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KUMASI, GHANA**

**Selection of Contractor Insurance Option in the Ghanaian Construction
Industry**

by

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A Thesis Submitted to the Department of Building Technology, College of Art and
Built Environment in Partial Fulfillment of the Requirement for the degree of

MASTER OF SCIENCE

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DECLARATION

I hereby declare that this submission is my own work towards the MSc. Construction Management and that to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the university or any other university, except where due acknowledgement has been made in the text.

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ABSTRACT

Insurance in the Building Industry is the process of swapping a conditional claim for a set amount to safeguard the benefits of stakeholders undertaking a construction venture. Insurance in construction is a primary technique of handling risks in the construction sector. It has been established that persons involved in the construction sector are repeatedly faced with various instances of situations that have many unknowns, are often detrimental and mostly unpredictable. This research had the aim of assessing the selection of feasible contractor insurance option in the Ghanaian construction industry. Literature review was undertaken and it tackled the underlying risk factors associated with contractor insurance provision and selection of contractor insurance option. Quantitative research method was adopted and structured questionnaires were used to gather data from contractors, consultants and insurance officers. Fifty-nine questionnaires were retrieved from seventy distributed representing an eighty-four percent response rate. Descriptive statistics and Relative Importance Index (RII) were the analytical tools used for the analysis. The findings showed that: exchange rate fluctuation, unrealistic contract duration, inaccurate estimating, interference from client, mistakes in design documents, inadequate contractor experience and materials damage were the most significant risk factors. Furthermore, the contractor insurance options that were selected the most were: Employers' liability, Professional indemnity, Workers' compensation, Contractors all risk, Performance bond, Third party insurance and Bid bond. The study recommended that series of educational as well as training programs ought to be organized for contractors to advise them on the different insurance options available for the different types of construction risk.

Keywords: Contractor, insurance, risk, selection, options, Ghana

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DEDICATION

I dedicate this piece of work to the Almighty God for His loving mercies and protection throughout the year of studies. Again, to my parents and loved ones.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

The industry of construction is one that is largely and greatly associated with risk and hazards from workforce, project, plant and equipment, haulage among others (Wang and Chou, 2003). Construction insurance describes the different forms of policies and guidelines to safeguard construction projects, the assembly and use of machinery. Conventionally, insurance is presumed to be restricted to the construction phase (Wang and Chou, 2003). However, construction projects are a whole life sequence and comprise feasibility stage, invitation and assessment of tenders, awarding of contract, mobilization and construction stage, handing over and maintenance phase (Bunmi, 2003).

Construction insurance is the process of swapping a conditional claim for a set amount to safeguard the benefits of stakeholders undertaking a construction venture. Insurance in construction is a primary technique of handling risks in the construction sector (Rendell and Yablonsky, 2003). Its principal purpose is to transmit risks from subcontractors, main contractors, clients and stakeholders who are involved in construction to insurance firms so as to offer contingent money in difficult times. Construction insurance is essential in ensuring the accomplishment of construction projects with the insurers splitting loss which comes about due to contingencies and other adversities (Guilin *et al.*, 2004; Hillson, 2004).

With the increase in construction management and engineering, insurance packages in the construction industry have become progressively specified. Even though it is best to get one insurance cover for a contract, it is not probable due to wide range of

risks in contracts and insurers concentrate on definite risks. Project insurance also referred to as wrap-up is a broad insurance available for construction projects (Wang *et al.*, 2004). Project insurance is unlike traditional insurance whereby respective contractors provide their own insurance cover. It enables contractors or clients to acquire an insurance policy that covers almost every party involved in a construction venture. In the long run, especially big projects, more detailed project insurances may cover every party with gap-free cover (Heidenhain, 2001).

From the legal standpoint, insurance assigns and distributes risks of a project among the stakeholders. Insurance options serve as a mechanism of risk transfer whereby insured transmit risk from uncertainty to state of certainty at a fixed premium cost (Hillson, 2004). Insurance is important and hence there exists the need to establish a framework for selection of contractor insurance options.

1.2 PROBLEM STATEMENT

The construction industry and its stakeholders are extensively associated with a great extent risk. This is because of the characteristic and nature of construction events, procedures, surroundings and entire organization. It has been established that persons involved in the construction sector are repeatedly faced with various instances of situations that have many unknowns, are often detrimental and mostly unpredictable (Rendell and Yablonsky, 2003).

The risk repercussions or consequences of contractual risks comprise litigation, claims, interruption of work, abandonment of work, poor coordination, cost overruns and delays (Hillson, 2004).

There have been theoretical developments in this area of research. Bunni (2003) investigated into risks and insurance in the construction industry. Wang and Chou

(2003) also undertook research into risks on highway projects. Gap exists in their works since they did not develop a framework for selection of insurance options.

Notwithstanding its significance, insurance has not received the necessary attention it should have in the construction industry in Ghana (Wang *et al.*, 2004). This research therefore seeks to fill this gap by developing a decision support framework/criteria for the selection of feasible contractor insurance option in the Ghanaian construction industry.

1.3 AIM AND OBJECTIVES

1.3.1 Aim

This research aimed at assessing the selection of feasible contractor insurance option in the Ghanaian industry of construction.

1.3.2 Objectives

In an attempt of accomplishing the research aim, these specific objectives were set:

1. To examine the environment of contractor insurance provision in the construction industry of Ghana;
2. To determine the underlying risk factors associated with contractor insurance provision in the construction industry of Ghana; and
3. To assess the selection of contractor insurance options in the Ghanaian construction industry

1.4 RESEARCH QUESTIONS

1. What is the environment contractor insurance provision in the construction industry of Ghana?

2. What are the underlying risk factors associated with contractor insurance provision in the construction industry of Ghana?
3. What is the selection of contractor insurance options in the Ghanaian construction industry?

1.5 SCOPE OF STUDY

The scope of this research study was limited to construction stakeholders in the Kumasi metropolis. The Kumasi metropolis was opted as the scope for the study since it is the second biggest city of the country and has a various construction related activities operating in the town. The choice of Kumasi as a scope was influenced by the convenience of data collection due to its proximity to the research. This aided in the quick retrieval of survey questionnaires. Because Kumasi is also an administrative and a business town bustling with varying construction works, it made it very easy to locate respondents for the research. Contextually, the scope consisted of insurance firms, D1 contractors and consultants in the built environment.

1.6 METHODOLOGY

First of all, pertinent literature related to this topic was reviewed. The quantitative strategy was used for the study. This research espoused positivist models to be its major philosophical stance after a consideration of the axiological, ontological and epistemological positions.

After the existing literature had been reviewed, it aided in developing a survey questionnaire which focused on the aim and specific objectives. The Likert scale system of rating was used for the questions on the questionnaires. The purposive and snowballing techniques which fall under the non-probability sampling techniques

were employed. Analytical tools for the analysis of data collected consisted of descriptive statistics, mean score ranking and Relative Importance Index (RII).

1.7 SIGNIFICANCE OF STUDY

Construction insurance is important in ensuring the success of construction projects due to insurers splitting the losses arising from calamities. This research will increase awareness on risks which are insurable and the policies which the stakeholders are open to once they enter into contracts. The findings of this study will also provide a framework to determine selection of contractor insurance. Academia will also profit from the findings since it will contribute to the body of knowledge on contractor insurance.

Construction insurance has a significant effect on the guarantee of project success, with insurers sharing losses in subsequent natural disasters as well as other incidents. Construction insurance is among the few ways of managing risks in relation to construction projects. This insurance requires to be deliberated upon and have a concrete understanding that not every risk can be adequately covered under insurance, or can be insured for, or be insured against an acceptable price. Construction insurance does not receive the attention it deserves as a result of lack of proper risks management practices within the industry of construction. The research will seek to ascertain insurable risks in addition to the various insurance types typically involved in the Ghanaian industry of construction. The study is expected to contribute in raising the awareness of the insurable risks and policies which project participants are exposed to, in the contracts they enter into.

1.8 STRUCTURE OF THE STUDY

The study's design is structured into five interrelated chapters. The chapter one introduces the study as it outlines the study's background with the inclusion of the research aim and objectives, problem statement, research question, and scope of the research. The chapter two reviews pertinent literature connected to the research. Chapter three elucidates the methodology chosen. This will tackle sample size determination, research philosophy, sampling techniques, sample population, statistical tools, and questionnaire design and administration. The chapter four is the results and discussion of data gathered. The chapter five being the last chapter the study wraps up the whole research as it reviews the foremost contributions of the study to the body of knowledge.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

The chapter two assesses pertinent literature connected to contractor insurance options. This chapter begins by giving a background of construction and an overview of the Ghanaian construction industry. It also explains the concepts of risk, and insurance in the construction industry. Finally, contractor insurance options that are selected are also espoused.

