Effects of Taxation on Public Infrastructure Financing in Nairobi City County, Kenya

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Abstract: *Public infrastructures in Kenya, specifically Nairobi City County have witnessed failures and poor implementation coupled with rising cost of sustaining them. The involvement of foreign or international bodies in funding the infrastructures has pointed to inadequate public financing to run local infrastructures. Studies have examined various factors that lead to this difficult situation while pointing to politics, poor economy and lack of quality management. This study aimed at finding out the effect of direct and indirect taxation level on public infrastructure financing. The main objectives of the study were to explore how direct taxation affects public infrastructure financing, to examine how indirect taxation affects public infrastructure financing and to determine the effect of both direct and indirect taxation on financing public infrastructure. In order to achieve the objectives, this study adopted a descriptive study design. A sample size of 7 sectors was drawn from a target population of 57 sectors which included roads and highways, healthcare, education, water, and sports. Stratified random sampling was employed in the selection of sample size. The study was anchored on public finance theory supported by stewardship theory and stakeholder theory. The study instrument involved use of a questionnaire focusing on the online approach. Data analysis involved descriptive as well as inferential statistics run on both computer programs of MS - Excel sheets and Statistics for Social Scientists Program (SPSS, ver.21). The analyzed data was presented in percentages, means, standard deviation and statistical inferences including modeled correlation and regression. The correlation analysis results validate that, direct taxation had a strong positive relationship with public infrastructure financing as indicated by a positive Pearson coefficient of 0.808 and p - value 0.000. Pearson correlation and variable coefficient term results revealed that public infrastructure financing and indirect taxation were positively and significantly correlated with r=0.804 and p - value 0.000. Additionally, Pearson correlation results revealed that combined direct and indirect taxation, and public infrastructure financing were strongly positively correlated with r=0.837 and p - value 0.000. The regression analysis on the other hand, revealed that direct taxation, indirect taxation and combine taxation had a positive effect on the public infrastructure financing with coefficient constants of 0.682, 0.396 and 0.714 respectively. The study therefore, recommended tax administrators to develop proper channels ensuring all citizens remit their taxes. Paid taxes to be put to good use, officials found to squander revenue from the public should be stripped off of their duties and placed to face severe punishment. The study concluded that improving on direct taxation results to improved public infrastructure financing. Secondly, indirect taxation influenced public infrastructure financing positively, and improving matters concerning indirect taxation would result to an improved public infrastructure financing. Lastly, combined direct and indirect taxes were improved, the resultant effect would be an improvement on public infrastructure financing. On the other hand, the study recommended that public empowerment should be made constant to educate the masses on indirect taxation how it comes about and its importance to the economic growth of a country. Additionally, revenues from indirect taxes should be put to facilitate important public infrastructures, where those involved in the projects need to demonstrate transparency in how they handle the revenues to build and maintain trust with the taxpayers.*

Keywords: Taxation, Public Infrastructure Finance

1. Introduction

Taxation is the key avenue through which governments get their revenues in any country apart from any form of investment. The taxes collected by governments are then expected to be the main ingredient in the expenditure and in particular on public goods, services and works. These include both public and private joint ventures [2]. The basis of attracting finances for such works as highway construction, bridge making and airport construction has been used for key political leverage and a leeway for tax evasion but there is need for strategic planning on how such infrastructures could be well monitored as it has happened in Germany, USA and France to a large extent [12].

In Africa, politics play a big role in the running of many infrastructures in the developing world with tax reliefs being used for exploitation by influential government players. On many occasions, tax subsidies are offered selectively and not on a need - be basis leading to cases of abuse as discussed [1], in their study of highways construction in Nigeria through bond financing. Both direct and indirect taxes could be the target of such abuse thus affecting public infrastructures. Earlier on [19] discuss the success of such public infrastructures in Ghana.

This study is anchored on the public finance theory as propagated by [16] which states that the economic relationship between a state and its citizens is one of exchange in which, the citizens pay taxes in exchange some public service goods, services and works. Another scholar [9] also advocated the use of this theory. The theory is important in that the whole basis of this study focuses on public infrastructure financing. In support of this theory is the stewardship theory by [7] who stated that managers, left on their own, will act as responsible stewards of the assets they control as applied [17]. [17] An organization should create value for stakeholders and not just the shareholders. This means there should be morals and values in managing

organizational infrastructure. The study used a regression model as applied in previous studies [3].

