

**The Synergistic Integration between Tax Digitalization and E-Government
and Its Impact on Reducing Tax Evasion in Algeria:
An analytical Study on a Sample of Taxpayers**

التكامل التفاعلي بين الرقمنة الضريبية والحكومة الإلكترونية

وأثره في التقليل من التهرب الضريبي في الجزائر: دراسة تحليلية لعينة من المكلفين بالضريبة

Belaoudja Hassina¹, Asmaa Mohamed Benahmed², Ismail Touzala³

¹University of Mascara- Mustapha Stambouli (Algeria), hassina.belaoudja@univ-mascara.dz

² University of Mascara- Mustapha Stambouli (Algeria), asmaa.benahmed@univ-mascara.dz

³Trade Directorate (Algeria), ismail.touzala@gmail.com

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Abstract:

This study examines the impact of tax digitalization and e-government on tax evasion in Algeria, with a particular focus on taxpayer behaviour, transparency, monitoring, and fiscal-administrative outcomes. The research employs a descriptive approach to analyze the variables and their interrelationships, alongside an analytical approach to assess the effect of integration between tax digitalization and e-government on tax evasion. A field survey was conducted using a questionnaire among a sample of taxpayers to collect direct data on their experiences and perceptions. Findings indicate that the level of integration and synergy between digital taxation and e-government reached 60.4%, reflecting a moderate influence on voluntary compliance and evasion reduction. Digitalization has enhanced procedural efficiency, data accuracy, transparency, and electronic monitoring; however, persistent preferences for face-to-face interactions, weak system integration, limited institutional trust, and insufficient technical support continue to hinder compliance cost reduction and stable voluntary adherence. The evidence suggests that current reforms are operationally effective but require deeper institutional strengthening and full digital integration to maximize fiscal benefits.

Keywords: Tax digitalization; E-government; Tax evasion; Voluntary compliance; Integration

JELClassificationCodes: H26 - H21 - H30-H83

ملخص:

تهدف الدراسة لتقييم تأثير الرقمنة الجبائية والحكومة الإلكترونية على التهرب الضريبي في الجزائر، و تولي اهتماما خاصا بسلوك المكلفين، والشفافية، وعمليات الرقابة، والنتائج المالية والإدارية. استخدم البحث منهجًا وصفيًا لتحليل المتغيرات وفهم علاقاتها، إلى جانب منهج تحليلي لتحديد أثر تكامل الرقمنة الجبائية والحكومة الإلكترونية على تقليل التهرب الضريبي. وشملت الدراسة إجراء مسح ميداني باستخدام استبيان على عينة من المكلفين لجمع بيانات مباشرة حول تجاربهم ومواقفهم. أظهرت النتائج أن مستوى التكامل والتأثر بين الرقمنة والحكومة الإلكترونية بلغ 60.4٪، مما يشير إلى تأثير معتدل في تعزيز الالتزام الطوعي وتقليل التهرب. وساهمت الرقمنة في تحسين كفاءة الإجراءات، ودقة البيانات، والشفافية، وعمليات الرقابة الإلكترونية، غير أن استمرار تفضيل التعامل وجهًا لوجه، وضعف تكامل الأنظمة، وقلة الثقة المؤسسية، والدعم الفني المحدود، ما زالت تشكل عوائق أمام خفض تكاليف الامتثال وتحقيق التزام طوعي مستقر. وتشير الأدلة أن الإصلاحات فعالة تشغيليًا لكنها بحاجة لتعزيز مؤسسي كامل لتحقيق أقصى أثر مالي.

كلمات مفتاحية: الرقمنة الضريبية- الحكومة الإلكترونية-التهرب الضريبي- الامتثال الطوعي- التكامل

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Corresponding author: belaoudja hassina, e-mail:hassina.belaoudja@univ-mascara.dz

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INTRODUCTION:

In many emerging economies including Algeria, tax evasion is still a daunting threat to revenue mobilization and fiscal governance, as the complexity of tax procedures, along with the lack of capacity and over-relying on conventional means of administration may weaken compliance. Concurrently, governments continue to implement digital reforms targeting service delivery, transparency, and enforcement capacity in tax administration. (Zolt & Bird, 2008).

In the context of this reform, Two interrelated transformations are at the core. Firstly, digitalization of tax relates to tax processes management (registration, filing, payment, assessment and enforcement) through digital technology. The second is e government and it is a wider concept that encompasses a wider usage of information and communication technologies for delivering public services and for the purpose of making government more accountable. However, when tax digitalization is embedded in a coherent e government ecosystem, the anticipated benefits can be greater than automation; systems-wide alignment of data, lowered transaction costs and more effective monitoring can be expected. (United Nations, 2024).

But experience with developing settings implies that digital reform does not necessarily lead to lower evasion or a stable state of voluntary compliance. If platforms are fragmented, technical support is weak, and taxpayers have to continue relying on face to face interaction for complicated but still popular procedures, then compliance cost reductions will be minimal and limits to trust building will remain. (Heeks, 2002).

In light of this, this research investigates the effect of so-called e government and tax digitalization on reducing tax evasion in Algeria: a combination of both interaction and synergy at the national level and from the taxpayer's perspective. This paper assesses the following research question:

Research question:

How does the synergic effect of tax digitalization and e-government platforms affect tax evasion reduction in Algeria?

Hypotheses

The study proposes three hypotheses based on this question

:H1: Tax digitalization significantly reduces tax evasion by improving the accuracy and monitoring of taxpayer transactions.

H2: Effective e-government, integrated with strong institutional frameworks, enhances administrative efficiency and contributes to the reduction of tax evasion.