2.2 THE CONSTRUCTION INDUSTRY

According to Levy (2007), construction is an undertaking that produces complex, long-term and unique infrastructure and housing projects. From the planning phase through to the handing of facility to the client, construction activities involves various kinds of stakeholders like the clients (may be government entities, individual, or corporations); contractors; architect; subcontractors; engineers; legal representatives; financing institutions; suppliers; and others. These diverse kinds of stakeholders come with conflicting and varying expectations to the construction project. The control over a project in the environment where these stakeholders operates turns to change as the project progresses; there are also continual demands on the execution of projects to be within a set time frame and cost.

The construction industry itself forms a complex, large, and dynamic sector that have great influence on the world's economies. The workers of construction including other employees construct houses, workplaces, roads and repair or maintain the world's physical infrastructure. The works of construction involve raising of new projects that involves undertakings with sectioning of lands for sale as site for

building or preparing new lands as sites for raising new construction projects. The activities in construction involves renovation activities that includes alterations, additions or maintenance as well as repair of engineering or building projects like utility or highways systems (Gambatese *et al.*, 2007).

2.3 RISK TRANSFER AND INSURANCE MECHANISM

There involve a lot of issues in project construction. Taken in consideration to manage these uncertainties involves risk management as well. The management of risk as a system is the design to counteract risks involved in the various phases of a construction project. The dissimilar perceptions hold by construction stakeholders concerning risk upshots different definitions altogether on risk management. Generally, the focus of risk management is on dealing with the hostile outcomes of risk. According to Flanagan and Norman (1993), the management of risk refers the field which ensures existing with the likelihood in prospect activities or event that may upshot adversative factors. The management of risk can be defined as the process designed for decision making on reducing the possibilities or effect of the occurrence of risk (Treceno *et al.*, 2003; Bunni, 2003; Broome, 2002).

Risk management includes managing both positive and negative consequences of risks. That is, risk management forms an endless process in where the causes of uncertainties are realized in a well-ordered manner, their influence considered and gets limited by some conditions, and their outcome and chances managed resulting in a tolerable balance between opportunities and risks (Williams *et al.*, 1998; Dawson, 1997).

Risk management has to do with having the understanding concerning a project and taking into consideration better decisions in regards to the management aspect of the project in the future (Smith, 1999). According to Dawson (1997), there exist similarities amid the inconsistency in the various definitions, which he summarized as follows:

- It considers mechanisms to control risks as it provides a satisfactory level of general exposure.
- It engages systematic approaches or methods.
- Risk management is formal process.
- Risk management is not one-time event.
- It is aimed at identifying risks in a business or operation settings.
- It assesses the effect of risks at above settings.

Risk identification is aimed at identify all noteworthy causes, sources and events of risk in construction project. The assessment aspect of risk is used in defining and assessing all the technical characteristics of the individual risk. Risk analysis refers to the process where those aspects of the individual risk, in addition to the risk dependence restraints, are engaged to conclude on the impact of these risks and the activities involved as Tah and Carr (2001) stated. Operative risk management ensures the reduction of risk exposure and thus lessens loss. The responses and attitudes to risk include:

(1) Absorption or retention of risk

(2) Mitigation or reduction of risk

- Training and education on potential risk alert to staff
- Reduction in the likelihood of loss through physical protection

- Setting up systems to check consistency and instill the attitude of asking “what if” questions

(3) The transfer of risk

- Altering the conditions of the contract to enhance modifying the risk
- Assigning works to different party
- Arranging for compensation should any uncertainty arise

(4) Avoidance of risk

One of the major principles used to ascertain the outcome of risk transfer is in case the insured has that quality of being competent to evaluate critically the situation involving exposure to danger and the needed skills in controlling or minimizing this actual risk (Kangari, 1995). Traditionally, contracts are deployed as tools for the distribution of risk among the involved parties. Alongside the project, the nature as well as the degree of the risks may alter, different kinds of risk may as well set in and the prevailing ones may alter their significance or be changed and thus changes as such may either worsen or some of the risks may be ease. Accurate as well as comprehensive distribution of risks can be attained by not just via the conditions of the contract only as Rahman and Kumaraswamy (2002) observed.

Implementation of risk management way outs can be articulated concerning the rudimentary approaches of managing risk and the extents of the tactical management of risk as well as management awareness (Suominen, 1995). For example, an effective management of risk could be attained by applying an insurance-weighted transfer approach or a careful control approach. Nevertheless, applying a risk-ware or shift strategies suggests taking larger risk and managing a lesser risk for firms. Once the risk management level and the management’s strategic consciousness are

together small, the “shift strategy” is employed. It mostly occurs in situations in which there exist no traditional way of managing insurance and risk exists. Insurance alone is perceived as primary tool for controlling risk when the management’s strategic consciousness is low and the risk management level is high. Insurance does not always remain the best option in managing risk. There are other alternatives in dealing with risks in the case where management’s strategic consciousness upsurges to a specific extent.

2.3.1 Insurable Risks

This refers to risks that are covered by insurance. For an insurer to accept risk, the risk should be what is called “pure risk”; meaning the risk possess the disadvantage side of consequence alone, the traditional insurance does not cover speculative risks. Furthermore, risk has been impulsive and inadvertent, with available statistics to insurers assist in simulating previous events and thus create a laudable premium.

Contractors’ All Risks (CAR) insurances insures damages that are physical to project supplies used on site – be it in storage, in transit or forming part of the activities of the project. Whether or not a risk is insurable, there exist other factors that are connection with insurance policy requirement that must be thought of: insurance period; sufficient limit; indemnification gaps and overlaps; cost/premium; negotiation and flexibility of an insurance policy; aptitude and honour of underwriter to insure damages to the indemnified; limitations as well as exclusion of the insurance policy.

The deductible is mostly among the major practical ways of placing insurance. There are two basic ideas behind deductibles: the first has to do with the elimination of small claims, in which administration costs alone exceed the claim; and the second

has to do with ensuring that what is insured complies with the set obligation of the insurer to sidestep claims through taking into consideration all the reasonable precautions so as to prevent damage or loss (Howard, 1997). Consequently, it enhances the management of risk.

Wang *et al.* (2004) stated that, insurance is an operative measure for mitigating risks be it at the market, project or country level. Example, political insurance came to being to reduce the incidence of risks in changing of a law, political and expropriation instability, justice enforcement, insurance cover for the third party to recompense the entire staff and the public. Nevertheless, not every risk is transferrable to insurance. Generally, the checklists of risk assessment have offered an outline for identifying risks that are insurable (Williams *et al.*, 1998). Risk analysis together with insurance survey questionnaires can assist in identifying insurable risks.

2.4 CONSTRUCTION INSURANCE

In view of insurance from the legal perspective, it assigns risks in the construction project setting to the parties involved in the project. From the aspect of an indemnity, risk is the foundation of insurability as well as calculation of premium (Bunni, 2003). According to Dickson (1983), insurance as a mechanism for transferring risk which the insured handed over from a condition of insecurity to a foregone conclusion of the insurance premium. Insurance is a device used when outworkers do the alteration of a steady identified yearly premium particularly for an unidentified possible loss.

CII (1993) and FIDIC (1986) defined insurable risks as follows:

- Dependable evaluations of claim severity and frequency are available.

- The tailored and adequate policy.
- Possible losses that are unintentional and accidental.
- An insurable risk requires to be measured quantitatively.
- Unavailability of additional substitute for risk transfer elucidations.
- Losses that are measurable and determinable.
- Premium or risk charge is economically viable.
- A large number of standardized and comparatively independent units of exposure.
- The confidence and trust of insurers about their entitlement service and their affluence.
- Risk insurability.
- The contrast of the potential loss of risks and the insurance premium.

An archetypal project in the field of construction will take into consideration the insurance on:

- Destruction to construction plant
- Material damage
- Non-negligent Indemnity
- Third Party Liability
- Important loss

Examples of insurance covers that are mostly not included but are attainable

- Inherent defects
- Motor
- Contract Performance Guarantee Bond
- Professional Indemnity

2.4.1 Perspectives on Risks from Clients, Contractors and Insurers

The management of risk can be defined as the process designed for decision making on reducing the possibilities or effect of the occurrence of risk (Treceno et al., 2003). There exist various kinds of stakeholders in the construction industry, including insurers, subcontractors, clients, suppliers, suppliers etc. According to Chapman and Ward (1997), the various parties in construction projects have dissimilar viewpoints on risks base on their respective background as well as benefits. For clients, the concern is with the risk of the construction project not being able to meet the set time frame of the project and exceeding the project budget; contractors are concern with the profiting from the project; and the workers are concern about their health and safety on site and risk of suffering ill health and having accidents (Anderson, 2000). Again, certain risks stay unusual to a party whereas others also share with others according to Baartz and Longley (2003). Consequently, a number of conflicts as well as claims throughout the life cycle of the project. The parties have dissimilar understanding and views on risks, which intermingle with their priorities and their objectives as well. Risks are seen among parties that engage in project management and are as well best in managing the factors that cause risk (Flanagan and Norman, 1993). For instance, design consultants are in charge of design defects; contractors control safety risks; and a building owner deals with political risks. Construction insurance thus covers the interest of financiers, subcontractors, clients, contractors, engineers, suppliers and architects.

