptions and incentives are balanced against the imperative to secure adequate revenue for public expenditures.

I.3. Tax Evasion and Tax Fraud: Definitions and Mechanisms

Tax evasion refers to the exploitation of legal loopholes within tax legislation, where taxpayers deliberately underreport earnings or manipulate figures to reduce tax liabilities. Although often technically compliant with existing laws, these actions subvert the law's intent and raise significant ethical concerns (Sherien & Sayed, 2020, p. 1522). Tax evasion represents a deliberate circumvention strategy that undermines equitable tax enforcement and erodes public revenues.

Conversely, tax fraud constitutes overt illegal actions aimed at deceitfully minimizing tax obligations. This includes falsification of financial records, inflation of expenses through fictitious invoices, and deliberate omission of income, all constituting criminal violations subject to legal penalties (Sumartaya & Hafidiah, 2014). Common fraudulent practices entail:

Tax fraud refers to the deliberate manipulation and deceptive conduct by taxpayers regardless of their legal classification with the intent of unlawfully minimizing their tax obligations. Such conduct constitutes a violation of tax law, as it is predicated on the intentional distortion or omission of financial information, resulting in inaccurate reporting of taxable income (Efeeloo & Dick, 2018). As highlighted by (Maqbil, 2012, p. 242), tax fraud may manifest in several forms, including but not limited to:

- a. Submitting tax declarations based on fabricated accounting data or forged documentation, often aimed at reducing taxable profits through the use of falsified purchase or sales invoices;
- b. Deliberate concealment or premature destruction of accounting records and financial ledgers, prior to the expiration of the statutory retention period, in an effort to obstruct verification processes;
- c. Artificial distribution of profits by dominant shareholders to fictitious or non-existent partners, thereby manipulating income reporting and evading applicable tax liabilities.

II– Methods and Materials:

II.1. Study Population and Sample Design

The target population for this research comprised tax officers operating within Algeria's national tax administration structures. Determining an adequate sample size is a foundational consideration in empirical research, particularly when employing structural equation modeling (SEM). In this context, (Hair & al, 2014, p. 116) advocate for a minimum of 200 observations to ensure statistical robustness. Based on these recommendations, the study adopted a purposive sampling strategy, ultimately collecting data from 360 respondents, thereby exceeding the recommended threshold and ensuring the validity of multivariate statistical analyses.

Data collection was carried out between early January and mid-May 2025, covering a broad spectrum of tax officers operating within Algeria's decentralized tax administration network. This time frame ensured the inclusion of diverse regional perspectives and operational conditions across the national tax system.

The survey was deliberately restricted to tax officers to preserve the study's analytical focus on internal administrative efficiency. This design aligns with the core objective of examining how digital transformation and tax policy interact within tax administrations to curb non-compliance. Direct inclusion of taxpayers was excluded due to logistical and confidentiality constraints. Complementary secondary data from the Algerian Directorate General of Taxes indicate that tax collection rates ranged between 82% and 86% during 2021–2023, supporting the relevance of analyzing the issue from within the administrative system.

- Hypothesis Development

This section presents the empirical testing of the hypotheses specifically formulated to address the central questions of this study. These hypotheses were derived based on the conceptual framework and informed by an extensive review of both theoretical and empirical literature. They were designed to capture the key relationships relevant to the study's objectives and context. To validate them, structural equation modeling (SEM) was employed, given its robustness in analyzing complex causal relationships among latent variables and their observed indicators.

- The first hypothesis: There is a statistically significant direct effect of digital transformation on reducing the phenomena of tax evasion and fraud in tax administrations in Algeria.
- The second hypothesis: There is a statistically significant direct effect of tax policy on reducing the phenomena of tax evasion and fraud in tax administrations in Algeria.
- The third hypothesis: There is a statistically significant indirect effect of digital transformation on enhancing the effectiveness of tax policy in reducing the phenomena of tax evasion and fraud in tax administrations in Algeria.

II.2. Research Strategy and Data Collection Tools

The study employed a quantitative research strategy grounded in the inductive reasoning approach, which is particularly appropriate for exploring emerging phenomena in real-world administrative environments. This methodological orientation facilitates a comprehensive analysis of relationships among key variables and provides a solid basis for hypothesis testing and generalization.

Data were gathered via a structured questionnaire, which remains one of the most reliable instruments in behavioral and administrative sciences, particularly in contexts where alternative data collection methods face logistical or operational constraints (Hair Jr & al, 2010) (Venkatesh & al, 2003). The questionnaire consisted of two sections: the first covered respondents' demographic attributes, while the second addressed the core constructs of the study.

Items were measured using a five-point Likert scale, developed based on an in-depth review of relevant literature and subsequently validated by a panel of subject-matter experts to ensure semantic clarity, relevance, and content validity.

