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IMPLICATIONS OF CATASTROPHIC RISK FUTURE AS ALTERNATIVE RISKS TRANSFER SOLUTION ON PERFORMANCE OF MANUFACTURING COMPANIES IN NIGERIA

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Abstract.

The manufacturing companies are faced with many risks which includes regular business risks such as credit risks, switch in market taste, human and personnel risks, injury, damage to third party and so on. The industry handles these risks by way of risk transfer through insurance by shifting the financial implication of loss, injury or damage to another party or parties. However, there are risks that are existential to the industry that can be described as catastrophic such as hurricane, earthquake, terror attacks etc. These type of risks cannot be adequately covered by regular insurance. This class of risks can only be covered by non-insurance transfer by way of Alternative Risk Transfer, ART. The study aim to determine impact of Catastrophic Risk futures (CRF) as an alternative risks transfer solutions on the performance of Nigeria manufacturing companies revealed significant correlation between CRF as an ART solution and performance with correlation coefficient (r) of 0.630 with a p-value of 0.000. The ANOVA findings also showed performance of manufacturing enterprises could be strongly be predicted by CRF as well as a positive association between CRF solution and performance of the manufacturing companies. Therefore, we can conclude that there is significant relationship between CRF as an ART solution and the performance of Nigeria manufacturing companies and that CRF do have real impact on the performance of the manufacturing concerns. However, stakeholders such as the Government, the Manufacturers Association of Nigeria (MAN) and Security and Exchange Commission, SEC needs to work together to create enabling environment for ART to thrive by sensitization of the industry on the concept and benefits of ART. The industry must ensure that all alternative risk transfer solutions comply with local and international regulatory standards to avoid legal complications and ensure growth of the ART solutions in the country..

Keywords*: Alternative Risk Transfer Solutions, Performance, Manufacturing Companies.*

JEL Classification:D81

INTRODUCTION

Risks in the modern world pose a variety of threats that might have far-reaching, multi-generational consequences on people, society, the economy, and the environment. Everyone from people to governments in both rich and developing nations has the formidable task of mitigating these affects' financial effects. To alleviate the financial strain on their operations, investments, claim management, and profitability that would result from having to bear the costs of risk, most manufacturing companies are continuously seeking new ways to contribute to risk management. One way they do this is by offering funding for recovery and reconstruction after a risk event (Ben & Jouili, 2015).

Various types of risk might emerge in the manufacturing business, including those that occur during the hiring process, the manufacturing stage, distribution, and so on. Insurance, which entails transferring monetary responsibility for harm, loss, or damage to another party or

parties, is the most prevalent kind of risk transfer. Nwite (2006) lists non-insurance shifting the behaviours that generate loss as another avenue for risk transfer.

In response to the widespread adoption of risk management principles in the 1950s, American businesses developed Alternative Risk Transfer (ART) systems. The pattern of insurance capacity crises from the 1970s through the 1990s caused it to develop steadily, according to Doherty (2000). It was Schnell and Eling (2017). Companies were able to insure their own risks using ART products like captives and risk retention organisations in the beginning, according to Schanz (1999), but in the 1990s, the scope expanded to include risk transfer, limited insurance, reinsurance, and tax-deductible advantages via capital markets (2004). Reinsurance, sidecars, ILW, CAT bonds, options, futures, and captives are all examples of ART products that may be used to get access to extra capital market funds. Huang (2010).

The idea of ART is based on the convergence of insurance, banking, and the capital market, which aims to effectively supply businesses enough money to cover different types of risks. In 2000, Asaff, the European Commission, and Hofmann all made contributions. Due to the individualised nature of ART products, the notion defies reduction to a single, all-encompassing description. As a result, a wide variety of business demands drive demand for ART goods. The following categories, however, are applicable to ART products: Securitization (including CAT bonds) and insurantization (including credit default swaps, collateralized debt, residual value, and revenue guarantee products) are mentioned by Allen (2002) and Gjertsen (2002). Reinsurance and captive insurance businesses are also part of finite risk insurance.

Risk securitization via catastrophe bonds, insurance industry-linked securities, and reinsurance industry sidecars are some of the alternative risk transfer covers used by manufacturing companies. Risk trading through industry loss warranties and weather derivative contracts is another option. Finally, transformer vehicles are used to transform capital market risks into reinsurance industry risks. Captive insurance businesses, longevity risk transfer, securitization tied to the life insurance sector, and other alternative risk financing approaches are sometimes considered by Burca and Batrinca (2014).

This study aims at delving into the implications of alternative risk transfer solutions on the performance of manufacturing companies, with a specific focus on the manufacturing industry in Nigeria. By analyzing the effectiveness of these solutions, they seek to provide insights into their potential impact on operational efficiency, financial stability, and overall performance in the Nigerian manufacturing sector.

Statement of the problem

Examining how different risk transfer strategies may affect the efficiency and productivity of Nigerian industries is the primary goal of this research. In short, alternative risk transfer solutions are not always a bad idea, but doing them wrong might have serious consequences for a business.