2.4.1.1 Clients

Clients in the industry of construction are in charge of the bill and therefore it becomes significant to appreciate their outlooks as well as their needs. From clients' viewpoint, the process of risk management should begin from updating the project

through to the phase of handing over of project to the client. Clients form the foremost group that carry out the risk management process and later engage contractors at the earlier phase or in the construction phase conferring the method of procurement. For instance, design and construction would engage contractors in the early phase. Clients would prefer to reach the anticipated objectives, that is, quality, cost and time.

According to Edwards (1995), a client or a financier (promoter) is apprehensive about a sound return rate gotten for undertaken risks and as well how probably variations in timing, benefits as well as estimated costs would have an effect on the rate of return. Nevertheless, the above ought to balance with the entire transfer of risk cost.

Foremost risks confronted by the insured according to Baartz and Longley (2003) and Palmer et al. (1996) are: land acquisition risk; failure to fund; major changes in requirements; client-furnished materials not available; extra government administration cost; interference among parties; project delay; and failure to make progress payments. The above factors cause the fear of increasing the cost consequently by frequent repairs, faulty projects and wasting investment, and uninhibited project.

2.4.1.2 Contractors

Contractors play a major role in dealing with risks involve in construction. They are in charge of successful managing risk in construction (Treceno *et al.*, 2003). According to Wang and Chou (2003), the ability of a contractor in managing risk is among the foremost issues to the performance of a project. There is a tendency of contracts in the last two decades to swing the risks from the client straight to the

contractor (Lynch, 2003), through the usage of clauses on contracts (Wang and Chou, 2003). If no requirement exist on the distribution of a particular condition of risk, the contractor as well as the client would usually have consent that risk like that ought to be taken by the contractor, in cases where those kinds of risks source from sudden disruption by the umpire like demands of assistance to the local community, illegal waste disposal, and intimidations by gangs (Wang and Chou, 2003). The terms and conditions of the contract ought to be clearly defined so as to allocate risks among the involved parties. It would not be enough having an unclear idea as to who should be responsible for a risk and such condition can cause misunderstanding which could also lead to disputes or worse, project failure.

Risks that the contractor ought to assume, consider, lay off or allocate can begin at any stage from the bid agreement stage through to the handling of project to client and even follow up maintenance (Baartz and Longley, 2003). It is impossible for a contractor to undertake every single risk. The ability of the contractor to control and as well bear the consequence of risks must be considered as Boothroyd and Emmett (1996) opines. Thus, an enhanced understanding concerning risks allows easy allocation of risks to the involved parties.

Risks that are in connection with the process of construction are easy to identify unlike others that cannot even be seen. According to Palmer *et al.* (1996), from the viewpoint of the contractor, risks include site conditions; late deliveries of materials; site availability delays; unexpected price fluctuations; penalties, costs, and damages resulted through the completion of project works etc. Contractors ought to consider also the duties in carrying insurance to subcontractors, consultants, and insurers. In times of choosing among the various strategies of risk management, the following consideration must be taken by the contractor including risk management

capabilities, risk responsibilities, and risk patterns as Wang and Chou (2003) suggests.

Not all risks are shareable with clients (e.g. bureaucratic delays). Risks like materials' quality and workmanship are transferable to suppliers or subcontractors. Theft and fire for example, constitute risks that are insurable. For these reasons, the management of risk becomes a decision-making process that ought to be followed by contractors to transfer, retain, avoid or reduce risks.

According to Boothroyd and Emmett (1996), contractors ought to be well compensated for any kind of risks which they take charge to be the utmost profitable course for clients from the insurers' viewpoint. Traditionally, client's satisfaction forms the basis for insuring the works; normally by means of an insurance policy. It is in the interest of a client to mitigate damage or loss to the project during the phase of construction and again reinstating or repairing them in case of damage or loss which the contractor is responsible for in the contract. Furthermore, the client needs protection from the claims that are popping up against the contractor; be it a third party or the contractor's employees, and mostly the contractor underwrites the client for claims as such. The contractor often organizes the client's public liability insurance as well as his/her liability to lessen that kind of risks.

Contractors are capable of achieving the precise responsibilities and risks allocation which are conveyed in the insurance contract. Insurance is a tool for risk transfer and it is a critical and major part of the whole system of risk management. Three issues are discussed here:

1. Assessment of risks and needs

The contractor would be required to assess the risks to be insured. Suppose insurance policy is wrongly issued in relation to the risks, it could give rise to lack of insurance cover by insurers the time claims set in. Insurance policies in construction must be designed to suit to a particular setting (Bunni, 2003). Contractors must be innovative and must have also that ability of negotiating with the insurers so as to improve the insurance's conditions, which are modified to suit the changed needs and obtain the utmost reduction of premium by means of implementing appropriate loss control as well as management of risk measures through their expert team.

2. The precise insurer and the fitting insurance policy

A contractor has familiarized himself with the various insurance policies in construction. The contractor should again have in mind the quality of each insurer regarding their claims paying ability or their financial strength and reputation of the market. Insurance quality can be confirmed only when the insurer is called in to make payment of a justifiable claim.

3. Supporting and settlement of claim

Contractors undertake major role in making decisions on items' value needed to be issued as well as negotiation on premium to be rendered to the insured. The standards required by contractors in choosing among insurers are just premium, but other services also for settling claims and support for managing risk. To effectively engage insurance in construction project, contractors must:

- Have full understanding on the perception hold by insurers towards the construction industry and develop technology to counter that.
- Keep tight the connection between him and the insurer who is versed in insurance products in relation to the industry.

- Establish an effective system of risk management, quality control as well as safety management programs to lessen risks.
- Educate their employees to have better understanding on current insurances.

2.4.1.3 Insurers

Whereas contractors are in charge of positive risk management in construction projects, insurers can assist contractors with their expertise in risk management upon identifying possible risk and developing strategies to counter future risks. According to Williams *et al.*, (1998), the readiness of the insurer to cover all his properties with insurance replicates in favour of the insured's efforts at environment, safety, and health control.

Risks involved in construction are difficult and hazardous to assess, very complicated, and it involves cost as well as control. It is demanded of the insurer to make provision for the highest quality of service in insurance with the assistance of research, training, information technology, and up-to-date engineering knowledge (Heidenhain, 2001). Nevertheless, not every insurer shows interest in construction insurance basically for the following reasons:

- Projects under construction as well susceptible to damage or loss (Costner, 2002). For projects taken in numerous expertise (particularly unverified), or demand immense organization and control, they are further susceptible to facing more losses (non-insurable or insurable) even though it is false to normal works of construction. Nevertheless, risks in construction are riskier compare to assets risks.
- Plenty things insured (Costner, 2002) normally includes contractor, financiers, owner/principle, suppliers/vendors, sub-contractors etc.

- Multifaceted risks are risks that are normally correlated. Third party personal injury risk or property risks, insures construction risks, plant/equipment in evidence etc.

As a result of multifaceted features, a project under construction involves a lot of parties as well as risks. Instead, insurers' chance is within the concluding, negotiating, and drafting of manageable longstanding, multi-line insurance arrangements, occasionally covering for some time mostly more than ten years as Heidenhain (2001) stated.

1) Co-operation with Contractor

It is not just severity and probability of risks but it includes also suitable management system of risk and it has important influence on both the acceptance of risk and the insurance premium.

Consequently, effective co-operation should be accomplished involving all parties as parties have similar objectives to the project, deprived of losses and not exceeding budget (Treceno *et al.*, 2003).

Insurers can make the following recommendation for suitable risk management techniques for projects contractors to:

- Upsurge inevitability on exposure of finance;
- Lessen the claim size if it happens that way;
- Moderate the likelihood of arising risk

2) Premium Dilemma

Insurers contend with themselves on prices as well as services. Insurers are driven by profit like in some business, however not driven by market share. Currently, insurers are stuck to their guaranteeing procedures more willingly than the market share.

Nevertheless, insurers in other emerging countries, like China, possibly will have to about the prerequisite for growing the market share of premium against the need to raise rates to attain revenue. Since risks are interconnected, insurers must consider having both insurable risks as well as the pertinent risks.

3) Participation in Loss Prevention

To lessen the chances of events and consequently claims, underwriters ought to consider taken the vigorous role in assisting the indemnified so as to manage risks. The appointed engineer should have in mind the various types of projects that would be practiced according to risk analysis and identification.

