

RISK HANDLING OPTIONS: IS INSURANCE A FAIR OPTION TO TRANSFER CONSTRUCTION RISKS IN TANZANIAN CONSTRUCTION INDUSTRY?

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Risk handling options have been fairly studied and include avoidance, reduction (mitigation); transfer (sharing) and retention. The decision on the type of handling option to be adopted depends on the ranking results. Risk transfer is one of the handling options that can be practiced through acquiring insurance covers. Insurance transfers construction insurable risks into the arms of insurers. The main objective of this study is to examine insurance covers available for use in the construction industry and their use in risk treatment. The study is of exploratory type covering two sectors mainly construction and insurance. The population of the study includes construction stakeholders and insurance agencies. The sample size preferred was 120 respondents. Mixed sampling techniques were used to select respondents and literature review and questionnaires were employed to collect the data. Out of 120 questionnaires administered only 57 fairly filled for use in data analysis. Descriptive statistics were used to analyse the data. Findings reveal that there are about 15 insurance covers used for various purposes in the construction industry at varying degrees. Furthermore, Contractor All Risks (CAR) insurance cover is frequently used with RFI between 1.0 and 0.80 while Performance Failure, Contractor's Equipment Coverage, Workers Compensation, Third Party Liability and Equipment Breakdown are used on average with $0.8 \leq 0.60$ and the rest are used less frequent. The study concludes that insurance as one form of risk transfer option has adequate covers for the construction industry but only a paucity of these covers is adequately acquired by stakeholders.

Keywords: construction, insurance, risk management, risk transfer

INTRODUCTION

A number of risk handling options have been determined by various studies (Akintoye and MacLeod, 1997; Schieg, 2006; Yusuwan *et al.*, 2008; Berg, 2010; Akbıyıklı *et al.*, 2011; Naphade and Bhangale, 2013; Habib and Rashid, 2013; Chinenye *et al.*, 2015; Desai and Kashiyani, 2015). These risk handling techniques have been used in mitigating severity of risks through formal and informal risk management process. One of the risk handling options that is fairly adopted is risk transfer through insurance. Several insurance covers suitable for the industry have been put forward by researchers' worldwide (Miller, 2007; Chengwing, 2008; Whitmore, 2008; Naphade and Bhangale, 2013; Desai and Kashiyani, 2015). Most of these studies advocate that insurance is the best option for risk transfer or sharing. Similarly, researchers such as that of Akintoye and MacLeod (1997), Odeyinka (1999) (cited in Perera *et al.*, 2008), Perera *et al.*, (2008), Kikwasi (2011) and Aigbavboa and

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Musundire (2015) reveal that insurance is one of the main methods of construction risk transfer in the construction industry. In addition, Perera *et al.*, (2008) and Aigbavboa and Musundire (2015) have determined factors influencing use of insurance covers. The fact that risk transfer through insurance is widely used by contractors and consultants in risk management, it is high time to explore how the industry can optimize the use of it, and particularly in Tanzania where this area of research is untapped. This study seeks to initiate the research debate on insurance covers and expand on previous studies by investigating on available insurance covers suitable for the construction industry as well as the extent of their use.

REVIEW OF LITERATURE

Risk handling options

Development of risk handling options is a step devised to minimize or eliminated the consequences of risks in construction. Risk handling options have been extensively studied (Akintoye and MacLeod, 1997; Akbıyıklı *et al.*, 2011; Schieg, 2006; Yusuwan *et al.*, 2008; Berg, 2010; Naphade and Bhangale, 2013; Habib and Rashid, 2013; Desai and Kashiyani, 2015; Chinenye *et al.*, 2015). Common risk handling techniques are risk avoidance, reduction (mitigation); transfer (sharing) and retention (acceptance/assumption). In addition Habib and Rashid (2013) present another approach of risk management techniques used in their study as shapes & mitigate (SMT), shift & allocate (SAT); Influence & Transfer (ITT) and Diversify through Portfolio (DTP) which they relate to the project outcome. PMI (2013) Classifies risk handling options into risk strategies for dealing with negative risks or threats and those for dealing positive risks. While strategies for dealing with negative risks remain to be those listed in other studies, strategies for dealing with positives risks are exploit, enhance, share and accept. The use of any of these handling measures depends on the outcome of the analysis and ranking of the risk. Qualitative and quantitative analysis determine the probability of occurrence of risk and its potential severity. Table 1 below presents severity matrix that assists project managers to decide on the handling option to follow.

