Scenario Planning as a Recipe for Corporate Performance: The Nigerian Manufacturing Sector Experience

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Abstract

As organisations struggle to deal with an increasingly uncertain world, they are looking to their managers to find ways in helping them to prepare for possible futures. Many organisations now apply scenario planning methods as means of evaluating their effectiveness and performance under different sets of assumptions about the future. This study investigates the relationship between scenario planning and corporate performance in the manufacturing sector in Nigeria. A survey research method was used to generate data from a sample of manufacturing firms in Nigeria on scenario planning and corporate performance variables. Responses from the survey were statistically analyzed using descriptive statistics, product moment correlation, regression analysis and Z-test (approximated with the independent sample t-test). The results of the study indicate a statistical significant relationship between scenario planning and corporate performance as well as reveal a significant difference between the performance of firms whose scenario planning are low and the performance of firms whose scenario planning are high. The research findings provide insights regarding how the interaction between scenario planning and corporate performance would assist the growth and development of the manufacturing sector in Nigeria.

Keywords: Nigerian, Scenario planning, Scenarios, Corporate performance, Manufacturing sector

1. Introduction

The context in which most firms operate has become increasingly dynamic, uncertain, and unpredictable. In the light of the uncertainty, firms are required to adapt their strategy formulation and implementation actions to re-align them in a way that maximizes their value creation potentials (Kang, Morris and Snell, 2007).

As firms struggle to deal with the increasingly uncertain world, they are looking to their managers to find ways in helping them understand the choices, opportunities and implications that uncertainty presents. Failures in organizations have been largely due to the inability to recognize change well before hand. Only firms that have the ability to scan the environment effectively with a shared mental model, leading to innovation, can achieve success and profit potential in the long run. This is the function of scenario planning which ensures long-term sustainable survival of an organization (Sevaguru and Safa, 2009; Geus, 1997).

Scenario planning is a way of understanding the forces at work in recent times, such as demographics, globalization, technological change and environmental sustainability that will shape the future. Many organisations now apply scenario planning methods to operational planning, budgeting and forecasting processes as means of evaluating their effectiveness under different sets of assumptions about the future (Axson, 2011). Indeed, CEOs are suddenly painfully aware that spreadsheet models that offer a detailed single vision of the future are almost certain to be wrong in many critical respects, so corporate leaders are casting about for alternative methods of managing future uncertainty that actually help a business prepare for a number of

alternative possibilities. This is scenario planning, and it has nothing to do with prediction. Rather, it is about anticipation of plausible future events that might happen, and which would have significant effects upon an organization (Marren and Kennedy, 2010).

Scenario planning is rooted in the proposition that all forecasts are wrong. This approach to planning considers scenarios to be instrumental in understanding and anticipating environmental trends. It relies on the construction of alternative scenarios as a form of sensitivity analysis performed on the most likely scenario (Yoe, 2004).

Despite the potentials of the Nigerian manufacturing sector as the engine of growth, an antidote of unemployment, a creation of wealth and the threshold for sustainable development, it has suffered severe decline in its contribution to national output (Imhonlele, 2009). This is probably because the sector is not crises-prepared. Crisis-prepared companies reduce their actual exposure to crisis situations by pre-emptively exploring the source of potential threats and building defences to those threats. They do this by taking a proactive stance to enrich the firm's absorptive capacity and dynamic managerial capabilities through scenario planning (Worthington, Collins and Hitt, 2009; Martin and Salomon, 2003; Sirmon, Hitt and Ireland, 2007).

Hence, this study investigates the relationship between scenario planning and corporate performance in the Nigerian manufacturing sector in. The choice of manufacturing sector was made because of its significance and potential to Nigeria's economic development. For instance, according to the President of Nigeria, Goodluck Jonathan, the manufacturing sector is the key to the realisation of Vision 20/2020 aspiration. It is a critical sector. If the nation must create jobs, it must manufacture (Ayorinde, 2011). Sample from the survey were drawn from manufacturing firms in Lagos state. Lagos state was considered because it is undoubtedly the commercial hub of Nigeria, with the largest concentration of industries (Iwugo, D'Arcy and Andoh, 2003), and over 55 percent of manufacturing firms in Nigeria have their head offices located in Lagos state (MAN, 1994; MAN, 2003; MAN, 2006). Therefore, Lagos offers an attractive place for the study (Oghojafor, Kuye and Sulaimon, 2011).

