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*Financing Constraints and Delivery Performance of
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Public–Private Partnerships*

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Financing Constraints and Delivery Performance of Affordable Housing Projects in Kenya: Evidence from Public–Private Partnerships

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Abstract

Affordable housing remains a major development challenge in Kenya, with financing constraints affecting the delivery of projects implemented through public–private partnerships (PPPs). The study examined the effect of financing constraints on the delivery performance of affordable housing projects in Kenya, with particular focus on the moderating role of government and PPP support. The study was anchored on Transaction Cost Economics (TCE) and adopted a descriptive survey design. The population comprised 36 affordable housing projects in Nairobi City County, with project managers, financing officers and government/PPP officers providing 108 respondents. A census approach was used. Data were collected using structured questionnaires and analysed using SPSS Version 27 through descriptive statistics, multiple linear regression and moderated regression analysis. The findings established that access to construction finance and financing structure positively influenced project delivery performance, while financing cost and payment delays constrained delivery. Government and PPP support positively influenced project delivery and moderated the relationship between financing constraints and delivery performance. The study concludes that effective affordable housing delivery requires adequate and timely construction finance, manageable financing costs, timely payments, appropriate financing structures and effective government–private-sector collaboration. The study recommends strengthening affordable housing financing and PPP frameworks, improving access to affordable finance, streamlining payment and approval processes, and enhancing risk-sharing mechanisms. In practice, developers, financiers and government agencies should strengthen financial planning, cash-flow management and contractual coordination. The findings also support the applicability of TCE in explaining how financing and transaction-related conditions influence affordable housing project delivery.

Keywords: *Financing Constraints, Delivery Performance, Affordable Housing Projects, Public–Private Partnerships.*

1. INTRODUCTION

Affordable housing remains a major development priority globally because adequate shelter is closely associated with health, sanitation, infrastructure, social inclusion and sustainable urban development. The importance of housing is reflected in the United Nations Sustainable Development Goals (SDGs), particularly SDG 3 on good health and well-being, SDG 6 on clean water and sanitation, SDG 9 on infrastructure and innovation, SDG 10 on reduced inequalities, and SDG 11 on inclusive, safe and sustainable cities and communities. Rapid urbanization,

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population growth and increasing housing costs have, however, widened the gap between housing demand and supply, particularly among low- and middle-income households. Consequently, governments have adopted different approaches involving direct public provision, subsidies, private-sector participation and public–private partnerships (PPPs) to expand the supply of affordable housing. The experiences of countries such as Denmark, Singapore, Chile, Brazil and New Zealand demonstrate that affordable housing delivery depends not only on government commitment but also on appropriate institutional arrangements and sustainable financing mechanisms (OECD, 2025; UN-Habitat, 2020; World Bank, 2018; Salvi del Pero, 2016).

International experience demonstrates the importance of combining public resources with private and household financing to improve the scale and sustainability of affordable housing programmes. Singapore, for example, has relied heavily on government-led housing provision through the Housing and Development Board, supported by government loans and grants, compulsory savings and state-controlled land acquisition (UN-Habitat, 2020; World Bank, 2018). Chile has adopted a demand-side subsidy model that combines government grants, household savings and private bank loans, while Brazil's Minha Casa, Minha Vida programme combines public credit, subsidies and private-sector participation to support low- and middle-income households (Salvi del Pero, 2016; UNOPS, 2025). Similarly, Indonesia has combined government subsidies, PPPs and international financing under programmes such as the Program Sejuta Rumah to increase housing supply (World Bank, 2017; Wardana & Syafhendry, 2025). These experiences suggest that the capacity to mobilize and coordinate different sources of finance is a critical determinant of affordable housing delivery. They also demonstrate that government intervention remains important where market-based financing alone cannot provide housing at prices affordable to lower-income households.

Despite these interventions, financing remains one of the major constraints to affordable housing delivery globally. Affordable housing projects require substantial upfront capital for land, infrastructure, construction, labour and associated development costs, while the intended beneficiaries generally have limited purchasing power. Developers therefore require access to long-term and relatively affordable finance to maintain project viability without transferring excessive costs to households. High interest rates, short debt tenures, stringent lending

requirements, limited equity, rising construction costs and uncertainty regarding project revenues can increase the cost of capital and undermine project bankability. These challenges have encouraged greater reliance on PPPs, through which governments can provide land, infrastructure, subsidies, guarantees and regulatory support while private-sector partners mobilize capital, technical expertise and construction capacity. However, PPPs do not automatically eliminate financing constraints because their success depends on bankable projects, appropriate risk allocation, predictable public-sector commitments and access to suitable long-term finance (World Bank, 2018; UN-Habitat, 2020).

The financing challenge is particularly severe in Africa, where rapid urbanization, population growth, poverty and limited formal housing-finance systems have intensified the shortage of decent and affordable housing. Africa's urban population increased from approximately 32 million in 1960 to 458 million in 2020, creating substantial additional demand for housing and urban infrastructure (Centre for Affordable Housing Finance in Africa [CAHF], 2022). The continent is estimated to face a housing shortage of approximately 51–56 million units, with the deficit being driven by rapid population growth, urban migration and limited capacity to supply housing affordable to low-income households (UN-Habitat, 2024). African countries have consequently adopted different financing approaches, including public subsidies, mortgage refinancing, development-finance institutions, international development funds, community financing and PPPs. Nevertheless, limited access to long-term capital, high borrowing costs, weak mortgage markets, inadequate infrastructure and constrained public budgets continue to limit the ability of housing programmes to achieve their intended scale (CAHF, 2024; UN-Habitat, 2024).

