Revenue Under Siege: Assessing The Statistically Significant Impact of the COVID-19 Pandemic on Sectoral Tax Collection in Zambia

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DOI: https://doi.org/10.47772/IJRISS.2026.100700118

Received: 10 July 2026; Accepted: 15 July 2026; Published: 27 July 2026

ABSTRACT

The COVID-19 pandemic posed unprecedented challenges to domestic revenue mobilisation worldwide, with developing economies especially exposed given their already constrained fiscal capacity. Although a substantial body of research has documented the macroeconomic shocks the pandemic caused globally, empirical evidence on its statistical impact on sectoral tax collection in Zambia has remained limited. This study addresses that gap using a five-year panel of administrative tax data (2017-2021) obtained from the Zambia Revenue Authority (ZRA), covering sixteen tax sectors grouped under direct, indirect, and trade taxes. A mixed-methods design was adopted in which quantitative analysis was dominant, complemented by qualitative evidence drawn from key informants within the revenue administration so that the statistical results could be interpreted alongside institutional experience. After checking the relevant assumptions, a repeated measures ANOVA was used to compare annual aggregate tax collections across the study period. All four multivariate statistics (Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root) produced identical, statistically significant results *($p < 0.05$)* with a large effect size *(partial $\eta^2 = 0.618$)*. Bonferroni-adjusted post-hoc comparisons showed that tax collection in 2021 differed significantly from 2017, 2018, and 2020, indicating that COVID-19 depressed revenue collection across sectors before a recovery took hold in the final year of the study. The qualitative evidence indicates that this recovery coincided with the Zambia Revenue Authority's move toward digitalised tax administration and more innovative approaches to managing compliance, alongside a broader institutional push to build resilience against future shocks. The study contributes to the growing body of knowledge on the pandemic's fiscal effects globally and in developing economies specifically and offers policy recommendations of value to the Zambian government and to comparable economies elsewhere.

Keywords: COVID-19; domestic revenue mobilisation; sectoral tax collection; fiscal resilience; tax administration; Zambia.

INTRODUCTION

Domestic revenue mobilisation sits at the centre of sustainable public finance. Revenue raised from within a country's own economy allows government to fund essential services and to invest in the physical and social infrastructure that underpins development. Tax revenue is widely regarded as the most dependable of these sources because, unlike external borrowing or development assistance, it does not add to a country's debt burden. Yet for most developing countries the capacity to raise adequate domestic revenue is held back by narrow tax bases, extensive informality, administrative inefficiency, and exposure to macroeconomic shocks (IMF & World Bank, 2024; OECD, 2025).

The COVID-19 pandemic delivered a shock of a different order of magnitude. As governments worldwide imposed lockdowns, movement restrictions, and business closures to contain the disease, supply chains buckled and global trade contracted to less than half its pre-pandemic volume (OECD, 2022). Governments

simultaneously increased spending on health services, social protection, and economic support programmes even as their tax receipts fell sharply (IMF, 2021; OECD, 2022), a combination that pushed fiscal deficits and debt to GDP ratios to levels the IMF and OECD have described as unprecedented in modern history (IMF, 2021; OECD, 2022).

Sub-Saharan Africa felt this shock especially acutely. Most economies in the region entered the crisis with low tax to GDP ratios and thin fiscal buffers, so the contraction in output, trade, and household income translated quickly into falling tax revenue (IMF & World Bank, 2024). Heavy dependence on a narrow set of primary commodities compounded the effect. The falling commodity prices reduced corporate tax receipts just as domestic activity was also contracting (IMF, 2021). Many revenue authorities responded by accelerating the digitalisation of tax administration and introducing relief measures (OECD, 2022), though the pace of recovery has varied considerably from one country to the next depending on institutional capacity, economic structure, governance quality, and the specific policy mix each government adopted (OECD, 2022; IMF & World Bank, 2024).

In Zambia, government introduced a package of relief measures intended to protect the livelihoods of the citizens and businesses whose economic activity ultimately sustains tax collection. These included relief on tax and other government fees, customs relief on the temporary importation of emergency goods and materials, waiver of interest on overdue tax and other government debts, and simplification and automation of tax and other compliance processes. Whether these measures actually softened the decline in revenue collection, however, remains an open empirical question, particularly since the same lockdowns that justified the relief measures also suppressed the production, employment, investment, and consumption that generate tax revenue in the first place (IMF, 2021; OECD, 2022).

A considerable body of work has examined the macroeconomic fiscal consequences of the pandemic at global and regional level (IMF, 2021; OECD, 2022), but this literature is overwhelmingly descriptive and cross country in orientation. It rarely drills down to the sector specific tax collection functions of individual countries, and where administrative fiscal data is used, it is typically summarised rather than subjected to inferential statistical testing. Consequently, existing studies offer limited insight into the actual magnitude or statistical significance of the pandemic's effect on particular tax sectors.

This study addresses that gap by applying repeated measures ANOVA to secondary administrative data from the Zambia Revenue Authority covering sixteen tax sectors over 2017-2021, and by pairing that statistical analysis with institutional perspectives gathered directly from ZRA officials. In doing so, the study contributes evidence that can inform tax administrators, policymakers, and researchers concerned with revenue performance and fiscal resilience during systemic crises, both within Zambia and in comparable developing country settings. Three contributions follow from this design. First, the study supplies statistically robust evidence, generated through repeated measures ANOVA, of the extent to which COVID-19 affected Zambia's sectoral tax collection, evidence that moves beyond the descriptive treatment common in the wider literature. Second, by triangulating this quantitative evidence with institutional accounts from ZRA officials, the study extends work on fiscal resilience in developing economies beyond aggregate indicators toward an understanding of the mechanisms operating within the revenue administration itself. Third, the study is intended as a practical resource for the Zambia Revenue Authority and revenue administrations in comparable developing countries, it offers an evidence base for designing more adaptive, crisis responsive fiscal administration and policy.

Problem Statement

Tax revenue is the principal source of fiscal resources available to the Zambian state, and weak revenue performance constrains government's ability to invest in development, service its debt, and deliver public services. The COVID-19 pandemic exposed this vulnerability starkly, business insolvencies rose, formal employment contracted, the informal sector shrank, and compliance weakened across tax types.

Three knowledge gaps motivate the present study. First, while the broad fiscal consequences of the pandemic are well documented, there is limited empirical evidence establishing whether COVID-19 had a statistically significant effect on tax collection at the sectoral level in Zambia over 2017-2021, a question that can only be answered using inferential rather than descriptive statistics. Second, comprehensive analysis of how individual tax types performed across the pandemic period is scarce. Third, and most consequential for policy, there is little theoretically grounded analysis of the institutional arrangements that could help Zambia's revenue administration build resilience against future shocks of this kind (Mwale, 2020).

Accordingly, the study asks; (i) Did the COVID-19 pandemic have a statistically significant effect on tax collection across different sectors of the Zambian economy between 2017 and 2021? (ii) What institutional measures could strengthen tax collection resilience against future pandemics or comparable economic shocks?

