The effect of the housing levy on the performance of the affordable housing programme in Kenya

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ABSTRACT

This study digs into how different fiscal policy tools affect Kenya's Affordable Housing Programme. There is a huge gap over two million homes are needed in Kenya for decent accommodation. This study looked at four key tools: the Housing Levy, tax incentives, mortgage interest rates, and government spending. The research draws on Public Finance Theory, Keynesian Theory, and Fiscal Federalism, using descriptive and causal design, and crunching time-series data from 2022–2025 (sources like Kenya Revenue Authority, National Treasury, Central Bank of Kenya). Ordinary Least Squares regression drove the analysis. The findings reveal that Tax incentives ($\beta = 0.0853$, $p = 0.032$) and budget absorption rates ($\beta = 0.0081$, $p = 0.014$) helping affordability. The Housing Levy had a negative effect, but it was not significant ($\beta = -0.0215$, $p = 0.147$). Mortgage interest rates showed a positive impact ($\beta = 0.943$, $p = 0.020$), mostly as a supply-side constraint. The model explained 77.58% of the variation in affordability. From this, it is clear that the success of these policies depends way more on how well they are implemented and on market reforms, not just on raising funds. The study recommended that government of Kenya should make the Housing Levy more transparent and results-based. Tax incentives should be tied to real performance. Additionally, Kenya needs long-term building finance, plus results-based budgeting to boost spending effectiveness. All together, these findings help figure out better fiscal strategies for Kenya's Bottom-Up Economic Transformation Agenda and encourage more sustainable housing.

Keywords: Affordable Housing Programme, Government Housing Policy, Housing Levy, Housing Finance, Housing Development, Housing Affordability, Kenya.

I. INTRODUCTION

Affordable housing is a global development priority and a key pillar of sustainable urbanization. According to UN-Habitat (2021), more than 1.6 billion people worldwide lack adequate housing, with nearly one billion living in informal settlements or slums, particularly in low- and middle-income countries. Urbanization, population growth, and underfunding are exacerbating the problem of global housing shortage. Statistics are astounding. By 2050, there will be around 6.7 billion city dwellers, indicating more strain on housing resources (United Nations, 2022). Governments across the globe are adopting various fiscal policies to tackle this issue. Housing subsidies, tax credits, and mortgage interest deduction programs have been introduced in the USA to assist low-income and middle-class citizens in buying a house (OECD, 2021).

However, such measures do not guarantee success due to the lack of sufficient funding by governments, increasing construction costs, shortage of land resources, and inadequate regulation mechanisms. Mortgage-based approaches tend to exclude the poorest groups since only less than 20% of urban dwellers in poverty can obtain mortgage loans (World Bank, 2022). This leads to further expansion of informal settlements. Thus, significant concerns are associated with the sustainability, equity, and proper management of urban development. Global practice suggests that housing taxation, tax benefits, mortgage subsidies, and government funding can be crucial for implementing affordable housing policies. However, the outcomes of such approaches vary depending on the context and conditions.

Therefore, there is a clear need for developing country-specific affordable housing solutions. Kenyan society experiences similar housing challenges to other African countries caused by rapid urbanization, population growth, and budgetary constraints. According to projections, the population of the continent will reach 2.5 billion people by 2050, currently, more than 60% of urban dwellers reside in informal settlements lacking infrastructure and proper ownership arrangements (UN-Habitat, 2021; United Nations, 2022).

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Indeed, mortgages are limited because mortgage-to-GDP is less than 3% in many African nations (above 30% in more developed economies) (African Development Bank [AfDB], 2021). As a result, informal settlements become the prevalent form of urban dwellings. Fiscal measures are essential for affordable housing. However, the application of fiscal measures is hindered by a lack of financing, poor legislation, and a low degree of institutional capacity. These factors define the context for affordable housing in Kenya. Indeed, this country suffers from one of the worst housing crises in Sub-Saharan Africa due to rapid urbanization, high demographic growth, and poor financing mechanisms.

There are 2 million houses needed in Kenya. At the same time, annual demand for houses reaches 250,000, but 50,000 are constructed per year, which leaves an annual deficit in housing of almost 200,000 dwelling units (Kenya National Bureau of Statistics [KNBS], 2023; World Bank, 2022). More than 60% of urban dwellers reside in informal settlements with poor property security, congestion, and inadequate services (UN-Habitat, 2021). To address this problem, Kenya has decided to make affordable housing a priority issue within the frameworks of the Big Four Agenda (2017-2022) and the Bottom Up Economic Transformation Agenda (2022-present).

While The Big Four targeted the provision of 500,000 houses, only slightly more than 10% of the target was achieved due to limited financial resources, land, and minimal contribution from the private sector (National Treasury, 2022). The Bottom-Up agenda, however, introduced a new set of fiscal measures to be used in the housing sector: a housing levy to generate at least KSh 60 billion annually, tax exemptions to developers, cheap mortgage loans, and funding for housing projects (National Treasury, 2023; CBK, 2023). However, obstacles persist. The uptake of mortgage loans continues to be insignificant since only 25,725 mortgage loan accounts existed in 2022, amounting to less than 1% of the adult population. The reason is the high interest rate and unaffordability of mortgage loans (CBK, 2023). Furthermore, although developers are incentivized through tax exemptions, they have no interest in participating due to the high cost of housing construction in the country (30-40%) compared to regional averages (World Bank, 2022). Finally, government expenditure towards housing amounts to less than 3% of total government spending over the decade. Kenya must therefore have a proper assessment of how these fiscal instruments are functioning, the successes, and the failures, in order to undertake reforms that will fast-track housing delivery and reduce the budget deficit, hence improving the lives of many people.

1.1 Statement of the Problem

Kenya's housing crisis is not easy to erradicate, even though the government has tried to tackle it with the Affordable Housing Programme (AHP). Right now, there's a gap of about two million homes, and every year, demand outpaces supply by a whopping 200,000 units (KNBS, 2023; World Bank, 2022). Because of this, over 60% of people living in Kenya's cities end up in informal settlements, where basic services are tough to get and secure land rights are almost unheard of (UN-Habitat, 2021).

This constant shortfall makes it nearly impossible for the government to hit the targets in its Big Four Agenda and Bottom-up Transformation Agenda, both of which put a strong emphasis on decent, affordable housing as the backbone of economic growth and social stability. The government hasn't been sitting on its hands. They've rolled out several fiscal measures like the Housing Levy (a special tax), tax breaks for developers, support for cheaper mortgages, and direct funding in the national budget, yet these steps have not brought the changes they promised.

The Housing Levy introduced within a series of recent fiscal years was estimated to generate revenues exceeding KSh 60 billion annually; however, it is currently subject to a series of disputes that may affect its implementation (National Treasury, 2023). Despite the VAT tax incentives for VAT exemption of inputs related to construction, the prices remain 30–40% higher compared to those in neighboring countries due to high costs associated with construction activities (World Bank, 2022). Moreover, the development of mortgage remains low: only 25,725 accounts are available among 20 million people who make up Kenya's labor force (CBK, 2023).