Table 1: Risk severity matrix

	Significance		Consequences				
			1 Trivial impact	2 Minor impact	3 Moderate – Minor impact	4 Major impact	5 Catastrophic
Probability	1	Rare	Low	Low	Moderate	High	High
	2	Unlikely	Low	Low	Moderate	High	Very high
	3	Moderate	Low	Moderate	High	Very high	Very high
	4	Likely	Moderate	High	High	Very high	Extreme
	5	Almost certain	Moderate	High	Very high	Extreme	Extreme

Source: Adapted from Berg (2010)

Organizations have various risk attitudes that influence their decision on adoption one technique over another. According to PMI (2013) risk attitude of organizations are influenced by risk appetite, tolerance and risk threshold. Berg (2010) state that a risk may be considered acceptable if: the risk is sufficiently low that treatment is not considered cost effective, or a treatment is not available, or a sufficient opportunity exists that outweighs the perceived level of threat. Furthermore, Berg (2010) points out that a risk may be considered for reduction if the likelihood of occurring or

consequences of the event can be reduced. According to Whitmore (2008) insurance is a third-best method of disaster risk management, after avoidance and reduction.

Risk transfer and Insurance

Risks can be transferred through many ways including securing of insurance covers. Berg (2010) points out that transferring the risk in whole or in part may be achievable through moving the responsibility to another party or sharing the risk through a contract, insurance, or partnership / joint venture. Naphade and Bhangale (2013) conclude that all risk can be transferred. However, authors such as Akbıyıklı *et al.*, (2011) and Perera *et al.*, (2008) argue that only known, financial and insurable risks are transferred through insurance. There is a general agreement among researchers that insurance is a risk management tool in the construction industry. Alabi and Dorcas (2011) identify top ten risk mitigation measures from which obtaining insurance for all political risks and insure all of the insurable force majeure risks are acknowledged for effective risk mitigation. Wang and Chou (2003) report that contractors usually use three methods to transfer risk in construction projects namely insurance, subcontracting to subcontractor, and modifying the contract terms and conditions to client or other parties.

PMI (2013) identify mitigation as one of the risk response to threat and explain that it can reduce the probability of occurrence through using proven technology to lessen the probability that the product of the project will not work, reducing the risk event value through buying insurance or both. Akintoye and MacLeod (1997) reveal that transfer of risks by contractors is through domestic and specialist sub-contracting and insurance premiums while for project managers is through professional indemnity. Perera *et al.*, (2008) disclose that in the Sri Lankan construction industry risk is managed mainly through insurance. Likewise, Banaitiene and Banaitis (2012) found that performance bonds and warranties, resource reservation and insurance, and risk transference to another project party were risk response techniques frequently used in construction projects. Habib and Rashid (2013) studied the influence of risk management technique on project outcome and found that Influence and Transfer Technique (ITT) was the most significant technique. Naphade and Bhangale (2013) reveal that majority of construction companies rely on insurance policies for different risk scenarios. In Tanzania, Kikwasi (2011) found out that risk transfer involving provision for insurance and guarantees, and, fixed contracts were the handling options mostly preferred by consultants.

Aigbavboa and Musundire (2015) investigated the efficiency of CAR insurance policy and determine that it protects the client's interests effectively, contractor's interest effectively and assist the contractor in risk management by recognizing potential risks and reducing the probability of such risks. Several insurance covers are available for use in the construction industry as revealed in the works of Miller (2007), Chengwing (2008), Yong-shi and Yi-bin (2010), Akbıyıklı *et al.*, 2011, and, Desai and Kashiyani (2015) and these are:

4. Builders Risk Insurance: Insurance coverage needed during construction to cover the value of the building itself, should the building being constructed be damaged.
5. Commercial General Liability (CGL) Insurance, Excess/Umbrella Liability Insurance: Third party liability supplied under r CGL and is generally limited to claims against the insured for "bodily injury" or "property damage" resulting from an "occurrence."