Research Objectives

General Objective

To assess the impact of the COVID-19 pandemic on sectoral tax collection in Zambia between 2017 and 2021.

Specific Objectives

The study sought to:

1. Examine trends in sectoral tax collection before, during, and after the COVID-19 pandemic.
2. Determine whether the COVID-19 pandemic significantly affected sectoral tax collection in Zambia.
3. Assess the magnitude of the pandemic's effect on sectoral tax collection using repeated measures ANOVA.
4. Identify policy measures capable of strengthening tax collection resilience during future public health or economic crises.

Research Questions

1. How did sectoral tax collection change before, during, and after the COVID-19 pandemic in Zambia?
2. Did the COVID-19 pandemic have a statistically significant effect on sectoral tax collection in Zambia?
3. What was the magnitude of the pandemic's effect on sectoral tax collection?
4. Which policy interventions can strengthen tax collection resilience during future crises?

Research Hypotheses

Null Hypothesis (H_0): There is no statistically significant difference in mean sectoral tax collection across the study period (2017-2021).

$H_0: \mu_{2017} = \mu_{2018} = \mu_{2019} = \mu_{2020} = \mu_{2021}$

Alternative Hypothesis (H_1): At least one year's mean sectoral tax collection differs significantly from the others.

$H_1: \exists\, \mu_i \neq \mu_j$

These hypotheses map directly onto the repeated measures ANOVA used in the study and provide the statistical basis for evaluating the pandemic's effect on sectoral tax collection.

LITERATURE REVIEW

Theoretical Framework

Understanding how the pandemic reshaped tax collection requires a framework capable of explaining both taxpayer behaviour and the strategies revenue administrations adopt under conditions of economic distress. This study draws on three established taxation theories in combination the Ability to Pay Theory, the Benefit Theory of Taxation, and the Cost of Service Theory, each of which have been applied individually in prior taxation research but which together offer a fuller account of how an external shock such as COVID-19 can affect taxpayers' capacity to pay, their willingness to comply, and government's total revenue collection.

The Ability to Pay Theory holds that tax obligations should track a taxpayer's economic capacity, so that those with greater income or wealth contribute proportionately more (Musgrave & Musgrave, 1989). A contraction in economic activity therefore reduces taxpayers' capacity to pay, and tax collection falls most in the sectors hit hardest by the pandemic. In Zambia, the hotel, leisure, and tourism sectors were especially exposed, with unemployment, business closures, and depressed corporate profitability eroding taxable income for individuals and firms alike.

The Benefit Theory of Taxation, by contrast, frames tax payment as a return for the services and benefits citizens receive from government (Wicksell, 1958). Under ordinary conditions this perceived reciprocity supports voluntary compliance. During the pandemic, however, governments expanded health and social protection spending, sometimes by diverting funds from other purposes, precisely as their tax receipts were falling, widening the gap between the benefits citizens received and the taxes government was able to collect. Where that gap becomes visible to taxpayers, it can weaken the perceived fairness of the tax bargain.

The Cost of Service Theory examines taxation from an administrative standpoint, holding that tax collection is justified where the administrative cost of collection is proportionate to the yield obtained (Langmead & Baker, 2016). COVID-19 raised the cost of routine tax administration sharply: the everyday interaction between taxpayers and officials that revenue authorities relied on was largely replaced, within a short space of time, by digital channels that many administrations had to build from scratch. This study therefore also examines how the pandemic altered the cost structure of ZRA's revenue-collection function.

Taken together, these three theories offer a layered account of tax collection under economic stress. The Ability to Pay Theory explains why taxpayers' capacity to meet their obligations falls during a severe downturn; the Benefit and Cost of Service theories explain how taxpayer perceptions and administrative design shape the revenue that can actually be realised from that reduced capacity. Applying all three together therefore provides an adequate theoretical basis for examining how the pandemic's spread affected tax collection across Zambia's economic sectors.

Empirical Evidence: Global and Regional Perspectives

Internationally, COVID-19 produced the most severe disruption to domestic revenue mobilisation since the global financial crisis, simultaneously depressing production, employment, trade, and consumption while sharply increasing government spending on health, social protection, and recovery programmes (IMF, 2021; OECD, 2022). The resulting fiscal deficits and debt burdens were widespread, but their scale and duration varied considerably across countries. Advanced economies generally recovered faster, helped by stronger institutions, broader tax bases, more mature digital tax systems, and greater fiscal space to fund large support packages. Developing economies, in contrast, tended to experience more prolonged revenue declines, reflecting narrower tax bases, weaker administrative capacity, extensive informality, and greater reliance on some sectors such as tourism, informal trade, commodity exports that were disproportionately exposed to lockdowns and disrupted supply chains (IMF, 2021; OECD, 2022).

This divergence was equally visible within Sub-Saharan Africa. Countries across the region entered the crisis with low tax to GDP ratios and large informal sectors, so contracting output and trade fed through rapidly into falling tax revenue even as health and social protection spending rose (OECD, ATAF, & AUC, 2022). What distinguished countries from one another was less the severity of the initial shock than institutional quality: governments with stronger governance frameworks and more advanced digital revenue administration were generally better able to sustain compliance and recover collections once the immediate disruption had passed (Nikiema, 2025). Nigeria, South Africa, Kenya, and Zambia all combined tax relief with an accelerated shift to digital administration, though the effectiveness of these measures differed according to each country's economic structure, taxpayer behaviour, and administrative readiness (Ernst & Young, 2020; Statistics South Africa, 2022; Tax Justice Network Africa, 2020).

Across both the global and the Sub-Saharan African literatures, one methodological limitation that recurs was that the evidence base leans heavily on aggregate indicators, total tax revenue, fiscal deficits, tax to GDP ratios analysed descriptively rather than through inferential techniques capable of establishing whether observed changes are statistically significant. Digital transformation of tax administration emerges consistently as a central adaptive response across this literature, but because the underlying analyses remain descriptive and aggregated, they say little about how individual tax sectors within a given country responded differently to the crisis, or about the statistical robustness of the recovery trends they describe. This combination of aggregation and descriptive method is precisely the gap the present study is designed to close.

Empirical Evidence from Zambia and the Research Gap

Zambia's own experience of the pandemic mirrored the regional pattern: contracting activity in mining, manufacturing, tourism, wholesale and retail trade, transport, and hospitality narrowed the tax base even as government increased spending on health, social protection, and economic recovery (ZRA, 2021). The Zambia Revenue Authority's response centred on accelerated digital administration, expanded electronic registration, online filing, electronic payment platforms, and virtual taxpayer support mirroring adaptations documented internationally as central to administrative resilience during systemic disruption (OECD, 2021; Ernst & Young, 2020, ZRA, 2019).

