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RISK FINANCING TECHNIQUES AND SAFETY CULTURE OF ROAD CONSTRUCTION COMPANIES IN EKITI STATE, NIGERIA

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Abstract

*This study explores the effects of risk financing techniques on the safety culture among selected road construction companies in Ado-Ekiti, Nigeria. The study engaged a descriptive survey research design. The population of the study comprises all twenty-eight (28) indigenous road construction companies in Ekiti State out of which seven road construction companies were purposively chosen for the study. A total of 130 copies of a structured questionnaire were dispersed among the respondents to gather data for this study, out of which 118 which represent a 90.6% response rate was found useful for analysis. Descriptive and inferential statistics were used for data analysis. The regression results the from structural equation model revealed that the Risk retention has a significant influence on the safety culture with estimates .143(P= .015< .05) while the risk transfer technique recorded an estimate -.002(P=.987>.05) indicating a negative insignificant relationship with the safety culture of road construction companies in Ekiti State, Nigeria. Finally, this study confirms that risk financing techniques hold a negative significant joint influence on the safety culture of road construction companies in the metropolis of Ado, Ekiti State based on reported estimates -.591and (P =***< .05). Therefore, the researcher recommends that road contractors*

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should be meticulous about the appropriate risk financing techniques that will aid safety culture.

Keywords: *Risk Management; Risk Financing Techniques; Road Construction Project; Safety Culture; Structural Equation Modelling.*

Jel Classification*: G32, L74,*

Introduction

Road construction worksite is most risky and dangerous workplaces in the construction industry. This is because a road construction project is opened to a high level of risk from project inception to completion. It is highly hazardous and involved the use of heavy machinery such as graders, excavators, compactors, trenchers, bulldozers, wheel tractor-scraper, forklift trucks, dragline excavators, cranes, and liquid substances like asphalt, cement, chemical substance, bituminous occasioned by the high incidence of accidents and fatality. Risk in a road construction project is the probability of an event that disrupts the successful execution of the project within the anticipated time, calculated cost, scope, and quality standard (Ogunbayo, 2014; Msoba, Samson & Mlinga, 2018). Risks can ensue from any phase of the project life cycle. It could be at the planning and designing stage, construction and development, material production, legal and contractual confines, financing stage, operation-onsite, maintenance, and logistic stage (Gain, Mishra & Aithal, 2022). If risks were not identified early it could create a lot of exposure and uncertainties thereby affecting the time of completion, cost, scope, and quality of the project delivery (Vivian, 2021).

Because road construction projects are carried out in the most complex and dynamic locations, it breed high levels of uncertainty and inherent risks to project objectives and the safety of the workforce. It exposes both the management and workers to a wide range of risks and safety hazard (Gilkey, Puerto, Keefe, Bigelow, Herron, Rosecrance & Chen, 2012). Although, risk management would not eliminate all risks from the projects but it will ensure risks are managed effectively to achieve project objectives and timely delivery anticipated at the inception (Al-Ajmi & Makinde, 2018).

Risk financing as one of the risk response actions entails the determination of how risks inherent in the road construction projects can be funded at the least possible cost. Choosing appropriate risk financing techniques depends on the adequate assessment of the risks and considering financial capacity of the

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construction company. Whatever risk financing techniques adopted to cushion the effect of risk exposures in road construction projects, it is important to evaluate the cost effectiveness of such technique in order to make right decision on which risks should be financed (Epstein, Metz & Mc Laughlin, 2013). Financing risks exposure in road construction projects could provide incentives for parties involved to manage the risk consequences and minimize damages at construction sites (Smith & Kam, 2018). Managing road construction risks effectively also cater for workforce safety issues.

In developing countries like Nigeria, findings have shown that majority of construction risk management decisions are based on manager's personal instinct, prior experience and professional judgment **(**Jarkas & Haupt, 2015; Bahamid & Doh, 2017; Sebastian, Francis & Charity, 2018). There is no general consensus on appropriate usage of risk financing techniques adopted by road construction companies because one of the major challenge faced by the indigenous contractors is how to balance road construction costs against the future costs of the project (Smith & Kam, 2018). Indigenous construction companies in developing countries often used preventive and remedial risk response techniques to manage their uncontrollable project risks and to address workforce safety at worksite (Kartam and Kartam, 2001; Iqbal, Choudhryb, Holschemacherc, Alid & Tamošaitienė, 2015).

Managing a project successfully within the stipulated time, budgeted funds and specification has constituted a major problem because of poor safety culture, poor implementation of appropriate risk financing techniques and poor policy management systems among indigenous construction companies in Nigeria. (Byakika, 2016, Latief, et al, 2017). Empirically, there seem to be sparse studies on risk financing techniques (risk transfer and risk retention) as a response to ensuring safety on construction road projects. Based on the problem identified above, this study seeks to investigate the effect of risk financing techniques and safety culture among indigenous road construction companies in Ado-Ekiti, Nigeria.

