

Digital Tax Reforms: Learning from Global Experiences

إصلاحات الضرائب الرقمية: الدروس المستفادة من التجارب العالمية

BESTANI Abdelkarim¹, BENATA Mohammed²¹ Université de Mascara, abdelkarim.bestani@univ-mascara.dz,² Université de Mascara, mohammed.benata@univ-mascara.dz,

Received on: 29/01/2026

Accepted on: 06/05/2026

published on: 31/05/2026

Abstract: This paper is a comparative study of how tax systems in five representative countries on various continents (South Korea, Rwanda, Estonia, Brazil, and Australia) have been digitalized. Based on a documentary analysis of official sources (World Bank, OECD, IMF, AfDB, and national tax administrations), the analysis identifies the significant effects of digitalization on tax compliance, the decrease in the cost of collection, the widening of the tax base, and the enhancement of the revenue source. The findings indicate that first movers like Estonia and South Korea have over 95% compliance rates and at the same time collection costs less than 0.5%, whereas emerging countries like Rwanda do so through situation-specific solutions, especially mobile money. Nevertheless, there are still challenges in digital inclusion, cybersecurity, and data protection. The research suggests that developing nations should implement technology that suits their situation, establish institutional credibility, and regularly monitor major indicators (compliance, collection cost, revenue/GDP).

Keywords: Digitalization, taxation, tax compliance, public revenue, digital inclusion.

JEL classification codes: H20, H21, H26, O33, O38.

ملخص: تتناول هذه الورقة دراسة مقارنة حول كيفية رقمنة الأنظمة الضريبية في خمس دول ممثلة من مختلف القارات (كوريا الجنوبية، رواندا، إستونيا، البرازيل وأستراليا). استنادًا إلى التحليل الوثائقي للمصادر الرسمية (البنك الدولي، منظمة التعاون الاقتصادي والتنمية، صندوق النقد الدولي، البنك الأفريقي للتنمية، والإدارات الضريبية الوطنية)، يحدد التحليل التأثيرات الكبيرة للرقمنة على الامتثال الضريبي، وانخفاض تكلفة التحصيل، وتوسيع القاعدة الضريبية، وتعزيز مصادر الإيرادات. وتشير النتائج إلى أن الدول الرائدة مثل إستونيا وكوريا الجنوبية تحقق معدلات امتثال تزيد عن 95% وفي الوقت نفسه تكون تكلفة التحصيل أقل من 0.5%، بينما تحقق الدول النامية مثل رواندا ذلك من خلال حلول مخصصة للظروف، وخاصة عبر النقود المتنقلة. ومع ذلك، لا تزال هناك تحديات تتعلق بالشمول الرقمي، والأمن السيبراني، وحماية البيانات. ويقترح البحث أن على الدول النامية تنفيذ التكنولوجيا المناسبة لظروفها، وإرساء المصادقية المؤسسية، ومراقبة المؤشرات الرئيسية (الامتثال، تكلفة التحصيل، الإيرادات/الناتج المحلي الإجمالي) بانتظام.

الكلمات المفتاحية: الرقمنة، الضرائب، الامتثال الضريبي، الإيرادات العامة، الشمول الرقمي

تصنيف JEL: H20, H21, H26, O33, O38.

Corresponding author: Bestani A., e-mail: abdelkarim.bestani@univ-mascara.dz

1-Introduction

Digitalization is radically reshaping tax systems worldwide to reinvent the modalities of tax collection, the association between tax collectors and taxpayers, and the quality of public policies. This development is in reaction to a twofold need: to enhance tax collection and maximize revenues, decrease administrative expenses, and expand the tax base.

This study investigates the effects of digitalization on tax systems through practical examples from five countries: South Korea (Asia), Rwanda (Africa), Estonia (Europe), Brazil (America), and Australia (Oceania). Using a comparative examination, this study brings forth the achievements, challenges, and lessons for developing countries that can inspire them in their own digital financial transition.

The study is based on documentary research that relies on international sources (World Bank, OECD, IMF, African Development Bank, UNCTAD) and reports by national tax administrations.