Existing Zambian studies, however, have concentrated almost entirely on taxpayer compliance and the behavioural determinants of compliance among small and medium enterprises (Mwale, 2020; Banda & Kumari, 2022), typically relying on descriptive analysis or survey-based perception data rather than longitudinal administrative records capable of testing whether revenue changes across categories are statistically significant. The principal exception is Kayombo et al. (2022), who applied one-way repeated measures ANOVA to examine how COVID-19 affected revenue diversification, profitability, and income volatility among sixteen commercial banks in Zambia, finding that the pandemic's effects varied across financial performance indicators rather than acting uniformly on the sector. That study demonstrates both that COVID-19's effects in Zambia were sector-specific and that repeated measures ANOVA is a workable tool for testing this within a Zambian setting but its focus on banking leaves open whether a comparable pattern holds for domestic tax collection more broadly, a question the present study takes up directly using administrative revenue data from the Zambia Revenue Authority.

A second gap concerns integration rather than method: Zambian studies of tax compliance, administrative reform, and fiscal policy have generally been conducted in isolation from one another, so there is limited understanding of how administrative responses, digital transformation, and organisational adaptation actually shaped tax collection outcomes during the pandemic. Addressing both gaps together, the absence of sector specific inferential analysis and the absence of institutional explanation for whatever statistical patterns emerge is the specific contribution of this study. By applying repeated measures ANOVA to sixteen tax sectors and complementing that analysis with institutional evidence from ZRA officials, the study (i) provides statistically robust evidence of temporal change in sectoral tax collection during the pandemic, (ii) moves beyond descriptive treatment to identify where significant differences in performance actually occurred across sectors, and (iii) uses the qualitative evidence to explain the institutional mechanisms behind those differences, extending the

explanatory sequential mixed-methods approach of Creswell and Creswell (2023) into a domain sectoral tax administration where it has rarely been applied in Zambia. The study's contribution is therefore methodological, in its application of inferential statistics to administrative tax data; empirical, in the sector specific evidence it supplies on Zambia's domestic revenue mobilisation; theoretical, in extending the Ability to Pay framework to a systemic economic shock; and practical, in the evidence-based recommendations it offers for strengthening fiscal resilience, digital tax administration, and adaptive revenue management in developing economies generally (Kayombo et al., 2022; OECD, 2022; IMF & World Bank, 2024).

CONCEPTUAL FRAMEWORK

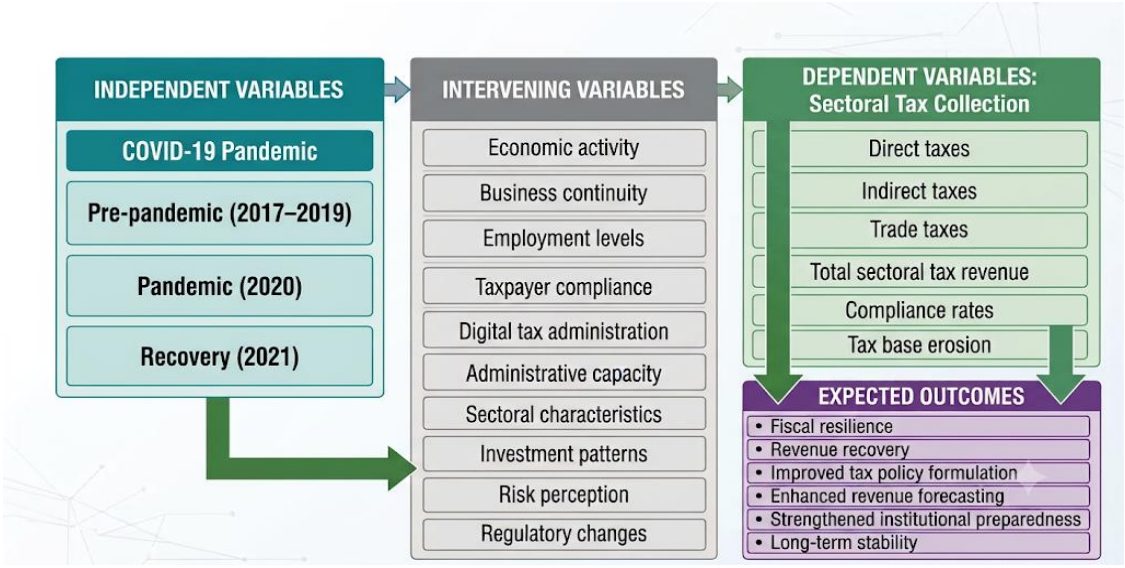
The conceptual framework brings together the theoretical perspectives discussed above with empirical evidence on the pandemic's fiscal impact, mapping the pathways through which changes in sectoral revenue arose over the study period. It identifies the economic and institutional factors that mediated the relationship between the independent variable the COVID-19 pandemic and the dependent variable, sectoral tax revenue.

The independent variable is treated temporally across three phases: 2017-2019 as the pre-pandemic period of normal economic conditions, 2020 as the pandemic year in which lockdowns had their fullest effect, and 2021 as the early recovery period following the removal of most restrictions. Framing the pandemic as a time-based variable in this way allows the study to test whether the revenue changes observed across sectors over these phases are statistically significant.

The dependent variable is sectoral tax collection the annual amount collected by each of the sixteen sampled tax sectors administered by the Zambia Revenue Authority before, during, and after the pandemic which supplies the empirical basis for assessing COVID-19's fiscal effects on domestic revenue collection.

Between these two variables sit a set of intervening economic and institutional factors: the decline in economic activity and consequent fall in taxpayers' ability to pay, driven by supply-chain disruption, business closures, and rising unemployment; the effect of movement restrictions on taxpayer compliance; and the range of policy responses tax relief, deferred payments, customs and VAT exemptions on imported goods introduced by government, whose effect on sectoral collection depended on how each measure was designed and implemented by ZRA and government more broadly. The framework also incorporates institutional characteristics such as ZRA's capacity to administer taxes digitally and adapt to changing circumstances, and the observation that more formalised, better regulated sectors were likely to prove more resilient than informal ones.

Figure 1: Conceptual Framework



Source: Authors' compilation based on the conceptual research variables

This framework, anchored in the Ability to Pay, Benefit, and Cost of Service theories, guided the study's central hypothesis that mean sectoral tax collection differs significantly across the pre-pandemic, pandemic, and recovery periods. That hypothesis was tested using repeated measures ANOVA, and the results were then interpreted against the economic and institutional environment set out in this framework.

METHODOLOGY

Research Philosophy

The study was grounded in a pragmatist research philosophy, which allows quantitative and qualitative approaches to be combined where doing so best serves the research objectives, rather than adhering to a single methodological tradition (Saunders et al., 2019). The quantitative strand which looked at the statistical analysis of changes in sectoral tax collection before, during, and after the pandemic served as the principal method of enquiry. The qualitative strand, consisting of unstructured interviews with ZRA officials, played an explanatory role, situating the statistical findings within their operational and policy context and thereby strengthening the overall credibility of the study.

Research Approach

The study followed a predominantly deductive approach. Existing taxation theory and empirical evidence on COVID-19's fiscal consequences informed the hypothesis that sectoral tax collection differed significantly across the study period, which was then tested using inferential statistics applied to secondary panel data from ZRA. Limited inductive reasoning was applied when interpreting the interview evidence, which helped explain the statistical patterns identified in the quantitative analysis and offered practical insight into how the pandemic affected tax administration in practice.

