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

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ABSTRACT

Common risks such as credit risks, personnel injury, and damage to third party are easily insurable. However, industries are faced with risks that are existential such as terrorist attacks, hurricane, earthquake etc. Clearly, these are outside the conventional risk transfer mechanism of normal insurance of shifting the financial liability of occurrence to a willing party, but in today's world existential risks are clear and present, hence the need to develop extra-risk transfer mechanism to provide adequate cover. Such mechanisms are non-insurance and are termed Alternative Risk Transfer, ART.The aim of study is to determine impact of Catastrophe bond (CAB) as an alternative risks transfer solutions on the performance of Nigeria manufacturing companies. Based on the responses to the survey, Catastrophe bond (CAB) on one hand and performance of manufacturing in Nigeria on the other, revealed significant correlation between CAB as an ART solution and performance with correlation coefficient (r) of 0.661 with a p-value of 0.000. The ANOVA findings also showed performance of manufacturing enterprises could be strongly be predicted by CAB as well as a positive association between CAB solution and performance of the manufacturing companies. Therefore, we can conclude that there is significant relationship between CAB as an ART solution and the performance of Nigeria manufacturing companies and that CAB 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. Manufacturing companies need to engage risk management experts to understand their exposure to choose effective and appropriate ART strategies, customized to cater to their specific needs and risk profiles, rather than a one-size-fits-all solution.

Keywords: Implications, Alternative, Risk Transfer Solutions, Performance, Manufacturing Companies

Introduction

There is a wide variety of personal, social, financial, environmental, and intergenerational implications that might result from the dangers that exist in the world today. Everyone from people to governments in both rich and developing nations has the formidable task of mitigating these affects' financial effects. Because of this problem, most manufacturing companies are continuously seeking new ways to help manage risks. One way they do this is by securing funds to cover recovery and reconstruction costs after a risk event. This

way, their operations, investments, claim management, and profitability won't have to bear as much of the financial burden (Ben &Jouili, 2015).

There are several potential points of failure in the manufacturing sector, including the hiring process, the manufacturing phase, the distribution phase, 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. The non-insurance transfer of loss-causing activities is another kind of risk transfer (Nwite, 2006).

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). The use of alternative risk transfer (ART) products, according to Schanz (1999), expanded in the 1990s to include finite insurance, reinsurance, and risk retention groups, as well as risk transfer and risk transfer with tax deductibility advantages via capital markets. The year 2004 was Whenceta. As a result, extra capital may be accessed via ART instruments like as reinsurance, sidecars, ILW, CAB, options, futures, and captives. In 2010, Chieh....

When it comes to providing businesses with the financial resources they need to mitigate risk, ART is all about the intersections of insurance, banking, and the capital market. In 2000, Asaff, the European Commission, and Hofmann all made contributions. There is no universally applicable definition of art since each piece is custom-made to fit the specifications of the buyer. A wide variety of corporate demands are the basis for the need for ART goods. The following categories, however, are applicable to ART products: Allen (2002) and Gjertsen (2002) discuss securitization, insurantization, captive insurance businesses, finite risk insurance (reinsurance), credit default swaps, collateralized debt, residual value, and revenue guarantee products.

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. Alternative risk financing methods are sometimes considered, such as captive insurance firms, longevity risk transfer, securitization tied to the life insurance business, and other similar approaches. Published by Burca and Batrinca in 2014. The purpose of this research is to examine the effects of various risk transfer strategies on the productivity of Nigerian manufacturing firms.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

Findings should provide light on how different risk transfer strategies may affect the productivity of Nigerian factories. Simply said, there are instances when an alternate risk transfer solution is the best option, but making a mistake may have a significant impact on the company's bottom line.

There are a number of problems that require fixing with the way manufacturing businesses employ alternative risk transfer options. In order to use these strategies successfully and get the most out of them, it is essential to understand these challenges.

Additionally, some Nigerian industrial organisations may overestimate their risk exposure, leading to a high opportunity cost. Take the hypothetical case of a manufacturing corporation that sets aside substantial funds to offset potential losses caused by unforeseen risks. Those savings will have been better spent if the dangers did not materialise or if the harm was much less 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).

The reality that man cannot lead a meaningful life free from taking risks becomes more apparent. Since insurance is not a foolproof method of risk transfer, manufacturing businesses should always look for other, more efficient methods to transfer risk. Jones (2002).