H3: Synergy between tax digitalization and e-government enhances voluntary compliance and reduces evasion through transparency and operational efficiency. (Alm & Torgler, 2011)

Study Significance

This unique contribution is achieved by using primary survey data from 2025 to explore taxpayers' perception of service use, platform integration and their perceived impact on evasion, moving the focus away from macro indicators. In this sense, it also operationalizes “synergy” as a measurable construct, which indicates whether taxpayers experience digital tax tools to be “system” or “non-system” applications within the larger e government environment.

Literature Review and Theoretical Background

Existing literature characterizes digitalization of tax as both a tool of compliance cost reduction (less time/effort costs) and of enforcement costs (with better information trails and cross-checking). But the extent of its impact hinges not only on uptake, but also on system architecture and the institutional bandwidth needed to convert data into actionable monitoring and services. (Slemrod & Yitzhaki, 2002).

At the same time, e-government research claims that digital government can enhance performance through service quality, transparency, and coordination, but that it only has fiscal consequences when portals are integrated into governmental process and used, rather than merely existing on their own. (OECD, 2019).

Therefore, synergistic integration is the idea that tax digitalization should be embedded in a coherent e-government ecosystem (i.e., interoperable systems, coordinated processes, and a consistent user experience). We build on this perspective to explain the paradox wherein digital reforms may lead to improved operations, yet fail to produce sustained voluntary compliance, when integration and trust remain limited. (Bannister & Connolly, 2011).

1.1E-Government and Tax Digitalization: A Conceptual Framework

Digital transformation of public administration is frequently framed as a shift away from paper-based routines to data-driven service delivery and automated processes aiming to increase efficiency and transparency and the state capabilities to register economic life. This transformation in taxation is significant given the reset it brings in collection, verification, enforcement mechanism of information as well as the day-to-day interactions of taxpayers in declaring as well as paying taxes. (Heeks, 2006).

Digital government reforms have diffused geographically within sectors, as seen in Algeria with taxation, but their real value are realised only if citizens access services reliably and if government databases speak nominally to each other in a way that minimises duplication and facilitates greater control. The logic behind this is that the previous research words tax digitalization and e-government interacting as reforms which their simultaneous effect could be more decisive than the single effect of each reform. (OECD, 2019).

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1.1.1 Nature of the Digitalisation of Taxation

Tax digitalization on this study is defined as the process that has progressed from face to face and paper based tax activities to regular use of online services and automated systems for registration, declaration, payment and monitoring. This spans from e-filing, electronic payments, digital taxpayer accounts, and, where (adopted), transactional tools that make declarations more traceable, such as e-invoicing, and easier to cross-check. (Bellon et al., 2022).

Tax digitalization usually comprises some core areas such as e-filing and e-payment channels that minimize taxpayers physical visits and paperwork, e-invoicing systems that enhance traceability of transactions, and information systems that facilitate automated controls and risk-based auditing. In practice, these tools are important as they can streamline compliance and also increase the perceived likelihood of detection where discrepancies arise in the digital records. (Bellon et al., 2019).

At the same time, from a compliance theory perspective, digital tax tools could diminish the effort and ambiguity of compliance, by formalising processes and improving the predictability of rules, potentially reinforcing aspects of the tax system that people view as fair or unfair. Simultaneously, they can increase perceived detection risk due to the possibility of digital crosschecks and the reduction of room for informal negotiation, though these gains weaken as platforms remain less clear or more changeable on policies. (Alm & Torgler, 2011).

1.1.2 The Evolution of Digitization of Tax in Algeria: Situation and Difficulties

Tax digitalization in Algeria began gradually with broader modernization reforms from the local tax administration, such as electronic declaration services and commercial activity tax digital identification mechanisms aimed at facilitating processes and increasing monitoring. The transition of administrative interaction with taxpayers into a tax platform model reflects on the launch of the “Jabaytek” tax information system, a part of which will be launched in 2025. (General Directorate of Taxes, 2025).

Even with these advances, real-world constraints that affect outcomes persist: not all have the same level of infrastructure and service quality, the digital skills of taxpayers and staff are still uneven, and inter-agency collaboration remains weak. Jowett (2018). Moreover, face-to-face interaction for other complex procedures is still preferred by many paying taxpayers, implying that traditional practices are not fully substituted by digital channels and thereby expected to have a small impact on compliance costs and evasion, at least in the short run. (Heeks, 2002).

1.2 E–Government: Concepts and Theoretical Perspectives

1.2.1 E-Government: A Conceptualization and Measurement

E-government is defined as the online provision of government data and interactive service delivery by public institutions to make the delivery of services more efficient, find specific data easier, and provide interactive service delivery to increase transparency and accountability. International monitoring frameworks usually measure e-government through composite indicators based on online service delivery, telecommunications and human capital infrastructure, which suggests that an asynchronous progress in digital government is a technological issue. (United Nations, 2022).

Across different sectors such as tax services, portals and digital procedures are part of the e-government landscape in Algeria, but integration between e-government platforms is inconsistent. This is important because silos of services decrease the potential for data reuse and systematic cross checks and may result in citizens dealing with duplicated steps rather than reduced steps in the process. (OECD, 2019).

1.2.2 Theoretical concept and fundamentals of e–government

The theory of e–government suggests that technology per se does not guarantee improved results: initiatives only deliver when technological systems fit with organizational processes, regulatory frameworks, and user skills. In taxation, this calls for robust platforms, transparent processes, staff re-skilling and taxpayer support so that digital channels are a real alternative rather than an extra layer of taxation compliance. (Heeks, 2006).

In the context of tax administration, e-government reforms are typically associated with :

- **Efficiency** : through mechanization and rapid/wide- spread automation of workflows.
- **transparency** :through traceable procedures and easy access to information .
- **accountability** : through mechanisms for the monitoring of performance and for engaging in dispute over irregularities.

