



Corporate Foresight and Organizational Resilience of Oil and Gas Companies in Nigeria

Chijioke K. Mama¹ and Kemi A. Alagah (Ph.D)²

¹Department of Management, Faculty of Management Sciences University of Port Harcourt, Nigeria | Email: chijioke.mama@yahoo.com | Phone: +2347061013333

²Department of Management, Faculty of Management Sciences University of Port Harcourt, Nigeria | Email: alagahk@gmail.com | Phone: 08054274593

Abstract: *This study examined the relationship between Corporate Foresight and organizational Resilience. The predictor variable Corporate Foresight was dimensioned by Scope of Scanning, while Resilience was measured by Adaptive Capacity and Robustness. This study was completed as a cross sectional survey on a population that comprised of 190 Senior Management level staff (Unit heads and equivalent) of oil and gas companies in the six Nigerian states of Rivers, Delta, Bayelsa, Edo, Akwa Ibom and Cross Rivers. Purposive sampling and simple random sampling were used to select the samples. Quantitative data was collected through the use of questionnaires as survey instrument. Exploratory factor analysis was carried out on the instrument, while reliability test was equally executed to access instrument's consistency. The adjusted size of the sample was 152 senior management staff, determined by using the Krejcie and Morgan's sample size determination formula. Quantitative data obtained from 122 valid questionnaires returned, were analyzed using the Statistical Program for Social Sciences and Amos. Descriptive statistics was used to analyze the data, while Structural Equation Modeling was used as the inferential statistic tool for testing the research hypotheses. Findings show that corporate foresight (scope of scanning) has positive significant relationship on resilience. The study recommends that oil and gas companies in Nigeria should adopt appropriate corporate foresight practices to build resilience, to survive and remain profitable in a turbulent business setting.*

Keywords: *Corporate foresight, scope of scanning, robustness, adaptive capacity, organizational resilience, oil and gas*

1.0 INTRODUCTION

The recent proliferation of management research around the resilience phenomenon has been credited to several pioneering research works. Linnenluecke (2017) insightfully highlights the seminal works of Straw *et al.*, (1981) and Meyer (1982), while Olivos (2014) point to the groundbreaking research "Resilience and Stability of Ecological Systems" by Holling in 1973. With respect to more certain, more predictable and less dynamic business environments; business leaders and decision makers normally rely on experience and a knowledge-based view of organizations for leading, directing, controlling and staffing organizations. But the recent

emergence of numerous disruptive forces in the business environment, coupled with a growing complexity in the structure of organizations, have motivated management practitioners; to search for new paradigms and concepts that will enhance organizations' ability to surmount challenges and thrive. One such paradigm is the organizational resilience phenomenon. Southwick *et al.*, (2014) are of the opinion that, although we have slight distinctions in the perception of the resilience construct across disciplines, there exists a seeming multidisciplinary unanimity that resilience includes "a concept of healthy, adaptive, or integrated positive functioning over the passage of time and in the aftermath of adversity. Relatedly, available evidences now support the growing worry that *conventional* oil resource is fast disappearing, which suggest that petroleum will continue to be found in tougher terrains such as deep offshore and ultra-deep offshore locations. This necessitates the acquisition of resilience capabilities by oil and gas companies. On the other hand, Corporate Foresight permits firms to build strong foundations for future competitive advantage (Rohrbeck, Battistella & Huizingh, 2015). The inherent competitive advantage of corporate foresight makes it a critical subject for modern day organizations. According to Oner and Beser (2011) corporate foresight permits preparation for diverse challenges with adequate lead-time. Neef and Daheim (2005) contend that businesses carry out corporate foresight to reduce uncertainty by detecting new and relevant trends; prepare strategic decisions; champion innovations processes and create/nurture new businesses. Foresight primarily aims to arm the organization against disruptions in areas such as science, strategy or technology as well as to harness benefits (Becker, 2002). The quest to establish any potential correlation between foresight and resilience has necessitated this study; because empirical evidence will be required to affirm such correlation. The high risk, high uncertainty, and unconventional nature of work/work environments; that is prevalent in the petroleum sector require resilience, as an important capability. In Nigeria the macroeconomic business milieu is ridden with uncertainties that are characteristic of emerging economies, and others uncertainties that are typical/specific to the petroleum sector in Nigeria. Policy shocks, political uncertainties and insecurity are some notable challenges in the Nigerian macroeconomic environment that requires resilience.