The study treated tax evasion and tax fraud as a single construct tax non-compliance reflecting their shared behavioral and institutional roots. This integration allowed for a more coherent and parsimonious model, particularly suited to the Algerian fiscal environment, where both forms of non-compliance arise from similar systemic and technological constraints. Thus, the approach captured the broader mechanisms through which digital transformation and tax policy collectively influence the reduction of irregular fiscal practices.

II.3. Instrument Validity and Reliability

A. Construct Validity through Confirmatory Factor Analysis (CFA)

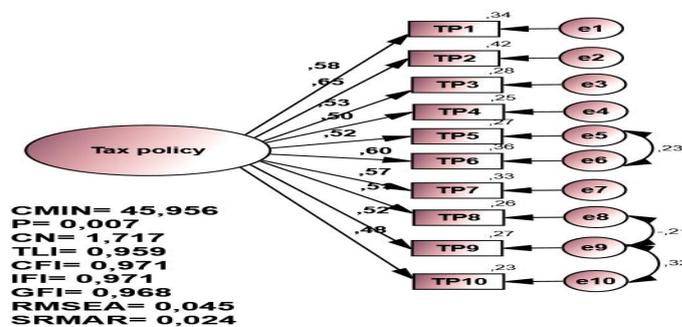
To assess the construct validity of the measurement instrument, Confirmatory Factor Analysis (CFA) was conducted using AMOS Version 26. The variables under investigation were operationalized into three latent constructs, each measured through a set of reflective indicators:

Theme	Number of Statements	Code
Axis One: Tax Policy	10	TP
Axis Two: Digital Transformation in Tax Administration	10	DT
Axis Three: Tax Evasion and Fraud	8	TE

The source: Prepared by the researcher

B. CFA Results for the "Tax Policy" Construct

Figure (1): Results of the Confirmatory Factor Analysis for the Tax Policy Theme



The source: Prepared by the researcher based on the results from Amos V.26.

As illustrated in Figure (1): all factor loadings for the Tax Policy dimension ranged from 0,484 to 0,647, thus meeting the commonly accepted thresholds for convergent validity (Hair & al., 2014; Hulley & al, 1988). Each loading exceeded the minimum benchmark of 0,45, indicating acceptable item reliability. Moreover, Critical Ratio (CR) values surpassed 1.96, and p-values were all statistically significant at $p < 0,001$, affirming the internal consistency of the construct.

C. CFA Results for the "Digital Transformation in Tax Administration" Construct

Figure (2): Results of the Confirmatory Factor Analysis for the Digital Transformation of Tax Administration Dimension.

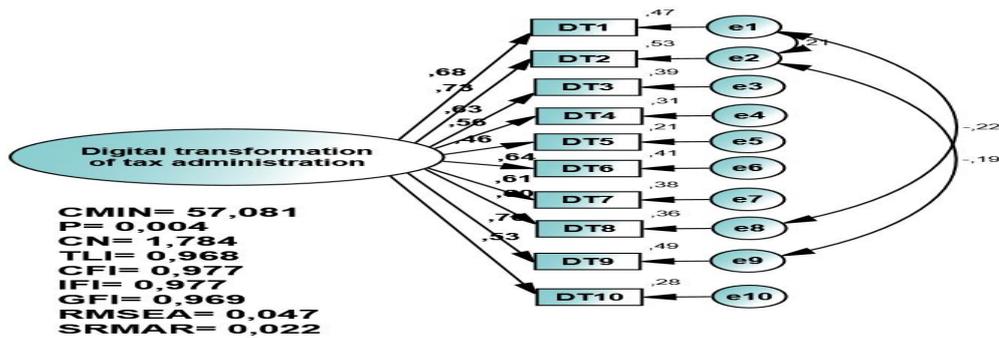
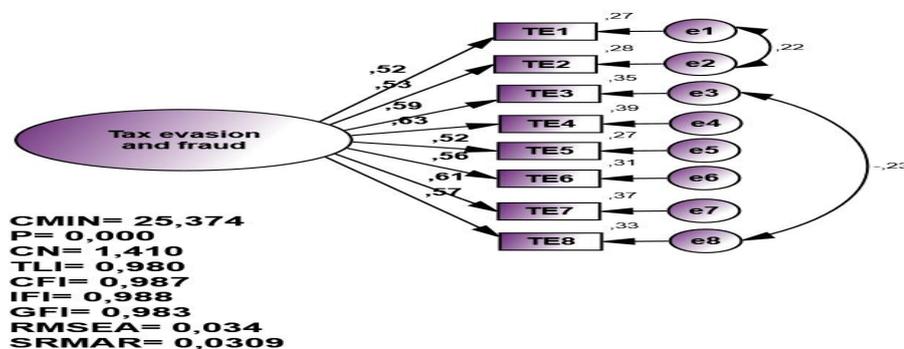


Figure (2): summarize the CFA findings for the Digital Transformation construct. Factor loadings ranged between 0,460 and 0,729, aligning with recommended criteria for construct validity. All items showed strong significance levels ($p < 0,001$) and CR values exceeding 1,96, reinforcing the dimensional coherence and structural integrity of this latent variable.

