Simulation Models and Corporate Financial Planning of Banks in Bayelsa State, Nigeria

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Abstract

This paper examines the application of simulation models in corporate financial strategy of banks in Bayelsa State, Nigeria. To achieve the objective of this paper, primary and secondary sources of data was used. The primary data was obtained from a well structured questionnaire of three sections with a reliability of 78% that was administered to one hundred and twelve (112) bank officials in Bayelsa State, Nigeria and secondary data was obtained from relevant books, journals and internet materials. The primary data collected was analysed using relevant econometric tools of Breusch-Godfrey Serial Correlation test, White Heteroskedasticity test, Ramsey RESET test, ADF and multiple regression. The analysis reveals simulation model is significantly related to shareholders satisfaction, customer service and return on capital employed. Hence, the paper concluded that simulation models provide relevant, reliable and sufficient information for organizations to achieve short, medium and long term objectives. Therefore, recommendations were provided for improve the application of simulation models.

Keywords: Simulation model, Agent based model, System based model, Corporate planning, financial strategy.

Introduction

The business decision-making has increasingly become complex and sophisticated. This is because of the dynamics in contemporary business environment. According to Singh (2006), successful firms are different from failures and some firms consistently outperform the industry even in difficult times. Modern business executives' responsibilities and tasks include managing various and multifaceted internal tasks of the firm. Hence, a firm's immediate external environment that consists of forces and conditions in the form of competitors, suppliers, government agencies and customers, poses a set of challenging factors. A firm's remote environment consisting of social, economic, political and technological factors in which a firm operates (ICAN, 2006; Singh 2006; Nwachukwu, 2008). The natural environment has also become an important strategic issue for business oeganisations. Therefore each of the factors of the external environment needs to be assessed, anticipated, monitored and incorporated in the critical decision making process of modern orgaisations (Aluko, Gbadamosi, Odugbesan and Osuagwu, 2005; Urieto, 2008). According to Singh (2006), to deal effectively with all that affects the ability of a company to grow profitably, executives design strategic management processes, they feel, will facilitate the optimal positioning of the firm in its competitive environment. Such positioning is possible because these strategic processes allow more anticipation of environmental changes and improved preparedness for reacting to unexpected internal or competitive demands using relevant models (Singh, 2006; Sharma, 2009; Gupta and Hira, 2007). One of such models that can be applied in solving complex problems in management sciences is simulation models.

Simulation models have been used in management sciences for several years. Lin, Carroll and Carley (2007) posit that managerial behaviours and organizational outcomes are recognized to be the result of the interactions of multiple interdependent processes. Hence it is assumed that when studying the complexities of managerial and organizational behaviours a more systematic method for theory development and analysis may prove necessary. Axelrod (1997) noted that simulation models are useful in this regard. Simulation has the ability of showing greater utility for acquiring theoretical insight through developing theories and exploring their consequences. Lin, Carroll and Carley (2007) suggest that researchers in the field of management have been slow to advantage of simulation methods. Simulations involve the generation of an artificial history of a given system and then observe it to draw inferences relating to the operating system and then observe it to draw inferences relating to the operating features of a real system being represented. According Gupta and Hira (2007), simulation is a representation of reality through the use of a model or other device which will react in the same manner as reality under a given set of conditions. Simulation experiments are artificial because they are based on computer models and their data are generated by a computer program. Simulations are based on formal models and a formal model is a precise formulation of the relationship among variables, including the formulation of the process through which the values of the variables change overtime, based on theoretical reasoning.

Prior studies on simulation models (Smith and Golden, 1989; Shafer and Smith, 2004; Lin, Carroll and Carley,

2007) investigated simulations on the basis of strategic management. For example, Smith and Golden (1989) investigated strategic planning and organizational performance in a business simulation; Shafer and Smith (2004) examined simulation models in operations management, trends and research opportunities and Lin, Carroll and Carley (2007) investigated simulation models in organizational and management research. These studies are alien to the banking industry and to Nigeria's setting where culture and other environmental variables may play down on the validity of their findings. Also there are little or none exist on the impact of simulation models on corporate planning in the banking industry. Therefore, the present study attempts to fill the gap in the literature. Hence, to achieve the objective of this study, the paper is divided into five interconnected sections. The next section examines the theoretical and empirical literature. The third section presents the materials and methods. The fourth section examines the results and discussions and the final section presents the conclusion and further area.

LITERATURE REVIEW
This section reviews the literature that is relevant to the problem under investigation. The review also covers empirical studies in the area focusing attention on the research problems that were investigated by the studies, the hypotheses that were formulated and tested and their findings and limitations. The rationale was to critically use the evidence from the studies to establish the gaps in the literature and also to serve as a basis for validation of the findings of the paper.

