

Review Article

Preventing Contract Termination Pitfalls in Construction Projects: Insights from the Ghanaian Construction Industry

Charles Egyabeng Coleman^{1, 2, *} , Mundia Muya¹ , Chipulu Chipulu¹ 

¹Department of Civil and Environmental Engineering, University of Zambia, Lusaka, Zambia

²Department of Construction Technology and Management, Cape Coast Technical University, Cape Coast, Ghana

Abstract

Purpose: Premature termination of construction contracts is a recurring problem that causes financial losses, delays, and strained stakeholder relationships. However, there is limited research on the specific causes of contract termination, particularly in Ghana, and practical solutions to prevent it are often overlooked. This study aims to investigate the pitfalls of contract termination in the construction industry and to propose effective prevention strategies based on empirical data. **Design/Methodology/Approach:** A quantitative research approach was adopted, employing a combination of purposive and random sampling techniques to gather data from 315 participants representing diverse roles within the construction sector. A structured questionnaire based on contract termination pitfalls was used, and data analysis involved descriptive statistics, factor analysis, and structural equation modeling (SEM) techniques. **Findings:** The study identified several critical factors influencing contract termination, including prompt payment by clients, adherence to contractual terms, competent supervision, and effective dispute resolution mechanisms. Through factor analysis and SEM, two main constructs emerged: Proactive Contract Management Strategies (PCMS) and Contract Termination Risk Mitigation Measures (CTRMM), each comprising specific indicators crucial for preventing terminations. **Originality/value:** This research contributes to the existing literature by providing empirical evidence of contract termination pitfalls and effective prevention strategies within the construction industry. The study's multidimensional analysis approach, integrating quantitative techniques with Structural Equation Modelling (SEM), enhances the understanding of complex contractual dynamics and risk management in construction projects. **Implications:** The findings have practical implications for construction stakeholders, project managers, and policymakers. Implementing proactive contract management strategies such as clear payment protocols, rigorous quality control, and effective communication channels can significantly reduce contract termination risks. The study underscores the importance of integrating legal frameworks, innovative techniques, and managerial approaches in contract portfolios to enhance contract performance and project success in the construction sector.

Keywords

Construction Contract Termination, Termination Pitfalls, Prevention Strategies, Risk Management, SEM

1. Introduction

The construction industry is one of the major contributors to national development. To achieve a vibrant construction

industry, stakeholders are tasked with the contract design and its exception [1]. Oftentimes, the reverse of transforming

*Corresponding author: charles.coleman@cctu.edu.gh (Charles Egyabeng Coleman)

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construction projects into diversified development projects occurs due to the early termination of the construction contracts [2]. Notably, termination results from a pleading of one or all of the agreement parties [3].

The concept of contract in a construction setting connotes the legal agreement that establishes the roles and responsibilities of all parties, manages dispute resolutions, and sets price and performance expectations in the fulfilment of a construction project [4]. Nonetheless, it exists as single contracts entered into between two contracting parties under the universal construction processes, which are diverse and based on the distinct construction management speciality.

The early termination of construction contracts has been rooted in the construction industry for a long time [5]. It has been observed that some of the key reasons for the early termination of construction contracts are associated with gaps and weaknesses in the contract terms and administration of the contract. Contract termination in construction projects can indeed result in substantial financial losses, delays, and disputes among stakeholders [6]. This issue underscores the critical importance of understanding the factors that contribute to preventing contract termination pitfalls [7]. Such understanding is not only crucial for ensuring the success of individual projects but also for promoting the long-term sustainability of the construction industry [8].

Moreover, focusing on exploring these factors within specific industry contexts, such as the Ghanaian construction sector, becomes imperative due to the unique challenges and opportunities present in such environments [9]. Ghana's construction industry, like many others in developing nations, contends with infrastructure development needs, regulatory complexities, and financing constraints [10, 11]. By examining how these factors intersect with contract termination risks, researchers can develop targeted strategies that align with the industry's dynamics and contribute to enhanced project outcomes [12]. Ghana's construction industry is faced with challenges of early construction contract termination [13]. This could trigger the termination of other contracts in the construction supply chain.

However, the literature is devoid of studies investigating the prevention of contract termination pitfalls in Ghana's construction industry. Thus, in this research, with the energies and inputs of practitioners in Ghana's construction industry, through a quantitative design, a consolidated list of factors abstracted from the literature will be transformed into a successful prevention of contract termination pitfalls framework with a focus on avoiding termination pitfalls associated with contract terms and contract administration. This will add to the body of knowledge in construction research.

2. Literature Review

2.1. Overview of Contract Termination

Contract termination in construction projects is a critical issue that reverberates throughout the project's lifecycle, affecting all parties involved, from contractors and subcontractors to clients and regulatory bodies [14, 15]. It is a critical issue due to its potential to disrupt project timelines, budgets, and overall project success, ultimately impacting industry reputation and stakeholder relationships [16]. At its core, contract termination signifies the premature ending of a contractual agreement before the intended completion of the construction project [17, 18].

