Artigo original

http://dx.doi.org/10.18623/rvd.v22.n6.4013

CRISIS MANAGEMENT FRAMEWORK AND THE INVESTMENT VIABILITY OF MULTINATIONAL MANUFACTURING COMPANIES - AN EMPIRICAL EVIDENCE FROM NIGERIA

ESTRUTURA DE GESTÃO DE CRISES E A VIABILIDADE DE INVESTIMENTO DE EMPRESAS MULTINACIONAIS DE FABRICAÇÃO - UMA EVIDÊNCIA EMPÍRICA DA NIGÉRIA

Article received on: 8/15/2025
Article accepted on: 11/14/2025

Maureen Chiegeonu Arukwe*
*Department of Management, Faculty of Business Administration, University of Nigeria, Nsukka, Nigeria
maureen.ngwu@unn.edu.ng

Lovlyn Ekeowa Kelvin-Iloafu*
*Department of Management, Faculty of Business Administration, University of Nigeria, Nsukka, Nigeria
lovlyn.kelvin-iloafu@unn.edu.ng

Francis Ezieshi Monyei**
**Department of Industrial Psychology and People Management, College of Business and Economics, University of Johannesburg, Gauteng, South Africa
fmonyei@uj.ac.za

Wilfred Isioma Ukpere**
**Department of Industrial Psychology and People Management, College of Business and Economics, University of Johannesburg, Gauteng, South Africa
wiukpere@uj.ac.za

Ifeoma Joanes Onodugo*
*Department of Management, Faculty of Business Administration, University of Nigeria, Nsukka, Nigeria
Ifeoma.onodugo@unn.edu.ng

Anthony Obiora Ude*
*Department of Management, Faculty of Business Administration, University of Nigeria, Nsukka, Nigeria
Obiora.ude@unn.edu.ng

The authors declare that there is no conflict of interest

Abstract

This study investigates the connection between multinational manufacturing companies' investment viability in Nigeria and the crisis management framework (CMF). The study design that was employed was ex post facto. According to Machameratios.com's compilation as of December 31, 2022, the population was made up of manufacturing enterprises listed on the Nigerian Exchange Group (NXG). The data was interpreted using descriptive statistics, such as mean and standard deviation. To validate the datasets and establish the link between the research variables, correlation analysis was performed. Additionally, STATA version 14.2 was used to conduct panel random effects regression with robust standard errors, as outlined in the model specification sections. The results indicated that the crisis management framework had a significant negative relationship with investment viability. As a policy recommendation, the study suggests that to reduce or eliminate environmental impacts and comply with legal requirements, multinational manufacturing firms in Nigeria should adopt an effective waste management system. This measure not only reduces the risks associated with crisis frameworks but also enhances their investment viability.

Keywords: Crisis Management Framework. Environmental Disclosure. Investment Viability. Multinational Manufacturing Companies. Nigeria.

Resumo

Este estudo investiga a relação entre a viabilidade do investimento de empresas multinacionais do setor manufatureiro na Nigéria e a estrutura de gestão de crises (EGC). O estudo utilizou uma abordagem ex post facto. De acordo com a compilação do Machameratios.com, em 31 de dezembro de 2022, a população do estudo foi composta por empresas manufatureiras listadas no Nigerian Exchange Group (NXG). Os dados foram interpretados utilizando estatísticas descritivas, como média e desvio padrão. Para validar os conjuntos de dados e estabelecer a relação entre as variáveis da pesquisa, foi realizada uma análise de correlação. Adicionalmente, o software STATA versão 14.2 foi utilizado para conduzir uma regressão de efeitos aleatórios em painel com erros padrão robustos, conforme descrito nas seções de especificação do modelo. Os resultados indicaram que a estrutura de gestão de crises apresentou uma relação negativa significativa com a viabilidade do investimento. Como recomendação política, o estudo sugere que, para reduzir ou eliminar os impactos ambientais e cumprir os requisitos legais, as empresas multinacionais do setor manufatureiro na Nigéria devem adotar um sistema eficaz de gestão de resíduos. Essa medida não apenas reduz os riscos associados às estruturas de gestão de crises, mas também aumenta a viabilidade do investimento.

Palavras-chave: *Estrutura de Gestão de Crises. Divulgação Ambiental. Viabilidade de Investimentos. Empresas Multinacionais de Manufatura. Nigéria.*

1 INTRODUCTION

Most emerging economies, particularly Nigeria, have continued to face numerous devastating effects of poor risk management, crises and disasters that limit advancement, including disruptions in value chains, fatalities, damage to assets, and adverse environmental impacts (Monyei & Ukpere, 2024; Mustapha, 2018). Even though the crisis management frameworks (CMF) offer structured approaches for organisations in

these regions to be proactive in preparations, response, and recovery from crises, the results are still far from expectations. Workplaces should modify their communication tactics in response to any crisis, according to the Situational Crisis Communication Theory (SCCT) (Coombs, 2015). By doing this, it ensures efficient crisis management, which is essential for reducing risk and the negative effects of crises on business operations. Multinational manufacturing firms can lower the risk of crises and guarantee business continuity by implementing a strong crisis management strategy. These companies' decisions to invest in Nigeria are influenced by a number of factors, including the country's business climate, socio-political structure, and economic stability. Notably, Nigeria saw the emergence of several conglomerates known as multinational companies (MNCs) following the abolition of the slave trade (Aworom, 2013). Due to their economic influence over Nigeria following its independence, Nigeria became the obvious choice for European countries in need of a market for excess goods and a location to hire cheap labour and raw materials (Eluka et al., 2016). Strong crisis management systems are necessary due to the challenges faced by multinational firms in Nigeria. Because of the region's complex socio-economic and political environment, MNCs must implement strategies that not only handle current problems but also promote long-term sustainability and resilience. Valackiene (2011) asserts that crisis management in the business sector necessitates taking the organisation's strategy management and crisis planning procedures into account. Nigeria's MNC landscape has faced several challenges throughout the years, including political instability, local conflicts, and logistical and infrastructure challenges. Nigeria's wealth of natural resources presents significant investment opportunities, but global firms must also navigate difficult socio-political situations. Managing crises and lowering risks in such a dynamic climate are crucial concerns for these businesses. Numerous global companies have demonstrated resilience in managing crises in Nigeria. For example, Shell Petroleum Development Company has implemented extensive community involvement programs to reduce conflicts related to oil exploration activities (Shell Global, 2021). Their approach highlights how crucial it is to understand local dynamics and cultivate stakeholder trust. Another notable example is Coca-Cola's operations in Nigeria. The corporation has adopted a proactive approach to crisis management by investing in local supply chains and forming partnerships with regional businesses, which enhances operational stability and boosts the local economy (Coca-Cola Corporation Report, 2022). The implementation of early warning systems (EWS)