2. Literature Review

2.1 Overview of Scenario Planning

Scenario Planning is a process of strategic management that prepares managers in organizations for possible futures. These futures, which are called as scenarios, may or may not unfold in reality in the same manner as predicted. However, they will provide valuable options that may favour all the circumstances that can possibly befall on a firm. The options can range from doing nothing at one extreme to strong expansion policies in another. The idea is to get the management to face any scenario Sevaguru and Safa, 2009.

Scenarios are neither predictions nor forecasts of the future. They are simply projections of imagined futures (Kiely, Beamish and Armistead, 2004), and coherent and credible alternative stories about the future (Cornelius, Putte and Romani, 2005). A scenario is a description of possible or probable future. It conveys the projection of the future with various possibilities, rather than a single set of conditions or a single view of what the future might look like. According to Cornelius *et al.,* (2005), scenarios serve many functions: First, they present a background for the design and selection of strategies. Second, scenarios provide managers an awareness of environmental uncertainties by confronting them with fundamentally different futures states. Third, scenarios provide a tool for the identification of what might possibly happen and how a firm can act upon or react to future developments. Thus, scenarios can serve as early warnings mechanisms. Fourth, scenarios offer the possibility to combine quantitative data with qualitative input, assisting scenario planners to incorporate results from other forecasting techniques and allow for soft and fuzzy variables. Finally, scenarios can help broaden managers' mental models by clearly confronting them with their own biased viewpoints.

Scenario planning does not intend to predict the future; rather it is concerned with drawing attention to the major forces underlying potential futures (Zegras, Sussman, and Conklin*, 2004). It involves the assumption that the future has the tendency to be discontinuous and therefore, that organisations need to be constantly rethinking their identities (Brown and Starkey, 2000). It is a process that provides the capability to think about the future (Yeoman and McMahon-Beattie, 2005). Zegras *et al.,* (2004) see scenario planning as a tool designed to help a firm judge how effective decisions made today will be in the uncertain future. Scenario planning is not a replacement for traditional planning techniques such as forecasting; it focuses on helping firms to better prepare for the unexpected.

Planning with scenario aids top level managers in identifying potential weaknesses in their operations. When plans are implemented to buttress those weak points, new operational plans and abilities are uncovered. Scenario planning is a tool used by firms to translate their organizational learning capabilities into preconceived operational responses designed to react to, and then recover from, an exogenous shock. It begins by considering possible events that could reasonably, although remotely, occur within the external environment (Worthington, Collins and Hitt, 2009; Kang, Morris and Snell, 2007). It is a strategic planning technique that focuses on entertaining a wide variety of business-specific and economic options. It helps managers and their practices

expand their horizons and respond more quickly to changing conditions (Buttell, 2009).

2.2 Approaches to Scenario Planning

Kiely *et al.,* (2004) identify and explicate three main categories of approaches to scenario planning:

The first category is intuitive logic which involves the application of reasoned judgment and intuition in describing alternative futures to represent specific themes or assumptions.

The second category is trend analysis which involves structured steps for identifying scenario components and grouping them into compatible assumptions to form scenarios. Often, this will involve mathematical or econometric modelling based on combinations of values or events, subjective estimates of the events and event interactions with an emphasis on looking for the unexpected or events upset trends.

Finally, between these two ends of the spectrum are procedural scenarios and cross-impact analysis. Procedural scenarios provide a useful bridge between the totally informal, intuitive techniques and the demanding methodological constraints of highly quantitative techniques of mathematical modelling.

2.3 Scenario Planning Process

The followings are the steps in the scenario planning process, as enunciated by Horwath (2006):

1) *Identify the participants*. Bring together individuals that can offer ardent insights and fresh perspectives. Consider including people outside the firm as well, such as select customers, suppliers and thought leaders.

2) *Choose a time frame.* (generally from one to five years).

3) *Select the key players that will impact the scenarios* (that is, competitors, customers, suppliers, governmental agencies, etc.).

4) *Identify the key trends shaping the future.* Classify the trends into groups such as economic, political, social-cultural, demographic and technological. Then rate each trend as positive, negative or neutral.