Finally, according to the budget analysis conducted over the past decade, the share of expenditures allocated to housing projects does not exceed 3% of the total amount of all other governmental expenses (National Treasury, 2023). All above figures demonstrate that despite having a potential, the proposed measures do not correspond to reality. In general, fiscal policy instruments aimed at increasing both demand and supply were adopted; however, there are limited sources to evaluate the effectiveness of such actions within the Affordable Housing Programme. Hence, the aim of this research was to investigate the performance of the fiscal policies, in order to determine what works for Kenya so as to offer affordable and durable housing.

1.2 Research Objectives

To analyse the effect of the Housing Levy (earmarked tax) on the performance of the Affordable Housing Programme in Kenya.

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II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 The Housing Market Filtering Theory

The Housing Market Filtering Theory was developed by Hoyt in 1939 and was further improved by Grigsby and Lowry. In simple words, the theory allows understanding the effect new houses have on the housing market. When the developers build new homes for the middle and upper class of people, it triggers further actions. The newly developed dwellings are occupied while those built earlier get vacated; older homes filter down to poorer families over time. Consequently, it may seem that newer units are not affordable enough for the most impoverished groups of people, but filtering takes care of that issue and increases housing accessibility for everybody.

In relation to this research, the importance of the theory is immense because it describes how certain policy measures such as tax incentives or mortgage finance influence the housing market. Government involvement through provision of tax incentives or favorable interest rates would lead to an increase in construction; consequently, the additional supply of units intended mainly for the middle class allows for other homes to become available for sale or renting at lower prices. Thus, the affordability of low-income housing is increased, which is exactly what is expected of the Affordable Housing Programme in Kenya. The example from Kenya demonstrates this theory very well. Namely, there is no development of low-cost housing in this country; instead, developers aim at the middle income segment since it is where the profit is.

This increases the supply of the mid-tiered units; in time, older and relatively less costly houses will become accessible to those that need them most. Furthermore, there is the possibility that mortgage finance may influence demand, causing the filtering process and increasing accessibility to affordable homes. Moreover, this theory addresses an area that has been neglected by past studies. In Kenya, previous investigations have concentrated on the factors that are quite apparent: costly land prices, poor infrastructure, and too many regulations. The lack of knowledge about how filtering influences home affordability in Kenya provides an opportunity to analyze how fiscal measures affect this country’s housing program.

In its simplest form, housing refers to buildings where individuals reside, including apartments, houses, and all types of residential units. It is an essential human necessity that provides individuals with shelter, privacy, and a place to conduct their activities (Anwar, 2025). If housing is affordable, reliable, and habitable, individuals will enjoy improved living conditions (UN-Habitat, 2024). Adequate housing implies a decent, reliable, and affordable dwelling for everyone. The concept of inclusive, sustainable, and affordable housing lies at the foundation of developing equitable cities, according to UN-Habitat (2024). Individuals require a dwelling to access other basic necessities, such as job opportunities, education, health care, and social amenities (UN-Habitat, 2024). Besides providing protection from harsh weather conditions, housing is where individual daily activities take place. Types of dwellings depend on people's financial status, geographical location, and requirements (Anwar, 2025). In addition, housing plays a crucial role in shaping national development through investments and employment opportunities.

2.2 Empirical Review

2.2.1 Housing Levy on the Performance of the Affordable Housing

The main focus of Otieno & Kariuki's (2021) article is on the period following the introduction of the Kenyan Housing Levy, when public debate and resistance to the initiative took place among various stakeholders. The contribution of their paper lies in its attempt to make an evaluation of the potential efficiency of this levy and Kenyans' readiness to pay for it early on. The research involved analyzing policies and conducting semi-structured interviews of key policymakers representing Ministries of Transport, Infrastructure, Housing and Urban Development, and the Central Organization of Trade Unions. The results showed that, although the new levy could become a good source of funding for improving Kenya's housing situation, the main concerns regarding it included its compulsory character, high financial pressure on low-income earners, and ability of the government to manage such resources fairly. However, this study lacks one crucial aspect; being prospective, it was conducted without any financial operations taking place and thus cannot provide information on actual revenues generated by the levy and their effect on housing improvement projects.

This study addressed the matter directly using the revenues collected by the Kenya Revenue Authority and linking it directly to the number of houses constructed post levying. The issue was taken out of theoretical estimates to reality. Chepkwony (2022) concentrated his research on the initial years of the implementation of the Housing Levy focusing particularly on the taxpayers' compliance since, in order to introduce a mandatory levy, the compliance is critical. The advantage of this study lies in the focus on the importance of the degree of public support and cooperation in the success of this measure. Chepkwony used mostly quantitative methods conducting a survey on 500 formal sector workers in Nairobi and Mombasa. The main purpose of this study was to find out whether taxpayers' perception of the levy's transparency, benefit, and fair distribution were important in terms of encouraging compliance. Indeed, distrust

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of fund managers and unreasonably perceived levy made compliance low resulting in search for ways to bypass the requirement.

Whereas it had not considered one important group of people – employers and payroll managers who are responsible for administering the housing levy in terms of cost and additional effort involved. Thus, this study filled that gap by bringing both HR and finance managers to explore the process of levy administration as well as challenges associated with such additional administrative costs in terms of successful levy implementation. Unlike Mwangi (2023), who focused on the implications of housing levy implementation, Mwangi analyzed the consequences of the same policy in the context of the economic crisis caused by rising inflation rates and declining disposable incomes post 2022. Indeed, is the prospect of having affordable homes worth forcing citizens to cut down their expenses today? To address that question, Mwangi conducted quantitative research exploring wage data provided by the Kenya National Bureau of Statistics and simulating impact of 1.5% levy on earnings of poor, middle, and rich classes. While the findings have not been particularly encouraging, showing that low-wage earners suffer from negative consequences of levying, the paper did not consider if there were any positive results.

And thus came the need for the current study, which asked if the funds collected had resulted in sufficient new houses that made the populace feel that the cost they paid was worth the benefits received. Okoth (2020) widened the scope of the debate by analyzing Kenya's Housing Levy against similar initiatives in other African countries. Policymakers enjoy making comparisons, as it is easier to identify good ideas and hidden risks. In the study, Okoth concluded that legal clarity, operational independence, and well-defined objectives were important success factors while politics and mismanagement posed problems. While the findings gave useful lessons for policy formulation, the study failed to provide any statistical evidence of how the above factors led to the observed outcomes. The current study took the debate further by utilizing the analytical framework of Okoth and testing the effects of operational autonomy and transparency on the fund's capacity to launch new housing projects using Kenyan data. Kamau and Mutisya (2019) provided a broader outlook by focusing on sustainable financing for affordable housing, going beyond annual budget allocations.