2.0 LITERATURE REVIEW

2.1 Scope of scanning

Scope of scanning as a sub-construct measures, the form and extent of environmental scanning performed by firms as elements of foresight practices. Yasai-Ardekani and Nystrom (1996) defined "scope of scanning" as the spectrum of unique environmental aspects that is monitored in scanning programs/campaign. Scope in scanning is essential since the act of environmental observance is widely accepted as an applied method in foresight, according to Conway and Stewart (2005). A company's environment comprises of the relevant social and physical factors that reside within and beyond its boundary (Duncan, 1972 as cited in Mayer, Steinecke & Quick, 2011). Environmental scanning equally comprises of a surveillance tool for observing the external environment, according to Wong, Sit, Sultan, Li and Hung (2015). According to Aguilar (as cited in Mayer *et al.*, 2011) the main function of environmental observance is to consciously gather, properly interpret and prudently use pertinent information

relating to events, incidences and interactions in those implicated environments. Furthermore, evidences in literature suggest that scope of observance differs among all firms; this influences the potential dynamics of foresight within firms. Empirical evidence shows that high-performing companies carry out more frequent scanning, use wider information acquisition techniques, and achieve a fit between the scanning process and their organizational peculiarities (Daft *et al.*, 1988; Sawyerr, 1993; Yasai-Ardekani & Nystrom, 1996 as cited in Rohrbeck, 2011). A wider scope of scanning will deliver greater information and richer foresight for the firm. The observation by Zhang, Majid and Foo (2015) that “organizations have to closely monitor their task and remote environments, and use the acquired environmental information to assist in tactical and strategic decision making” further confirms the assertion that a close monitoring (which may imply wider scope of observance) may deliver more benefit than a narrow scope and vice versa.

Regarding the scope and kind of scanning in corporate foresight practices, we see that the scanning act is not a monolithic activity because environmental scanning entails the dual acts of “looking at” information (mostly reviews of data available) as well as “looking out” for data/information (scouting for unavailable data or clues); and this searching may stand as competitor intelligence gathering, market analysis among others forms of scanning behaviours (Choo, 1999).

In addition, Zhang *et al.*, (2011) also stated that environmental observance is proving to be needed and to be of great import in all scenarios. Riding on the above statements and conceptualizations, this study agrees that scanning is a corporate foresight activity, and it's appropriate to say that the “scope of scanning” implemented sufficiently measures the presence, maturity and adequacy of corporate foresight. This understanding, as well as, a reference to the work of Rohrbeck (2011) which utilized scanning scope as a corporate foresight dimension has informed the decision to apply “scope of scanning” for this research on corporate foresight.

2.2 The concept of Organizational Resilience

2.2.1 Robustness

Resilience was measured in this research using robustness as a sub-construct. Robustness measures the organization's ability to filially continue on its part both during, as well as, after crises or catastrophe. The principal objective of organizational robustness is the retention and preservation of its current structure and existing function amidst disruption. Studies suggest that the firm's ability to retain structure in crises is very critical since it confers resilience on systems via the proper control of the initial functions, without compromising internal structure (Pavard, Dugdale, Saoud, Darcy & Salembier, 2008). According to Pavard, Dugdale, Saoud, Darcy and Salembier (2008), “The terms robustness and resilience are often used interchangeably and are very broadly interpreted to mean the ability of a system to remain stable and function correctly in unforeseen environmental conditions”. Robustness describes organizational stability and constancy, as well as, the disposition to retain “intact structure” and low deviation amidst crises and challenges (Maurer & Lechner, n.d). Robustness and resilience are complementary concepts (Dugdale & Pavad, 2010) and organizational robustness is widely

considered and used as a good measure of organizational resilience. When confronted with crises or disaster, organizations typically come under diverse kinds of pressure that threaten existing structure and function and which can undermine its ability to respond appropriately. Therefore, organizational robustness theorist postulate that structure alteration and function deviation in crises/challenges is inimical to firm competitiveness and even firm survival. Robust organizations are fundamentally capable of creating reliably strong systems that remain undeformed in function and structure when challenged; this is important, if one considers the great amounts of real and potential disruptions that face organizations today. Since traditional response mechanisms may be compromised in moments of crises, robustness theorist postulate that post crises functional and structural integrity depict the magnitude of resilience present in an organization. The connection between resilience and robustness is widely established, notably in the work of Anderis, Walker and Ostrom (2013); which explored the nexus between resilience, robustness and enterprise sustainability status, in addition to their collective influence. Furthermore, Heinemann, (2018) in discussing “resilience management” within physical and biological systems identified robustness as a strategic factor of resilient bodies, consequently defining robustness as “a pre-event strategy to identify system designs that perform well when facing variations in conditions of use

2.2.2 Adaptive capacity

Gorley (2012) registered the need to view adaptive capacity as a continuous learning activity and not some set of skills. Wybo (2012) is of the believe that “adaptive resilience corresponds to the ability of the organization (at any level) to keep achieving its tasks by adapting its functioning to hazardous situations, uncertainty, time pressure and threats”.