5) *Select the key unknowns for the future* and rate each on two scales: probability of occurrence and potential impact (with 1 being low and 10 being high).

6) *Construct 3-5 scenarios*. Based on the group's compilation and review of the key players, trends and unknowns, develop 3-5 scenarios complete with a situation analysis and outcomes. Then give each scenario a descriptive name.

7) *Strategy development*. Once the scenarios have been created, review the current strategy to determine how well it would work in that scenario. If a strategy is not articulated or the current strategy would not fair well in the scenarios, adopt a process to create a new strategy.

8) *Create contingency plan*. With the 3-5 scenarios in hand, work on creating a contingency plan for each scenario. The contingency plan should describe the situation or scenario, the goals and objectives within that framework, the strategies and tactics to achieve them and corresponding metrics.

It is argued that scenario planning is linked to how strategy is formulated and has a major influence on decisions taken by management, and consequently corporate performance. According to Visser and Chermack (2009), it is generally believed that scenario planning positively contributes to corporate performance. However, Phelps, Chan and Kapsalis (2001) posit that although scenario planning is increasingly practiced to enable firms to cope with changing competitive environments, little or no evidence is available about the effects of scenario planning on corporate performance. Hence, the following hypotheses are proposed:

$H_{01:}$ There is no significant relationship between scenario planning and corporate performance.

$H_{02:}$ Scenario planning has no significant impact on corporate performance.

$H_{03:}$ There is no significant difference between the performance of firms whose scenario planning are low and the performance of firms whose scenario planning are high

3. Methodology

To investigate the relationships that exist between scenario planning and corporate performance in the Nigerian manufacturing sector, a cross-sectional survey design was employed by collecting data from a defined population. The use of survey research method is justified because it follows a correlational research strategy and helps in predicting behaviour (Bordens and Abbott, 2002). It also helps to determine whether or not a relationship exists between the variables of study (Kerlinger, 1973). Responses were sought from manufacturing firms on a wide range of issues relating to scenario planning and corporate performance.

The population of this study comprised manufacturing firms in Nigeria. Since 55.2 percent of Nigeria's 2250 manufacturing firms are based in Lagos state (MAN, 1994 and MAN, 2003), Lagos was consequently considered

a good representation of manufacturing firms in Nigeria. Thus, the population sample was taken from Lagos state.

With the help of field research assistants, copies of the questionnaire were administered on manufacturing firms in Lagos state. Manufacturing firms in Lagos state constitute the sample frame which is a representative subset of the population from which the sample was drawn. A senior manager or chief executive of every selected firm was approached and persuaded to fill the questionnaire. Some manufacturing firms did not participate because they were apathetic and unwilling to divulge information. To justify their lack of cooperation, they adduced reasons such as management policy and suspicion.

A simple random sampling technique was adopted in selecting the participating manufacturing firms. A total of 740 copies of the questionnaire were administered on the manufacturing firms but 670 were completed and returned. This represents 90.54 percent response rate. According to Saunders, Lewis and Thornhill (2003), sampling is a part of the entire population carefully selected to represent that population. Random sampling is a strategy of choice for learning an unknown function in a given class of functions (Grochenig, Potschery and Rauhutz, (2010). A justification for using random sampling technique is that it uses the principle of 'randomisation' which is a procedure of giving every subject in a population an equal chance of appearing in the selection (Asika, 1991). Another justification is that it eliminates the possibility that the sample is biased by the preference of the individual selecting the sample (Bordens and Abbott, 2002). It is also justified, as it is particularly imperative when one is required to apply research findings directly to a population (Mook, 1983).

The participating manufacturing firms constituted the units of analysis. The administration of the questionnaire was done on one senior manager or chief executive at each firm surveyed. The use of primary data method is justified because according to Bain (1995 in Cowton, 1998), it is the quickest and simplest of the tools to use, if publication is the aim.

4. Empirical results

4.1 Variables and Measures

4.1.1 Scenario Planning

Nine items were specifically designed to measure the extent to which firms can identify the forces that will drive future change, recognise the key variables that will affect those forces, and rehearse the future so that they are able to adapt rather than react to change. A five-point Likert scale ranging from ''strongly disagree to strongly agree'' was used in the measurement. Respondents' rating on all the items were summed up and averaged to obtain a scenario planning index. Scenario planning index is classified high when the index is equal to or greater than 4.0 and low when it is lower than 4.0. An alpha score of 0.90 indicates that a high reliability is associated with the scale.