Country experiences in Africa illustrate how financing constraints can undermine housing delivery even where governments have established ambitious programmes. In South Africa, for example, affordable housing projects often struggle to assemble financing structures that are simultaneously bankable for investors and affordable to low- and moderate-income households. High and volatile borrowing costs, short debt tenures, rising construction and operating costs, land and infrastructure constraints and limited public resources can weaken project viability and delay financial closure (National Treasury & GTAC, 2016; World Bank, 2018; UN-Habitat, 2020). Similar challenges are evident in Namibia, Tanzania and Rwanda, where governments have introduced large-scale

housing initiatives but continue to confront substantial housing deficits and the need to mobilize additional private and institutional finance (Randa, 2020; European Investment Bank, 2024; Uchumi360 Business Intelligence, 2025; Rwanda Housing Authority, 2026). These experiences demonstrate that the existence of a housing programme does not necessarily translate into effective delivery; the availability, affordability, timing and structure of financing are critical to converting housing policies and plans into completed units.

Kenya faces similar but particularly acute housing challenges. The country has a housing deficit estimated at approximately two million units, with annual demand estimated at about 250,000 units compared with an annual supply of approximately 50,000 units (Habitat for Humanity Kenya, 2025). The Kenya National Housing Corporation (2023) similarly identifies an annual housing deficit of approximately 200,000 units, exacerbated by rapid urbanization. The problem is especially pronounced in urban areas, where millions of people live in informal settlements characterized by inadequate housing, limited infrastructure and insecure tenure. Nairobi illustrates the magnitude of the challenge, with a large proportion of its population living in informal settlements and many households relying on rental accommodation. The housing deficit is therefore not simply a question of the number of units available but also of whether housing can be financed and delivered at prices consistent with the incomes of low- and middle-income households (Kenya National Housing Corporation, 2023; Habitat for Humanity Kenya, 2025; UN-Habitat, 2024).

In response to this challenge, the Government of Kenya has placed affordable housing at the centre of its development agenda. The Affordable Housing Programme was introduced in 2017 and subsequently strengthened through the Affordable Housing Act, 2024, which established a statutory framework for financing and implementing affordable and institutional housing. The programme seeks to expand housing supply while supporting employment, infrastructure development, urban transformation and improved living conditions. The government has also promoted private-sector participation through PPP arrangements to complement public resources and increase the scale of housing development. This approach is important because the financing requirements of affordable housing are substantially greater than the resources that can be mobilized through conventional public expenditure alone. The use of PPPs is therefore intended

to combine public resources, including land and policy support, with private capital, construction expertise and project-management capacity. However, the effectiveness of this approach depends on whether PPP projects can secure adequate, affordable and timely financing and whether financial risks are appropriately shared among the participating parties (Government of Kenya, 2024; Kenya PPP Directorate, 2024).

Despite the significance of housing programmes, the program continues to face financing constraints that threatens the delivery performance of affordable housing projects. Financing constraints heavily restrict the delivery performance of affordable housing projects by causing severe construction delays, budget shortfalls, and missed annual targets. Housing financing is central in determining the availability, affordability and adequacy of housing in the country with the cost of financial facilities going to the final consumers of housing services (KIPPRA (2021)). . From the demand side, affordability of housing compares price of properties relative to income levels, thus the cost of financing ought not to overstretch the cost of property, which will make properties unaffordable to majority of the population. The Kenya affordable housing financing is funded through the government housing levy of 1.5% which can collect between KES. 72 billion annually. Kenya faces an annual affordable housing financing gap of roughly Sh300 billion, requiring nearly Sh400 billion each year while the mandatory housing levy collects only about Sh100 billion. This financing gap, call for partnership between public and private sector (Public–Private Partnerships) to close this financing gap.

1.1 Empirical Gap

Affordability of housing has become a global challenge for both developed and developing countries. Especially, developing nations are facing a housing shortage due to increasing urbanization, income disparity, and institutional restraints. Affordable and sufficient housing, coupled with essential services, infrastructure, and conducive environment besides only shelter, is conceded by the UN as a basic human right. The empirical evidence generally confirms that financing constraints are a persistent challenge in affordable housing, although the magnitude and specific mechanisms differ across contexts. Gibb and Hayton (2017), in their examination of affordable housing supply in European states, identified structural barriers to both housing finance and delivery, including reductions in public expenditure following the financial crisis. Similarly,

Kavaarpuo et al. (2024), applying Transaction Cost Economics to housing development in an underdeveloped financial market, found that formal housing finance was scarce and expensive, forcing developers and households to adapt their financing strategies and rely on alternative financing mechanisms. Evidence from South Africa reinforces this concern. Ngema and Chauke (2026) found that affordable housing projects face difficulties in assembling financing structures that are simultaneously bankable for investors and affordable to beneficiaries, while Ganiyu et al. (2017) identified mortgage payment subsidies, down-payment grants and mortgage interest deductions as potential alternatives for addressing weaknesses in existing housing-financing arrangements. Collectively, these studies demonstrate that inadequate access to finance, high financing costs and limited availability of suitable financing instruments constitute important constraints to affordable housing development.

The existence of financing constraints, however, does not necessarily imply that financing is the only determinant of affordable housing delivery. Rafique et al. (2026), using PLS-SEM in Pakistan, found that market and financial restrictions did not have a significant effect on affordable housing delivery, whereas policy and governance failures, institutional and regulatory impediments and socio-cultural constraints had more substantial effects. This finding contrasts with Siati et al. (2025), who found a positive and significant relationship between project financing design and implementation of affordable housing projects in Nairobi. Similarly, Kimani (2020) established that innovative housing financing significantly influenced affordable housing delivery in Nairobi City County. The contrasting findings suggest that the effect of financing constraints may be context-dependent and mediated by institutional, regulatory and project-management conditions. Financing may therefore be necessary for project implementation, but its contribution to delivery performance depends on whether financing arrangements are appropriately designed, accessible at reasonable cost and supported by effective governance and implementation structures.

