Optimizing Mortgage-Financed Construction: An Empirical Assessment of Critical Success Factors in Kenya

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Abstract

Critical Success Factors (CSFs) are widely recognized as key determinants of construction project success, yet their specific influence on mortgage-financed construction projects (MFCPs) in Kenya remains underexplored. This study empirically analyzed the relationship between CSFs and project performance, focusing on five performance indicators—budget adherence, schedule adherence, quality, safety, and cash flow. Using a survey research design, data were collected from 1,063 MFCPs initiated during the 2021/2022 financial year. Respondents included site agents and clerks of works, with data analyzed through descriptive statistics, correlation, and multiple regression. The findings reveal that quality performance is the most sensitive to CSFs, showing strong positive correlations with project-related, consultant-related, contractor-related, and resource-related factors. Budget adherence also demonstrated moderate positive associations with project management, contract management, financial health, and contractor competence, underscoring the importance of internal governance systems in cost control. Schedule adherence exhibited weaker but significant correlations with resource, financial, contract, and client-related factors, reflecting the influence of external bottlenecks such as permitting and regulatory delays. Safety performance, however, showed no significant correlation with CSFs, highlighting the need for specialized safety management practices distinct from general success drivers. Regression analysis confirmed that CSFs collectively explain approximately 38% of the variance in project performance, indicating that while they are critical, other external and project-specific factors also play substantial roles. The study concludes that embedding CSFs into project governance frameworks is essential for improving quality and cost outcomes, while schedule and safety require complementary strategies. Recommendations emphasize strengthening contractor capacity, resource adequacy, and dedicated safety oversight to enhance MFCP performance in Kenya.

Keywords: Critical Success Factors, Project Performance, Mortgage Financing, Construction Management, Kenya

Introduction

Globally, the construction industry has long recognized the importance of Critical Success Factors (CSFs) in determining project outcomes. CSFs, such as effective project management, contractor competence, resource adequacy, and client involvement, are widely acknowledged as key drivers of project success across diverse contexts (PMI, 2021). Empirical studies in developed economies show that projects with strong CSF alignment achieve better cost control, schedule adherence, and quality outcomes (Dadzie & Yalley, 2018). However, construction projects remain complex, multi-dimensional undertakings where success depends on the interplay of financial, managerial, and external factors. This makes the identification and prioritization of CSFs essential for improving project performance worldwide.

Across Africa, the housing deficit exceeds 51 million units, with governments increasingly turning to mortgage financing as a mechanism to accelerate housing delivery (UN-Habitat, 2020). Yet, project performance remains inconsistent, often undermined by weak governance, contractor inefficiencies, and resource constraints (Muigai et al., 2025). Regional studies highlight that CSFs such as stakeholder engagement, contract management, and resource availability are critical in mitigating risks and ensuring project viability (Wanjau et al., 2024). Despite this recognition, many projects still suffer from delays, cost overruns, and quality deficiencies, suggesting that CSFs are not consistently embedded into project management frameworks.

In Kenya, MFCPs are central to the Affordable Housing Programme, which seeks to address a housing deficit of approximately 2 million units (Kenya National Bureau of Statistics, 2021). The Central Bank of Kenya (2023) reported 1,063 new mortgage facilities in the 2021/2022 financial year, underscoring the growing reliance on mortgage financing for project delivery. However, MFCPs continue to face challenges, including budget overruns, schedule delays, cash flow disruptions, and quality concerns. Evidence suggests that CSFs such as project management competence, contractor capability, and resource adequacy strongly influence project outcomes, yet their relative importance and combined effect remain underexplored in Kenya's housing sector (Wanjau et al., 2024). Although CSFs are widely acknowledged as determinants of project success, empirical evidence on their effect in Kenya's mortgage-financed construction sector is limited. Existing studies have identified risks and financing challenges but have not systematically analyzed how CSFs across domains translate into measurable improvements in project performance. This gap constrains developers, financiers, and policymakers from designing interventions that strengthen project delivery. While global and regional literature emphasizes the role of CSFs in enhancing project outcomes, few studies in Kenya have empirically tested their relationship with MFCP performance. The weak integration of CSFs into project governance frameworks limits e the sector's ability to achieve consistent success. The objectives of this study therefore include: (i) to identify and categorize the critical success factors influencing MFCPs in Kenya, (ii) to assess the current performance of MFCPs in Kenya, and (iii) to analyze the relationship between CSFs and the performance of MFCPs in Kenya.

Methodology

Research Design

A research design establishes a framework for data gathering and analysis. This study adopts the survey research design described by Bryman (2012) and Creswell and Plano Clark (2017). Bryman (2012) describes a survey as one that studies multiple cases at a single point in time by measuring quantifiable data

with the aim of identifying patterns of association. The advantage of data quantification is that it provides a consistent benchmark to the researcher and, at the same time, makes it possible to understand relationships between variables (Bryman, 2012).

Sampling Methods and Sample Size

The unit of analysis was the construction project, while the unit of observation was either the site agent or the clerk of works found on site. Inferences made were on all mortgage-financed construction projects, given that the sample size was selected probabilistically as outlined in the next section.