The researchers considered financing schemes from abroad and performed calculations based on a hypothetical levy income that may result from this tax in a country where formal sector employment is stable. It turned out that such a financial instrument is quite capable of bringing income to the government – provided that everything goes well and the economy does not face any difficulties. What about practical aspects? In this case, the research focused on how close to reality the assumptions made during the calculations were and revealed how much actual revenue was collected by KRA after deducting the collection costs from the hypothetical figures. Therefore, the aim of the study was to determine the effectiveness of this measure as a sustainable source of finances. Next, it is time to talk about tax incentives. To find out whether they actually attracted the attention of investors and developers, Mburu and Atela (2022) carried out a comprehensive study in this field.

They found out that indeed, the developers were aware of the existence of tax incentives such as VAT exemptions and additional deductions but identified several major barriers such as high-cost lands, complex approval processes, and unclear policies. This piece of literature had a critical limitation since it could not measure the impact of tax incentives because it measured the attitude and intention of the investors alone but not the impact. This paper bridges this gap by measuring the effect of tax incentives by quantifying KRA tax incentives utilized and comparing it against the construction of housing units completed within the same time frame.

III. METHODOLOGY

3.1 Study Area

This study was specifically focused on the affordable housing sector in Kenya, particularly from the perspective of fiscal policy changes at the national level. The research was confined to big cities such as Nairobi, Mombasa, Kisumu, and Nakuru, as there is a greater demand for affordable housing in these regions and also due to the fact that most government and private housing initiatives are being undertaken there. The analysis was aimed at evaluating the impact of fiscal tools such as Housing Levy, tax concessions, interest rate concessions, and budgetary allocations on the success of affordable housing initiatives in these urban centers.

3.2 Research Design

This study adopted descriptive research design. Essentially, this type of research requires the researcher to simply observe and describe the trends that are observable in practice without any need for manipulating the situation through experiments (Mutai, 2022). Descriptive design enabled the research to identify how the interventions affected housing delivery since the introduction of the Affordable Housing Programme and the Housing Levy, establishing trends, gaps, and relationships between fiscal policy measures and housing delivery. At the same time, the research

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employed a causal (explanatory) approach. Thus, it sought to establish whether a particular tax incentive would lead to the construction of more affordable housing as opposed to other alternatives.

3.3 Data Collection and Analysis

The research solely depended on secondary data, which was systematically collected from credible national sources regarding information on fiscal policy and affordable housing. Information on Housing Levy revenues and taxation incentives was obtained from KRA, while budgetary allocation and expenditure on housing projects was obtained from the National Treasury. All data collected was organized, verified, and entered into STATA. Initially, the analysis began with descriptive statistics through the computation of mean, percentages, standard deviation, minimum and maximum, kurtosis, skewness, and frequencies to have some understanding of the data.

The analysis was done using OLS regression technique which uses squared difference between actual and estimated values of the relationship under examination (Gujarati & Porter, 2020). It reported correlation coefficients to show how strong those links were, and R^2 values to reveal how much of the difference in affordable housing outcomes the fiscal policies actually explained.In the functional model aligned with the study topic, affordable housing performance in Kenya was treated as the dependent variable, while the independent variables included Housing Levy revenue, tax incentive value, mortgage interest rates, and government budgetary allocation. The functional form of the empirical model was as follows:

Affordable Housing Performance = f(Housing Levy, Tax Incentives, Interest Rates, Budgetary Allocation)

$AHP=f(HL, TI,MIR,GBA)$…….…….. (1)

The regression model was as follows;

$AHP_t=\beta_0+\beta_1HL_t+\beta_2TI_t+\beta_3MIR_t+\beta_4GBA_t+\varepsilon_t$ ……..…… (2)

AHP_t was the dependent variable Affordable Housing Performance, β_0 was the y intercept (Constant), β1-4 are the coefficients of HL, TI, MIR and GBA, IHL was the Housing Levy, TI was the Tax Incentives, MIR was the Mortgage and Interest Rates and GBA was the Government Budgetary Allocation while t represents time (2018-2024) and ε_t was an error term.

3.4 Diagnostic Tests

In this research, diagnostic tests was performed to test for the regression model assumptions before carrying out regression analysis.

3.4.1 Normality Test

To determine whether the time series data used in this study on the effect of selected fiscal policy instruments on the performance of affordable housing in Kenya are normally distributed, the Jarque-Bera test was applied, alongside evaluations of skewness and kurtosis. Skewness provides a measure of the asymmetry of the data distribution, while kurtosis assesses the "tailedness" or the frequency of outliers within the data. In line with Glinskiy *et al.*, (2024), the acceptable skewness range is between -3 and +3, while acceptable kurtosis values fall between -10 and +10. The Jarque-Bera test are a goodness-of-fit test that determines if the dataset diverges from a normal distribution based on its skewness and kurtosis values (Hall, 2020).

In this test, the null hypothesis assumes that the data are normally distributed. If the p-value obtained was less than 0.05, the null hypothesis was rejected, implying that the data does not follow a normal distribution. If the p-value exceeds 0.05, the null hypothesis was not rejected, suggesting that the distribution of the data was normal and appropriate for further econometric modeling (Hair, Page & Brunsveld, 2020). Ensuring normality was crucial in this study for the reliability of OLS regression results were used to examine the relationship between fiscal policy variables and affordable housing performance.

3.4.2 Autocorrelation Test

The presence of autocorrelation in the time series data was examined using the Durbin-Watson (DW) test. Autocorrelation refers to the correlation of a variable with its own past values, and if present, it can lead to inefficient and biased regression results. According to Wooldridge (2020), the result of the Durbin-Watson (DW) statistic should be within the range of 0 to 4. In case your DW statistic falls within 1.5 to 2.5, there are high chances that you do not have any autocorrelation in your errors since this range is known as the safety range. A DW statistic less than 1.5 shows positive serial correlation while one greater than 2.5 indicates negative serial correlation. The basic purpose of performing this test was to test the lack of serial correlation. However, when this DW statistic fell outside the safety range, it indicated the existence of autocorrelation in the residuals which led to erroneous results in the regression analysis. Since this study relied on time series data spanning from 2018 to 2024, checking for autocorrelation was of paramount importance in making sure that the results were valid.

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3.4.3 Heteroscedasticity Test

As far as the study investigated the effects of fiscal policies on affordable housing in Kenya, the presence of heteroscedasticity in this case became an issue to verify. The Breusch-Pagan test and the Cook-Weisberg test have been applied to determine whether heteroscedasticity was observed. Generally, these two tests evaluate the consistency of variance of the residuals, which means they examine whether the variance is homoscedastic (stable within the entire sample) or heteroscedastic (it changes throughout the sample). The absence of variance consistency reduces the validity and reliability of regression analysis outcomes (Greene, 2021). Null hypothesis was stated as "variance is stable (homoscedastic)". Rejection of the null hypothesis in case when a p-value was less than 0.05 indicated that heteroscedasticity existed.

