The Impact of Digital Tax Administration on Taxpayer Compliance and Revenue Performance

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Abstract

The rapid advancement of digital technology has transformed tax administration systems across the globe. This study examines the impact of digital tax administration on taxpayer compliance and government revenue performance in Indonesia. Employing a mixed-methods approach combining quantitative analysis of secondary data from the Directorate General of Taxes (DGT) spanning 2018–2023, with qualitative interviews of 30 tax officials and 50 individual taxpayers, this research identifies key factors mediating the digital transition. Results indicate that the implementation of e-Filing, e-Billing, and Core Tax Administration System (CTAS) significantly increased compliance rates by 18.4% and improved revenue realization by 23.7% over the study period. The findings also reveal that taxpayer digital literacy and system usability are critical determinants of voluntary compliance. The study concludes that sustained investment in digital infrastructure, taxpayer education programs, and transparent governance frameworks is essential for optimizing the benefits of digital tax transformation. Policy recommendations include integrating behavioral nudge strategies into digital interfaces and expanding broadband access to underserved regions.

Keywords: *Digital Taxation, Taxpayer Compliance, Tax Administration, Revenue Performance, e-Filing*

INTRODUCTION

Taxation is a cornerstone of public finance, providing governments with the resources necessary to fund public goods, social services, and infrastructure development. In recent decades, the digital revolution has fundamentally altered how tax authorities administer and enforce tax obligations, prompting a global shift toward electronic tax systems. Indonesia, as a rapidly developing economy with over 270 million inhabitants and a relatively low tax-to-GDP ratio, has aggressively pursued digital transformation in its tax administration system to enhance compliance and revenue collection efficiency.

The Directorate General of Taxes (DGT) of Indonesia launched its digital transformation agenda through the implementation of several key initiatives, including e-Registration, e-Filing, e-Billing, and, most recently, the Core Tax Administration System (CTAS). Despite these efforts, academic inquiry into the precise mechanisms through which these systems influence taxpayer behavior and aggregate revenue outcomes remains limited. Previous studies have examined digital tax administration in developed economies (OECD, 2021; Vasile & Croitoru, 2022), but empirical evidence from emerging markets such as Indonesia is sparse.

The gap in the literature is particularly pronounced with respect to the behavioral dimension of digital compliance. While structural factors such as penalty enforcement and audit frequency are well-documented drivers of compliance (Allingham & Sandmo, 1972; Slemrod, 2019), the role of digital interface design, system usability, and taxpayer digital literacy in shaping voluntary compliance has received comparatively little systematic investigation. This study seeks to address this gap by combining administrative data analysis with primary qualitative data to offer a comprehensive assessment of Indonesia's digital tax transition.

The novelty of this research lies in its integration of compliance theory with technology acceptance frameworks to explain outcomes in a developing-country context. By benchmarking Indonesia's digital tax performance against regional comparators Malaysia, the Philippines, and Thailand the study also provides actionable insights applicable to policymakers across ASEAN. The remainder of this paper is organized as follows: Section 2 describes the research methodology; Section 3 presents and discusses findings; Section 4 provides conclusions and recommendations.

RESEARCH METHODOLOGY

This study employs a mixed-methods design, integrating quantitative secondary data analysis with qualitative primary research. The quantitative component draws on administrative datasets published by the DGT for the period 2018–2023, including annual tax revenue figures, taxpayer registration records, and compliance audit outcomes. Panel regression models were used to estimate the relationship between the rollout of specific digital tax modules and compliance indicators, controlling for macroeconomic variables such as GDP growth rate and unemployment.

The qualitative component comprised semi-structured interviews with 30 tax officials stationed at three Regional Tax Offices (KPP) in Jakarta, Surabaya, and Medan, as well as 50 individual taxpayers purposively selected to represent diverse demographic profiles including age groups, income brackets, and educational backgrounds. Interview transcripts were

subjected to thematic analysis using NVivo 12, with themes developed inductively from the data and subsequently mapped onto the Technology Acceptance Model (TAM) constructs of perceived usefulness and perceived ease of use.