This premature cancellation can stem from a variety of factors, each with its own unique implications and complexities that warrant thorough examination and strategic mitigation measures [16].

A fundamental cause of contract termination lies in breaches of contract terms and conditions. These breaches can manifest in several ways, such as delays in project milestones, failure to meet quality standards, or non-compliance with safety regulations [7]. Such deviations from agreed-upon terms often lead to disputes and, if unresolved, can escalate to contract termination. Financial considerations play a significant role in construction projects. Disputes over payments, cost overruns, inadequate budget allocations, or disputes regarding payment milestones can strain relationships among stakeholders, erode trust, and create conditions conducive to contract termination [19]. Construction projects are inherently susceptible to unexpected challenges, such as adverse weather conditions, material shortages, labour disputes, or geopolitical factors [20]. These unforeseen circumstances can disrupt project schedules, increase costs, and create tensions among project participants, potentially leading to contract termination if parties fail to navigate these challenges effectively.

Projects often undergo changes in scope due to evolving client requirements, design modifications, or regulatory updates. Mismanagement of these scope changes, including inadequate documentation, failure to obtain necessary approvals, or disputes over additional costs and timelines, can escalate into conflicts and, ultimately, contract termination [21]. The ramifications of contract termination extend beyond immediate project setbacks [19]. They include financial losses, damage to reputations, strained relationships among stakeholders, legal implications, and delays in project delivery. These consequences highlight the imperative for proactive measures aimed at preventing contract termination pitfalls and fostering collaborative, resilient project environments.

Several factors contribute to contract termination, including breaches of contract terms such as delays, poor quality standards, or safety violations [7]. These breaches often lead to disputes that, if unresolved, escalate to termination. Financial disputes, such as delayed payments or cost overruns, also contribute significantly to strained stakeholder relation-

ships and increased risks of contract termination [20]. Furthermore, unforeseen challenges like adverse weather, material shortages, or labour issues can disrupt construction projects, creating further conditions that might lead to termination if not properly managed [21].

The study aims to explore these issues, particularly the impact of contractual terms and administration failures on contract termination, which aligns with the study's objective of identifying triggers for termination in the construction industry. The research also seeks to propose strategies for mitigating these risks, focusing on practical and preventive measures.

2.2. Prevention Strategies for Contract Termination Pitfalls

Prevention strategies play a crucial role in mitigating contract termination pitfalls in construction projects, ensuring smoother project execution and stakeholder relationships. Here are some key strategies supported by relevant literature:

- a) Developing comprehensive contracts with clear terms, deliverables, responsibilities, and dispute resolution mechanisms is fundamental in preventing contract termination [9]. Clear contractual agreements help minimise misunderstandings and ambiguities, providing a solid foundation for project execution and reducing the likelihood of disputes escalating to termination points.
- b) Effective communication is paramount throughout the project lifecycle to prevent contract termination. Maintaining open and transparent communication channels among stakeholders through regular project meetings, progress reports, and proactive issue resolution mechanisms can significantly mitigate conflicts [22, 23]. Timely communication helps address concerns promptly, fostering collaboration and trust among project participants.
- c) Implementing robust risk management practices is critical for identifying and addressing potential threats to project success early on [24]. This includes conducting thorough risk assessments, developing mitigation strategies, and regularly monitoring risks throughout the project. Addressing risks such as financial uncertainties, supply chain disruptions, or regulatory changes proactively can significantly reduce the chances of contract termination due to unforeseen challenges.
- d) Establishing formal dispute resolution mechanisms within contracts is another essential strategy to prevent contract termination [9]. Including mediation or arbitration clauses provides structured processes for resolving conflicts amicably and efficiently, promoting fairness, maintaining project momentum, and preserving positive stakeholder relationships. These mechanisms also reduce the reliance on legal proceedings, saving time and costs associated with litigation.

The study's objective to propose proactive strategies for mitigating contract termination risks directly relates to these prevention strategies. By identifying the importance of clear communication, effective risk management, and formal dispute resolution mechanisms. Again, the study supports the goal of developing a framework for preventing contract termination pitfalls.

The study aims to incorporate these strategies into a framework that supports the prevention of contract termination risks in construction projects, particularly in the Ghanaian context.