3.4.4 Multicollinearity Test

The accuracy of regression estimates will occur when none of the variables conflicts with other variables. Multicollinearity test is carried out by Variance Inflation Factor (VIF). Once VIF is above 10, there will be a conflict. The challenge is that variables like Housing Levy, tax incentives, interest rates, budget allocations, among others, are highly correlated thus making estimation difficult in terms of their influence on housing performance (Wooldridge, 2021). 3.7.5 Stationarity Test It is worth emphasizing the importance of stationarity testing especially in studies involving time series. In my study, Augmented Dickey-Fuller (ADF) test will be applied to the economic variables including Housing Levy, tax incentives, interest rates, budget allocations, affordable housing performance indicators and others. This is because stationarity will help in avoiding misleading results known as "spurious regression". ADF test is performed based on the null hypothesis showing the existence of unit root thus non-stationarity. The acceptance of alternative hypothesis, on the other hand, shows stationarity of data. P-value of less than 0.05 denotes stationary data ("Augmented Dickey Fuller Test," 2021).

IV. FINDING & DISCUSSIONS

4.1 Descriptive statistics

The following table shows the descriptive statistics of main variables of the study. We can see measures like averages and standard deviations. It gives us an idea about housing affordability, housing expenditure, tax burden, mortgage interest rate and budget spending on household needs. Table 4.1 lays out the descriptive stats for the key variables from the sample period. You'll see things like averages and spreads. The table gives a first look at housing affordability, housing costs, tax burden, mortgage rates, and household budget expenses. All of that helps paint a picture of what's going on before digging deeper into the econometric analysis.

Table 1

Descriptive Statistics

Statistic	lnAffordability	lnHousingCost	lnTaxIndex	lnMortgageRate	lnBudgetExpenditure
Mean	4.0469	37.0750	7.4083	2.7722	76.9167
Minimum	3.6376	4.2000	1.8000	2.5257	58.0000
Maximum	4.4308	80.9000	16.0000	2.9857	92.0000
Std. Dev.	0.2539	25.1771	4.9252	0.1504	9.9678
Skewness	−0.0873	0.3506	0.4262	−0.1633	−0.2949
Kurtosis	1.8138	1.8836	1.8335	1.8254	2.3289
Median	4.0672	32.9500	6.5000	2.7817	77.5000
Observations (N)	12	12	12	12	12

Table 4.1 The mean value for the logarithm of housing affordability stands at 4.0469 with only 0.2539 for the standard deviation, indicating little variation or volatility in terms of housing affordability rates. Notably, the range of the minimum and maximum log values (3.6376, 4.4308) is also quite low. Skewness amounts to –0.0873, meaning there is near-symmetry in the distribution, while the kurtosis figure of 1.8138 suggests that it is relatively platykurtic. Thus, the current distribution seems consistent with other recent studies showing slow change in housing affordability rate due to lack of shocks and presence of institutions regulating the housing market (Mulliner & Maliene, 2020; Arestis & González, 2021). Housing costs, however, present a different picture. The mean value for the logarithm of housing costs is 37.0750, but the standard deviation comes out to be 25.1771. The minimum value stands at 4.2000 while the maximum is 80.9000.

This is quite a difference. Also, from the skewness of 0.3506, it can be noted that the unusually high housing costs do not occur frequently; however, their occurrence skews the average toward the right tail of the distribution.

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Additionally, from the kurtosis of 1.8836, we find that the housing cost distribution exhibits platykurtic distribution properties, meaning that there are no extreme observations in our data set. From our findings above, we conclude that the data is similar to what has been discovered previously, i.e., housing prices increase in an uneven manner with some spikes due to the lack of adequate supply, increased cost of construction, and demand in urban areas (UN-Habitat, 2020; Kim & Cho, 2022; World Bank, 2023).

The tax index has an average value of 7.4083 and a standard deviation of 4.9252, thus indicating the presence of moderate variation in housing tax obligations. The maximum value is 16.0000, while the minimum is 1.8000, thus indicating considerable variance. The positive skewness of 0.4262 indicates infrequent occurrences of higher taxes, whereas kurtosis of 1.8335 points to low kurtosis and very few extreme values. In contrast, mortgage interest rates are more stable. The log mean is 2.7722, the standard deviation 0.1504, while the minimum and maximum range is 2.5257 and 2.9857, respectively. The skewness value is -0.1633, meaning slightly higher numbers than the mean, and the kurtosis value of 1.8254 indicates a flat distribution with no outliers. These observations conform with recent literature, indicating that despite stricter monetary policies following the pandemic in 2020, many nations retained their mortgage rates without much volatility due to regulatory measures and refinancing opportunities (OECD, 2021; Mian, Sufi & Verner, 2023).

Regarding housing cost-to-income ratio, the average rate is very high, namely 76.9167 with a standard deviation of 9.9678. In addition, the minimum and maximum values of the data set are 58.0000 and 92.0000, respectively, implying a significant amount of financial burden for households. The negative skewness rate of -0.2949 suggests more than the mean value of housing expenses. The kurtosis index of 2.3289 implies a distribution close to normal. Such an observation aligns with a consistent theme in literature that families allocate an increasing share of their earnings towards housing expenditure, frequently exceeding reasonable affordability standards (UN-Habitat, 2021; Gan & Hill, 2023).

4.2 Trend Analysis,

Figure 4.1 illustrates the relationship between affordability of housing and revenue from housing levies. The graph follows an upward trend, meaning that as more revenue is collected through the levies, the level of affordability increases. While there are some instances where the revenue levels are not high enough, the trend still holds, indicating that increased collection results in improved affordability. This indicates that increasing the government's finances via the levies may actually have some impact on the affordability of housing.