Several problems arise when manufacturing businesses adopt alternate risk transfer techniques. To maximise the advantages of these strategies and ensure their proper implementation, it is essential to understand these challenges.

Furthermore, some Nigerian industrial organisations may overestimate their risk exposure, leading to a high opportunity cost. As an example, let's say the manufacturing business

decides to set aside a substantial amount of money in order to mitigate the impact of any unforeseen risks. Those saved money are lost investment possibilities if unforeseen hazards don't materialise or if they materialise with far less harm than anticipated. The business may have expanded its consumer base or invested in R&D with the funds instead of putting them aside. So, if a manufacturing firm overcompensates due to overestimating risk, it would lose money that might have been invested in other alternatives. Jouili and Ben (2015).

As time goes on, it's simpler to see that man cannot lead a meaningful life free from taking risks. Since insurance is not a foolproof method of risk transfer, manufacturing businesses should always look for other, more efficient methods to transfer risk. (Morton, 2002).

In order for Nigerian manufacturing enterprises to reap the advantages of alternative risk transfer solutions, it is critical to address these concerns. Manufacturing companies can overcome these challenges and improve their risk management strategies and performance by raising awareness, collaborating with specialised experts, streamlining regulatory processes, considering cost implications, managing risk retention effectively, and providing implementation support. Next, several inquiries are warranted in light of the preceding reasoning: Do manufacturing enterprises in Nigeria feel the effects of alternative risk transfer investments and business decisions? Is claim management in Nigerian manufacturing enterprises related to alternative risk transfer? Is it possible for Nigerian manufacturing enterprises' development and profitability to be impacted by the efficacy of alternative risk transfer policies? This study effort will thoroughly investigate the responses to the questions in order to examine the "gap" that will be addressed.

Aim and Objectives of the Study

The aim of the research work is to examine the implication of alternative risks transfer solutions on the performance of Nigeria manufacturing companies. The specific objectives of the study are:

To identify if the use of Catastrophe Risk Futures (CRF) as alternative risk transfer will affect the performance of Nigerian manufacturing companies

Significance of the Study

The result of this study is expected to enhance the knowledge of alternative risk transfer solution and how it affects the manufacturing companies' profitability and growth in Nigeria. It will also be of great importance to the manufacturing industry practitioners and other experts handling alternative risk transfer solutions for manufacturing companies. It will be useful in helping to understand how alternative risk transfer solution affects manufacturing industry's operations, profitability, and growth and suggest ways on how to choose the effective alternative risk transfer solution that would improve the performance of manufacturing companies in Nigeria. It will also serve as a basic study for those who may wish to carry out further research on the study.

Scope and Delimitation of the Study

The study covers Alternative Risk Transfer and Manufacturing companies in Nigeria. The study is limited to manufacturing companies operating in Nigeria and based in Lagos state which makes up the sub-set of the Nigeria manufacturing Industry. The reason for this choice was the need to explore this important sector which contributes a large percentage to the

Gross Domestic Products of Nigeria. Lagos state is also chosen as the study area due to the large concentration of manufacturing companies in the state with the highest manufacturing activities.

Research Questions

The specific research questions of the study are:

To determine whether the use of catastrophic futures as alternative risk transfer greatly affects the performance of manufacturing companies in Nigeria?

Study Hypotheses

The specific research hypothesis of the study is:

There is no significant relationship between the use of Catastrophe Risk Futures (CRF) and the performance of Nigeria manufacturing companies

Operational Definition of Terms

Alternative Risks Transfer: This Technique allows companies to purchase coverage and

Transfer risk without having to use traditional commercial insurance

Manufacturing Company: any business that uses components, parts or raw materials to make a finished good.

Profitability: the degree to which a business or activity yields profit or financial gain.

Financial Performance: a subjective measure of how well a firm use assets from its primary mode of business to generate revenues and make profit.

Insurance: an arrangement by which a company or the state undertakes to provide a guarantee of compensation for specified loss, damage, illness, or death in return for payment of a specified premium.

Self-Insurance: insurance of oneself or one's interests by maintaining a fund to cover possible losses rather than by purchasing an insurance policy.

Captive Insurance: a wholly owned subsidiary created to provide insurance to its non-insurance parent company (or companies)

Hedging: the process of transferring risk to another party and protecting your own organization from that risk.

Financial Derivative: are financial contracts, set between two or more parties, that derive their value from an underlying asset, group of assets, or benchmark.

Industry Loss Warranty: a reinsurance or derivative contract that kicks in when losses experienced by an industry exceed a specified threshold. Coverage is typically triggered when an index provider says the relevant threshold has been met.

Catastrophe Bond: a high-yield debt instrument designed to raise money for companies in the insurance industry in the event of a natural disaster.

Catastrophe Risk Futures: derivatives contracts first traded on the Chicago Board of Trade (CBOT) to hedge against catastrophic losses.