The aim of the study is to investigate the effects of risk financing techniques on the safety culture among selected road construction companies in Ado-Ekiti, Nigeria while the specific objectives are to:

i. ascertain the influence of risk retention techniques on the safety culture among selected road construction companies in Ado-Ekiti metropolis;
ii. investigate the relationship between risk transfer techniques and safety culture among selected road construction companies in Ado-Ekiti metropolis;

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iii. evaluate the joint effect of risk financing techniques on the safety culture of selected road construction companies in Ado-Ekiti metropolis.

The following relatable questions were raised to achieve the stated objectives:

i. Do risk retention techniques influence the safety culture of selected road construction companies in Ado-Ekiti metropolis?
ii. What is the relationship between risk transfer technique and the safety culture of selected road construction companies in Ado-Ekiti metropolis?
iii. How do risk financing techniques jointly affect the safety culture of selected road construction companies in Ado-Ekiti metropolis?

In the quest to proffer answers to the above research questions; the following propositions were postulated:

H_{01}: Risk retention techniques have no significant influence on safety culture of selected road construction companies in Ado-Ekiti metropolis;

H_{02}: There is no significant relationship between risk transfer techniques and the safety culture of selected road construction companies in Ado-Ekiti metropolis;

H_{03}: Risk financing techniques have no joint effects on the safety culture of selected road construction companies in Ado-Ekiti metropolis.

Literature Review

Risk in Road Construction Projects

The term 'risk' is a multifarious concept that has the possibility of a negative incident occurring during the project lifecycle, which could disrupt achievement of project objectives. Risk is inherent in all construction activities and all the stakeholders should familiarise themselves with different categories of risks in road construction project so as to manage the risks effectively to prevent it from disrupting achievement of project objectives (Ogunbayo, 2014). Risks is an action that have pernicious influence on the financial and operational performance of road construction company. Risk in road construction projects entails multifarious undertakings which has negative influence on the four broad areas of project management known as time, cost, scope and quality (Ehsan, Alam, Mirza & Ishaque, 2010).

Risk Management in Road Construction Projects

Risk management involve systematic method of recognizing, evaluating, analyzing, responding, observing and regulating risks inherent in road construction

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projects. Risk management in road construction project is the process concerned with planning, identification, assessment, analysis, monitoring and controlling of road project risks (PMBOK, 2004). It is a technique that is inevitable to the success of road construction project. It is a process that should be embrace with high regards among road construction companies in Nigeria, especially the indigenous construction companies for the purpose of attaining financial stability and maintaining solvency.

Risk Financing Techniques

Risk financing techniques is an integral part of risk management. It is critical in addressing a major issue: how to align a road construction company's willingness to take on a project despite the risk potential with its capacity to do so. It is a risk response activity to abate the effect of risks inherent in road construction worksite. Risk financing techniques is the utilisation of funds to cover the financial effect of unpredicted losses or cost related to unplanned negative events at the road construction worksite. In road construction projects, risk financing techniques is a systematic approach to funding or paying for the loss occurrences that a project faces in the most efficient and cost-effective way feasible (Epstein, Metz & Mc Laughlin, 2013). Effective risk financing techniques in road construction project require a thorough assessment of the current risks as well as potential risk exposures. Also, it is critical to assess the cost-effectiveness of risk financing options before deciding which risks should be financed.

Risk Retention Strategy

Risk retention is a risk financing strategy adopted by construction companies to accept parts of its construction risks and manage it internally. Risks can be retained in two possible ways, namely active retention or passive retention (Redja & McNamara, 2014; Renault & Ansary, 2020). Active risk retention involves a conscious managing plan developed after a persistent valuation of the possible losses and outlays of alternative ways of handling risks while passive risk may occur because of ignorance, risk manager indifference or a failure to detect a significant risk in road construction project. Risk retention is used when the impact of risk is small and its cost can be included as legitimate project cost (Bustan, Sammang, Nurali & Ramli, 2015). Paleologos and Fletcher (1999) asserted that risk retention is based on the idea that possible construction obligation costs can be documented as legitimate projects costs and priced into project.

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Redja and McNamara (2014) stipulated that adoption of risk retention takes the following: (1.) Current Net Income: losses from risk exposures might be paid out of current net income and treated as costs for that year. When a high number of losses exceed current revenue, other assets must be liquidated to cover the losses. (ii.) Funded Reserve: This involve setting aside liquid funds to finance road construction losses. (iii.) Credit line: Road construction losses can be covered by establishing a credit line with a bank, which can be used to borrow funds to cover losses as they occur. One of the most significant drawbacks of using a credit line is that repayment might exacerbate any cash flow issues that a road construction company may be experiencing. (iv.) Self-finance: This is a special form of retention used by road construction company to pay for losses arising from workers' bodily injury at worksite, medical treatment, drug prescribed to injured workers.