In this study, the population included all construction projects financed through mortgages throughout the country. This study focuses on the 1,063 mortgages initiated during the 2021/2022 financial year, as per the annual banking report by the Central Bank of Kenya (2023). The sample size was calculated based on the following formulae from Cochran (1977) and Baartt et al. (2001).

$$n_o = \frac{t^2 \times s^2}{e^2}$$

Where: -

- n_0= required return sample size
- t = alpha level value (0.01 = 2.576 for sample size of 120 or more; the alpha level of .01 indicates the level of risk the researcher is willing to take that true margin of error may exceed the acceptable margin of error.) 2.576 is the z-score for a 99% confidence interval.
- s = estimated standard deviation in population for 7-point scale (1.167; estimate of variance deviation for 7-point scale calculated by using 7 [inclusive range of scale] divided by 6 [number of standard deviations that include almost all (approximately 98%) of the possible values in the range])
- e = acceptable level of error for the mean being estimated (0.21; number of points on primary scale × acceptable margin of error; points on primary scale = 7; acceptable margin of error = .03 [error researcher is willing to accept])

Therefore;

$$n_o = \frac{2.576^2 \times 1.167^2}{0.21^2} = 205$$

However, since this sample size exceeds 5% of the population (1,063×5%=53), the following (Cochran, 1977) correction formula should be used to estimate the final sample size.

$$n_f = \frac{n_0}{1 + \frac{n_0}{population}} = \frac{205}{1 + \frac{205}{1063}} = 171\ projects$$

Where;

- n_f= final sample size
- n_0= original sample size
- Population = target population

This study adopted simple random sampling as its choice of selecting the sample size from the population. According to Kothari (2004), this sampling method is also known as chance sampling or probability sampling because each item in the population has an equal chance of being included in the sample, and each of the possible samples, in the case of a finite universe, has the same probability of being chosen. An ideal sample is one that meets the requirements of efficiency, representativeness, dependability, and adaptability.

Data Collection

Upon approval of the research proposal by the JKUAT Graduate School, the researcher sought permission from the National Commission for Science and Technology and Innovation (NACOSTI) to collect field data. According to (Creswell, 2003), structured interviews and questionnaires are the two most common research methods associated with survey research design. The former was adopted in this study as the method of collecting data. The measured indicators were derived from previous literature and refined so that they would be appropriate for the respondents but also generate enough data for hypothesis testing. The questionnaires were self-administered, and the majority of the questions were closed-ended. This made the collected data easily compatible with statistical analysis, which is the preferred method of data analysis in this study.

Data Analysis

The quantitative data were subjected to descriptive analysis using SPSS software. Descriptive statistics were used mostly to describe the distribution of variables. Measures of frequency (percent, count) and measures of central tendency (mean) were among the descriptive statistics that were performed. Pearson correlations and multiple regression analysis were used to evaluate the relationship between the CSFs and the performance of MFCPs.

Results and Discussion

Demographic Profiles

Five aspects of demographic profiles were considered in the data collection tool. These were: level of education, professional background, type of project, project value, and project duration. Their results have been presented in the following sections.

Level of Education

Results presented in Figure 1 showed that 52.5% (n=64) of the respondents had a bachelor's degree, while 36.1% (n=44) had a master's degree. Together, these two categories account for 108 out of 122 respondents (approximately 89%). This suggests that the sector is largely comprised of highly educated professionals. This could be attributed to the fact that most financial institutions prefer to give mortgages to salaried individuals who tend to be educated professionals. 5.7% (n=7) had a Diploma while only 3.3% (n=4) were PhD holders. The low number of Doctorates was expected, given that only a small percentage (probably only those in academia) of professionals advance beyond a master's degree. The least represented group was the post-secondary certificate holders, 2.4% (n=3).

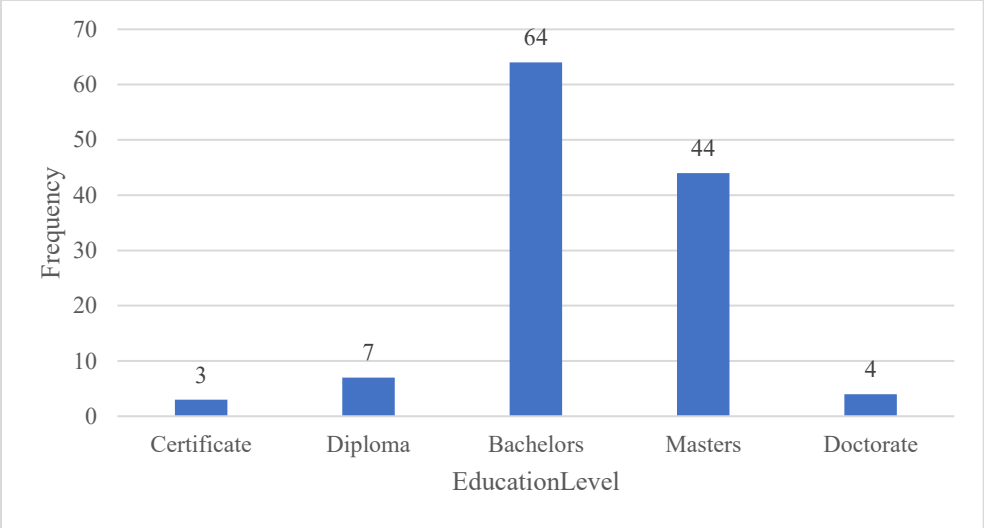

Figure 1: Level of Education

The findings reveal that Kenya's mortgage-financed construction sector is dominated by highly educated developers, with bachelor's and master's degrees being the norm. This likely enhances professionalism but may also create barriers for those with lower academic qualifications. The financial institutions appear to value highly educated professionals.