Reliability and validity were ensured through triangulation of data sources, member checking of interview interpretations with selected respondents, and independent coding by two researchers achieving an inter-rater agreement coefficient (Cohen's kappa) of 0.81. Ethical approval was obtained from the Institutional Review Board of Universitas Indonesia (No. IRB-UI-2023-045), and all participants provided written informed consent prior to data collection.

RESULTS AND DISCUSSION

Results

Panel regression analysis revealed a statistically significant positive association between the phased rollout of e-Filing and the Annual Tax Return (SPT) submission rate ($\beta = 0.34$, $p < 0.01$), indicating that the progressive implementation of digital filing infrastructure has meaningfully improved taxpayer compliance behavior across the observed period. This finding suggests that as e-Filing became more accessible and user-friendly, the transactional burden previously associated with manual return submission was substantially reduced, thereby lowering the barriers that had historically deterred timely filing among both individual and corporate taxpayers. The reduction in compliance costs including time, travel, and administrative effort appears to have generated a measurable behavioral response, encouraging greater participation in the formal tax system. The e-Billing system was found to complement these gains by reducing payment delays by an average of 11.2 days ($p < 0.05$), which in turn was associated with a 7.9% reduction in late-payment penalties collected, suggesting a meaningful shift toward improved voluntary on-time payment behavior among registered taxpayers. Together, these results indicate that the integration of e-Filing and e-Billing within a unified digital tax administration ecosystem has created compounding compliance benefits that extend beyond mere procedural convenience to fundamentally reshape taxpayer engagement with fiscal obligations.

Overall compliance rates defined as the ratio of registered taxpayers who filed returns on time increased from 67.3% in 2018 to 79.8% in 2023, representing an 18.4 percentage point improvement over the five-year study period (see Table 1). This upward trajectory is particularly significant given that the same period encompassed substantial macroeconomic disruption, including the COVID-19 pandemic, which in many comparable economies produced sharp reversals in tax compliance and revenue collection performance. The sustained improvement in compliance rates therefore points to the resilience and adaptive capacity of digitally enabled tax administration systems, which continued to function effectively even as in-person service channels were constrained or entirely suspended during periods of public health restriction. The expansion of the registered taxpayer base during this period further amplifies the significance of the compliance rate improvement, as maintaining and growing the proportion of on-time filers among an enlarging population of obligated taxpayers represents a considerable administrative achievement. These findings collectively affirm that digital tax administration reforms, when implemented in a phased and coordinated manner, can generate durable and measurable gains in voluntary compliance that persist across varying economic conditions.

Revenue performance also improved significantly over the study period, with total tax revenue increasing from IDR 1,315.9 trillion in 2018 to IDR 1,867.9 trillion in 2023, representing a nominal increase of 41.9% that reflects both the direct effects of expanded compliance and broader macroeconomic growth dynamics. After controlling for inflation and GDP growth factors that would ordinarily account for a substantial portion of nominal revenue expansion the real revenue improvement attributable to digital administration is estimated at 23.7%, a finding that isolates the genuine administrative efficiency gains produced by e-Filing and e-Billing adoption from external economic conditions. This estimate is consistent with the findings of Okunogbe and Pouliquen (2022) in Sub-Saharan Africa, where similar digitalization interventions yielded comparable revenue improvements by broadening the effective tax base and reducing opportunities for underreporting and evasion. The convergence of findings across geographically and institutionally distinct contexts strengthens the external validity of the present study's results, suggesting that the revenue benefits of digital tax administration are not idiosyncratic to the Indonesian context but reflect a generalizable relationship between technological modernization and fiscal performance. These revenue gains carry important implications for public finance policy, as the additional resources generated through improved compliance can be directed toward development expenditure, debt reduction, or the further strengthening of tax administration capacity in a self-reinforcing cycle of institutional improvement.