In order for Nigerian manufacturing enterprises to reap the advantages of alternative risk transfer solutions, it is critical to address these concerns. To overcome these challenges and improve their performance and overall risk management strategies, manufacturing companies can increase awareness, collaborate with specialised experts, streamline regulatory processes, consider cost implications, manage risk retention

effectively, and provide implementation support. Then, following the reasoning given above, several inquiries are warranted: How do alternative risk transfer investments and business choices affect Nigerian manufacturing companies? How do Nigerian manufacturing firms plan to handle claims in the event of an alternative risk transfer scenario? What impact, if any, would different risk transfer policies have on the development and profitability of Nigerian manufacturing firms? In order to investigate the "gap" that will be addressed in the study, the questions' replies will be thoroughly investigated.

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 (CAB) 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 companiesin the state with the highest manufacturing activities.

Research Questions

The specific research questions of the study are:

To find out if the use of catastrophic bonds as alternative risk transfer has significant impact on 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 Catastrophic Bond (CAB)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.

Catastrophic 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.

LITERATURE REVIEW

Theoretical Framework

Agency Theory

Economists who subscribe to agency theory see business relationships as a series of contracts between persons acting in their own self-interest. According to Ross and Mitnick (1970). According to agency theory, which is relevant when discussing various risk transfer options, organisations function on the basis of a basic principal-agent relationship. Management acts as an agent for the shareholders by transferring decision-making power from the shareholders, who are the principals. The use of industry loss guarantees and other alternative risk transfer mechanisms in risk management creates a new dynamic in which management's and shareholders' objectives may not coincide. There may be a conflict of interest if agents have their own goals in mind while principals want to maximise shareholder value.

Manufacturing businesses in Nigeria may see changes to their risk management and decision-making procedures as a result of new risk transfer solutions. If management and stockholders have divergent views on risk, a conflict of interest might develop. In order to optimise and effectively execute alternative risk transfer mechanisms, which affect the manufacturing enterprises' overall performance, it is essential to understand and manage these agency difficulties..

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.

Conceptual Framework

The Concept of Alternative Risk Transfer

The concept of alternative risk transfer (ART) does not have a precise definition. Most organizations see alternative risk transfer (ART) as a use of alternative techniques to achieve the same hedging and transfer of risk without involving a risk bearing entity as with traditional insurance company or reinsurance company. Alternative risk transfer (ART) is not just a product, but rather a pattern of doing business which has two generally accepted segments- risk transfer through alternative risk carriers and risk transfer through alternative products Swiss-re (2014). One reason for this is that the range of risk products that can reasonably be defined as ART have expanded over time as product innovation continues. Alternative risk transfer enables companies to transfer risks to another party or to the capital market by way of converting these risks into tradable securities with long term maturation.

Alternative risk transfer techniques allow organizations to purchase a coverage and transfer risks through manufacturing industry pools and more conveniently securitizing underwriting proceeds. Securitizing underwriting proceeds here entails making the capital market to take more direct role in providing insurance` industry and reinsurance industry services by hedging manufacturing industry risks against long term tradable securities De-Mey (2017). This practice which is the broad field of alternative risk transfer (ART) is said to bring about a convergence of insurance industry services and financial markets. Alternative risk transfer covers include; risk securitization through catastrophe bonds, insurance industry-linked securities and reinsurance industry side-cars, trading of risk through industry loss warranties, weather derivative contracts by transforming capital market risks into reinsurance industry through transformer vehicles.

Transferring risk to alternative carriers entails funding organizations, such as captive business investors or pools, which are willing to take on some of the business investor’s risk for a fee. Generally, alternative risk transfer (ART) emphasizes capital preservation over operating performance and place greater weight on business retention over 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.

Catastrophic Bonds (CAB)

Catastrophic bonds (**CAB**) are a type of insurance-linked security (ILS) that provides coverage to investors against losses from a specified peril. **CAB** are typically structured as a securitization of insurance risk, and they are issued by special purpose vehicles (SPVs). According to Bodie, Kane and Marcus (2015), **CAB** are designed to provide investors with a high return on investment (ROI) in exchange for the risk of losing their investment if the specified peril occurs. **CAB** are typically issued with a maturity of three to five years, and they typically have a high coupon rate.

Burca&Batrinca (2014), posited that **CAB** have become increasingly popular in recent years, as investors have sought to diversify their portfolios and gain exposure to the insurance market. **CAB** are also attractive to investors because they are typically uncorrelated with other asset classes, such as stocks and bonds. Also, **CAB** work by transferring the risk of a specified peril from an insurance company to a group of investors. The insurance company typically issues the CAB through an SPV. The SPV then uses the proceeds from the bond issuance to purchase reinsurance from the insurance company. The reinsurance agreement specifies the peril that is covered, the trigger for a claim, and the payout amount. If the specified peril occurs and the trigger is met, then the insurance company will make a claim to the SPV. The SPV will then use the proceeds from the CAT bond to pay out the claim to the bondholders.