Professional Background

Given the expected diverse backgrounds of the respondents (developers), the question on their professional background was framed in an open-ended format. The results have been presented in the form of a word cloud, as demonstrated in Figure 2. A significant proportion of respondents have backgrounds in construction-related disciplines. These included Construction Management, Civil Engineering, Quantity Surveying, Structural Engineering, Architecture, and Mechanical Engineering, among others. A number of developers come from finance and banking backgrounds. This is expected since bank officials are well exposed to the various mortgage financing options available in the market. As expected, the range of professions was very wide.

Figure 2: Professional Background

Type of Projects

The respondents were asked to indicate the type of project they were currently undergoing, and which was mortgage-financed. Results presented in Figure 3 showed that residential houses were the most commonly mortgage-financed with a frequency of 68.3% (n=82). They were followed distantly mixed-use development 13.3% (n=16) and commercial buildings 11.7% (n=14). Office buildings and industrial houses were the least mortgage-financed types of construction projects, each with a frequency of 3.3% (n=4).

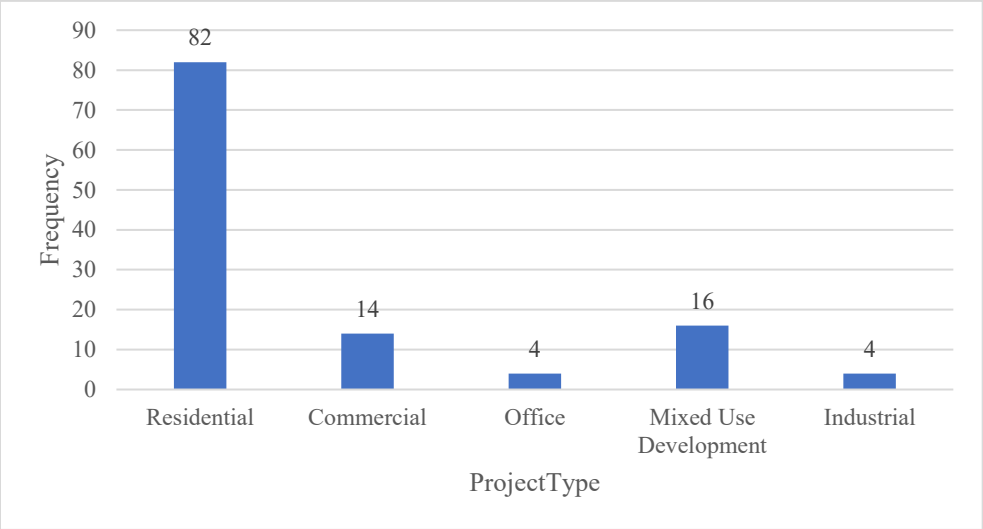

Figure 3: Type of Project

The results revealed that residential projects overwhelmingly dominate the mortgage-financed construction sector in Kenya, with commercial, office, mixed-use developments, and industrial projects making up a much smaller share. The overwhelming dominance of residential projects likely reflects Kenya's ongoing demand for housing, driven by population growth, urbanization, and government initiatives such as affordable housing programs. Mortgage products and incentives may be more accessible or attractive for residential developments compared to other sectors. The lower numbers for commercial, office, and industrial projects may a number of things, (i) mortgage financing is less commonly used or less available for non-residential developments, (ii) these sectors might rely more on alternative financing structures (e.g., corporate loans, equity investment), and (iii) there may be greater perceived risk or longer payback periods for non-residential projects, making them less attractive for mortgage-backed funding. This is because such projects are more capital-intensive compared to residential projects.

The presence of 16 MUD projects (13.3%) suggests a growing trend towards integrated developments that combine living, working, and leisure spaces. This aligns with global urbanization trends and can enhance project viability by diversifying revenue streams and meeting multiple market needs. This is fundamental in ensuring that completed projects are capable of repaying the loan obligations.

Project Value

The respondents were asked to indicate the value of the construction project they were currently undertaking. Figure 4 presents interesting results where the extremes recorded the highest frequencies. The results assumed an inverted bell curve. The majority of the construction projects (n=62, 51.2%) undertaken had a value of "up to 20 million" Kenyan shillings, followed by those with a value of "above 120 million" Kenyan shillings (n=32, 26.4%). Projects worth KShs. 81 – 100 million had a frequency of 9.1% (n=11) while those worth KShs. 21 – 40 million had a frequency of 8.3% (n=10). Projects worth KShs. 41 – 60 million and KShs. 61 – 80 both came last with a frequency of 2.5% (n=3).