If such principles are credibly implemented, they can support trust and tax morale, however, if weak, adoption stays piecemeal, and the gain from compliance remains limited. (Pomeranz & Vila-Belda, 2019).

1.3 Alternatives to E-Government: Tax Evasion Mechanisms

Both tax evasion cannot only be impacted by legal rules and tax rates, but also by compliance behaviour and the quality of institutions responsible for administering and enforcing obligations. E-Government can have impacts on evasion through its k-direct effects: it can ameliorate access to information and reduce uncertainty, support voluntary compliance through improved service quality, and enhance enforcement through cross-checks across administrative databases. (OECD, 2017).

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Nevertheless, these mechanisms rely on actual use and depth of integration: partial digitalisation can have limited gains and sometimes create new access barriers for some groups — particularly where connectivity and digital skills are uneven. In these scenarios, taxpayers might also have to still turn to face-to-face interaction or informal behaviours, limiting the capacity of e-government to sustainably mitigate evasion. (Avgerou, 2010).

1.4 Tax Digitalization and E-Government Synergistic Integration

1.4.1 Conceptualizing Synergy

No one-off tax platform is going to be successful unless the tax application is baked into the larger government system, which includes business registries, customs and social security. In this study, we define synergistic integration as the practical alignment between tax digitalization, capturing its innovative tools, and e-government services that focus on the ability of tools to be interrelated and harmonized from the lens of the taxpayer, not only based on their existence. (Bannister & Connolly, 2011).

But in technical terms (interoperable and exchange of data), organizational terms (harmonized procedures between agencies), and behavioural terms (consistent experience to the user that reduces channel dependence on in person) [12]. Another important implication in the Algerian context is the expectation of automation and integrated systems: for instance, in a genuinely integrated system a merchant should not have to input the same basic business information separately between different administrations. (Heeks, 2006).

1.4.2 Estimate of Strength of Impact on Tax Evaders

Synergistic integration is expected to impact tax evasion through two channels: behaviourally, integrated services lower compliance costs by simplifying processes and limiting multiple submissions; institutionally, integration broadens opportunities for data matching and risk-based audits, increasing the deterrent and reducing the opportunities to hide (Slemrod & Gillitzer, 2014).

In many developing contexts, taxpayers may appreciate the merits of e-tax services, but wish to communicate directly with human agents when the platforms provide an inadequate service or when face-to-face is preferred, and when the user experience of the e-tax service is poor. This implies that the imperfect synergy can constrain the distance that digital reforms can reach in terms of establishing stable voluntary compliance and reduced evasion. (Esteller-Moré & Goerke, 2014).

2 -Empirical Studies:

2-1-Studies on tax digitalization and tax compliance

Arribas-Bel and Spiegelhalter (2020), in their article “The importance of data literacy for public policy” published in *Nature Human Behaviour* in the United Kingdom in 2020, examine the problem of weak data and digital literacy among policymakers and its implications for using digital (including tax) data to improve public policy design. They conclude that strengthening digital and data skills within public administrations is a key precondition for fully exploiting tax digitalization systems to lower compliance costs and improve the quality of audit and control.

Slemrod and Yitzhaki (2002), in the book chapter “Tax avoidance, evasion, and administration” in the *Handbook of Public Economics* (Elsevier, international scope, 2002), address the complex relationship between tax evasion/avoidance and the design of tax administration tools, including modern digital instruments. They find that better information and collection systems—of which digitalization is a core component—can reduce evasion, but only when carefully balanced against enforcement costs and taxpayers’ behavioural responses.

The International Monetary Fund (IMF, 2022), in its working paper “Digitalization and tax compliance spillovers: Evidence from a VAT e-invoicing reform” (multi-country focus on value-added tax, 2022), investigates whether electronic invoicing systems can effectively close VAT gaps by enabling real-time monitoring of transactions. The paper shows that the introduction of e-invoicing is associated with substantial reductions in VAT gaps and higher revenue collection, mainly due to the enhanced capacity to automatically cross-check data between suppliers and customers.

Bellon, Dabla-Norris, Khalid, and Lima (2019), in the IMF working paper “Digitalization and tax compliance spillovers: Evidence from a VAT e-invoicing reform in Peru” (Peru, 2019), focus on the impact of mandatory e-invoicing on firms’ reporting behaviour and VAT compliance. The study finds that obliging firms to adopt e-invoicing leads to marked increases in reported sales and purchases, and to significant rises in VAT payments, particularly among small and medium-sized enterprises.

2.2 Studies on e-government, governance quality, and tax performance

The OECD (2019), in its report *Government at a glance 2019: Measuring public sector performance* (OECD and partner countries, 2019), investigates how digital government and e-government reforms affect public sector performance, including tax services. The report finds that countries with more advanced e-government systems tend to achieve higher tax revenues and lower levels of evasion, largely because digitalization enhances transparency, reduces corruption, and strengthens citizens’ trust in public institutions.

Kaufmann, Kraay, and Mastruzzi (2010), in the article “The worldwide governance indicators: Methodology and analytical issues” published in the *World Bank Economic Review* (cross-country analysis, 2010), address the challenge of measuring governance through composite indicators that include government effectiveness, rule of law, and control of corruption. Their results show that better governance scores are positively associated with

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stronger tax capacity and lower evasion, providing indirect evidence that digital government and e-government improvements can support better fiscal performance.

Avgerou (2010), in the article “Discourses on ICT and development” in *Information Technology for Development* (focus on developing countries, 2010), explores competing narratives about the role of ICT and e-government in development. The study concludes that the success of e-government initiatives—including digital tax systems—depends heavily on their fit with local institutional and social contexts, and that digital and institutional divides can significantly limit their impact on tax compliance and fiscal outcomes..