In accordance, Cai (2016) posited that **CAB** offer a number of benefits to both investors and insurance companies. For investors, **CAB** offer the potential for a high ROI in exchange for the risk of losing their investment. **CAB** are also attractive to investors because they are typically uncorrelated with other asset classes. For insurance companies, **CAB** offer a way to transfer risk to the capital markets. This can help insurance companies to manage their risk more effectively and improve their financial performance. **CAB** can also help insurance companies to expand their product offerings and gain access to new markets.

According to Canh et al, (2020), **CAB** are a valuable tool for investors and insurance companies to manage risk and improve financial performance. However, **CAB** are also complex and expensive instruments. Investors and insurance companies should carefully consider the benefits and risks of **CAB** before making a decision about whether or not to participate in a CAT bond program.

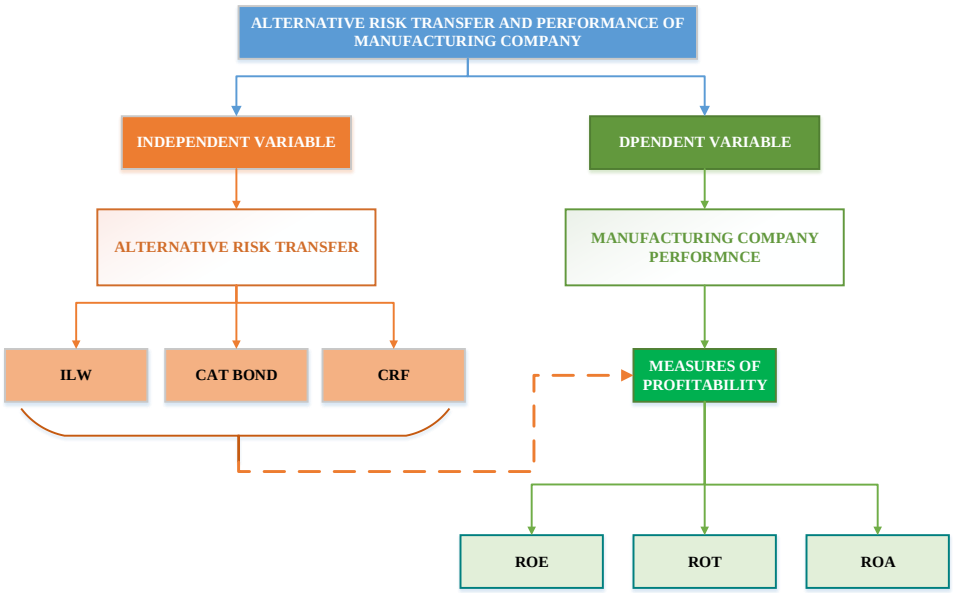
According to Creswell (2011), **CAB** can be used to cover a wide range of catastrophic losses, but they can also be used to cover smaller losses. More so, **CAB** are typically issued by large insurance companies, but

they can also be issued by smaller insurers and other entities. **CAB** are typically traded on over-the-counter markets, but they can also be traded on exchanges. **CAB** have become an increasingly important part of the insurance market in recent years. As the frequency and severity of natural catastrophes increases, **CAB** are expected to play an even greater role in helping insurers and investors to manage risk.

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 andbrokers 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



Empirical Review

The Use of Catastrophic Bonds

Modelling Catastrophe Risk Bonds is the primary emphasis of Shao's (2015) research paper. This research has two main conclusions. It started by looking at how CAT bonds with various model configurations are priced. Secondly, it used a new framework to create three catastrophe-based bonds: earthquake, general, and nuclear risk. It used real-world data to estimate the model's parameters, and it used Monte Carlo simulation to get numerical results. It also includes comparing various models.

According to Mariani and Amoruso (2016), the rising frequency of natural catastrophes and the resulting economic losses are driving the fast expansion of catastrophe bonds in the financial markets. These losses are being severely underwritten by insurance and reinsurance providers. By facilitating the transfer of risk

to the capital market, these securities provide a viable option. The study's overarching goal is to provide empirical evidence of the diversification benefits enjoyed by investors operating in this market area. The current study verifies that investors do, in fact, get diversification and total return advantages from investing in catastrophic instruments. Actually, the quantitative analysis's end findings demonstrate how stable cat-bonds are, with lower volatility and rather consistent returns. Therefore, the possibility of risk associated with these bonds would not hinder their growth. The current popularity of catastrophe bonds in particular exemplifies the potential for these products to be more widely used and improved portfolio strategies.