D. CFA Results for the "Tax Evasion and Fraud" Construct

Figure (3): Results of the Confirmatory Factor Analysis for the Phenomena of Tax Evasion and Tax Fraud.



The source: Prepared by the researcher based on the results from Amos V.26.

The CFA outcomes for the Tax Evasion and Fraud construct, presented in Figure (3), confirmed that all item loadings fell within the acceptable range of 0,515 to 0,628, further satisfying convergent validity requirements. As with the previous constructs, the estimates were statistically significant at $p < 0,001$, with CR values exceeding the 1,96 threshold.

The CFA results for all three constructs validated the appropriateness of the instrument for subsequent structural modeling. All measurement items achieved standardized loading estimates above the recommended minimum, with robust model fit indicators and statistical significance across all latent constructs. These findings justify the use of the instrument for hypothesis testing in the subsequent stages of analysis.

E. Reliability of the Study Instrument

Table (2): Cronbach's Alpha Coefficients for the Study Dimensions

Dimension	Cronbach's Alpha Coefficient	Decision
Tax Policy	0,812	Excellent
Digital Transformation of Tax Administration	0,858	Excellent
Tax Evasion and Tax Fraud	0,790	Good
Overall Questionnaire	0,918	Excellent

The source: Prepared by the researcher based on the results from Spss V.26.

As shown in Table (2), the Cronbach's Alpha coefficients for all dimensions of the study exceed the acceptable threshold of 0,70, indicating a high level of internal consistency across the items measuring each construct. The overall questionnaire achieved a reliability score of 0,918, which reflects a very high degree of instrument reliability. This supports the validity of the data collected and justifies proceeding with further statistical analysis based on these measures.

II.4. Study Results (Analysis and Discussion)

A. Descriptive Analysis of Respondents' Answers

Table (3): Descriptive Statistics of the Study Sample's Responses by Dimension

Dimension	Mean	Standard Deviation	Decision
Tax Policy	4,035	0,503	Strongly
Digital Transformation of Tax Administration	4,091	0,540	Strongly
Phenomena of Tax Evasion and Tax Fraud	4,167	0,465	Strongly

The source: Prepared by the researcher based on the results from Spss V.26.

Table (3) reveals that the highest mean score was recorded for the dimension "Phenomena of Tax Evasion and Tax Fraud," with a value of 4,167 and a standard deviation of 0,465. This indicates a strong level of agreement among tax officers regarding the statements associated with this dimension. It suggests that tax officials perceive current tax policies as providing effective legal frameworks to combat evasion and fraud, including adequate penalties and deterrents. Additionally, the results reflect the view that digital transformation plays a crucial role in addressing these issues. The findings also highlight that taxpayers' low awareness of their fiscal obligations contributes significantly to the prevalence of tax evasion and fraud.

The second-highest mean score 4,091 was associated with the dimension "Digital Transformation of Tax Administration," with a standard deviation of 0,540. This result underscores the respondents' strong agreement that digital platforms implemented by tax administrations are user-friendly and enhance operational efficiency. These platforms facilitate accurate data processing and improve communication with stakeholders, thereby promoting greater taxpayer compliance. Respondents also acknowledged the platforms' benefits in terms of confidentiality, security, cost reduction, and time savings. Moreover, training sessions provided to employees help strengthen their digital competencies and increase their satisfaction with the digital systems in place.

The "Tax Policy" dimension ranked third with a mean score of 4,035 and a standard deviation of 0,503. This also reflects strong agreement among respondents, indicating that the

existing tax policies support equitable distribution of tax burdens across social groups, ensure efficiency in tax collection processes, and strive for clarity and simplicity in tax legislation. Furthermore, the policies are perceived as being aligned with citizens' purchasing power and as encouraging investment through incentives directed toward small and medium enterprises. Respondents also noted the strict enforcement of tax obligations, particularly for businesses, emphasizing the importance of compliance within the legally specified deadlines.

B. Normality Test

To assess whether the study variables follow a normal distribution, skewness and kurtosis coefficients were employed. According to established statistical standards, the skewness coefficient should lie within the range of [-3, +3], while the kurtosis coefficient should fall between [-10, +10]. Some researchers, such as (Kline Rex, 2016, pp. 76, 77), suggest that kurtosis values exceeding 10 may indicate potential issues, and values above 20 reflect serious violations of normality assumptions. In the current analysis, the criteria proposed by Hair et al. (2010) were adopted, which recommend that acceptable skewness and kurtosis values fall within the interval [-1,96, +1,96], ensuring a normal distribution appropriate for structural equation modeling.