This form of retention can be used for workers' health insurance benefit by saving money to fund workers' health care cost (Redja & McNamara, 2014). (v.) Captive Finance: Losses from risk exposures on road construction project could be paid by captive arrangement. A captive firm is a wholly-owned subsidiary company that provides risk-mitigation services to its parent company (Redja & McNamara, 2014; Renault & Ansary, 2020). Road construction company can fund its losses through its subsidiary established for such purpose. A captive insurance company may be formed in a situation where the parent company cannot find a firm to insure their specific business risks or if the premium paid to the captive insurer enjoys tax exemption and the captive services and coverages are very affordable (Redja & McNamara, 2014).

Risk Transfer Strategy

In road construction projects, risk transfer is the arrangement to shift the burden of construction risk exposures to third party, either through commercial insurance or submitted sub-contractors such as suppliers, contractual modifications, variation and change orders (Gain, Mishra & Aithal, 2022). Although risk transfer does not eliminate risk existence, it ensures that risks are managed and handled by the professionals who can manage them effectively (Okate & Kakade, 2019; Renault, Agumba & Ansary, 2020). Risk transfer is the process of transferring ownership of construction risk exposures to an insurance company or another third party without increasing the overall quantity of risks or reducing the significance of risk causes.

Insurance as a risk transfer strategy is the pooling of inadvertent losses by passing such risks to insurers, who undertake to indemnify insureds for such losses,

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provide other financial benefits in the event of their occurrence, or provide services related to the risk (Redja & McNamara, 2014). Purchasing insurance policy, for example, transfers a certain construction risk of loss from the contractors to the insurer. The most widely used approach for preventing risk occurrences by the contractor was to transfer risk to other project participants and rely on the client's subjective opinion (Gain, Mishra & Aithal, 2022).

Safety Culture and Road Construction Worksite

Safety culture is the consequence of individual and group credence, outlooks, insights, capabilities, and shapes of behavior that affect an organization's commitment to, and the style and effectiveness of health and safety management in an organisation (Hughes and Ferret, 2016). It is a term used to define the ethics, standards, assertiveness, and principles held collectively regarding safety within an organization. Safety culture is becoming more widely acknowledged as a crucial strategy and possibly a prerequisite for addressing the pervasive problems with construction accidents. Akpan (2012) asserted that safety culture is a system of thoughts, conventions, assertiveness, and social- technical practices aimed at reducing individual experience to potentially hazardous or damaging situations both within and outside of an organization. Road construction projects are capital intensive and highly hazardous. This is why the right methods must be used to manage both the risks and the safety of the workers in the construction worksites. Safety practices have not been given due attention among indigenous construction companies in Nigeria, and methods of accomplishing project goals have been marked by accidents, injuries, and deaths, posing a threat to the workers' lives and well-being. Thus, every road construction stakeholder, particularly the client and their representative, should be concerned about project safety right from the start of the project by implementing sustainable ideas and practices that will eradicate potential for a misfortune (Ogundipe et al., 2018).

Theoretical Review

This research was based on Heinrich's Domino Accident Theory, which was created in 1931 by W. H. Heinrich, a safety manager and pioneer in the subject of industrial accidents. According to the hypothesis, accidents typically result from a chain of events. Heinrich listed five primary reasons as causes of accidents at construction sites, these are social environment and inherited behavior, staff/workers fault, dangerous act with machine-driven and bodily-exposure, accident and injury. Heinrich claims that a corrective action sequence can be

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achieved by reducing risks associated with product design or process changes, educating employees through the organization of training sessions that cover all aspects of safety, and enforcing both internal and external rules, regulations, and standard operating procedures that both employees and management must follow when performing their duties.

Empirical Review

According to Jayasudha and Vidivelli (2016), there is a dearth of understanding on how to successfully apply construction planning tools and financing techniques. Road construction projects should use construction planning tools and techniques, and experts should be periodically trained on the usefulness and improvement of information technology in the construction business, mostly in project planning and implementation. Based on the discussion of construction safety and health issues on road construction investigated by Byakika (2016), it was found that arranging proper work zone layouts, relatively good traffic management on the construction sites, good condition of plant and equipment, and regular provision of first aid; provision of personal protective equipment, efficient safety committees and adequate training will aid safety practices and culture at road construction sites. As opined by Latief, Machfudiyanto and Harryanto (2017) bad policy management systems are the source of poor safety culture in road construction companies. But improving policy management in relation to safety culture, such as through careful monitoring, penalties, strict punishments, training and education can make road construction sites safer.

Ogundipe et al, (2018) revealed that the most important factors influencing effective usage of safety-gear at work sites include: absence of safety managers on site; poor training on usage of safety gear and failure to adapt to safety practices by workers because they were contrary to their previous training. This article stated that making efficient use of audio-visual showing devices on the work site, performing in-house safety training for workers, and guaranteeing that every construction site has at least one safety manager will go a long way toward improving worker safety practices. Changquan, Guangshe, Brenda and Jide-Sun (2019) investigated the mediating functions of communication skills in the relationship between leader-member interactions and construction worker safety behavior. Finding from the study explained that to increase construction safety behavior, safety managers should strengthen their leadership and communication abilities, as well as promote a supportive safety environment on the construction site.

