Risk Factors Affecting the Construction Industry in Ghana

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ABSTRACT

The issue of risk management has become pivotal in the planning and execution of construction projects globally. The current economic situation in Ghana, like that of other developing countries, requires all project contractors to manage such potential risks themselves. The study sought to use a survey and the theory of risk constraint to rank the major risk factors that affect the construction industry in Ghana, which eventually delay the delivery period and increase the overruns. The post-positivist perspective and research worldview, the quantitative research approach was employed in this study to arrive at a single and reliable truth with precision and accuracy, while using descriptive survey design. The survey questionnaires were distributed using a simple random approach to 118 respondents, of which 113 were received in a good state to be used in the study. The data were analysed using the relative importance index (RII) tool after a successful pilot testing to determine appropriate reliability and validity thresholds. Overall, the results revealed that construction design risk factors are the most important factor affecting the construction industry in Ghana, followed by financial and technical risk factors. The study further revealed that the “slow payment by clients” is the most important financial risk factor that affects the construction industry in Ghana, with an RII score of 0.94. It was also found that the "high interest rate"(RII = 0.77) and "Exchange rate fluctuation" (RII = 0.70) are the second and third most critical financial risk factors that affect the construction industry in Ghana. The RII results further showed that political and regulation risk factors are not among the important factors that influence the construction industry in Ghana. Project contractors, therefore, ought to be mindful and smart technically, financially, and politically when executing publicly funded building projects to avoid cost and duration overruns.

Keywords: Risk factors, risk management, project contractors, construct industry, overruns

INTRODUCTION

The issue of risk management has become pivotal in the planning and execution of construction projects globally. The construction industry impacts significantly on the global stage including that of Africa and Ghana. The construction sector contributes around 10%, 80, and 50% of the Gross Domestic Product (GPD), total assets, and investment fixed assets respectively in the developing countries (Jekale, 2004). In the case of Ghana, the contribution of the construction sector towards the GPD has seen significant growth, until the adverse effect of the covid-19 but reduced from 12.6% to 6.8% (Ghana Statistical Service (GSS), 2021). There is, therefore, a direct relationship between a nation’s development with improved roads and the construction of other infrastructural facilities to promote trade and commerce as indicated by (Samanta, 2015; Baadjei, 2023).

However, the failure of constructors to deliver construction projects on time continues to be the bane of developing countries' development, much as there has been significant improvement in technology and project management techniques (Famiyeh et al., 2017; Muhwezi et al., 2014). For example, Amoatey and Okanta (2017), confirmed that on average road projects in Ghana often experience 70% delay, with the educational institutions projects usually abandoned when there is a change in political power due to procurement-related factors. Again, Amoah et al., (2022), in their empirical studies agreed that procurement-related issues and political interreferences unnecessarily influence and delay road construction in the public sector in Ghana.

Meanwhile, the delivery time of the construction project is a critical consideration to the owner in terms of time and money, just as it is for the contractor. Such delays have adverse impact on project success in terms of time, cost, quality, and safety risk factors (Fardi & El-Sayegh, 2006).

Project- risks are, therefore, uncertain events or situations which can negatively impact the success of the project, if not properly planned to address them as part of the management process. Compared to other industries, the construction sector has more risks due to its uniqueness including huge financial investment, bad cost overruns, long execution periods, political uncertainty, and dynamic organizational structures (provide a source). The current economic situation in Ghana, just like other developing countries requires all contractors to manage such potential risks themselves. Therefore, risk analysis and management continue to be a major feature of the project management of construction projects in an attempt to deal effectively with uncertainty and unexpected events and to achieve project success.

In addressing this situation, many researchers have relied on the theory of constraints to understand the potential risk analysis to guarantee project success in the construction industry. Ranking the factors in the construction industry in Ghana would, therefore, improve service delivery on the part of the contractors and other industry players as this will reduce the cost overruns and delivery time frame in the construction industry.