Table 1. Tax Compliance and Revenue Trends in Indonesia (2018–2023)

Year	Registered Taxpayers (million)	SPT Filing Rate (%)	Compliance Rate (%)	Tax Revenue (IDR trillion)
2018	38.6	72.1	67.3	1,315.9
2019	41.9	73.4	69.1	1,332.7
2020	43.5	74.0	70.5	1,070.0
2021	45.6	76.3	73.8	1,277.5
2022	49.0	79.0	77.4	1,716.8
2023	52.3	82.5	79.8	1,867.9

Source: Directorate General of Taxes (DGT), Annual Report 2023.

Discussion

The qualitative findings complement and extend the quantitative results by providing rich contextual depth that statistical analysis alone cannot fully capture, particularly in illuminating the mechanisms through which digital tax administration reforms translate into observable compliance improvements. Interview data revealed three dominant themes explaining the compliance improvement: (1) reduced transaction costs, (2) increased system trust, and (3) enhanced transparency, each of which operates through distinct but interrelated pathways that collectively shape taxpayer decision-making and behavioral outcomes. The reduction in transaction costs was the most consistently reported theme across respondent

groups, reflecting the broad experiential shift produced by the transition from paper-based to digital filing processes. Respondents consistently noted that e-Filing eliminated the need to visit tax offices, reduced paperwork burden, and enabled 24/7 submission access conveniences that were particularly valued by self-employed taxpayers and small business owners who previously faced significant opportunity costs associated with in-person compliance activities. These findings align with the Technology Acceptance Model (TAM)-based propositions of Davis (1989) and subsequent adaptations in tax compliance research (Warsame & Ireri, 2016), affirming that perceived ease of use and perceived usefulness remain central determinants of taxpayer adoption of digital public service platforms.

The theme of increased system trust emerged as a particularly consequential factor in shaping sustained compliance behavior, as respondents reported that the consistency, reliability, and official character of the e-Filing and e-Billing platforms instilled greater confidence in the integrity of the tax administration process. Unlike informal or manual submission channels, which were associated with uncertainty regarding receipt confirmation and potential for documentation loss, digital platforms provided automatic acknowledgment receipts and real-time transaction records that gave taxpayers verifiable proof of compliance. This shift in institutional trust is theoretically significant, as it reflects a transition from compliance motivated primarily by fear of penalty a coercive compliance orientation toward compliance motivated by confidence in the fairness and efficiency of the system, which research consistently identifies as a more durable foundation for voluntary tax behavior. Enhanced transparency, the third dominant theme, was closely related to trust, with respondents noting that digital platforms made tax obligations, deadlines, and payment histories more legible and accessible than had been possible under manual systems. The convergence of these three themes suggests that the compliance gains observed in the quantitative analysis are not merely the product of reduced friction but reflect a deeper transformation in the quality of the relationship between taxpayers and the fiscal administration, with implications for the long-term sustainability of compliance culture.

However, the data also surfaced critical challenges that complicate an unqualified reading of the positive compliance and revenue trends identified in the quantitative analysis. Approximately 34% of interviewed taxpayers reported experiencing technical difficulties during peak filing periods, particularly between January and March when submission volumes reach their annual maximum, pointing to persistent server capacity constraints that the current digital infrastructure has yet to fully resolve. These system failures are consequential not merely as technical inconveniences but as potential compliance barriers, since taxpayers who encounter repeated system errors during filing attempts may miss submission deadlines through no fault of their own, generating unwarranted penalties and eroding the trust that digital platforms are designed to cultivate. Furthermore, elderly taxpayers and those residing in rural areas expressed significantly lower levels of digital self-efficacy, describing difficulties in navigating online interfaces, uploading required documentation, and troubleshooting system errors without access to technical assistance. These findings echo broader concerns about digital exclusion in public service delivery (Mossberger et al., 2022), suggesting that compliance gains from digitalization are not uniformly distributed across population segments and that aggregate improvement statistics may mask significant disparities in access and experience across demographic and geographic subgroups.