must be prioritised in MNC crisis management. By using these methods, potential risks can be identified before they develop into major emergencies. Examining Nigeria's political, economic, and environmental developments can serve as the foundation for EWS. When investing in Nigeria, multinational corporations (MNCs) encounter a complex interplay of opportunities and obstacles. Although the area is notable for its rich natural resources, varied culture, and advantageous position, it also faces serious socio-political instability, inadequate infrastructure, and unclear regulations (Ali & Isse, 2002). High levels of corruption are more common in countries with weak economies, which impedes the rate and extent of development. Nigeria's industrial sector's electricity distribution is still dreadfully inadequate and trailing, according to Ngwu et al. (2025) and Odiaka (2006). According to Okafor (2008), the nation's continuous energy shortage is a significant barrier to economic, technological, and industrial advancement. It is one of the several unresolved issues that have significantly impeded and warped Nigeria's progress (Ayobolu, 2006). Due to political unrest, ethnic conflicts, and militant activity, the area has experienced regular disruptions that put international investments at serious risk (Ufomba et al., 2025; Okwuosa et al., 2020). Additionally, inadequate infrastructure hampers operational efficiency and increases vulnerability during crises. The foregoing narrative emphasises the dire need for studies to elucidate the pivotal role of an effective, robust and sustainable crisis strategy. Hence, the timeliness of this study, which investigates crisis management frameworks adopted by manufacturing MNCs in Nigeria, and their association with investment viability.

1.1 Study Objectives

Holistic aim: Analyse the crisis management framework (CMF) and the investment viability of multinational manufacturing companies in Nigeria.

Specific aims:

- Determine the extent return on assets and equity affect the environmental disclosure of products and services.
- Examine the effect of compliance with environmental law and regulation disclosure on effluent and waste disclosures.

2 UNDERSTANDING THE RELATED LITERATURE

2.1 The Situational Crisis Communication Theory by Timothy Coombs (2007)

The necessity of effective crisis management communication is recognised by Coombs' 2007 situational crisis communication theory. The strategies employed by leaders to maintain stakeholder trust and protect their reputations during times of crisis are described in the Coombs Situational Crisis Theory (Coombs, 2007; 2022). The most popular theory among academics is the Situational Crisis Communication Theory (Macnamara, 2021). The Coombs Situational Crisis Theory, according to Guerber et al. (2020), offers an organised framework for comprehending how organisational leaders interact with stakeholders in times of crisis. Organisational leaders can adapt their communication methods to combat crises and protect their reputation by keeping in mind the logical processes that support stakeholders' opinions. Coombs and Holladay (2010) offered several recommendations for crisis communication practitioners, including the recommendation that organisational leaders focus on portraying crises as technological failures, as this strategy typically results in more favourable opinions of the issue and the organisation in question. Organisational leaders should carefully consider how their crisis response plans interact, taking into account the event's severity, responsibility, and history (Othman and Yusoff, 2020). Additionally, Coombs and Holladay emphasised the importance of modifying communication tactics in response to the evolving circumstances, emphasising its significant impact on the error's perception. Despite its widespread acceptance and significant contribution to career development research and methodology, this theory has faced criticism. Cultural disparities may result in limitations (Barkley, 2020). According to Barkley, the Japanese society places a high importance on avoiding conflict, collectivism, and peace. Therefore, in times of crisis, leaders of Japanese organisations may place a higher priority on preserving public harmony than on full disclosure and transparency. According to Barkley's research, the situational elements and communication strategies of Coombs' Situational Crisis Theory should be modified to better suit the nuances of Japanese culture. Coombs' Situational Crisis Theory may ignore the psychological and emotional components of crisis communication, which are essential for comprehending stakeholder requirements and reactions, due to its focus on strategic communication (Claeys & Cauberghe, 2014). Directors of manufacturing

companies should thus take these limitations into account and add more components to their crisis management plans in order to guarantee efficient communication and protect their value in severe circumstances.

2.2 Crisis Management Frameworks

Organisations can anticipate, respond to, and recover from crises with the use of frameworks for crisis management. MNCs should pay special attention to the following bases: Crisis Management's Four Phases: Phases of prevention, preparation, response, and recovery are all included in this paradigm (Coombs, 2015). Every stage is essential to minimising harm and guaranteeing the continuance of business operations. A crisis, which can include anything from an office fire to a natural disaster, a terrorist outbreak, an information breach, or the death of a CEO, can result in material and immaterial costs for a company, such as lost sales, damage to its reputation, and a drop in revenue (Hayes, 2024). A crisis is an unforeseen circumstance that makes people of an organisation anxious (Indeed Editorial Team, 2024). A business may face numerous crises, and in order to keep the business moving in the right way, effective management procedures are necessary. Rodservich (2024) defined seven sorts of crises, including the following: Natural catastrophes, financial, legal, human resource, product flaws, communication, and political crises. Any company with expertise in crisis mitigation may predict and reduce any eventuality (Indeed Editorial team, 2024). Organisational hazards can happen quickly and without warning, and they have the potential to cause significant harm to stakeholders or employees. These occurrences can be categorised as crises, and they need to be managed skilfully and effectively, according to the CFI Team (2024).