The construction industry in Ghana faces a lot of risk factors that delay the time frame for the execution thereby increasing cost overruns due to political uncertainty, huge capital investment in the sector, and the longer execution time frame. Therefore, understanding and ranking such risk factors from the perspective of both clients and project managers or contractors are vital for the growth of the industry.

However, most studies in Ghana looked at this phenomenon from the clients' perspectives. Again, it appears that these studies in the Ghanaian context rarely ranked these risk factors to guide the contractors in minimizing cost and time frame when executing construction projects and their management. Notably among such empirical studies in Ghana on this phenomenon includes (Famiyeh et al., 2017; Amoako et al, 2021; Amoatey and Okanta, 2017; Assiedu & Adaku, 2019; Barajei et al., 2023).

Ranking these risk factors in the construction industry in Ghana would help the contractors to prioritize these factors as part of their managerial roles, to improve service delivery and thereby reducing the cost overruns, associated uncertainties, and time frame in the construction industry. Thus, to fill the gap, this study focused on ranking the risk factors in the order of magnitude when managing the building and construction from the contractor's perspective in Ghana. The study aimed to use this survey in finding out while ranking the major risk factors affecting the construction industry which eventually delay the delivery period and rather increase the cost overruns through the lens of the theory of risk constraint

THEORY AND LITERATURE REVIEW

Theoryof constraints

The theory of constraints is a comprehensive management philosophy aimed at continuous investigation of more than one goal in the project if the project works aimed at achieving a certain achievement in a project. This theory underpinned this study as its main objective is to achieve more achievement in the present and to address the problems that arise in the future. It is defined as a systematic scientific approach to problem diagnosis and the mechanism of its solution based on its various tools (Abd E-Karim et al, 2015)and defined it as an administrative philosophy that reflects an "appropriate" basis for making determinations about the limitation or management of constraints and how to manage them effectively and efficiently. The concept of " theory of constraints " is an "integrated" system consisting of a set of principles, concepts and tools that help enterprises identify and address the constraints and bottlenecks to which they are exposed and thus help to achieve the objectives of (p.1).Accordingto this theory, each goal achieved bytheprojecthasat least one "constraint", which prevents it from achieving its highest performance in relation to its goal, and explains that the theory of constraints confirms that projects that have at least one "constraint" tools (Abd E-Karim et al, 2015; p.1). In an entrepreneurial environment, the resource may be (political, economic, technological, social or legal (Bazin, 2017). The theory goes that exclusion of the constraint increases the rate of production and

supports executive management plans. The limitations theory recognizes that time is very important. Control of constraints aims to achieve the production of more paragraphs of the project.

The importance of the theory of constraints

Dario (2017) indicated that the importance of the theory of constraints helps managers to walkthrough logical steps of flow through the process as they seek to

i. acceptance of the problem.

ii. Acceptance of the direction towards the proposed solution

iii. Acceptance that the proposed solution would be sufficient to overcome the problem

iv. Overcoming any potential negative ramifications.

v. Overcoming any obstacles when applying.

Constraint

The meaning of the constraint is defined as any disability that restricts the ability of enterprises to achieve their goals, whilst restriction is any specific that prevents the project from achieving its objectives or achieve a level of performance for this goal and may be restrictions (physical or intangible) (Hillson, 2020). In view of this, any factor or reason limiting the movement of companies towards achieving the main objective is to increase the volume of money in the present and future and from the increase in profits and then the possibility of continuation and development constitute constraint. From the above, it is clear that the restriction is any factor or specific that hinders the company from achieving its current and future goals whether the registration is physical or non-intangible.