RESEARCH METHODOLOGY

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.

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)

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.

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.

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 namelyCatastrophicBondsas dependent variables. Background information of the respondents consist of 4 items. In Section B, eight items were used as measuring dimensions for Catastrophic Bonds.

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

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)

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.

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)

$Y = B_0 + B_1 X_1 + a$

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 Bonds, CAB is independent variables of the study.

RESEARCH INTERPRETATION

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

4.1. Descriptive Statistics

Table1.

Descriptive Statistics

	N	Mean	Std. Deviation
PMC	221	1.8235	0.48724
CAB	221	1.8039	0.52370
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.

Companies employing Catastrophe Bonds (CAB) exhibit a mean performance score of 1.8039, with a standard deviation of 0.52370. The standard deviation indicates a moderate level of variability around the mean. The use of CAB appears to be associated with a performance level in close proximity to the overall mean. Deeper analysis is required to understand whether this observed difference is statistically significant and the implications for manufacturing company performance.

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.

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	ILW
PMC	Pearson Correlation	1	.648**
	Sig. (2-tailed)		0
	N	221	221
CAB	Pearson Correlation	.661**	.506**
	Sig. (2-tailed)	0	0
	N	221	221

**. Correlation is significant at the 0.01 level (2-tailed).

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 (CAB).

The statistical analyses revealed noteworthy correlations, thus establishing a robust foundation for comprehending the impact of ART on manufacturing company performance.Specifically, Catastrophe Bonds (CAB) demonstrated a correlation coefficient (r) of 0.661, with a p-value of 0.000 < 0.05, emphasizing a substantial correlation.

This evidence leads to rejection of the null hypothesis that there is no correlation between CAB and manufacturing company performance. Instead, the alternative hypothesis is accepted which underscores the presence of a substantial and meaningful relationship between Catastrophic bonds (CAB)and the performance of manufacturing companies.

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	CAB	.	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 Catastrophic bonds (CAB). 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.

Table4: 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 CAB)
b. Dependent Variable: PMC

The study sought to determine which regression model best predict manufacturing companies' performance following the application of Catastrophe Risk Futures (CAB). 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.

Table5: An ANOVA of the Regression of Catastrophe Risk Futures (CAB)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)CAB

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 CAB application. There are, however, discernible variations among the sampled companies. But CAB is agreed to have impact on the performance.

Furthermore, alternative risk transfer methods,in this case, CAB 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 (CAB) as Alternative Risk Transfer solution on one hand and performance of manufacturing companies in Nigeria on the other, the study revealed significant correlation between CAB and performance with correlation coefficient (r) of 0.661 with a p-value of 0.000. The ANOVA findings also showed performance of manufacturing enterprises could strongly be predicted by CAB as well as showed a positive association between CAB 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 CAB and the performance of Nigeria manufacturing companies.

This proves that all the benefits offered by CAB 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 (CAB) 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 0.318 and p-value of 0.000, shows that Catastrophe Risk Futures (CAB) has a positive and significant impact on the Performance of manufacturing companies. That is the initiation of a unit change in Catastrophe Risk Futures (CAB) confirms the theory to the time about 0.318, which means increase inCatastrophe Risk Futures (CAB)causes 0.318 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 CAB 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. Manufacturing companies should need to engage risk management experts to understand their exposure to choose effective and appropriate ART strategies, customized to cater to their specific needs and risk profiles, rather than a one-size-fits-all solution.

2. Manufacturing companies should ensure that all alternative risk transfer solutions comply with local and international regulatory standards to avoid legal complications.

3. Manufacturing companies should invest in training for employees to understand and manage these alternative risk transfer solutions effectively.

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

5. Manufacturing companies should maintain transparency with stakeholders about the company's risk management strategies to build trust and confidence.

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

7. Government and the Manufacturers Association of Nigeria, MAN should create an enabling environment for Alternative Risk transfer, ART to thrive in the Nigerian space in conjunction with the Security and Exchange Commission, SEC. To do this, MAN needs to sensitize and engage its members on ART and its benefits.
8. 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 ittill perfect pricing mechanism can be achieved.
9. The industry or organization must determine the point of diminishing return for investments in ART as a percentage of the balance sheet.

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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