2.3. Application in the Ghanaian Construction Industry

The aforementioned prevention strategies are highly relevant within the Ghanaian construction industry, which faces its own unique challenges and opportunities [25]. With a growing emphasis on infrastructure development, regulatory reforms, and capacity building, Ghanaian construction projects can benefit significantly from proactive measures to prevent contract termination pitfalls. However, it is essential to tailor these strategies to suit the local regulatory frameworks, cultural nuances, and industry dynamics prevalent in Ghana [26]. By integrating these prevention strategies into project management practices and fostering collaborative relationships among stakeholders, the Ghanaian construction industry can enhance project outcomes, mitigate risks, and sustain long-term growth and development [27]. This integration involves not only adopting these strategies within project frameworks but also aligning them with Ghana's specific regulatory and cultural landscape. For instance, clear contractual agreements should reflect local legal requirements and industry standards to ensure enforceability and clarity for all parties involved.

Effective communication practices, such as regular project meetings and progress reports, must consider cultural communication styles and hierarchies prevalent in Ghanaian business environments. This ensures that communication channels remain open, transparent, and conducive to collaborative problem-solving [28]. Robust risk management practices should encompass local economic factors, supply chain intricacies, and regulatory compliance peculiarities in Ghana [29]. Identifying and mitigating risks specific to the Ghanaian context, such as currency fluctuations, material availability challenges, or political uncertainties, strengthens project resilience and minimises contract termination risks.

Establishing formal dispute resolution mechanisms within contracts should align with Ghanaian legal frameworks and cultural preferences [30]. This may involve incorporating culturally accepted mediation or arbitration practices to resolve conflicts efficiently while preserving business relationships and project momentum.

3. Research Methodology

3.1. Survey Design

The study employed quantitative research methodology, using a questionnaire survey. The analysis of information from large samples almost inevitably requires quantitative methods [31]. The quantitative research data was collected through closed-ended questionnaires. The quantitative research was selected to conduct an in-depth analysis of contract termination in the Ghanaian context, aiming to identify reliable preventive measures. From this starting point, quantitative methods enable a thorough analysis of issues involved in the termination of construction contracts. Purposive sampling is a technique used for this study. This technique selects respondents who are most likely to yield appropriate and useful information [32]. By using this technique, the researcher is able to identify and select cases that will use limited research resources effectively [33]. A random sampling technique was employed for sample selection, and data was gathered through an online survey platform and by hand. It ensures that each member of the population has an equal chance of being included in the sample [34, 35]. A total sample of 315 respondents was collected, with more than half of the respondents consisting of quantity surveyors and procurement officers. For this study, information was gathered from well-reputed public and private firms made up of construction practitioners. This included engineers, project managers, architects, contract managers, and lecturers from Technical Universities in Ghana.

3.2. Data Collection

This paper used a combination of a literature review and an expert questionnaire survey to identify the key factors influencing contract termination in Ghana. A questionnaire survey was the instrument designed, distributed, and retrieved to identify the main factors for the prevention of contract termination. Questionnaire surveys have been proven to be reliable when adopted for data collection in different parts of the world. For example, [36] studied the main causes of cost overruns in the Australia Highway project. [37] also carried out a questionnaire survey among key stakeholders (contractors, consultants, and client organisations) in Nigeria. The questions were formulated to align with the management strategies of contract termination pitfalls and were structured to suit the expertise of industry and academic professionals. The questionnaire gave each participant a chance to identify variables that they perceived as likely to contribute to the avoidance of contract termination by responding on a scale from 5 (very high extent) to 1 (no extent).

Descriptive analysis was used to analyse the data as demanded by the research objective. More specifically, Factor Analysis (FA) was employed to examine the research objective, employing multivariate correlational data analysis

techniques such as exploratory factor analysis (EFA) using SPSS version 26, confirmatory factor analysis (CFA), and structural equation modeling (SEM) with AMOS version 22 for the analysis. FA enables researchers to explore the underlying structure of complex datasets, particularly when dealing with multivariate correlational data. Employing techniques such as exploratory factor analysis (EFA) using SPSS version 26 allows for the identification of latent variables and their relationships within the dataset. EFA facilitates the extraction of meaningful factors or dimensions from a large set of observed variables, thereby uncovering patterns and associations that may not be readily apparent through univariate analysis alone.

Furthermore, confirmatory factor analysis (CFA) serves as an essential step in validating the identified factors and assessing the model fit. By specifying a priori hypotheses regarding the relationships between observed and latent variables, CFA enables researchers to test the goodness-of-fit of the proposed factor structure against the empirical data. This process enhances the rigour and validity of the findings, providing confidence in the underlying conceptual framework.

Moreover, structural equation modeling (SEM) with AMOS version 22 offers a powerful analytical approach for examining complex relationships among multiple latent variables simultaneously. SEM allows for the testing of theoretical models and hypotheses by integrating measurement models (CFA) with structural models, thereby providing insights into the causal pathways and interdependencies among constructs. By employing SEM, researchers can assess the direct and indirect effects of various factors on construction contract termination pitfalls, elucidating the underlying mechanisms driving these relationships.