1. Theoretical Framework

Agency and stakeholders' theories were adopted as the theoretical basis for this research.

1.1 Agency Theory

Agency theory is an economic theory that views the firm as a set of contracts among self-interested individuals Ross and Mitnick, (1970). Agency theory, as applied to the context of alternative risk transfer solutions, posits that there is a fundamental principal-agent relationship within organizations. Shareholders (principals) delegate decision-making authority to management (agents) to act on their behalf. In the realm of risk management, the adoption of alternative risk transfer solutions such as industry loss warranties introduces a dynamic where the interests of shareholders and management might not perfectly align. The principals seek to maximize shareholder value, while agents may have their own objectives, which can lead to a potential conflict of interests.

In the case of Nigerian manufacturing companies, the introduction of alternative risk transfer solutions may influence the decision-making processes and risk management strategies. Potential conflicts of interest might arise if management perceives risk differently from shareholders. Understanding and addressing these agency issues are crucial for effective implementation and optimization of alternative risk transfer mechanisms, ultimately impacting the overall performance of the manufacturing companies.

1.2 Stakeholder Theory

Stakeholder theory posits that organizations should consider the interests of all stakeholders, not just shareholders according to Freeman (2016). In the context of alternative risk transfer solutions, stakeholders include not only investors but also employees, customers, suppliers, and the broader community. The effective management of risks through alternative risk transfer solutions can impact various stakeholders differently, and their perceptions and reactions can, in turn, influence the company's performance.

For Nigerian manufacturing companies, the implications of alternative risk transfer solutions extend beyond financial metrics. Stakeholder theory suggests that a company's reputation, relationships with suppliers and customers, and overall social responsibility are critical aspects of performance. How a company manages risks can affect its standing in the eyes of various stakeholders. A well-executed risk management strategy not only protects financial interests but also contributes positively to the company's relationships with stakeholders, influencing its long-term sustainability and performance.

However, these two theories provide a theoretical lens through an understanding gained of the implications of alternative risk transfer solutions on the performance of Nigerian manufacturing companies. The nuanced interplay between agency relationships, and stakeholder considerations contributes to a holistic understanding of how risk management strategies impact the overall performance of manufacturing firms in Nigeria.

2. CONCEPTUAL FRAMEWORK

2.1 The Concept of Alternative Risk Transfer

There is no agreed-upon definition of alternative risk transfer (ART). The term "alternative risk transfer" (ART) is often used to describe a set of practices that businesses utilise instead of conventional insurance or reinsurance companies to accomplish the same goals of hedging and risk transfer. Risk transfer via alternative risk carriers and risk transfer through alternative goods are the two main components of alternative risk transfer (ART), which is more than simply a product. 2014, Swiss-re. One explanation for this is the ever-expanding list of potentially dangerous items that meet the criteria for ART, thanks to relentless product development. By transforming their risks into marketable securities with long-term maturities, corporations may engage in alternative risk transfer, which allows them to transfer their risks to a third party or the capital market.

Through the use of alternative risk transfer strategies, such as manufacturing industry pools and the more convenient securitization of underwriting funds, organisations are able to obtain coverage and transfer risks. This is an example of securitization, which involves the capital market playing a more active role in supplying services to the insurance and reinsurance industries via the hedging of manufacturing sector risks against long-term marketable securities. In 2017, De-Mey worked. Insurance sector services and financial markets are supposedly brought together by this approach, which falls within the expansive area of alternative risk transfer (ART). Many other methods exist for transferring risk, such as catastrophe bonds, insurance-linked securities, and reinsurance industry side-cars; industry loss warranties for trading risks; weather derivative contracts; and transformer vehicles for transferring risks from the capital market to the reinsurance industry.

Various financing organisations, including captive business investors or pools, are prepared to assume a portion of the risk associated with company investments in exchange for a fee; this practice is known as risk transfer to alternate carriers. In general, ART prioritises the preservation of capital above operational effectiveness and gives more weight to the retention of businesses than to their market share. Ryan et al, (2017) categorized alternative risk transfer (ART) vehicles into the following broad groupings:

1. Captive or self-insurance methods: Known to be the most common form of alternative risk transfer. This is a type of alternative risk transfer established by organizations to cover their own risk but do not insure the risk of the public. Hence, they have access to reinsurance industry market and enjoy tax haven. Self-insurance industry is the largest portion of the alternative carrier market available for companies under state insurance industry commission regulation as it allows the company (adjust the amount of risk that they have on their portfolio) to reduce costs and streamline the claims process.

2. Risk retention groups and captive insurance company tends to be more popular with large corporations. A captive is an insurance company that insures the risks of its owner, affiliated businesses or a group of companies. It issues policies, collects premiums and pays claims just like a traditional insurance company. What fundamentally distinguishes a captive and makes it alternative to commercial insurance company is the form of ownership and who keeps the insuring company’s profit.