4.1.2 Corporate performance

Corporate performance scale includes ten performances criteria derived from Khandwalla (1995). The ten performance criteria include: profit growth, sales revenue, financial strength, operating efficiency, performance stability, public image, employee morale, environmental adaptation, new ideas, and social impact on the society. A five-point Likert scale was applied to measure the extent of the firms' performance, using the ten criteria. The scores on the ten items were summed up and averaged to determine the mean index of firms' performance. An index of less than 4.0 was regarded as low firms' performance while an index of 4.0 and above was regarded as high firms' performance. A reliability score of 0.86 was generated from the Cronbach's alpha test using the adapted scale from Barringer and Bluedorn (1999).

4.2 Analytical Tools and Hypotheses Tests and Results

To derive useful meaning from the data, and examine the propositions of this study, data from the survey were analysed using SPSS (Statistical Package for Social Sciences) as well as the following descriptive and inferential statistical techniques:

Descriptive statistics such as mean, percentages and frequencies were employed in the study to measure demographic characteristics of respondents, to answer research questions relating to scenario planning and corporate performance. They are not meant to test a formal research hypothesis, but rather the summaries from a sample that characterise that sample (Simon, 2002). According to Kerlinger (1973), studying sets of numbers as they are is cumbersome; thus, it is necessary to reduce the sets in two ways: calculating the averages and calculating the measures of variability.

Pearson's Product-moment correlation was applied to examine the existence of relationship between scenario planning and corporate performance. Pearson's product moment correlation coefficient is a parametric test that assumes normal distribution of data comprising interval or ratio variables, among other parameters (Field, 2000).

Regression analysis was used to ascertain the amount of variations in the dependent variable (corporate

performance) which can be associated with changes in the value of the independent or predictor variable (scenario planning) in the absence of other variables.

Z-test (approximated with the independent sample t-test in the SPSS package) was employed to test the hypothesised relationship as stated in null hypothesis 3. Since the data were collected on a rating scale which is 'presumed to be interval scale', this parametric test is considered appropriate (Emory and Cooper, 1991). Also, going by the central limit theorem, ''for sufficiently large samples (n=30), the sample mean will be distributed around the population mean approximately in a normal distribution. Even if the population is not normally distributed, the distribution of sample mean will be normal if there is a large enough set of samples'' (Cooper and Schindler, 2001). Since the sample size for this study is large (n=670), the use of this statistic is justified.

The demographic profile of respondents in Table 1 reveals that majority of the respondents were males, constituting 86 percent of all the respondents. Respondents who were 30 but less than 60 years old make up 89.9 percent of the entire respondents. Those who were less than 30 years old constitute only 8.4 percent, while 60 years and above constitute an insignificant proportion (1.8 percent) of the entire respondents. Majority of the respondents sampled were married and they constitute 80.1 percent, while 17.9 percent were single. The divorced, widower and widow make up only 1.9 percent. Also, in terms of educational qualification, majority (46 percent) of them were masters' degree holders. Respondents who were holders of bachelor's degree or equivalent constitute 32.4 percent while those who had professional qualifications make up 21 percent. Doctoral degree holders constitute the least (0.6 percent) of all the educational qualifications.

Table 2 shows the demographic profile of firms. This reveals that the number of firms with workforce that is less than 50 employees constitute the highest (17.9 percent), while those with above 350 employees are the lowest (11 percent).

In terms of the age of the firms, those who are 30 years and above constitute the highest (37.3 percent). Organisations that are less than 5 years old constitute only 2.4 percent of the entire participating firms.

4.2.1 Mean indices, Correlation Coefficient, Regression analysis and Independent Samples Test

Tables 3 and 4 indicate the mean indices of scenario planning and corporate performance respectively. Concerning scenario planning, the mean index of participating firms was 4.21. They were attracted to scenario planning probably because of their desire to experiment with scenarios, to examine several options or risks that might occur in the future. On other hand, the mean index of participating firms concerning corporate performance was 4.07. This implies the firms' willingness to put forth adequate efforts towards performance enhancement.