Table 07: Normality Test Results for the Study Variables

Table (4): Results of the Normality Distribution

Variable	Skew	c.r.	Kurtosis	c.r.
Axis One: Tax Policy				
TP1	-0,925	-7,163	0,833	3,227
TP2	-0,717	-5,557	0,241	0,935
TP3	-0,881	-6,826	0,778	3,014
TP4	-0,778	-6,025	0,540	2,090
TP5	-0,562	-4,351	0,323	1,249
TP6	-0,871	-6,749	1,418	5,490
TP7	-0,667	-5,167	-0,088	-0,342
TP8	-0,979	-7,580	1,764	6,833
TP9	-0,590	-4,566	0,068	0,264
TP10	-0,713	-5,520	0,740	2,865
Multivariate			38,170	23,374
Axis Two: Digital Transformation of Tax Administration				
DT1	-0,802	-6,209	0,632	2,449
DT2	-0,991	-7,674	1,156	4,476
DT3	-0,987	-7,645	1,140	4,415
DT4	-0,750	-5,808	0,765	2,964
DT5	-0,910	-7,050	1,071	4,147
DT6	-0,792	-6,136	0,554	2,147
DT7	-0,662	-5,124	0,169	0,655
DT8	-0,819	-6,347	0,948	3,670
DT9	-0,930	-7,202	0,927	3,590
DT10	-0,711	-5,508	0,284	1,099
Multivariate			55,343	33,890
Axis Three: Tax Evasion and Fraud				
TE1	-0,829	-6,423	0,705	2,732
TE2	-0,540	-4,186	0,292	1,131
TE3	-0,801	-6,203	1,414	5,475
TE4	-0,641	-4,963	0,183	0,709
TE5	-0,557	-4,317	-0,222	-0,858
TE6	-0,638	-4,946	0,741	2,870
TE7	-0,755	-5,850	0,532	2,061
TE8	-0,635	-4,917	0,736	2,851
Multivariate			30,854	23,141

The source: Prepared by the researcher based on the results from Amos V.26.

From Table (4), the skewness and kurtosis coefficients for all the study variables, as assessed in accordance with the criteria proposed by Hair et al. (2010), fall within the acceptable threshold for normal distribution, specifically the interval $[-1,96, +1,96]$. These findings confirm that the data collected for each construct exhibit univariate normality, thus justifying the application of structural equation modeling (SEM) techniques. Consequently, the statistical outputs generated using AMOS v.26 are deemed methodologically robust and valid for subsequent inferential analysis.

C. Hypothesis Testing

To evaluate the direct hypotheses proposed in the study, a series of simple linear regression analyses were conducted. In parallel, the indirect (mediated) hypothesis was examined to determine the statistical significance of the mediating effect and assess its acceptance or rejection. For this purpose, the structural model was utilized, as it provides comprehensive goodness-of-fit indices that assess the degree to which the theoretical model aligns with the observed data. These indices were calculated using AMOS v.26.

According to (Hakim & al, 2009, p. 25), when the model exhibits an adequate fit based on these indices, the results of hypothesis testing can be considered highly reliable. Furthermore, to assess the significance of the mediating paths, the bootstrapping technique was employed, utilizing 95% confidence intervals. This method, known for its statistical precision, relies on resampling thousands of times from the original dataset to generate robust estimates and validate the indirect effects.

The model fit was evaluated using several key indices: (Tigza, 2012, pp. 244, 247)

- CMIN (Chi-square minimum), where lower values indicate a better fit;
- CMIN/DF (CN), where values less than 5 are desirable;
- GFI (Goodness-of-Fit Index), with values $\geq 0,90$ reflecting acceptable fit;
- TLI (Tucker-Lewis Index), with values $\geq 0,95$ indicating good fit;
- CFI (Comparative Fit Index), where $CFI \geq 0,95$ denotes excellent fit;
- SRMR (Standardized Root Mean Square Residual), with values $\leq 0,05$ considered optimal, and
- RMSEA (Root Mean Square Error of Approximation), where values between 0,05 and 0,08 are considered acceptable.

- First Hypothesis Test

The first hypothesis is evaluated based on the following null and alternative hypotheses:

H0: There is no statistically significant direct effect of digital transformation on reducing the phenomena of tax evasion and fraud in tax administrations in Algeria.

H1: There is a statistically significant direct effect of digital transformation on reducing the phenomena of tax evasion and fraud in tax administrations in Algeria.

Table (5): Analysis of Variance and Correlation Coefficient to Explain the Effect of Digital Transformation on Reducing Tax Evasion and Fraud

The source	Sum of Squares	df	Mean Square	F	Significance (SIG)	Correlation Coefficient (R)	R-squared (R ²)
Regression	37,311	1	37,311	422,441	0,000	0,736	0,541
Residual	31,619	358	0,088				
Total	68,930	359					

The source: Prepared by the researchers based on the results from SPSS v.26.

