Tax Administration Transformation and Tax Revenue Collection in Kenya: An ARDL Bounds-Testing Approach

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ABSTRACT

This paper evaluates the joint effect of the Kenya Revenue Authority's (KRA) three-pronged tax administration transformation, signaled by iTax system usage, tax base expansion, and data-driven compliance, on domestic tax revenue collection. No prior study has jointly evaluated these three reforms using national-level time-series data, a gap this paper addresses. Quarterly secondary data covering January 2014 to March 2023 (N = 37) were obtained from KRA and analyzed using a correlational design. Based on the Augmented Dickey-Fuller and Phillips-Perron unit-root tests, which confirmed mixed-order integration among the series, an autoregressive distributed lag (ARDL) bounds-testing approach to cointegration was applied. This was complemented by an error-correction model (ECM) and pairwise Granger causality tests. iTax usage correlated weakly with revenue (r = 0.29), tax base expansion (r = 0.84) and compliance (r = 0.95) correlated strongly. The bounds F-statistic (11.91) confirmed long-run cointegration. In the long run, compliance increased revenue by 114 percent (p = 0.000), while tax base expansion (–12 percent, p = 0.033) and iTax usage (–8 percent, p = 0.152) were associated with declines in revenue. The error-correction term adjusted at 209 percent per quarter, and the model explained 88 percent of revenue variance, passing all residual diagnostics. Causality ran bidirectionally between iTax usage and revenue, and unidirectionally from base expansion and compliance to revenue. The findings suggested that Kenya's revenue reforms should be sequenced. Investment in data-driven compliance and enforcement should be prioritized, followed by deeper integration with the iTax system. Base-expansion drives should always be paired with monitoring of the existing taxpayer base.

Keywords: iTax, tax base expansion, data-driven compliance, ARDL bounds testing, tax revenue collection.

INTRODUCTION

Meeting revenue targets remains a central fiscal challenge for tax administrations worldwide, and Kenya is no exception. The Kenya Revenue Authority (KRA) missed its collection target in 13 of the last 14 fiscal years, the sole exception being FY2021/2022, when it collected KES 2.03 trillion against a KES 1.976 trillion target. This was the first time collections crossed the two-trillion mark. To narrow this persistent fiscal deficit, KRA has pursued a three-pronged transformation agenda: expanding the tax base, embedding technology-driven compliance through the iTax system, and adopting data-driven, risk-based enforcement. Multilateral bodies such as the African Tax Administration Forum, the OECD, and the IMF have consistently identified effective domestic tax systems as central to a nation's growth and development agenda (Besley & Persson, 2009, 2010; Gaspar et al., 2016). This position has been formalized in Sustainable Development Goal target 17.1 and in Kenya's 2015 commitment under the Addis Tax Initiative.

Comparable reform experiences elsewhere are instructive but inconclusive about the separate contribution of each lever. Georgia's 2003 tax reform bundled anti-corruption enforcement, base simplification, and system automation into a single, tightly sequenced package. The resulting revenue gains couldn't be decomposed to isolate the contribution of technology or data analytics independently of the accompanying political and

enforcement reforms (World Bank, 2012; Magumba, 2019). Rwanda's rollout of electronic billing machines raised VAT payments by only 5.4 percent, despite reaching 77.8 percent of VAT-registered firms, suggesting that technology adoption alone is a weak lever unless matched by demand-side incentives (Eissa et al., 2014). In Tajikistan, electronic filing cut compliance time by roughly 40 percent but left average tax paid largely unchanged, except among firms previously likely to evade (Okunogbe & Pouliquen, 2022). Within East Africa, Ethiopia's sales registration machines improved VAT compliance only when paired with visible enforcement (Mascagni et al., 2021), and Uganda's digitization and taxpayer-segmentation reforms left its tax-to-GDP ratio broadly stagnant at around 13 percent (Kagina, 2015).