Hypothesis (H_{01}) was tested using correlations coefficients test. Pearson's product moment correlations coefficient (0.530**) shows that scenario planning and corporate performance are significantly and positively correlated with each other at 0.01 level of significance. Hence, the null hypothesis of no significant relationship is rejected. Thus, there is a significant relationship between scenario planning and corporate performance. In other words, since scenario planning focuses on helping firms to better prepare for the unexpected, the greater the use of scenario planning by an organisation, the higher is likely to be its performance.

Hypothesis (H_{02}) was tested by means of a Regression Analysis. The results of the Regression Analysis of the relationship between scenario planning and corporate performance are shown in Table 5. Table 5b above shows that the analysis of variance of the fitted regression equation is significant with F value of 260.725. This is an indication that the model is a good one. Since the p-value is less than 0.05, it reveals a statistically significant relationship between the variables at 95 percent confidence level. Therefore, the null hypothesis of no significant impact is rejected. Therefore, scenario planning has a significant impact on corporate performance.

The R^2 statistic in Table 5a indicates that the model as fitted explains 28.1 percent of the total variability in corporate performance. In other words, only 28.1 percent of the total variability in corporate performance can be explained by scenario planning. The value $R^2 = 0.281$ shows that scenario planning cannot be considered as a good predictor of corporate performance.

The standardized coefficients (Beta) value in Table 5c reveals that the independent variable is statistically significant at 0.05 significant level.

Hypothesis (H_{03}) was tested using Independent Samples Test. The results of the independent sample t-test as shown in Table 6a reveal that the performance mean index (4.28) of firms with high scenario planning is different from the performance mean index (3.28) of firms with low scenario planning. This difference between the two mean was found to be statistically significant at p < .05 (Table 6b). Therefore, the null hypothesis of no significant difference is rejected. Hence, there is a significant difference between the performance of firms with high scenario planning and the performance of firms with low scenario planning. That is, firms that do more scenario planning perform better than firms that do less scenario planning.

5. Conclusions and Implications for Management

This appears to be the first comprehensive study of the relationship between scenario planning and corporate performance in the Nigerian manufacturing sub-sector. Most studies in this area have been on developed economies, thus filling the gap in literature.

Although, the result of the study revealed that scenario planning is not a good predictor of corporate performance, yet, a positive and statistically significant relationship was found between scenario planning and corporate performance. The high involvement of participating firms could be as a result of their desire to experiment with scenarios. This is done by way of ordering their perceptions about alternative future situations in which decisions might be played out. The findings of the study also reveal that firms that are high in scenario planning perform better than firms that are low in scenario planning. These suggest that scenario planning is a good practice, but it informs the need for proper articulation of the process and the steps involved. Hence, firms may require sufficient knowledge of the techniques and process of scenario planning to efficiently and effectively utilise it.

The central roles of the manufacturing sector in the growth and development of any economy cannot be over emphasised. However, the efficiency and effectiveness of the manufacturing sector in performing these roles is a function of the firms' entrepreneurship. Achieving corporate performance to provide much more vivacity in the economy is not something that just emerges. It is among other things, dependent on scenario planning of the firms.

This research has revealed valuable findings for academicians, researchers and management executives from private to public particularly in developing economies. The findings have some important implications for management of manufacturing firms. It signifies the need for manufacturing firms to imbibe scenario planning culture, if they must be competitive and enhance corporate performance. The study can also help researchers to better understand the relationship between scenario planning and corporate performance in the manufacturing sector in Nigerian.

Cognizance should also be taken of the fact that since the performance of manufacturing firms is likely to influence the performance of the economy, the Nigerian government has a role to play. It needs to provide the legal//political atmosphere, and social infrastructures necessary to facilitate scenario planning activities, especially in the manufacturing sector. This will allow firms to take advantage of the opportunities and contain threats in the environment as they emerge.