2.3 Investment Viability of Multinational Manufacturing Companies

According to Kelvin-Iloafu (2024), investment is the commitment of resources that have been saved or set aside from consumption in the hopes of future gains. Investing is the act of investing money, time, or effort in anything. Investments are undertaken with the hope that the assets' value will rise or that they will eventually provide more benefits. Investments are made with the intention of increasing value or generating more income (Denomme & Grimsley, 2023). According to Hayes (2024), an investment is any

purchase made with the expectation of earning money or seeing its value rise. The consistent rise in an asset's value is called appreciation. Income requires "waiting" for a return on investment, which is its fundamental characteristic (Kelvin-Iloafu, 2024). To turn a profit today, resources including time, money, and effort must be utilised (Hayes, 2024). Any asset purchased with the intention of increasing its value or generating income is regarded as an asset. Resources (cash, time, effort, or an asset) must be employed each time an investment is made in the expectation of eventually earning a larger return (Kelvin-Iloafu, 2024). An investor has a wide range of investment options. Purchasing stocks and other alternative financial assets from the capital markets, making real estate investments, and obtaining liquid assets like gold and collectables are some examples. As an alternative, you can invest directly or indirectly in a range of endeavours (Picardo, 2025). Money can be used to start a business or buy assets, like as real estate, to rent them out or subsequently sell them at a higher price (Picardo, 2025). According to Kelvin-Iloafu (2024), return on investment (ROI), which is computed by deducting the current investment from the initial worth or value, is the primary metric used to evaluate the performance of an investment.

2.4 Firms' Product and Service Offering

According to Kelvin-Iloafu (2017), a product is anything that is supplied or sold to satisfy the wants or wishes of both the seller and the consumer. Additionally, products are actual or intangible goods that companies produce, stock, and market in order to meet the demands and preferences of their customers. These include luxuries like designer handbags and e-books as well as basics like food and toothpaste (Shopify, 2024). Furthermore, according to Kelvin-Iloafu (2017), a product is a combination of both tangible and intangible attributes, including pricing, packaging, the reputation of the maker and seller, and services that customers may identify as fulfilling their needs. A service is an intangible commodity that customers can buy to fulfil their wants or wishes, while a product is a tangible good that is created and sold to fulfil a need or desire (Kelvin-Iloafu, 2017). While services are benefits or activities that one party provides to another, such as transportation, advice, or haircuts, products are material things like clothing or telephones. In contrast to goods, services—like a haircut or a DSTV subscription—are transient and typically require multiple payments to be received. Services are intangible

products that are typically actions or procedures (Shopify, 2024). The goal of both products and services is to provide value to customers (Tiwari, 2024). It is important to acknowledge that customers are more interested in the value they will obtain from using products and services. The two categories of products are consumer and industrial. Products are the tangible commodities that a company sells to clients. A prospective consumer could want to buy or utilise these goods. Products include, among other things, food and drink, apparel, toys, gadgets, automobiles, and houses. (Editorial team, indeed, 2024). Services are intangible things that a company can offer its clients. These are regular occurrences that use the labour of at least one other person for the client's advantage. When someone serves another person, they may be managing a task or performing a job. Prices for services can differ greatly depending on the type of service, the level of demand, and the experience of the person or individuals providing it. Services include things like health care, auto and home repairs, personal care, professional services, and creative services (Indeed Editorial team 2024).

2.5 Compliance with Environmental Law and Regulation

Monyei et al. (2023) assert that companies need to have a sustainable strategy in order to protect the environment, even if they continue to produce and sell a variety of goods. Environmental compliance, which refers to a wide range of laws, rules, and guidelines established by the government and other regulatory authorities that direct the behaviour of business owners and operations inside a certain region, is one of these sustainable techniques in this instance. Compliance and enforcement are necessary to guarantee that national environmental laws and international environmental treaties actually provide the desired environmental outcomes (Compliance Quest, 2024; Paddock et al, 2011). Monitoring compliance ensures that international manufacturing firms adhere to environmental regulations that reduce their impact on the environment and safeguard natural resources. The increased focus on green innovation in recent years has put more pressure on businesses to address environmental challenges. However, since adopting green practices can be expensive, there is usually a cost involved (Trccompanies.com, 2021). This is to provide businesses with the chance to think about how they affect the environment. It enables us to pursue economic advancement while leaving a more ecologically friendly earth for future generations by lowering pollution,

safeguarding species, and increasing green cover (Compliance Quest, 2024). Businesses have an obligation to do their homework on environmental regulations. Owing to the complexity of the regulatory landscape, it is helpful to have advisors who understand the laws and can guide you through how they affect your business in order to ensure that you adhere to all relevant regulations (Monyei et al. 2023).
In other words, regulatory compliance refers to following the laws, rules, and guidelines that govern how companies conduct their operations. The number and extent of environmental restrictions have grown in recent years. The environment is protected by all the legislation. Companies must be informed about environmental laws and take part in reporting in order to maintain compliance, regardless of the industry in which they operate. Violating the law may result in dire repercussions. Furthermore, a lot of companies consider compliance with environmental laws to be an essential part of their corporate culture. Businesses that care about social issues appreciate the guidance these rules offer. The effectiveness of Nigeria's environmental law in terms of regulatory compliance is hampered by a number of challenges, including enforcement, fraud, lack of public knowledge, monitoring, stakeholder involvement, capacity building, and a weak judicial system, according to Atoyebi and Ifediora (2024).

2.6 The Environmental Laws in Nigeria

The impact that laws have on promoting environmentally sensitive attitudes and behaviours cannot be overstated (Atoyebi & Ifediora, 2024). Planning, pollution prevention, control, and environmental protection can all benefit from these rules. Nigerian environmental laws are summarised as follows, per Atoyebi and Ifediora (2024):

1. Constitution of the Federal Republic of Nigeria, 1999
2. National Environmental Standards and Regulations Enforcement Agency (NESREA) Act 2007
3. Niger-Delta Development Commission (NDDC) Act
4. The Land Use Act, 1978
5. Oil Pipelines Act CAP 07, LFN 2004.
6. Environmental Impact Assessment (EIA) ACT. CAP E12, LFN 2004.