2-Definition and Conceptual Framework

2.1 Tax Compliance

Tax compliance refers to the level of voluntary compliance with taxes that have been enacted in law, such as registration, filing, calculation, and payment of taxes. According to the OECD (2004, 2014), there are four dimensions of compliance: (i) registration compliance, where the company must register correctly with the tax authority; (ii) filing compliance, where the company must submit proper and complete tax returns; (iii) payment compliance, where the company must pay all tax owed correctly and in due time; and (iv) reporting compliance, where the company must be able to calculate tax owed properly and in accordance with the legislation. Thus, tax compliance is both a form of discipline among taxpayers and a performance tool that shows the effectiveness of tax administration, which is the degree of trust and cooperation between citizens and the state (Slemrod & Yitzhaki, 2002).

2.2 Administrative Cost

Tax collection cost or administrative cost of taxation is the financial, human, and technical resources used by the administration of the tax to take care of the actual collection of government revenues. It is normally measured as a ratio of the total tax revenue and is one of the major measures of the efficiency and performance of tax systems.

The OECD (2021) and IMF (2011) state that administrative costs consist of:

- 1) Direct costs: The budgetary expenses of tax administrations (salaries, IT systems, infrastructure, training, audit, and services in collection).

- 2) Indirect costs: The cost to taxpayers to do so (time, advisory fees, and accounting systems).
- 3) Digitalization savings: Automation, electronic invoicing, and e-services that successively lower collection expenses.

As such, a low administrative cost means that it is more fiscally efficient, but a high cost can be indicative of bureaucracy, lack of automation, or organizational difficulties in collecting revenue.

2.3 Electronic Transactions Share

The share of electronic transactions is the percentage of payments and settlements made through digital means (bank cards, online payment, mobile money, e-wallets, QR codes, etc.) of the overall number of financial transactions within an economy. It is generally measured as follows:

- 1) Volume: Number of electronic transactions/Total number of transactions.
- 2) Value: Number of electronic transactions/total transactions.

The World Bank (2020) states that this indicator is a primary indicator of financial digitalization, financial inclusion level, and fiscal modernization, as it can minimize cash use, enhance traceability, and increase the formalization of the economy (Castro & Scartascini, 2015).

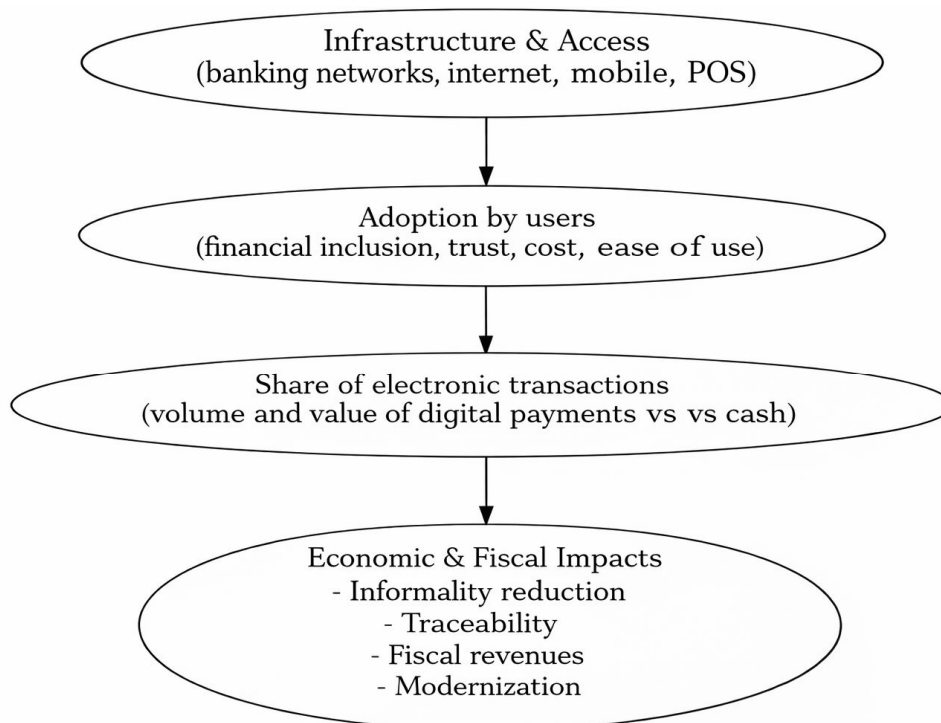
The percentage of electronic transactions can be studied in various dimensions.