Types of Constraints

According to (Pialles, 2017), in the construction projects, the restrictions are divided into five types:

1. **Technological Restrictions (technical)**: This includes all matters relating to the project's working paragraphs and how to implement these paragraphs as required to equip technicians, equipment, and construction materials, as any failure or malfunction in processing leads to delay of work and thus becomes a constraint that requires processing for the purpose of continuing the work.
2. **Economic Restrictions**: These include all expenses related to the project and its receipt in the form of payments from the project-funded party as agreed between the company and that party, as any disruption in the delivery of expenses leads to the interruption of work and becomes an economic constraint that needs to be addressed.
3. **Environmental Restrictions**: This type of restriction relates to the nature of the area surrounding the construction project and the environmental obstacles that prevent, obstruct, or delay the start of the construction project. This restriction is essential for the project in a given area. In some cases, some projects are not suited to the environmental reality. Therefore, the state may sometimes have to change the location of the project, cancel it, or treat it in accordance with the environmental dictates dictated to them (Hillson, 2020).
4. **Legal Restrictions**: These relate to the manner in which approvals are obtained from the departments and acquisitions of the work area in terms of the land on which the project is built, the work approvals, and the legal permissions related to the site, all of which are important in the process of starting the project.
5. **Political Restrictions**: These include everything related to the security and stability of the state. If the instability in the security area affects all the joints of the state very significantly, it affects most of the restrictions mentioned above.

METHODOLOGY

The post-positivist perspective and research worldview, the quantitative research approach was employed in this study to arrive at a single and reliable truth with precision and accuracy. In this present study, the researcher considered the most suitable research design to be a non-experimental, univariate, and descriptive survey design. The term survey can be used to designateany research activity in which the investigator gathers data from a portion of a population for thepurpose of examining the characteristics, opinions or intentions of that population (Couchman &Dawson 1995: 70; Polit & Beck 2004:234). A cross-sectiondescriptive survey design is selected because of its highdegree of representativeness and the ease in which a researcher could obtain the participants' opinions (Groves et al,. 2009). Therefore, this design best describes various aspects or characteristics and/or behaviour of a sample population without covering why certain things happen or controlling other variables, which the other designs lack in the qualitative approach (Groves et al,. 2009). In this present study, the researcher obtained and described theviews of the respondents with regard to the nature of the risk factors affecting the construction industry in Ghana. The focus of this study was on a single variable, namely certain views. When very little is known about a topic or to explore a research question, a descriptive design isapplied. Within the context of this research, the risk factors affecting the construction industry in Ghana had not been documented before in the Ghanaian setting. In descriptive research the research variable is examined, as it exists without investigator interference. Control over the research setting is limited (Brink & Wood 1998: 289-291, Burns & Grove 2001:201). In this study, there was no manipulation of variables and the researcher did not attempt to control the research setting. However, the data collection conditions were standardised to enhance data quality.

A muti-stage sampling technique was used by purposely selecting registered quantitative surveying firms, which included surveyors from governmental and non-governmental institutions, including banks and insurance companies in the country. The survey questionnaires were subsequently distributed using a simple random approach to 118 respondents, out of which 113 were received in a good state to be used in the study, the 5-point Likert scale was employed to collect data from the respondents to rate the risk levels from very high to very low in the construction industry in Ghana. The data were analysed using the relative importance index (RII) tool after a successful pilot testing to determine appropriate reliability and validity thresholds.

RESULTS

Relative Importance Index (RII) Analysis

The Relative Importance Index (RII) technique was used to rank the risk factors affecting the construction industry in Ghana. The RII value must fall within the range of 0 to 1, inclusive. A five-point Likert scale ranging from 1 to 4 was used in this section of the questionnaire. The scale was defined as follows: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree. The RII for each of the risk factors affecting the construction industry in Ghanawas calculated using Equation 1 below (Olomolaiye et al., 1987; Chan and Kumaraswamy, 1997).

$$\text{RII} = \frac{\sum W}{A\ x\ N} = \frac{5n5 + 4n4 + 3n3 + 2n2 + 1n1}{5\ x\ N}$$

W is the weighting given to each variable by the respondents, ranging from 1 to 5. A represents the highest weight, which is 5 in this case. N indicates the total number of respondents. The RII value varies from 0 to 1, excluding 0, as stated by Kometa, Olomolaiye, and Harris (1994), Özdemir (2010), and Waris et al. (2014). The data demonstrates that when the value of RII increases, the factor becomes more significant, and conversely. Chen et al. (2010) classified the important levels generated from RII into five categories: High (H) ($0.8 < \text{RII} < 1.0$), High-Medium (H-M) ($0.6 < \text{RII} < 0.8$), Medium (M) ($0.4 < \text{RII} < 0.6$), Medium-Low (M-L) ($0.2 < \text{RII} < 0.4$), and Low (L) ($0.0 < \text{RII} < 0.2$).