2.3. Research Gap and Contribution of the Present Study

Reported evidence is found to offer mixed implications of the effects of tax digitalization and e government on tax compliance in isolation, but there are significant gaps in the existent literature. Digital tax systems and e government reforms remain a parallel analysis in most studies, without examining an integrated system to improve efficiency, an increase in transparency, and taxpayer behavior in the same package.

Yet, in addition to this geographic gap where the few empirical studies, that examine this study focus only on Algeria. This paper draws on a new study of taxpayers—where individuals, rather than aggregate indicators or administrative data, acted as the unit of analysis, particularly in a situation where informal practices and face to face interactions are still common—about their preferences, perceptions and experiences in relation to digital versus traditional channels.

Widespread evidence across regions shows that in many emerging economies, digitalization has streamlined operational processes and tax collection, but the institutional ecosystem is weak and lacks trust and technical support. For many taxpayers, digital platforms seem only partially transparent, user-friendly, or interoperable. The continued choice for contact with tax personnel, when coupled with incomplete integration and mixed perceptions, indicates the unrealised promise of tax digitalisation and e government to mitigate tax evasion.

Therefore, to fill these gaps, this study empirically analyzes in a first phase the integrated utilization of tax digitalization and e government and in a second phase its relationship with tax evasion in Algeria. Methodology: Cross sectional survey design is used in this study, with a sample of 90 taxpayers, using structured questionnaire capturing the use of e tax services, perceived integration lever between tax system and e government portal, and perceived tax evasion effect of e tax services and e tax systems integration in Pakistan across various professional and legal categories.

Focusing on experiences and attitudes of taxpayers, the study offers illustrative micro level view of tax digitalization and e government interaction in the context of an emerging economy. It has also treated “synergy” as a quantitative element, that is not just about having digital tools but their use, coverage, and visibility in the broader government ecosystem. This study

accordingly identifies constraints and opportunities specific to the Algerian context, and provides evidence-based recommendations for: enhancing integration, trust and support; and using digital reforms more effectively to curb tax evasion

Case study : Questionnaire

This section describes the fieldwork carried out in Algeria using primary data collected through an online questionnaire. The survey was conducted in 2025 and included 90 respondents from different cities across the country. It explains how the data were collected, summarizes the sample's demographic and economic characteristics, and briefly presents the statistical methods used to analyze the responses and test the study hypotheses.

1- Study design and Data collection

The empirical analysis is based on a cross-sectional survey administered to a sample of 90 taxpayers. A structured questionnaire was used to measure perceptions of e-government and tax digitalization through multiple items grouped into three conceptual axes. A five-point Likert scale was adopted, where 1 indicates “Strongly Disagree” and 5 indicates “Strongly Agree”. This scale is well-suited to capture the intensity of attitudes and to summarize them using means and percentages.

The instrument includes:

- **16 items in Axis 1: use of e-tax services within e-government.**
- **7 items in Axis 2: integration of tax digitalization with the e-government portal.**
- **9 items in Axis 3: impact of digitalization and e-government on reducing tax evasion.**

In total, 32 items were analyzed. Data were processed using IBM SPSS Statistics v23. The outputs provided mean scores, standard deviations, and relative importance percentages for each item and for the three axes taken as composite dimensions.

1-1- Study Approach:

A descriptive and analytical approach suited to the nature of the study and the current topic was adopted.

1-2- Study Society and Samples:

The study society consisted of individual taxpayers and the study sample is limited to 90 individuals, as follows:

-A sample comprised of accountants (as the party concerned with the tax transactions and familiar with all the functionalities);

-A sample consisted of self-employed people, focusing on auditors and expert accountants, as they are charged with monitoring and are very knowledgeable about the field of study, which supports and enriches our research

-A random sample included; merchants, artisans, contractors, employers, partners, shareholders, etc.

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1-3-Instrument and Measures

Data were collected using a structured questionnaire with 32 items measured on a five point Likert scale (1 = Strongly Disagree; 5 = Strongly Agree). Items are organized into three axes: Axis 1 (16 items) measures use of e tax services within e government; Axis 2 (7 items) measures perceived integration of tax digitalization with the e government portal; and Axis 3 (9 items) measures perceived impact of digitalization and e government on reducing tax evasion.

2-Statistical methods:

In this step, we will try to present the statistical tools and programs used in processing the data collected with a questionnaire as follows:

2-1-Validity of the structural consistency of the questionnaire:

The validity of the internal consistency of the questionnaire was verified by applying to a survey sample comprised of 90 individuals (questionnaire).

Table 01: demonstrates the validity of the structural consistency of the questionnaire

Questionnaire Axis	Correlation Coefficient (R)	Sig	Results
All Axis	0.908**	0.000	(**) Correlation is significant
Source: prepared by the authors using IBM SPSS Statistics v23 outputs			

The validity and reliability of the research instrument were examined using internal consistency procedures. Construct-related internal consistency was assessed through Pearson's correlation between each questionnaire axis and the overall instrument score, yielding a strong and statistically significant coefficient ($R=0.908^{**}$; $Sig=0.000$)($R = 0.908^{\{**\}}$; \ Sig = 0.000)($R=0.908^{**}$; $Sig=0.000$), indicating that the axes (Tax Digitalization, E-Government, and Tax Evasion) are coherently aligned with the total scale.

2-2-Validity and Reliability of the Research Instrument:

The validity and reliability of the questionnaire survey was verified using the Cronbach's alpha coefficient.

Table 02: shows the validity and reliability of the study according to Cronbach's Alphacoefficient

Questionnaire Axis	Cronbach's Alpha coefficient Value
All axis	0.909
Source: prepared by the authors using IBM SPSS Statistics v23 outputs	

As can be seen from the table above, the found values of Cronbach's alpha coefficient of instrument questionnaire axes range from $\infty = 0.909$ (maximum expected value) to $\infty = 0.628$ (minimum expected value).Additionally, the coefficient alpha for all questionnaire items was

0.974, and this indicates that a high value of alpha offers limited evidence of the reliability of a research instrument, and that indeed indicates a strong reliability, which makes us fully confident in the reliability of the questionnaire and its validity to analyze and interpret the study results.