- 1) Infrastructure and Access:
 - Payment terminals (POS and ATMs).
 - Internet and mobile coverage.
 - Banking and Fintech Interoperability.
- 2) User adoption:
 - Penetration rate of bank accounts.
 - Faith in citizens and businesses.
 - Ease and low price of services:
- 3) Economic and Fiscal Impacts:
 - Traceability through the reduction of the informal economy.
 - Improvement of tax control (electronic invoicing and e-payments).
 - In addition to transaction effectiveness and security.
- 4) The most significant Public Policy Indicator is as follows:
 - Measured by central banks, payment authorities, and the World Bank.
 - Monitored to track the advancement of a cash-free economy and a decrease in the use of cash.

The conceptual structure of the share of electronic transactions is depicted in the diagram below, showing the connection between infrastructure,

user adoption, the percentage of digital payments, and the economic and fiscal effects.

Fig.1.Conceptual Framework of the Share of Electronic Transactions



Source: Authors

The diagram above shows the effects of electronic transactions on economic and fiscal performance. It shows that the evolution of financial and digital bases (banking networks, Internet, mobile, and payment terminals) is a prerequisite for facilitating user uptake. The result of this adoption, which is determined by banking penetration, trust, cost, and ease of use, is the growth of electronic payments relative to cash. Subsequently, the further development of these digital transactions contributes to the increased traceability of financial flows, the decrease in the informal economy, and the enhancement of the mobilization of tax revenues, and the tax system, in general, becomes more modernized.

2.4 Impact on Tax Revenues

Impact on tax revenues This term describes the quantifiable impact of fiscal, administrative, or technological reform (especially digitalization) on the amount and composition of collected government revenue. It includes shifts in the tax to GDP ratio, the aggregate amount of revenues, and their stability over time.

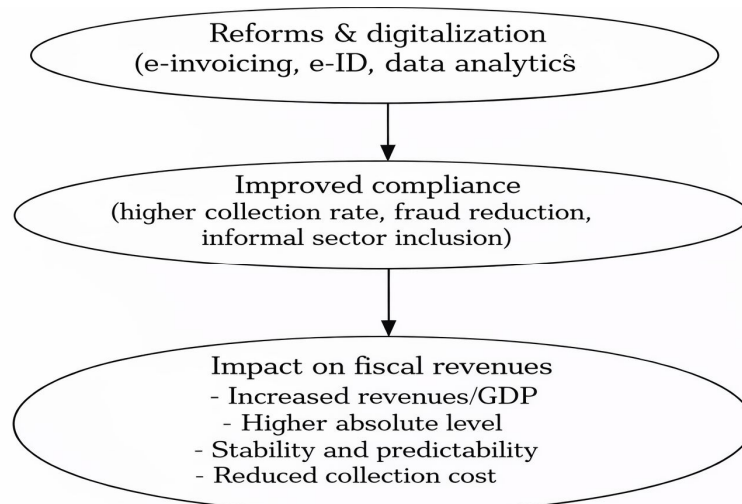
The effect may be either positive (as the tax base is expanded, compliance improves, and tax evasion is reduced) or neutral/negative (if reforms have high transition costs or the informal sector remains).

The OECD (2021) holds that the digitalization of tax administrations also tends to raise tax revenues by:

- Broadening the tax base is also important.
- Reducing fraud and evasion is another benefit.
- Improving transaction traceability is another advantage
- Securing revenue during times of crisis.

The diagram below provides the conceptual structure of the change in tax revenues to emphasize the correlation between fiscal and digital reforms, enhanced compliance, and the resultant impact on the level, stability, and cost of tax revenues.