Risk Factors Affecting the Construction Industry in Ghana

The analysis of the Relative Importance Index (RII) for risk factors affecting the construction industry in Ghanarevealed that out of the 50 individual factors, only 13are classified as "High" importance with an RII

range of 0.82-0.94 (refer to Table I) and 20 and 17 of them were respectively ranked as "High-Medium" importance with an RII range of 0.60-0.79 and "Medium" importance with an RII range of 0.40-0.58. The results indicate that the top ten most important risk factors affecting the construction industry in Ghana, ranked by their Relative Importance Index (RII), are as follows: Slow payment by clients (RII = 0.94), Incomplete design scope (RII = 0.93), Late material delivery (RII = 0.92), Errors in estimate (RII = 0.91), Delay of information from designer (RII = 0.90), Innovative construction method (RII = 0.89), Theft (RII = 0.88), Errors in drawings(RII = 0.88), Increase in the cost of materials (RII = 0.86), and Inadequate or ambiguous specifications(RII = 0.86).The majority, namely 50%, of the top 10 risk factors are construction design risk factors, followed by technical risk factors (40%) and financial risk factors (10%).Likewise, the results revealed that construction design risk factorsare the most important factor affecting the construction industry in Ghana, followed by financial and technical risk factors.

Table I: Ranking of Risk Factors Affecting the Construction Industry in Ghana

Risk Factors	RII	Rank	Level of importance
Personal Risk (Technician & Labour)	**0.642**	**4**	**High-Medium (H-M)**
Frequent job changes by skilled labour	0.60	30	High-Medium (H-M)
Lack of skilled labour	0.77	16	High-Medium (H-M)
Lack of labour	0.66	23	High-Medium (H-M)
Strikes and labour disputes	0.47	46	Medium (M)
Lack of experienced supervisors	0.71	19	High-Medium (H-M)
Technical Risk	**0.677**	**3**	**High-Medium (H-M)**
Materials	**0.702**		**High-Medium (H-M)**
Materials shortages	0.64	25	High-Medium (H-M)
Late material delivery	0.92	3	High (H)
Increase in the cost of materials	0.86	9	High (H)
Damage during storage	0.57	35	Medium (M)
Damage during transportation	0.52	39	Medium (M)
Equipment	**0.695**		**High-Medium (H-M)**
Frequently out of order or damaged	0.86	11	High (H)
Unavailability of equipment	0.58	34	Medium (M)
Unavailability or high cost of spare parts	0.60	32	High-Medium (H-M)
High maintenance cost	0.74	17	High-Medium (H-M)
Construction Process	**0.683**		**High-Medium (H-M)**
Low productivity due to severe climate	0.44	47	Medium (M)
Errors or omissions in BOQ	0.60	32	High-Medium (H-M)
Insufficient time to prepare bids	0.79	14	High-Medium (H-M)
Delay of information from designer	0.90	5	High (H)
Construction Site	**0.712**		**High-Medium (H-M)**
Access problems	0.61	29	High-Medium (H-M)
Work hours limited	0.68	22	High-Medium (H-M)
Traffic congestion	0.84	12	High (H)
Local regulations	0.55	36	Medium (M)
Theft	0.88	7	High (H)
Ground Conditions	**0.480**		**Medium (M)**
Lack or inadequate site investigation	0.49	43	Medium (M)
Errors in information on site investigation	0.47	45	Medium (M)
Construction Design Risk	**0.829**	**1**	**High (H)**
Inadequate or ambiguous specifications	0.86	9	High (H)
Errors in drawings	0.88	7	High (H)
Incomplete design scope	0.93	2	High (H)
Innovative construction method	0.89	6	High (H)
New materials and equipment	0.63	27	High-Medium (H-M)