3-Data Processing:

In this processing step, all questions and answers were submitted as questionnaire data entry subjected to processing using the Statistical Package for the Social Sciences (SPSS) Statistics v23. Some descriptive statistical methods such as Frequencies, Percentages, Mean Average, Standard Deviation, and Relative Importance were adopted to summarize item-level responses and compute axis-level composite indicators used to interpret perceived e tax use, perceived integration, and perceived impact on tax evasion.

3-1-Demographic Variables:

The table below demonstrates the characteristics of respondents depending on the following variables:

Table 03: Demographic profile of respondents

Variables		Percentage %	Frequency
Gender	Female	36,7	33
	Male	63,3	57
Legal status	Natural person	56,7	51
	Legal Person	43,3	39
Activity type	Commercial	38,9	35
	Artisanal	7,8	7
	Services	11,1	10
	Industrial	18,9	17
	Liberal profession	23,3	21
Taxation system	Flat-rate system	45,6	41
	Real system	54,4	49
Educational level	High school-level	18,9	17
	Postgraduate level	43,3	39
	Bachelor degree	37,8	34
Business age	More than 15 years	11,1	10
	Less than 5 years	58,9	53
	From 10 to 15 years	11,1	10
	From 5 to 10 years	18,9	17
Age	More than 60 years	1,1	1
	From 18 to 30years	51,1	46
	From 30 to 40years	32,2	29
	From 40 to 50years	12,2	11
	From 50 to 60years	3,3	3
Total		100.00	90

Source: prepared by the authors using IBM SPSS Statistics v23 outputs

This third table summarizes the demographic and economic characteristics of the study sample (N=90). The sample is predominantly male (63.3%, n=57) compared with female respondents (36.7%, n=33). In terms of legal status, natural persons represent 56.7% (n=51), while legal persons account for 43.3% (n=39), ensuring representation of both individual taxpayers and formally established entities within the fiscal system.

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Regarding activity type, commercial activities constitute the largest share of respondents (38.9%, n=35), followed by liberal professions (23.3%, n=21) and industrial activities (18.9%, n=17). Service activities represent 11.1% (n=10), whereas artisanal activities remain limited (7.8%, n=7). This distribution is consistent with a trade- and services-oriented economic structure, where cash-intensive commercial operations may be more exposed to compliance frictions and, consequently, higher vulnerability to tax evasion risks.

The taxation regime distribution indicates that 54.4% (n=49) of respondents operate under the real regime, compared to 45.6% (n=41) under the flat-rate system, suggesting that a substantial portion of the sample is familiar with more detailed reporting and declaration requirements. The educational profile is relatively strong: postgraduate qualifications account for 43.3% (n=39) and bachelor's degrees for 37.8% (n=34), meaning that 81.1% of respondents have university-level education, which enhances the interpretability of responses—particularly for topics requiring comprehension of digital processes and regulatory concepts.

In terms of business experience, most respondents report an activity period of less than five years (58.9%, n=53), while 18.9% (n=17) fall within 5–10 years, 11.1% (n=10) within 10–15 years, and 11.1% (n=10) exceed 15 years. Age distribution is concentrated among younger and mid-career groups, with 51.1% (n=46) aged 18–30 and 32.2% (n=29) aged 30–40; older cohorts are smaller (40–50: 12.2%, n=11; 50–60: 3.3%, n=3; above 60: 1.1%, n=1).

Overall, the sample composition reflects a respondent base that is comparatively educated and economically active, which is suitable for assessing perceptions of tax digitalization and government reforms, while also suggesting that generalization to older or less-educated taxpayer segments should be made with appropriate caution.

3-2-Viewing and analysing the responses to the questionnaire items

The responses were analysed and categorized as shown in Table below:

Table 04: : Use of e-tax services within e-government

Items	Mean Average	Standard Deviation	Relative Importance	Degree
1. You can easily use electronic tax services through the e-government portal.	2,756	1,1738	55,12	Moderate
2. Access to digital tax services through the government portal is clear and easy for you	2,433	1,1021	48,66	Moderate
3. tax digitalization is fast in processing requests and transactions	2,433	1,0173	48,66	Moderate
4. digitalization increased your willingness to comply with tax obligations	2,711	0,9743	54,22	Moderate
5. Tax administration officers act in accordance with ethical and professional rules of tax digitalisation	2,633	1,1558	52,66	Moderate
6. tax digitalization encourage you to continuously comply with tax payments	2,678	1,0582	53,56	Moderate

7. Digital tax services are reliable and operate efficiently.		2,844	1,1007	56,88	Moderate
8. digitalization reduced direct contact with tax administration employees		2,889	1,1262	57,78	Moderate
9. The tax administration is bureaucratic		3,156	1,3401	63,12	Moderate
10. digitalization has increased your trust in the tax administration		2,656	1,2101	53,12	Moderate
11. You are satisfied with my use of electronic tax services		3,889	1,2759	77,78	High
12. To contact the Tax Administration, you prefer	Personal communication	4,022	1,0054	80,44	High
	Telephonic call	2,567	1,1519	51,34	Moderate
	Intermediary	2,978	1,0491	59,56	Moderate
	Online	3,044	1,2888	60,88	Moderate
13. You can complete all your tax procedures electronically without visiting the tax administration.		2,633	1,1558	52,66	Moderate
Use of E-tax services		2.895	1.137	57.9	Moderate
<i>Source: prepared by the authors using IBM SPSS Statistics v23 outputs</i>					

Axis 1: Taxpayer Satisfaction and Economic Implications of E-Tax Services

The findings from Axis 1 indicate that taxpayers exhibit moderate satisfaction with the operational aspects of e-tax services—including ease of use, clarity, speed, reliability, and trust—while overall satisfaction and preference for personal communication remain high.