Models: Models are central to scientific discoveries, designs and discussions (Ngerebo-a, 2009). A model is any representation of a real thing, event or circumstances. According to Umoh (2005a), a model is a simple and convenient way of presenting or representing a complete experience, process, object or phenomenon, so that the representation can be used to explain the generality, and predict the future. He argues that several tools or objects can pass as models.

Simulation Models: The technique of simulation has long been used by the designers and analyst in physical sciences and it promises to become an important tool for talking the complicated problems of managerial decision-making (Gupta and Hira, 2007). Axelrod (1997) posits that simulation is recognized as a third way of conducting science. It is not only rendered irrelevant the deductive problem of analytical intractability but also partially overcomes the empirical problem of data availability, since a simulation process produces its own virtual data. Due to these features, simulation using computer software is capable of enormously aiding in theory construction. Simulation model can be adopted to generate hypotheses that are integrated and constant. It begins with a model of the behaviour of the system a researcher wishes to investigate. Simulation is therefore, a computational model of system behaviour coupled with an experimental design; the execution of the design is called a virtual experiment to distinguish simulation experiments from traditional laboratory experiments. Once a simulation has been developed, it can be used for a variety of research purposes. Axelrod (1997) identified three purposes: prediction, proof, discovery, explanation, critique, prescriptions and empirical guidance. Burton (2003); Macy and Willer (2002) state that a number of topologies of simulation model have been proposed. Many simulation in management theory use agent based models and system dynamic models. Agent-Based models is centred on modeling the behaviour of adaptive actors who comprise a social system and who influence one another through their interaction (Macy and Miller, 2002). The behaviour of the system is an emergent property of the interaction of the agents. The agent consists of the members of an organisation who influence each other's enculturation and turnover behaviour through social influence and an emergent organizational property is the cultural hererogeneity of the organisation. Strong and Macy (2001) examined the cascades in the organizational adoption of fads by modeling the manner in which organizational agent are influenced by one another to adopt innovative practices. Rivkin and Siggelkow (2003) argues that the model of the decision behaviour of top management agents to examine the interdependence of organizational search and stability, and decision characteristics. The agent based model simulates the behaviour of the agents who makes up a social system including, in particular, how they interact to influence one another and the outcome of interest typically are the consequences of the agent behaviours for the social system as a whole. There is no direct modeling of the whole system but the system behaviour emerges from the interactive behaviour of its constituent agents. System dynamic models are modeling the behaviour of the system as a whole, rather than modeling the behaviour of the actors within the system. At the system level this model stimulates the process that leads to changes in the same system overtime. The models are presented in diagrams of variables connected with arrows including feedback loops that depict the direction of the influence of variables on one another, and each influence components is then formalized. In the words of Mehar (1998),

> financial simulation models have become an important addition to the quantitative toolkit of the financial analysts, economists and corporate planners. They are particularly valuable for financial planning because they provide a consistent framework that simultaneously accounts for the entire interrelationship in a firm's financial structure. By simulating the model into the

future one can forecasts and analyze the effects of economic conditions and policies on the firm's financial position, in alternative financial strategies. The models can be used to generate Proforma annual accounts i.e. the balance sheet and income statement that would apply in future under specific assumptions about Capitalization, Debts, Equity, Retained Earnings, Profits, Cash Balances, Receivables, Payables and Inventories etc. A major advantage of simulation is to be able to handle complex problems that are impossible to solve via analytical approaches. In our study, only models of a mathematical and symbolic nature will be dealt with ones that can be computerized. The results from the computer program/ software can then be analyzed.

Corporate Planning: Planning is both an organizational necessity and a managerial responsibility. According to Lucey (2005), planning is an inescapable part of all rational human activity. He defined planning as *the establishment of objectives, and the formulation, evaluation and selection of the policies, strategies, tactics and action required to establish these objectives. It comprises long-term/strategic planning and short term operational planning.* The planning activities involve making decisions about long term goals and strategies. The strategic goals are major targets or end results, which involves long term survival, growth and values of the organisation. According to Saale (2007), strategic goals translate into measures of returns on investment, profitability, market share, quantity and quality of output, productivity and contribution to society. Aluko, Gbadamosi, Odugbesan and Osuagwu (2005), states that corporate planning is a systematic, objective and comprehensive process of long-range planning taking into consideration the organizations resources, capabilities and environment in totality. It deals with the futurity of present decisions in terms of goal-setting, developing strategies to achieve them; translating strategies into detailed operational programmes and assuring that plans are carried out. It is a set of instructions to managers of organizations describing the role each is expected to play in the attainment of corporate goals. The corporate planning of an organisation is operationalised in this study using shareholder satisfaction, customer service, return on shareholders' capital and corporate profitability.