3.3. Analysis and Findings

3.3.1. Descriptive Statistics

General demographics (GRD) of the respondents are given in this section. The analysed data also affirmed the respondents' background information. Descriptive statistics were used to summarize the data and to describe the samples, for example, percentages, means, and standard deviation.

3.3.2. Profile of the Respondents

Section provides background information about the respondents. These top skills included type of firm, job title, position, and work experience in the construction industry. This ensured the credibility and reliability of the data obtained [38]. The summary of the results of the background characteristics data is presented in Table 1.

Table 1. Demographic Characteristics of the Respondent.

Demographic Characteristics	N	Percent
Profession		
Contract manager	25	7.9
Procurement officer	84	26.7
Quantity surveyor	104	33
Engineer	73	23.2
Architect	12	3.8
Project manager	12	3.8
Lecturer	5	1.6
Qualification		
HND	8	2.5
BSc/BTech	165	52.4
Masters	138	43.8
PhD/DPhil/DTech	4	1.3
Years Practiced		
6-10 years	117	37.1
11-15 years	89	28.3
16-20 years	69	21.9
21 years and above	40	12.7
Current specialization		
Building works only	121	38.4
Civil works only	69	21.9
Building and civil	125	39.7

Demographic Characteristics	N	Percent
works		
Employer		
Public sector	248	78.7
Private sector	67	21.3
Total	315	100

From the data collected, 26.7% are procurement officers. About 33% are quantity surveyors, and engineers are about 23.2%. Again, contract managers have 7.9%, while architects and project managers obtain 3.8% each. The smallest percentage is lecturers with 1.6. As shown by the results, quantity surveyors and procurement officers constitute the majority of the sample size.

Table 1 presents the academic qualifications of the respondents. As shown, 52.4% have BSc/BTech qualifications, 43.8% are MSc/MTech certificates, 2.5% are Higher National Diploma (HND) holders, and 1.5% are those with PhD education. This indicates that the majority of the respondents are BSc/BTech degree holders, which implies that they have reasonable knowledge about the subject of contract termination. As shown, 37.1% of the respondents have 6 to 10 years of experience, and 28.3% have between 11 and 15 years. Lastly, 21.9% have 16 to 20 years, and 12.7% are those that have 21 years of service.

With regards to the current specialization, 39.7% are building and civil works. About 38.4 %, of the respondents are building works only, and 21.9% are civil works only. This result explains that the majority of the respondents are employed in the public sector, representing 78.7 %, while 21.3% of the respondents are engaged in the private sector.

Table 2. Prevention of Contract Termination.

Factors	Mean	Std. Dev.	Rank
Client must pay for claims and work done on time	4.41	0.856	1
Parties must avoid wrongful termination	4.29	0.814	2
Competent professionals inspecting and supervising works	4.16	0.862	3
Contractor must perform on time and accordance with applicable specifications	4.15	0.833	4
Contractor must maintain good working relationships with client's engineer	4.14	0.872	5
Serving warning letters to contractor (1, 2, 3)	4.09	0.957	6
Closely review project specifications	4.05	0.824	7
Maintain credibility by not making unachievable promises	4.05	0.892	7
Inviting contractor for meeting with consultants	4.03	0.897	8
Formalize extensions for excusable delay	3.92	0.941	9

Factors	Mean	Std. Dev.	Rank
Firm adopting one or forms of competitive advantage	3.81	0.953	10
Contractor should not refuse to perform during dispute resolution	3.78	0.832	11
Scientific identification and prediction of termination	3.63	0.929	12

Table 2 presents the factors crucial for preventing contract termination in a project setting. The data is ranked by mean scores and standard deviations, reflecting both the perceived importance and consensus among respondents. Topping the list is the requirement for clients to pay promptly for claims and work, indicated by the highest mean score of 4.41 and a relatively low standard deviation of 0.856, suggesting strong agreement among respondents on its significance. Following closely is the imperative to avoid wrongful termination (mean score of 4.29), emphasizing the need for clear contractual understanding and adherence to terms. Competent inspection and supervision (mean score of 4.16) also feature prominently, un-

derscoring the role of skilled oversight in project success. Timely contractor performance and adherence to specifications (mean scores of 4.15 and 4.05) further underscore the importance of meeting project milestones and quality standards. Maintaining positive relationships with client engineers and avoiding unrealistic promises are also highlighted as key factors.

Conversely, aspects such as formal dispute resolution processes and competitive advantages, while still relevant, are rated slightly lower in importance. Overall, the statistical interpretation underscores the multifaceted nature of contract stability and the varied strategies deemed essential for its preservation by industry professionals.

Table 3. Unidimensionality and Reliability of Prevention of Contract Termination Construct.