Non-standard details of drawings	0.71	19	High-Medium (H-M)
Errors in estimate	0.91	4	High (H)
Incompatibility between drawings and method	0.82	13	High (H)
Political and Regulation Risk	**0.521**	**5**	**Medium (M)**
Frequent changes in law	0.51	40	Medium (M)
War, revolution or civil disorder	0.50	42	Medium (M)
Requirements to use local labour	0.53	38	Medium (M)
Customs and import restrictions	0.44	48	Medium (M)
Unstable politics	0.55	37	Medium (M)
Embargo	0.40	50	Medium (M)
Long procedure for approval and permits	0.72	18	High-Medium (H-M)
Financial Risk	**0.703**	**2**	**High-Medium (H-M)**
Slow payment by clients	0.94	1	High (H)
Inadequate payment for variations	0.60	30	High-Medium (H-M)
Financial problems due to errors in the estimate	0.62	28	High-Medium (H-M)
Inflation	0.64	25	High-Medium (H-M)
Exchange rate fluctuation	0.70	21	High-Medium (H-M)
High local and national taxes	0.65	24	High-Medium (H-M)
High interest rate	0.77	15	High-Medium (H-M)
Environmental Risk	**0.470**	**6**	**Medium (M)**
Pollution due to the construction process	0.51	41	Medium (M)
Waste treatment regulations and laws	0.49	44	Medium (M)
Preservation of historical findings	0.41	49	Medium (M)

Personal Risk (Technician & Labour)

The RII findings aboutpersonal risk factors (technician and labour) (Table II) indicate that the lack of skilled labouris the most crucial personal risk factor that affect construction industry in Ghana, with an RII value of 0.77. The "lack of experienced supervisors"(RII = 0.71) and "lack of labour" (RII = 0.66)were also identified as the second and third most critical personal risk factor that affect construction industry in Ghana.

Table II: RII and Ranking of Personal Risk (Technician & Labour)

Personal(Technician & Labour)Risk Factors	RII	Category Ranking	Overall Ranking	Level of importance
Frequent job changes by skilled labour	0.60	4	30	H-M
Lack of skilled labour	0.77	1	16	H-M
Lack of labour	0.66	3	23	H-M
Strikes and labour disputes	0.47	5	46	M
Lack of experienced supervisors	0.71	2	19	H-M

Technical Risk Factors

Table III shows the Relative Importance Indices (RIIs) of 20technical risk factors affecting the construction industry of Ghana. It was revealed that Late material delivery (RII = 0.92), Delay of information from designer (RII = 0.90), Theft (RII = 0.88) and Increase in the cost of materials (RII = 0.86were ranked the four most highly importanttechnical risk factors affecting the construction industry of Ghana. These were followed by Frequently out of order or damaged, Traffic congestion, Insufficient time to prepare bids and High maintenance cost.

Table III: RII and Ranking of Technical Risk Factors

Technical RiskFactors	RII	Category Ranking	Overall Ranking	Level of importance
Materials	**0.702**			**H-M**
Materials shortages	0.64	10	25	H-M
Late material delivery	0.92	1	3	H
Increase in the cost of materials	0.86	4	9	H
Damage during storage	0.57	15	35	M
Damage during transportation	0.52	17	39	M
Equipment	**0.695**			**H-M**
Frequently out of order or damaged	0.86	5	11	H
Unavailability of equipment	0.58	14	34	M
Unavailability or high cost of spare parts	0.60	12	32	H-M
High maintenance cost	0.74	8	17	H-M
Construction Process	**0.683**			**H-M**
Low productivity due to severe climate	0.44	20	47	M
Errors or omissions in BOQ	0.60	13	32	H-M
Insufficient time to prepare bids	0.79	7	14	H-M
Delay of information from designer	0.90	2	5	H
Construction Site	**0.712**			**H-M**
Access problems	0.61	11	29	H-M
Work hours limited	0.68	9	22	H-M
Traffic congestion	0.84	6	12	H
Local regulations	0.55	16	36	M
Theft	0.88	3	7	H
Ground Conditions	**0.480**			**M**
Lack or inadequate site investigation	0.49	18	43	M
Errors in information on site investigation	0.47	19	45	M