2.5 MOTIVES FOR CONSTRUCTION INSURANCE PURCHASE

The focused of transformational programs in the confounded zones globally, in addition to hasty technological growth which happens in the changing approaches to combined the risk principles, construction, indemnity, liability, and responsibility in these zones which result in a greater demand for construction insurance (Bunni, 2003). The motives for cumulative request of insurance in construction, particularly in emerging countries are as follows:

- (1) New Technology
- (2) Legal Aspect
- (3) Safety Consideration
- (4) Financial Consideration
- (5) Management Consideration

The typical pooling-of-risks incentive for indemnity acquisitions could practically be succeeded by the theory of transaction-costs in which indemnity gives a low-cost substitute to a costly subject astringent between the other parties of the company

according to Main (2000). Incentives for insurance acquisition could comprise transaction cost theory, human capital, informational asymmetries, costs of financial distress pooling-of-risks, taxation, and insurer services.

2.6 UNDERLYING RISK FACTORS ASSOCIATED WITH CONTRACTOR INSURANCE PROVISION

2.6.1 Special Risk Considerations

The collective term used in describing the various policies that ensures protection in the industry of construction for erection, works etc. is what is referred to as 'Construction Insurance'. Generally, construction insurance is anticipated to be restricted to just the construction stage. Nevertheless, construction project itself is a life process altogether; it includes in order feasibility study stage, call for tender and evaluation of tenders stage, award of contract stage, construction and erection phase, handling project to client and maintenance. A lot of researchers (Bunni, 2003; Palmer *et al.*, 1996; Levine, 1991; and Hickson, 1987) argued on all insurance policies in the course of the entire project phase. Construction insurance services and products have specially developed from the time of the first Contractors' All Risks policy was hand out in the year 1929 to insure activities inside construction projects. In the year 1934 in Germany, a special policy was issued which started spreading to other parts of the European continent (Wassmer, 1998). Dormant flaws in connection with insurance were presented as the Decennial Insurance by the French underwriters in the year 1980. Construction insurance can be divided into two general categories: liability and property insurance. Currently, the two categories have been extended to include business interruption in the course of construction project and it is referred to as Advance Loss of Profit (ALOP) or Delay in Start-up (DSU). Even though it might appear perfect to secure one an insurance policy cover on a contract, but the situation

here is that it is impossible to do so because contract risks come in diverse ways and even insurers major in insuring other risks over others as Levine (1991) opines. Project insurance which is at times called ‘wrap-up’ is an insurance that embraces all aspects of a construction projects. Different from conventional construction insurance, project insurance permits either the contractor or the client to make purchases of an insurance policy that would cover most parties inside the project. Project insurance can best protect the interests of the client and again assist in avoiding insurance gap. For long term projects, especially major construction works, there exist various project insurances that would be able to cover such projects (Edwards *et al.*, 1996). Nevertheless, such insurances have other limitations. For instance, project size is a significant requirement and a leading factor used in determining whether or not a project qualifies for project insurance. Therefore, a project ought to be large enough or should at least contain some important labour costs so as to qualify it financially viable; if not, extra administrative cost normally render it less valuable to be covered under the insurance.

2.6.2 Changing Environment

The next concern is on the way insurance program adapt to the ever changing business setting of the industry of construction like construction contracts as well as procurement methods. Projects under construction are day in day out becoming complex in their nature, and again the introduction of methods of procurement indicates that contractors ought to reconsider their method to the ways construction related risks are handled in their respective firms or projects. Furthermore, Griffiths and Armour (1997) observed the following challenges to insurance firms to be the consequences of the changing business environment.

- Progressively multifaceted projects have made the general configuration of risk transfer and contracts outdated.
- Increasing number of major construction projects can upshot in accumulative occurrence of deficit in indemnity cover
- Proprietors were making demands of a far greater say over premium levels and cover prescribed to their benefit mainly for the reason that insurance costs on large projects denoted an upsurge cost.
- There exist many projects in the emerging countries and even these numbers keep on upsurging; a number of them were specified that indemnity cover ought to be arranged in markets which insurers are unacquainted.
- Expertise/technology had improved the intrinsic design risk which could become the duty of the client who may not even be prepared for the increasing risk.

2.6.3 Procurement Methods

According to Potter (1995), as skill and experience upsurges, the influence of the client on procurement and construction practices also increases. Concerning the growth in technology from the perspective of civil engineering, procurement has changed from the traditional methods to construction management. Some specific types of procurement normally support contractors in insuring liability and works risks like the turnkey. A given procurement mostly contains some specific requirements as well as preferences to the construction insurance. For instance, BOO or BOT project demands a complete multi-year or multi-line compendium cover. The single-line professional underwriters face the challenge of losing business as a result of the lack of tractability provided they fail to write multifaceted insurance concepts, as a result of those covers not being common their records as Heidenhain (2001)

suggests. Underwriters have to secure for themselves a more flexible and fulfilling requirements for new methods of procurement.

Construction insurance certainly keeps on being flexible and it adapts to altering indemnity needs consequently for the large methods of procurement changes, which is confronting the industry of construction. Majority of these needs came to being as a result of the new methods of project finance, as well as the transfer of these needs is mostly executed by financiers of the project (Howard, 1997). To meet the above demands, one has engaged the new solutions of insurance.

2.6.4 Construction Contracts

Works contract forms a legal device that divides financial risk among the client and the contractor of the construction project (Wassmer, 1998). Works of contract does not only specify how financial risks are to be allocated, but it does also oblige the contractor to underwrite the works to cover damage or loss. Standard conditions of contract governing the parties' relationships outline clear the responsibilities for the damage or loss to works in the course of the project, and hold the clauses with regards to the obligations to indemnify. The foremost circumstances of contract will usually be the major document for the relation between the contractor and the client for risk allocation and responsibilities of insurance. The contractor evaluates the risk distribution and thus fills the requirements of the insurance inside the contract.

Expert institutions as well as associations made a proposal on the standard contract forms like the JCT, ICE, NEC, FIDIC contract conditions. Each particular standard as well as any special additional clause for a project concerned ought to be evaluated to identify the party that should be responsible for what backup indemnities are itemized and needed, who should be responsible for a particular insurance cover,

what deductibles are allowed, and what insurances are needed (Advanced Study Group, 1999).

Shifting of liability that result from the newest requirements of contract for insurance causes a complex web of statistics, law, construction, insurance, economics, and engineering.

Every specific contract is reformed together with the growth of the industry of construction. The building owner relies on the contractor for the maintenance of enough insurance under the FIDIC 1979 previously. Nevertheless, client-controlled indemnity was recommended strongly for huge engineering projects specifically civil, with the various options written inside the Contract Conditions to permit the possibility in 1995, as a result of clients' form the only group can depend on the upsurging practice and skills of their own managers of risk to supervise the contractor's arrangements for insurance as Griffiths and Armour (1997).

Having a complete understanding concerning construction insurance for a specific project like the procurement methods, terms of the construction contracts, and type of project, ought to be enhanced. Furthermore, construction projects have a multifaceted arrangement of interrelationships between and within parties for a particular project, and as well details a number of types of property and numerous interests of ownership (Cavignac, 2003). Contractors ought to ensure insurers write insurance policies in the correct way that considers the interest of the parties involved in addition to protecting them.

2.7 INTERACTION TO RISK MANAGEMENT

According to Rendell and Yablonsky (2003), insurance was in time past proven to be one of the profitable and convenient ways of managing certain risk types or even all

kinds of risk. For this reason, the foremost concern about insurance is how it can be evaluated for the management of risks involve in construction. Purchasing indemnity for a public insurer remains still the most used method among others and it is also the most profitable way in handling high severity losses for small and medium sized firms according to Rendell and Yablonsky (2003). Because of contractual and constitutional requirements, insurance is important for managing risk in construction as Edwards *et al.* (1996) suggests. Nevertheless, too much dependency on insurance can cause a higher cost of risk to the industry (CII, 1993). Construction firms, precisely contractors, mostly have the no option than to go in for insurance. Nevertheless, indemnity is the only choice left for managing risk. One has to understand that, not all risks are insurable for a particular price that seems adequate as Baartz and Longley (2003) opines. The ITF (i.e. Insurance Task Force) realized that, owners and their respective contractors ought to understand that costs in relation to financing risk has now become an important portion in the body of total cost of project, and thus with the right co-operation and management the cost involved in financing risk were manageable. If managing risk cannot be proven to be the most profitable solutions, thus, contractors may opt for other means. The indemnified previous loss or damage experience could have some effect on the premium. The insured keeps control over the cost in a way to prevent loss and in so doing reduces the quantity of losses and thus reduces premium as well (Williams *et al.*, 1998). To keep the market share, underwriters are considering the claims track records of an individual firm in the construction industry, so as to deliver the outmost deal (Edwards *et al.*, 1996). Therefore, construction insurance can assist to the indemnified to positive towards managing risk.

Nevertheless, organizational structure normally upshots hindrances to the integration of managing risk (Williams *et al.*, 1998). Not many firms have full time managers who are specifically in charge of risk and also risk management system. Conversely, the same limitation seems to be common among the various academic institutions concerning the structure of courses on risk management; this has left students with the assumption that the management of risk is subtopic of human resources, accounting, or finance as Smith (1999) suggests. Consequently, a combined risk management strategy ought to be built from both external and internal approaches. The two approaches consider experience sharing, establishing and implementing risk management system, and knowledge learning. Premium in insurance ought to be based on the contractor's records on safety and management of risk to boost contractor in taking active programs in managing risk.