The connection or link between adaptive capacity and competitiveness is evident in several earlier studies. Hendricks (2018) stated that adaptability implies; how quickly organizations adjust their plans and how they improvise to reach stated targets. Therefore it’s perceived as a very essential factor for competitive advantage. Reeves and Deimler (2011) also noted that it may no longer be attainable for firms to create competitive advantage solely from their industry position, scale, and first-order capabilities: rather managers are finding that it stems from some other firm abilities such as “Adaptability”. The relevance of adaptive capacity in present day organizations is accentuated by the growing degree of environmental dynamism, which places all organizations large and small at similar or equal risk of being disrupted by change. With so much change happening in business environments; adaptability scholars’ content that building long term capabilities, may be of inferior importance, presently; when juxtaposed with adaptability as a capacity. Adaptive capability as operationalized by Lee *et al.*, (2013) is thereby adopted as the measure of resilience”.

2.3 Objectives of the study

- a) To examine the relationship between scope of scanning and robustness
- b) To determine the relationship between scope of scanning and adaptive capacity

2.4 Research Hypotheses

H₀₁: There is no significant relationship between scope of scanning g and robustness of oil and gas firms in Nigeria

H₀₂: There is no significant relationship between scope of scanning and adaptive capacity of oil and gas firms in Nigeria.

3.0 RESEARCH METHODOLOGY

A quasi-experimental research design was used for the study. Cross sectional survey was carried out with the aim of investigating the relationship between corporate foresight (scope of scanning as its dimension) and organizational resilience (resilience measured by robustness and adaptability) of oil and gas companies in Nigeria. The study population consisted of 190 senior managers and unit heads of 36 oil and gas companies covering upstream, midstream and downstream companies. Sampling was done using both purposive and random sampling techniques. Out of this accessible population, a sample was drawn using the Krejcie and Morgan sampling formula which yielded a sample size of 152 respondents. Survey data was collected through questionnaire. The predictor variable scope of scanning was adapted from the work of Rohrbeck (2011). One measure of the criterion variable adaptive capacity was adapted from the work of Lee *et al.*, (2013), while the other measure robustness was adapted from the work of Kantur and Iseri-say (2015). All variables were measured based on the 5 point liker scale. The study instrument was duly subjected to a test of reliability using the Cronbach Alpha test, with results obtained meeting or exceeding the 0.7 Cronbach Alpha value considered a threshold by Nunnally, (1978). Principal Component Analysis (PCA) was used to determine the eigenvalues of the items, which was used to ascertain the contribution of each statement. Inferential statistics carried out on the data collected was done with Structural Equation Modeling (SEM) and the outputs was deployed to test the hypotheses and predict the relationship between the two main constructs of scope of scanning and organizational resilience.

4.0 RESULTS AND DISCUSSION

Figure 1.0: Measurement Model of Scope of scanning

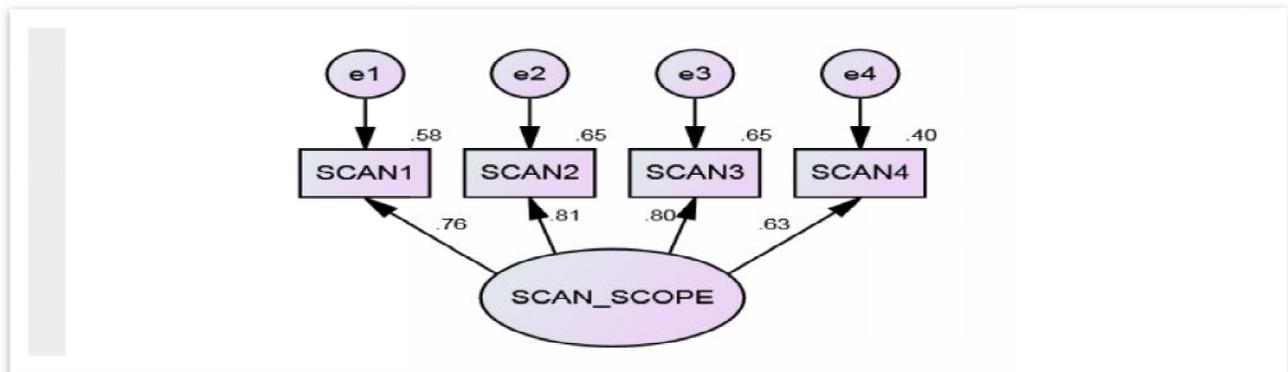
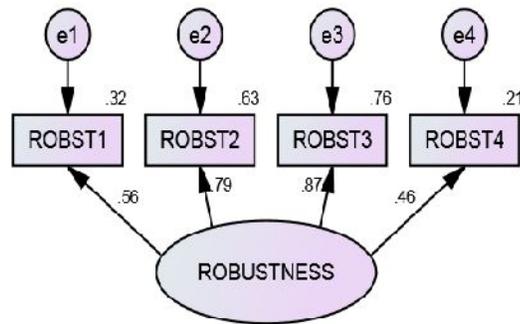