Kenya-specific studies have so far examined these variables separately or within narrow samples. iTax has been evaluated in isolation and within single regions or taxpayer segments (Oeta, 2017; Annrita, 2019; Benaihia & Omondi, 2017). Tax reforms and corporate compliance have been studied only within the Large Taxpayers Office (Livoi, 2017) while the size of Kenya's informal sector has been linked to revenue performance without reference to system usage or compliance monitoring (Murunga et al., 2021). No study has jointly evaluated iTax usage, tax base expansion, and data-driven compliance using national-level, quarterly time-series data spanning a full decade of the iTax era. This is the gap the present paper addresses.

The paper is anchored in Musgrave's (1959) Theory of Public Finance and complemented by the Technology Acceptance Model (Davis, 1989). It pursues three specific objectives: (i) to establish the effect of iTax system usage on tax revenue collection; (ii) to establish the effect of tax base expansion on tax revenue collection; and (iii) to establish the effect of data-driven compliance on tax revenue collection, using quarterly KRA data for January 2014 to March 2023.

LITERATURE REVIEW

Theory of Public Finance

The study is anchored in Musgrave's (1959) Theory of Public Finance which identifies taxes, charges, and borrowing as the principal sources of government revenue. It assigns government three functions: allocation of goods and services, distribution of the costs and benefits of taxation and spending across society, and stabilization of the economy. Musgrave further argued that the economic incidence of a tax, which ultimately bears its burden after-market adjustment, matters more than its statutory incidence. He also argued that because tax administration is a cost function while revenue collected is a transfer, the cost of administering and enforcing a tax system should be minimized relative to the revenue it raises. The three study constructs map onto these functions as follows: iTax usage operationalizes allocation by digitizing the assessment and collection of liabilities; tax base expansion operationalizes distribution by widening the pool of taxpayers; and data-driven compliance operationalizes the administration-cost proposition by lowering the marginal cost of detecting non-compliance.

Technology Acceptance Model

The Technology Acceptance Model (Davis, 1989) explains the behavioral micro-foundations of system adoption through perceived usefulness and perceived ease of use. It explains that adoption does not automatically translate into effective use (Bagozzi et al., 1992), and the model has itself been criticized for offering limited explanatory power once adoption has occurred (Benbasat & Barki, 2007; Chuttur, 2009). The two theories are treated as complementary: TAM explains why and how taxpayers adopt iTax, while Musgrave's theory explains why an efficient, low-cost reform agenda is central to government's revenue-raising function.

Empirical literature and research gap

Evidence on technology-driven compliance is decidedly mixed. Eissa et al. (2014) found that near-universal adoption of Rwanda's electronic billing machines raised VAT payments by only 5.4 percent. Okunogbe and Pouliquen (2022) found that Tajikistan's e-filing program left average tax paid unchanged except among firms previously likely to evade. Brun et al. (2020), using cross-country data, reported a two-way association in which better-resourced tax administrations both acquire more information technology and collect more revenue.

Against this, Fan et al. (2024) found that China's digitized VAT invoicing raised revenue because it enabled cross-checking that made false input-tax claims harder to sustain. Mascagni et al. (2021) found that Ethiopia's real-time sales registration machines improved compliance only when paired with visible enforcement. Within Kenya, Oeta (2017) and Annrita (2019) reported positive iTax effects, but both relied on staff-perception surveys confined to a single region or taxpayer segment and treated iTax as the sole explanatory factor.

In a base expansion analysis, Murunga et al. (2021) found that the size of Kenya's informal sector depresses tax revenue using an ARDL approach on national data from 1970 to 2018. In the study, the informal-sector size was modeled as a single explanatory variable without reference to digital registration or compliance monitoring. Senoga et al. (2009) used a Social Accounting Matrix to show that Uganda's tax base could be broadened by targeting under-taxed sectors, but could not specify how such sectors are identified in practice. Schneider (2005) estimated that the shadow economy accounted for 41 percent of GDP in developing countries, underscoring the scale of the untaxed base but not how much of it is realistically collectible.