	PCMS	CTRMM	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
Parties must avoid wrongful termination	0.758		0.623	0.395	0.809	0.837
Client must pay for claims and work done on time	0.754		0.623	0.405	0.808	
Formalize extensions for excusable delay	0.72		0.667	0.449	0.796	
Closely review specifications	0.684		0.652	0.438	0.801	
Maintain credibility by not making unachievable promises	0.67		0.633	0.429	0.805	
Inviting contractor for meeting with consultants		0.784				0.818
Scientific identification and prediction of termination		0.773	0.544	0.328	0.781	
Firm adopting one or forms of competitive advantage		0.7	0.639	0.421	0.734	
Serving warning letters to contractor (1, 2, 3)		0.639	0.655	0.465	0.726	
Competent professionals inspecting and supervising works						
Contractor must maintain good working relationships with client's engineer						0.818
Contractor should not refuse to perform during dispute resolution						
Contractor must perform on time and accordance with applicable specifications						

Extraction Method: Principal Component Analysis

The EFA was conducted to assess the unidimensionality and reliability of the Prevention of Contract Termination (PCT) construct. Maximum Likelihood with Varimax Rotation (ML Varimax) was specified as the extraction and rotation method. There were thirteen (13) items measuring the construct. The Kaiser-Meyer-Olkin (KMO) of 0.921 with Bartlett's test of sphericity of $p < 0.000$ was also obtained, indicating consistency with the recommended KMO cut-off value of 0.70 and Bartlett's test of sphericity of $p < 0.05$ suggested by [39]. These results suggested that factor analysis could be conducted with the data. All eight items (PCT1, PCT2, PCT3, ..., PCT13), which are expected to measure Prevention of Contract Termination (PCT), loaded two components.

Using a threshold of 0.5 for factor loading, which is greater than the recommended value of 0.40 as suggested by [40] and [41], some of the items had their factor loading exceeding 0.5 for the respective component excluding “Competent professionals inspecting and supervising works”, “Contractor must maintain good working relationships with client's engineer”, “Contractor should not refuse to perform during dispute resolution” and “Contractor must perform on time and accordance with applicable specifications” which recorded a threshold below 0.5, making them bad representative of the component.

For the first component, five (5) items recorded a threshold greater than 0.5. They are “Parties must avoid wrongful termination”, “Client must pay for claims and work done on time”, “Formalize extensions for excusable delay”, “Closely review project specifications” and “Maintain credibility by not making unachievable promises”. These items measure Proactive Contract Management Strategies (PCMS). Thus, they will be called Proactive Contract Management Strategies (PCMS).

For the second component, four (4) items recorded a threshold more than 0.5. They are “Inviting contractor for meeting with consultants”, “Scientific identification and prediction of termination”, “Firm adopting one or forms of competitive advantage” and “Serving warning letters to con-

tractor (1, 2, 3)”. These items measure Contract Termination Risk Mitigation Measures (CTRMM). Thus, they will be called Contract Termination Risk Mitigation Measures (CTRMM). After using the EFA to extract the components, the corrected item-total correlation for the items of the component was extracted using the suggested cut-off value of 0.30. It was found that the items were good measures of the components since the Cronbach's alphas were greater than 0.800 at 0.837 for the component (PCMS) and at 0.818 for the component (CTRMM), indicating acceptable internal reliability [42, 43].

3.3.3. Structural Equation Model for Prevention of Contract Termination Construct

After the constructs demonstrated sufficient evidence of one-dimensionality and reliability using EFA, a CFA was then administered. By assessing the goodness-of-fit of this model, we used the recommended goodness-of-fit indices for the Prevention of Contract Termination (PCT) construct [44, 45]. The sample data on the FCF model yielded the $S - B\chi^2$ of 2.475 with 26 degrees of freedom (df) with a probability of $p = 0.0000$. This chi-square value indicated that the departure of the sample data from the postulated model was significant and hence indicative of good fit. The chi-square test is very sensitive to sample size and is used more as a descriptive index of fit than as a statistical test [46].

The CFI value was found to be 0.965, which was greater than the cut-off limit of 0.90, so the model is described as acceptable. The NFI value was 0.943, which is within the given range, but the given cut-off value of NFI is ≥ 0.90 , as shown in Table 4. Therefore, the model is acceptable. The PNFI value obtained is 0.681, which is also below the cut-off value of 0.80. Also, the RMR of 0.032, which is less than 0.05 and GFI value of 0.958, are greater than 0.090. These fit indexes for the Prevention of Contract Termination (PCT) model suggested that the postulated model adequately described the sample data.

Table 4. Robust fit index for Prevention of Contract Termination.