5.1 Limitations and Future Research Direction

The following suggestions for future studies merit consideration:

First, the sample was drawn from Lagos State, Nigeria. This limits the generalisations of the findings. Thus, it is suggested that future research should extend the study to manufacturing firms across the entire country. Second, future studies may need to expand to cover the service industry rather than limiting them to the manufacturing sector. Then, generalisation of the findings might be well justified. Third, future study should also consider the analysis of firm size and firm age, and their influence on scenario planning and corporate performance. These might be relevant in making policy decisions for the organisation. Finally, examination of the impact of corporate performance on scenario planning might also be considered in future research.

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Table 1. Demographic Profile of Respondents

		Frequency	*Percent*
Sex	Male	576	86.0
	Female	94	14.0
	Total	670	100.0
Age (in years)	Less than 30	56	8.4
	30 but less than 40	146	21.8
	40 but less than 50	200	29.9
	50 but less than 60	256	38.2
	60 and above	12	1.8
	Total	670	100.0
Marital status	Single	120	17.9
	Married	537	80.1
	Divorced	5	0.7
	Widower	2	0.3
	Widow	6	0.9
	Total	670	100.0
Educational qualification	Bachelor's degree or equivalent	217	32.4
	Masters' degree	308	46.0
	Doctoral degree	4	0.6
	Professional qualification	141	21.0
	Total	670	100.0

Source: *Research Survey*

Table 2. Demographic Profile of Firms

		Frequency	*Percent*
Number of employees	Fewer than 50	120	17.9
	50-100	110	16.4
	101-150	102	15.2
	151-200	98	14.6
	201-250	89	13.3
	251-350	77	11.5
	Above 350	74	11.0
	Total	670	100.0
Age of organisation (in years)	Less than 5	16	2.4
	5 but less than 20	198	29.6
	20 but less than 30	206	30.7
	30 years and above	250	37.3
	Total	670	100.0

Source: *Research Survey*

Table 3. Mean Index of Scenario Planning

Scenario Planning	Frequency	Average weight
Identifying events with uncertain outcomes that will most likely affect the organisation.	670	4.21
Identifying major stakeholders, who will be most interested and affected by possible outcomes	670	4.29
Identifying the current interests of the stakeholders and whether and why these interests have changed over time in the past.	670	4.14
Identifying and exploring the economic forces including how and why they exert influence on the organisation	670	4.47
Identifying and exploring the political forces including how and why they exert influence on the organization	670	4.13
Identifying and exploring the legal forces including how and why they exert influence on the organization	670	4.07
Identifying and exploring the technological forces including how and why they exert influence on the organization	670	4.48
Identifying and exploring the societal forces including how and why they exert influence on the organization	670	4.15
Developing models to help quantify consequences of the various outcomes.	670	3.99
Mean of means		**4.21**

Source: *Research Survey*

Table 4. Mean Index of Corporate Performance

Performance indicators	Frequency	Average weight
Profit growth	670	4.19
Sales revenue	670	4.24
Financial strength	670	4.13
Operating efficiency	670	4.17
Performance stability	670	4.16
Public image	670	4.07
Employee morale	670	3.79
Environmental adaptation	670	3.97
New ideas	670	4.19
Social impact on the society	670	3.79
Mean of means		**4.07**

Source: *Research Survey*

Table 5. Regression Analysis of Scenario Planning and Corporate Performance

5a   Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.530	.281	.280	6.032

5b   ANOVA

Model		Sum of Squares		Mean Square	F	Sig.
	Regression	9484.982	1	9484.982	260.725	.000
	Residual	24301.382	668	36.379		
	Total	33786.364	669			

5c   Coefficientsp

Model		Unstandardized Coefficients		Standardized Coefficients		Sig.
		B	Std. Error	Beta	t	P
	(Constant)	9.279	1.961		4.731	.000
	Corporate Performance	.829	.051	.530	16.147	.000

Dependent Variable: corporate performance

p < 0.05

Table 6. Independent Samples Test on the performance of firms that are high in scenario planning and the performance of firms that are low in scenario planning

6 a: Group Statistics

	SCENARIO PLANNING	N	Mean	Std. Deviation	Std. Error Mean
CORPORATE PERFORMANCE INDEX	LOW	144	3.2889	.89545	0.07462
	HIGH	526	4.2867	.45908	0.02002

6 b: Independent Samples Test

	t-test for Equality of Means					
	t	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
CORPORATE PERFORMANCE INDEX	-18.268	668	.000	-.99780	-1.10505	-0.89055