On compliance, Ameyaw et al. (2016) found unidirectional causality from taxation to economic growth in Ghana and stressed the role of voluntary compliance anchored in the threat of enforcement. The OECD (2022) reported that tax administrations that deploy analytics and integrate systems realize better compliance outcomes. Livoi (2017), by contrast, found an inverse relationship between tax reforms and corporate compliance among Kenya's Large Taxpayers Office. The study was based on staff perceptions rather than observed filing and payment behavior, a methodological distinction that matters for how that finding should be read alongside the present study. Taken together, the reviewed literature isolates individual reform variables, relies substantially on perception-based measures, or is confined to sub-national samples. None evaluates all our three constructs jointly at a national level over a full decade of administrative data, the gap this paper addresses.

METHODOLOGY

Research design and data

The study adopts a positivist, correlational design using secondary quarterly time-series data obtained from KRA and the Kenya National Bureau of Statistics for January 2014 to March 2023 (N = 37 quarterly observations). A correlational design was appropriate because the three explanatory variables are reforms already implemented by KRA rather than variables the study could manipulate or assign. The design was operationalized through the ARDL bounds-testing approach to cointegration (Pesaran et al., 2001), chosen because it remains valid regardless of whether the underlying series are purely I(0), purely I(1), or a mixture of both orders. This condition was confirmed by this study's unit-root tests. It was therefore preferable here to Engle-Granger or Johansen approaches, which require uniform orders of integration.

Model specification

Building on the tax-revenue modeling framework of Kandil (2002), extended by Ekeocha et al. (2012) and Nwaorgu et al. (2016), the study specifies revenue as a function of iTax usage, tax base expansion, and data-driven compliance: $Rev_t = f(REG_t, ATPS_t, RFPT_t, \mu_t)$, expressed in natural-log form as:

$$lnREV_t = a_0 + a_1 lnREG_t + a_2 lnATPS_t + a_3 lnRFPT_t + \mu_t$$

where, REV_t is quarterly domestic-tax revenue collected (PAYE, withholding tax, rental income tax, VAT, VAT withholding, excise duty and corporate/individual income tax); REG_t is the number of new taxpayer registrations on iTax, the proxy for tax base expansion; $ATPS_t$ is the cumulative number of transactions completed by active taxpayers on iTax, the proxy for iTax system usage; $RFPT_t$ is the value of returns filed and paid on time (VAT, PAYE and monthly rental income tax), the proxy for data-driven compliance; and μ_t is the error term. Natural logarithms were taken so that the estimated coefficients are directly interpretable as elasticities.

Estimation strategy

Descriptive statistics and Pearson correlations provided an initial view of the data. Stationarity was assessed using both the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests, since a preliminary test for the significance of the trend and constant indicated that both should be restricted from the unit-root and cointegration specifications. Because the PP test is more robust to serial correlation and structural breaks in the residual variance, its results were used to select the model form for the subsequent ARDL bounds test, with ADF results reported as a robustness check.

Optimal lag length was determined using the unrestricted vector autoregression (VAR) lag-selection criteria (LR, FPE, AIC, SC, and HQ). The ARDL bounds F-test (Pesaran et al., 2001) tested for a long-run levels relationship, with the null of no cointegration rejected when the computed F-statistic exceeded the upper critical bound at the 5 percent level. Where cointegration was confirmed, long-run coefficients were estimated from the conditional error-correction regression, and short-run dynamics were captured through an error-correction model (ECM).

The ECM adjustment term captures the speed of return to long-run equilibrium after a shock. Residual diagnostics comprised the Jarque-Bera test for normality, the Breusch-Godfrey LM test for serial correlation, the ARCH test for heteroscedasticity, variance inflation factors (VIF) for multicollinearity (rejection threshold VIF > 10; Gujarati, 2004), the Ramsey RESET test for functional-form misspecification, and CUSUM/CUSUMSQ tests for parameter stability. Finally, pairwise Granger causality tests established the direction of influence between each reform variable and revenue collection, with variables differenced where necessary to achieve a uniform order of integration before the causality tests were run.