1. Shareholders Satisfaction: Shareholders are entitled to dividends when they are declared. They benefit if a company prospers and stand a risk of loss of their investment if the company fails. They are owners of the company. Satisfaction is defined as the overall evaluation of consumption experience. Shareholders satisfaction is the ability of a business entity to meet the expectations of those who made investment towards the birth or up-keep of the business.

2. Customer Service: Customer service involves a wide variety of activities intended to ensure that customers receive the goods and services they required to satisfy their needs or wants in the most effective and efficient manner possible. The key objective of customer's service is to retain customers. Customer retention is a performance indicator and has the tendency of making a customer to stick with a brand and beyond the objective and subjective assessment (Sorce, 2002).

3. Return on Shareholders' Capital: The shareholders through the investment they engaged upon contributes to the firm's capital. They expect a return on their capital and this expectation must be met. Collier (2003) states that return on investment is the rate of return achieved on the capital employed by the shareholders. Shareholders expect a measure of their firms profitability are achieved in a given period expressed as a percentage of the total amount invested in the firm. They also expect a measure of profitability in which profit is expressed as a percentage of investment.

Therefore on the basis of the above literature, the following hypothesis was examined:

1. There is no significant relation between simulation model and corporate planning in the Nigerian Banking industry.

Evolution of the Nigerian Banking Industry

Banking in Nigeria went through phases and covers a wide span of time from an era of free banking or virtually absolute freedom in tune with the dictate of the economies of classical liberalism, to era of rigid or strict potential regulations. According to Jimmy (2008), Alao (2010), the history of banking in Nigeria is divided into four phases: the embryonic, expansion, consolidation/reform and post consolidation phases. The embryonic phase of banking evolution dates back to 1892 when the African Banking Corporation of South Africa, established a branch in Lagos followed by the British Bank of West Africa in 1894 while Barclays Bank DCO (Dominion, Colonial and Overseas) and the British and French Bank for commerce and industry were established in 1925 and 1949, respectively (Appah and John, 2011).

Banking in Nigeria started with the establishment of National Bank of Nigeria Limited in 1933, Agbonmagbe Bank Limited in 1945 and the African Development Bank Limited in 1948. The expansion of banking evolution was the establishment of Rural Banking Scheme in 1977, People's Bank in 1989 and Community Banks in 1990. The consolidation phase started with the 2004 and 2005 mergers and acquisitions of banks where 89 banks were

reduced to 25. The post-consolidation phase is the clamouring and calling for mega banks in the country through Bank penetration from the United States and Europe, respectively. Nzotta (2004) reported that the evolution of banking in Nigeria is divided into nine phases as shown below:

Evolution of Banking in Nigeria

Phases	Date	Period
First	Up to 1952	Free banking era
Second	1952-1959	Pre-central banking era
Third	1959-1970	Era of banking legislation
Fourth	1970-1976	Era of indigenization
Fifth	1977-1985	Post Okigbo era
Sixth	1986-1992	De-regulation era
Seventh	1993-2001	Era of banks distress
Eighth	2002-2004	Universal banking
Nineth	2004-Date	Era of bank consolidation

Source: Nzotta (2004)

Table 1 above shows the evolution of banking in Nigeria according to Nzotta (2004). The free banking era (up to 1952) was characterized by the absence of legislation and this resulted in a banking boom. The pre-central banking era (1952-1959), commenced with the enactment of the Banking Ordinance in 1952. The establishment of the Central Bank of Nigeria (CBN) in 1959 gave impetus to the era of banking legislation. The era of indigenization (1970-1976), marked the indigenization of expatriate banks operating in the country. The post Okigbo era (1977-1985), saw the implementation of the recommendations of the Okigbo panel on the review of the financial system. The de-regulation era (1986-1992), saw the privatization of government interests in various banks and the entry of more banks into the financial system. The era of banks distress (1993-2001), saw the emergence of illiquid and terminally distressed banks in the system. The era of universal banking (2002-2004), marked the commencement of universal banking in Nigeria and finally, the era of bank consolidation (2004-date), was characterized by the consolidation of banks through mergers and acquisitions.