The results presented in Table (5) indicate that the computed F-value ($F = 422,441$) significantly exceeds the critical tabulated value of 3,84, confirming the model's statistical validity. Furthermore, the associated significance level ($p = 0,000$) is well below the conventional threshold of 0,05, suggesting that the proposed regression model is appropriate for testing the hypothesis.

Additionally, the correlation coefficient ($R = 0,736$) demonstrates a strong positive relationship between digital transformation and the reduction of tax evasion and fraud, falling within the range of $[0,50; 1]$. The coefficient of determination ($R^2 = 0,541$) reveals that 54,1% of the variance in reducing tax evasion and fraud is explained by digital transformation, thereby underscoring the explanatory strength of the model.

Table (6): Testing the Significance of the Simple Linear Regression Model Coefficients for the Effect of Digital Transformation on Reducing Tax Evasion and Fraud

Model	Coefficients	Standard Error	BETA	T	Significance Level
Constant (A)	1,739	0,120		14,510	0,000
Regression Coefficient (B1)	0,597	0,029	0,736	20,553	0,000

Linear Regression Model: $Y = A + B1 X$, $TE = 1,739 + 0,597 DT$

The source: Prepared by the researcher based on the results from SPSS v.26.

The values displayed in Table (6) confirm the statistical significance of the model coefficients. The constant term ($A = 1,739$) and the regression coefficient ($B1 = 0,597$) both yield p-values = 0,000, which are substantially below the significance threshold ($\alpha = 0,05$). This implies that digital transformation exerts a statistically significant positive effect on reducing tax evasion and fraud.

More specifically, the estimated regression model indicates that a one-unit increase in digital transformation corresponds to a 0,597 unit reduction in the incidence of tax evasion and fraud, ceteris paribus. As a result, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_1) is accepted, confirming the presence of a statistically significant direct effect of digital transformation on curbing tax evasion and fraud in Algerian tax administrations.

- Second Hypothesis Test

The second hypothesis is tested in light of the following null and alternative assumptions:

H_0 : There is no statistically significant direct effect of tax policy on reducing the phenomena of tax evasion and fraud in tax administrations in Algeria.

H_1 : There is a statistically significant direct effect of tax policy on reducing the phenomena of tax evasion and fraud in tax administrations in Algeria.

Table (7): Analysis of Variance and Correlation Coefficient to Explain the Effect of Tax Policy on the Phenomena of Tax Evasion and Fraud

The source	Sum of Squares	df	Mean Square	F	Significance (SIG)	Correlation Coefficient (R)	R-squared (R^2)
Regression	23,021	1	23,021	179,522	0,000	0,578	0,334
Residual	45,909	358	0,128				
Total	68,930	359					

The source: Prepared by the researcher based on the results from SPSS v.26.

The statistical results presented in Table (7) demonstrate that the computed F-statistic ($F = 179,522$) exceeds the critical tabulated value of 3,84, thereby confirming the model's statistical validity. Moreover, the associated significance level ($p = 0,000$) is considerably below the conventional threshold of 0,05, affirming the suitability of the model for hypothesis testing.

In terms of association strength, the correlation coefficient ($R = 0,578$) indicates a moderate-to-strong positive linear relationship between tax policy and the reduction of tax evasion and fraud, falling within the accepted range of [0,50; 1]. The coefficient of determination ($R^2 = 0,334$) further implies that 33,4% of the variability in the phenomena of tax evasion and fraud can be explained by changes in tax policy. These findings provide compelling evidence supporting the alternative hypothesis, suggesting that tax policy plays a statistically significant and direct role in mitigating tax evasion and fraud within Algerian tax administrations.

Table (8): Testing the Significance of the Simple Linear Regression Model Coefficients for the Effect of Tax Policy on the Phenomena of Tax Evasion and Fraud

Model	Coefficients	Standard Error	BETA	T	Significance Level
Constant (A)	2,147	0,153		14,041	0,000
Regression Coefficient (B1)	0,504	0,038	0,578	13,399	0,000

Linear Regression Model: $Y = A + B1 X$, $TE = 2,147 + 0,504 TP$

The source: Prepared by the researcher based on the results from SPSS v.26.

The findings reported in Table (8) confirm the statistical significance of the coefficients within the simple linear regression model. Both the constant term ($p = 0,000$) and the regression coefficient ($p = 0,000$) present significance levels well below the conventional threshold of 0,05, reinforcing the reliability of the estimated parameters.