Research Design

The study adopted an explanatory sequential mixed-methods design with a dominant quantitative component. The first phase applied quantitative analysis to secondary panel data covering 2017-2021 to establish whether sectoral tax collection differed significantly across the study period; the second phase used unstructured interviews with ZRA officials to interpret and explain those statistical findings. This design suited the study's primary objective by establishing statistical significance while allowing the qualitative evidence to supply institutional explanation, improving methodological triangulation and the overall robustness of the findings (Creswell & Creswell, 2018).

Study Area

The study was conducted within the Zambia Revenue Authority, the statutory body responsible for tax administration in Zambia under the Zambia Revenue Authority Act, covering direct taxes, indirect taxes, customs duties, and other government revenues. ZRA was selected because it holds the official administrative records needed to examine sectoral tax collection before, during, and after the pandemic.

Data Sources

Both secondary and primary data were used. The quantitative analysis drew on secondary data extracted from ZRA Annual Reports, Tax Statistics publications, and official administrative records for 2017-2021, providing the annual sectoral tax collection figures used in the repeated measures ANOVA. The qualitative component comprised unstructured interviews with ZRA officials directly involved in tax administration during the COVID-19 period; these interviews were designed not to generate standalone qualitative findings but to explain the patterns identified in the quantitative analysis.

Target Population and Sampling Procedure

The study population comprised all major tax sectors administered by ZRA and reported consistently in its annual statistical publications between 2017 and 2021, covering direct taxes, indirect taxes, customs and excise duties, and other statutory categories. Because the objective was to track change over time, each tax sector formed a repeated observational unit measured across five consecutive financial years.

Rather than drawing a sample, the study adopted a census approach, including every tax sector for which complete, comparable annual data existed throughout the period, an approach consistent with guidance favouring complete enumeration where the target population is small and fully accessible (Saunders et al., 2019). During data preparation, sectors with incomplete records across the five-year period were removed by listwise deletion to satisfy the assumptions of repeated measures ANOVA, leaving sixteen tax sectors with complete observations for every year. The Yamane sampling formula was therefore not applicable, since the analysis relied on complete administrative records rather than a sampled survey population.

Data Collection Procedures

Quantitative data were drawn from ZRA Annual Reports and Tax Statistics publications for the financial years 2017-2021 the Authority's official, audited administrative records. Annual reports were first reviewed to identify tax sectors reported consistently throughout the period; tax collection values for each eligible sector were then extracted into a Microsoft Excel database and cross-checked repeatedly against the original reports to limit transcription error, before being imported into SPSS for cleaning, coding, and analysis.

Unstructured interviews were conducted with selected ZRA officials who had direct experience of revenue administration during the pandemic, focusing on administrative challenges, taxpayer compliance behaviour, implementation of relief measures, and the expansion of digital tax administration. As with the data sources described above, these interviews were used to explain and contextualise the quantitative results rather than to stand as an independent qualitative study.

Data Analysis Procedures

Analysis proceeded through a structured sequence of descriptive and inferential procedures in SPSS. Descriptive statistics, means, standard deviations, minimum and maximum values summarised annual sectoral tax collection and provided an initial view of revenue trends ahead of inferential testing.

Before hypothesis testing, the assumptions underlying repeated measures ANOVA were checked. Normality was assessed using both the Kolmogorov-Smirnov and Shapiro-Wilk tests, supplemented by graphical inspection of normal probability plots. Sphericity was evaluated with Mauchly's Test; where this assumption was violated, Greenhouse-Geisser corrected degrees of freedom were applied, consistent with recommended practice for repeated measures analysis (Field, 2018; Pallant, 2020).

The principal analytical technique was one-way repeated measures ANOVA, chosen because the same sixteen tax sectors were observed repeatedly across five years, making the annual observations statistically dependent rather than independent, precisely the structure repeated measures ANOVA is designed to handle. This mirrors the approach of Kayombo et al. (2022), who applied the same technique in SPSS to panel data from sixteen Zambian commercial banks to assess COVID-19's effect on bank performance, establishing a methodological precedent for its use in a Zambian economic setting.

Where the overall test indicated significant differences, Bonferroni-adjusted pairwise comparisons identified the specific years between which those differences occurred, controlling the family-wise error rate associated with multiple comparisons. Effect sizes were reported as partial eta squared (η^2) to capture the practical, and not merely statistical, significance of the differences observed.

Interview data was analysed thematically, responses were reviewed repeatedly, coded for recurring themes, and organised into categories reflecting taxpayer compliance, institutional response, digital transformation, and operational challenge, which were then integrated into the discussion to interpret the quantitative findings.

Validity, Reliability and Research Rigour

Quantitative validity rested on the use of official ZRA administrative records, the authoritative source of Zambian tax collection data which reduced measurement error relative to survey-based alternatives. Reliability was supported through standardised extraction procedures, systematic cross-checking of extracted figures against the original publications, and consistent coding protocols. Because the quantitative component drew on audited administrative records rather than psychometric instruments, conventional internal-consistency measures such as Cronbach's alpha were not applicable and were not computed; reliability instead rests on the consistency, completeness, and reproducibility of the administrative dataset itself. Methodological triangulation integrating statistical analysis with institutional insight from ZRA officials further strengthened the credibility of the study by grounding the statistical findings in the operational realities of tax administration during the pandemic.

Ethical Considerations

Ethical approval was obtained through the relevant academic procedures of ZCAS University prior to data collection, along with formal authorisation to access institutional information and engage ZRA officials. Participation in the interviews was voluntary and preceded by informed consent. Confidentiality and anonymity were maintained by reporting interview responses in aggregated form without identifying individual participants; secondary data were drawn from publicly available ZRA publications and used solely for academic research purposes. All electronic datasets and interview records were stored securely and accessed only by the researcher, in keeping with the principles of voluntary participation, confidentiality, informed consent, beneficence, and responsible data management.

RESULTS

Descriptive Statistics

Descriptive statistics were computed to examine trends in sectoral tax collection over the five-year study period. Table 1 presents the annual mean tax collections, standard deviations, and the number of tax sectors included in the analysis.

Table 1: Descriptive Statistics -Tax Collected by Sector (2017-2021)

Year	Mean (K)	Std. Deviation (K)	N
2017	1,561,537.50	1,403,754.99	16
2018	1,565,125.00	1,365,603.32	16
2019	1,766,556.25	1,537,220.90	16
2020	1,894,412.50	1,481,316.65	16
2021	2,310,062.50	1,678,416.38	16

Source: Authors' compilation from Zambia Revenue Authority data (2017-2021)

The descriptive statistics point to a broad upward trend in mean sectoral tax collection across the study period, rising from K1.56 million in 2017 to roughly K2.31 million in 2021. Growth was incremental across most of the period, but the largest single increase approximately K415,650 occurred between 2020 and 2021. The relatively large standard deviations recorded in every year reflect substantial variation among sectors, consistent with

differences in sector size, economic activity, and revenue-generating capacity. Descriptive statistics alone, however, cannot establish whether these year-on-year differences are statistically significant, which is why inferential analysis was undertaken next.