RESULTS

Descriptive statistics

Table 1 summarizes the descriptive statistics for the four study variables over 37 quarterly observations. Active-taxpayer transactions (ATPS) averaged 28.78 million per quarter, ranging from 13.49 million in 2014Q1 (the quarter iTax was rolled out) to 48.78 million in 2023Q1. Taxpayer registrations (REG) averaged 430,326 per quarter, ranging from 99,564 in 2014Q1 to 893,891 in 2023Q1, reflecting the base-expansion drive that accompanied the e-TIMS roll-out. Revenue (REV) averaged KES 198.06 billion per quarter, with a minimum of KES 20.33 billion in 2014Q1 and a maximum of KES 347.91 billion in 2022Q2, the quarter KRA met its annual target for the first time in the study period. Returns filed and paid on time (RFPT) averaged KES 104.77 billion per quarter, peaking at KES 166.99 billion in 2023Q1. Jarque-Bera statistics indicate REV, REG, and RFPT are consistent with a normal distribution at the 5 percent level, while ATPS departs from normality.

Table 1. Descriptive statistics (N = 37)

Statistic	ATPS	REG	REV (KES)	RFPT (KES)
Mean	28,779,472	430,326	198,059,569,749	104,767,547,477
Median	26,967,312	416,698	210,370,749,683	105,448,254,363
Maximum	48,776,124	893,891	347,907,346,843	166,986,570,723
Minimum	13,490,978	99,564	20,332,908,753	13,341,043,872
Std. dev.	11,268,047	158,567	79,278,823,784	40,825,550,939
Skewness	0.260	0.853	–0.658	–0.620
Kurtosis	1.730	4.678	2.785	2.643

Jarque-Bera	2.905	8.828	2.740	2.564
Probability	0.234	0.012	0.254	0.277

Source: Authors' computation, EViews 12 Student Version

Correlation analysis

Table 2 reports Pearson pairwise correlations. iTax usage correlated weakly and positively with revenue ($r = 0.29$, $p < 0.01$) and with tax base expansion ($r = 0.08$, $p = 0.65$, not significant). Tax base expansion was strongly and positively correlated with revenue ($r = 0.84$, $p < 0.01$) and compliance ($r = 0.90$, $p < 0.01$). Compliance correlated strongly and positively with revenue ($r = 0.95$, $p < 0.01$), the strongest bivariate association in the dataset. The weak iTax-revenue correlation is consistent with the administrative-data evidence of Eissa et al. (2014) and Okunogbe and Pouliquen (2022), while the strong compliance-revenue correlation echoes Fan et al. (2024) and the OECD's (2022) finding that analytics-driven administrations achieve better compliance outcomes. The strong base-compliance correlation ($r = 0.90$) flagged the need for a formal multicollinearity check, addressed below.

Table 2. Pearson correlation matrix

Variable	**ATPS**	**REV**	**RFPT**	**REG**
ATPS	1.000			
REV	0.837**	1.000		
RFPT	0.902**	0.947**	1.000	
REG	0.077	0.288*	0.228	1.000

Note: ** significant at 1%; * significant at 5%.

Source: Authors' computation, EViews 12 Student Version

Stationarity tests

An initial OLS regression testing the joint significance of the trend and constant terms for each series was significant ($p < 0.001$ in all cases), so both were restricted from the unit-root and cointegration specifications that followed. The ADF test suggested REG and RFPT were stationary at level, I(0), while ATPS and REV required second differencing, I(2). The Phillips-Perron test, more robust to serial correlation and heteroscedasticity in this dataset, suggested a more favorable picture. REV, ATPS and RFPT were found to be stationary at level, I(0), and REG was stationary after first-differencing, I(1). None of the series required a second difference (Table 3). Because of its superior robustness properties in this context, the PP results were adopted for the subsequent analysis. This mixture of I(0) and I(1) orders is precisely the condition the ARDL bounds-testing framework accommodates, and is consistent with comparable regional evidence (Murunga et al., 2021, for Kenyan tax revenue; Maganya, 2020, for Tanzanian fiscal series).