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Vivian (2021) identified that risk financing in road construction projects is inevitable in controlling the economic losses attributable to pre-loss objectives. Applying the most appropriate risk financing strategy can prevent an unsuccessful road construction project that considerably impairs the company's financial status. A good technique should be established and implemented by the organizations or parties concerned in order to efficiently and successfully prevent and manage these risks. Construction firms should prevent profitless construction projects by being able to recognize them from the start to reduce financial volatility.

Aduloju and Akindipe (2022) posits in their study on risk financing strategy and project success among builders in Nigeria that a strong positive link exists between risk financing techniques and project completion. They adjudged that if contractors, clients and workers at the construction site become more active in risk management implementation, there will be improvement in stakeholders' teamwork and communication within the Nigerians construction sector and this will facilitate successful completion of the project. Also, Gain, Mishra and Aithal (2022) affirmed in their study that risk response strategy commonly used by client is risk transfer while monitoring the risk and establishing a contingency plan are the contractor's risk response strategies for road construction projects in Sindhupalchowk district.

Research Methodology

Descriptive research design was used for this study. The population of the study comprises of all the twenty-four (24) registered indigenous road construction companies in Ekiti State (Ekiti State Ministry of works, 2022) while the sample size for this study consists of seven active indigenous road construction companies operating in Ekiti State. This study engage simple random sampling. This sampling technique provides no basis for calculating the likelihood that each item in the population was involved in the sample and the procedure was used purposely because it allows the researcher to have access to the respondents that is readily available to attend to the research instruments (Kothari, 2004). In order to ensure that pertinent data are adequately collected for this study, primary sources of data was used. A well-structured questionnaire was designed to address the research questions posed by the study, provide pertinent data for the testing of research hypotheses, and accomplish both the study's general and more granular aims. A five-point Likert scale was used to grade questionnaire, with the options of strongly disagree, disagree, undecided, agree and strongly agree. Out of one-hundred and thirty (130) copies of the questionnaire distributed among managers, employees

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and site workers of the road construction companies that were selected for the study, one-hundred and eighteen (118) representing 90.7 percent of the total were completed and found fit for the study analysis.

The content validity of the research instrument was established by the experts in the field of insurance. The specialists evaluated the instrument for applicability and suitability, linguistic completeness of items, aptness of content, and representation of the numerous questions and scales. In order to achieve the purpose for adopting the instrument, a pilot test re-test was conducted to test its reliability measure. The test result produced a Cronbach values of 0.812 for risk financing construct and 0.922 for safety culture which depicts a high stability of the questionnaire. This result was consistent with statistical inferences regarding the reliability of the scale, and the internal consistency. The data collected were analysed using descriptive and inferential analyses. The descriptive analysis presented the data using frequency table and charts while structural equation modelling was employed to test the hypotheses.

Results and Discussion

This section presents the descriptive analysis of the respondents, chart diagrams of the responses and structural equation modeling to answer the study research objectives and hypotheses on effects of risk financing techniques on the safety culture among selected road construction companies in Ekiti State, Nigeria.

Table 4.1: Demographic Characteristics of the Respondents

Characteristics	Frequency	Percentage
Educational Qualification		
Bachelor's Degree/HND	93	78.8
Master's Degree	18	15.3
Doctorate Degree	2	1.7
Others (ND, SSCE, GCE, etc.)	5	4.2
Total	118	100.0
Respondent Position in the Organisation		
Top Manager	15	12.7
Middle Manager	14	11.9
Supervisor	26	22.0
Worker	63	53.4
Total	118	100.0
Do you have organisation risk financing		

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Characteristics	Frequency	Percentage
Yes	110	93.2
No	8	6.8
Total	118	100.0
My company have safety practice/policies for its operation		
Yes	116	98.3
No	2	1.7
Total	118	100.0
Management fully consider risk financing techniques to manage identified risk		
Yes	110	93.2
No	8	6.8
Total	118	100.0
Do you apply safety at worksite		
Yes	116	98.3
No	2	1.7
Total	118	100.0

Field Survey, 2022

Table 4.1 presented the demographic characteristics of the respondents such as educational qualification of the respondents, and respondent position in their organisation. The Table revealed that 93(78.8%) of the respondents have Bachelor's Degree/Higher National Diploma, 18(15.3%) have Master's Degree, 2(1.7%) have Doctorate Degrees and 5(4.2%) have either Ordinary National Diploma or Senior Secondary Certificate Examination or General Certificate or Primary certificate. This depicted that majority of the respondents have degree certificates or its equivalent and above, which implies that the respondents are well educated to provide suitable responses to the items in the questionnaire. On the level of respondent position in their organisation, 15(12.7%) were top managers, 14(11.9%) occupied middle managers position, 26(22.0%) were supervisors and 63(53.4%) were road constructions site-workers. This shows that appropriate respondents positions were included in the study.