1.1 Statement of the problem

Public infrastructures play a key role in the development of any nation and hence the need to finance them is very clear for any person in a country. The magnitude of public infrastructures is such that it is difficult to finance without involving public participation. The problem has been in adequate financing. This situation can be revised by providing the link between infrastructure and direct as well as indirect taxation.

Studies in the developed world on revenue collection and expenditure indicate a balanced expenditure in most Western nations with a few exceptions of countries that did not fully optimize their tax collection [14]. To optimize on tax revenue a certain level of transparency is necessary for the government as well as the tax payer. [20] Pointed out that full implementation of any tax reforms specifically on the tax levels and administrative requires punitive measures. Effectively this would enhance tax collection. However, even with all that transparency loopholes would still be experienced with tax reforms as shown by [6] in various tax reforms across Europe as well as the USA. The amount of tax revenue collected by an economy largely is based on the form of taxes and regulations. The notion however in the South of the continent is that taxes favour corruption in government as opposed to helping the government develop its people economy [5]. Shoddy performance of government projects leading to incomplete work is blamed on this position. Similar conclusions have been made by other including [18] on Botswana tax regime, [11] on Zanzibar as well as [15] on South Africa.

In Kenya, are empirical literature on the relationship between taxation and public infrastructure financing. But it is clear that a large amount of public debt is used on infrastructure which is very costly. This situation can be revised by providing the link between infrastructure financing and direct and indirect taxation. In Nairobi county for example, there are many infrastructures underway financed by government revenues including Ngong' - Kibera - Lang'ata missing link at Kenya Shillings 2 billion, Kasarani - Summer - Mwiki road at Kenya Shillings 0.5 billion and Upper Hill - Mbagathi road at Kenya Shillings 1.2 billion. Other infrastructures financed through government include TB clinic at Mama Lucy Hospital, City and Nyayo stadiums, as well as the water for all infrastructures around city estates. These are infrastructures replete with government financing which is a direct allocation of government revenues coming from taxes [21].

The foregoing studies open up a gap that this current study intends to fill up. First there is a clear difference in infrastructure financing in the Western world with developed countries like in East Asia estimated 2 trillion US Dollars are spent in infrastructure as opposed to Kenya infrastructure financing in terms of economic and public finance culture which spent an average of 1.4 billion US Dollars from combine both public and private tax funds collected. The same can be said of the regional studies on public infrastructure financing. Another notable factor is the disparity in technological level between the regions and Kenya.

1.2 Specific Objectives of the Study

1) To establish the effect of direct taxes and the financing of public infrastructures in Kenya.
2) To determine the net effect of indirect taxes on the financing of public infrastructures in Kenya.
3) To determine the combined effect of direct and indirect taxes on public infrastructure funding in Kenya.

1.3 Significance of the Study

The findings of this research could be of importance to various interested parties with respect to public infrastructure financing. Of specific benefit would be the custodian of the government finances, the Treasury for better management of finance policy making.

Similarly, special benefits resulting from the study would be to those in tax use to the society in particular the county government who aim to improve the lives of citizens through successful public infrastructures.

The study could also be of great importance to public as well private infrastructure managers who seek to have successful infrastructures with minimum costs and timely delivery. Of note also is that the study could be of great importance to the general public who are the key users or consumers of public infrastructures. Lastly, the study will contribute to the existing academic body of knowledge on direct and indirect taxes in Kenya and stimulate further research in that field on public infrastructure financing.

2. Theoretical Review

This study was anchored on three theories including public finance, stewardship and infrastructure management theories.
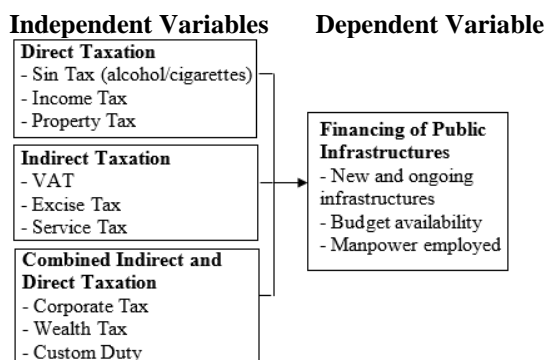
The theory of public finance was propagated by [16] stating that the economic relationship between a state and its citizens is one of exchange in which, the citizens pay taxes in exchange some public service goods, services and works. [9] Has advocated for application of public finance theory to international level as well arguing that taxation and debt of the government affects every person in every nation where taxes are paid, which is the whole world anyway. In other words, public finance principles are applicable everywhere regardless of the citizenry of the person as long as a public good is being consumed. Public finance theory was meant to recognize that market failure would occur if only private firms were to supply all goods and services whether shared or not. For example, the security of a country, mass public goods like water, electricity and usage of roads or highways would be almost impossible to use without the application of public finance theory. The theory informs government expenditure on non - reliance of donor funds. These points towards efficient tax collection both direct and indirect while