Fit Index	Cut-Off Value	Estimate	Comment
$S - B\chi^2$		2.475	
Df	$0 \geq$	26	Acceptable
CFI	$0.90 \geq$ acceptable $0.95 \geq$ good fit	0.965	Good fit
PCFI	Less than 0.80	0.697	Good fit
RMSEA	Less than 0.08	0.019	Acceptable
RMSEA 95% CI	0.00-0.08 “good fit”	0.004-0.048	Acceptable
NFI	Greater than 0.90 “good fit”	0.943	Good fit

Fit Index	Cut-Off Value	Estimate	Comment
IFI	Greater than 0.90 “good fit”	0.952	Good fit
PNFI	Less than 0.80	0.681	Good fit
RMR	Less than 0.05 “good fit”	0.032	Good fit
GFI	Greater than 0.90 “good fit”	0.958	Good fit

Note: $s-bx^2$ = Chi-Square, DF = Degree of Freedom, CFI = Comparative Fit Index, PCFI = Parsimony Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation, RMSEA 95% CI = Root Mean Square Error of Approximation 95% Confidence Interval, NFI = Normed Fit Index, IFI = Incremental Fit Index, PNFI = Parsimony Normed Fit Index, RMR = Root Mean Residual and GFI = Goodness of Fit Index.

Table 5. Final Conceptual Model Indicator Variables for Prevention of Contract Termination.

Latent Component	Indicator Variable	Measurement Variable	Label
Proactive Contract Management Strategies (PCMS)		Parties must avoid wrongful termination	PCMS1
		Client must pay for claims and work done on time	PCMS2
		Formalize extensions for excusable delay	PCMS3
		Closely review project specifications	PCMS4
		Maintain credibility by not making unachievable promises	PCMS5
Contract Termination Risk Mitigation Measures (CTRMM)		Inviting contractor for meeting with consultants	CTRMM1
		Scientific identification and prediction of termination	CTRMM2
		Firm adopting one or forms of competitive advantage	CTRMM3
		Serving warning letters to contractor (1, 2, 3)	CTRMM4

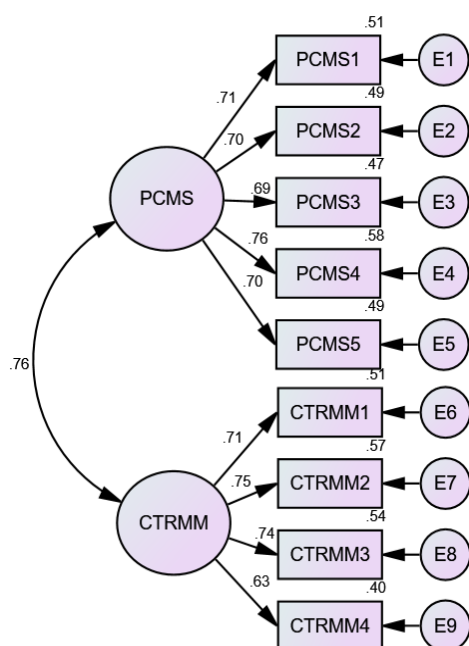


Figure 1. CFA Model for Prevention of Contract Termination.

Unidimensional model for Prevention of Contract Termination (PCT) features are presented (Figure 1 and Table 5). Out of the thirteen (13) indicator variables, nine (9) were obtained and used for the final CFA analysis [47, 48]. With regards to 315 questionnaires analyzed for this construct, nine (9) indicator variables made up of two (2) components realized as PCMS (PCMS1, PCMS2, PCMS3, PCMS4 and PCMS5), and CTRMM (CTRMM1, CTRMM2, CTRMM3 and CTRMM4).

Table 6 shows the correlation values, standard errors and the test of statistics of the final nine-indicator model. All the correlation values were less than 1.00, and all the p-values were less than the significant value of 0.05 and showed appropriate signs. The estimates were therefore deemed reasonable as well as statistically significant. The parameter with the highest standardized coefficient was the indicator with variable PCMS4, and its parameter coefficient was 0.764.

Most of the parameter estimates had high correlation values close to 1.00. The high correlation values suggest a high degree of linear association between the indicator variables and the unobserved variables (PCMS and CTRMM). In addition, the R square values were also close to the desired value of 1.00, indicating that the factors explained more of the vari-

ance in the indicator variables. The results therefore suggest that the indicator variables significantly predict the unobserved components because all the measured variables are

significantly associated with the components (PCMS and CTRMM) under Prevention of Contract Termination (PCT) factors.

Table 6. Factor Loading and P-Value of Prevention of Contract Termination.