2.7 Firms' Effluents and Waste Disclosure

Wastewater that leaves an industrial outfall, sewer, or treatment facility, whether or not it has been treated, is referred to as effluent (Ngwu et al. 2025; Okeke et al. 2021). Waste, however, is an unused by-product of production, transformation, or consumption (United Nations Statistics Division, 2022, in Wulansari & Adhariani, 2022). According to Okeke et al. (2021), waste also includes any substance that is dumped after use or that is faulty, useless, or worthless. Waste is produced by both industrial and residential processes, and both have negative consequences that endanger the ecosystem's equilibrium. For instance, industrial waste degrades the environment, endangering natural resources and reducing people's standard of living (Meiryani & Noviantini, 2024). When it comes to environmental sustainability projects, environmental disclosure is a way to demonstrate corporate social responsibility and rights through information transparency (Julansa et al., 2020). The waste data is examined by concentrating on waste components from multinational manufacturing companies, such as gas emissions, solid waste, and liquid waste (effluent). The importance of corporate social responsibility (CSR) is brought to light by concerns about environmental preservation (Meiryani & Noviantini, 2024). Every company's operations, including those of global manufacturing companies, involve waste and effluent. They should have a moral obligation to respect the law, be truthful, and refrain from dishonesty (Harmoni & Andriyani, 2008). Building sustainable development requires maintaining an effective and high degree of waste management from an economic, environmental, and sociocultural perspective (Okeke et al, 2021; Schönborn et al, 2019).

3 METHODOLOGY

A post-factum, longitudinal data design was employed in the investigation. The figures include all quoted foreign manufacturing companies on the Nigerian Exchange Group (NGX). The Nigerian Exchange Group covered eleven (11) years from 2011 and 2021 as of the fiscal year 2022. Purposeful sampling was used to choose twenty (20) listed foreign manufacturing enterprises; the selection was based on the Nigerian Exchange Group (NGX). Companies that lacked the required information were eliminated from the sample. Descriptive statistics were used in the study to help interpret the data on the mean,

standard deviation, maximum, and minimum. The relationship between the study's dependent and independent variables was shown by correlation analysis. However, as explained in the model specification sections, the panel random effect regression was employed to achieve the study's objective. The econometric method employed in this study was panel random effect regression using robust standard error methods. Panel data regression produces superior results because it makes use of a lot of data, minimises degrees of freedom, prevents multicollinearity, and helps capture the varied cross-sectional (firm-specific) impacts that the various pools may have on the dependent variable of the model. The data gathered, which included cross-sectional characteristics among the sampled firms and time, supported its use.

3.1 Model Descriptions

Based on previous empirical research and theoretical literature, the current study used Gholami, Sands, and Rahman's (2022) model to express the econometric model, which is as follows:

$$ROA_{it} = \beta_0 + \beta_1 PSEID_{it} + \beta_2 CELRD_{it} + \beta_3 EWD_{it} + + \beta_4 FSize_{it} + \beta_5 LEV_{it} + \mu_{it} \quad (1)$$

$$ROE_{it} = \beta_0 + \beta_1 PSEID_{it} + \beta_2 CELRD_{it} + \beta_3 EWD_{it} + \beta_4 FSize_{it} + \beta_5 LEV_{it} + \mu_{it} \quad (2)$$

Considering the studied literature as well as associated theories, the a priori expectation is stated as: $\beta 1X1it < 0$, $\beta^2X^2it < 0$, $\beta^3X^3it > 0$, $\beta^4X^4it < 0$, and $\beta^5X^5it > 0$. This expectancy is supported by the findings from the reviewed literature and other empirical investigations. The following summarises the operationalisation of the proxies:

where:

ROA = Return on Assets
ROE = Return on Equity
PSEID = Product & Service Environmental Impact Disclosure

CELRD = Compliance to Environmental Law and Regulation Disclosure

EWD = Effluent and Waste Disclosure

FS = Firm Size

LEV = LEVERAGE

β_0 = Constant

β_1- β_5 = Slope Coefficient

μ = Stochastic Disturbance

I = i^{th} Company

t = Time

3.2 Analyses of Data and Interpretations

Table 1

The descriptive statistics

```
. summarize roa roe PSEID CELRD EWD FS Leverage
```

Variable	Obs	Mean	Std. Dev.	Min	Max
roa	220	.0699435	.1061456	-.157263	.539594
roe	220	.1062289	.7830725	-9.893803	1.408151
PSEID	240	.1333333	.3406451	0	1
CELRD	240	.1208333	.3266146	0	1
EWD	240	.3166667	.4661483	0	1
FS	240	17.44712	1.803027	13.83465	21.52516
Leverage	240	.8071759	3.4501	0	48.67

Source: STATA 14.2/Author (2025).

Table 1 above shows the study's descriptive data, which include 220–240 observations from 130 organisations across 11 years. The companies under investigation had an average return on assets, or ROA, of 0.0699 with a standard deviation of 0.1061456, according to descriptive statistics. This indicates that the values in the dataset are often near 0.0699. It demonstrates that the dataset's standard deviation has a moderate degree of fluctuation. This indicates that over the study period, the sample companies had an average of 6.99%. When there is less variation in the data collection, a lower standard deviation shows that the data points are nearer the average. Their ROE averaged 0.1062 (1.062%) and had a standard deviation of 0.7831 (7.831%) for the same period. The independent variable CELRD had an average of 0.1208 (1.208%) with a standard deviation of 0.3266 (3.266%), and PSEID had an average of 0.1333 (1.333%) with a

standard deviation of 0.3406 (3.406%). Additionally, the EWD average is 0.3167 (3.167%) with a standard deviation of 0.4661 (4.661%), according to the data. With standard deviations of 1.80 and 3.45, the average company size and leverage over the study period were 17.45 and 0.81, respectively. Conversely, a higher standard deviation signifies more variation in the data points. A standard deviation value greater than 1.0 suggests that the data may contain an anomaly. The researcher carried out the analysis without changing any statistics in order to maintain consistency in the data set.