ensuring value for citizens' taxes. The theory is anchoring the dependent variable, public infrastructure financing. Stewardship theory was proposed by [7] who stated that managers, left on their own, will act as responsible stewards of the assets they control. In this current study the assets include those public goods as well as the taxes collected from the owners of the goods, the citizens. The key assumptions in stewardship theory are that managers are not opportunistic agents, but good stewards of corporations who diligently work towards the owners' interest. In this case the owners are supposed to be the tax payers whose taxes the stewards use to manage public goods. This theory is informing the study demonstrating that there can be no development without trusted people relating their skills and dedication to the government. The theory is anchoring both objectives one and two covering indirect and direct taxes.

The theory of stakeholders by [8] propagates that a firm must have the interest of stakeholders and not just the shareholders. The scholar also adds that the firm needs to create value with the interest of stakholders thus not focusing solely on profit making for the owners and shareholders. In other words, the companies or firms or organizations should try to create value for each other and hence not live in isolation from their neighbours. Scholars point to the fact that both the private entrepreneur and the public officer are tax payers and in most cases the pubic infrastructure benefits both as citizens in the country. [10] View the inclusion of citizens at the conception of infrastructure as key to success of such infrastructure. The theory is important as it justifies limits of government in terms of taxation viz - a - viz people development. The theory also covers the relationship of public infrastructure financing and taxation which involves stakeholders such as citizens paying taxes, the tax collection body and the infrastructure custodians like the Kenha and City Education Directorate.

2.1 Conceptual Framework

A conceptual framework defines the relationship between independent and dependent variables showing the direction of course and effect of the two variables. The dependent variable is public infrastructure financing with specific measurement infrastructures including road construction, water services and health facilities in Nairobi County, while the independent variables comprise the direct, indirect and combined taxations including VAT, PAYE and income tax.

Independent Variables   **Dependent Variable**

Direct Taxation
- Sin Tax (alcohol/cigarettes)
- Income Tax
- Property Tax

Indirect Taxation
- VAT
- Excise Tax
- Service Tax

Combined Indirect and Direct Taxation
- Corporate Tax
- Wealth Tax
- Custom Duty

Financing of Public Infrastructures
- New and ongoing infrastructures
- Budget availability
- Manpower employed

Figure 1: Conceptual Framework
Source: Researcher (2021)

3. Research Methodology

This study adopted a descriptive design emphasising on non - interference of the study phenomena [13]. The study is suited for descriptive research since tax and revenue collection are long - term aspects that require primary and secondary observation. Kothari notes the importance of applying such a methodological research design for policy making. As a policy issue, tax collection aspects and public infrastructure financing are therefore suited for descriptive study design. The unit of analysis therefore are the public infrastructure financed through taxation whereas the unit of observation was respondent managers in charge of the public infrastructures at KENHA and others in Nairobi County. Stratified sampling was a key method that ensures objectivity in data collection giving a true representation of the target population. Kothari further lament that a sample size of 10 percent and above is adequate and acceptable for the study. This study, therefore, implies that 7 sectors are adequate for this study.

3.1. Data Collection Instrument

This study used both primary and secondary data obtained through a structured questionnaire administered to the study sample respondents as well as records from custodian bodies of the public infrastructures. This study ensured content validity and reliability of the questionnaires that was be used. Specifically, content validity involving expertise feedback will be used to affirm and improve the instrument validity through a pilot study. According to [13], Cronbach alpha coefficient the threshold of acceptability of an instrument is 0.6 while figures of over 0.7 are considered extremely reliable. If the Cronbach coefficient is below 0.5, reliability is lost and the instrument must be reviewed. The reliability test is carried out using SPSS computer program with data from the pilot study.