The table showed that 110(93.2%) of the respondents confirmed that their organisation has risk financing technique guideline while 8(6.8%) of the respondents submits that they don't have risk financing technique guidelines in

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their organisation. 110(93.2%) of the respondents affirmed that their organisation management fully considered application of risk financing techniques to manage identified risks for road construction projects undertaken while 8(6.8%) of the respondents revealed that their management does not considered use of risk financing technique to manage identified risks for the road construction projects undertaken. Concerning organisation having safety culture practices/policies for its operation, 116(98.3%) confirmed that they have safety culture practices guiding their operation while only 2(1.7%) affirmed that their organisation does not have safety culture policies for their operation. This implies that majority of road construction companies in Ekiti State embrace safety culture practices for road construction works. Lastly, 116(98.3%) of the respondents affirmed that they apply safety at worksite while 2(1.7%) affirmatively said they do not they apply safety at worksite. This also implies that top managers, middle managers, site-supervisors and site-workers were all safety conscious while carrying out their responsibilities at the road construction work-sites.

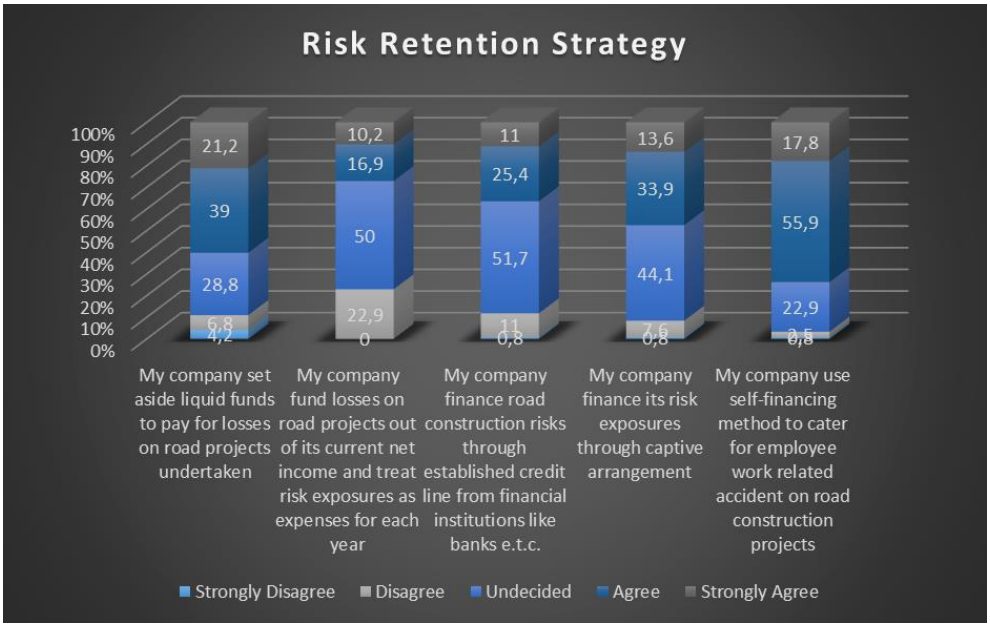

Figure 4.1: *The graphical model explains responses on risk retention's questions raised.*
Source: Field Survey, 2022

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The Figure 4.1 explains the respondent responses on question raised on risk retention. For the statement "my company sets aside liquid funds to pay for losses on road projects undertaken", 28.8 were undecided, 60.2 percent agreed with the statement while 10.7 percent disagreed. For the statement that *"my company fund losses on road projects out of its current net income and treat risk exposures as expenses for each year",* while 22.9 percent expressed disagreement and only 27.1 percent agreed with the statement. For the statement that *"my company finance road construction risks through established credit line from financial institutions like banks",* 36.4 percent agreed with the statement while 11.8 percent disagreed. For the statement that *"my company finance its risk exposures through captive arrangement",* 47.5 percent agreed with the statement, 8.4 percent disagreed while others are undecided. For the statement that *"my company use self-financing method to cater for employee work related accident on road construction projects",* while 73.7 percent agreed with the statement, 3.3 percent disagreed and others were undecided.

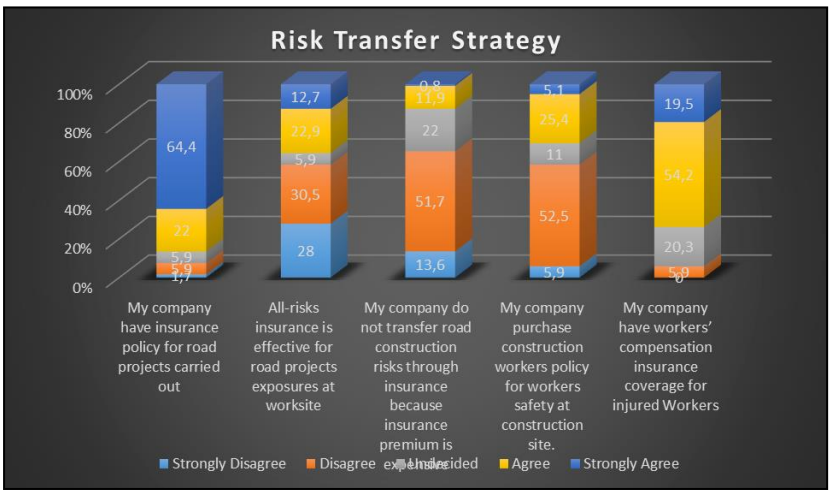

Figure 4.2: *The graphical model explains responses on risk transfer's questions raised*