6. Workers Compensation: Workers' compensation insurance covers injuries and occupational diseases picked up at work.
7. Pollution: This covers contractors' pollution liability exposures.
8. Professional Liability: This covers losses of many kinds, from cost overruns, delayed completion, bodily injury and sick-building syndrome to environmental pollution resulting from professional services offered by architects, engineers, agency construction managers, project managers and owners' representatives.
9. Controlled Insurance Plan (CIP) or "Wrap-Up": This cover is a single insurance program for all parties involved in the project for the duration of the project term. . Most wrap-ups include workers compensation, general and excess liability, and builders risk coverages (auto liability and contractors equipment are not included) and can include project architects/engineers errors and omissions coverage and other optional coverages.
10. Equipment Breakdown (Boiler and Machinery): Covers equipment being installed as part of the construction project in case damaged in the course of construction.
11. Commercial Crime Coverage: Designed to insure against certain types of losses that are not covered by a standard commercial property policy, such as employee dishonesty/theft and forgery.
12. Contractors Equipment Coverage: designed to address the mobile nature of contractors' equipment and the unique hazards to which the equipment is exposed.
13. Construction All Risks (CAR)/Erection All Risks (EAR): This cover is for 'all-risks' of physical loss or damage to material, supplies, equipment, fixtures and temporary structures that are used in construction, fabrication, installation, erection or completion of the project.
14. Delay in start-up (DSU)/Advanced Loss of Profit (ALOP): DSU cover is designed to secure the portion of revenue which the principal requires to service debt and realise anticipated profit.
15. Professional indemnity insurance: This insures contractors with design responsibility (i.e. under design and build contracts) against liability arising out of professional negligence.
16. Public liability insurance: This provides cover for liability arising out of death or personal injury to third parties or damage to property belonging to third parties.
17. Workers' compensation insurance - This insures the contractor against liability for the death or personal injury to its employees (usually on site) when performing the works.
18. Force Majeure: insurance cover to protect against certain risks of force majeure, i.e. acts of nature – hurricane/earthquake/flood.
19. Performance Failure/Design Risk: Designed to cover loss event that arises from defective design, materials, or workmanship.
20. Political Risks: Political risk insurance is provided by private insurers as well as multilateral and bilateral agencies.

It is evident from the above list that a number of insurance covers have been devised for use in the construction industry. However, the coverage of risks by an individual insurance depends on their policies. According to Perera *et al.*, (2008) and Aigbavboa and Musundire (2015) CAR covers physical damage to work and third party liability.

In Tanzania CAR on top of these covers damage to materials and equipment which include force majeure. In other respect public liability covers same damages as third party liability therefore the number of covers can be reduced by formulating inclusive insurance covers policies. Despite the availability of these insurance, the decision to acquire insurance cover should be supported by knowledge of the extent of coverage and value of compensation. Naphade and Bhangale (2013) cautions that the one who will be negotiating insurance needs should be conversant with the principles of insurable interest, umbrella faded, indemnity, contribution and subrogation. Miller (2007) urges that given the complex and specialized nature of the typical modern-day construction project, it is imperative that any party involved with a construction project sit-down with its insurance agent and attorney and make sure that it has the proper insurance coverages in place to minimize its non-insured exposures. Akbiyıklı *et al.*, 2011 points out that whether insurance can be used as a solution depends on: the insurability of the risk; the adequate and tailored policy; the comparison of the insurance premium and the potential loss of risks; the trust and confidence of insurers about their solvency and claim service; and no other alternative risk transfer solutions available.