2.8 CONTRACTOR INSURANCE OPTIONS

Below are issues which may arise in relation to the key classes of insurance commonly required in construction and infrastructure projects

2.8.1 Contract Works Insurance:

Contract Works insurance is often provided as a combined material damage and legal liability policy. The first part of the policy usually insures against physical damage to:

- I. the works under construction;
- II. materials for the project stored on-site and off-site;
- III. temporary structures;
- IV. hired plant and equipment; and

V. contractor's plant and equipment (although in some cases this is insured separately under Contractor's Constructional Plant insurance).

The second part of the policy insures against damage to property or personal injury to third parties arising from construction activities on and off the site. Contract Works policies will usually contain exclusions for, amongst other things, faulty workmanship and design. They do not cover all risks associated with the building works and most importantly, where design is an issue, must be supported by professional indemnity cover. This type of insurance is usually taken out by the contractor but can be taken out on a principal controlled or project manager controlled basis and in such case should name the principal, project manager, contractors and subcontractors as insured under that policy.

A construction program is usually put to the insurers (such as developing an underground mine which will go down to a certain number of levels and construct a treatment plant which will take 18 months) and the contract works insurers agree to cover the principal and the contractors for that period. At the completion of the construction phase the insurer will then take over. Sometimes however there is a phased handover from the contract works policy to the ISR policy and this is because it is a cheaper option but it can get very complicated. What that means is the contract works policy will apply to various stages of the project and as each stage is completed that stage is taken out of the contract works policy and covered under the ISR policy. So for example you might find that you have a pipeline which has been built and is completed and the pipeline may be used to run off water while part of the mine is developed. Once the pipeline has been completed it can be taken out of the contract works policy and put into the ISR policy. However if it is being used for construction purposes it may be considered to still fall under the contract works

policy but it may also fall under the ISR policy because it itself has been completed. You may end up with disputes between insurers, for example, the ISR insurer may say that the pipelines are not covered by the ISR policy because they are being used as part of the construction process but the contract works insurer may argue that the pipeline is not covered because it has been completed and is no longer itself under construction. Similar complications can arise where the works involve extensions or refurbishment to existing structures. The interface between the works and the existing structure must be clearly defined to avoid a stand-off between insurers. Another means of minimizing such insurance disputes is for the Contract Works and ISR policies to be placed with the same insurer. However, this can give rise to other issues (Allens, 2003).

2.8.2 Industrial Special Risk (ISR)

This form of insurance is at times referred to as “Property Damage and Business Interruption” insurance. Similar to the CWI, ISR policy generally has two parts. The first part has to do with property damage, which insurance cover is made for physical damage, loss or destruction to every perceptible asset which belongs to the insured. Suppose a loss occurs, the policy permits replacement or reinstatement of the lost or damaged asset. The policy includes much exclusion just like the other policies, including faulty materials or workmanship, theft, erosion, war, earthquakes, radiation, flood, wear and tear, fraudulent acts etc. The second part has to do with business interruption section where insurance is offered to significant or untainted economic losses subsequent from an interference or interruption with business that result damage to properties insured in the first part of ISR. For instance, ISR would underwrite something like:

Should any property used by the indemnified at the sites is damaged, destroyed or lost and the business existed by the indemnified in the effects thereof is interjected or affected by the underwriters (insurers) will obliged to pay an amount of the loss underwent as a result of that disturbance or nosiness. According to Allens (2003), policies will generally cover one or the other the loss of gross profit or the reduction in gross earnings and in others too the indemnified can designate the formula to take on. The calculation on the loss of profits claim within the business interruption section is actually difficult and it is required to engage experienced loss adjusters and some accountancy companies recruit expertise in these operations. Additionally, in referring to above, it is important to consider managing the line between the transition of particular items and the works and existing structures so as to cover the two under the Contract Works policy and to also cover the principal's ISR policy.

2.8.3 Professional Indemnity (PI)

This insurance underwrites the insured for some amount with which the insured now becomes liable to under the terms and conditions of the insurance policies to make payment consequently to any alleged or actual careless act, omission or error in the deportment of the insured profession or business. Expenses as well as costs incurred during the defense, investigation, or settlement of a claim are counted in, at times in addition to the limit of policy. Insurance under the Professional Indemnity is claims that have been turned into insurance. This shows that the PI respond only to claims made against a firm in phase of the policy, regardless of the time the act of carelessness truly occurred. This point is key in differentiating PI against other policies like the Public and Product Liability, in which coverage is just for the occurrences in the time the policy is enforce regardless the claim being made after the expiry of the policy.

It is mostly common for a client to demand from a contract to have PI insurance in which the contractor is obliged to provide design, engineering, project management etc. all depending on the client. At times, the client will take charge of the PI insurance for claims through to the value of the excess inside the procured policy of the principal. The motive backing this approach might be the following: the precise project would rise to PI challenges for many specialists; these consultants are expected to convey to the client the cost involved in obtaining the PI insurance as demanded by the client and as would be likely to face risk of the claim which is made by a different client (Allens, 2003).

2.8.4 Public and Product Liability

The public and product liability insurance is occasionally called the “General Liability insurance” or “Combined Liability”. Once more, there are two typical modules to this particular policy:

Public Liability: the lawful liability to recompense third parties in relation to the activities of a business of the insured. Public liability is restricted to an extreme amount for every even or occurrence, but mostly inexhaustible number of events give respond to any policy yearly. **Product Liability:** the lawful liability to recompense third parties in relation to an insured product. Product liability is restricted to an extreme amount for every product claim in a policy yearly. In major projects, it is mostly common for the client to demand from the contractor to procure Product and Public Liability insurance straightaway alongside the project activities itself. Public and product liability insurance afterwards takes charge of the insurance cover under the insurance for Contract Works.

2.8.5 Workers' Compensation

Every country state has constitutional requirements for its employers to ensure effective compensation insurance to workers for the benefit of all including the employers themselves. Whereas there exist variations among countries, workers' compensation insurance efficiently covers all aspects of liabilities, be it arising under an act or a public law, concerning the death of or an injury to workers' reckoned to be personnel. The head of the institution or firm may also seek authorizations on the supplier's employees' reimbursement policy, in the case of a contract for a project with particular acknowledged hazards. A principal will typically pursue the named as well as the insured under the contractor's employee's reimbursement policy. This is intended to cover all claims by contractors' workers who proclaim the principal is a reckoned proprietor.

2.8.6 Compulsory Third Party Motor Vehicle

The Insurance law, PNDCL. 227, 1989 (National Insurance Commission, Ghana) made it obligatory to provide insurance cover in consideration of the third party's damage liability through motor vehicle accident. For example, the workers administration of the CTP plan, compensation legislation, and premiums levied as well as the extent of cover provided varies between different jurisdictions. Heads of organizations are most at times oblige to include the provision needed to take out every essential CTP insurance as demanded by statute in a particular jurisdiction for the use of vehicle in relation to work inside the contract (PNDCL. 277, 1989).

2.8.7 New Insurance Products

As the insurance market brings in new methods for addressing risk projects the new insurance products also evolve; one of the newest insurance product on the market is what it is referred to as transactional insurance (Allens, 2003).

Transactional insurance protects parties against any risk-related eventualities or incongruities that might block business transaction completion if otherwise. For instance, transactional insurance may be engaged so as to replace the traditional risk types like representation or indemnities as well as warranties inside the documentation of the project, a party accepting reduced monetary benefit, and letters of credit. According to Allens (2003), risks that are addressed by means of transactional insurance comprise environmental liabilities and decisions, loss associated with existing litigation, one party's withdrawal from the transaction, unfavourable regulatory changes as well as unfavourable tax treatment. Clearly, the exact terms of the policy in the aforementioned 'categories' of insurance vary between different insurers and will be affected by the dominant market situations and as well project circumstances that are to be insured.

CHAPTER THREE

METHODOLOGY

3.1 INTRODUCTION

The research methodology adopted for this research is espoused in this chapter. The research strategy, approach and process are explained. The research population, sample and sampling techniques are discussed. Instruments of data collection and analytical methods are dealt with in this chapter.

3.2 RESEARCH APPROACH

To effectively improve the reliability and validity of any social research is to demonstrate the research approach (Cresswell, 2007). The deductive approach was adopted for this research. This is for the reason that the investigator had to evaluate and present important facets of the problem being investigated.