Further evidence suggests that financing constraints can translate into poor delivery performance by affecting the cost, timing, scale and affordability of housing projects. When developers cannot secure adequate and affordable capital, projects may experience delayed financial closure, inadequate cash flows, construction interruptions, cost escalation and failure to achieve planned

outputs. Ngema and Chauke (2026) argue that blended financing arrangements involving government subsidies, concessional loans, equity and credit-enhancement instruments can reduce the effective cost of capital and stabilize project cash flows, implying that weaknesses in these financing mechanisms can undermine long-term project viability. In Kenya, Siati et al. (2025) provide direct empirical support by demonstrating that project financing design significantly affects affordable housing project implementation. Orango et al. (2025) further found that real estate market conditions significantly influence the performance of PPPs in delivering affordable housing in Nairobi Metropolitan, emphasizing that performance involves not only constructing houses but delivering them at reasonable costs and prices consistent with the purchasing power of the target population. Thus, the literature indicates that financing constraints can affect delivery performance both directly, through insufficient or costly project capital, and indirectly, by increasing project costs and reducing the affordability and commercial viability of completed housing units.

At the same time, the literature identifies public–private partnerships as a potential mechanism for overcoming financing constraints, particularly where governments have insufficient resources to finance affordable housing entirely from public budgets. Eseoghene et al. (2022), examining PPPs and affordable housing delivery in Nigeria, found that effective partnerships require clearly defined success metrics, continuous performance monitoring and the identification and resolution of emerging problems. In Kenya, Kimani (2020) found that collaborative approaches substantially influenced government delivery of affordable housing, while Radford (2026) argues that PPPs have considerable potential to expand affordable housing delivery by combining public and private resources. Similarly, Orango et al. (2025) demonstrate the importance of the broader real estate market to PPP performance, suggesting that private participation is more likely to produce successful outcomes where market conditions support project viability. PPPs can therefore provide access to private equity, debt, technical expertise, land and project-management capacity while allowing government to provide policy support, land, infrastructure, subsidies or guarantees. However, Canelas (2025) cautions that affordable housing PPPs introduce considerable ambiguity and complexity, indicating that partnership arrangements themselves can generate transaction and coordination challenges.

Based on the empirical literature: affordable housing projects experience financing constraints; these constraints can undermine delivery performance; and PPPs can potentially provide a mechanism for mobilizing additional resources and sharing project risks. Nevertheless, the evidence remains inconclusive regarding the extent to which financing constraints specifically influence the delivery performance of affordable housing projects implemented through PPPs in Kenya. Existing Kenyan studies have examined project financing design (Siati et al., 2025), innovative financing and collaborative approaches (Kimani, 2020), real estate market conditions and PPP performance (Orango et al., 2025), and broader financing constraints in affordable housing (Mose, 2021). However, these studies do not sufficiently establish how specific financing constraints such as availability of finance, cost of finance, adequacy of financing, access to long-term capital and financing delays affect project delivery outcomes within PPP arrangements. This gap is particularly important given the contrasting international evidence, where financing constraints are significant in some contexts but less influential than governance and institutional factors in others (Rafique et al., 2026). The present study therefore seeks to empirically establish whether and how financing constraints affect the delivery performance of affordable housing projects under PPPs in Kenya, while recognizing PPPs as a potential mechanism for addressing, rather than automatically eliminating, the financing problem.

1.2 Theoretical Background

This paper is based on Transaction Cost Economics. Advanced by Williamson (1979), Transaction Cost Economics provides a framework for comprehending the costs associated with participating in market economic activities. Transaction Cost Economics (TCE) explains how economic actors organize their transactions to minimize costs. The transaction costs are incurred while monitoring, controlling, and managing economic activities. The theory's main assumption is that transaction costs are an intrinsic part of any economic activities (Rindfleish, 2020). These costs fundamentally shape the organizational structure of firms and market dynamics. TCE is grounded on two main assumptions on economic actors, bounded rationality and opportunism along with three key aspects of economic exchanges: asset specificity, frequency, and uncertainty (Rindfleish, 2020).

TCE has been used by many researchers across different disciplines such as production, supply chain management, transport, planning and policy analysis and property management (Shahab,

2022). It has served as a framework for understanding how economic agents aim to optimize income by reducing production costs. Kavaarpuo et al (2024) employed Transaction Cost Economics Theory while studying Financing Housing Development in an Underdeveloped Financial Market: Learning from Developers' Financing Adaptations.

Transaction Cost Economics is relevant to this study because it explains how the costs associated with planning, negotiating, contracting, monitoring and enforcing agreements influence organizational and project outcomes. In affordable housing projects implemented through public-private partnerships (PPPs), transactions involve multiple actors, including government agencies, private developers, financial institutions, contractors and other stakeholders. These relationships generate transaction costs arising from information asymmetry, complex contractual arrangements, negotiations, due diligence, monitoring, contract enforcement and renegotiation. TCE argues that such costs are influenced by factors such as asset specificity, uncertainty and transaction frequency, with greater uncertainty and asset specificity increasing the potential for opportunistic behaviour and higher transaction costs (Williamson, 1975; Williamson, 1985). In affordable housing PPPs, the specificity of land, infrastructure and project investments, together with uncertainty surrounding construction costs, interest rates, government commitments and housing demand, can increase transaction costs. These costs may make projects less financially attractive, increase the resources required to secure financing and contribute to delays in reaching financial close and commencing implementation.

The theory is also relevant because it provides a basis for explaining how financing constraints may affect delivery performance in affordable housing PPPs. When transaction costs are high, private financiers and developers may require greater risk premiums, stronger guarantees, more extensive due diligence and more complex contractual safeguards before committing funds. This can increase the cost of finance and prolong financing negotiations, potentially delaying project implementation. Similarly, poorly designed contracts or unclear allocation of financial and implementation risks can lead to disputes, renegotiations and additional costs, which may subsequently affect project completion time, cost, quality and achievement of planned outputs. TCE therefore provides a theoretical explanation of why the efficiency of contractual and institutional arrangements between public and private partners can influence the extent to which

financing is secured and projects are delivered successfully. In this study, TCE consequently helps explain the underlying mechanism through which transaction-related costs, uncertainty and contractual risks can exacerbate financing constraints and ultimately influence the delivery performance of affordable housing projects implemented through PPPs.