3.2. Data Analysis

Data for this study involved both qualitative and quantitative to be analysed using both descriptive and inferential statistics. After entry and cleaning data, both descriptive and inferential statistics were run over a SPSS computer program. The descriptive analysis involved frequencies, mean and standard deviation while the inferential statistics involved correlation and multi - regression models. Previous studies by scholars [3] have successfully used models to further explain the tax phenomena in their findings. Similarly, the use of models is recommended by Bland and Overton. This study adopted a multi - regression model based on the variables in conceptual framework in previous chapter.

This study utilized the following multi - regression equation:

$$PIF = \beta_0 + \beta_1 DT_1 + \beta_2 InT_2 + \beta_3 CDInT_3 + e$$

Where:
PIF represents Public Infrastructure Financing
β_0 is the constant term

β_1, β_2 & β_3 are the independent variable coefficient

DT_1= Direct taxes

InT_2= Indirect taxes

$CDInT_3$= Combined direct and indirect taxes

ε = the error term (errors arising from the custodians of public infrastructures).

3.3 Ethical Consideration

In order to have a successful and professional field study, all efforts were taken to ensure the confidentiality of all respondents is assured. No part of the collected data was divulged to other parties without the consent of the university. Similarly, the results of the study were used strictly for academic purposes as a partial requirement of this degree.

4. Research Findings

4.1. Response Rate

A total of 57 questionnaires administered. From the total, 54 questionnaires were fully completed and returned representing 94.7 percent. The high response rate was attributed to the method of drop and pick used by the researcher in data collection and also to the personal enrolment by the researcher in the process. The busy respondents were allocated adequate time for giving their responses. Additionally, given the fact that the researcher followed all the required code of conduct and ethical considerations, the respondents were well convinced to take part in the survey, additionally, respondents were given directions on how to respond which made the process a smooth one and all these led to the high response rate. A high response rate is an indicator of the quality attributed to the research findings. Kothari (2014) noted that in a field of social sciences a response rate of 50% is solid enough to allow for analysis to be carried on. That means the rate of 94.7 percent was excellent.

4.2 Test for reliability

Table 1: Reliability test

Variable	Number of items	Cronbach's Alpha	Verdict
Direct Taxation	5	0.846	Reliable
Indirect Taxation	6	0.832	Reliable
Direct & indirect Taxation	6	0.831	Reliable
Public infrastructure	8	0.858	Reliable

Source: Research survey (2021)

Table 1 provides the Cronbach alpha results for the study's variables which were direct taxation, indirect taxation and public infrastructure financing. As observed, all the results were above the minimum value of 0.7. As a result, the research instrument was found to have internal consistency and was reliable for use.

4.3 Descriptive Analysis

Descriptive statistics help in expounding the level of agreement of the respondents with regards to taxation and public infrastructure financing study variables statements. Descriptive statistics also help specifically in understanding data distribution patterns. However, descriptive analysis can't suggest explanation for phenomenon. This gives a reason to conduct inferential analysis in addition to fundamentally suggest explanations and conclusion based on extrapolations rather than merely summarizing the data, although, both analyses are very crucial.

Table 2: Study variables descriptive analysis

	N	Mean	Std. Deviation
Does the Treasury remit taxes with respect to public infrastructures	54	3.90	.717
Failed infrastructures attract any penalty from the government	54	3.84	.905
Staff running public infrastructures are paid extra remuneration apart from their normal salary	54	4.15	.781
Both direct and indirect taxes can be used on any public infrastructure	54	3.63	.692
The treasury does not use specific taxes for specific public infrastructures	54	3.83	.734
The government supplements KRA shortcomings through external loans	54	3.85	.563
The government supplements KRA shortcomings through external loans	54	3.70	.816
How do you feel the Treasury should spend taxes on public infrastructure financing	54	4.12	.755
Indirect taxes provide a stable and predictable flow of revenue to develop development objectives	54	3.81	.773
There is adequate infrastructure and technology that modernize tax collection system	54	3.76	.845
There is constant training of tax - administrators to keep them up - to - date with modern trends in tax administration	54	4.02	.816
The government has managed all public infrastructures successfully	54	3.96	.748
There is adequate staffing for all the current pubic infrastructures	54	3.89	.629
Adequate funding for the current infrastructures	54	4.12	.574
Most infrastructures only require local funding	54	3.97	.784
There is provision for both new and ongoing infrastructures funding	54	3.85	.696
KRA is the sole source of government revenue	54	3.89	.758
All public infrastructures are financed through funds from KRA	54	4.00	.623
All KRA remittances to Treasury are adequate for current public infrastructures	54	3.92	.740
Valid N (listwise)	54		