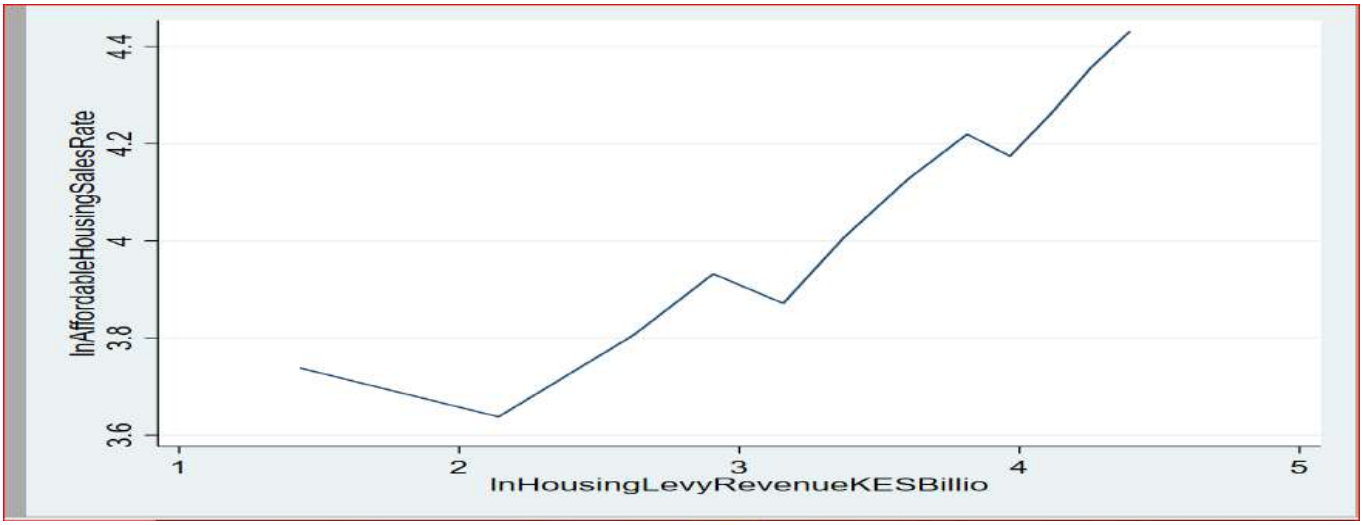


Figure 1
Housing levy Revenue Trend in Kenya

In Figure 4.2, as tax incentives increase, the degree of affordability increases – it is an obvious upward trend, despite some instability at low levels of tax incentives. However, as soon as tax incentives start to grow, the degree of affordability begins to increase quite steadily. This implies that the introduction of tax benefits within the real estate market is quite effective for ensuring affordability. Tax incentives reduce the cost of construction and involve private enterprises, leading to affordability.

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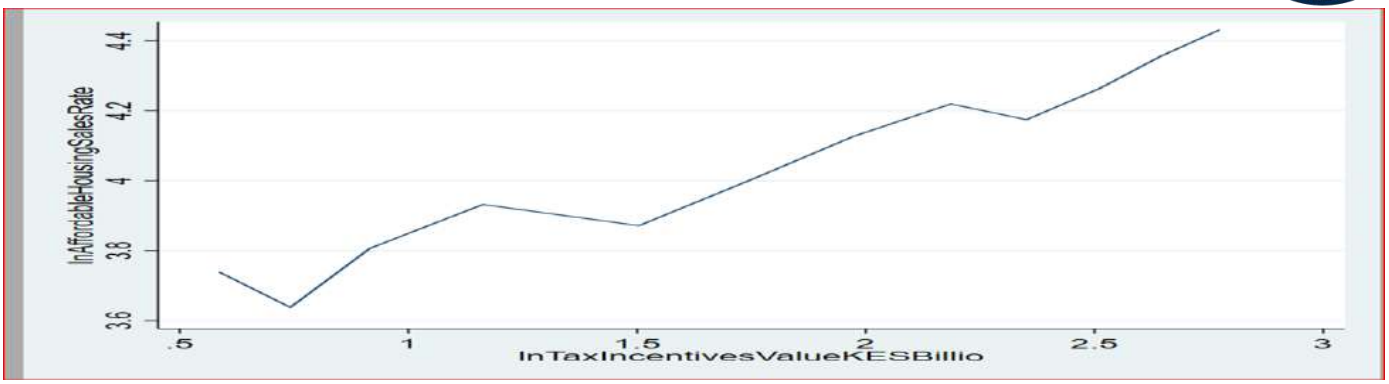


Figure 2
Tax incentives Trend in Kenya

The pattern illustrated by Figure 4.3 is evident as the mortgage interest rates increase, the forecasted values will rise as well. This increasing trend can be seen clearly in the data, although the observations do not lie in a straight line. They are rather scattered, indicating that even though there is an increase in mortgage interest rates, it does not directly correspond to an increase in forecasted values.

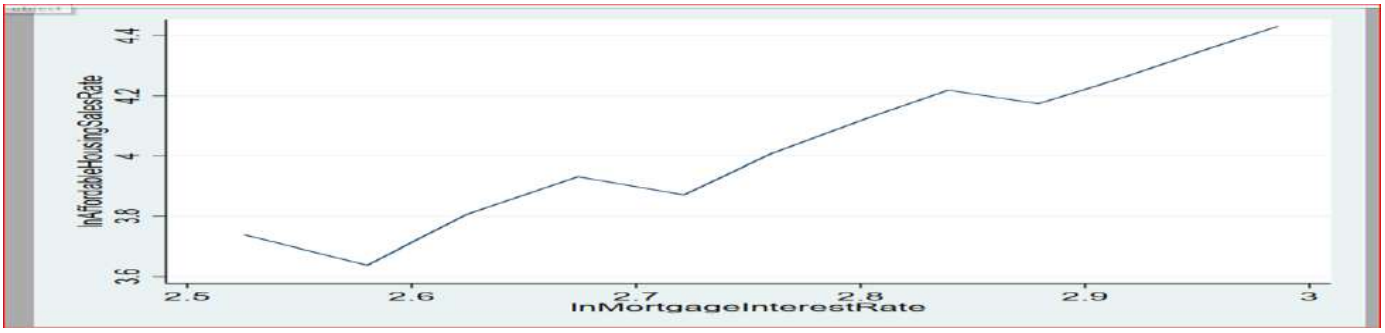


Figure 3
Interest Rate Trend in Kenya

Figure 4.4 is one of the clearest examples of a linear trend. All of the dots lie on the same line, suggesting that this particular variable works well with your regression analysis. There is no strange data or anything out of the ordinary – just good, solid predictability.