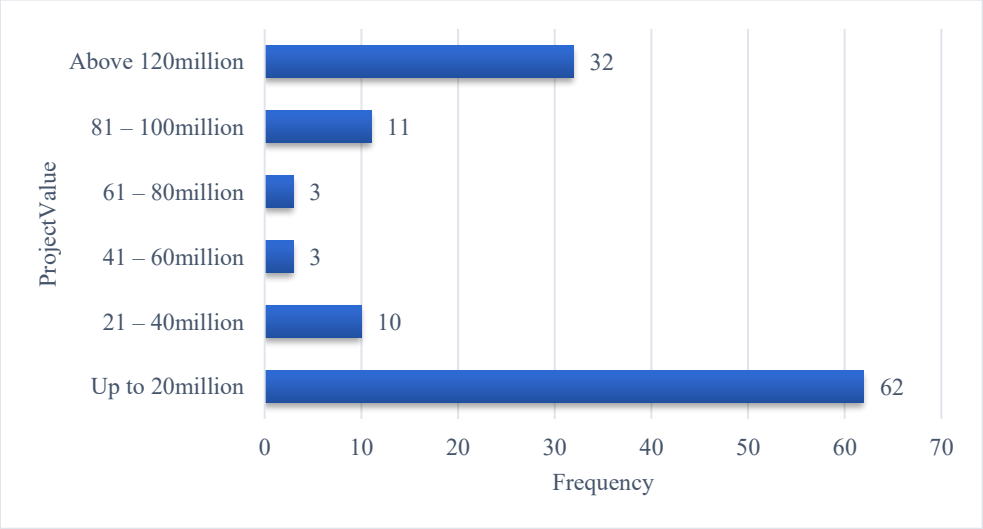

Figure 4: Project Value

The majority of projects (51%) fall into the "Up to 20 million" category. This suggests a strong concentration of small- to mid-scale developments, likely targeting affordable housing, which is a significant need in Kenya. This aligns with national priorities like the Affordable Housing Programme, which aims to increase access to affordable housing for low- and middle-income households (World Bank, 2020). The second-largest category (26%) includes high-end or large-scale developments. These could be commercial real estate, mixed-use developments, or luxury residential units aimed at upper-income markets or investors. This may reflect Kenya's growing upper-middle-income earners. The data reveals a "missing middle" in project value (21–100 million), indicating a possible need for more tailored financing instruments for mid-sized developers.

Project Duration

The project duration was measured in weeks. This was done based on intervals of 12 weeks. Results in Figure 5 showed a fair distribution across all groups. Projects with a duration of "above 72 weeks" were the most with a frequency of 24.8% (n=30). Projects with a duration of "61-72 weeks" had the least representation with a frequency of 5.0% (n=6). Short-duration projects of "less than 12 weeks" had a frequency of 9.1% (n=11).

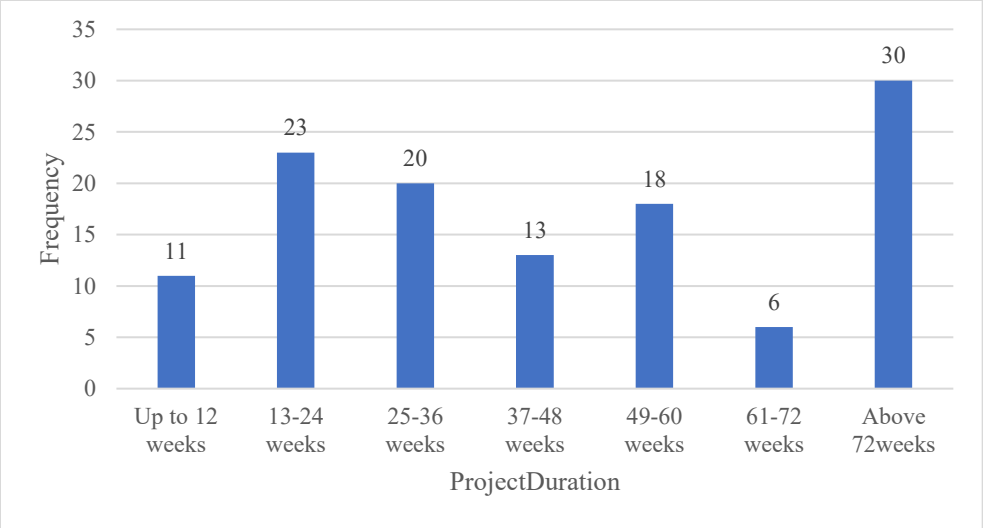

Figure 5: Project Duration

The highest number of projects (24.8%) reported durations of above 72 weeks, indicating that a significant portion of mortgage-financed developments in Kenya are long-term, complex projects, likely to be large-scale or multi-phase developments. This finding complements the earlier findings on project values, where a substantial number of projects also had high values, suggesting that large investments correlate with extended construction timelines.