3. Single-parent captives are owned by one company or group (the parent). Pure captives are single parent captives that accept only the risks of the owner (or owner-affiliates). Not all

single-parent captives are pure captives; in some instances, a single-parent captive can accept business from third parties.

4. Group captives offer insurance services to several or many unrelated policyholder and owners and can take many forms. Some group captives dedicate themselves to a particular industry, while others choose to write in a limited geographic area, such as a single state. Group captives are the alternative risk transfer (ART) vehicle that most resembles a commercial business investor and have similar rating dynamics.

2.2 Catastrophic Risk futures (CRF)

Catastrophic Risk Futures are a type of financial contract that provides coverage against losses from catastrophic events. Catastrophic futures are typically structured as contracts for difference (CFDs), and they are traded on exchanges. According to Creswell (2011), catastrophic futures are designed to provide protection to investors and businesses against the financial impact of catastrophic events. Catastrophic events can include natural disasters, such as hurricanes, earthquakes, and floods, as well as man-made disasters, such as terrorist attacks and pandemics including business risk such as power outages or supply chain collapse.

According to Cummins et al, (2018), catastrophic futures are a relatively new type of financial contract hence still evolving. Investors and businesses should carefully consider the benefits and risks of catastrophic futures before making a decision about whether or not to participate in a catastrophic futures market.

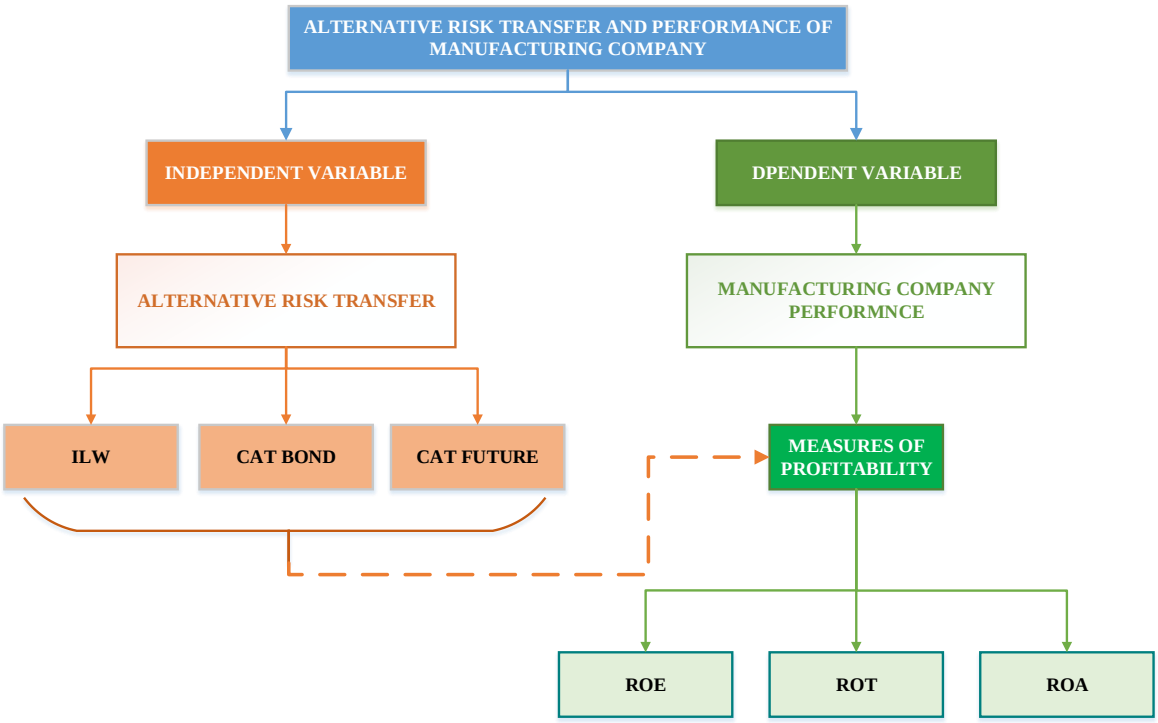
Also, Derbali and Jamel (2018) posited that catastrophic futures are still a relatively new type of financial contract, and the market for catastrophic futures is still developing. However, the market for catastrophic futures is expected to grow in the coming years as investors and businesses become more aware of the benefits of catastrophic futures. Din et al (2017), catastrophic futures are typically traded on exchanges, but they can also be traded over-the-counter. Catastrophic futures contracts are typically traded in denominations of $1 million or more. Catastrophic futures work by transferring the risk of a catastrophic event from the buyer of the contract to the seller of the contract. The buyer of the contract agrees to pay the seller a premium if the specified catastrophic event occurs. The seller of the contract agrees to pay the buyer the difference between the strike price of the contract and the market price of the underlying asset if the specified catastrophic event occurs. For instance, the strike price of a catastrophic futures contract is the price at which the contract will be settled if the specified catastrophic event occurs. The underlying asset of a catastrophic futures contract can be a variety of different things, such as a stock index, a commodity index, or a currency index.