Source: Field Survey, 2022

The Figure 4.2 explains the respondent responses on question raised on risk transfer strategy. For the statement "my company have insurance policy for road projects carried out", this implies that 86.4 percent agreed with the statement while

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7.6 percent disagreed. For the statement that *"all-risks insurance is effective for road projects exposures at worksite" while* 5.9 percent were undecided, 35.6 percent agreed with the statement and 58.5 percent disagreed. For the statement that *"my company do not transfer road construction risks through insurance because insurance premium is expensive",* while 22.0 were undecided, 12.7 percent agreed with the statement, 65.3 percent disagreed. For the statement that *"my company purchase construction workers' policy for workers at construction site",* while 11 percent were undecided, 30.5 percent agreed with the statement, 58.4 percent disagreed. For the statement that *"my company have workers' compensation insurance coverage for injured workers",* 20.3 percent were undecided, 73.7 percent agreed with the statement, 5.9 percent disagreed.

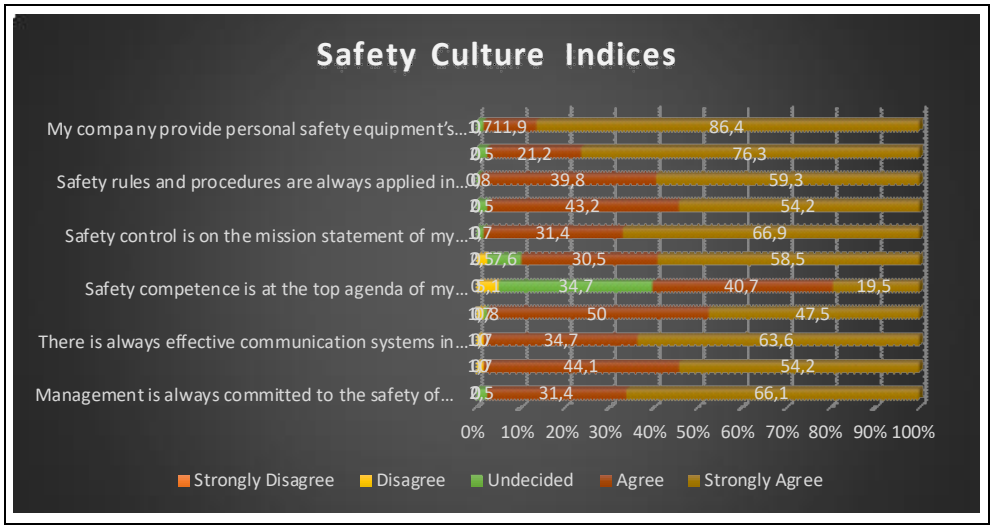

Figure 4.3: *The graphical model explains responses on safety culture's questions raised*
Source: Field Survey, 2022

Figure 4.3. explains the responses on safety culture indices of road construction companies in Ekiti State. For the statement "*In my organisation, management is always committed to the safety of members of staff at all times*", while 2.5 were undecided, 97.5 percent of the respondents agreed with the statement. For the statement that *"staff members are permitted to participate in the safety procedures in my organisation",* while 1.7 percent disagreed, 98.3 percent agreed with the

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statement. For the statement that *"there is always effective communication systems in our organisation when it comes to safety atmospheric conditions",* while 98.3 percent agreed with the statement, 1.7 percent disagreed. For the statement that *"safety education and training are always the priority of my organisation",* 97.5 percent agreed with the statement, 1.7 percent disagreed, 0.8 percent were undecided. For the statement that *"safety competence is at the top agenda of my organisation when seeking for the right personnel to fill the gap",* 60.2 percent agreed with the statement, 5.1 percent disagreed and 34.7 percent were undecided.

For the statement "*management of my organisation place priority on staff safety even at the expense of organisational activities*", 89 percent of the respondents agreed with the statement while 2.5 disagreed, 7.6 percent were undecided. For the statement that *"safety control is on the mission statement of my organisation",* while 1.7 percent were undecided, 98.3 percent agreed with the statement. For the statement that *"workers' involvement in safety is usually allowed in my organisation",* while 2.5 percent were undecided, 97.4 percent of the respondent agreed with the statement. For the statement that *"safety rules and procedures are always applied in the running of my organisation",* 0.8 percent were undecided while 99.1 percent agreed with the statement. For the statement that *"Events happenings are frequently reported in my organisation to ensure safety at all times",* 2.5 percent were undecided while 97.5 percent agreed with the statement. Lastly, for the statement that *"my company provide personal safety equipment's such as helmet, hand glove, site overall wears etc. for worksite", 1.7* percent were undecided while 98.3 percent of the respondents agreed with the statement.