Table 3. Unit-root test results (Phillips-Perron, level equation, no constant/trend)

Variable	**Level (Adj. t-stat)**	**Prob.**	**Order of integration**
LnATPS	–10.02*	0.000	I(0)
LnREG	–10.13*	0.000	I(1)

LnREV	–9.38*	0.000	I(0)
LnRFPT	–6.13*	0.000	I(0)

Note: * indicates rejection of the unit-root null at the 5% level, Newey-West automatic bandwidth selection.

Source: Authors' computation, EViews 12 Student Version

Cointegration: ARDL bounds test

VAR lag-selection criteria identified lag 3 as optimal (minimum AIC of -11.48; supported by LR and FPE). At this lag, the ARDL bounds test produced an F-statistic of 11.91, exceeding the upper bound critical value (3.63) at the 5 percent level (k = 3, n = 34), and a t-statistic of -6.21, exceeding the corresponding upper bound (-3.33). Both reject the null of no long-run level relationship, confirming that iTax usage, tax base expansion, data-driven compliance, and revenue collection move together in the long run (Table 4).

Table 4. ARDL F-bounds and t-bounds cointegration test

Test statistic	**Value**	**Significance**	**I(0) bound**	**I(1) bound**
F-statistic (k = 3)	11.909	10%	2.01	3.10
		5%	2.45	3.63
		1%	3.42	4.84
t-statistic	-6.211	5%	-1.95	-3.33

Source: Authors' computation, EViews 12 Student Version

Long-run and short-run ARDL estimates

Table 5 reports the long-run coefficients from the conditional error-correction regression. Compliance (RFPT) exerted a large, positive, and highly significant long-run effect on revenue (α = 1.1438, p = 0.000). A 1 percent increase in returns filed and paid on time was associated with a 114 percent increase in revenue. Tax base expansion (REG) exerted a negative and significant effect (α = -0.0790, p = 0.033), and iTax usage (ATPS) exerted a negative, marginally significant effect (α = -0.1207, p = 0.033) in the cointegrating vector. Compliance was consistently the dominant, positive, and significant driver.

Table 5. Long-run ARDL coefficients (cointegrating vector)

Variable	**Coefficient**	**Std. error**	**t-statistic**	**Prob.**
LNATPS	–0.1207	0.0529	–2.283	0.033
LNREG	–0.0790	0.0531	–1.487	0.152
LNRFPT	1.1438	0.0394	29.060	0.000

Cointegrating equation: LNREV = -0.1207 LNATPS – 0.0790 LNREG + 1.1438 LNRFPT

Source: Authors' computation, EViews 12 Student Version

The error-correction term was negative and highly significant (ECM coefficient = -2.098, p = 0.0000003), confirming convergence to long-run equilibrium. Because its absolute value exceeds one, the system does not

return to equilibrium monotonically but through a dampened oscillation, over-correcting each quarter and converging on alternating sides of the equilibrium path. This pattern is consistent with a revenue system governed by fixed, short statutory filing cycles. In the short run, compliance again dominated. A contemporaneous change in RFPT raised revenue by 0.71 percent ($p = 0.002$), with partial offsetting in the following quarter, consistent with filing-cycle smoothing rather than collection instability. The fitted ECM explained 88 percent of the variance in quarterly revenue changes ($R^2 = 0.882$, adjusted $R^2 = 0.838$).

Table 6. Short-run error-correction estimates (selected coefficients)

Variable	Coefficient	Std. error	t-statistic	Prob.
D(LNRFPT)	0.7141	0.2007	3.559	0.002
D(LNRFPT(–1))	–1.1918	0.2798	–4.260	0.000
D(LNATPS(–1))	7.2431	1.7071	4.243	0.000
D(LNREG(–1))	0.1363	0.0366	3.724	0.001
CointEq(–1)	–2.0976	0.2843	–7.378	0.000

$R^2 = 0.882$; Adjusted $R^2 = 0.838$; Durbin-Watson = 2.050.