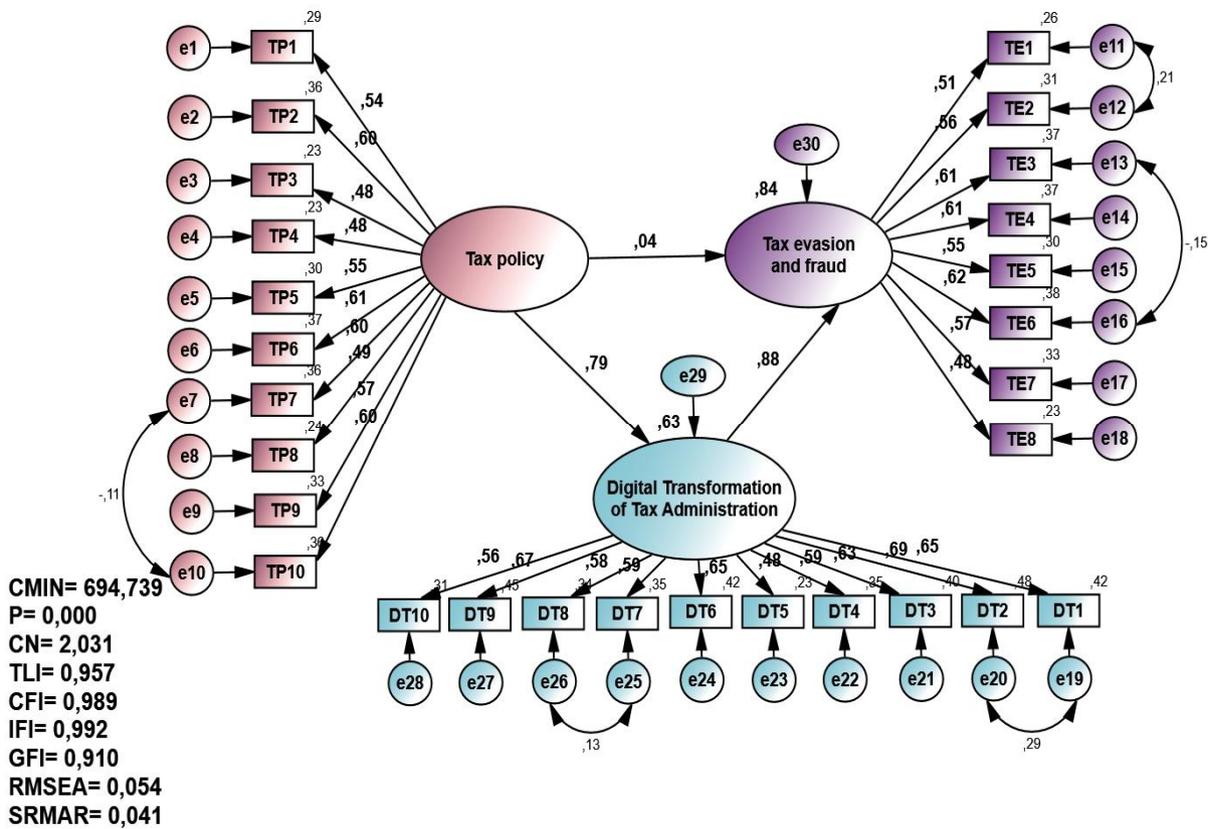
The value of the regression coefficient ($B = 0,504$) implies that for every one-unit increase in the tax policy variable, the level of tax evasion and fraud is expected to decrease by 0,504 units, holding other factors constant. This positive impact supports the rejection of the null hypothesis in favor of the alternative. Accordingly, it can be concluded that tax policy exerts a statistically significant direct effect on curbing tax evasion and fraud within the Algerian tax administration context.

- Third Hypothesis Test

To test the third hypothesis, the following null and alternative hypotheses are formulated:
 Ho: There is no statistically significant indirect effect of digital transformation on enhancing the effectiveness of tax policy in reducing the phenomena of tax evasion and fraud in tax administrations in Algeria.

H1: There is a statistically significant indirect effect of digital transformation on enhancing the effectiveness of tax policy in reducing the phenomena of tax evasion and fraud in tax administrations in Algeria.

Figure (4): Structural Model of the Indirect Effect of Digital Transformation on Enhancing the Effectiveness of Tax Policy in Reducing Tax Evasion and Fraud



The source: Prepared by the researchers based on the results from AMOS V.26.
 Table (9): Testing the Indirect Mediation Relationship Before and After Bootstrapping

Testing the Indirect Mediating Relationship	Standardized Indirect Effects			
		TP	DT	TE
before the bootstrap	TE	0,698	00	00
Testing the Indirect Mediating Relationship after the bootstrap		Indirect Effects - Lower Bounds		
	TE	0,556	00	00
		Indirect Effects - Upper Bounds		
	TE	0,883	00	00
		Indirect Effects - Two Tailed Significance		

TE	0,000
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The source: Prepared by the researchers based on the results from AMOS V.26.