2. METHODOLOGY

The study adopted descriptive survey design. Descriptive survey design enables the researcher to summarize and organize data in an effective way. It provides tools for describing collections of statistical observations and reducing information to an understandable form. Mugenda and Mugenda (2008) define descriptive research as the procedure for data collection so as to test hypothesis and answer questions on the area under study. This study adopted a descriptive research design since the design helps to understand the characteristics of a group in a given situation, offers ideas for further probe and research and help to make certain decisions (Sekaran & Bougie, 2016). The study population was 36 affordable housing projects in Nairobi City County under public-private partnership delivering. As of mid-2026, there are 36 active Affordable Housing Programme projects underway in Nairobi County, with several major sites such as parts of Mukuru, Kibra (Soweto B), and advanced phases of Pangani and Park Road having advanced well past the 50% completion mark or reaching full handover status. The unit of analysis were the affordable housing projects while the unit of observations included project manager, financing officer and Government/PPP Officer leading to 108 respondents. Thus, the target population was 108 project managers, financing officers and government/PPP Officer. A census of all the 108 project managers, financing officers, government/PPP Officers and was conducted.

Data collection was done using a structured questionnaire. Through the closed ended questions, the researcher was able to measure various attributes and therefore obtaining responses that are varied. Validity and reliability of the questionnaire was conducted. Validity of the tool was done using construct validity. To ensure construct validity, the questionnaire had different sections which addressed the study specific objectives. For construct validity, KMO tests were used. Cooper and Schindler (2014) suggest that variables with factors loading 0.7 are acceptable. However, a minimum of 0.5 value of factor loading is allowed as suggested by other researchers. Similarly, Kilic et al, (2020), argued that factor loading of 0.5 and above is acceptable. Reliability

of the research instrument was tested using Cronbach's alpha coefficient (α). Cronbach (1951) suggests that a Cronbach value of 0.7 is deemed reliable whereas.

SPSS version 27 was employed to analyze the data. Data analysis involved descriptive statistics using means and standard deviation. Multiple linear regression was also used to determine the effect of access to construction finance, financing cost, payment delays and cash-flow constraints and financing structure on affordable housing project delivery performance. To determine the moderating effect of government and PPP support on financing constraints and delivery performance of affordable housing projects, moderated regression model was used to test whether a moderator changes the relationship between an independent variable and a dependent variable.

$$Y = \beta_0 + \beta_1 X + \beta_2 M + \beta_3 (X * M) + \varepsilon$$

Where:

Y is performance of affordable housing projects, X is financing constraints, M is government and PPP support, and $X * M$ is Interaction between financing constraints and government and PPP support. β_0 is Constant/intercept, β_1 coefficient of financing constraints, β_2 is coefficient government and PPP support, β_3 is coefficient of interaction term and ε is error term.

If interaction term (β_3), $p\text{-value} < 0.05$ there is moderating effect, otherwise no moderating effect. The key coefficient for testing moderation is β_3 (the interaction term). If the interaction term is statistically significant, this indicates that government and PPP support significantly changes the strength or direction of the relationship between financing constraints and delivery performance of affordable housing projects.

A critical p value of 0.05 was used to determine whether the overall model was significant or not. The individual regression coefficients were checked to determine whether the independent variables significantly influenced the dependent variable. A critical p value of 0.05 was used to determine whether the individual variables are significant or not. Pearson R correlation was used to measure strength and the direction of linear relationship between variables. Small associations are indicated by values ranging from 0.1- 0.29, medium associations are indicated by values ranging from 0.3-0.49, and strong association is indicated by value of 0.5 and above. As

per Schober et al. (2018), r of 0.7 and above implies very strong correlation, 0.5-0.69 strong correlations, r of 0.39 to 0.49 is moderate correlation, r less than 0.39 is weak correlation.

3. RESULTS

The sample size in the study comprised of 108 respondents. A total of 102 questionnaires were distributed representing 94.4 percent response rate. Fincham (2008) points out that a response rate of approximately 60 percent is sufficient for a research study.

3.1 Correlation results

The study conducted correlation analysis to determine the strength and direction of correlation between financing constraints and delivery performance of affordable housing projects in Kenya. The study adopted Pearson correlation method. Pearson correlation (r) measures the nature and strength of association between research variables and ranges ± 1 . As per Schober et al. (2018), r of 0.7 and above implies very strong correlation, 0.5-0.69 strong correlations, r of 0.39 to 0.49 is moderate correlation, r less than 0.39 is weak correlation, r of 1 is perfect correlation whereas 0 implies no correlation. The correlation Results are presented in Table 1.

The correlation results indicate that access to construction finance had a very strong positive association with affordable housing project delivery performance ($r = .746$, $p < .001$). This implies that projects with better access to construction finance tended to record better delivery performance. Financing cost had a strong negative association with delivery performance ($r = -.681$, $p < .001$), suggesting that higher financing costs were associated with poorer project delivery. Similarly, payment delays had a strong negative association with delivery performance ($r = -.581$, $p < .001$), indicating that delays in financing-related payments were associated with deterioration in project implementation. These findings imply that adequate and timely access to affordable construction finance is important for maintaining project schedules, controlling costs and supporting the successful completion of affordable housing projects. On the other hand, expensive financing and delayed payments may constrain cash flows, interrupt construction activities and increase the likelihood of cost and time overruns.