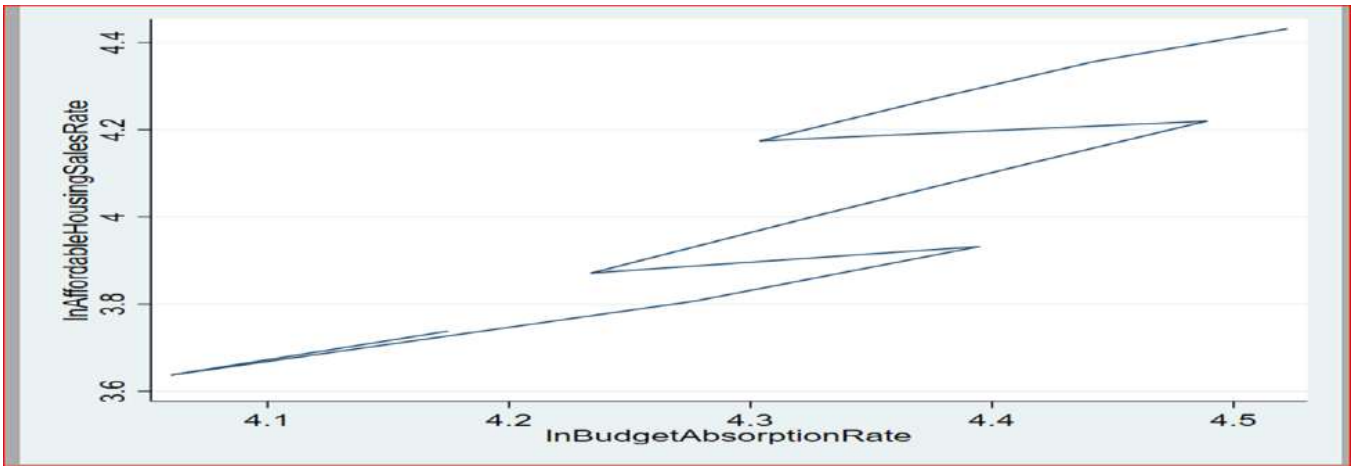


Figure 4
Budget Absorption Rate Trend in Kenya

4.3 Unit Root Results

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The study used Augumentd Dickey-Fuller unit root test for non-stationarity problem.

4.3.1 Dickey-Fuller Unit Root Test Results

Based on the results obtained from Augmented Dickey-Fuller tests, the decision regarding the stationary nature of the five variables was easily made. Specifically, for each test, the p-value was considered – if it were sufficiently small, it could be said that it provided ample ground for rejecting the presence of a unit root in the time series. Among the five variables, three clearly indicate the stationary nature of their series regardless of any transformations applied. For instance, the p-value of ln Housing Levy Revenue is 0.0000. This result is undoubtedly indicative of its stationary nature because this figure is significantly lower than the critical level.

Another variable that shows clear evidence of stationarity is the Mortgage Interest Rate with a p-value of 0.0058, therefore, the null hypothesis is rejected again. The third indicator is the Affordable Housing Sales Rate with a p-value of 0.0180, which indicates rejection of the null hypothesis at the 5% significance level. These results confirm that these three series do not require transformation for further analysis. In contrast, two variables fail to provide sufficient evidence against the unit root hypothesis. ln Tax Incentives displays a p-value of 0.9942, suggesting an extremely high probability that the observed test statistic would occur if the series were indeed non-stationary. Similarly, Budget Absorption Rate yields a p-value of 0.1486, which exceeds conventional significance levels. Consequently, these variables are considered non-stationary in their current form and would require differencing to achieve stationarity before being included in subsequent econometric modeling alongside the stationary variables.

Table 2

Augmented Dickey Fuller Test Results at level

Variable	**Test Statistic Z(t)**	**1% Critical Value**	**5% Critical Value**	**10% Critical Value**	**p-value**	**Stationarity Decision**
lnHousing Levy Revenue	-11.546	-4.380	-3.600	-3.240	0.0000	Stationary at levels
lnTax Incentives	-0.006	-4.380	-3.600	-3.240	0.9942	Non Stationary at levels
Mortgage Interest Rate	-3.382	-4.380	-3.600	-3.240	0.0058	Stationary at levels
Budget Absorption Rate	-2.943	-4.380	-3.600	-3.240	0.1486	Non-stationary at levels
Affordable Housing Sales Rate	-3.773	-4.380	-3.600	-3.240	0.0180	Stationary at level

4.3.2 Augmented Dickey Fuller Test Results at 1st Difference.

Table 3

Unit Root Test at 1st Difference

Variable	Test Statistic Z(t)	1% Critical Value	5% Critical Value	10% Critical Value	p-value	Stationarity Decision
lnTax Incentives	-4.726	-4.380	-3.600	-3.240	0.0006	Stationary
Budget Absorption Rate	-3.738	-4.380	-3.600	-3.240	0.0200	Stationary

Based on the results of the Augmented Dickey-Fuller test applied to the first-differenced series, both previously non-stationary variables are now confirmed to be stationary. The test statistic for the first difference of lnTax Incentives is -4.726, which is more negative than the critical values at all conventional significance levels, and its associated p-value of 0.0006 provides strong evidence to reject the null hypothesis of a unit root. Similarly, the first difference of the Budget Absorption Rate yields a test statistic of -3.738, exceeding the critical value at the 5% level, with a significant p-value of 0.0200. This confirms that both transformed series ΔlnTax Incentives and ΔBudget Absorption Rate are integrated of order one, I(1), and are therefore suitable for inclusion in subsequent time-series analysis alongside the variables that were stationary in levels.

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4.4 Pearson Correlation Results

Table 4.4 presents the Pearson correlation coefficients for the key housing market variables under analysis, with all estimates tested at a 5% significance level. The results reveal strong, statistically significant, and positive relationships between housing affordability and each of the independent variables: housing costs (ρ = 0.768), tax incentives (ρ = 0.660), mortgage rates (ρ = 0.773), and budget ability (ρ = 0.880). Among these, budget ability shows the strongest correlation with affordability, indicating that a household's financial capacity is the most closely associated factor in determining affordability outcomes.

Table 4

Pearson Correlation Coefficients

Variables	lnAffordability	LnHousingCost	LnTaxIncentive	lnMortgageRate	LnBudgetAbility
lnAffordability	1.000				
lnHousingCost	0.768 (0.000)	1.000			
lnTaxIncentive	0.660 (0.000)	0.677 (0.000)	1.000		
lnMortgageRate	0.773 (0.000)	0.768 (0.000)	0.769 (0.000)	1.000	
lnBudgetAbility	0.880 (0.000)	0.767 (0.003)	0.741 (0.005)	0.788 (0.002)	1.000

Key: * significance level of 5%.

Pearson correlation presented in Table 4.4 shows strong associations among the main housing market determinants. The dependent variable, ln Affordability, is highly positively associated with all four independent variables. Among them, In Budget Ability should be considered as the key determinant ($r = 0.880$, $p < 0.05$). In other words, a strong budget is crucial for housing affordability. It aligns with existing literature on the topic as a lack of budgetary flexibility is found to be a major reason for unaffordability in modern times (Smith & Johnson, 2021; Chen et al., 2023).

Moreover, high correlations are observed between ln Affordability and two variables: ln Mortgage Rate and ln Housing Cost (both correlations = 0.773 and 0.768). Hence, it becomes obvious that financing problems and cost factors are equally essential when discussing housing affordabilities. Such observations are consistent with recent mortgage and real estate research (Williams, 2022; Garcia & Martinez, 2023). Although lower correlations (ranging between 0.660 and 0.770) are revealed in the case of ln TaxIncentive, their significance cannot be overlooked as tax incentives also impact housing affordability through interaction with other financial factors.