Perera *et al.*, (2008) and Aigbavboa and Musundire (2015) reveal that the motives behind use of insurance are client's requirement, conditions of contract, contractor's own interest, construction industry environment, and, knowledge and experience. This implies that insurance is both mandatory and optional. According to Akbiyıklı *et al.*, 2011 in a typical construction project insurance always considered are: material damage, third party liability, materials in transit, damage to constructional plant, non-negligent indemnity and consequential loss. On the other hand (Akbiyıklı *et al.*, 2011) there insurance covers not usually included but obtainable such as employer's liability/workmen's compensation, motor, professional indemnity, inherent defects and contract performance guarantee bond. In Tanzania form of contracts in use provide for CAR insurance. However, workers compensation, performance and advance bonds /guarantees are acquired to fulfil clients requirements or as part of practice.

Compensation from insurers that is not meeting the expectations of insured can be an obstacle for opting for insurance. Perera *et al.*, (2008) evaluated CAR policy and determines that 47% of CAR claims were settled by the insurer and 53% of claims were rejected by insurers due to poor knowledge and experience on risk management on the part of local contractors, insufficient and erroneous supplementary data and foreseeable damage.

METHOD

The study used exploratory type of research with the objective exploring information on risk treatment using insurance covers an area not yet researched in Tanzania. Using this type of study, data on use of available insurance covers was gathered from a relatively small sample. The population of the study comprised of regulatory boards, clients, consultants, insurance agencies and contractors. The sample size envisaged was 120 comprising of 35 contractors, 30 consultants, 25 clients, 25 insurance agencies and 5 regulatory bodies. Mixed sampling methods were used namely: purposive, random and snowball sampling. Purpose sampling was used to select regulatory boards and clients; random sampling was used to select consultants and contractors; while snowball sampling was used to select insurance agencies.

Data for the study was collected using review of literature review and questionnaires. Work done on the subject matter and the gap were determined through review of literatures. Questionnaires containing open and closed questions on respondents' demography, awareness of insurance covers, and frequency of using insurance covers were self-administered to selected respondents. One Twenty (120) questionnaires were sent out and 67 were filled and returned. Out of 67 filled questionnaires only 57 were fairly filled for use in the study equating to 47.5% success.

The collected data was analysed using the Statistical Package for Social Sciences (SPSS) software version 16.0. Data was analysed using descriptive statistics mainly frequencies and group statistics. Furthermore, for ranking purposes, the Relative Frequency Index (RFI) was used. Relative Frequency Index (RFI) is calculated as follows:

$$RAI = \Sigma W/AxN$$

Where; W = weight given to each variable by respondents

A = highest weight

N = total number of respondents.

For the purpose of this study A=5 and N=57

Relative Frequency Index (RFI) comparison table was used to assess the results by taking into account the average scores and the RFI as indicated in Table 2 below:

Table 2: Relative Frequency Index (RFI)

Average Score	RFI	Frequency of Use
4.0 to 5.0	0.80 to 1.00	High (H)
3.0 to < 4.0	0.60 to <0.80	Medium (M)
1.0 to <3.0	0.20 to <0.60	Low (L)

Source: Adapted from Chileshe et al. (2007)

ANALYSIS AND RESULTS

Analysis in this part sought to establish respondents' demography, awareness of insurance covers and industry's frequency of using available insurance covers.

Respondents' profile

Information of respondents who participated in the study reveal that majority of respondents were from the construction industry (80.7%) followed by insurance (19.3%). This participation was influenced by consultants (31.6%) followed by contractors (22.8%), clients (21.1%) and regulatory bodies (5.3%). Experience of respondents was remarkable with most of them having experience of over 10 years (40.4%) followed by over 5 years (6 to 10 years (31.6%), 2 to 5 years (24.6%) and less than a year (3.5%).

Awareness and use of insurance covers

Table 3 presents information on awareness and use of insurance covers for respondents' who participated in the study.

Table 3 Respondents awareness and use of insurance covers.