Table 1.0: Measurement Model Analysis of Scope of scanning

Model	Chi square significance	GFI	NFI	CFI	RMSEA	VARIABLE	FACTOR LOADINGS	SQUARED MULTIPLE CORRELATION
SCOPE OF	(2df)=3.898	0.983	0.980	.990	0.080	SCAN 1	0.763	0.581
	p=0.142					SCAN 2	0.808	0.653
SCANNING	CMIN/DF=1.949	0.900	0.900	0.950	0.080	SCAN 3	0.804	0.646
						Acceptable Limits=>	SCAN 4	0.629

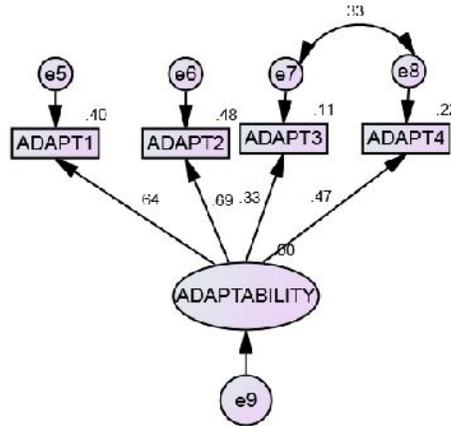
Figure 2.0: Measurement Model of Robustness



Model	Chi square significance	GFI	NFI	CFI	RMSEA	VARIABLE	FACTOR LOADINGS	SQUARED MULTIPLE CORRELATION
ROBUSTNESS	(2df)=.496 p=0.436 CMIN/DF=.248 ACCETABLE LIMIT>>>	.998	.996	1.000	.0.000	ROBST 1	0.562	.316
						ROBST2	0.794	.631
						ROBST3	0.870	.756
						ROBST4	0.457	.209

Table 2.0 Measurement Model Analysis of Robustness

Figure 3.0: Measurement Model of Adaptive capacity



Model	Chi square significance	GFI	NFI	CFI	RMSEA	VARIABLES	FACTOR LOADINGS	SQUARED MULTIPLE CORRELATION
FIRM ADAPTIVE CAPACITY	(1df)=1.133 p=0.287 CMIN/DF=1.133 ACCEPTABLE LIMIT	0.995	0.984	.998	0.033	ADAPT 1	.635	.404
						ADAPT2	.691	.477
						ADAPT3	.333	.111
						ADAPT4	.474	.225

Table 3.0 Measurement Model Analysis of Adaptive Capacity

Figure 4.0 Structural Model of Scope of scanning and Robustness

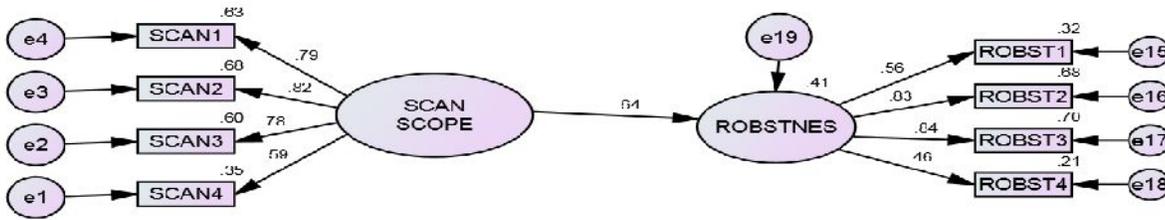
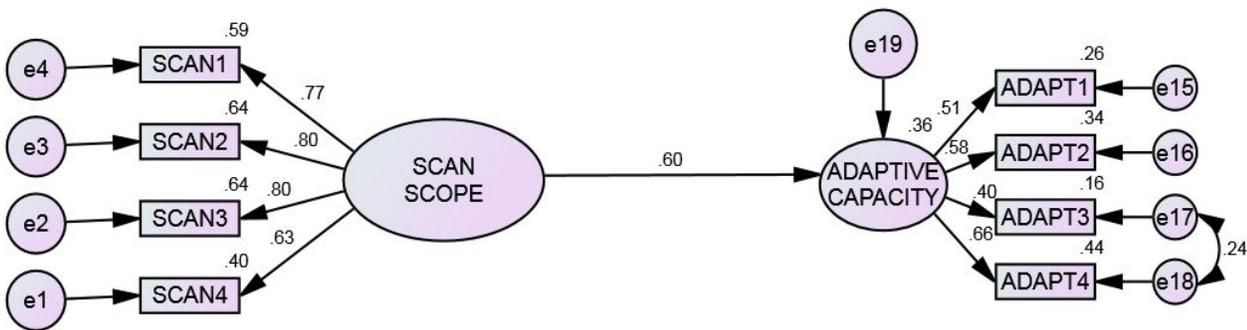