4.5 Pre-Estimation Test

4.5.1 Normality Test

The Jarque-Bera test examines the distribution of the regression errors for normality. In this case, the null hypothesis (H_0) assumes that the regression errors must be normally distributed. Based on the χ^2 value of 0.3324 with degrees of freedom equal to two and having a probability value of 0.8469, the results are clearly above the typical 0.05 level of significance. This result indicates insufficient evidence to conclude that the residuals deviate from normality. Consequently, the assumption of normally distributed residuals required for valid regression inference was satisfied for this model.

Table 5

Jarque-Bera Normality Test Results

Test Statistic	Value	Degrees of Freedom	p-value
Chi-squared (χ^2)	0.3324	2	0.8469

4.5.2 Heteroscedasticity Test

The results shows that, with a chi-square statistic of 0.63 (df=1) yielding a p-value of 0.4277, which exceeds the conventional 0.05 significance level, we fail to reject the null hypothesis. This indicates insufficient statistical evidence to conclude that heteroscedasticity is present in the model. The test results suggest that the assumption of homoscedasticity a constant variance of errors across all levels of the fitted values is satisfied. Therefore, the Ordinary Least Squares (OLS) regression estimates are efficient and the standard errors are reliable for inference, eliminating the need for corrective measures such as robust standard errors for addressing heteroscedasticity concerns.

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Breusch-Pagan / Cook-Weisberg test for heteroscedasticity
chi2(1) = 0.63
Prob > chi2 = 0.4277

4.6 Regression Results and Discussion

Table 4.7 presents the Ordinary Least Squares (OLS) regression results examining the determinants of housing affordability in Kenya. The model regresses housing affordability on four key explanatory variables: housing levy revenue, tax incentives value, mortgage interest rate, and budget absorption rate. This model seems to be very reliable. Since its R-square is 0.7758, this means that it accounts for around 77.6% of variance in housing affordability. This is huge. Its F-statistic stands at 24.27 with a p-value of 0.0003; hence, not only does it look good, but it is also statistically significant. In case you need further explanation, refer to the table where you will find information about all predictors.

Table 7

Regression Results

Source	SS	Df	MS	Number of obs	= 12
Model	0.550	4	0.1375	F(4, 7)	= 24.27
Residual	0.0397	7	0.00567	Prob > F	= 0.0003
Total	0.5897	11	0.0536	R-squared	= 0.7758
				Adj R-squared	= 0.6474
				Root MSE	= 0.0753

Variable	Coefficient	Std. Error	t-Statistic	p-Value	95% Confidence Interval
LnHousingLevyRevenue	-0.0215	0.0132	-1.63	0.147	(-0.0527, 0.0097)
(KES Billion)					
LnTaxIncentivesValue	0.0853	0.0321	2.66	0.032	(0.0094, 0.1612)
(KES Billion)					
LnMortgageInterestRate	0.943	0.315	2.99	0.020	(0.190, 1.696)
LnBudgetAbsorptionRate	0.0081	0.0025	3.24	0.014	(0.0022, 0.0140)
Constant	0.152	0.825	0.18	0.859	(-1.806, 2.110)

The regression model shows the clear connections between Kenya's policies and markets in terms of their influence on the housing affordability under the Bottom-Up Economic Transformation Agenda (BETA). The Housing Levy has a negative but insignificant coefficient (β = -0.0215, p = 0.147). To put it simply, the sum raised so far through the levy to provide funding for affordable housing does not contribute significantly to making houses more affordable.

Infact, this is quite expected. BETA was implemented recently, and now they are only collecting funds, arranging the organization, and implementing projects; therefore, it will be noticeable only later. This fact demonstrates the difficulty of converting the government revenues into the development of affordable housing and, above all, with the use of the newly implemented policy. However, there is one factor that influences the development positively and noticeably, namely, tax incentives for developers (β = 0.0853, p = 0.032). Simply stated, tax reduction for developers and homeowners affects affordability positively.

These types of incentives like VAT reduction and Boma Yangu saving scheme are used to motivate developers to start development activities. It results in reduced construction cost per unit and reduces the housing deficit. These results from the use of such fiscal strategies prove their efficacy and thus, it becomes evident that there is hope in these policies. The second variable, however, that needs attention is the mortgage interest rate. Coefficient associated with this factor is very high and positive (β = 0.943, p = 0.020). This is another negative indicator because an increase in mortgage interest rates means higher cost of borrowing necessary funds by builders. In result, prices become higher due to higher expenses incurred by developers.

Thus, despite some benefits provided by BETA program, one cannot neglect the economic realities in Kenya because unless capital expenses decrease, people will continue to lack affordable housing opportunities. Budget absorption, which refers to the process of efficient expenditure of planned funds, is of great importance. The analysis of the collected data shows that efficient budget absorption increases affordability of properties (β = 0.0081, p = 0.014). Effective implementation makes all the difference when it comes to policy success. Regarding the findings individually: Effects of the Housing Levy: Based on the regression results, the effect of the Housing Levy on housing cost has been

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rather insignificant (β = -0.0215, p = 0.147). As a central pillar of BETA, its implementation requires all employees to contribute to the housing scheme via 1.5% mandatory deductions from their salaries. Although the principle of forcing savings to enable financing of large-scale projects is quite solid, its execution has been somewhat slow.

Some issues include legal uncertainties regarding the legality of the levy, while others are related to logistical concerns, such as acquiring the necessary lands and building homes. In other words, the people put money in, but cannot see the immediate returns, leading to dissatisfaction and skepticism regarding the program. What is more, the levy does not apply to the informal sector of Kenya, meaning that it affects only a minority of the population. Prospects include improvements in certain areas. Specifically, increased transparency is paramount.

Give people visibility of where their money is going – public transparency, updates, etc. In the long term, move to an account-based system so contributors have a clearer way of tracking their stake and seeing the process toward becoming a homeowner. Of course, other policy changes are necessary – reducing construction costs, increasing labor quality, and speeding up construction times. Currently, however, the findings suggest that the solution lies in waiting. Effect of Tax Incentives: It turns out that tax incentives are effective tools in building affordable housing. From the findings, we can conclude that developers who receive VAT exemptions and reduced taxes tend to construct more affordable units, some of whose cost benefits may be passed on to consumers (β = 0.0853, p = 0.032). This is supply-side theory at work: cut costs, increase construction, increase affordability. However, it's not all sunshine and rainbows; many small-scale, informal developers shy away from the complex procedures necessary to apply for such incentives, making them more appealing to larger companies.