The second most common durations are 13–24 weeks (19%) and 25–36 weeks (17%). These reflect short- to medium-term construction projects, likely aligned with small- to mid-sized residential projects, such as single-family homes, low-rise apartments, or smaller gated communities. Only 11 projects (9%) were completed in up to 12 weeks, suggesting that rapid builds are rare, possibly due to challenges such as bureaucratic delays (permits, approvals), shortage of skilled labour or materials, and limited use of prefabricated or modular technologies, among other reasons. Long project durations raise the risk profile for lenders and developers, especially in Kenya, where project delays are common (World Bank, 2021).

Current Performance of MFCPs

Five aspects were used to evaluate the performance of MFCPs. These were: budget adherence, schedule adherence, project quality, safety standards, and project cash flow. A seven-point Likert scale was used. The results have been presented in Table 1.

Table 1: Performance of MFCPs

Variable	N	Min	Max	Mean	SD	CV
Budget Adherence	123	1	6	3.21	.861	27%
Schedule Adherence	123	1	5	3.15	.906	29%
Quality Expectations	123	2	7	4.89	.895	18%
Safety Incidents	123	1	7	4.86	1.719	35%
Cash Flow Problems	122	1	7	4.23	1.365	32%

Source: (Author, 2025)

Budget adherence in mortgage-financed construction projects (MFCPs) in Kenya shows a mean score of 3.21, indicating slight overruns attributed to unforeseen costs and poor planning. Schedule adherence averages at 3.15, revealing that most projects are behind schedule, often due to manageable issues but occasionally due to systemic challenges. Project quality averages 4.89, indicating a focus on meeting standards, though some projects face significant quality deficiencies. Safety standards show a mean of 4.86, with most incidents being minor, but serious accidents signal a need for better safety management. Cash flow issues are prevalent, with a mean of 4.23 reflecting moderate challenges that disrupt payments and project timelines. High variability in responses across these metrics illustrates the inherent risks and inconsistencies within the construction sector in Kenya.

Critical Success Factors of MFCPs

In this section, respondents were asked to indicate the extent to which they agreed with various statements relating to critical success factors of MFCPs. Seven options were presented to them, ranging from "extremely low" to "extremely high". A total of 61 CSFs were evaluated and summarised in ten categories, as presented in Table 2.

Table 2: Critical Success Factors of MFCPs

	Critical Success Factors	Min	Max	Mean	SD	CV	RII	Rank
1.	Procurement-Related Factors	1	7	4.83	1.180	25%	0.690	9
2.	Project-Related Factors	1	7	5.37	1.161	22%	0.766	3
3.	Client-Related Factors	1	7	4.86	1.357	28%	0.695	8
4.	Consultant-Related Factors	1	7	5.40	1.159	22%	0.771	2
5.	Project Management-Related Factors	1	7	5.45	1.098	20%	0.779	1
6.	Contractor-Related Factors	1	7	5.25	1.147	22%	0.749	4
7.	Resource-Related Factors	1	7	5.08	1.212	24%	0.726	6
8.	Financial-Related Factors	1	7	4.96	1.349	28%	0.709	7
9.	Contract Management-Related Factors	1	7	5.16	1.329	26%	0.737	5
	External Factors	1	7	4.50	1.524	34%	0.643	10

Source: (Author, 2025)

Relationship Between the Performance of MFCPs in Kenya and the CSFs

The relationship between the performance of MFCPs and the Critical Success Factors was evaluated on two levels. First, a correlation analysis was carried out. This was followed by a multiple linear regression.

Correlation Between the Performance of Mfcps and the Csfs

Table 3 presents a correlation analysis between the aggregated critical success factors and various performance indicators in MFCPs. The results reveal the following key insights for mortgage-financed construction projects in Kenya. First, quality performance is the most sensitive to all CSFs, especially project-related factors. Focus on team capabilities, project scope handling, resource provision, and consultant and contractor competence is paramount. Second, budget adherence benefits from contract management, project management, resource and financial health, and contractor effectiveness. These factors help control costs by streamlining execution and reducing risks. Third, schedule adherence depends on a mix of internal management (contracts, resources, finances) and external conditions, with client factors

also playing a role. Lastly, safety performance remains independent of these general critical success factors, requiring specialized management focus.

Table 3: Correlation between Performance of MFCPs and CSFs

Critical Success Factors		BA	SA	QP	SP
Procurement-Related Factors	Pearson Correlation	.187*	.090	.434**	.094
	Sig. (2-tailed)	.039	.326	.000	.305
	N	122	122	122	122
Project-Related Factors	Pearson Correlation	.180*	.119	.600**	.075
	Sig. (2-tailed)	.046	.191	.000	.412
	N	123	123	123	123
Client-Related Factors	Pearson Correlation	.177	.220*	.296**	-.031
	Sig. (2-tailed)	.053	.015	.001	.737
	N	121	121	121	121
Consultant-Related Factors	Pearson Correlation	.233*	.095	.422**	.008
	Sig. (2-tailed)	.010	.303	.000	.930
	N	120	120	120	120
Project Management-Related Factors	Pearson Correlation	.361**	.156	.432**	-.017
	Sig. (2-tailed)	.000	.086	.000	.849
	N	122	122	122	122
Contractor-Related Factors	Pearson Correlation	.314**	.245**	.410**	-.002
	Sig. (2-tailed)	.000	.007	.000	.984
	N	120	120	120	120
Resource-Related Factors	Pearson Correlation	.355**	.299**	.473**	.015
	Sig. (2-tailed)	.000	.001	.000	.874
	N	118	118	118	118
Financial-Related Factors	Pearson Correlation	.297**	.295**	.287**	-.097
	Sig. (2-tailed)	.001	.001	.001	.290
	N	121	121	121	121
Contract Management-Related Factors	Pearson Correlation	.374**	.260**	.372**	-.068
	Sig. (2-tailed)	.000	.004	.000	.461
	N	121	121	121	121
External Factors	Pearson Correlation	.241**	.279**	.318**	-.046
	Sig. (2-tailed)	.008	.002	.000	.616
	N	120	120	120	120