Inferential Statistic Results

Table 4.2: Results of Structural Model Fitness Indexes

Name of Category	Name of Index	Index value	Required level
Absolute Fit	RMSEA	.000	< 0.08
Incremental Fit	CFI	.918	> 0.90
Parsimonious Fit	Chisq/df	2.868	< 5.0

Note: RMSEA= root-mean-square error of estimation; CFI= comparative fit index; parsimonious comparative fix index used-chi-square difference.

Table 4.2 showed the fitness of the model. The result revealed a root mean error of approximation (RMSE) value of .000 indicating an absolute model fitness since

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this value is less than .08. Likewise, the baseline comparisons indicating a comparative fit index (CFI) of .918 which is greater than 0.90 required level, the model parsimonious fit with minimum discrepancy (CMIN/DF) of 2.868 is less than 5.0. The above analysis implied that the model in figure 4.1 satisfied the conditions for measurement of goodness of fit in structural equation modelling. Hence, the model is appropriate to envisage the effects of risk financing techniques on the safety culture among selected road construction companies in Ekiti State, Nigeria.

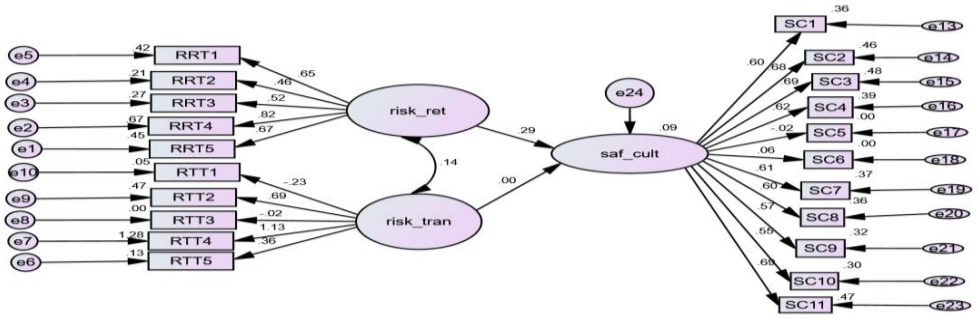

Figure 4.4 *Path Diagram on Effect of Risk Retention Strategy and Risk Transfer Strategy on Safety Culture among selected road construction companies in Ado-Ekiti.*

In figure 4.4 above, there are three latent variables (Risk Retention and Risk Transfer) are the exogenous variable) representing risk financing techniques while Safety Culture is the endogenous variables. Twenty-one observed variables were used altogether, ten was used to measure the underlying exogenous variables (risk retention and risk transfer) and eleven was also used to measure the endogenous variable (Safety Culture).The diagram 4.4 presented the path coefficient for regression of the risk financing variables and safety culture variables of selected road construction companies in metropolis of Ado, in Ekiti State, Nigeria in other of loading or regression weights (effects). Risk Financing techniques represented by Risk Retention and Risk Transfer has the estimates β_1 = .29, β_2 = .00 respectively had positive effects on safety culture of indigenous road construction companies in Ekiti State. This indicated that safety culture of road construction companies in Ekiti State increases as the companies employed risk retention strategy and/or risk transfer strategy to manage identified risks and also a decrease

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in risk financing techniques might lead to decrease in safety culture among road construction companies in Ekiti State.

Hypothesis Testing

H_{01}: Risk retention techniques have no significant influence on safety culture of selected road construction companies in the metropolis of Ado-Ekiti.

Table 4.3: Regression Weights on influence of risk retention technique on the safety culture among selected road construction companies in the metropolis of Ado-Ekiti

Relationship	Estimate	S.E.	C.R.	P
Safety_Culture<--- Risk_Retention	.143	.059	2.436	.015

Authors' Computation, 2022 in Spss Amos v23

Table 4.3 showed the direct influence and the significance of risk retention on safety culture. From the table, it is found that risk retention have significant influence on safety culture with an estimates .143(p = .015< .05). This indicates that risk retention technique has positive significant influence on safety culture of road construction companies' in Ekiti State, Nigeria. Hence, there is statistical evidence to reject the null hypothesis that risk retention techniques have no significant influence on safety culture of selected road construction companies in the metropolis of Ado-Ekiti. This result is consistent with Aduloju and Akindipe, (2022), Renault, Agumba and Ansary (2020) which indicated a positive relationship between risk retention strategy and project success.

H_{02}: There is no significant relationship between risk transfer techniques and safety culture of selected road construction companies in the metropolis of Ado-Ekiti.