Source: Authors' computation, EViews 12 Student Version

Diagnostic tests

The fitted ARDL-ECM model passed the full range of residual diagnostics (Table 7). Residuals were normally distributed (Jarque-Bera = 0.216, $p = 0.898$), serially uncorrelated (Breusch-Godfrey LM F-statistic = 1.989, $p = 0.141$), and homoscedastic (ARCH F-statistic = 0.388, $p = 0.763$). Variance inflation factors for all three regressors were below the conventional threshold of 10 (centred VIF: 4.19 for LNATPS, 1.70 for LNREG, 5.51 for LNRFPT), indicating no harmful multicollinearity despite the strong bivariate correlation between base expansion and compliance. The Ramsey RESET test found no evidence of functional-form misspecification (F-statistic = 0.026, $p = 0.873$), and CUSUM/CUSUMSQ plots remained within the 5 percent critical bounds throughout the sample, indicating stable model parameters.

Table 7. Residual diagnostic tests

Test	Statistic	Value	Prob.	Conclusion
Normality	Jarque-Bera	0.216	0.898	Residuals normally distributed
Serial correlation	Breusch-Godfrey LM (F)	1.989	0.141	No serial correlation
Heteroscedasticity	ARCH (F)	0.388	0.763	Homoscedastic
Multicollinearity	Max. centred VIF	5.51	–	No harmful collinearity (VIF < 10)
Functional form	Ramsey RESET (F)	0.026	0.873	Correctly specified
Parameter stability	CUSUM / CUSUMSQ	–	–	Stable within 5% bounds

Source: Authors' computation, EViews 12 Student Version

Granger causality

Table 8 reports pairwise Granger causality tests at lag 3, with ATPS and REG differenced to achieve a uniform order of integration. Causality between iTax usage and revenue was bidirectional, consistent with a reinforcing loop in which technology use supports collection and a better-resourced administration reinvests in technology. Causality between tax base expansion and revenue ran in both directions at this lag structure, though the negative long-run coefficient in Table 5 indicates the direction of that influence was diluting rather than augmenting revenue. Causality between compliance and revenue was unidirectional, running cleanly from compliance to revenue ($p = 0.0002$), with no significant reverse causality. No significant causality was found among the three reform variables themselves in either direction (all $p > 0.37$), indicating that each lever's influence on revenue is direct rather than mediated through the other two.

Table 8. Pairwise Granger causality test (lag = 3)

Null hypothesis	Obs.	F-stat	Prob.
LNATPS does not Granger-cause LNREV	34	4.345	0.013**
LNREV does not Granger-cause LNATPS	34	1.396	0.265
LNREG does not Granger-cause LNREV	34	3.917	0.019**
LNREV does not Granger-cause LNREG	34	3.529	0.028**
LNRFPT does not Granger-cause LNREV	34	9.692	0.000**
LNREV does not Granger-cause LNRFPT	34	1.209	0.325

Note: ** significant at 5%.

Source: Authors' computation, EViews 12 Student Version

DISCUSSION

iTax system usage and revenue collection

The weak bivariate correlation ($r = 0.29$) and statistically insignificant long-run coefficient ($\alpha = –0.079$, $p = 0.152$) for iTax usage indicate that system usage alone was not a significant driver of revenue, even though usage and revenue Granger-cause one another. This is consistent with TAM's (Davis, 1989) distinction between adopting a technology and using it effectively. Growing transaction volumes captured the quantity of system usage but not the quality of the declarations passing through it. It also aligns with Musgrave's (1959) framing of technology as an enabler that lowers administrative costs rather than a revenue-generating instrument in its own right. The finding diverges from the positive iTax effects reported by Oeta (2017) and Annrita (2019), both reliant on staff-perception surveys within a single region or taxpayer segment. However, the study aligns with the administrative-data evidence of Eissa et al. (2014) and Okunogbe and Pouliquen (2022), where technology adoption alone likewise failed to move average tax paid.