2.3 Nigeria Manufacturing Sector

In manufacturing industries, risks arise in different forms; it could be at the process of staffing, production stage, distribution etc. The most common form of risk transfer is by way of insurance which involves shifting of the financial liability for loss, injury or damage to another person or persons. Other mechanisms for transferring risk include; non-insurance transfer and transferring the activities that causes the loss (Nwite, 2006). To ensure future growth on alternative transfer mechanisms, there has been a development of independent, alternative risk consulting firms that works with agents and brokers. These alternative risk transfer firms educates the agents and brokers on expertise general experience in the ART market as well as those that may need to supplement their ability to execute these tasks with a

team of industry specialist Artemis (2010) The manufacturing companies in Nigeria operate in the current unstable environment which is fraught with numerous risks that could endanger its survival and success. These risks include political risk, credit risk, liquidity risk, foreign exchange risk, market risk, interest rate risk, among others. However, Nigeria is rarely exposed to catastrophic disruptions such as of earthquakes, hurricane or epidemic of avian flu that caused large scale damage to businesses and manufacturing setup in other part of the world such as North America and Asia.

RESEARCHER'S CONCEPTUAL MODEL



3. EMPIRICAL REVIEW

3.1 The Use of Catastrophic Risk Futures

Graciela (1999) posited that new risks seem to be unavoidable in a period of rapid change. The last few decades have brought us the risks of global warming, nuclear melt-down, ozone depletion, failure of satellite launcher rockets, collision of supertankers, AIDS, and Ebola. In the study, researcher propose a novel framework for providing insurance cover against risks whose parameters are unknown. In fact many of the risks at issue may not be just unknown but also unknowable. It is difficult to imagine repetition of the events leading to global warming or ozone depletion, and therefore difficult to devise a relative frequency associated with repeated experiments. Hardesty (2018) by means of a peculiar magic, insurance preserves the quantified value of capital through destructive, contingent events. The principal subjects of this project, global reinsurers, stand at the end of a long line of loss claims, holding capital together as forces threaten to tear it apart.

Hoyt et al, (1995) posited that in December 1992 the Chicago Board of Trade (CBOT) began trading catastrophe insurance futures. These contracts were intended to serve as a new form of risk shifting for the insurance industry and a low-cost alternative to reinsurance. The focus

of the paper is to determine if catastrophe futures have the ability to offer a viable hedge for insurers, and consequently, whether such contracts are likely to be successful. In spite of some regulatory and institutional barriers, these contracts appear to provide an attractive alternative to reinsurance for some companies, particularly for large, nationally diverse insurers.

Lane and Mahul (2013) in their study posit that the price of catastrophe risks is viewed by many to be too high and/or too volatile. Catastrophe risk practitioners point out that, contrary to standard insurance, such as automobile insurance, catastrophe re-insurance is exposed to infrequent but potentially very large losses. It thus requires keeping a large amount of capital in hand, generating a cost of capital to be added to the long-term expected loss.

The findings of Zhou et al, (2023) showed that natural disasters and climate change risks generally lower insurer profitability and risk-sharing capacity, bank stability and credit supply, returns and stability of stock and bond markets, foreign direct investment inflows, and international lending. Factors such as income levels, rigorous financial regulations, capital abundance, market diversification, and adaptation strategies mitigate the negative effects.

4. RESEARCH METHODOLOGY

4.1 Research Design

The research employed pragmatism paradigm descriptive survey design and mixed method approach for collection of both qualitative and quantitative data for results triangulation Wambugu et al, (2015).

The method was employed to free the results of the study from bias so as to produce the least margin of error with increased trust in the precision of data collected and thus provide results that are judged to be credible. The design also helped the researcher to plan and implement the study in a way that helped to obtain intended results, and thus helped increased the chances of obtaining information that could be associated with the real situation. The research design is premised on a quantitative approach to provide a reliable result. The design is less time-friendly and cost effective.

4.2 Population of the Study

The population of this study consist of all the manufacturing companies in Nigeria. The total number of registered manufacturing companies in Nigeria is 565 out of which 550 resides in Lagos Dun and Bradstreet (2023). The choice of Lagos state as a study area was supported by the fact that 97% of the total number of manufacturing companies and products generated in Nigeria was from Lagos State alone. (Dun and Bradstreet (2023)

4.3 Sampling Techniques

The convenience sampling technique was used to select participants from the strata of the study that are accessible and willing to participate in the survey. The researcher selected 10 manufacturing companies based on their availability and readiness of the respondents to complete the research instrument.

4.4 Sample Size

The study employed the Yemane (1967) formula from which a minimum sample size of 200 was determine. Due to low rate of response with survey design, a total of 232 copies of questionnaire were deployed for the study. Since the target population comprised of all manufacturing companies in Lagos metropolis, then the total sample size for the study was statistically determined by Taro Yamane's (1967) formula as cited in Ajay and Masuku (2014) as:

N = N/1+Ne2

N= 550/1+ 550(0.05)2 = 232

Where: N=the sample size, N=the population size, e = the acceptable sampling error

95% confidence level and =0.05 are assumed.