Table 1: Correlation results between financing constraints and delivery performance of affordable housing projects

		Affordable Housing Project Delivery Performance	Access to construction finance	Financing cost	Payment delays	Financing structure	Government and PPP Support
Affordable Housing Project Delivery Performance	Pearson Correlation	1.000					
	Sig. (2-tailed)						
Access to construction finance	Pearson Correlation	.746**	1.000				
	Sig. (2-tailed)	0.000					
Financing cost	Pearson Correlation	-.681**	-.673**	1.000			
	Sig. (2-tailed)	0.000	0.000				
Payment delays	Pearson Correlation	-.581**	-.564**	.590**	1.000		
	Sig. (2-tailed)	0.000	0.000	0.000			
Financing structure	Pearson Correlation	.638**	.436**	-.339**	.683**	1.000	
	Sig. (2-tailed)	0.000	0.000	0.000	0.000		
Government and PPP Support	Pearson Correlation	.664**	.608**	-.473**	.615**	.643**	1.000
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	

** Correlation is significant at the 0.01 level (2-tailed).

Financing structure was positively and strongly associated with delivery performance ($r = .638$, $p < .001$), indicating that more appropriate and effective financing arrangements were associated

with better project delivery. Government and PPP support also demonstrated a strong positive association with delivery performance ($r = .664$, $p < .001$), implying that government facilitation and effective PPP support mechanisms may enhance the implementation of affordable housing projects. The implication is that improving the structure of project financing and strengthening government–private-sector support can contribute to better delivery outcomes. However, because correlation analysis establishes association rather than causation, the results do not by themselves demonstrate that financing factors cause changes in delivery performance; this causal relationship should be assessed using the subsequent regression analysis.

3.2 Regression results Financing Constraints and Delivery Performance of Affordable Housing Projects

Multiple linear regression was used to determine the effect of financing constraints and delivery performance of affordable housing projects in Kenya. The study specifically determined the effect of access to construction finance, financing cost, payment delays, and financing structure on performance of affordable housing projects. The model summary results are presented in Table 2.

Table 2: Model Summary results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.788 ^a	.621	.606	.55168
a. Predictors: (Constant), Access to construction finance, Financing cost, Payment delays, Financing structure				

The model summary results indicate a strong overall relationship between access to construction finance, financing cost, payment delays, financing structure and the performance of affordable housing projects, as shown by $R = .788$. The R^2 of .621 indicates that the four financing-related variables jointly explain 62.1% of the variation in affordable housing project delivery performance. The adjusted R^2 of .606 shows that after adjusting for the number of predictors in the model, the variables still explain 60.6% of the variation in project performance, suggesting that the model has substantial explanatory power. The results suggest that access to construction finance, financing cost, payment delays and financing structure are important predictors of affordable housing project delivery performance in Kenya. The ANOVA test results are shown in Table 3.

Table 3: ANOVA Test Results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	48.434	4	12.109	39.785	.000 ^b
	Residual	29.522	97	.304		
	Total	77.956	101			

a. Dependent Variable: Affordable Housing Project Delivery Performance

b. Predictors: (Constant), Access to construction finance, Financing cost, Payment delays, Financing structure

The ANOVA results show that the regression model comprising access to construction finance, financing cost, payment delays and financing structure is statistically significant in explaining affordable housing project delivery performance, $F(4, 97) = 39.785$, $p < .05$. Since the significance value is below the 0.05 threshold, the null hypothesis that the predictors jointly have no significant effect on delivery performance is rejected. The implication is that financing-related factors, considered collectively, significantly influence the delivery performance of affordable housing projects in Kenya. This supports the model summary finding that the financing variables jointly provide substantial explanatory power and suggests that improving access to finance, controlling financing costs, reducing payment delays and establishing appropriate financing structures can enhance project delivery performance. The regression coefficients results are shown in Table 4.

Table 4: Regression Coefficient results

Model	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	t	
(Constant)	2.069	.663		3.123	.002
Access to construction finance	.521	.111	.491	4.695	.000
Financing cost	-.330	.096	-.323	-3.432	.001
Payment delays	-.170	.076	-.167	-2.237	.006
Financing structure	.231	.112	.216	2.063	.017

a. Dependent Variable: Affordable Housing Project Delivery Performance

The regression coefficients indicate that access to construction finance had a positive and statistically significant effect on affordable housing project delivery performance ($B = 0.521$, $p < .05$). This implies that a one-unit increase in access to construction finance is associated with a 0.521-unit increase in delivery performance, holding other factors constant. Financing costs had a negative and statistically significant effect ($B = -0.330$, $p = .05$), indicating that higher financing costs reduce project delivery performance. Similarly, payment delays had a negative and significant effect ($B = -0.170$, $p = .006$), suggesting that delays in financing-related payments adversely affect project implementation. Financing structure had a positive and statistically significant effect ($B = 0.231$, $p = .017$), implying that appropriate financing structures contribute to improved delivery performance. Since all four predictors have p-values below .05, each makes a statistically significant contribution to explaining affordable housing project delivery performance.

The findings imply that access to adequate construction finance is the most influential financing factor in the model, based on its largest standardized coefficient ($\beta = .491$), followed by financing cost ($\beta = -.323$), financing structure ($\beta = .216$), and payment delays ($\beta = -.167$). Therefore, improving access to construction finance should be a priority for enhancing the timely and effective delivery of affordable housing projects. The negative coefficient for financing cost implies that developers and PPP partners may experience reduced delivery performance when borrowing becomes expensive, while the negative effect of payment delays highlights the importance of timely financial disbursements and payments throughout project implementation. The positive effect of financing structure further suggests that well-designed combinations of financing sources and risk-sharing arrangements can strengthen project implementation. The results demonstrate that both the availability and quality of financing arrangements are important determinants of affordable housing project delivery performance in Kenya, supporting the need for financing mechanisms that are accessible, affordable, timely and appropriately structured.