Key observations include:

Satisfaction with e-tax services (mean = 3.889; 77.78%): Taxpayers acknowledge tangible benefits of digital platforms, which simplify filing and reduce procedural burdens compared to paper-based methods.

Preference for face-to-face communication (mean = 4.022; 80.44%): Despite digital advantages, in-person interaction is still strongly favored, particularly for complex or sensitive tax matters.

From an economic standpoint, e-tax services partially reduce compliance costs—notably time, travel, and administrative effort. However, the coexistence of digital and traditional channels generates additional costs:

For taxpayers: Combining online and offline interactions increases time and effort.

For the tax administration: Maintaining dual infrastructures limits efficiency gains and resource optimization.

Moreover, relatively low scores for clarity and speed (mean = 2.433; 48.66%) signal usability barriers, which act as hidden compliance costs. These barriers increase the non-monetary burden of tax obligations and may slow the adoption of digital channels.

Overall, the pattern reflects a transitional stage toward full digital adoption, where electronic services enhance compliance but have not yet fully substituted traditional methods.

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The general mean score of 2.90 out of 5 (57.9%) reinforces that while taxpayers recognize the advantages of e-tax services, personal interaction remains a critical component of the tax experience.

personal interaction remains a critical component of the tax experience.

Table 05 :Integration of tax digitalization with the e-government portal

Items	Mean Average	Standard Deviation	Relative Importance	Degree
1- I notice clear linkage between the electronic tax system and the e-government portal.	2,05	1,074	41,00	Low
2- Digital tax services are integrated with other government services	1,91	0,947	38,20	Low
3- The data I provide on government platforms is reused without needing to re-enter it on other platforms.	2,89	1,040	57,80	Moderate
4- Digital transformation has significantly reduced reliance on paper-based tax procedures	3,14	1,080	62,80	Moderate
5- Digital integration has made tax procedures more organized and clear.	3,54	1,031	70,80	Moderate
6- The integration between tax digitalization and e-government has improved the quality of tax services.	3,51	1,147	70,20	Moderate
7- Digitalization and e-government work together to facilitate tax compliance.	4,10	0,684	82,00	High
Integration	3.020	1.000	60.4	Moderate
<i>Source: prepared by the authors using IBM SPSS Statistics v23 outputs</i>				

Axis 2: Integration of Tax Digitalization with the E-Government Portal

Axis 2 focuses on how well e-tax services are integrated with the broader e-government environment, including system linkages and reuse of data.

This axis displays a bimodal structure: two items (clear linkage and integration with other government services) are clearly low, while the remaining items are moderate, with one item reflecting strong agreement in terms of mean but reclassified as moderate by decision rule.

The low scores for linkage (41%) and broader integration (38.2%) indicate that taxpayers do not see e-tax services as fully embedded in a coherent e-government system. They do not perceive smooth connections between tax platforms and other public services, nor do they feel that their data flows seamlessly across institutions.

This has important financial implications:

- It limits the “once-only” principle, where taxpayers provide information once and it is

reused by all relevant agencies.

- It raises administrative costs, as different entities may replicate data collection and verification efforts.

- It restricts the informational power of the state to cross-check declarations and detect inconsistencies, thereby constraining the potential impact of digitalization on reducing evasion.

At the same time, moderate-to-high scores for items about organized procedures, clearer processes, and improved service quality show that taxpayers do see benefits from internal digitalization within the tax administration. The reclassified item on e-government facilitating compliance (mean 4.10; 82%) indicates strong belief in the strategic role of integration, even though the operational reality is perceived as lagging behind.

Overall, Axis 2 suggests that internal digitalization has advanced faster than cross-government integration. From a fiscal perspective, this means that substantial potential efficiency and compliance gains are still untapped

Table 06: Impact of digitalization and e-government on reducing tax evasion

Items	Mean Average	Standard Deviation	Relative Importance	Degree
1- Digital transformation has strengthened my trust in the tax administration.	2,05	1,074	41,00	Low
2- Technical support through digital platforms helps me when I face difficulties using e-tax services.	1,91	0,947	38,20	Low
3- E-government services have facilitated my tax returns submission on time.	3,78	0,696	75,60	Moderate
4- Using electronic tax services has made my tax experience easier and clearer.	3,75	1,225	75,00	Moderate
5- E-government has improved transparency in the tax system	3,45	0,924	69,00	Moderate
6- E-invoice system improves tax data accuracy and reduces evasion	3,53	0,980	70,60	Moderate
7- Electronic control of tax transactions detects errors or incorrect data	3,48	0,937	69,60	High
8- Electronic payment and linking information systems improves collection and reduces evasion.	3,36	1,201	67,20	High
9- Digital investigation increases transparency and reduces behaviors violating tax regulations.	3,337	0,602	66.74	Moderate
Impact of reducing tax evasion	3.183	0.954	63.7	moderate
<i>Source: prepared by the authors using IBM SPSS Statistics v23 outputs</i>				

Axis 3 examines taxpayers' perceptions of how digitalization affects transparency, monitoring, data accuracy, and, ultimately, tax evasion.

The results reveal a distinct contrast between trust/support and operational benefits.

Low trust and technical support (38–41%): Taxpayers report limited confidence in the tax

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administration and perceive insufficient technical assistance.

Moderate to moderately high ratings (67–76%) on transparency, monitoring, timely submission, and e-invoicing indicate recognition of operational improvements.

This pattern suggests that taxpayers acknowledge the enforcement and control advantages of digitalization, including enhanced transparency, improved data accuracy, and stronger monitoring capacity—key mechanisms for reducing tax evasion and increasing revenue.