Construction Design Risk Factors

The findings revealed that construction design risk factors are the most important risk factors influencing construction projects in Ghana. The RII resultspresented in Table IVshow thatIncomplete design scope and Errors in estimate are the two most highly important construction design risk factors that affect the construction industry in Ghana, with the RII scores of 0.93 and 0.91 respectively. Other significant construction design risk factors include innovative construction methods, errors in drawings, inadequate or ambiguous specifications and incompatibility between drawings and methods.

Table IV: RII and Ranking of Construction Design Risk

Construction Design RiskFactors	RII	Category Ranking	Overall Ranking	Level of importance
Inadequate or ambiguous specifications	0.86	5	9	H
Errors in drawings	0.88	4	7	H
Incomplete design scope	0.93	1	2	H
Innovative construction method	0.89	3	6	H
New materials and equipment	0.63	8	27	H-M
Non-standard details of drawings	0.71	7	19	H-M
Errors in estimate	0.91	2	4	H
Incompatibility between drawings and method	0.82	6	13	H

Political and Regulation Risk Factors

The overall RII results showed that political and regulation risk factors are not among the important factors that influence the construction industry in Ghana. However, among the individual political and regulation risk factors, the findings presented in Table V reveal that the "Long procedure for approval and permits"(RII = 0.72) is the most important factor that affects construction projects in Ghana.

Table V: RII and Ranking of Political and Regulation Risk Factors

Political and Regulation RiskFactors	RII	Category Ranking	Overall Ranking	Level of importance
Frequent changes in law	0.51	4	40	M
War, revolution or civil disorder	0.50	5	42	M
Requirements to use local labour	0.53	3	38	M
Customs and import restrictions	0.44	6	48	M
Unstable politics	0.55	2	37	M
Embargo	0.40	7	50	M
Long procedure for approval and permits	0.72	1	18	H-M

Financial Risk Factors

The study reveals that the "slow payment by clients"is the most important risk factor that affects the construction industry in Ghana, with an RII score of 0.94. It was also found that the "High interest rate"(RII = 0.77) and "Exchange rate fluctuation" (RII = 0.70)are the second and third most critical financial riskfactors that affect the construction industry in Ghana (see, Table VI).

Table V: RII and Ranking of Financial Risk Factors

Financial Risk Factors	RII	Category Ranking	Overall Ranking	Level of importance
Slow payment by clients	0.94	1	1	H
Inadequate payment for variations	0.60	7	30	H-M
Financial problems due to errors in the estimate	0.62	6	28	H-M
Inflation	0.64	5	25	H-M
Exchange rate fluctuation	0.70	3	21	H-M
High local and national taxes	0.65	4	24	H-M
High interest rate	0.77	2	15	H-M

Environmental Risk Factors

The RII results of environmental risk factors (Table VI) showed that "Pollution due to the construction process" ranked as an important factor affecting the construction industry in Ghana with an RII of 0.51. The "Waste treatment regulations and laws" and "Preservation of historical findings"were also ranked the second and third "Medium" important environmental risk factors affecting the construction industry in Ghana. These competencies recorded RII values of 0.49 and 0.41 respectively.