Based on the results presented in Figure (4), all model fit indices fall within acceptable ranges, confirming a good model fit for the proposed structural model. Thus, no further modifications to the model structure were deemed necessary. The model demonstrates the presence of significant direct and indirect effects among the variables: tax policy (TP) as the independent variable, digital transformation (DT) as the mediator, and tax evasion and fraud (TE) as the dependent variable.

As shown in Table (9), the standardized indirect effect of digital transformation in mediating the relationship between tax policy and the reduction of tax evasion and fraud is 0,698. The statistical significance of this indirect path was assessed through Bootstrapping, yielding a p-value of 0,000, which is well below the standard threshold of 0,05, indicating statistical significance.

Moreover, the bootstrapped confidence interval for the indirect effect lies between 0,556 and 0,883, confirming that the indirect effect does not include zero and is thus robust. These results lead to the rejection of the null hypothesis (H_0) and the acceptance of the alternative hypothesis (H_1), thereby concluding that digital transformation significantly and positively mediates the relationship between tax policy and the reduction of tax evasion and fraud in Algerian tax administrations.

III- Results and discussion :

The empirical results of this study provide compelling evidence that digital transformation exerts a decisive role in enhancing the effectiveness of fiscal policy through its indirect influence on reducing tax evasion and fraud. This outcome partially aligns with the tendencies observed in prior literature but extends them by empirically validating the mediating role of digital transformation within the Algerian context a dimension that has received limited attention in earlier research.

Earlier studies such as Fallah (2006) and Khalasi (2008) highlighted the structural and institutional constraints limiting the efficiency of Algeria's fiscal policy, particularly weak interdepartmental coordination and the absence of a strategic long-term vision. In contrast, the current findings demonstrate that digitalization can effectively compensate for these deficiencies by enhancing administrative coherence, improving information flow, and increasing operational transparency across tax departments.

Similarly, the results corroborate the observations of Bkriiti and Yousfi (2015) and Massmesh et al. (2020) regarding the persistent socio-economic repercussions of tax evasion on public revenues. Yet, this study advances the discussion beyond descriptive diagnosis by providing robust statistical evidence that digital tools such as integrated databases and reference systems serve not merely to improve administrative efficiency but also as a deterrent mechanism that reduces information asymmetry between taxpayers and authorities. This fosters greater system credibility and encourages voluntary compliance, which are crucial pillars of sustainable tax governance.

The confirmed indirect effect of digital transformation ($\beta = 0,698$; $p = 0,000$) resonates strongly with recent international evidence. For instance, Chen et al. (2024) demonstrated that corporate digitalization in China significantly mitigates tax avoidance by enhancing transparency, reducing agency costs, and strengthening external oversight. The parallels with the present study are noteworthy: in both cases, digital transformation emerges as more than a technological improvement it becomes an institutional enabler that reshapes the operational logic of fiscal policy and amplifies its effectiveness.

Moreover, while Salmi and Mouloud (2023) observed that traditional administrative detection mechanisms in Algerian tax administrations remain outdated and insufficiently integrated with digital systems, the current findings reveal that technological modernization can directly address these weaknesses. By linking information systems and ensuring real-time data synchronization, digitalization enhances the traceability of fiscal operations and the precision of compliance monitoring.

Overall, this study makes both theoretical and methodological contributions. Theoretically, it redefines digital transformation as a strategic mediating construct that bridges the gap between fiscal policy formulation and its practical enforcement. Methodologically, it employs Structural Equation Modeling (SEM) to empirically validate both direct and indirect causal paths something that previous Algerian studies had not quantitatively established.

Consequently, the findings reaffirm that fiscal governance effectiveness is contingent upon the synergy between policy design and technological modernization. Digital transformation thus emerges as a critical lever for achieving transparency, reinforcing compliance, and rebuilding public trust ultimately transforming fiscal objectives into measurable, data-driven, and sustainable governance outcomes.

IV- Conclusion:

The persistence of tax evasion and fraud continues to pose a significant threat to the effectiveness and credibility of tax policy, undermining the state's capacity to mobilize domestic sources and sustain fiscal and economic equilibrium. When left unaddressed, these phenomena erode the revenue base and compromise the strategic goals of public finance. The empirical findings derived from the field study conducted within Algerian tax administrations underscore the critical role of digital transformation as a catalyst for enhancing the performance of fiscal instruments. The analysis confirms a substantial indirect effect (0,698) of digital transformation in reinforcing the efficacy of tax policy in curbing evasion and fraudulent practices, affirming its relevance as a modern governance tool within the tax domain.