3.2.1 Research Strategy

The enquiry of research objective is simply the research strategy as Naoum (2002) define. There are three (3) main types of research strategy according to Naoum (2002) asserted. They are qualitative, quantitative and triangulation. However, the one to employ in any exact research practically relies on the intent of the study, type, as well as the availability of information for the study (Naoum, 2002). In effect, the study utilizes the quantitative research strategy. According to Frechtling and Sharp (1997) questionnaire, tests and present database is the common data collection technique used in quantitative research technique. Further, hard and reliable information are often collected in qualitative research, whereas quantification is emphasized. The representation of the sample collected is normally large. Thus, the outcome under quantitative research can be generalized to a larger population within

an acceptable error limits. The reliability of the results is grounded on careful choice measuring instrument and how correctly it measures targets (Patton, 2005).

3.3 RESEARCH DESIGN

Research design is explained as the plan or outline that serves as a guideline in the gathering and explanation of data (Al-Moghany, 2006). It refers to the series of steps that connect research questions and collected data. Research design is the plan guiding the investigator to gather, analyze and explain observations (Nachmias and Nachmias, 1992). It involves a clear process of evidence permitting researcher to make inferences about causal relations of variables under study (Nachmias and Nachmias, 1992).

Research design is defined by Al-Moghany (2006) as an outline that explains what data are important, what questions to investigate, which data to be gathered and how data will be analyzed. Research design provides answers to questions under study (Polit and Hungler, 1999; Al-Moghany, 2006). It also mitigates challenges encountered when undertaking research (Naoum, 1998). It is impossible for researchers to assume people reason in a certain way without confirming from them (Polit and Hungler, 1999; Al-Moghany, 2006). According to Polit and Hungler (1999), research design explains the method to be utilized as well as how the investigator hopes to device controls to improve the interpretation of outcomes.

There are varying research designs that are used to meet the challenges anticipated in the review schedule (Weisberg and Bowen, 1977). As opined by Naoum (1998), the most used technique in data collection to gather opinions, facts and views of people is using structured questionnaire. A questionnaire survey design was employed in this survey.

3.4 POPULATION SAMPLING AND SAMPLING TECHNIQUE

The population of a study contains of all people, things or measurements of interest. From Strydom *et al* (2005) sampling simply denotes drawing part of a population or to represent a whole (population). It is largely specified that the bigger the population, the lesser the proportion of that population (Naoum, 1998).

For this study, the targeted population consisted of D1 contractors, consultants and insurance personnel. Purposive and snowball sampling techniques were employed. The study employed a purposive sampling technique grounded on the research design, drive, as well as applied inference of the study. In other words, the researcher chooses what desires to be identified as well as carried out to identify individuals will be ready to give the information by virtue of understanding or practice. According to Mugenda (1999), purposive sampling is sampling technique that allows the researcher to use samples that have the required information with respect to his/her research objective. Snowball led to one respondent directing the researcher to respondents with similar characteristics being looked for. This was done until a representative sample size of seventy (70) was obtained.

3.5 SOURCES OF DATA

The researcher utilized primary sources of data. The main purpose of the study is to gather info that can be analyzed, to enable interpretation, and aided the investigator to grow unique information such as eye witness accounts, and personal observations.

3.6 DATA COLLECTION METHODS

According to Sarantakos (2005) the strategy of data collection which is best preferred by quantitative researchers is questionnaires or survey. Questionnaire surveys questionnaires are the mainly employed way of collecting information in the

social sciences (Sarantakos, 2005). According to Cohen *et al.* (2005) and Creswell (2005); survey questionnaires are employed in many manners to collect data. Survey questionnaires are exceptional methods of collecting data using both open and closed ended questions (Sarantakos, 2005). Creswell (2005) stated that quantitative research utilizes instruments to determine variables of a research. This instrument is made up of definite questions and alternatives of response which the investigator already ascertained.

3.6.1 Development of Questionnaires

The questionnaires were devised to deal with the aim, objective and research questions of the research (Oppenheim, 1996). A good questionnaire is made up of questions which generate varying kinds of data from the respondents (Gall *et al.*, 2003). Questionnaires should be brief, and questions set in a simple way (Gall *et al.*, 2003).

The design of an effectual questionnaire survey is dependent on four essential factors: wording of question, classification, variables coding and general acceptance (Sarantakos, 2005). The instruments for survey must first clearly define the focus of the research. It must translate the objectives to measurable features which add to the research focus (Salant and Dillman, 1994). A good question is one that generates responses which are valid and reliable (Fowler and Floyd, 1995). Survey questions must employ words which match the levels of education of respondents (McIntyre, 1999). Fowler and Floyd (1995) implied that the question and response options should be clear to the respondent and the investigator. Wording must avoid ambiguous understandings (Salant and Dillman, 1994; Fowler, 1995).

3.6.1.1 Questionnaire Format

Literature recommends that the optimal extent of questionnaire varies from one side of A4 paper to eight pages of A4 paper (Naoum, 1998; Oppenheim 2000; Saunders *et. al.*, 2000; Fellows and Liu, 2003).

3.6.1.2 Content of Questionnaires

After identifying the people who will respond to the questionnaire together with their characteristics was to concentrate on the design of the questions that provided the essential knowledge for the study. The way in which the survey questions were presented has an effect on the quality of the responses hence needful to guarantee that accurate questions were posed, understood well and presented in the correct format (Wahab, 1996). The questionnaire comprised questions primarily closed-ended and scaled-response nature and the questions were typed on normal A4, white colour sheets including a cover page.

3.7 RESEARCH INSTRUMENT AND QUESTIONNAIRE DESIGN

The research data was gotten mainly by the usage of structured questionnaires. Questionnaires are a cheap means to collect information from a possibly huge sum of participant (Fellows and Liu, 2003). Thoughtful opinions were made available to the phrasing of the questions. Theoretically, this was employed to mark the effectiveness answers that respondents give to a particular question.

3.8 ANALYTICAL TOOLS FOR DATA ANALYSIS

Finding solutions by means of understanding the data as well as the outcomes. It is hard to describe raw data, firstly, data must be described and analyzed then understand the outcomes of the study (Strydom *et al.*, 2005). Analysis is the categorization, gathering, manipulating as well as succinct data to acquire responses

to research questions. The drive of analysis is to condense information to a clear, reasonable as well as interpretable form that the relationships of issues under study can be tested plus also permits inferences to be complete.

The purpose of editing and organizing field data before the main statistical analysis is to aid in perfecting the data quality and to minimize errors and other shortfall that may affect findings and eventual outcome (Yuen, 2007). After checking and filtering the questionnaires retrieved for completeness, the data was entered into SPSS version 23. Even though, Missing Values (MV) and incomplete questionnaires are frequent in research works and may be attributed to varying reasons, yet it is needful to make sure that the missing values do not have an effect on the analysis so as to improve validity (Bentler, 2005). The SPSS software is automated and designed to control the effect of incomplete and missing data. The questionnaires retrieved for this research did not have any missing values. After successfully, inputting the data into SPSS, the analysis began in order to help solve the research questions and meet the research objectives. Questionnaires retrieved were edited to ensure they were complete. Data obtained was arranged to make the analysis easy. The computable data from the questionnaires was coded into the software called Statistical Package for Social Sciences (SPSS) version seventeen (v. 17).

Data presentation using descriptive statistics

Descriptive statistics (simple frequencies and percentages) was used for the analysis of respondents' demographic background. Descriptive statistics comprises of methods for summarizing and presenting data. The descriptive statistics in the analysis of data helps for easy comprehension of huge amounts of data; and provides chance to correspond the research results to people (Ryan, 2004).

Data presentation using tables

Good tables are integral part of packaging and presenting data to audience. Tables help to minimize the amount of data values in a text; and aid in eliminating less important variables in discussing the data (UN, 2009). According to Miller (2004), good tables must aid audience to find and understand numbers within the table; and both the layout and labeling must be straightforward and unobtrusive in order to draw substantive attention to the data which is conveying information to audience. Tables should contain concise and well-organized data that supports the analysis to be made (*ibid*, 2009). The UN (2009) clearly pointed out that tables should be able to stand on their own; and should contain descriptive title; indicate source. Drawing on from the above, the data collected from the field through the use of questionnaire was presented in table format which belong to the demonstration or presentation categories of tables in order to highlight key figures and as this research is analytical. The results were presented in table format as it will aid in the analysis of key and critical results. The tables were corresponding to the number of questions. The tables were designed to suit the five components of table design identified by UN (2009). The statistical methods which were used in analyzing the data were frequencies and descriptive statistics. The descriptive statistics is the analytical tool for presenting data. Descriptive statistics comprises of methods for summarizing and presenting data. The descriptive statistics in the analysis of data helps for easy comprehension of huge amounts of data; and provides chance to correspond the research results to people (Ryan, 2004).

Data presentation using Relative Importance Index (RII)

Furthermore, detailed analysis was conducted on the specific objectives using Relative Importance Index (RII). The RII values and mean aided in ranking the

phenomena in terms of their importance by using index weights. W represented the weighting assigned to each factor by respondents, A represented the highest weighting (*ie.* 5 for this study) and N represented the total number of samples.