3.3 Moderating Effect of Government support and PPP on the relationship between Financing Constraints and Delivery Performance of Affordable Housing Projects.

Moderated regression model was used to determine the moderating effect of government and PPP support on financing constraints and delivery performance of affordable housing projects. The model summary results after moderation are shown in Table 5.

Table 5: Model summary Results after Moderation

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.668 ^a	.446	.429	.66406

a. Predictors: (Constant), Government support and PPP, Financing Constraints* Government support and PPP (Interaction term)

The moderated regression model produced an R of .668, indicating a moderately strong overall relationship between financing constraints, government and PPP support, and affordable housing project delivery performance. The R² of .446 indicates that the model explains 44.6% of the variation in delivery performance. The results suggest that the inclusion of government and PPP support and the financing constraints * government/PPP support interaction term provide a moderate level of explanatory power for delivery performance. The ANOVA results after moderation are shown in Table 6.

Table 6: ANOVA results after moderation

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	34.740	3	11.580	26.260	.000 ^b
Residual	43.216	98	.441		
Total	77.956	101			

a. Dependent Variable: Affordable Housing Project Delivery Performance

b. Predictors: (Constant), Financing Constraints, Government support and PPP, Financing Constraints* Government support and PPP (Interaction term)

The ANOVA results after moderation show that the moderated regression model was statistically significant. This indicates that financing constraints, government and PPP support, and the financing constraints*government/PPP support interaction term jointly provide a significant explanation of variations in affordable housing project delivery performance. Since the

significance value is below the 0.05 threshold, the null hypothesis that the predictors jointly have no significant relationship with delivery performance is rejected. The implication is that the moderated model is statistically useful for explaining affordable housing project delivery performance; however, the ANOVA result does not by itself establish whether government and PPP support significantly moderates the relationship between financing constraints and delivery performance. This requires interpretation of the interaction-term coefficient and its significance level. The regression coefficient results showing interaction term is shown in Table 7.

Table 7: Coefficient results after Moderation

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.522	3.545		.712	.478
	Financing Constraints	-.480	.186	-.436	-2.581	.003
	Government support and PPP	.154	.073	.131	2.109	.034
	Financing Constraints* Government support and PPP (Interaction term)	.210	.073	.165	2.876	.000

a. Dependent Variable: Affordable Housing Project Delivery Performance

The coefficient results indicate that financing constraints had a negative and statistically significant effect on affordable housing project delivery. This suggests that, while holding other variables constant, an increase in financing constraints is associated with a decline in project delivery performance. Government support and PPP had a positive and statistically significant direct effect on delivery performance, implying that stronger government and PPP support is associated with improved delivery performance. Most importantly, the interaction between financing constraints and government/PPP support was positive and statistically significant. This confirms that government and PPP support significantly moderates the relationship between financing constraints and affordable housing project delivery performance.

The positive interaction coefficient ($B = .210$) indicates that government and PPP support weakens the negative effect of financing constraints on project delivery performance. In other words, although financing constraints independently undermine delivery performance, stronger government and PPP support helps cushion or mitigate this adverse effect. For example, government interventions such as provision of land, infrastructure, guarantees, policy support and facilitation of private-sector participation, together with PPP mechanisms for mobilizing private capital and sharing project risks, can reduce the extent to which financing limitations translate into poor delivery outcomes. The implication is that government and PPP support serves as a buffering mechanism, making affordable housing projects more resilient to financing constraints. Thus, the study provides empirical evidence that effective government–private sector collaboration can help alleviate the adverse consequences of financing constraints on the delivery of affordable housing projects in Kenya.

4. DISCUSSION

The findings demonstrate that access to construction finance is an important determinant of affordable housing project delivery performance in Kenya. The correlation analysis established a very strong positive relationship between access to construction finance and delivery performance, while the regression results confirmed a positive and statistically significant effect. The standardized coefficient further indicates that access to construction finance was the strongest predictor of delivery performance among the four financing variables examined. This implies that affordable housing projects with adequate and timely access to construction capital are more likely to maintain construction activities, meet planned schedules, control costs and achieve intended outputs. Conversely, limited access to construction finance can constrain cash flows, delay procurement and construction activities, and ultimately reduce project delivery performance.

The finding is consistent with Siati et al. (2025), who established that project financing design had a positive and significant effect on the implementation of affordable housing projects in Nairobi Metropolis. It also agrees with Kimani (2020), who found that innovative housing financing significantly influenced affordable housing delivery in Nairobi City County. Similarly, Kavaarpuo et al. (2024) reported that formal housing finance was scarce and expensive in underdeveloped financial markets, necessitating alternative financing arrangements. The present finding therefore

agrees with the existing literature, particularly the Kenyan evidence, by demonstrating that access to adequate financing is central to project implementation. It also supports Gibb and Hayton (2017), who identified financing barriers as structural obstacles to affordable housing supply. However, the finding differs from Rafique et al. (2026), who found that financial restrictions did not have a significant effect on affordable housing delivery in Pakistan. This difference may reflect variations in institutional environments, financing systems and the effectiveness of alternative support mechanisms across countries.

Similarly, the results demonstrate that financing structure has a positive and statistically significant effect on affordable housing project delivery performance. The variable recorded a strong positive correlation with delivery performance and a significant positive regression coefficient. This suggests that projects supported by appropriately designed financing structures tend to perform better than those relying on less suitable financing arrangements. A well-designed financing structure can combine different sources of capital, distribute financial risks among project partners and align the maturity of financing with the long-term nature of housing investments. Within PPP arrangements, an appropriate combination of public financing, private equity, debt, guarantees, subsidies and other financing instruments can improve project bankability and reduce pressure on a single financing source. The finding therefore implies that the quality and appropriateness of the financing architecture are important for achieving effective affordable housing project delivery.