The respondents are selected from the 10 manufacturing companies. The distribution of the research instrument was conducted proportionally in all the selected manufacturing companies.

4.5 Data Collections Instrument

To ensure proper capturing of adequate information relating to the impact of the alternative risk transfer and performance of manufacturing companies in Lagos, Nigeria, data required for the study were generated from a primary source of information. The primary data source instrument was a well-structured and self-administered questionnaire.

The research instrument was divided into 2 sections. Section A constitutes of respondents socio-demographic information relates to the background information of the respondents, section B relates to method of alternative risks transfer namely Catastrophic Risk Futures as dependent variables. Background information of the respondents consist of 4 items. In Section B, eight items were used as measuring dimensions for Catastrophic Risk Futures.

The data instrument adopted a liker scale measurement of 'strongly agree', 'agree', 'undecided', disagree, and strongly disagree. The responses, according to Pallant (2011) were accorded values as follows; strongly agree=5, agree=4, undecided =3, disagree = 2, strongly disagree= 1

4.6 Test of Validity and Reliability of the Research Instrument

Regarding the correctness of the survey instrument, logical and criterion-related types of validity were adopted. While the congruent (construct) validity was carried out through variables explained from literature, the logical (content)validity was employed via administration and distribution of chosen and decided survey instruments to my supervisors, risk management experts and academia in the manufacturing and insurance and risk management professions. Having distributed the research instrument, experts thoroughly examined it, came up with logical and reasonable suggestions, and thus gave advice that assisted in designing a questionnaire that accurately measured the variables. For criterion related validity, the risks managers' behavior was further scrutinized to ensure the appropriateness of the survey instrument.

A pilot study was conducted to confirm the validity and reliability of the research instrument. To ensure the instrument reflected the variables of the study, experts in the field of management reviewed the research instrument and found them to be suitable. Cronbach Alpha test was further

used to test the reliability of the instrument and all results were above the required minimum of 0.7 in line with the position of Nunnally and Bernstein (1994)

4.7 Method of Data Analysis

Descriptive Statistical analysis with the aid of Mean, frequency and percentage employed for demographic data collected. Inferential statistical analysis (regression and modeling analysis) was used to test the study variables.

4.8 Model Specification

To analyze the implication of alternative risks transfer solutions on the performance of Nigeria manufacturing companies, (formula) were adopted;

Performance = f(Alternative risk transfer, random variable)

$Y = B_0 + B_1 X_1 + a$

4.9 Operationalization of Research Variables

Variables used in the analysis are chosen based on relevant theory and literature in line with similar studies on the subject and based on the availability of data (primary source). The data collected are presented in a tabulated and in interpreted in relation to the research objectives.

Then, in the study, normal variables are used to measure the variables. The nominal variables can be placed into categories like male/female, young, adult, senior or freshman/ sophomore/ junior/ senior. The study has two measurement variables (alternative risks transfer solutions and manufacturing companies), to analyzing the data (hypothesis test).

Dependent Variables

Manufacturing companies' performance was the independent variable for the study.

Independent Variables

Catastrophic Risk Futures, CRF is independent variables of the study.

5. RESEARCH INTERPRETATION

This research aims to delve into the nuanced relationship between alternative risk transfer solutions and the performance of manufacturing companies in Nigeria.

5.1 Descriptive Statistics

Table 1.

Descriptive Statistics

	N	Mean	Std. Deviation
PMC	221	1.8235	0.48724
CRF	221	1.7986	0.54961
Valid N (listwise)	221		

Interpretation

The mean performance score of manufacturing companies (PMC) stands at 1.8235, accompanied by a standard deviation of 0.48724. This implies that, on average, the performance of manufacturing companies in Nigeria hovers around this central value. The standard deviation suggests a moderate level of variability, indicating that while there is a degree of consensus in performance, there are discernible variations among the sampled companies.

In the case of Catastrophe Risk Futures (CRF), the mean performance score is 1.7986, and the standard deviation is 0.54961. The wider dispersion of scores around the mean suggests a slightly greater variability in the performance of companies employing CRF. This prompts an exploration into the potential implications of CRF as an alternative risk transfer solution on the performance of manufacturing companies and the factors contributing to the observed variation.

The initial findings offer valuable insights into the mean performance scores and variability associated with alternative risk transfer solutions in Nigerian manufacturing companies. However, a comprehensive understanding requires advanced statistical analyses.

5.2 Correlation Analysis

The goal of the study was to investigate the connection between manufacturing organization's performance and alternative risk transfer. The performance of manufacturing companies was compared to alternative risk transfer using the Pearson correlation coefficient, with a 95% confidence level applied. All indicators of alternative risk transfer and manufacturing company performance were examined using the aforementioned assumptions in order to determine the strength of the association between the two variables.