Fig.2.Conceptual Framework of the Impact on Tax Revenues



Source: Authors

2.5 Digital Inclusion

Digital inclusion is a term used to reflect the policies, mechanisms, and practices designed to enable every individual to have access to information and communication technologies (ICT) that are effective, equitable, and autonomous. It is not confined to the presence of technical infrastructure (access to the Internet, equipment) but entails:

- Accessibility (infrastructure, network coverage, and low cost).
- Donkey skills (the ability to utilize online services).
- Socio-economic adoption (use of digital tools to obtain public, financial, tax, and other services).

As declared in the OECD (2019, "Going Digital: Shaping Policies, Improving Lives), digital inclusion can be considered one of the pillars of

inclusive growth, as it can alleviate disparities in access to key services (education, health, taxation, and financial services).

The idea may be structured in three major dimensions.

1) Technological Access:

- Internet commitment (fixed and mobile).
- Access to equipment (computers, smartphones).
- Affordable access costs:

2) Digital Skills and Usage

- Digital literacy level.
- Training and support (e-learning and online tax assistance).
- Use of digital services (electronic payment and e-invoicing).

3) Socio-economic Participation and Adoption

- Inclusion of marginalized populations (rural areas, women, and young people).
- Confidence in online services (transparency and security).
- Skills to exploit the economic and administrative possibilities presented by digital technology (e.g., e-governance, electronic taxation).

2.6 Application to the Fiscal Field

The fiscal digitalization scenario is as follows:

- The effectiveness of e-taxation presupposes digital inclusion: when a part of the population does not have access to digital tools, it establishes a tax gap (invisible non-contributors).
- Other countries, such as Rwanda, have achieved success by using a mobile-first tactic, which has allowed the use of electronic tax services even in remote locations.
- Thus, it plays a major role in tax compliance, reducing the informal sector, and expanding the tax base.

3. Methodology

The chosen methodology is a systematic review of the documentary.

- Official Sources: Reports of the national tax administration, World Bank, IMF, OECD, African Development Bank (AfDB), and international databases.
- Analytical Criteria: Tax compliance rate, administrative cost (collection cost), proportion of electronic transactions, and the effect of digitalization on tax revenues (shift in revenue-to-GDP ratio).
- Comparative Approach: A summary table was created, which involved five representative countries chosen to represent a variety of economic and institutional settings.

Table 1.International Comparison of Digital Tax Systems

Criteria	South Korea (Asia)	Rwanda (Africa)	Estonia (Europe)	Brazil (Americas)	Australia (Oceania)
Level of Digital Maturity	Very high	Moderate, rapidly growing	Exceptional (global leader)	High but heterogeneous	High, innovation-driven
Key Fiscal Platforms	Hometax, Electronic Invoicing	e-Tax, Mobile Money	e-Tax Board, X-Road	SPED, Nota Fiscal Eletrônica	ATO Portal, pre-filing, data analytics
Digital Mandates	100% digital for businesses	Mobile filing & payment for all	Automatic filing for 98% of taxpayers	Mandatory electronic invoicing	Pre-filled returns for 90% of individuals
Tax Compliance Rate	>95% (World Bank, 2022)	+15 pts in 10 years (RRA, 2021)	~96% (Estonian Tax Board, 2022)	+20% for SPED firms	>94% individuals (ATO, 2023)
Impact on Tax Revenues	+20% in 5 years (OECD)	Revenue/GDP +3 pts (2010–2020)	Stable revenues, lower costs	VAT revenues +30%	Revenue stabilization
Administrative Cost	<0.5% of revenues	Not public, declining	~0.3% (IMF, 2022)	~1.2% (OECD, 2022)	~0.7% (ATO, 2023)
Digital Inclusion	Very strong	Moderate (mobile-based)	Universal e-ID	Moderate, regional gaps	Strong, rural gaps
Technologies Used	Big data, AI, automation	SMS, mobile payments, cloud	Blockchain, e-ID, AI	Data mining, SPED	Big data, ML, AI
Major Challenges	Cybersecurity	Connectivity, literacy	Data protection	Tax complexity	Privacy & consent
Key Lessons Learned	Centralization & trust	Local adaptation	Digital state model	Transparency via tech	Proactive tax services

Source: Authors

4-Results

The comparative review of digital taxation reveals that there are major disparities regarding compliance with tax, costs involved in collection, effects on tax revenues, and it is inclusive of digital. Based on such results, it is possible to discover the best practices and limitations that are country-specific.