Source: Researcher survey (2021)

The analysis results on study variables were presented in the table 2 as shown. Included in the table 2 are the means and standard deviations of individual statements on all study variables. A mean of above 4 means that respondents agreed with the statements, a response of 3 to 3.99 translates to respondents neither agreeing nor disagreeing with the statements while means of below 3 indicate that respondents differ with the statements. Hence, the respondents neither

agreed nor disagreed with the statement that the treasury remits taxes with respect to public infrastructures. The statement's mean and standard deviation were 3.90 and 0.717 respectively. The statement was supported with mean value of 4.15 and standard deviation 0.781.

Regarding the statement that both direct and indirect taxation could be used to finance public financing, the respondents neither agreed nor disagreed with the statement evidenced by a M= 3.63, SD=0.692. The results concur with those by Peer and Sinozic (2019), who supported the fact that local taxation enhanced development of public infrastructure. With M=3.84, SD=0.905, the respondents had neutral response regarding the statement that failed infrastructures attracted penalty from the government, this was evidenced with the mean which show they neither agreed nor disagreed. However, a big portion of the respondents agreed with the statement that the staff running public infrastructures were being paid extra remuneration apart from their normal salary. Moreover, with M=3.83, SD=0.734, respondents were neutral when it came to the statement that treasury uses specific taxes for specific infrastructure. These figures explain the fact that the respondents neither agreed nor disagreed with the fact that direct taxation was being fully executed, it shows that it was only moderately practiced and put in use towards public infrastructure financing in Kenya.

As per the mean and standard deviation results on the statement that the government supplemented KRA shortcomings through external loans which were 3.85 and 0.563 respectively, respondents neither agreed nor disagreed with it. In the same breadth, the respondents also neither agreed nor disagreed with the statement that fully funded infrastructures from external sources did not get tax allocations. The result was supported by a mean of 3.70 and standard deviation 0.816.

Majority of the study respondents neither agreed nor disagreed with the statement that treasury allocated fully sufficient tax from taxes to cater for public infrastructure, evidenced by mean and standard deviation of 3.81 and 0.773 respectively. The respondents however held different opinion when it came to the statement that indirect taxes provided stable and predictable flow of revenue to boost development objectives, respondents agreed with it as supported by mean value of 4.12 and standard deviation of 0.755. Additionally, respondents had neutral feeling when it came to the statement that there existed adequate infrastructure and technology that modernized the tax collection system.

The statement's mean and standard deviation was 3.76 and 0.845 in that order. Lastly, respondents agreed that there was constant training of tax - administrators to keep them up - to - date with the modern trends in tax administration. The mean of the statement was 4.02 and its standard deviation was 0.816.

As per the results in table 2, majority of the respondents neither agreed with the statement that the government manages all public infrastructures successfully. The researchers suggested that accounting for spill over ensure projects are well completed and justifies the expenditure of the revenue. The statement that there was adequate staffing for all the public infrastructures had majority of the respondents neither agreeing nor disagreeing. The statement had a mean of 3.89 and standard deviation of 0.629. The results on the statement that there was adequate funding for the infrastructure had the participants of the survey having a different opinion, as they were in agreement with the statement.

The statement was supported by a mean result of 4.12 and a standard deviation of 0.574. Different to that, most respondents were neutral on most infrastructures requiring local funding only. This statement had a mean of 3.97 and a standard deviation of 0.784. With mean=3.85, standard deviation=0.696, respondents neither agreed nor disagreed with the statement that there was provision for new and ongoing infrastructures funding. Respondents neither agreed nor disagreed that KRA was the main source of government revenue, this results were supported by a mean of 3.89 and a standard deviation of 0.758. However, majority of the respondents agreed that all public infrastructures were financed by funds from KRA. Evidenced by mean=4.00 and standard deviation=0.623. Having a mean of 3.92 and a standard deviation of 0.740, the respondents thus neither agreed nor disagreed that all KRA remittances to treasury were adequate for current public infrastructures.