Table 2.

Correlations

		PMC	CRF
PMC	Pearson Correlation	1	.630**
	Sig. (2-tailed)		0
	N	221	221
CRF	Pearson Correlation	.630**	1
	Sig. (2-tailed)	0	
	N	221	221

The findings derived from the research study unveiled compelling insights into the intricate relationship between Alternative Risk Transfer (ART) and the performance of manufacturing companies. The investigation scrutinized a key variable within the realm of ART namely Catastrophe Risk Futures (CRF).

Catastrophe Risk Futures (CRF) displayed a correlation coefficient (r) of 0.630, accompanied by a p-value of 0.000 < 0.05, further affirming a significant correlation.

This compelling evidence led to the rejection of the null hypothesis, which posited no correlation between CRF and manufacturing company performance. Instead, the acceptance of the alternative hypothesis underscores the presence of a substantial and meaningful relationship between Catastrophe Risk Futures (CRF) and the performance of manufacturing companies.

In light of these robust statistical findings, the research study concludes that Catastrophe Risk Futures (CRF) is evidently linked to the performance of manufacturing companies.

5.3 Regression Analysis

With an emphasis on the manufacturing sector in Nigeria specifically, simple linear regression was used to examine the effects of alternative risk transfer strategies on the performance of manufacturing enterprises. The purpose of the simple regression model was to determine whether the performance of manufacturing organizations can be predicted by alternative risk transfer solutions.

Table 3.

Variables Entered/Removed[a]

Model	Variable Entered	Variables Removed	Method
1	CRF	.	Enter

a. Dependent Variable: PMC

b. All requested variables entered.

The model summary results indicate that the performance of manufacturing companies and those anticipated by the regression model have a good positive association (R=0.772) with Catastrophe Risk Futures (CRF). Furthermore, alternative risk transfer methods account for 59.6% (R2=0.596) of the variance in the performance of manufacturing enterprises. The outcomes align with the research conducted by Wing and Jin (2015), who discovered a noteworthy correlation between Performance and Alternative Risk Transfer. The table below displays the summary findings of the regression model.

Table 4: Regression Model Summary of Alternative Risk Transfer and Performance of Manufacturing Companies

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.772[a]	.596	.591	.31170	.596	106.861	3	217	.000	1.781

a. Predictors: (Constant CRF)

b. Dependent Variable: PMC

The study sought to determine which regression model best predict manufacturing companies' performance following the application of Catastrophe Risk Futures (CRF). The ANOVA findings showed that regression model produces a considerably superior forecast of the performance of manufacturing enterprises, with F-statistics (3,217) = 106.861 being significant at P value = 0.000 < 0.05. The table below displays the output statistics findings of the regression ANOVA.

Table 5: An ANOVA of the Regression of Catastrophe Risk Futures (CRF) and Performance of Manufacturing Companies

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	31.146	3	10.382	106.861	.000[b]
	Residual	21.083	217	.097		
	Total	52.229	220			

a. Dependent Variable: PMC

b. Predictors: (Constant) CRF

5.4 Discussion of Findings

The results of this research align with the findings put forth by Amolo et al (2021) in their comprehensive exploration of Alternative Risk Transfer (ART) and its impact on the performance of power projects. Amolo et al (2021) assert that ART plays a significant role in

influencing the performance of hydroelectric energy projects. This further confirms the work of Sunday and Torutein (2018) as it contributed to the academic discourse through their meticulous study on the Analysis of Alternative Risk Transfer strategies in Manufacturing Organizations.

Sunday and Torutein's research sheds light on the positive effects of Alternative Risk Transfer strategies on manufacturing firms. Their findings underscore that the implementation of such strategies is associated with favourable outcomes including peace of mind for effective business operations and ventures, as well as serving as a preventive measure against economic losses. These insights collectively contribute to a growing body of knowledge that emphasizes the importance of Alternative Risk Transfer mechanisms in diverse sectors, ranging from power projects to manufacturing organizations.

The standard deviation suggests a moderate level of variability, indicating that while there is a degree of consensus in performance of the companies as a result of CRF application. There are, however, discernible variations among the sampled companies. But CRF is agreed to have impact on the performance.

Furthermore, alternative risk transfer methods, in this case, CRF accounts for 59.6% (R2=0.596) of the variance in the performance of manufacturing enterprises. The outcomes align with the research conducted by Wing and Jin (2015), who discovered a noteworthy correlation between Performance and Alternative Risk Transfer.

The convergence of evidence from both studies suggests a generalizable trend wherein the adoption of Alternative Risk Transfer approaches as a valuable factor in enhancing the overall performance and resilience of projects and organizations. The implications of these findings extend beyond specific industry contexts, offering valuable insights for decision-makers, practitioners, and scholars alike. As businesses continue to navigate a dynamic and unpredictable environment, understanding and leveraging Alternative Risk Transfer strategies may prove instrumental in mitigating uncertainties, sustained success, and fostering a climate conducive to economic growth. Thus, our findings coupled with the findings presented by Amolo et al, (2021) and Sunday and Torutein (2018) collectively contribute to the evolving landscape of risk management practices, providing a foundation for further exploration and application in various domains.