4.1 Tax Compliance

The rate of compliance with taxation is quite high in countries where digital taxation is well developed. In South Korea and Estonia, compliance is higher than 95%, primarily because of the high use of electronic filing, automated processes, and integrated taxation databases. In Rwanda, the introduction of e-tax systems and the extensive use of mobile money significantly increased compliance rates, as the initial levels were rather low, but the growth was more than 15%. Mandatory electronic invoicing in Brazil greatly enhanced tax compliance and boosted VAT revenue by over 30 % over the period 2009-2019. The use of pre-filled tax returns in Australia has helped tax

authorities achieve a compliance rate of more than 94 % among individual taxpayers.

4.2 Collection Cost

The increased cost of tax collection has also been reduced by digitalization. Collection costs in Estonia account for approximately 0.3 % of the total tax revenues in the country, making it one of the most efficient tax administrations in the world. The same level of efficiency is registered in South Korea, where the cost is nearly 0.5%, with the collection costs in Australia estimated to be about 0.7%. Conversely, Brazil is not yet characterized by comparatively low collection costs, which are around 1.2, primarily because of the complexity of the tax system and regional differences. In the case of Rwanda, the exact numbers are not publicly displayed yet, but the available evidence shows a slow decrease in administrative expenses due to the spread of digital tax solutions.

4.3 Impact on Tax Revenues

There is a positive shift in the presence of digital tax systems on the population's revenues, but there is a difference between countries. Electronic invoicing and integrated tax platforms have been used in South Korea, leading to a rise in tax revenues of about 20 % in five years. In Rwanda, the tax revenue to GDP ratio rose to almost 16 % against 13 % in 2010-2020, which is a positive indicator of raising domestic revenue collection. Following the adoption of the SPED system, Brazil has seen a sharp increase in VAT revenues, but regional inequalities remain a problem. In Australia, digitalization was not a factor that resulted in a steep increase in revenue but helped prevent a decrease in revenue and an increase in budgetary forecasting.

4.4 Digital Inclusion

Digital inclusion is also a determinant of the effectiveness of a digital tax system. In South Korea and Estonia, digital coverage is nearly universal and is supported by a national digital identity system and ubiquitous Internet access. Rwanda saw it as a context-based approach through excessive dependence on mobile-based solutions as they were able to get as many people involved as much as possible, regardless of information infrastructure. Nevertheless, Brazil and Australia remain characterized by regional imbalances, especially in urban and rural regions, which restrict the full potential of digitalization taxes.

5- Discussion

5.1 Impact on Compliance and Revenues

The fact that digitalization (e-invoicing, interoperability, e-ID) contributes to the increase in the conformity rate and the expansion of the assiette fiscale is verified by the literature and official reports. The examples of both South Korea and Estonia have proven that automation with a strong level of confidence in an institution is conducive to quasi-universal conformity.

5.2 Reduction in Collection Cost

The leading countries (Estonia, South Korea, and Australia) reported very low administrative costs (0.3–0.7), which translates into notable efficiency. For emerging countries, the generalization of mobile solutions and simplification of procedures are steps toward greater effectiveness.

5.3 Inclusion and Risks

Digital inclusion is a significant issue. The rapid adoption of mobile services in Rwanda has been made possible by the growth of mobile services, although rural areas have been covered with difficulty. In developed nations, data protection and cybersecurity are significant issues, especially among the leaders of the digital state, such as Estonia.

6. Conclusion

The digitalization of tax systems has become a critical lever for modernizing the work of state administration, improving tax compliance, and reinforcing state revenues. The comparative analysis made on the example of five countries (South Korea, Estonia, Rwanda, Brazil, and Australia) shows that efficiency, transparency, and inclusion gains are a direct result of the interplay between technological innovation, institutional governance, and citizen trust.