Table 2

Normality Test

```
. swilk roa roe PSEID CELRD EWD FS Leverage

                    Shapiro-Wilk W test for normal data
```

Variable	Obs	W	V	z	Prob>z
roa	220	0.90156	15.959	6.404	0.00000
roe	220	0.31975	110.285	10.873	0.00000
PSEID	240	0.95256	8.300	4.914	0.00000
CELRD	240	0.94614	9.424	5.209	0.00000
EWD	240	0.99136	1.511	0.959	0.16881
FS	240	0.96935	5.362	3.899	0.00005
Leverage	240	0.16086	146.825	11.585	0.00000

Source: Author (2025) and STATA 14.2

Table 2 displays the results of the Shapiro-Wilk normality test. The variables with z-statistics of 6.404, 10.873, 4.914, 5.209, 0.959, 3.899, and 11.585 for ROA, ROE, PSEID, CELRD, FS, and Leverage, respectively, were found to have a z-statistics probability of 0.0000 less than 0.05 for the variable EWD. Because the z-statistics probabilities for the variables were less than 0.05 ($p < 0.05$), the results indicate that the variables ROA, ROE, PSEID, CELRD, FS, and Leverage were not in a normal distribution. The data is presumed to meet normality assumptions if the p-value is greater than 0.05 ($P > 0.05$); if it is less than 0.05 ($p < 0.05$), it is presumed that the data does not. If the p-value is less than the significance level (usually 0.05), the model specification states that there is evidence to reject the null hypothesis. Additionally, the variable EWD was considered to be normally distributed because its z-statistical probability was greater than 0.05 (p 0.05); however, non-parametric regression techniques were used in the study to carefully evaluate and compare the t-statistics with probability statistics in accordance

with Gujarati's (2004) findings, without the researcher intending to alter the data. OLS regression, or pooled ordinary least squares, was used to achieve the study's objectives before looking at differences in the underlying assumptions of the OLS regression. Prior to these diagnostic tests, tests for heteroscedasticity and multicollinearity were performed to evaluate the relationship or correlation between the independent and dependent variables in the studies. As a result, we employ the Spearman rank correlation analysis to investigate the relationship and association, as illustrated below.

Table 3

Analysis of Correlation

```
. correlate roa roe PSEID CELRD EWD FS Leverage
(obs=220)
```

	roa	roe	PSEID	CELRD	EWD	FS	Leverage
roa	1.0000						
roe	0.4331	1.0000					
PSEID	0.0385	0.0357	1.0000				
CELRD	-0.0737	-0.0048	0.2431	1.0000			
EWD	-0.0713	0.0485	0.5653	0.5276	1.0000		
FS	0.0833	0.0817	0.4177	0.2856	0.5753	1.0000	
Leverage	-0.1516	-0.9217	-0.0530	-0.0457	-0.0718	-0.0691	1.0000

.

Source: STATA 14.2; Author (2025).

To sustain it over time for overall growth, the optimal amount of CELRD and EWD of assets and equity must be determined. Table 3 presents the findings of the correlation analysis between the independent and dependent variables. It reveals that whereas CELRD has a negative correlation with ROA and ROE at -0.0737 (-7.4%) and -0.0048 (5%), EWD has a positive connection with ROE and a negative correlation with ROA at -0.0713 (-7%). The other independent variable, PSEID, was found to have a positive correlation with both ROA and ROE. The positive correlations between PSEID and ROA and PSEID and ROE suggest a relationship between the degree of PSEID and a company's profitability as measured by ROA and ROE.

3.3 Regression Analyses

3.3.1 Fixed and Random Effects

The cause-and-effect connections between the variables were investigated using either fixed or random effect regression panel analysis.

Table 4

Regression Analysis Combined Result

Variables	ROA Model (Pooled OLS)	ROE Model (Pooled OLS)	ROA Model (Fixed Effect)	ROE Model (Fixed Effect)	ROA Model (Random Effect)	ROE Model (Random Effect)	ROA Model (RE with Robust SE)	ROE Model (RE with Robust SE)
CONS.	-0.0441 (0.541)	0.060 (0.727)	0.543 (0.007) ***	1.492 (0.002) ***	0.0391 (0.723)	0.294 (0.284)	0.0391 (0.837)	0.294 (0.484)
PSEID	0.0671 (0.005) ***	0.151 (0.008) ***	-0.301 (0.242)	-0.0324 (0.594)	-0.000 (0.987)	0.016 (0.791)	-0.000 (0.991)	0.016 (0.863)
CELRD	-0.0187 (0.417)	-0.057 (0.305)	-0.005 (0.820)	-0.003 (0.958)	-0.011 (0.631)	-0.015 (0.787)	-0.011 (0.713)	-0.015 (0.837)
EWD	-0.0337 (0.112)	-0.056 (0.272)	-0.050 (0.005) ***	-0.105 (0.012) **	-0.054 (0.003) ***	-0.115 (0.007) ***	-0.054 (0.011) **	-0.115 (0.045) **
FS	0.006 (0.143)	0.004 (0.686)	-0.025 (0.028) **	-0.072 (0.008) ***	0.003 (0.587)	-0.004 (0.788)	0.003 (0.732)	-0.004 (0.848)
IG	0.040 (0.000) ***	0.081 (0.000) ***	0.017 (0.000) ***	0.029 (0.002) ***	0.023 (0.000) ***	0.041 (0.000) ***	0.023 (0.000) ***	0.041 (0.010) **
LEV.	-0.022 (0.087)	0.0001 (0.996)	-0.036 (0.000) ***	-0.041 (0.083)	-0.028 (0.008) ***	-0.021 (0.396)	-0.028 (0.142)	-0.021 (0.625)