Table 4.4: Regression Weights on relationship between risk transfer technique and the safety culture of selected road construction companies in the metropolis of Ado-Ekiti

Relationship	Estimate	S.E.	C.R.	P
SafetyCulture<--- Risk_Transfer	-.002	.093	-.017	.987

Authors' Computation, 2022 in Spss Amos v23

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Table 4.4. Showed the direction of relationship and the significance of risk transfer with safety culture. From the table, it shows that risk transfer technique has an estimates -.002 and (P=.987>.05). This indicates that risk transfer technique has a negative insignificant relationship with the safety culture of road construction companies in Ekiti State, Nigeria. This implies that managing identified risks in road construction sites through risk transfer strategy does not necessarily increase safety culture among road construction companies in Ekiti. Hence, there is no statistical reason to reject the null hypothesis which stated that there is no significant relationship between risk transfer techniques and safety culture of selected road construction companies in the metropolis of Ado-Ekiti. This result does not support the claim of Aduloju and Akindipe (2022).

Table 4.5: Coefficient of Determination of of Risk Financing Techniques on Safety Culture among selected road construction companies in Ado-Ekiti

Exogenous Variable	Squared Multiple Correlations
Safety Culture	.086

Authors' Computation, 2022 in Spss Amos v23

Table 4.5 presented the predictive power of the structural equation model and is calculated as the squared correlation between specific endogenous constructs actual and predicted values. The table showed that safety culture recorded the square of multiple correlation value of .086, which implied that 9% variation in safety culture was accounted for by risk financing techniques.

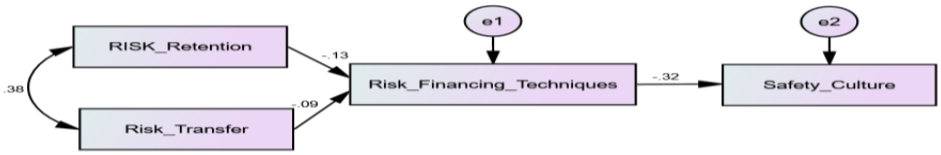

***Figure 4.4**: Path Diagram on Joint Effect of Risk Financing Techniques on Safety Culture among selected road construction companies in Ado-Ekiti.*

Figure 4.5 showed the path diagram for joint effect of risk financing techniques on safety culture of road construction companies in metropolis of Ado**.** The direct joint effect is represented by single-headed arrow in the path diagram. The path coefficient for regression of the risk financing technique on the safety culture is

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shown on the regression weights. Risk financing techniques has an estimates -.32 which show a negative joint effects on safety culture of indigenous road construction companies in Ekiti State. This indicated that the standardized joint effect of risk financing techniques on safety culture is -.32. That is when risk financing techniques goes up by one standard deviation, safety culture goes down by 0.32 standard deviation.

H_{03}: Risk financing techniques have no joint effect on safety culture of selected road construction companies in the metropolis of Ado-Ekiti.

Table 4.6: Regression Weights on Joint Effect of Risk Financing techniques on safety culture of selected road construction companies in the metropolis of Ado-Ekiti

Relationship			Estimate	S.E.	C.R.	P
Safety_Culture	<---	Risk_Financing_Techniques	-.591	.163	-3.624	***

Authors' Computation, 2022 in Spss Amos v23

Table 4.6 revealed the joint effect of risk financing techniques and its significance to safety culture. From the table, it is found that risk financing techniques have highly significant joint effect on safety culture with an estimates -.591(p =***< .05). This indicates that, the regression weight for risk financing techniques in the prediction of safety culture is significantly different from zero at the 0.001 level (two-tailed). Furthermore, the result shows that risk financing techniques has negative significant joint effect on safety culture of road construction companies in the metropolis of Ado, Ekiti State. Hence, there is statistical evidence to reject the null hypothesis that risk financing techniques have no joint effect on safety culture of selected road construction companies in the metropolis of Ado-Ekiti.

Conclusion and Recommendations

Among the previous studies, risk financing techniques and safety culture of road construction companies was not investigated. This gave the motivation for this work to examine the effects of risk financing techniques on the safety culture among selected road construction companies in Ado-Ekiti, Nigeria. Therefore, this study makes use of structural equation modelling on *Spss Amos v23* to established that exogenous latent construct (Risk retention) have significant influence on endogenous latent construct (safety culture) with an estimates .143(p = .015< .05) while risk transfer technique recorded an estimates -.002 and (P=.987>.05)

indicating a negative insignificant relationship with the safety culture of road construction companies in Ekiti State, Nigeria. Finally, this study confirms that risk financing techniques has negative significant joint effect on safety culture of road construction companies in the metropolis of Ado, Ekiti State based on reported estimates -.591(p =***< .05). Based on the study findings, the researcher recommends that road contractors should be meticulous about the appropriate risk financing techniques that will aid safety culture among road construction companies. Also, the management of road construction companies should endeavor to educate all staff at different level including site workers on the importance of risk financing technique and safety culture for road construction projects undertakings. Lastly, insurance companies should develop more risk financing policies that Construction Company can benefit from.

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