Highly digitized, interoperable, and data-rich tax systems, including those in Estonia and South Korea, prove that not only the compliance rate (>95%) but also the cost of collection (<0.5% of revenue) is reduced drastically. Developing nations such as Rwanda demonstrate that solutions such as mobile payments and simplified e-filing can produce results quickly as they are localized.

Nevertheless, fiscal digitalization is not a technological process per se; it requires institutional change and an effective system of digital governance. Cybersecurity, data protection, and digital exclusion risks continue to be significant issues, especially in developing nations, where Internet penetration and digital literacy lack even distribution.

6.1 Recommendations for developing countries

1) Fiscal Digital Foundation

- Invest in national platforms (tax portals, e-Tax, mobile systems) to be linked to customs, banking, and civil registry databases.

- Encourage the sharing of technology through partnerships between the state and companies to use secure and reliable technologies.

2) Take a Proactive and non-discriminative approach:

- The digitalization of filing and payments of large enterprises should start first and then trickle down to SMEs and informal sector workers.

- Establish non-complicated, multilingual mobile apps so that everyone can access them.

3) Enhancing Credibility and Openness:

- Publish performance indicators regularly: compliance rate, cost of collection, share of electronic payments, and revenue-to-GDP ratio.

- Provide effective communication on the confidentiality of personal and taxpayer information.

4) Building Human Capital and Change Management

- Introduce ongoing tax officer training and digital literacy training for taxpayers.

- Promote digital governance, academic research, and local innovation.

5) Make Cybersecurity the Center of Tax Reform:

- Ensure the existence of clear legal frameworks for data protection and the management of digital risks.

- Establish national centers for monitoring and responding to digital tax incidents (CERT).

6) Encouraging Regional and International Cooperation:

- Use the successful experiences of other countries, such as Estonia (X-Road) or Rwanda (e-Tax), to develop interoperable systems at the regional level.

- Participate in the World Bank, IMF, and OECD programs of technical assistance in the fast-tracking of the fiscal transition to the digital form.

6.2 General Perspective:

Fiscal digitalization should be considered one of the elements of sustainable development in the long run. It has the ability to enhance tax equity, decrease the informal economy, and augment public funds invested in education, health, and innovation. Thus, there is an interest among developing countries to have an integrated approach to adopting technology, governance, and inclusion to have an effective, fair, and resilient tax system in the 21 st century.

7- References

- African Development Bank Group (AfDB). (2020). African Economic Outlook 2020: Rwanda
- Bank for International Settlements. (2022). Annual economic report 2022: Payment systems and the decline of cash. BIS.
- Banque mondiale (2018). The Global Findex database 2017: Measuring financial inclusion and the fintech revolution. World Bank.
- Castro, L., & Scartascini, C. (2015). Tax Compliance and Enforcement in the Digital Era. Inter-American Development Bank Working Paper.
- International Monetary Fund. (2011). Revenue administration: Developing a taxpayer compliance program. IMF.
- International Monetary Fund. (2021). Digital money across borders. IMF.
- International Monetary Fund. (2021). The rise of digital money: A strategic plan to continue delivering on the IMF's mandate (Policy Paper No. 21/054). IMF.
- Organisation for Economic Co-operation and Development. (2004). Compliance risk management: Managing and improving tax compliance. OECD Publishing.
- Organisation for Economic Co-operation and Development. (2014). Tax compliance by design: Achieving improved SME tax compliance by adopting a system perspective. OECD Publishing.
- Organisation for Economic Co-operation and Development. (2019). Going digital: Shaping policies, improving lives. OECD Publishing.
- Organisation for Economic Co-operation and Development. (2021). Tax administration 2021: Comparative information on OECD and other advanced and emerging economies. OECD Publishing.
- Slemrod, J., & Yitzhaki, S. (2002). Tax avoidance, evasion, and administration. In Handbook of public economics (Vol. 3, pp. 1423-1470). Elsevier.
- United Nations Conference on Trade and Development. (2022). Data protection and privacy legislation worldwide. UNCTAD.
- World Bank. (2020). World development report 2021: Data for better lives. World Bank.