Table VI: RII and Ranking of Environmental Risk Factors

Environmental Risk Factors	RII	Category Ranking	Overall Ranking	Level of importance
Pollution due to the construction process	0.51	3	41	M
Waste treatment regulations and laws	0.49	2	44	M
Preservation of historical findings	0.41	1	49	M

DISCUSSION

The study sought to use a survey and the theory of risk constraint to rankthe major risk factors that affect the construction industry in Ghana which eventually delay the delivery period and rather increase the cost overruns. The results indicate that the top ten most important risk factors affecting the construction industry in Ghana, ranked by their Relative Importance Index (RII), are as follows: Slow payment by clients (RII = 0.94), Incomplete design scope (RII = 0.93), Late material delivery (RII = 0.92), Errors in estimate (RII = 0.91), Delay of information from designer (RII = 0.90), Innovative construction method (RII = 0.89), Theft (RII = 0.88), Errors in drawings(RII = 0.88), Increase in the cost of materials (RII = 0.86), and Inadequate or ambiguous specifications(RII = 0.86).The majority, namely 50%, of the top 10 risk factors are construction design risk factors, followed by technical risk factors (40%) and financial risk factors (10%). Overall, the results revealed that construction design risk factors are the most important factor affecting the construction industry in Ghana, followed by financial and technical risk factors. The RII results further showed that political and regulation risk factors are not among the important factors that influence the construction industry in Ghana. However, “long procedure for approval and permits” (RII = 0.72) could be the most important factor that affects construction projects in Ghana. The study also reveals that the “slow payment by clients” is the most important financial risk factor that affects the construction industry in Ghana, with an RII score of 0.94. It was also found that the "high interest rate"(RII = 0.77) and "Exchange rate fluctuation" (RII = 0.70) are the second and third most critical financial risk factors that affect the construction industry in Ghana

Construction designand technical risk factors

This study revealed that construction design and other technical risk factors such as incompetent design, errors in estimates, inadequate specifications, material shortages and delays, and innovative construction methods were the topmost ranked factors influencing the construction industry in Ghana. This finding confirms earlier studies conducted in Ghana by authorities such as Chelteau et al., (2023), Aje (2012), Asiedu and Adaku, (2019), and Larson and Gray (2017), who equally questioned the construction design accuracy competency of the industry players including lack of experienced supervisors or technicians, effective planning and designing, team capacity are topmost constraints of the construction in Ghana. This, therefore, calls for retooling and retraining of the construction sector players to improve their technical and professional skills and competencies regarding their material procurement processes, precision in the drawing and design to meet the required standard, and also to reduce cost and project overruns.

Financial risk factors

This studyfurther revealed that the *slow payment by clients* is the most important financial risk, followed by *high interest rate* and *exchange rate fluctuation* factors that affect the construction industry in Ghana. Previous studies in Ghana and elsewhere such as Damoah and Kumi, 2018, Das and Nyacho (2017), Mwelu et al., (2019) have all corroborated this finding by citing delayed payments, irregular cash flows, and high interest, and exchange rates were the major factors that contribute to high cost and duration of public construction projects in Africa and the world over. Given this, industry players including clients and project contractors ought to ensure constant cash flows for successful construction projects to minimize the duration and cost.

Political and regulation risk factors

Contrary to the previous studies, the current finding did not rate political influence as the topmost factor affecting timely construction project delivery in Ghana. It, however, indicated subtly that political influence could lead to long procedures for granting permits and approval for the commencement of construction projects in Ghana. Earlier studies such as Chelteau et al., (2023), Damoah et al., (2019), Amoah et al., (2021), Asiedu and Adaku, (2019), have concluded that political interference constraints the construction industry in Ghana severely. This indicates that one cannot completely discount the positive or negative influence of political interference on the building industry in Ghana. Project contractors ought to be mindful and be smart politically when executing a publicly funded building project to avoid cost and duration overruns.

CONCLUSION

The construction industry in Ghana is constrained by a number of risks that negatively influence project cost and duration. Topmost among them include construction design risk, followed by financial, technical, and potential political interference. Project contractors, therefore, ought to be mindful and smart technically, financially, and politically when executing public-funded construction projects to avoid cost and duration overruns.

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