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
BA=Budget Adherence; SA=Schedule Adherence; QP=Quality Performance; SP=Safety Performance

Source: (Author, 2025)

Quality performance (QP) recorded the strongest and most consistent positive associations. All CSF categories significantly correlate with quality performance, with coefficients ranging from weak (*client-related* 0.296) to moderately strong (*project-related* 0.600). This means that quality in MFCPs is highly sensitive to critical success factors across all domains, especially project-related factors (e.g., team effectiveness, scope handling), resource availability, contractor competency, and sound contract management. This highlights the vital role these factors play in ensuring technical compliance,

workmanship quality, and minimizing rework (Dadzie et al., 2012). Procurement and consultant factors also strongly influence quality, emphasizing the importance of selecting capable supply chain partners and consultants in driving superior outcomes.

Budget adherence (BA) recorded moderate positive correlations across the board. Significant positive correlations exist for *contract management-related* (r=0.374), *project management-related* (r=0.361), *resource-related* (r=0.355), *contractor-related* (r=0.314), *financial-related* (r=0.297), and *consultant-related factors* (r=0.233). *Procurement-related and project-related* factors also show significant but weaker correlations. This means that maintaining budget control depends on multiple success drivers, including effective contract and project management, resource adequacy and management, contractor capability, and stable financial arrangements. These align with literature indicating that these areas mitigate cost overruns through better planning, monitoring, and execution (Iribagiza & Kirabo, 2024; Kalegera & Omoro, 2020; Otike et al., 2024). Notably, external factors and client-related factors have weaker or near-significant influence on budget, suggesting internal team and management systems have stronger cost impacts.

Schedule adherence (SA) recorded positive but generally weaker correlations. Several CSFs significantly correlate with schedule adherence, notably *resource-related* (r=0.299), *financial-related* (r=0.295), *contract management-related* (r=0.260), *contractor-related* (r=0.245), *external factors* (r=0.279), and *client-related* (r=0.220). *Project management-related* and *procurement-related factors* show positive but not significant correlations. Schedule adherence is influenced by complex internal and external factors, including resource availability, financial stability, contract management, and client involvement. Timely availability of funds and resources, prompt decision-making by clients, and responsive contract management facilitate on-time delivery (Mogoa & Muchelule, 2023; Ngwai et al., 2019). That project-related factors (*team effectiveness, complexity*) have a weaker schedule impact may indicate that other external bottlenecks (permits, market conditions) are also at play.

Safety performance (SP) has no significant correlations with CSFs. None of the critical success factor categories shows a statistically significant correlation with safety performance. Correlations are very weak or slightly negative. Safety, as echoed across prior analyses, is mostly independent of these general success factors and relies heavily on dedicated safety management practices, regulatory enforcement, onsite safety culture, training, and monitoring (Ngacho & Das, 2015). This highlights the need for a distinct safety management focus distinct from general project success drivers.

These results have four main implications. The first one is about an integrated management approach for quality and cost. The findings underscore that quality and budget adherence depend on synergistic effects of project management, contract management, contractor competence, resource adequacy, financial health, and consultant expertise. Optimizing these areas creates robust platforms for technical excellence and financial control. Second, schedule integrity requires diverse inputs. Schedule adherence benefits from both internal coordination (contracts, finances, resources) and external factors (permitting, regulations). Coordinated efforts between stakeholders, transparent communication, and contingency planning enhance timely delivery. Third, client involvement affects schedule and quality. Although client-related factors show weaker influence, their significant link to schedule and quality highlights the importance of client clarity, engagement, and expectation management to support performance. Lastly, safety needs separate vigilance. Since safety remains uncorrelated with CSFs broadly, construction projects should maintain dedicated

safety leadership, continuous training, and strict enforcement to ensure worker well-being independently of other project success parameters.

Multiple Linear Regression between the Performance of MFCPs and the CSFs

Beyond the bivariate correlations, multiple linear regression was carried out between the Performance of MFCPs and the CSFs for the purpose of testing the study's hypothesis. The regression analysis was based on the equation below.