Tax base expansion and revenue collection

Tax base expansion presents the study's most counterintuitive result: a strong positive bivariate correlation with revenue ($r = 0.84$) alongside a negative, significant long-run coefficient ($\alpha = –0.121$, $p = 0.033$). Read together with the finding that new taxpayer registrations grew faster than the administration's capacity to monitor the resulting population, the most consistent interpretation is dilution rather than contradiction of Musgrave's (1959) distribution function. This demonstrates that recruiting taxpayers without commensurate monitoring investment lowers the average yield per registrant even as aggregate correlation with revenue remains positive. This is

consistent with Murunga et al. (2021), who found that growth in Kenya's informal, low-yield segments depresses realized revenue, and with Senoga et al. (2009), whose Ugandan evidence likewise found that base broadening raises revenue only when the newly captured base is identifiable and administrable.

Data-driven compliance and revenue collection

Data-driven compliance was, by a wide margin, the dominant driver of revenue collection. A strong bivariate correlation ($r = 0.95$), the largest and most significant long-run coefficient ($\alpha = 1.144$, $p = 0.000$), and a clean unidirectional causal flow from compliance to revenue were realized. This is the cleanest confirmation of Musgrave's (1959) administration-cost proposition: enforcement carried out through low-cost, data-driven detection converts an existing tax base and existing system usage into actual collections. The finding is consistent with Fan et al. (2024) and with Mascagni et al. (2021), and stands in instructive contrast to Livoi (2017), whose perception-based measure found reforms inversely related to compliance. The present study's behavior-based measure, covering all taxpayers, finds the opposite, underscoring that revenue conclusions should rest on observed filing and payment behavior rather than on staff or taxpayer perceptions. Taken together, the three reform levers read as complements rather than substitutes. That system usage generates the underlying data, base expansion supplies the taxpayer population, and data-driven compliance is what converts both into revenue.

CONCLUSION

This study set out to determine whether Kenya's tax administration transformation – operationalized through iTax system usage, tax base expansion and data-driven compliance – has delivered more revenue. It used a decade of quarterly national data and an ARDL bounds-testing strategy. The three levers were found to move together with revenue in the long run (bounds F-statistic = 11.91), but their individual contributions are markedly uneven. iTax usage alone does not significantly raise revenue; instead, it forms a reinforcing loop with collections. Tax base expansion, pursued over 2014–2023, drove revenue in the right direction but diluted its magnitude, reflecting recruitment that outpaced monitoring of the existing base. Data-driven compliance was the decisive lever to be pressed. A long-run elasticity roughly ten times larger than the other two variables combined resulted. The model explains 88 percent of the variance in revenue, and its residuals pass every conventional diagnostic test.

For policy and practice, Kenya's reform agenda should be sequenced by demonstrated potency rather than pursued as three equally weighted programs. Investment in analytics capacity, risk-based case selection, and enforcement follow-through should be prioritized, as data-driven compliance has the greatest revenue impact. Deepening iTax through integration with land, business registration, financial sector, and telecommunications data, and monitoring the quality (not merely the volume) of declarations, should follow. Base-expansion drives should be paired, from the outset, with retention and monitoring metrics for the existing taxpayer base, so that recruitment adds to revenue rather than diluting it.

Three limitations bound the interpretation of these results. First, the analysis is confined to 2014Q1–2023Q1, the period for which consistent iTax-era administrative data were available, precluding comparison with pre-iTax revenue trends. Second, evaluating three explanatory variables jointly limited the depth with which any single variable's mechanism could be examined. Third, several major post-sample reforms – the nationwide roll-out of e-TIMS, the 2023 Finance Act, and the tax amnesties of December 2022 and July 2026 – fall outside the study window, and their revenue effects remain unevaluated. Future research replicating this ARDL-based strategy over the post-2023 period and disaggregating iTax usage into declaration-quality rather than transaction-volume measures would extend and test the robustness of the findings reported here.

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