Figure 5.0 Structural Model of Scope of scanning and Adaptive capacity



Test of Hypothesis

H₀₁- There is no significant relationship between Scope of scanning and Robustness

Table 4.0: Result of standardized and unstandardized regression estimate of the model

Regression Weights	0.646
Standardized Regression Weight(β)	0.642
Squared Multiple correlation (R^2)	0.413
Critical Ration (CR)	4.205
p-value	0.000<0.05

Model parameters: (Standardized Regression Weight (β)= 0.642; Squared Multiple correlations (R^2) =41.3%, p-value = 0.000<0.05). This means that When **Scope of scanning** goes up by 1 standard deviation, **firms Robustness** goes up by 0.642 standard deviations. Thus an increase in corporate foresight in terms of Scope of scanning results also in in an increase in organizational resilience (as indicated in firm’s Robustness). That scope of scanning explains 41.3% variability in firms’ Robustness that is to say that the predictors of **ROBUSTNESS** explain 41.3 percent of its variance.

H₀₂- There is no significant relationship between scope of scanning and adaptive capacity

Table 4.1

Regression Weights	0.658
Standardized Regression Weight(β)	0.596
Squared Multiple correlation (R^2)	0.355
Critical Ration (CR)	3.473
p-value	0.000<0.05

Model parameters: (Standardized Regression Weight (β)= 0.596; Squared Multiple correlations (R^2) =35.5%, p value = 0.000<0.05). This means that When **SCAN_SCOPE** goes up by 1 standard deviation, **ADAPTIVE_CAPACITY** goes up by 0.596 standard deviations. Thus an increase in corporate foresight in terms of scanning scope also results in an increase in organizational resilience (as indicated in firm's adaptive capability).

Interpretation of results and discussion of finding

For hypothesis H₀₁: Given that the model fit results shown above have confirmed that the structural model used in the analysis was fit enough in representing the relationship between the data and the hypothesized relationship, and based on the fact that model parameters: (**β =.642, R^2 =41.3%; p=0.000<0.05**); indicate that a positive and significant relationship exists between the scope of scanning used by firms and organizational resilience (Robustness.) These empirical results do not support the Null hypothesis three (H₀₃) which states **There is no significant relationship between scope of scanning and robustness**. The study concludes that a significant and positive relationship exist between an organization's scope of scanning and its robustness.

For the second hypothesis (H₀₂): The model fit results shown above confirmed that the structural model used in the analysis was fit enough in representing the relationship between the data and the hypothesized relationship. The results of the structural modeling carried out above have the following parameters: (**β =.596, R^2 =35.5%; p= 0.00<0.05**); indicating that a positive and significant relationship exists between the scope of scanning of firms and firms adaptive capacity. These empirical results do not support the Null hypothesis one (H₀₁) which states that **There is no significant relationship between scope of scanning and adaptive capacity**. Rather, this study asserts that a corporate foresight (measured using firms' scope of scanning) has a positive and significant effect on firm's adaptive capacity.

5.0 CONCLUSIONS

The study provided valuable evidence with respect to how oil and gas companies can enhance their resilience capabilities through foresight practices. Thus, by utilizing a wide scope of scanning in an unstable business environment, organizations are able to detect trends (opportunities and threats) which will enhance their resilience. Effective scope of scanning may

include; analyzing the far future, looking into the fine details of emerging trends and scanning wider areas of the organization's environment, including areas and aspects that do not connect with the business, but which may nevertheless have unseen impacts.

5.1 Recommendations

Foresight capability is essential within Nigerian Oil and Gas companies; consequently organizations in this sector should strive to create and adopt a scanning scope that is reflective of their unique environment, their organizational capabilities and challenges.

5.2 Contribution to Knowledge

This study has provided valuable evidence on the practical managerial importance of corporate foresight and its relevance in building resilient organizations in the often turbulent Nigerian oil and gas sector.

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