The finding agrees strongly with Siati et al. (2025), who found that project financing design had a positive and significant effect on the implementation of affordable housing projects in Nairobi Metropolis. It also supports Ngema and Chauke (2026), who found that blended financing models combining government subsidies, concessional loans, equity and credit-enhancement mechanisms can reduce the effective cost of capital, stabilize cash flows and attract institutional investment. Similarly, Kimani (2020) established that innovative housing financing significantly influenced affordable housing delivery in Nairobi City County. The present study therefore largely agrees with previous studies, reinforcing the argument that appropriate financing structures facilitate project implementation. However, Canelas (2025) highlights the complexity and ambiguity that may arise within PPP arrangements, suggesting that sophisticated financing structures can also introduce coordination and contractual challenges. The present positive finding therefore implies

that financing complexity does not necessarily undermine performance when financing arrangements are properly designed, coordinated and supported by effective institutional mechanisms.

Financing cost negatively affects affordable housing project delivery performance. Financing cost recorded a strong negative correlation with delivery performance and a statistically significant negative regression coefficient. This means that increases in the cost of financing are associated with reductions in project delivery performance, holding other factors constant. High interest rates, borrowing charges and other financing expenses increase the cost of capital available to developers and PPP partners, thereby reducing funds available for actual construction activities. High financing costs may also increase project budgets, reduce financial viability and make it difficult for developers to maintain affordable selling or rental prices. The finding therefore demonstrates that access to finance alone is insufficient; the financing must also be available at a cost that allows projects to remain financially viable and affordable.

This finding agrees with Kavaarpuo et al. (2024), who found that formal housing finance in underdeveloped financial markets was not only scarce but also expensive, thereby encouraging reliance on alternative financing arrangements. It is also consistent with Ngema and Chauke (2026), who argued that blended financing arrangements involving government subsidies, concessional loans, equity and credit-enhancement instruments can reduce the effective cost of capital and improve the financial viability of affordable housing projects. The finding further supports Ganiyu et al. (2017), who proposed mortgage subsidies, down-payment grants and mortgage-interest deductions as mechanisms for reducing financing burdens. However, it contrasts with Rafique et al. (2026), who found no significant effect of financial restrictions on affordable housing delivery. The difference suggests that the effect of financing costs may depend on the availability of government interventions, concessional financing, risk-sharing mechanisms and the broader financial-market environment. In the Kenyan PPP context, therefore, the negative effect observed in this study suggests that expensive capital remains a significant constraint to effective project delivery.

The study established that payment delays have a significant negative relationship with affordable housing project delivery performance. Payment delays were strongly and negatively correlated with delivery performance and had a statistically significant negative effect in the regression model. The finding implies that delays in the release of funds, payment of contractors, disbursement of loans or settlement of project-related financial obligations can disrupt the continuity of construction activities. Such delays may create cash-flow shortages, prevent contractors from paying workers and suppliers on time, slow procurement and contribute to project schedule overruns. Payment delays may also result in claims, additional financing costs and strained relationships among government agencies, financiers, developers and contractors. Thus, financing timeliness is an important component of effective project financing, even where adequate financing has been secured.

The finding is consistent with the broader financing literature represented by Gibb and Hayton (2017), which identified barriers to housing finance as constraints on housing supply and delivery, and with Ngema and Chauke (2026), who emphasized the importance of stable cash flows for the long-term viability of affordable housing projects. It also supports Siati et al. (2025), whose finding that project financing design significantly influences implementation implies that effective financing arrangements must facilitate the timely availability of project resources. The present study therefore agrees with previous evidence that weaknesses in financial arrangements can translate into implementation difficulties. However, the present study provides more specific evidence by isolating payment delays as an individual financing constraint and demonstrating its statistically significant negative effect on delivery performance. This adds to previous Kenyan studies by showing that not only the availability and design of financing matter, but also the timing and reliability of financial disbursements during implementation.

The correlation results show that government and PPP support has a strong positive association with affordable housing project delivery performance. In the moderated regression, government and PPP support also had a positive and statistically significant direct effect on delivery performance. More importantly, the interaction between financing constraints and government/PPP support was positive and statistically significant. The positive interaction coefficient indicates that government and PPP support buffers the negative effect of financing

constraints on project delivery performance. This means that although financing constraints independently reduce delivery performance, stronger government and PPP support reduces the severity of this adverse relationship. Government interventions such as land provision, infrastructure development, policy facilitation, guarantees and regulatory support, combined with private-sector capital, technical expertise and risk-sharing, can therefore strengthen project resilience when financing constraints exist.

The finding agrees with Kimani (2020), who found that collaborative approaches significantly influenced affordable housing delivery in Nairobi City County, and with Eseoghene et al. (2022), who emphasized the importance of effective PPP arrangements, performance monitoring and problem resolution in affordable housing delivery. It also supports Radford (2026), who argues that PPPs have potential to expand affordable housing delivery by combining public and private resources, and Orango et al. (2025), who found that real estate market conditions significantly influence PPP performance in affordable housing delivery in Nairobi Metropolitan. The present study, however, makes an additional contribution by demonstrating empirically that government and PPP support moderates the financing constraints–delivery performance relationship. This finding partially contrasts with the caution raised by Canelas (2025) regarding the ambiguity and complexity associated with PPPs, as the current results indicate that, when effectively structured and supported, PPP arrangements can cushion the adverse consequences of financing constraints. Thus, the study supports the view that PPPs should not be regarded as an automatic solution to financing constraints, but rather as a mechanism through which government and private-sector resources, risks and capabilities can be combined to mitigate financing-related challenges.

4.1 Conclusions

The study concludes that the delivery performance of affordable housing projects in Kenya is influenced by the prevailing financing conditions. Access to construction finance is essential for ensuring that projects have adequate resources to support construction activities, procurement and timely completion. Financing costs and payment delays can constrain project implementation by increasing financial pressure and disrupting cash flows, while an appropriate financing structure can facilitate effective allocation of financial resources and project risks. The study therefore concludes that addressing financing constraints requires not only increasing the availability of

finance but also ensuring affordability, predictability and appropriateness of financing arrangements throughout the project implementation process.