The distributional unevenness of digitalization benefits raises important equity considerations for tax administration policy that extend beyond the compliance rates and revenue figures reported in aggregate analyses. If digital tax systems disproportionately serve urban, educated, and technologically literate taxpayers while creating additional barriers for rural, elderly, and low-income populations, the net effect may be to concentrate the burden of compliance difficulties on the most vulnerable segments of the taxpayer population. This dynamic risks reproducing and deepening existing socioeconomic inequalities through the mechanism of digital public service delivery, an outcome that is inconsistent with the equity objectives that underpin progressive tax system design. Policymakers must therefore consider complementary interventions including dedicated digital literacy programs, simplified interface designs for low-literacy users, and the maintenance of non-digital filing alternatives to ensure that the efficiency gains of digitalization do not come at the cost of inclusive access. Addressing these equity dimensions is not only a matter of social justice but also a strategic necessity for maximizing the aggregate compliance gains achievable through digital administration, as the segments currently experiencing the greatest exclusion represent an underperforming compliance frontier with significant untapped revenue potential.

The 2020 dip in total tax revenue to IDR 1,070.0 trillion is attributable to the COVID-19 pandemic, which simultaneously suppressed economic activity across virtually all productive sectors and triggered a series of government tax relief measures designed to mitigate the fiscal burden on households and businesses during the crisis period. Despite the severity of this revenue contraction, the recovery trajectory from 2021 onward was markedly steeper than pre-pandemic trends would have predicted, a pattern that tax officials attributed in part to the accelerated adoption of digital tax channels during the pandemic period when in-person services were restricted or entirely suspended. This observation is consistent with the "disruption-as-accelerator" thesis advanced by Sorbe et al. (2021), which argues that periods of acute institutional disruption can compress the adoption timelines of digital public service technologies by eliminating the inertia that sustains reliance on legacy systems under normal conditions. The pandemic effectively forced both the tax administration and taxpayers to invest in digital capability at an unprecedented pace, producing a structural shift in channel usage that persisted well beyond the period of acute crisis and contributed to the above-trend revenue recovery observed from 2022 onward. This finding carries significant implications for understanding the long-term governance effects of crisis-driven digitalization, suggesting that emergency-induced reforms can generate durable institutional improvements provided that the investments made during the disruption period are consolidated and sustained through deliberate post-crisis policy attention.

CONCLUSION

This study demonstrates that the digitalization of tax administration in Indonesia has yielded measurable improvements in taxpayer compliance and revenue performance over the 2018–2023 period. The integration of e-Filing, e-Billing, and the CTAS reduced compliance costs, increased system transparency, and enhanced service accessibility, collectively contributing to an 18.4-percentage-point rise in compliance rates and a real revenue gain of 23.7%. These results affirm that digital tax reform is not merely an administrative

modernization exercise but a substantive policy lever for fiscal strengthening in developing economies.

Nonetheless, the benefits of digitalization are contingent on complementary investments. Server infrastructure, digital literacy programs, and equitable broadband access are necessary preconditions for realizing the full potential of e-tax systems. Policymakers should also consider embedding behavioral nudges within digital interfaces such as personalized compliance reminders and progress bars to further increase voluntary compliance. Future research should extend this analysis using longitudinal datasets and explore heterogeneous effects across tax types and taxpayer categories.

RECOMMENDATION

Based on the research findings, the following recommendations are directed at the Directorate General of Taxes and relevant policymakers: (1) Strengthen digital infrastructure by scaling server capacity and implementing load-balancing protocols ahead of peak filing seasons. (2) Develop targeted digital literacy programs co-designed with community organizations to address the needs of elderly, rural, and low-income taxpayers. (3) Integrate behavioral insights into the design of the CTAS user interface, drawing on evidence-based nudge interventions proven effective in OECD and ASEAN contexts. (4) Establish a real-time compliance monitoring dashboard to facilitate proactive enforcement and reduce the administrative burden on tax officials.

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