CHAPTER FOUR

ANALYSIS OF DATA AND DISCUSSION OF RESULTS

4.1 INTRODUCTION

The previous chapters were the introduction, literature review and methodology. This chapter is analysis of data and discussion of results using Statistical Package for Social Sciences (SPSS) version seventeen (v 17). Respondents' demographic information was analyzed using descriptive statistics while the specific objectives were analyzed using mean score index and Relative Importance Index (RII). The initial part tackles the respondents' profile. The remaining section thoroughly explains into detail the definite objectives of this research. Seventy (70) questionnaires were distributed to the respondents and fifty-nine (59) questionnaires representing eighty-four (84) percent were retrieved. The high response rate of eighty-four (84) percent because of persistent follow ups on the respondents.

4.2 ANALYSIS OF DEMOGRAPHIC DATA

This section presents the demographic background. Its aim is to generate an understanding on the background of the respondents of this study. Confidence and reliability in data collected is more if the background and profile of the respondents are known.

4.2.1 Category of respondent

Respondents were asked to indicate which category they belonged to. From Figure 4.1 below, twenty (20) percent of respondents were in insurance firms. Fifty-three (53) percent of respondents were contractors. The remaining twenty-seven (27) percent were consultants. Majority of the respondents for this study are contractors.

It is also seen that the study has a fusion of different professionals in contractor insurance provision and this is good for the study.

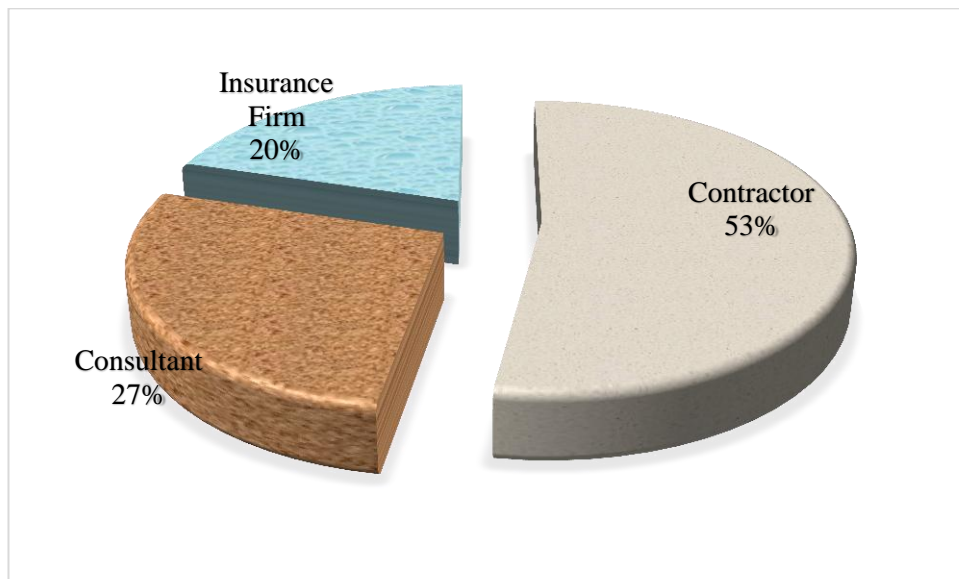


Figure 4.1 Category of respondent

4.2.2 Experience of respondents

The respondents for this study were asked how long they had been working. Figure 4.2 below presents the responses. Seventeen (17) of the respondents have less than 5 years' experience. Furthermore, twelve (12) respondents have 5-10 years' experience. Ten (10) respondents have 11-15 years' experience. In addition, sixteen (16) respondents have 16-20 years of experience. Finally, the remaining four (4) respondents have above 20 years' experience. It can be deduced that the majority of respondents have less than 5 years' experience. All the respondents also have enough experience and are therefore suitable to answer questions on contractor insurance provision.

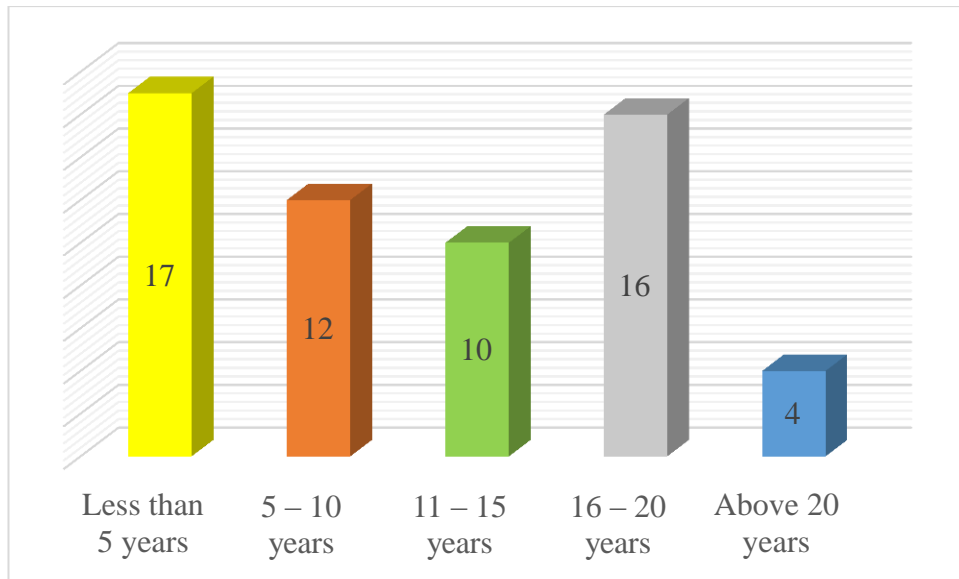


Figure 4.2 Experience of respondents

4.2.3 Number of projects undertaken within the last five years

The respondents of this study were asked in this section the number of projects they had being involved in within the past five years. From Table 4.1 below, twenty-six (26) respondents representing 44.07 percent had undertaken or was involved in 1 to 5 projects. Eighteen (18) respondents representing 30.51 percent had been involved in 6 to 10 projects. Nine (9) respondents representing 15.25 percent had undertaken or had been involved in 11 to 15 projects. The remaining six (6) respondents representing 10.17 percent had undertaken above 16 projects. All the respondents for this study have been involved in a number of projects. It is therefore implied that they have considerable experience and therefore their responses are taken to be reliable.

Table 4.1 Number of projects undertaken within the last five years

Number of projects	Frequency	Percentage	Cumulative Percentage
1-5 projects	26	44.07	44.07
6-10 projects	18	30.51	74.58
11-15 projects	9	15.25	89.83
Above 16 projects	6	10.17	100.0
Total	59	100.0	

Source: Author's Fieldwork (2016)

4.3 UNDERLYING RISK FACTORS ASSOCIATED WITH CONTRACTOR INSURANCE PROVISION IN THE CONSTRUCTION INDUSTRY

In this section, respondents were asked to rank the underlying risk factors associated with contractor insurance provision in the construction industry. Relative Importance Index (RII) analytical tool was used to rank the risk factors. From Table 4.2 below, exchange rate fluctuation ranked 1st with a mean of 4.24 and standard deviation of 0.850. Unrealistic contract duration was ranked 2nd with a mean of 4.13 and standard deviation of 0.826. Inaccurate estimating was ranked 3rd with a mean of 3.96 and standard deviation of 0.792. Interference from client was ranked 4th with a mean of 3.93 and standard deviation of 0.786. Mistakes in design documents was ranked 5th with a mean of 3.91 and standard deviation of 0.781. Inadequate contractor experience was ranked 6th with a mean of 3.70 and standard deviation of 0.738. Materials damage was ranked 7th with a mean of 3.52 and standard deviation of 0.705.

Table 4.2: Risk factors associated with contractor insurance provision in the construction industry

	<i>FREQUENCY</i>										
	1	2	3	4	5						
Exchange rate fluctuation	2	8	4	18	32	59	251	4.24	0.850	1	
Unrealistic contract	2	3	9	16	29	59	244	4.13	0.826	2	
Inaccurate estimating	5	4	7	15	28	59	234	3.96	0.792	3	
Interference from	4	4	9	17	25	59	232	3.93	0.786	4	
Mistakes in design	4	6	11	9	29	59	231	3.91	0.781	5	
Inadequate contractor	8	4	10	12	25	59	219	3.70	0.738	6	
Materials damage	10	2	12	17	18	59	208	3.52	0.705	7	
Errors in drawing	3	10	8	18	20	59	201	3.41	0.681	8	
Labour shortage	9	8	9	22	11	59	194	3.30	0.660	9	
Theft	8	15	2	25	9	59	189	3.20	0.641	10	
Materials shortage	11	6	15	17	10	59	186	3.15	0.631	11	
Shortage of liquidity	12	7	13	18	9	59	184	3.12	0.620	12	
Bad weather	6	12	19	15	7	59	182	3.08	0.617	13	
Acts of God	13	12	12	12	10	59	171	2.90	0.580	14	
Radioactive material	17	12	10	14	6	59	154	2.64	0.525	15	

Source: Author's Fieldwork (2016)

According to literature, vagueness surrounds numerous problems in building projects. Handling uncertainty includes dealing with risks. Exchange rate fluctuation is a risk that is predominant in construction projects (Wang *et al*, 2004). Due to the instability of the local currency against other foreign currencies, contractors find out that inflation affects the prices they had budgeted for thereby leading to losses. According to Sambasivan and Soon (2007), unrealistic contract duration is another risk that affects many projects. Contractors in their bid to win projects propose

timelines they are very sure they would not be able to meet. This leads to problems when undertaking the project. Inaccurate estimating also poses as a risk factor. This occurs when due to human errors and oversight, mistakes are conducted in the estimation process. This causes discrepancies when undertaking the construction project thereby leading to problems and dispute. These findings agree with literature.