CONCLUSION AND RECOMMENDATIONS

Based on the responses to the survey to determine relationship between Catastrophe Risk Futures (CRF) as Alternative Risk Transfer solution on one hand and performance of manufacturing companies in Nigeria on the other, the study revealed significant correlation between CRF and performance with correlation coefficient (r) of 0.630 with a p-value of 0.000. The ANOVA findings also showed performance of manufacturing enterprises could strongly be predicted by CRF as well as showed a positive association between CRF as an ART solution and performance of the manufacturing companies.

Therefore we could reject the first null hypothesis that there is no significant relationship between CRF and the performance of Nigeria manufacturing companies.

This prove that all the benefits offered by CRF do have real impact on the performance of the manufacturing concerns. By shifting the risk exposure of the sector to the capital market not

only protect against catastrophic losses that could have sunk an enterprise into oblivion, it provides another means of profit making opportunity to investors.

The study underscores the potential role of ART strategy can play in shaping and influencing success trajectory of the manufacturing industry. Understanding of a positive relationship between ART and performance as shown in this study can provide a valuable compass for strategic decision making, risk mitigation strategy and basis for organizational resilience.

The empirical findings reveal that Catastrophe Risk Futures (CRF) as a form of Alternative Risk Transfer solutions is expected to wield a positive and significant effect on Performance of manufacturing companies (PMC). This implies that average coefficient of 0.199 and p-value of 0.000, shows that Catastrophe Risk Futures (CRF) has a positive and significant impact on the Performance of manufacturing companies. That is the initiation of a unit change in Catastrophe Risk Futures (CRF) confirms the theory to the time about 0.199, which means increase in Catastrophe Risk Futures (CRF) causes 0.199 increases in the Performance of manufacturing companies. Hence, we fail to accept the first null hypothesis and we accept the alternate hypothesis that there is a significant relationship between the use of CRF and the performance of Nigeria manufacturing companies. The implication of this study to policymakers and regulators of pension funds business in Nigeria is that it informs them that different assets and liabilities contribute differently to the profitability of the company. This creates a need to identify assets with higher returns and liabilities with lower cost in order to increase profitability. Efficient management of these assets and liabilities will enable pensioners maximize profit and create value for shareholders.

Recommendations

Based on the findings of the study, the researcher recommends:

1. The industry or organization must determine the upper limit of business investment in ART as a percentage of the balance sheet beyond which there is no significant positive impact on performance or result in negative performance.

2. Manufacturing companies should seek to understand their exposure and determine adaptable alternative risk transfer solutions that cater to their specific needs and risk profiles rather than adopting a one-size-fits-all approach.

3. Manufacturing companies should engage with risk management consultants or insurance brokers who have expertise in alternative risk transfer solutions to ensure the chosen strategies are effective and appropriate.

4. Manufacturing companies should ensure that all alternative risk transfer solutions comply with local and international regulatory standards to avoid legal complications and ensure the ART solutions thrive in the country.

5. Manufacturing companies should implement a system for continuous improvement, monitoring and evaluation of the alternative risk transfer strategies to ensure they remain effective over time.

6. Manufacturing companies should diversify their portfolio of risk transfer solutions to spread risk and increase the potential for returns.

7. Transparency with stakeholders required about the company's risk management strategies to build trust and confidence.

8. Manufacturing companies should stay abreast of the latest developments and innovations in alternative risk transfer solutions to leverage new opportunities and improve risk management.

9. Government and the Manufacturers Association of Nigeria, MAN should create an enabling environment by way of legislatures and regulations for Alternative Risk transfer, ART to thrive in the Nigerian space in conjunction with the Security and Exchange Commission, SEC. MAN must sensitize and engage its members on ART and its benefits.

10. Appropriate pricing for ART is still an issue across the world. It will be more so in Nigeria given its relative novel status. Therefore, MAN and SEC must work together and keep at it till perfect pricing mechanism can be achieved.

Further Study

As it was not possible for the researcher to cover all investigate the impact of alternative risk transfer solutions on hidden liabilities and contingent risks that may not be fully reflected in all studies.Thus, beyond the two used in the study, further studies will be on the effects on other relevant assets and liabilities, such as receivables, payables, inventory, and long-term debt. Analyze the impacts of various alternative risk transfer options, including captives, insurance-linked securities, and catastrophe bonds.Further studies would explore risk transfer solutions tailored to the specific risks faced by different manufacturing sub-sectors in Nigeria. Further studies could be carried out using variables like interest rate etc. In addition, other the impact of alternative risk transfer solutions on hidden liabilities and contingent risks

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