4.4 Correlation Analysis

The following section presents the details of correlation analysis among the study variables. The degree of bivariate correlation of relationship existing among the dependent and independent variables was determined using the Pearson correlation analysis. However, correlation analysis can't reveal the degree of effect only reveals the sense and degree of association between the study variables. This result to further conduction of regression analysis to establish the degree of effect in which the predictor variables has on dependent variable.

Table 3: Study Variables Correlation Analysis

	DT	IT	CDIT	PIF
DT	1	.855**	.960**	.808**
IT		1	.966**	.804**
CDIT			1	.837**
PIF				1

**. Correlation is significant at the 0.01 level (2 - tailed).
Independent variables: Direct Taxation (DT), Indirect Taxation (IT), Combined Direct and Indirect Taxation (CDIT)
Dependent variable: Public Infrastructure Financing (PIF)
Source: Researcher survey (2021)

To test the degree of relationship that existed between the independent and the dependent variables of the study, Pearson correlation analysis was conducted. The results from the analysis helped in establishing the relationship. With r=0.808, p - value 0.000 and $\alpha = 0.01$, the results validate that direct taxation had a positive and significant correlation with public infrastructure financing as indicated by a positive Pearson coefficient of 0.808 which is strongly positive. This

therefore means that when improvements in direct taxations are made, then public infrastructure financing would likely improve.

Additionally, results of the Pearson correlation revealed that public infrastructure financing and indirect taxation were positively and significantly correlated with r=0.804, p - value 0.000 and α = 0.01. The strong Pearson correlation is supported by the coefficient of 0.804, therefore, indirect taxation can be said to be a strong contributor to public infrastructure financing in that an improvement in indirect taxation would result to public infrastructure financing improvement.

Lastly, with r=0.837, p - value 0.000 and α = 0.01, the results validate that combined direct and indirect taxation had a positive and significant correlation with public infrastructure financing as indicated by a positive Pearson coefficient of 0.837 which is strongly positive. This therefore means that when improvements in direct taxations are made, then public infrastructure financing would likely improve.

4.5 Regression Analysis

As earlier indicated, correlation analysis is not sufficient to determine the degree of association and influence. To determine the degree of association, regression analysis was conducted. However, in order to carry on with regression analysis, diagnostic tests including multicollinearity and normality tests were conducted to determine the symptom of linearity and normality of data distribution respectively.

Table 4: Multi - collinearity Test

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Direct Taxation	.315	5.124
	Indirect Taxation	.269	3.713
	Combine Direct & Indirect Taxation	.006	6.759
a. **Dependent Variable**: Public Infrastructure Financing			

Source: Survey Data (2020)

The results in table 4.5 reveal that there was moderate correlation between the study variables as all as variance inflation factors (VIF) lies between 1 and 9.9, which is the expected margin. As per the results, direct taxation had a VIF value of 5.124, indirect taxation had 3.713 and combine direct and indirect with 6.759, all of which were acceptable. The results therefore mean, that there no severe warrant corrective measure that need to be taken before regression analysis is conducted.

Table 5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.839[a]	.704	.687	.28062
a. Predictors: (Constant), Combined Direct and Indirect Taxation, Indirect Taxation, Direct Taxation				
b. Dependent Variable: Public Infrastructure Financing				

Source: Survey Data (2021)

Table 5 presents the results from the data analysis of the correlation coefficient (R), between the dependent variable public infrastructure financing and the predictor variable taxation. As per the table, R=0.839 was the correlation coefficient of the dependent and independent variables, which supports a strong and positive relationship. Additionally, the results also show that $R^2 = 0.704$ which translates to the fact that 70.4 percent of public infrastructure financing in Kenya can be explained by the study variables (direct and indirect taxation). However, 29.6 percent of public infrastructure financing could be influenced by other variables that were not included in the study.

Table 6: ANOVA Analysis

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.384	3	3.128	39.723	.000[b]
	Residual	3.937	50	.079		
	Total	13.322	53			
a. Dependent Variable: Public Infrastructure Financing						
b. Predictors: (Constant), Combined Direct and Indirect Taxation, Indirect Taxation, Direct Taxation						

Source: Survey Data (2021)

Table 6 shows that the significance level was lower than α = 0.05, the significance of the ANOVA model was 0.000, with its F value being 39.723. These results mean that statistically, taxation had significant effect on public infrastructure financing.