4.4 CONTRACTOR INSURANCE OPTIONS

Respondents from the contracting and insurance firms were asked in this portion to rank the contractor insurance options on a Likert scale of 1 to 5. Table 4.3 below illustrates the results analyzed using Relative Importance Index (RII). Employers' liability was ranked 1st with a mean of 4.32 and standard deviation of 0.862. Professional indemnity was ranked 2nd with a mean of 4.15 and standard deviation of 0.831. Workers' compensation was ranked 3rd with a mean of 4.05 and standard deviation of 0.810. Contractors all risk was ranked 4th with a mean of 3.97 and standard deviation of 0.798. Performance bond was ranked 5th with a mean of 3.53 and standard deviation of 0.706. Third party insurance was ranked 6th with a mean of 3.42 and standard deviation of 0.682. Bid bond was ranked 7th with a mean of 3.25 and standard deviation of 0.651.

Table 4.3: Contractor insurance options

	<i>FREQUENCY</i>										
	1	2	3	4	5						
Employers' liability	2	3	4	16	34	59	255	4.32	0.862	1	
Professional Indemnity	1	3	11	15	29	59	245	4.15	0.831	2	
Workers	2	3	14	16	25	59	239	4.05	0.810	3	
Contractors all risk	2	8	4	20	25	59	234	3.97	0.798	4	
Performance bond	10	2	12	17	18	59	209	3.53	0.706	5	
Third party insurance	2	11	8	18	20	59	202	3.42	0.682	6	
Bid bond	9	10	12	13	15	59	192	3.25	0.651	7	
Motor insurance for	8	15	2	25	9	59	189	3.20	0.641	8	
Public liability	11	6	15	17	10	59	186	3.15	0.631	9	
Goods in transit	12	7	13	18	9	59	184	3.12	0.620	10	
Fire perils insurance	8	8	29	4	10	59	177	3.00	0.600	11	
Fidelity guarantee	12	3	30	8	6	59	170	2.88	0.576	12	

Source: Author's Fieldwork (2016)

Professional insurance covers an indemnified for totals which the insured turn into legally responsible to recompense because of any concrete or supposed remiss act, error or lapse in the department of its profession (Villarreal, 2008). Charges as well as outlays acquired to examine, settle or protect, occasionally together with the policy limit. Workers' compensation insurance includes efficiently all charges, either instigating under an act or at common law, in connection to loss of life of, or injury to, workers (*Ibid*). It is common for a prime to request a builder to keep the required employee's compensation insurance in reverence of all workers involved in carrying out the contract. The findings agree with past works literature.

CHAPTER FIVE

SUMMARY OF FINDINGS AND RECOMMENDATIONS

5.1 INTRODUCTION

This research has been on the selection of contractor insurance options in the Ghanaian industry. This final chapter ends the research. Firstly, the attainment of the research objectives (summary of findings) is shown. This is followed by the conclusion of the study. Recommendations are proposed and finally, direction for future research is given.

5.2 ACHIEVEMENT OF RESEARCH OBJECTIVES

5.2.1: To examine the environment of contractor insurance provision in the construction industry of Ghana

Literature review was conducted on the environment of contractor insurance provision in the Ghanaian construction industry. Sources of literature undertaken included books, journals and conference proceedings. Some of the insurance provisions for Ghanaian contractors by insurance firms include: Public liability, Goods in transit, Fire perils insurance, motor insurance for vehicles, Employers' liability, Professional indemnity, Workers' compensation, Contractors all risk, Performance bond, Third party insurance and Bid bond.

5.2.2: To determine the underlying risk factors associated with contractor insurance provision in the construction industry of Ghana

Questionnaires were distributed to respondents and they were asked to determine the underlying factors associated with contractor insurance provision in the Ghanaian construction industry. Using Relative Importance Index for the ranking, the following factors were the most significant risk factors: exchange rate fluctuation,

unrealistic contract duration, inaccurate estimating, interference from client, mistakes in design documents, inadequate contractor experience and materials damage. These factors had the highest mean and RII values.

5.2.3: To assess the selection contractor insurance options in the Ghanaian construction industry

Questionnaires were distributed to the respondents of this study to assess the selection of contractor insurance options in the Ghanaian industry. Relative Importance Index was the analytical tool for analyzing the data. In descending order, these were found to be the contractor insurance options that were selected the most: Employers' liability, Professional indemnity, Workers' compensation, Contractors all risk, Performance bond, Third party insurance and Bid bond. These factors had the highest means and relative importance indices and were therefore the most selected contractor insurance options.

5.3 CONCLUSION

Construction insurance options are very useful in the transfer of risks in the construction sector. With the increase in construction management and engineering, insurance packages in the construction industry have become progressively specified.

5.4 RECOMMENDATIONS

- Series of educational and training programs should be organized for contractors to advise them on the different insurance options available for the different types of construction risks.
- Good relationship must exist between contractors and insurance firm officials to boost the best insurance provision.

- Contractors must be innovative and be able to negotiate with insurance firms in order to gain premium reductions and improved conditions of service.
- Insurers must be proactive in ensuring the insured control risk when undertaking works.
- Insurance firms must make regular visits to construction sites to be abreast of ongoings and give advice on risks.
- Consultants and clients must ensure professionals are engaged to draft construction contracts with regard to the nature, procurement and contract limitations.

5.4 DIRECTION FOR FUTURE RESEARCH

Future research should be conducted on alternate risk transfer mechanisms. Furthermore, other analytical tools like Analytical Hierarchy Path (AHP) should be conducted on similar studies.

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APPENDIX

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF BUILDING TECHNOLOGY

QUESTIONNAIRE

**TOPIC: “EXPLORING THE SELECTION OF CONTRACTOR INSURANCE
OPTION IN THE GHANAIAN CONSTRUCTION INDUSTRY”**

I am a post graduate student pursuing Construction Management at the Kwame Nkrumah University of Science and Technology (KNUST) conducting a research on contractor insurance option.

The aim of this research is to explore the selection of contractor insurance option in the Ghanaian Construction Industry.

This is purely for academic purposes and all information will be treated with strict confidentiality. Your response would be highly appreciated for the success of the research.

Kindly respond to the question by ticking the appropriate box for each item.

PART ONE: RESPONDENT PROFILE

1. Which of the following groups do you fall under?

Contractor

Consultant

Insurance firm

2. How long have you been practicing?

Less than 5 years

5 – 10 years

11 – 15 years

- 16 – 20 years
- Above 20 years

3. How many projects have you undertaken within the last five years?

- 1-5 projects
- 6 – 10 projects
- 11 – 15 projects
- Above 16 projects

PART TWO: UNDERLYING RISK FACTORS ASSOCIATED WITH CONTRACTOR INSURANCE PROVISION IN THE CONSTRUCTION INDUSTRY

Kindly rank the following underlying risk factors associated with contractor insurance provision in the construction industry using the following Likert scale [1= Not severe; 2= Less severe; 3=Moderately severe; 4= Severe; 5= Very severe]. Please tick (√) in the space provided.

	Risk Factors	1	2	3	4	5
1	Labour shortage					
2	Inaccurate estimating					
3	Materials damage					
4	Unrealistic contract duration					
5	Errors in drawing					
6	Interference from client					
7	Bad weather					
8	Shortage of liquidity					
9	Radioactive material					
10	Materials shortage					
11	Exchange rate fluctuation					
12	Theft					
13	Mistakes in design documents					
14	Inadequate contractor experience					
15	Acts of God					
	<i>Any other, please state and rank</i>					

PART THREE: RATE OF SELECTION OF CONTRACTOR INSURANCE

OPTIONS

Kindly rank the most selected contractor insurance options using the following Likert scale [1= Very Low; 2= Low; 3=Moderate; 4= High; 5= Very high]. Please tick (√) in the space provided.

	Insurance Options	1	2	3	4	5
1	Bid bond					
2	Performance bond					
3	Professional Indemnity					
4	Workers Compensation					
5	Motor insurance for vehicles					
6	Employers' liability					
7	Public liability					
8	Fidelity guarantee					
9	Third party insurance					
10	Goods in transit					
11	Fire perils insurance					
12	Contractors all risk					
	<i>Any other, please state and rank</i>					