Assessment of Statistical Assumptions

Test of Normality

Table 2: Tests of Normality -Tax Collected by Sector

Year	K-S Statistic	df	K-S Sig.	S-W Statistic	df	S-W Sig.
2017	.217	16	.043	.850	16	.013
2018	.183	16	.155	.868	16	.026
2019	.200	16	.086	.863	16	.021
2020	.195	16	.107	.885	16	.047
2021	.168	16	.200*	.879	16	.037

Source: Authors' compilation based on data analysis results from SPSS.

Four of the five annual observations did not depart significantly from normality ($p > 0.05$) on the Kolmogorov–Smirnov test. The 2017 observations produced a statistically significant result on this test, suggesting some departure from normality, but the Shapiro–Wilk statistics and graphical inspection indicated that this departure was not severe enough to invalidate repeated measures ANOVA. Given the balanced dataset and ANOVA's general robustness to moderate departures from normality, approximate normality was considered adequately satisfied (Pallant, 2020; Field, 2018).

Test of Sphericity

Table 3: Mauchly's Test of Sphericity – Measure: Tax

Mauchly's W	**Approx. χ^2**	**df**	**Sig.**	**G-G Epsilon**	**H-F Epsilon**	**Lower-bound**
.014	57.740	9	.000	.358	.386	.250

Source: Authors' compilation based on data analysis results from SPSS.

Mauchly's Test was statistically significant ($W = 0.014$, $\chi^2 = 57.740$, $p < 0.001$), indicating a violation of sphericity. The Greenhouse-Geisser correction ($\varepsilon = 0.358$) was therefore applied when interpreting the within subjects' effects, reducing the risk of Type I error and giving more reliable significance estimates under sphericity violation (Field, 2018).

Effect of the COVID-19 Pandemic on Sectoral Tax Collection

Table 4: Multivariate Tests - Effect of Time on Tax Collection

Test	Value	F	Hyp. Df	Error df	Sig.	Partial η^2
Pillai's Trace	.618	4.846	4.000	12.000	.015	.618
Wilks' Lambda	.382	4.846	4.000	12.000	.015	.618
Hotelling's Trace	1.615	4.846	4.000	12.000	.015	.618
Roy's Largest Root	1.615	4.846	4.000	12.000	.015	.618

Source: Authors' compilation based on data analysis results from SPSS.

All four multivariate test statistics converged on the same significance level ($p = 0.015$), indicating statistically significant differences in sectoral tax collection across the five years examined. The effect size was substantial *(partial $\eta^2 = 0.618$),* meaning that roughly 61.8% of the variation in sectoral tax collection was associated with differences across the study period, a large effect by conventional benchmarks, indicating that the temporal changes observed were not only statistically significant but economically meaningful. The null hypothesis of no difference in mean sectoral tax collection across the study period was therefore rejected: sectoral tax collection changed significantly between 2017 and 2021.

Pairwise Comparisons

Table 5: Pairwise Comparisons (Bonferroni Adjusted) -Measure: Tax

(I) Year	(J) Year	Mean Diff. (I–J) (K)	Std. Error	Sig.	95% CI Lower	95% CI Upper
2017	2021	-748,525.00*	211,232.85	.029	-1,442,644.28	-54,405.73
2018	2021	-744,937.50*	178,264.85	.008	-1,330,722.67	-159,152.33
2019	2021	-543,506.25	167,380.44	.054	-1,093,524.82	6,512.32
2020	2021	-415,650.00*	93,707.16	.005	-723,575.35	-107,724.65
2017	2018	-3,587.50	61,146.94	1.000	-204,518.70	197,343.70
2017	2019	-205,018.75	91,134.42	.399	-504,489.97	94,452.47
2017	2020	-332,875.00	155,467.23	.491	-843,746.32	177,996.32

Source: Authors' compilation based on data analysis results from SPSS.

Mean sectoral tax collection in 2021 differed significantly from *2017 ($p = 0.029$), 2018 ($p = 0.008$),* and 2020 *($p = 0.005$),* indicating that the most pronounced shift in revenue performance occurred during the recovery phase rather than during the pandemic year itself. Comparisons among the earlier years (2017-2019) and between 2019 and 2020 were not significant after Bonferroni adjustment, suggesting that the sharpest change in tax collection became visible only in the transition from the pandemic period into recovery.

SUMMARY OF FINDINGS

Three findings emerge from the statistical analysis. First, descriptive statistics show an overall upward trend in sectoral tax collection across the five years, though the pace of growth varied. Second, repeated measures ANOVA confirms that the temporal differences observed are statistically significant, meaning sectoral tax collection varied meaningfully across the pre-pandemic, pandemic, and recovery periods. Third, the post-hoc comparisons identify 2021 as the year of greatest statistical divergence from earlier years, pointing to the recovery phase as the period of most significant change in revenue performance following the pandemic's onset. These findings are examined in the discussion that follows against international, regional, and Zambian literature.

DISCUSSION

The Pandemic's Effect on Sectoral Tax Collection

The central finding of this study is that COVID-19 had a statistically significant effect on sectoral tax collection in Zambia. Repeated measures ANOVA identified significant temporal differences in tax revenue across the five years of the study *($p = 0.015$)*, with a substantial effect size *(partial $\eta^2 = 0.618$)* indicating that the pandemic accounted for a large share of the variation in sectoral tax revenue. This pattern aligns with the Ability to Pay

Theory's central premise that tax receipts track taxpayers' capacity to meet their obligations (Mulolani, 2013). Since business closures, layoffs, and falling household and business incomes during the pandemic curtailed that capacity directly and did so unevenly across sectors. Read alongside the institutional dimension of the Ability to Pay framework, the revenue authority's own capacity to collect what taxpayers, in principle, hence these findings carry implications for tax administration that extend beyond taxpayer behaviour alone.

The findings also speak to the Benefit Theory of Taxation, which highlights how government spending obligations shift during a crisis. The pandemic drove a sharp rise in health and social-protection expenditure at precisely the moment tax revenue was falling across every sector examined, a mismatch that places real strain on fiscal sustainability and underscores the importance of maintaining taxpayer confidence through transparent, effective tax administration during public health emergencies.

Comparison with Previous Empirical Studies

These findings sit comfortably within the broader international evidence that COVID-19 substantially disrupted domestic revenue mobilisation across both developed and developing economies, while also showing how country-specific economic structure, institutional capacity, and administrative adaptability shape the magnitude and persistence of that disruption. Placing the Zambian results alongside evidence from other developing countries sharpens this comparison and situates the study's contribution within the wider debate on fiscal resilience under systemic economic stress.

The significant decline in sectoral tax collection identified here parallels evidence from Nigeria, where falling business activity, declining household income, and restricted economic movement produced comparable contractions in tax revenue (Nabena, 2020), and from South Africa, where reduced employment, corporate profitability, and consumption depressed VAT and corporate income tax receipts before recovery took hold in 2021 (Statistics South Africa, 2022). The consistency of this pattern across three quite different economies suggests that contracting economic activity was the principal transmission channel through which the pandemic reduced tax collection across much of Sub-Saharan Africa, rather than any single country-specific factor.