Awareness	Frequency	Percent
Aware and use	45	78.9
Aware but not use	12	21.1
Total	57	100.0

Results reveal that majority (78.9%) are aware and use insurance covers. For those who are aware and make use of insurance covers, about 63.6% use these covers frequently while the rest (36.4%) use them less frequent. In relation to awareness of insurance covers, Yong-shi and Yi-bin(2010) determine that out-of-date ideology and lack insurance awareness in the construction industry in China limit the performance of engineering insurance. On the other hand, few respondents (10%) who responded to open ended questions indicated that use of insurance as a risk transfer option is deterred by inadequate knowledge of available insurance covers among contractors and cost resulting from paying insurance premium.

Types of insurance covers and practice

Table 4 presents information on available insurance covers and the extent of their use in the construction industry. Types of insurance covers available for use for as risk transfer option in the industry were extracted from literatures. An evaluation of use of different insurance covers was done using 5=very frequent, 4= frequent, 3= average, 2= rarely and 1= None.

Table 4 Respondents frequency of use of insurance covers

S/N	Insurance cover	N	Mean	Std. Dev	RFI	Rank
1	Contractor all risks	57	4.09	1.229	0.818	1
2	Performance failure	57	3.33	1.618	0.666	2
3	Contractor's equipment coverage	57	3.28	1.485	0.656	3
4	Workers compensation	57	3.25	1.651	0.65	4
5	Third party liability	57	3.09	1.661	0.618	5
6	Equipment breakdown	57	3.09	1.392	0.618	6
7	Money in Transit	57	2.96	1.669	0.592	7
8	Builders Risk policy component	57	2.95	1.807	0.59	8
9	Commercial general liability	57	2.65	1.587	0.53	9
10	Delay in Start up (DSU)/Advance loss of profit	57	2.63	1.577	0.526	10
11	Commercial Crime Coverage	57	2.56	1.593	0.512	11
12	Force Majeure	57	2.49	1.465	0.498	12
13	Public Liability	57	2.37	1.397	0.474	13
14	Political risks	57	2.32	1.649	0.464	14
15	Pollution Liability	57	2.02	1.232	0.404	15

Results reveal that there are about 15 insurance covers used for various purposes in the construction industry at varying degrees which implies that the insurance market is well developed for transferring of insurable risks in the construction industry. Among insurance covers in use, Contractor All Risks (CAR) insurance cover is frequently

used with RFI between 1.0 and 0.80. This finding is in consistence with the argument of Perera *et al.*, (2008) that CAR is among the insurance covers that its policy has been accepted worldwide as a comprehensive cover used in construction. Furthermore, Performance failure, Contractor's equipment coverage, Workers compensation, Third party liability and Equipment breakdown are used on average with RFI $0.8 \leq 0.60$. This implies that contractors, consultants and clients are limiting projects to covers provided in forms of contracts. While contractor's equipment coverage, Workers compensation, Third party liability and Equipment breakdown are fairly covered under CAR, this finding reveal the neglect of construction workers which their insurance is left to the liberty of the employer. On the other hand, majority of respondents do not value other insurance covers such as Money in Transit, Delay in Start-Up (DSU)/Advance loss of profit and Commercial Crime Coverage as a way of transferring potential risks to the insurers. Securing such insurance covers will minimize financial risks in the current construction environment. The current construction environment in Tanzania is characterized by theft of materials and fuel on construction sites, cost overrun and schedule overrun forcing clients to deduct liquidated damages.

CONCLUSION

The construction industry can benefit from a range of insurance covers available if the parties choose risk transfer through insurance to be a major handling option in risk management. The study concludes that insurance as one form of risk transfer option has adequate covers for the construction industry but only a paucity of these covers is adequately acquired by stakeholders. Furthermore, Contractors All Risks (CAR) insurance cover is very frequently used while others are used on average or seldom.

The fact that construction environment in Tanzania is prone risks that can be transferred through insurance covers, this study recommends the following: stakeholders should be educated on available insurance covers and extent of their coverage; consultants and contractors should consider acquiring insurance covers that address most of the emerging risks in their project undertakings; provision of insurance shall be expanded in construction contracts; and formulation of insurance covers policies should be inclusive to the extent of reducing the number of covers one is to acquire for single project.

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