Table 5

Model Statistics

Statistic	ROA (Pooled OLS)	ROE (Pooled OLS)	ROA (Fixed Effect)	ROE (Fixed Effect)	ROA (Random Effect)	ROE (Random Effect)	ROA (RE w/ Robust SE)	ROE (RE w/ Robust SE)
F-Statistic	12.35 (0.000)***	8.01 (0.000)***	16.34 (0.000)***	9.77 (0.000)***	72.00 (0.000)***	41.80 (0.000)***	44.50 (0.000)***	26.26 (0.000)***
R-Squared	0.3478	0.2569	0.0220	0.0124	0.2122	0.1188	0.2122	0.1188
VIF	1.52	-	-	-	-	-	-	-
Hausman Test	-	-	11.01 (0.088)					
LM Test	-	-	-				77.90 (0.000) ***	

Note: 1: brackets {} represent p-values; 2: **, *** indicate statistical significance levels at 5% and 1% respectively.
Source: SATA 15/Author (2025)

3.4 Hausman Specification Test

An estimate's consistency is evaluated in the Hausman specification test by comparing it to a less successful estimator that is known to be consistent. The Hausman specification test is used to support the model selection. This is the general type of regression that uses both random and fixed model effects. It is said as follows:

$$w_{it} = \beta x_{it} + \alpha_i + \varepsilon_{it};\ i = 1, \dots, N; t = t_i, \dots, T_i \qquad (3)$$

i - Stands for the ith Individual, and t for the time or period.

The selection of fixed and random effects regression models was verified using the Hausman test and the Breusch and Pagan Lagrangean Multiplier test, also called the LM test for random effects. By contrasting the coefficients produced by the reliable fixed-effects estimator and the effective random-effects estimator, it examines the null hypothesis. Therefore, if the p-value < χ^2 is less than 05, the fixed-effects model should

be employed; if the p-value > χ^2 is greater than 05, random effects can be utilised without risk. The Hausman test statistic is typically:

$$H = (\hat{\boldsymbol{\beta}}^{RE} - \hat{\boldsymbol{\beta}}^{FE})'\left[Var(\hat{\boldsymbol{\beta}}^{RE}) - Var(\hat{\boldsymbol{\beta}}^{FE})\right]^{-1}(\hat{\boldsymbol{\beta}}^{RE} - \hat{\boldsymbol{\beta}}^{FE}) \quad (4)$$

where:

FE stands for the vector of coefficient estimates for the fixed effects model and RE for the random effects model. This statistic's distribution under the null hypothesis is χ^2 (k). The degrees of freedom (k) are equal to the number of factors (l).

Table 6

Hausman Fixed Random

```
. hausman fixed random

                 ---- Coefficients ----
                 (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
                 fixed        random         Difference          S.E.
-------------------------------------------------------------------------
        PSEID    -.0323565     .0155669      -.0479233           .01416
        CELRD    -.0029047    -.0145591       .0116544          .0073862
          EWD    -.1047007    -.1153005       .0105999                 .
     Leverage      -.04099    -.0208213      -.0201688                 .
           IG     .0290318     .0406263      -.0115945                 .
           FS    -.0718197    -.0042259      -.0675938          .0213941
-------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =       11.01
                Prob>chi2 =      0.0881
                (V_b-V_B is not positive definite)
```

Source: SATA 15/Author (2025).

The Hausman test p-value (0.0881) indicates that we cannot reject H_0. Consequently, it is impossible to determine that the fixed effects model is better than the random effects model based on the available data. Based on this result, we apply the random effects of regression with robust standard errors. These results showed that PSELD has a small negative effect on ROA and a small positive effect on ROE. This suggests that the association between PSEID and ROA and ROE is not statistically

significant. Additionally, CELRD has a negligible negative impact on ROA and ROE. ROE and ROA are likewise considerably and adversely impacted by EWD.

4 DISCUSSION OF FINDINGS

The findings revealed that the crisis management framework had a significant negative association with investment viability. Consequently, it was shown that compliance with environmental law and regulation disclosure had a negative and negligible impact on return on assets and equity, while product and service environmental disclosure had a negative and negligible impact on return on assets and a positive but negligible impact on return on equity. On the other hand, return on assets and equity are significantly impacted negatively by waste and effluent disclosures. These findings imply that there is no clear correlation between the degree of disclosure in these areas and the investment made by Nigerian manufacturing firms. The findings from this research are consistent with Okeke et al.'s (2021) findings, which showed that economic value added is significantly impacted by the disclosure of effluent and waste treatment costs. Olawale's (2014) result that poor organisational performance is the cause of management issues with crisis management strategy. Similar evidence of this phenomenon exists as reported by Brynjolfsson et al. (2018), who argued that the viability of a firm may initially decline following disruptive management of a crisis and the time required for complementary assets such as new skills and organisational routines to develop. Moreover, in the study by Dziallas and Blind (2019), which investigated manufacturers' innovation in crisis management, observed that the processes frequently involve inefficiencies and transitional challenges before becoming viable. Their study emphasised that innovation outcomes depend not only on changed frameworks but also on an organisation’s absorptive capacity and readiness to integrate new processes. Furthermore, Mairesse et al. (2025), in their comprehensive review of extant empirical literature, found that the impact of innovative crisis management on firm sustainability varies substantially across contexts and time horizons. They noted that in many emerging economies, an innovation crisis can exhibit a negative or insignificant short-term relationship with efficiency due to resource constraints, weak infrastructure, and limited managerial expertise needed to support the innovation-driven processes. Thus, the negative

relationship observed between the crisis management framework and investment viability in this study is consistent with empirical evidence showing that the framework adopted in the management of crisis introduces transitional shortfalls in the viability of firms, and it requires substantial complementary investments before productivity gains become sustainable. Hence, this outcome should not be interpreted as a failure of the crisis management framework but rather as an indicator of the company being in the initial stages of framework adoption, where learning and adaptation costs outweigh immediate viability. Therefore, managers and policymakers should focus on strengthening organisational learning, workforce capability, and absorptive capacity to ensure that the viability of investment ultimately translates into sustained management of crisis frameworks.