Where the Zambian evidence diverges from parts of the regional literature is in the pace and shape of recovery. The OECD, ATAF, and African Union Commission (2022) found that countries with stronger digital tax administration and more resilient institutions tended to recover domestic revenue faster once the initial shock had passed, a conclusion echoed by Nikiema (2025), who links institutional quality directly to tax revenue performance during periods of uncertainty. Zambia's own recovery trajectory had most tax sectors showing no significant difference from pre-pandemic levels by 2019/2020, followed by a sharp, statistically distinct jump in 2021 which is broadly consistent with this institutional quality thesis, but it is also shaped by factors specific to Zambia. The continued dependence on mining revenue, the pace at which ZRA expanded digital tax administration, and the gradual recovery of commodity prices. Where some developing economies in the comparative literature show revenue remaining depressed well beyond 2021, Zambia's recovery appears comparatively front loaded into a single year, which is itself informative. It suggests that whatever combination of commodity recovery and administrative adaptation drove Zambia's rebound operated with unusual speed relative to some of its regional peers, a pattern that future comparative work could usefully test directly rather than infer.

Methodologically, this study also extends the existing evidence base. Much of the literature reviewed above relies on descriptive fiscal indicators or survey-based evidence, whereas the present analysis applies repeated measures ANOVA to sector-specific administrative data, producing statistically robust evidence on the timing and magnitude of change that descriptive approaches alone cannot supply. This mirrors the methodological approach of Kayombo et al. (2022), whose repeated measures ANOVA of sixteen Zambian commercial banks found that COVID-19's effects varied across financial performance indicators. Read together, the two studies indicate that the pandemic's economic consequences were heterogeneous not just across countries but within the Zambian economy itself, reinforcing the value of sector specific inferential analysis for both banking and tax policy.

The present study's further contribution lies in integrating this statistical evidence with institutional testimony from ZRA officials, something the existing Zambian literature, which tends to examine either macro-fiscal outcomes or taxpayer compliance in isolation, has not previously combined. That integration, developed in the next section, provides a fuller account of how operational adaptation, taxpayer behaviour, and digital transformation together shaped Zambia's revenue performance during the pandemic than either the quantitative or the qualitative evidence could supply on its own.

Integration of Quantitative and Qualitative Findings

The explanatory sequential design adopted here allowed the statistical results to be read against the institutional experience of tax administration during the pandemic. Where the ANOVA established that sectoral tax collection changed significantly over time. The interviews with ZRA officials explain why they converge on four related themes, taxpayer compliance challenges, operational disruption within ZRA, accelerated digital transformation, and institutional learning, each of which maps onto a specific part of the statistical results and, together, offers a fuller account of the mechanisms behind them than the quantitative evidence could provide alone (Creswell & Creswell, 2023).

Taxpayer Compliance Challenges

Officials interviewed for this study were consistent in attributing the decline in sectoral tax collection primarily to a genuine loss of taxpayer capacity rather than to any weakening of taxpayers' willingness to comply. They described businesses facing temporary closure, falling sales, disrupted supply chains, and liquidity constraints that limited their ability to meet tax obligations even where the intent to comply remained. Consistent with this, officials reported a marked rise in requests for payment extensions, deferred settlements, and flexible payment arrangements during the height of the pandemic, evidence of both taxpayers and ZRA attempting to balance revenue collection against firms' survival.

This account fits directly with the statistical pattern identified in Section 5: the significant overall temporal difference *($p = 0.015$)* and the large effect size *(partial $\eta^2 = 0.618$)* are consistent with a capacity-driven rather than a compliance-driven decline, because a fall in willingness to comply would be expected to persist into the recovery period, whereas the pairwise comparisons instead show collection recovering sharply and significantly by 2021 ($p = 0.029$, 0.008, and 0.005 relative to 2017, 2018, and 2020 respectively) once economic conditions improved. That the strongest statistical divergence occurs precisely at the point officials describe businesses regaining liquidity supports the interpretation that constrained ability to pay, rather than diminished willingness, drove the pandemic-era decline consistent with the Ability to Pay Theory's expectation that external shocks affect tax-paying capacity directly (Musgrave, 1959; James & Nobes, 2021), and with earlier Zambian evidence that economic hardship and administrative strain, rather than deteriorating tax morale, shaped compliance during the pandemic (Mwale, 2020; Banda & Kumari, 2022). International evidence reaches a similar conclusion: both the OECD (2021, 2022) and the IMF (2021) find that COVID-19 reduced compliance mainly through declining business activity rather than through deliberate evasion.

Operational Disruptions to Revenue Administration

Beyond taxpayer-side constraints, officials described how movement restrictions, social distancing, remote working, and public health protocols disrupted ZRA's own routine operations, field audits, taxpayer education, compliance inspections, debt recovery, and face to face taxpayer engagement all became harder to sustain. Officials had to redesign operational processes within a short period, reallocating staff and technology and adapting service-delivery channels to keep core functions running, even as they acknowledged that the transition period itself dampened the efficiency of revenue collection, particularly in the earliest phase of the pandemic.

This institutional account helps explain a specific feature of the statistical results: the absence of a significant difference between 2019 and 2020 in the pairwise comparisons (Table 5). If declining taxpayer capacity were the only mechanism at work, one might expect the pandemic year itself to register as the point of sharpest

statistical divergence; instead, the sharpest divergence appears only in 2021. The interview evidence suggests why during 2020 itself, ZRA's own operational capacity to identify, pursue, and collect revenue that taxpayers may still have owed was also constrained, muting the year-on-year statistical contrast even as underlying economic conditions worsened. Only once both taxpayer capacity and ZRA's own operational functioning began to normalise in 2021 does the statistical break become visible. This reading is consistent with international evidence that many tax authorities suspended field audits, extended filing deadlines, and scaled back face-to-face services during the pandemic (OECD, 2021; IMF, 2021), and with regional evidence that administrative resilience shaped countries' capacity to sustain revenue mobilisation throughout the crisis (OECD, ATAF, & AUC, 2022). It also extends earlier Zambian findings on the importance of ZRA's institutional capacity for compliance and service delivery (Mwale, 2020; Banda & Kumari, 2022) by showing, through the combination of statistical and institutional evidence, that operational resilience within ZRA was itself a determinant of the pattern of recovery observed in the data not simply a backdrop to it.

Digital Transformation and Revenue Recovery

The most consistent theme across the interviews was the speed with which ZRA expanded digital tax administration, electronic registration, online filing, digital payment platforms, virtual taxpayer support, and electronic communication to sustain operations while physical interaction was restricted. Officials described these tools as improving administrative efficiency (remote processing of returns, electronic verification, virtual education, online dispute resolution) and as reducing compliance costs and improving service speed for taxpayers and were clear that they viewed these changes as durable institutional reforms rather than temporary emergency measures.