Table 7: Regression Coefficients

Model		Unstandardized Coefficients		t	Sig.
		B	Std. Error		
1	(Constant)	1.824	.676	2.698	.012
	Direct Taxation	.682	.125	5.456	.003
	Indirect Taxation	.396	.140	2.829	.007
	Combined Direct and Indirect Taxation	.714	.406	1.788	.009
a. Dependent Variable: Public Infrastructure Financing					

Source: Survey Data (2021)

Table 7 shows the results of the analysis of coefficient of independent variables (direct taxation, indirect taxation, and combined direct and indirect taxation), t and the p values. The degree of influence that the predictor variables had on the dependent variable was tested via the multi - regression analysis and presented in form of a model estimation shown below.

$$Y = 1.824 + 0.682DT_1 + 0.396InT_2 + 0.714DInT_3$$

The results of the multi - regression analysis express that when direct taxation and indirect taxation are held constant, then public infrastructure financing in Kenya stands at 1.824 units as per the model. However, the researcher had the intention of assessing the effect of taxation on public infrastructure financing in Kenya. The influence of the predictor variables on the dependent variable was tested through the regression analysis.

Objective 1: Establishing the effect of direct taxes and the financing of public infrastructures in Kenya. The results

from the regression analysis proved that direct taxation had a positive and statistically significant effect on public infrastructure financing, with $\beta_1=0.682$, t=3.055, p - value 0.004 and $\alpha = 0.05$. Since the results of β1 were positive, it meant that direct taxation had a positive effect on public infrastructure financing in Kenya. Given the fact that direct taxation had a positive influence on public infrastructure financing, hence, an additional unit of direct taxation would mean a subsequent improvement in public infrastructure financing by 0.382 units in the same direction.

Objective 2: Moreover, the researcher set out to determine the net effect of indirect taxes on public infrastructure financing in Kenya. The results of the analysis as presented in the model suggest that indirect taxation had a positive and significant influence on public infrastructure financing and was therefore statistically significant. This was proven by $\beta_2=0.396$, t=2.833, p - value 0.007 and $\alpha = 0.05$. The positive β_2 had coefficient means that indirect taxation has a positive effect on public infrastructure financing. Hence, an addition unit of indirect taxation by one unit would result to subsequent increase in public infrastructure financing improvement by 0.396 units in the same direction.

Objective 3: Lastly, the researcher intended to determine the combined effect of direct and indirect taxes on public infrastructure financing in Kenya. As per the analysis result, combine indirect and direct taxes had a positive and significant influence on public infrastructure financing. This was supported by $\beta_3=0.714$, t=1.788, p - value 0.009 and $\alpha = 0.05$. With the positive β_3 coefficient, when direct and indirect taxation was improved by one unit, it would translate to an improvement in public infrastructure financing by 0.174 unit a positive direction.

5. Recommendations

Based on the positive and significant results that direct taxation had on public infrastructure financing, the study made policy recommendation that more strict measures should be put in place to trace tax those who avoid and evade paying taxes. Policies should be put in place to increase the allocation of revenue from collected tax to promote public infrastructure development which make it easier for citizens to access amenities, as this would encourage them to feel good about paying taxes. Additionally, it was recommended that the government should avoid increasing taxation to extreme levels as those leads to a lot of people giving false information.

Additionally, the findings demonstrated a positive and significant relationship between indirect taxation and public infrastructure financing, therefore, the study recommends that appropriate policies be put in place to ensure that the revenues collected from the indirect taxes are put to correct use, the policies should also keep those involved in the allocation of funds accountable to avoid misuse of revenues. Additionally, the government should continuously conduct civic education educating the public on indirect taxation and the benefits and use of revenue gotten from the indirect

taxes, which will help in making citizens aware of the importance of such taxes.

Combined direct and indirect taxation had a positive and significant correlation with public infrastructure financing. Therefore, recommendation was made that rules should be made which balance the development projects in all parts of the country. There should be uniformity in allocation of funds in all counties for public infrastructure which will ensure there is uniform development. This will be important as every citizen pays tax either directly or indirectly and they deserve the best infrastructure regardless of their geographical location.

5.1 Areas for Further Studies

Since the current study focused on direct, indirect, and combine direct and indirect taxes on public infrastructure financing in Kenya, this makes the findings only applicable to public infrastructure sectors in Kenya. In long run, a similar research should be conducted in private sectors while applying different method of data collection such as online survey to save on time by the future researchers. Lastly, future researchers can conduct similar research adopting different predictor variables such as debt, grants and equity on public infrastructure financing.

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