5 CONCLUSION AND POLICY IMPLICATION

These results demonstrate that environmental disclosure may not always be beneficial to investment viability. This could be due to the notion that companies with higher environmental openness have more environmental crises, or because investors see environmental disclosure as a cost rather than a benefit. These results suggest that the level of disclosure in this sector, with the exception of waste and effluent disclosure, has no direct impact on the investment feasibility of Nigerian manufacturing enterprises. The research's findings indicate that further thought needs to be given to how these variables interact and are structured. These findings allow for the formulation of specific policy recommendations aimed at enhancing the effect of crisis management on investment viability. These companies should focus on improving operational performance, cost control, product innovation, and other areas that may have a more direct impact on their return on equity. Manufacturing businesses should include environmental management strategies in their primary business plans. Better financial measurements may eventually follow from ensuring that environmental disclosures accurately reflect sincere attempts to achieve sustainability. Investors should consider the benefits and potential drawbacks of environmental disclosure when making financial decisions. Furthermore, in order to comply with legal requirements and prevent negative effects on the environment, these multinational manufacturing companies in Nigeria need to put in place an efficient waste management system. Given the negative consequences of effluent and waste disclosure,

businesses should also prioritise projects that lower waste output and improve waste management procedures. This proactive approach can mitigate negative perceptions among investors. Regulators should provide guidance on environmental disclosure to help firms understand what information to disclose and how to disclose it in a way that is likely to improve financial performance.

REFERENCES

Ali, A. M., & Isse, H. S. (2002). Determinants of economic corruption: A cross-country comparison. *Cato Journal,* Vol. 22, pp. 1 - 449.

Atobatele, O. (2023). Foreign direct investment: A case study of Nestlé S.A. in Nigeria. *Modern Economy,* 14, 825-832. Doi: 10.4236/me.2023.146044.

Atoyebi, O. M. & Ifediora, O. C. (2024). An Appraisal of the Effectiveness of Regulatory Compliance and Enforcement Mechanisms in Environmental Law. SAN FCIArb: U.K

Aworom (2013). How Europe Under-Developed Africa: African Journal of Culture, Philosophy and Society. Overture: London.

Ayobolu, J. (2006). EFCC, Corruption and the Due Process. Segun Toyin Dawodu: USA.

Barkley, K. (2020). Does one size fit all? The applicability of situational crisis communication theory in the Japanese context. *Public Relations Review,* 46(3), 1– 8. https://doi.org/10.1016/j.pubrev.2020.101911

Brynjolfsson, E., Rock, D., & Syverson, C. (2018). The productivity J-curve: How intangibles complement tangible capital. *National Bureau of Economic Research Working Paper* No. 25148.

CFI Team (2024) Crisis Management: The process of addressing a crisis in a manner that minimises damage and allows the organisation to recover quickly *https://corporatefinanceinstitute.com/resources/management/crisis-management/*

CFI Team (2025) Return on assets & ROA formula https://corporate *finance institute.com/ resources/accounting/return-on-assets-roa-formula/*

Claeys, A. S., & Cauberghe, V. (2014). What makes crisis response strategies work? The impact of crisis involvement and message framing. *Journal of Business Research,* 67(2), 182–189.

Coca-Cola Company Report (2022). Sustainability Report. Coca-Cola Company Publications Division, Web.

Compliance Quest (2024). What is Environmental Compliance? Environmental Compliance Retrieved online on the 26th of February 2025 *https://www.compliancequest.com/environmental-compliance/*

Coombs, W.T. (2007). Protecting organisation reputations during a crisis: the development and application of situational crisis communication theory. *Corporate Reputation Review, 10* (3), 163–176. Doi: 10.1057/palgrave.crr.1550049

Coombs, W. T., & Holladay, S. J. (2010). Examining the effects of mutability and framing on perceptions of human error and technical error crises: Implications for situational crisis communication theory. The handbook of crisis communication, 181–204. *https://doi.org/10.1002/9781444314885*

Coombs, W.T. (2015). Ongoing crisis communication: Planning, managing, and responding. *SAGE Publications Inc., Print.*

Coombs, W. T. (2022). Situational Crisis Communication Theory (SCCT) refines and clarifies a cognitive-based theory of crisis communication. The handbook of crisis communication, 193–204. *https://doi.org/10.1002/9781119678953.ch14*

Denomme, D, & Grimsley, S. (2023). What is an investment? Concept & overview *https://study.com/academy/lesson/what-is-an-investment-definition-lesson-quiz.html*

Dziallas, M., & Blind, K. (2019). Innovation indicators throughout the innovation process: An extensive literature analysis. *Technovation,* 80–81, 3–29.

Eluka, J., Ndubuisi, O.P.U. & Anekwe, R.I. (2016). Multinational corporations and their effects on the Nigerian economy. *European Journal of Business and Management.* Vol.8, No.9.

Guerber, A. J., Anand, V., Ellstrand, A. E., Waller, M. A., & Reychav, I. (2020). Extending the situational crisis communication theory: The impact of linguistic style and culture. *Corporate Reputation Review,* 23, 106–127.

Harmoni, A., & Andriyani, A. (2008). Disclosure of Corporate Social Responsibility (CSR) on the official website of the study company at PT. UNILEVER INDONESIA Tbk. In Proceedings, National Scientific Seminar on Computers and Intelligence Systems (KOMMIT 2008*) Auditorium Gunadarma University, Depok*, 20-21.

Hayes, A. (2024). Crisis management: Definition, how it works, types, and example *https://www.investopedia.com/terms/c/crisis-management.asp*

Indeed Editorial team (2024) Products vs. Services: Definitions, Differences and Tips *https://www.indeed.com/career-advice/career-development/products-vs-services*

Julansa, H., Zuraida, & Diantimala, Y. (2020). The effect of gas emission disclosure, Solid waste disclosure, and effluent disclosure on firm value. *International Journal of Academic Research in Business and Social Sciences,* 10(6), 449–475

Kelvin-Iloafu, L.E. (2017). Prospects for sustainability and viability of Nigerian manufacturing organisations through a teamwork approach. *African Journal of Business Management* Volume 11 No 11. 250-260 DOI: 10.5897/AJBM2016.8228

Kelvin-Iloafu, L. E. (2024). Basic Concepts in Small Business Management. Syon Prints Ventures: Enugu, Nigeria.