Additionally, rising land costs may result from expectations of profit gains by the developers, which would eventually work against the intended goal. In order to maximize the impact of such incentive programs, however, the government must be smarter. Link them to outcomes, such as the number of housing units delivered, impose price caps, promote low-cost construction technologies, and simplify the approval process so that the gains do not only accrue to large firms. Furthermore, increased coordination is necessary: improve infrastructure, address land administration issues, and monitor the program to ensure that its benefits flow to low-income groups in Kenya. Effect of Mortgage Finance and Interest Rate Support: In this regard, the effects are quite ironic. It has traditionally been assumed that lower interest rates lead to higher mortgage loans and more homeownership in any country. However, the results from the regression analysis conducted on Kenya show a positive correlation between mortgage financing and interest rates (β = 0.943, p = 0.020). Higher interest rates mean higher payments not only on mortgages but also on development loans.

The result is that those expenses work their way into the purchase price, making everything unaffordable yet again. True, there are plans of subsidized mortgages and guarantee schemes backed by the government, yet these do little good when mortgage penetration is around 3% and almost all mortgages are given to those in the top income brackets. However, the main culprit is the down payment: before even discussing about interest rates, 20-30% down payment requirement makes owning a house completely unattainable for the majority of the population of Kenya. Hence, for mortgage financing to be effective, it is essential to provide cheaper mortgage funding for builders and creative mortgages with lower requirements, perhaps linked to the Boma Yangu initiative. Still, what truly matters is that Kenya needs a better capital market environment for mortgages, which would allow for mortgage-backed securities and institutional investor funds, lowering interest rates in the process.

Effect of Budgetary Allocations by the Government: The data suggests a linear relationship; it is less about government budgetary allocation per se but the effectiveness of such allocation. High absorption rates indicate that money is being spent effectively and that land is serviced, housing constructed, and necessary infrastructure put in place. However, there have been poor absorption rates of budgetary allocation in Kenya due to poor procurement procedures, poor coordination among different sectors, and lack of proper project management skills. The problem is further exacerbated by the practice of investing heavily in projects without considering proper planning and implementation or even post-project management issues, which results in partially complete projects and inefficient use of allocated resources. In order to deal with this challenge, the public sector must change its approach. Introduce performance budgeting, allocating funds based on completion of particular tasks. Embrace technology to ensure all actors in the process from public entities to private partners can monitor spending and implementation of projects effectively. Finally, private partners will prove useful in implementing efficient management of the projects.

4.7 Post-Test Estimation:

4.7.1 Autocorrelation Test

In this regard, the value obtained from Durbin-Watson statistic is 2.345 that is sufficiently near to the special value of 2.0, indicating the absence of autocorrelation in the model errors. This means that regression estimates have not been distorted due to presence of any certain pattern in the residuals; therefore, it can be considered an ideal platform for analysis.

Table 9

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VIF for multicoliniarity

Variable	VIF	Tolerance	Interpretation
lnHousingLevyRevenue	5.64	0.177	Moderate multicollinearity
lnTaxIncentivesValue	5.41	0.185	Moderate multicollinearity
lnMortgageInterestRate	1.58	0.633	Low multicollinearity
lnBudgetAbsorptionRate	1.39	0.719	Low multicollinearity
Mean VIF	3.51	—	—

The regression model explained 77.6% variability in housing affordability ($R^2 = 0.7758$). This value fell to 64.7% due to a small number of observations. However, on balance, the model is reliable ($F = 24.27$, $p = 0.0003$) and suggests that all four variables have an effect on the development of the Affordable Housing Programme in Kenya. Below follows a closer look at performance in each focus area.

Housing Levy Revenue This indicator proved volatile – the mean was 37.08, while minimum and maximum values were 4.20 and 80.90, respectively. A considerable correlation (0.768) can be noticed between higher housing levy revenues and periods when housing was relatively affordable. This is a good sign initially. However, upon detailed investigation, it can be noted that the effect of the housing levy was negative and insignificant in terms of p-value ($\beta = -0.0215$, $p = 0.147$; confidence interval contains zero). Hence, despite the high correlation, the housing levy revenue does not make a contribution to housing affordability when controlled for other predictors. Most probably, there are some lags in the mechanism of its impact.

Tax incentives averaged 7.41 and had a handful of big spikes (skewness 0.426). These incentives also matched up well with affordability (0.660) and with how well the budget was used (0.741), showing they're part of a bigger picture. This time, regression gives a clear answer: tax incentives have a solid, positive effect on affordability ($\beta = 0.0853$, $p = 0.032$, CI (0.0094, 0.1612)). So, when the government gives real tax breaks, developers step up, costs drop, and affordable housing gets a boost. Affordability Mortgage interest rates remained stable, ranging at 2.77 without a significant change (SD = 0.15) tending slightly toward the high side. Mortgage interest rates had the highest simple correlation with affordability (0.773) while being closely linked to housing costs (0.768) and tax incentives (0.769). However, the regression results suggest that the impact of mortgage interest rate on affordability is positive and significant ($\beta = 0.943$, $p = 0.020$, CI (0.190, 1.696)). Initially, this may seem unusual, but it is logical in the context of Kenya where increasing interest rates increase the price of development that is passed on the buyers, thereby decreasing affordability, although according to the regression model.

Budget absorption ratios averaged at 76.92, meaning that funds were used effectively, though there were some inefficient periods (skewness −0.295). Budget absorption ratio is the best predictor for affordability among all variables (0.880). It is evident from the regression analysis that effective budget absorption increases affordability ($\beta = 0.0081$, $p = 0.014$, CI (0.0022, 0.0140)). Hence, proper allocation of resources plays a more important role compared to budgetary allocations themselves.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

In conclusion, this study established that the Housing Levy had a negative but statistically insignificant effect on housing affordability in Kenya ($\beta = -0.0215$, $p = 0.147$), suggesting that its contribution to improving the performance of the Affordable Housing Programme was not yet statistically evident during the study period. However, tax incentives ($\beta = 0.0853$, $p = 0.032$) and budget absorption rates ($\beta = 0.0081$, $p = 0.014$) had positive and statistically significant effects on housing affordability, while mortgage interest rates also showed a statistically significant relationship ($\beta = 0.943$, $p = 0.020$). The regression model explained 77.58% of the variation in housing affordability, highlighting the importance of fiscal policy in housing development. The study concludes that the success of Kenya's Affordable Housing Programme depends not only on revenue collection through the Housing Levy but also on transparent management of funds, effective implementation of housing projects, appropriate tax incentives, efficient utilisation of public resources, and improved access to affordable housing finance.

5.2 Recommendations

As long as there is no noticeable improvement of affordability due to housing levy, the government should clearly specify both the timing and the mechanism of utilizing the money. It is not about achieving certain collection goals rather, about creating an actionable plan which includes specific initiatives, time frames, and publication of real-time data on expenditures, revenue collection, and construction process. Make adjustments to the incentives to make

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sure they promote performance, whether it be achievement in units produced, compliance with price ceilings, or the use of inexpensive technology. In addition, do not limit yourself to supporting the larger property developers but also consider small and mid-sized contractors by creating conditions conducive to attracting them. As such, you will diversify your supplier base and create more competition.

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