$P_{MFCPs} = \beta_o + (\beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10}) + \varepsilon$ Where:

- P_{MFCPs} is the performance of Mortgage Financed Construction Projects
- β_o is a constant (intercept of Y, the predicted value for Y when X = 0)
- $\beta_{1\text{-}10}$ are the regression coefficients of the predictor variables ($X_{1\text{-}10}$)
- ε is the error of fit

The results of the regression analysis have been presented in Tables 4, 5, and 6. The Multiple Correlation Coefficient (R) value of 0.617 indicates a moderate positive correlation between the combined set of ten predictor variables (the CSFs) and the overall performance of mortgage-financed construction projects. This suggests that when these factors improve collectively, project performance tends to improve correspondingly, but there is still substantial unexplained variability. The achieved coefficient of determination (R^2=0.381) means that approximately 38.1% of the variance in project performance is explained by the linear combination of the ten critical success factors. This shows that while a significant portion of performance can be accounted for by these CSFs, over 60% of variation arises from other factors not captured within the model, such as project-specific idiosyncrasies, market dynamics, unforeseen risks, or measurement error. In construction project management research, an R^2 around 0.4 is fairly typical due to the complexity and multi-dimensional nature of construction performance (PMI, 2021).

The adjusted R^2 (0.315) corrects for the number of predictors in the model, penalizing for unnecessary variables that do not improve prediction. The drop from 0.381 to 0.315 indicates that some predictors may contribute little to explaining performance variance. This underscores the importance of considering parsimony in model building, focusing on the most critical factors enhances explanatory power and predictive validity (Hair Jr et al., 2010).

Table 4: Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.617a	.381	.315	.50919
a. Predictors: (Constant), External Factors, Project-Related Factors, Client-Related Factors, Contract Management-Related Factors, Contractor-Related Factors, Financial-Related Factors, Procurement-Related Factors, Project Management-Related Factors, Resource-Related Factors, Consultant-Related Factors				

Source: (Author, 2025)

Table 5 presents the ANOVA results of the regression analysis. The F-statistic is 5.792 with a p-value of .000, which is highly significant at the conventional alpha levels (e.g., $p < 0.01$). This indicates that the regression model as a whole statistically significantly predicts project performance. In other words, at least one or more of the ten critical success factors collectively explain variance in the performance of mortgage-financed construction projects better than a model with no predictors.

Table 5: ANOVA a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15.018	10	1.502	5.792	.000b
	Residual	24.372	94	.259		
	Total	39.390	104			
a. Dependent Variable: Project Performance						
b. Predictors: (Constant), External Factors, Project-Related Factors, Client-Related Factors, Contract Management-Related Factors, Contractor-Related Factors, Financial-Related Factors, Procurement-Related Factors, Project Management-Related Factors, Resource-Related Factors, Consultant-Related Factors						

Source: (Author, 2025)

Table 6 presents the multiple regression coefficients results. Only three out of ten factors were found to have a statistically significant standardized effect on the performance of MFCPs. The multiple regression analysis highlights that: (i) contractor-related and contract management-related factors are significant positive predictors of mortgage-financed construction project performance, underscoring their critical roles in cost, time, and quality management, (ii) consultant-related factors exhibit a significant negative relationship, suggesting potential challenges in consultant roles or project complexity that need further exploration and management refinement, and (iii) other factors, including procurement, resource availability, project management, client, financial, external, and project-related factors, do not show significant unique predictive power in this model, possibly due to interaction effects or overlapping constructs. According to Hair Jr et al. (2010), some variables show effects in bivariate correlations but lose significance in multivariate models due to shared variance with other predictors or insufficient sample size.

Table 6: Coefficients a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.727	.373		4.634	.000
	Procurement-Related Factors	-.185	.102	-.294	-1.808	.074
	Project-Related Factors	.101	.104	.151	.972	.334
	Client-Related Factors	-.021	.091	-.031	-.225	.822
	Consultant-Related Factors	-.391	.150	-.585	-2.597	.011
	Project Management-Related Factors	-.052	.127	-.075	-.411	.682
	Contractor-Related Factors	.359	.142	.534	2.531	.013
	Resource-Related Factors	.230	.134	.356	1.716	.089
	Financial-Related Factors	.083	.106	.132	.784	.435
	Contract Management-Related Factors	.193	.096	.307	2.004	.048
	External Factors	-.045	.087	-.078	-.520	.604
a. Dependent Variable: Project Performance						

Source: (Author, 2025)

Contractor-related factors have the strongest positive standardized effect (beta=0.534, p=.013). Contractor experience, competency, financial capacity, use of suitable methods, and adoption of technology significantly enhance overall project success. This aligns with prior studies highlighting contractors' pivotal

role in cost control, schedule management, and quality assurance (Mohammed & Bin Ishak, 2024). Therefore, emphasizing robust contractor selection and development strategies can yield substantial improvements in project outcomes.

Contract management-related factors (beta=0.307, p=.048) also exhibit a significant positive relationship with performance. This means that effective contract negotiation, implementation, communication, dispute resolution, and feedback systems foster smoother execution and reduce the risks of cost overruns and delays (Park & Kim, 2024). Therefore, strengthening contract administration practices is key to project success and mitigating disputes.