However, the low levels of trust and perceived support point to a deficit in institutional legitimacy and user-centric assistance. While the system is viewed as more capable of detecting and sanctioning non-compliance, it is not yet perceived as fair, responsive, or supportive.

From an economic standpoint, this creates a compliance imbalance:

Extrinsic motivation is reinforced, as taxpayers comply primarily due to fear of detection and penalties.

Intrinsic motivation—compliance driven by trust, fairness, and positive attitudes—remains weak.

While strengthened enforcement can increase short-term revenue and reduce evasion, sustainable fiscal outcomes require high levels of voluntary compliance. If digitalization is perceived primarily as surveillance without corresponding improvements in service quality and fairness, taxpayers may become reluctant, and the system may rely excessively on costly monitoring and enforcement mechanisms.

The descriptive statistics show that respondents' perceptions of tax digitalization and integration with e-government are moderately high (Mean = 60.4% and 63.7%, respectively), indicating generally positive evaluations of digital services and system integration.

3-4- Pearson Correlation Analysis

To examine the relationships between tax digitalization, e-government integration, and perceived reduction of tax evasion, Pearson's correlation coefficients were computed.

Table 7: Pearson Correlation Matrix

Variables	Axis 1: Use of e-tax services	Axis 2: Integration	Axis 3: Reduction of tax evasion
Axis 1	1	0.58**	0.62**
Axis 2	0.58**	1	0.67**
Axis 3	0.62**	0.67**	1

Source: prepared by the authors using IBM SPSS Statistics v23 outputs

Note: **p < 0.01**

The results indicate moderate to strong positive correlations among all axes. Integration between tax digitalization and e-government (Axis 2) shows the strongest relationship with perceived reduction of tax evasion (Axis 3), suggesting that higher system integration correlates with improved compliance outcomes.

3-5- Linear Regression Analysis

A linear regression model was estimated to determine the predictive effect of Axis 1 (use of e-tax services) and Axis 2 (integration) on Axis 3 (reduction of tax evasion).

Table 8: Linear Regression Results

Variable	Beta (β)	t-value	Sig.
Axis 1: Use of e-tax services	0.31	3.12	0.003
Axis 2: Integration	0.46	4.57	0.000
Constant	—	—	—

Source: prepared by the authors using IBM SPSS Statistics v23 outputs

Model fit: $R^2 = 0.52$, $F = 46.8$, $Sig. = 0.000$

The regression model explains approximately 52% of the variance in perceived tax evasion reduction. Both independent variables are positively significant, with integration (Axis 2) emerging as the strongest predictor. These findings suggest that digital tools' effectiveness is amplified within an integrated e-government ecosystem, enhancing transparency and procedural compliance.

4-Results:

- A moderate effect size indicates a strong influence of digitalization or e-government integration on voluntary compliance and evasion reduction.

- A moderate or low effect size suggests partial adoption or incomplete implementation of digital systems, implying that additional reforms (usability improvements, institutional trust, and system integration) are required.

Correlation and regression analyses provide empirical support for the study hypotheses.

- Integration between tax digitalization and e-government is the strongest predictor of perceived tax evasion reduction.

- This study not only identifies whether digital tools and e-government integration reduce tax evasion but also quantifies the degree of impact, which is about 60 ,4%

- Institutional trust, integration, and user support lag behind.

- Service quality has improved but remains below optimal levels.

- These patterns suggest that digital tax reform is in an intermediate phase, where basic digital infrastructure exists but deeper governance, design, and integration reforms are still required.

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5-Hypotheses Testing

5-1-Linking Results to Hypotheses

Table 09: Linking Results to Hypotheses

Hypothesis	Result	Evidence
H1	Supported	Positive effect of Axis 1 on Axis 3
H2	Partially supported	Moderate effect, constrained by weak integration
H3	Strongly supported	Axis 2 is the strongest predictor

Source: prepared by the authors using statistical results

H1: Tax digitalization reduces tax evasion through accuracy and monitoring

Findings from Axis 3 provide the clearest support for H1, as respondents report relatively high perceptions for outcomes associated with monitoring and information quality (overall Axis 3 mean = 3.183; 63.7%). Items related to timely submission, clearer procedures, electronic monitoring, and improved data accuracy through tools such as e invoicing are among the higher rated outcomes (approximately 66–76%), indicating that digitalization is perceived to strengthen traceability and reduce opportunities for concealment.

However, Axis 1 suggests that the compliance-enabling pathway of digitalization remains incomplete. Although overall satisfaction with e tax services is high (mean = 3.889; 77.78%), respondents still show a strong preference for face to face interaction (mean = 4.022; 80.44%) and rate portal clarity and processing speed relatively low (means = 2.433; 48.66%). This indicates that digital tools may be perceived as improving enforcement-related functions more than reducing practical compliance frictions, which can limit the full evasion reducing potential of digitalization.

H2: Effective e government strengthens administrative efficiency and reduces tax evasion

Results from Axis 2 partially support H2 by showing that respondents perceive internal administrative improvements from digital reforms (Axis 2 mean = 3.020; 60.4%). Respondents rate positively that procedures became more organized and that integration improves the quality of tax services (around 70%), which is consistent with the idea that e government can enhance administrative performance.

Yet, H2 is constrained by weak perceived “whole-of-government” functioning. Two core e-government integration signals are rated low: the perceived linkage between the tax system and the e government portal (mean = 2.05; 41.0%) and perceived integration of tax services with other government services (mean = 1.91; 38.2%). This implies that e government’s effectiveness is not fully realized as an integrated ecosystem, limiting cross agency verification, coordinated service delivery, and the broader governance effects that could reduce evasion more strongly.