Macnamara, J. (2021). New insights into crisis communication from an "inside" emic perspective during COVID-19. *Public Relations Inquiry,* 10(2), 237–262.

Mairesse, J., Mohnen, P., & Notten, A. (2025). *Innovation and productivity: The recent empirical literature and the state of the art.* Eurasian Business Review, *15,* 1-27.

Meiryani & Noviantini (2024) Waste and effluent disclosure: Case study of healthcare companies listed on the Indonesia stock exchange. *JAFA*, 11(1), 25-35 P

Monyei, F.E., Aiyelabegun, H.T., Kelvin-Iloafu, L.E. & Ukpere, W.I. (2023). Strategy sustainability of small and medium-sized ventures in the 4IR and post-COVID-19 era. *Onomázein*, *62*, 1258-1273.

Monyei, F.E. & Ukpere, W.I. (2024). Value Chain and Risk Management in the 4IR: Analysis from the Agro-Allied Sector. *Annals of Spiru Haret University*, 234.

Mustapha Y. M. (2018). National Disaster Risk Management Policy: National Emergency Management Agency: Abuja, Nigeria.

Ngwu, Robert O., Monyei, Francis E., Onodugo, Vincent A., & Ukpere, Wilfred I. (2025). Industrial parks: Analysing the extent to which competitiveness amongst operating firms impacts the industrial revolution of nascent economies. *OIDA International Journal of Sustainable Development*, *18*(11), 243-254.

Odiaka, P. (2006). Power sector reforms: Still a reign of blackouts. *The Guardian, August 24, 15*.

Okafor, E.M. (2008). Development crises of power supply and implications for the industrial sector in Nigeria. *Stud Tribes Tribals*, *6*(2), 83 - 92.

Okwuosa, I., Nwankwo, J., & Ezeani, E.C. (2020). Challenges facing foreign direct investment in South-eastern Nigeria." International Journal of Business Management, 15(4), 45-60.

Olawale, S. R. (2014) Crisis Management Strategy and its Effects on Organisational Performance of Multinational Corporations in Nigeria: Empirical Evidence from Promassidor Ltd. *European Journal of Business and Management.* Vol.6, No.23, 2014 79

Okeke, E. E., Ifurueze, M.S., & Nwadiaro, E.O. (2021). Effect of effluent and waste treatment cost disclosure on economic value added of quoted oil and gas firms in Nigeria's national innovation and research academia. *International Journal of Sustainable Development* ISSN: 2713-4683. Volume 6, Issue 4. Pages 78-97.

Othman, A. F., & Yusoff, S. Z. (2020). Crisis communication management strategies in the MH370 crisis with special references to situational crisis communication theory. *International Journal of Academic Research in Business and Social Sciences,* 10(4), 172–182.

Paddock, L. Qun, D., Kotzé, L.J., Markell, D.L., Markowitz, K. J., & Durwood Zaelke, D. (2011). Compliance and enforcement in environmental law: Toward more effective implementation. The IUCN Academy of Environmental Law Series. *https://doi.org/10.4337/9781781000946*

Picardo, E. (2025). Investing explained: Types of investments and how to get started *https://www.investopedia.com/terms/i/investing.asp*

Rodservich, M (2024). What is crisis management? Wikipedia CEO of PRLab strategies in MH370 crisis with special references to situational crisis communication theory. *International Journal of Academic Research in Business and Social Sciences*, 10(4), 172–182.

Schönborn, G., Berlin, C., Pinzone, M., Hanisch, C., & Lanz, M. (2019). Why social sustainability counts: The impact of corporate social sustainability culture on financial success. *Sustain. Prod. Consum.* 17, 1–10.

Shell Global (2021). Sustainable Development Report. Shell International Limited Publications Division, Web.

Shopify (2024). What Are Products and Services? Definition and Tips *https://www.shopify.com/ng/blog/products-and-services*

Tiwari, M (2024). What is the meaning of product and service? *https://www.quora.com*/What-is-the-meaning-of-product-and-service

Trccompanies.com (2021) What Is Regulatory Environmental Compliance? Retrieved online on the 26th of February 2025 *https://www.trccompanies.com/insights/*what-is-regulatory-environmental-compliance.

Tsipouridou, M., & Spathis, C. (2012). Earnings management and the role of auditors in an unusual IFRS context: The case of Greece. *Journal of International Accounting, Auditing and Taxation*, 21(1), 62-78.

Ufomba, R.E., Monyei, F.E., Ngwu, R.O., Ukpere, W.I., Kelvin-Iloafu, L.E., & Onodugo, I.J. (2025). An analysis of the impact of the sit-at-home phenomenon on small and medium enterprises' productivity and sustainability in South-Eastern Nigeria. *Journal of Ecohumanism*, *4*(4), 709 – 724. Doi: https://doi.org/10.62754/joe.v4i4.6779

United Nations Statistics Division (2022). Environmental Glossary. *https://unstats.un.org/unsd/environmentgl/gesform.asp?getitem=1178*

Valackiene, A. (2011). Theoretical substation of the model for crisis management in an organisation. *Engineering Economics*, 22(1), 78-90.

Wulansari, W. & Adhariani, D. (2022) Waste disclosure practices in Indonesia conference paper Doi: *10.4108/eai.10-8-2022.2320775*

Authors' Contribution

All authors contributed equally to the development of this article.

Data availability

All datasets relevant to this study's findings are fully available within the article.

How to cite this article (APA)

Arukwe, M. C., Kelvin-Iloafu, L. E., Monyei, F. E., Ukpere, W. I., Onodugo, I. J., & Ude, A. O. (2025). CRISIS MANAGEMENT FRAMEWORK AND THE INVESTMENT VIABILITY OF MULTINATIONAL MANUFACTURING COMPANIES - AN EMPIRICAL EVIDENCE FROM NIGERIA. *Veredas Do Direito*, *22*(6), e224013. https://doi.org/10.18623/rvd.v22.n6.4013