The study further concludes that government support and public–private partnerships are important in strengthening the capacity of affordable housing projects to overcome financing-related challenges. Government support can facilitate access to land, infrastructure, policy incentives, guarantees and regulatory approvals, while PPP arrangements can mobilize private-sector capital, technical expertise, project management capacity and risk-sharing mechanisms. Effective coordination between government and private-sector partners can therefore create a more supportive financing environment and enhance the ability of affordable housing projects to achieve their intended delivery outcomes. Sustainable affordable housing delivery requires an integrated financing approach in which adequate construction finance, manageable financing costs, timely payments, suitable financing structures and effective government–PPP collaboration are addressed collectively.

4.2 Implication to Policy and Practice

The findings imply that project developers, financial institutions and implementing agencies should strengthen mechanisms that improve the availability, accessibility and timeliness of construction finance for affordable housing projects. In practice, developers should prepare robust financial plans, maintain credible cash-flow projections and strengthen relationships with lenders and investors to facilitate timely access to funds. Financial institutions can develop financing products that are tailored to the cash-flow characteristics of affordable housing projects, including phased construction financing and longer-tenure facilities. Such measures can reduce interruptions in construction and enable developers to maintain project schedules and planned outputs.

The findings imply that practitioners should place greater emphasis on controlling the cost of capital used to finance affordable housing projects. Developers should assess the total cost of different financing options and adopt financing arrangements that balance affordability, risk and repayment requirements. Financial institutions and project financiers can support delivery by offering competitive lending conditions, while developers can combine different sources of finance to reduce excessive dependence on relatively expensive debt. Lower and more predictable

financing costs can improve project viability and enable developers to maintain affordable selling or rental prices without compromising project quality.

The findings have practical implications for the management of financial flows throughout the project lifecycle. Project developers, contractors and government agencies should establish clear payment schedules, strengthen financial monitoring systems and ensure that approved payments are processed within agreed timelines. Contractual arrangements should also clearly specify payment obligations, responsibilities and procedures for resolving payment-related disputes. In practice, timely disbursement of funds can help contractors maintain labour, procure construction materials and meet contractual obligations, thereby reducing disruptions associated with cash-flow shortages.

Furthermore, affordable housing projects require carefully designed financing structures that appropriately combine public and private sources of capital while allocating risks to the parties best positioned to manage them. Practitioners should consider combinations of equity, commercial or concessional debt, government support, guarantees and other appropriate financing instruments depending on project characteristics. PPP partners should undertake detailed financial and risk assessments before project implementation to ensure that the financing structure is sustainable throughout the project lifecycle. Effective structuring can improve financial resilience while supporting the achievement of affordable housing objectives.

Finally, the findings suggest that the government should strengthen the institutional and regulatory framework supporting affordable housing finance and PPP implementation. Policy should promote predictable access to construction finance, competitive financing costs, timely government and project payments, and transparent financing structures. The government should also strengthen PPP coordination, facilitate access to land and infrastructure, streamline approvals, and consider appropriate guarantees, incentives and risk-sharing mechanisms that can attract private-sector investment. Importantly, government and PPP support should be structured not merely to increase financing availability, but to mitigate financing constraints and create a predictable investment environment in which private-sector participation can contribute sustainably to affordable housing delivery.

4.3 Implication to Theory

The findings support Transaction Cost Economics by demonstrating that financing conditions and institutional arrangements are important in explaining the delivery performance of affordable housing projects implemented through PPPs. Consistent with Williamson's (1979) proposition that economic actors seek governance arrangements that minimize transaction costs, the findings suggest that access to construction finance, financing costs, payment delays and financing structure are closely linked to the efficiency of project implementation. The significant role of government support and PPP arrangements further reinforces the TCE argument that appropriate governance, contractual coordination, risk allocation and institutional support can reduce transaction-related uncertainties and mitigate the adverse effects of financing constraints. The findings therefore extend the application of TCE to affordable housing PPPs by showing that transaction costs arising from uncertainty, contractual complexity, monitoring, negotiations and risk allocation can influence the ability of project actors to secure and manage financing effectively, ultimately shaping project delivery performance. The study consequently demonstrates that TCE is useful not only for explaining firms' choices of governance structures but also for understanding how the efficiency of inter-organizational arrangements between government, private developers, financiers and other project stakeholders can facilitate or constrain affordable housing delivery.

4.4 Area or Further Research

Future research should examine other factors and concepts that may influence affordable housing project delivery performance beyond the financing constraints investigated in this study. These may include land availability and acquisition processes, construction material costs, technological adoption, project management competence, contractor capacity, regulatory and approval processes, political and policy stability, infrastructure availability, community participation, housing demand, market conditions, risk management, corruption and governance practices, and the capacity of institutions to coordinate PPP arrangements. Further studies could also examine concepts such as project risk allocation, institutional capacity, stakeholder coordination, financial innovation, supply-chain resilience and regulatory efficiency as potential determinants or moderators of affordable housing project delivery performance. Such investigations would provide

a broader understanding of the factors that facilitate or constrain the timely, cost-effective and quality delivery of affordable housing projects.

Future studies should employ longitudinal to complement the cross-sectional quantitative approach adopted in this study. Longitudinal studies could track affordable housing projects from financial closure through construction and completion, thereby establishing how financing conditions and other project factors change over time and affect delivery outcomes. Future researchers could also apply structural equation modelling, comparative multiple-case studies and mediation or moderated-mediation models to examine complex relationships among financing, institutional, project and market factors. Comparative studies across counties in Kenya or between Kenya and other African countries would further enhance the generalizability of findings on affordable housing project delivery performance.

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