Unexpectedly, consultant-related factors show a significant negative (beta=-0.585, p=.011) effect. This may suggest issues such as over-reliance on consultants, bureaucratic delays, conflicting advice, or misalignment between consultant designs/specifications and actual site conditions, which can hamper progress. Alternatively, more consultant involvement might be indicative of complex projects with inherent challenges leading to poorer performance, a reverse causality or omitted variable bias. It highlights the need to critically assess the role and effectiveness of consultants, ensuring they add value without causing delays or cost escalations. Improved coordination and clearer roles might be necessary.

Procurement-related factors (beta=-0.294, p=.074) and *resource-related factors* (beta = 0.356, p=.089) show marginal (near-significant) effects but in opposite directions for procurement (negative) and resources (positive). Other factors, such as *project-related, client-related, project management-related, financial-related*, and *external factors*, are not statistically significant predictors in this model. While these factors correlate with project performance in bivariate analyses, their unique contribution may be reduced in a multivariate context due to overlap with other variables or sample size limitations (Hair et al., 2017). For example, project management-related factors may be mediated through contractor or contract management effects. Client and external factors may influence performance indirectly or interactively.

These findings have four practical and theoretical implications. First, the dominant positive role of contractor and contract management factors supports prioritizing these domains for project interventions focusing on procurement, contract execution, and workforce competency (Kerzner, 2017). Second, the negative coefficient on consultant-related factors calls for further qualitative investigation to unpack root causes, possibly adjusting consultant engagement strategies or improving integration between designers and execution teams. Third, the marginal significance of procurement and resource factors suggests they remain important but may require complementary enablers (e.g., timely cash flow or effective contract enforcement) to translate fully into improved outcomes. Lastly, the insignificance of client and external factors here suggests their effects may be more diffuse or indirect, emphasizing the complexity of construction project ecosystems.

Consequently, the following two regression equations were formulated based on the regression analysis. The first one includes all predictors, while the second one only includes those that are statistically significant.

$$P_{MFCPs} = 1.727 - 0.185X_1 + 0.101X_2 - 0.021X_3 - 0.391X_4 - 0.052X_5 + 0.359X_6 + 0.230X_7 + 0.083X_8 + 0.193X_9 - 0.045X_{10}$$

$$P_{MFCPs} = 1.727 - 0.391X_4 + 0.359X_6 + 0.193X_9$$

Where:

- P_{MFCPs} is the performance of Mortgage Financed Construction Projects
- Procurement-Related Factors (X_1)
- Project-Related Factors (X_2)
- Client-Related Factors (X_3)
- Consultant-Related Factors (X_4)
- Project Management-Related Factors (X_5)
- Contractor-Related Factors (X_6)
- Resource-Related Factors (X_7)
- Financial-Related Factors (X_8)
- Contract Management-Related Factors (X_9)
- External Factors (X_{10}).

Conclusions and Recommendations

Conclusions

This study examined the relationship between Critical Success Factors (CSFs) and the performance of mortgage-financed construction projects (MFCPs) in Kenya. The findings demonstrate that CSFs exert a significant influence on prject outcomes, though their effects vary across performance dimensions. Quality performance emerged as the most sensitive indicator, showing strong positive correlations with nearly all CSF categories, particularly project-related, consultant-related, contractor-related, and resource-related factors. This underscores the importance of technical competence, resource adequacy, and effective contract management in ensuring compliance with standards and minimizing rework.

Budget adherence also showed moderate positive correlations with several CSFs, including project management, contract management, contractor capability, and financial health. This suggests that cost control depends on robust internal systems and effective resource allocation. Schedule adherence, while positively correlated with resource, financial, contract, and client-related factors, exhibited weaker associations overall, reflecting the influence of external bottlenecks such as permitting and regulatory delays. Safety performance, however, showed no significant correlation with CSFs, highlighting that safety requires distinct management practices beyond general success drivers.

Regression analysis confirmed that CSFs collectively explain approximately 38% of the variance in project performance, indicating that while they are critical, other external and project-specific factors also play a substantial role. The study concludes that embedding CSFs into project governance frameworks is essential for improving quality and cost outcomes, while schedule and safety require complementary strategies tailored to external conditions and specialized management.

Recommendation

For Developers and Project Managers

- Prioritize project management and contract management practices to strengthen budget control and reduce cost overruns.
- Invest in resource adequacy and contractor capacity building to enhance quality outcomes and minimize delays.

- Establish dedicated safety management systems, including training, monitoring, and regulatory compliance, since safety is not strongly influenced by general CSFs.

For Financiers and Clients

- Engage actively in project oversight to support timely decision-making and schedule adherence.
- Ensure financial stability and resource availability to reduce disruptions and improve delivery timelines.

For Policymakers and Regulators

- Streamline permitting and regulatory processes to reduce external delays that weaken schedule performance.
- Promote frameworks that embed CSFs into housing and construction policies, ensuring that project governance emphasizes management competence, contractor development, and resource adequacy.

Cross-Sectoral Recommendation

- Adopt an integrated CSF-based framework for MFCPs, focusing on quality and cost as primary success drivers, while complementing these with external risk management and specialized safety oversight.

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