This theme maps closely onto the recovery pattern identified in the pairwise comparisons: tax collection in 2021 differed significantly from every earlier year examined, and officials attribute a meaningful part of that recovery to the digital infrastructure ZRA had by then put in place. The convergence is informative in both directions. The statistical evidence establishes that a significant recovery occurred, while the interview evidence supplies a plausible institutional mechanism (digital administration restoring both taxpayer access and ZRA's own operational reach) that the ANOVA results alone cannot identify. This pattern is consistent with international evidence that digital transformation was a defining institutional response to COVID-19 across both developed and developing tax administrations (OECD, 2021), that countries with more advanced digital systems tended to recover faster (IMF, 2021), and that digitalisation strengthened institutional capacity across African revenue administrations specifically (OECD, ATAF, & AUC, 2022). It also aligns with the broader literature on tax administration reform, which links digital tools to lower transaction costs, greater transparency, and stronger taxpayer–administration interaction (James & Nobes, 2021; OECD, 2022). Read together with the statistical evidence, the interview accounts support treating digital tax administration as a long-term fiscal-resilience strategy rather than a crisis-specific expedient.

Institutional Learning and Fiscal Resilience

Beyond explaining the immediate statistical pattern, officials reflected on what the pandemic revealed about the limits of conventional tax administration and the institutional capabilities ZRA would need going forward. They pointed to business continuity planning, expanded digital infrastructure, stronger taxpayer communication, staff capacity development, and enterprise risk management as areas requiring permanent investment rather than one-off pandemic responses, and stressed that revenue authorities need the institutional capacity to respond rapidly to future public health or economic emergencies while sustaining core revenue functions.

This forward-looking theme extends rather than merely restates the statistical findings: it indicates that the 2021 recovery visible in the data reflected organisational learning as well as improving economic conditions, and that sustaining this recovery going forward depends on whether ZRA institutionalises the adaptive capacity it built during the pandemic. This conclusion is consistent with international evidence that resilient tax administration depends on institutional capability, digital maturity, governance quality, and strategic risk management (OECD, 2022), with regional evidence identifying institutional resilience and governance quality as central to domestic

revenue mobilisation in Africa (OECD, ATAF, & AUC, 2022), and with IMF (2021) evidence linking institutional and digital investment to governments' capacity to sustain fiscal performance under systemic uncertainty. It also builds on earlier Zambian work on administrative effectiveness and taxpayer confidence (Mwale, 2020; Banda & Kumari, 2022) by showing that institutional resilience, in the ZRA context, extends beyond compliance management to encompass organisational learning and strategic preparedness for future disruption, a dimension the statistical analysis alone could not have surfaced.

Practical and Policy Implications

Taken together, the statistical and institutional evidence carries several practical implications for tax policy, public financial management, and revenue administration in Zambia and in comparable developing economies exposed to similar fiscal vulnerabilities.

First, digital tax administration should be treated as a permanent institutional investment rather than a temporary crisis response. Quantitative evidence shows a significant recovery in sectoral tax collection following the initial pandemic shock, and the qualitative evidence attributes part of that recovery to the rapid expansion of electronic registration, online filing, digital payment platforms, and virtual taxpayer support. Continued investment in integrated taxpayer information systems, data analytics, and automated compliance management would strengthen administrative efficiency and improve government's capacity to sustain collection through future shocks (OECD, 2021, 2022; IMF, 2021).

Second, taxpayer compliance strategies need to be more adaptive during periods of economic disruption. Since the interview evidence points to genuine financial distress rather than declining willingness to comply as the principal driver of reduced collection, ZRA should complement conventional enforcement with structured payment arrangements, sector specific support, targeted compliance education, and risk based enforcement that recognises temporary reductions in ability to pay, consistent with the Ability to Pay Theory and with broader principles of equitable tax administration (Musgrave, 1959; James & Nobes, 2021; Mwale, 2020; Banda & Kumari, 2022).

Third, business continuity planning and enterprise risk management should be embedded within tax administration systems rather than improvised during a crisis. The operational disruption ZRA experienced exposed real vulnerabilities in conventional administrative processes while also demonstrating the value of organisational adaptability. Comprehensive business continuity frameworks, regular scenario planning, digital resilience assessments, and coordinated emergency-response mechanisms would help ZRA sustain essential functions during future public health emergencies or comparable shocks (OECD, ATAF, & AUC, 2022; OECD, 2022).

Fourth, evidence-based fiscal decision-making should draw more systematically on sector-specific administrative data. This study demonstrates that aggregate revenue indicators can conceal meaningful differences in the performance of individual tax sectors; routine monitoring at sectoral level would let government identify emerging fiscal vulnerabilities more quickly, target policy interventions, allocate administrative resources more efficiently, and evaluate the effectiveness of tax reforms with empirical evidence rather than aggregate proxies.

Finally, stronger collaboration between ZRA, taxpayers, business associations, and other public institutions would improve taxpayer confidence and voluntary compliance, particularly during periods of uncertainty when taxpayers need clear guidance on their obligations and the support available to them. Building this institutional trust should be treated as integral to, rather than separate from, a resilient domestic revenue mobilisation strategy.

Collectively, these implications extend beyond the immediate context of COVID-19: they offer evidence-based guidance for strengthening tax administration and institutional resilience in Zambia and in comparable developing economies facing future economic and public health shocks.

Limitations and Directions for Future Research

This study should be read in light of several limitations, each of which also points toward a specific direction for future research.

First, the quantitative analysis relied on annual administrative data covering sixteen tax sectors over a single five-year period (2017-2021). While these data were complete, consistent, and well suited to repeated measures ANOVA, the relatively short observation window and the coarse annual frequency limit the study's ability to capture longer-term revenue dynamics or the finer-grained timing of fiscal disruption beyond the immediate pandemic and recovery phases. Future work should extend the time series well beyond the pandemic period and, where possible, draw on quarterly or monthly administrative tax records rather than annual totals, which would allow researchers to trace the timing, magnitude, and duration of revenue shocks in far greater detail than an annual panel permits (OECD, 2022; IMF, 2021; OECD, ATAF, & AUC, 2022).

Second, the analysis focused specifically on sectoral tax collection and did not incorporate macroeconomic variables, GDP growth, inflation, exchange rates, commodity prices, unemployment, or business confidence that plausibly also shaped tax performance during this period. Incorporating such variables would allow future studies to model the interaction between macroeconomic conditions and domestic revenue mobilisation more directly, rather than inferring it, as this study necessarily does, from the pattern of sectoral results alone.

Third, although the qualitative interviews provided valuable institutional insight, they were deliberately designed to explain the quantitative findings rather than to constitute an independent qualitative investigation and were confined to ZRA officials. Broadening the range of respondents in future work to include taxpayers, business associations, tax practitioners, and policymakers would generate a fuller picture of how different stakeholders experienced and adapted to the pandemic's fiscal shock, and would allow qualitative evidence to carry more independent explanatory weight alongside the statistical analysis.