Hypothesised relationships (Path)	Unstandardised Coefficient (λ)	Standardised Coefficient (λ)	P-Value	R- Square	Significant at 5% Level
PCMS1 \leftarrow PCMS	1.000	0.713	0.00	0.509	Yes
PCMS2 \leftarrow PCMS	1.031	0.699	0.00	0.489	Yes
PCMS3 \leftarrow PCMS	1.114	0.688	0.00	0.473	Yes
PCMS4 \leftarrow PCMS	1.084	0.764	0.00	0.584	Yes
PCMS5 \leftarrow PCMS	1.077	0.701	0.00	0.491	Yes
CTRMM1 \leftarrow CTRMM	1.000	0.712	0.00	0.507	Yes
CTRMM2 \leftarrow CTRMM	1.094	0.752	0.00	0.566	Yes
CTRMM3 \leftarrow CTRMM	1.099	0.737	0.00	0.543	Yes
CTRMM4 \leftarrow CTRMM	0.944	0.630	0.00	0.397	Yes
PCMS \leftrightarrow CTRMM			0.00	0.760	Yes

4. Discussion of Results

4.1. Sources of Prevention Strategies for Contract Termination

The study's findings on preventing contract termination pitfalls in the Ghanaian construction industry align closely with existing literature, providing valuable insights and validating established theories. One of the key themes echoed in both the study and prior research is the significance of clear contractual agreements. The emphasis on contractual clarity and the avoidance of wrongful termination resonates with literature highlighting the importance of well-defined roles, responsibilities, and dispute resolution mechanisms in construction contracts [3, 8]. This aligns with the understanding that ambiguous or poorly structured contracts often lead to disputes, delays, and, ultimately, contract terminations [7].

The study's focus on timely payment by clients as a critical factor in preventing contract termination mirrors broader discussions on financial management in construction projects. Ample literature underscores the adverse effects of payment delays, budget constraints, and financial disputes on project continuity and contractor-client relationships [6, 20]. By highlighting this factor, the study reinforces the industry's recognition of financial stability and adherence to payment schedules as fundamental to project success and contract continuity.

Moreover, the study's identification of competent inspection and supervision, timely performance, and maintaining positive client relationships as pivotal strategies resonates with best practices advocated in construction project management literature. Effective project monitoring, adherence to schedules, and collaborative stakeholder relationships are consistently cited as critical elements for project success and risk mitigation [16, 9]. These findings underscore the interconnectedness of technical competence, project management practices, and relational dynamics in ensuring contract stability and successful project outcomes.

The integration of risk management practices within the prevention strategies, as highlighted in the study, also aligns with established frameworks in construction risk management literature. Proactive measures such as formalising extensions for excusable delays, close review of project specifications, and scientific identification of termination risks reflect a forward-looking approach to risk mitigation [24]. Literature emphasizes the importance of risk identification, assessment, and mitigation planning throughout the project lifecycle to reduce uncertainties and minimise the likelihood of contract terminations [21].

4.2. Limitations

This study is limited to the Ghanaian construction industry, which may restrict the generalizability of the findings to other regions or countries with different regulatory frameworks, economic conditions, and cultural contexts. Additionally, the

exclusive use of a quantitative research design may overlook in-depth qualitative insights that could offer a more nuanced understanding of the complex dynamics behind contract termination, particularly regarding the motivations and perceptions of individual stakeholders. The reliance on self-reported data from questionnaires also introduces the potential for response bias, where participants may provide socially desirable answers or withhold sensitive information, thus impacting the accuracy of the findings.

4.3. Summary of Findings

The demographic analysis of the respondents revealed key trends in the industry. Procurement officers and quantity surveyors constituted a significant portion of the sample, highlighting their pivotal roles in contract management and project execution. Most respondents held bachelors or master's degrees, showcasing a well-educated workforce in the sector. Years of experience ranged widely, with a substantial proportion having 6-15 years of practice, bringing valuable expertise to the study. The majority worked in the public sector, reflecting the industry landscape in Ghana.

The core findings revolved around crucial factors identified by industry professionals for preventing contract termination. Topping the list was the timely payment by clients for claims and work, emphasizing the financial stability aspect crucial for project continuity. Clear contractual terms to avoid wrongful termination ranked high, underscoring the importance of legal frameworks and adherence to agreements. Competent inspection, timely performance, and maintaining positive client relationships emerged as significant operational strategies contributing to contract performance.

Further analysis using structural equation modeling (SEM) validated the identified factors and their interrelationships within the Prevention of Contract Termination (PCT) construct. The confirmatory factor analysis (CFA) demonstrated good fit indexes, indicating that the model adequately represents the data. The unidimensional model revealed two essential components: Proactive Contract Management Strategies (PCMS) and Contract Termination Risk Mitigation Measures (CTRMM). These components encapsulated proactive steps and risk management practices crucial for averting contract termination pitfalls.

The study's robustness was evident in the statistical validation of the model, with high factor loadings, significant coefficients, and explained variances supporting the reliability and validity of the findings. The identified strategies, such as avoiding wrongful termination, ensuring timely payments, and adopting risk mitigation measures, integrate innovative techniques, offer actionable insights for industry stakeholders, policymakers, and researchers. Implementing these strategies aligned with the Ghanaian construction context can enhance project outcomes, minimize disputes, and foster sustainable growth in the construction sector.