Practical Contributions and Future Research Directions

The following study arrived at a set of recommendations, which are outlined as follows:

- Tax administrations remain constrained by structural and technological deficiencies, which hinder the full realization of digital transformation's potential. There is an urgent need to prioritize investments in digital infrastructure and institutional modernization programs that align with strategic tax policy objectives;
- Building the digital competencies of tax officials is essential to ensure optimal use of digital systems and to streamline operational processes, thereby improving the effectiveness of compliance monitoring and enforcement mechanisms;
- Legal and regulatory reforms should target loopholes in the current tax framework that provide opportunities for evasion and fraud, emphasizing the need for clarity, consistency, and enforceability in tax legislation;
- Integration of digital tax systems with other national policy platforms (e.g., customs, social security, commercial registries) will enhance data transparency and foster real-time detection and tracking of illicit financial behavior;
- Future research should focus on identifying barriers to digital adoption within the public sector and evaluating the long-term impact of digital tax reforms on revenue sustainability and taxpayer behavior, while also proposing proactive strategies to mitigate implementation risks.

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Annexs:

Annex (1): The Questionnaire Form Used in the Study

No	Statements
Axis One: Tax Policy	
01	The current tax policy provides a clear and coherent legal framework for enforcing tax obligations.
02	Tax regulations are designed to ensure fairness and equity among different income and social groups.
03	The tax system promotes efficiency in the collection process through simplified administrative procedures.
04	Tax laws are formulated in a transparent manner that minimizes ambiguity and interpretation conflicts.
05	The existing policy offers sufficient deterrents and penalties to limit tax evasion and fraud.
06	Fiscal incentives embedded in the policy encourage investment, particularly in small and medium enterprises.
07	The structure of tax rates is consistent with citizens’ purchasing power and economic conditions.
08	Tax policy ensures proportionality between the taxpayer’s capacity and the fiscal burden imposed.
09	Enforcement mechanisms are effectively applied to guarantee compliance within legal deadlines.
10	The continuous reform of tax policy reflects the government’s commitment to achieving fiscal justice and economic stability.
Axis Two: Digital Transformation of Tax Administration	

01	Digital platforms adopted by the tax administration simplify tax procedures and improve accessibility for users.
02	Online tax systems enhance operational efficiency through faster and more accurate data processing.
03	The digital environment facilitates effective communication between tax officers and taxpayers.
04	Automation in tax operations contributes to reducing human error and administrative delays.
05	The introduction of e-services has improved the transparency and traceability of fiscal transactions.
06	Digital platforms ensure high levels of confidentiality and data security for taxpayers' information.
07	The adoption of digital solutions significantly reduces both administrative costs and processing time.
08	Continuous training programs strengthen employees' digital skills and improve their adaptability to new systems.
09	The integration of artificial intelligence and data analytics supports better decision-making in tax administration.
10	Overall, the digital transformation initiative has enhanced employee satisfaction and the effectiveness of public service delivery.
Axis Three: Tax Evasion and Tax Fraud	
01	Tax evasion and fraud remain significant challenges for the national tax administration.
02	Insufficient awareness among taxpayers contributes to the persistence of non-compliance.
03	Weaknesses in digital monitoring systems facilitate opportunities for evasion and fraud.
04	The lack of effective coordination between fiscal institutions reduces the detection of irregular practices.
05	Strengthening digital oversight mechanisms would significantly reduce tax-related misconduct.
06	Current penalties for evasion and fraud are adequate but inconsistently enforced.
07	Social tolerance of informal economic activities indirectly encourages non-compliance.
08	Enhancing transparency and public trust in tax institutions is key to curbing evasion and fraud.

Annex (2): Standardized Regression Weights (Tax Policy)

	Estimate
TP4 <--- TP	,500
TP5 <--- TP	,523
TP6 <--- TP	,600
TP7 <--- TP	,571
TP10 <--- TP	,484
TP9 <--- TP	,521
TP8 <--- TP	,512
TP1 <--- TP	,583
TP2 <--- TP	,647
TP3 <--- TP	,526

Source: Outputs of the AMOS V.23 Software

Annex (3): Standardized Regression Weights (Digital Transformation of Tax Administration)

	Estimate
DT4 <--- DT	,561
DT5 <--- DT	,460
DT6 <--- DT	,639
DT7 <--- DT	,612

	Estimate
DT10 <--- DT	,531
DT9 <--- DT	,703
DT8 <--- DT	,596
DT1 <--- DT	,683
DT2 <--- DT	,729
DT3 <--- DT	,628

Source: Outputs of the AMOS V.23 Software

Annex (4): Standardized Regression Weights (Tax Evasion and Tax Fraud)

	Estimate
TE4 <--- TE	,628
TE5 <--- TE	,523
TE6 <--- TE	,557
TE7 <--- TE	,610
TE8 <--- TE	,574
TE1 <--- TE	,515
TE2 <--- TE	,533
TE3 <--- TE	,594

Source: Outputs of the AMOS V.23 Software