Fourth, while repeated measures ANOVA was well suited to testing whether sectoral tax collection differed significantly across the study period, it is not designed to establish causal mechanisms or to control the confounding macroeconomic factors noted above. Future studies could therefore usefully apply complementary techniques as robustness checks and as a way of probing causal structure more directly, panel regression, interrupted time-series analysis, mixed-effects modelling, autoregressive integrated moving average (ARIMA) models, or structural equation modelling, depending on data availability and the specific research question being pursued.

None of these limitations undermines the core contribution of the study, which remains one of relatively few sector-specific, inferential analyses of pandemic era tax collection in Zambia built on administrative data and mixed-methods inquiry. They instead mark out a clear agenda, longer and higher frequency time series, explicit macroeconomic controls, broader stakeholder engagement, and methodological triangulation through alternative statistical techniques for extending this line of research.

CONCLUSION

This study examined how the COVID-19 pandemic affected sectoral tax collection in Zambia, using administrative data from sixteen tax sectors over 2017-2021 within an explanatory sequential mixed-methods design that combined repeated measures ANOVA with institutional evidence from ZRA officials (Creswell & Creswell, 2023). The quantitative results establish that the pandemic had a statistically significant effect on sectoral tax collection, consistent with an initial decline followed by recovery as economic activity resumed; the qualitative evidence explains that pattern in terms of constrained taxpayer capacity, disrupted revenue-administration operations, accelerated digital transformation, and institutional adaptation. Together, these two strands of evidence offer a more complete account of how an external economic shock shapes tax administration and fiscal performance than either could supply alone.

The study also contributes to the broader literature on fiscal resilience by showing that COVID-19's effects differed across sectors and were shaped jointly by macroeconomic conditions and institutional capability consistent with evidence from other developing economies indicating that resilient domestic revenue mobilisation depends on adaptive governance, digital innovation, effective taxpayer engagement, and organisational preparedness, and not on sound fiscal policy alone (OECD, 2021, 2022; OECD, ATAF, & AUC, 2022; IMF, 2021). By combining inferential statistical analysis with institutional perspective, the study extends the existing evidence on tax administration during systemic disruption and offers one of the few sector specific analyses of pandemic era tax collection dynamics in Zambia.

From a policy standpoint, these findings point toward institutionalising digital tax administration, strengthening business continuity planning, embedding enterprise risk management within revenue administration, and making fuller use of sector-specific administrative data in fiscal decision-making measures that would strengthen tax-system resilience and government's capacity to sustain domestic revenue mobilisation through future public health or economic shocks (James & Nobes, 2021; OECD, 2022).

At the same time, the reliance on annual data from sixteen tax sectors over a single five-year period constrains how much the study can say about longer-term fiscal dynamics, which is why future research extending the time series, incorporating higher frequency administrative records and broader macroeconomic indicators, and applying complementary analytical techniques including panel regression, interrupted time series analysis, and mixed-effects modelling would meaningfully deepen understanding of fiscal resilience under continuing economic uncertainty.

Overall, this study contributes to the public financial management and tax administration literature by providing robust empirical evidence on how COVID-19 affected sectoral tax collection in Zambia, and by demonstrating that institutional capability, digital transformation, and adaptive governance will be central to sustaining domestic revenue mobilisation against future systemic shocks.

REFERENCES

1. Banda, D., & Kumari, N. (2022). Factors affecting tax compliance among small and medium enterprises in Zambia. International Journal of Research in Commerce, Economics and Management, 12(1), 121–132.
2. Creswell, J. W., & Creswell, J. D. (2023). Research design: Qualitative, quantitative, and mixed methods approaches (6th ed.). SAGE Publications.
3. Creswell, J. W., & Creswell, J. D. (2018). Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.). Sage.
4. Ernst & Young. (2020). Zambia issues additional fiscal measures to mitigate the impact of COVID-19. https://www.ey.com
5. Field, A. (2018). Discovering statistics using IBM SPSS Statistics (5th ed.). Sage.
6. International Monetary Fund. (2021). Fiscal monitor: A fair shot. International Monetary Fund. https://www.imf.org
7. International Monetary Fund, & World Bank. (2024). Stepping up domestic resource mobilization: A new joint initiative from the IMF and World Bank. International Monetary Fund and World Bank.
8. James, S., & Nobes, C. (2021). The economics of taxation: Principles, policy and practice (12th ed.). Fiscal Publications.
9. Wicksell, K. (1958). A new principle of just taxation. In R. A. Musgrave & A. T. Peacock (Eds.), Classics in the theory of public finance (pp. 72–118). Macmillan. (Original work published 1896)
10. Kayombo, K. M., Kamwengo, G. L., Katebe, M., & Sakutemba, E. (2022). The effect of COVID-19 on revenue diversification, profitability and risk of banks in Zambia. SAARJ Journal on Banking & Insurance Research, 11(6), 1–20. https://doi.org/10.5958/2319-1422.2022.00017.0
11. Langmead, P., & Baker, G. (2016). Tax policy issues in Zambia. Langmead & Baker Ltd.
12. Mulolani, C. (2013). Taxation principles and practice. Bana Printing Services.
13. Musgrave, R. A. (1959). The theory of public finance: A study in public economy. McGraw-Hill.

14. Musgrave, R. A., & Musgrave, P. B. (1989). Public finance in theory and practice (5th ed.). McGraw-Hill.
15. Mwale, R. K. (2020). Factors affecting tax compliance among small and medium enterprises in Lusaka, Zambia. Journal of Accounting, 3(1), 1–14. https://doi.org/10.47941/jacc.415
16. Nikiema, W. (2025). Tax revenue instability in Sub-Saharan Africa: Does institutional quality matter? American Journal of Economics and Sociology. Advance online publication. https://doi.org/10.1111/ajes.12598
17. Organisation for Economic Co-operation and Development. (2020). The impact of the coronavirus (COVID-19) crisis on development finance. OECD Publishing.
18. Organisation for Economic Co-operation and Development. (2021). Tax and fiscal policies after the COVID-19 crisis. OECD Publishing. https://doi.org/10.1787/5a8f24c3-en
19. Organisation for Economic Co-operation and Development. (2025). Revenue statistics in Africa 2025: Tax revenue trends in Africa, 2013–2023. OECD Publishing.
20. Organisation for Economic Co-operation and Development, African Tax Administration Forum, & African Union Commission. (2022). Revenue statistics in Africa 2022. OECD Publishing.
21. Pallant, J. (2020). SPSS survival manual: A step-by-step guide to data analysis using IBM SPSS (7th ed.). Routledge.
22. Saunders, M. N. K., Lewis, P., & Thornhill, A. (2019). Research methods for business students (8th ed.). Pearson.
23. Statistics South Africa. (2022). The impact of COVID-19 on national government finances in the 2020/2021 financial year. Statistics South Africa.
24. Tax Justice Network Africa. (2020). Pandemic: Potential impact of the COVID-19 pandemic in Kenya. Tax Justice Network Africa.
25. Zambia Revenue Authority. (2019). Annual report 2019. Zambia Revenue Authority.
26. Zambia Revenue Authority. (2021). Annual report 2021. Zambia Revenue Authority.