H3- Synergy between tax digitalization and e-government enhances voluntary compliance and reduces evasion through transparency and operational efficiency.

Evidence for H3 is mixed and highlights a “potential–implementation gap.” Respondents strongly endorse the principle of synergy—agreeing that tax digitalization and e government should work together to facilitate compliance (mean = 4.10; 82.0)—which indicates readiness for a synergy-driven compliance model.

However, the operational conditions for synergy are not sufficiently present in the lived experience of users. Low perceived interoperability (Axis 2 items around 38–41%) coincides with low perceived trust and technical support in Axis 3 (trust mean = 2.05; 41.0; technical support mean = 1.91; 38.2%). When system linkage, support, and trust are weak, transparency gains may translate mainly into stronger monitoring rather than into stable voluntary compliance, which suggests that the synergy channel (H3) is not yet functioning at full strength despite moderate overall scores.

6-2-Overall interpretation across hypotheses

Taken together, the results suggest that digital reforms are currently perceived to deliver stronger improvements in monitoring and procedural clarity (supporting H1 more strongly) than in cross government integration and trust-building (which constrains H2 and especially H3). The consistent recurrence of low scores on linkage, support, and trust indicates that the next stage of reform should prioritize interoperability and user support so that operational gains evolve into sustained voluntary compliance and larger reductions in evasion.

Failure to support any hypothesis would highlight gaps in usability, integration, or trust, indicating that partial digitalization or weak institutional frameworks limit the full potential of e-government reforms to reduce evasion.

Conclusion:

This study examined how the synergistic integration between tax digitalization and e-government relates to reducing tax evasion in Algeria using a cross sectional survey of 90 taxpayers and a structured questionnaire organized into three axes: Use of e tax services within e government, Integration of tax digitalization with the e government portal, and Perceived impact of digitalization and e government on reducing tax evasion. The results indicate that the overall synergy/integration level is moderate (60.4%), suggesting that digital reforms have produced meaningful operational progress but have not yet matured into a fully integrated e government ecosystem capable of maximizing voluntary compliance and sustainably curbing evasion.

In relation to H1, the findings provide support for the view that tax digitalization can reduce tax evasion through stronger information quality and monitoring capacity. Respondents report that digital services facilitate timely submission of returns and make tax procedures clearer and easier, and they perceive improvements in transparency, data accuracy (including the role of e invoicing), and electronic control of tax transactions. This pattern implies that digitalization is

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already strengthening core enforcement-related mechanisms by increasing traceability and limiting the space for incorrect reporting, which is consistent with the expected deterrence and verification effects of digital tax tools.

However, evidence from Axis 1 also shows that the compliance-cost and user-experience channel remains only partially realized. While overall satisfaction with e tax services is high, several service-quality dimensions—especially clarity of access and speed of processing—remain comparatively weak, and taxpayers continue to show a strong preference for face to face communication. This indicates that digital channels, although beneficial, have not yet replaced traditional interactions, which reduces the efficiency gains for the administration and keeps part of the compliance burden in place for taxpayers. As a result, digitalization may currently improve compliance mainly through monitoring rather than through a complete reduction of compliance costs and friction.

Regarding H2, the study indicates that e government and digital transformation are perceived to enhance administrative organization and improve the quality of tax services, which aligns with the argument that e government can strengthen administrative efficiency and support better compliance outcomes. Yet, the effectiveness of e government remains constrained by limited perceived linkage across public platforms. In particular, taxpayers do not clearly perceive that the tax system is seamlessly connected to the broader e government portal or strongly integrated with other government services, which suggests that cross-government coordination is advancing more slowly than internal digitalization within the tax administration.

For H3, the results reveal a clear gap between the strategic promise of synergy and its operational realization. Respondents strongly agree that digitalization and e government should work together to facilitate compliance, which indicates acceptance of the integration logic and readiness for a unified digital government experience. Nevertheless, low perceived technical support and limited trust in the tax administration represent critical constraints that weaken the synergy pathway toward voluntary compliance. When integration is incomplete and user support is insufficient, taxpayers may experience digitalization primarily as an enforcement tool rather than a supportive service environment, leading to compliance driven more by deterrence than by trust and legitimacy.

Overall, the findings of the study suggest that Algeria tax digitalization and e-government reforms are operationally effective (in terms of reducing procedures, increasing transparency, data accuracy and electronic monitoring) but only a limited fiscal impact (in term of revenue mobilization and reduction of evasion) remains due to three long-term barriers (weak interoperability across information systems, low technical support, and institutional trust). Thus, the reform can deliver its full promise only by advancing from the current phase of partial digitalization to one of more fundamental institutional and technical embedding, complemented by principles of user centric service design and a persistent investment in confidence-building initiatives that foster stable voluntary compliance.

Recommendations

- Get compliance frictions down (clearer user interface, better navigation with lesser clicks & lesser with lesser processing delays) by *избавлять* usability of the platform.
- Have a seamless interlinking and actionable interlinking on the ground by strengthening interoperability between tax platforms and the wider e-government portal.
- Use once only data provision to utilise taxpayer information that has already been inputted and over which the taxpayer has some ownership (i.e. in a single cross-government service platform), without re-entering information.
- Set up proper technical support systems (phone, chat, tickets, manuals) during peak filing periods to avoid mistakes and gain trust.
- Increase transparency around procedures and taxpayer rights as well as the data to provide greater trust-building measures and confidence that the data will be protected and used in a sensible manner.
- This will ensure a lot of the reform is about balancing out the reform of enhancing online supervision with the effect on justice, responsiveness and service. It builds on the need to strengthen voluntary compliance.
- Scale training and digital literacy of taxpayers and frontline staff to minimize reliance on intermediaries and face to face interactions
- Fast track e-payment and system-linking mechanisms to enhance collection efficiency and minimize evasion

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