4.4. Implications

The results of this study have significant implications for the construction industry in Ghana and beyond, as well as for research and policy consideration. One of the key takeaways is the critical importance of robust contract management practices in preventing early contract terminations. Clear and comprehensive contracts that outline roles, responsibilities, payment schedules, and dispute resolution mechanisms are paramount. Prioritizing these aspects can substantially reduce misunderstandings, disputes, and the likelihood of premature contract terminations, contributing to smoother project execution and stronger stakeholder relationships. Timely payment for work done emerged as a crucial factor in ensuring contract continuity.

Clients, especially public sector entities, need to adhere strictly to payment schedules to maintain healthy cash flows among contractors and subcontractors. Implementing policies and mechanisms that facilitate prompt payments and address financial disputes can significantly mitigate contract termination risks, ensuring financial stability across construction projects. The integration of risk management practices into contract prevention strategies is another critical implication highlighted by this study.

Proactive risk identification, assessment, and mitigation measures throughout project lifecycles are essential. Formalizing extensions for excusable delays, conducting thorough project specifications reviews, and leveraging predictive analytics for risk identification can bolster project resilience and reduce the chances of contract terminations due to unforeseen challenges. Professional development and training programs for construction industry professionals are also underscored. Emphasizing competent inspection, supervision, and performance requires continuous skill enhancement and knowledge acquisition among professionals. Strengthening technical competencies, project management skills, and communication abilities can lead to better project outcomes, enhanced client relationships, and overall industry performance.

The study's insights can further inform the development or enhancement of policy and regulatory frameworks governing the construction industry. Regulators and policymakers should consider incorporating guidelines or standards that promote contract clarity, fair payment practices, and proactive risk management strategies. Collaborative efforts between industry stakeholders and regulatory bodies can foster a more resilient and sustainable construction sector. Lastly, the study contributes significantly to construction research and knowledge advancement, particularly in contract management and risk mitigation.

Future research endeavours can build upon these findings by exploring nuanced factors influencing contract terminations, evaluating the long-term effectiveness of preventive measures, and conducting cross-country comparative studies to identify industry best practices.

5. Conclusion and Recommendation

5.1. Conclusion

In conclusion, this study sheds light on crucial factors and strategies for preventing contract termination pitfalls in construction projects, with a specific focus on insights from the Ghanaian construction industry. The findings underscore the importance of clear contract terms, timely payments, proactive risk management, and enhanced professional competencies in ensuring project continuity and success. By emphasizing these aspects, stakeholders can mitigate financial losses, disputes, and delays, fostering a more resilient and sustainable construction sector.

5.2. Recommendations

The following recommendations are suggested to be considered by the various institutions involved in project contracting in construction sectors.

To ensure contracts in construction projects have clear and unambiguous terms, including payment schedules, performance expectations, and dispute resolution mechanisms. This clarity reduces misunderstandings and minimizes the likelihood of contract termination due to breaches or disputes.

Implement robust risk assessment strategies early in projects to identify and mitigate potential challenges. Addressing risks such as material shortages, labour disputes, and regulatory changes proactively can prevent disruptions leading to contract termination.

Provide ongoing training and development programs for construction industry professionals. Enhancing technical skills, project management capabilities, and effective communication among stakeholders promotes smoother project execution and reduces contract termination risks.

Foster open communication channels and collaborative relationships among project participants, including contractors, clients, engineers, and regulatory bodies. Regular meetings, progress reports, and proactive issue resolution mechanisms can prevent conflicts from escalating.

Conduct periodic reviews of project specifications, milestones, and performance metrics. This helps identify deviations early, allowing for corrective actions to be taken promptly, thus reducing the risk of contract termination due to non-compliance or misunderstandings.

Abbreviations

N	Population
GRD	General Demographics
SEM	Structural Equation Modelling
PCMS	Proactive Contract Management Strategies
CTRMM	Contract Termination Risk Mitigation Measures

EFA	Exploratory Factor Analysis
CFA	Confirmatory Factor Analysis
SPSS	Statistical Package for Social Sciences
AMOS	Analysis of Moment Structures
s-bx ²	Chi-Square
DF	Degree of Freedom
CFI	Comparative Fit Index
PCFI	Parsimony Comparative Fit Index
RMSEA	Root Mean Square Error of Approximation
RMSEA	Root Mean Square Error of Approximation
95% CI	95% Confidence Interval
NFI	Normed Fit Index
IFI	Incremental Fit Index
PNF	Parsimony Normed Fit Index
RMR	Root Mean Residual
GFI	Goodness of Fit Index

Author Contributions

Charles Egyabeng Coleman: Conceptualization, Data curation, Formal Analysis, Methodology, Software, Validation, Writing – original draft

Mundia Muya: Methodology, Software, Supervision, Validation, Writing – review & editing

Chipulu Chipulu: Data curation, Formal Analysis, Investigation, Software, Writing – review & editing

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Conflicts of Interest

The authors declare no conflicts of interest.

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