MATERIALS AND METHOD

This paper applied survey research design. The primary data for the study were generated through the administration of questionnaires conducted to evaluate simulation model and corporate planning of banks in Bayelsa State, Nigeria. The target population includes all senior executives and managers of banks in Nigeria. The accessible population for the study was all senior executives and managers of banks in Bayelsa State, Nigeria for period December 2012 – March, 2013. The first part of the questionnaire contains questions on organization' and respondents' characteristics. The second part of the questionnaire examined simulation variables such as agent based model and system dynamic model (Macy and Miller, 2002; Burton, 2003; Rivkin and Siggelkov, 2003; Sastry; 1997) using five point scale of 5- strongly agree (SA), 4- agree (A), 3- undecided (U), 2- disagree (D) and 1-strongly disagree (SD). The third part of the questionnaire examines corporate planning effectiveness adopted from Sorce (2002), Collier (2003), Aluko, Gbadamosi, Odugbesan and Osuagwu (2005); Saale (2007) using the same scale. A total of one hundred and fifty (150) usable questionnaires were distributed to ten selected banks senior executives and managers and one hundred and twelve (112) representing seventy five percent (75%) completed and used for the analysis. Experts in strategy and business policy were used to validate the face and content validity of the instrument. The questionnaire were pre-tested using twenty (20) respondent and a reliability test was done on the data collected using Pearson Product Moment Correlation Coefficent, to explore the internal consistency of the questionnaire (kothari, 2004; Krishnaswamy, Sivakumar and Mathirajan, 2004; Ndiyo, 2005; Osuala, 2005; Baridam, 2008). The result of the reliability test shows that the designed questionnaire is highly reliable at 0.78. Excel software helped us to transform the variables into format suitable for analysis, after which the econometric view (E-view) was used for data analysis. The ordinary least square was adopted for the purpose of hypothesis testing. The ordinary least square was guided by the following linear model:

$$CP = F (SM) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$
$$SS = \beta_0 + \beta_1 ABM_1 + \beta_2 SBM_2 + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$
$$CS = \beta_0 + \beta_1 ABM_1 + \beta_2 SBM_2 + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$
$$RSC = \beta_0 + \beta_1 ABM_1 + \beta_2 SBM_2 + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4)$$

That is B_1-B_6>0

Where: CP = Corporate planning; SM = Simulation model; ABM = Agent based model; System based model; SS = Shareholders satisfaction; CS = Customer service; RSC = Return on shareholders' capital.

The study used relevant diagnostic tests and multiple regression model and granger causality test.

RESULTS AND DISCUSSION

This section of the paper presents the results and discussion obtained from questionnaires administered to respondents from the sampled banks in Bayelsa State of Nigeria.

Model Two

Table 1: Breusch-Godfrey Serial Correlation LM Test:

F-statistic	6.729192	Probability	0.131362
Obs*R-squared	13.53732	Probability	0.117264

Source: e-view output

Table one above shows the Breusch – Godfrey Serial Correlation LM test for the presence of auto correlation. The result reveals that the probability values of 0.13 (13%) and 0.11 (11%) is greater than the critical value of 0.05 (5%). This implies that there is no evidence for the presence of serial correlation.

Table 2: White Heteroskedasticity Test:

F-statistic	0.942165	Probability	0.468621
Obs*R-squared	9.519861	Probability	0.434577

Source: e-view output

Table two above shows the White Heteroskedasticity test for the presence of heteroskedasticity. The econometric result reveals that the probability values of 0.46 (46%) and 0.43 (43%) are considerably in excess of 0.05 (5%). Therefore, there is no evidence for the presence of heteroskedasticity in the model.

Table 3: Ramsey RESET Test:

F-statistic	0.067894	Probability	0.42795
Log likelihood ratio	0.071133	Probability	0.39695

Source: e-view output

Table three above shows the Ramsey RESET test for misspecification. The econometric result suggests that the probability values of 0.42 (42%) and 0.39 (39%) are in excess of the critical value of 0.05 (5%). Therefore, it can be seen that there is no apparent non-linearity in the regression equation and so it would be concluded that the linear model for the accounting services is appropriate.

Table 4: Augmented Dickey-Fuller Unit Root Test

Variable	ADF	1%	5%	Test for Unit root
Shareholder Satisfaction	-3.21686	-3.0246	-2.4105	I(0)
Agent based model	-3.59500	-3.0246	-2.4105	I(0)
System based model	-4.92345	-3.0246	-2.4105	I(0)

Source: e-view output

Table four above shows the Augmented Dickey-Fuller unit root test for stationarity of the variables. The result suggests that shareholder satisfaction, agent based and system based models with ADF of -3.21686, -3.59500, and -4.92345 less than 1% of -3.0246 and 5% of -2.4105. The result reveals that the variables are stationary at I(0). Therefore, ordinary least square can be applied in the analysis of data when data is stationary at I(0) (Greene, 2002; Wooldridge, 2006; Asterious and Hall, 2007; Brooks 2008; Gujarati and Porter, 2009; Kozhan, 2010).

Table 5: Multiple Regression Analysis

Dependent Variable: AS

Method: Least Squares

Date: 03/20/12   Time: 15:58

Sample(adjusted): 1 112

Included observations: 110 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.275444	2.256856	1.451330	0.1488
SS	0.285935	0.095662	2.989017	0.0033
ABM	0.249495	0.106627	2.339885	0.0206
SBM	0.216547	0.102573	2.111150	0.0363
R-squared	0.318414	Mean dependent var		12.99346
Adjusted R-squared	0.261218	S.D. dependent var		3.098167
S.E. of regression	2.888766	Akaike info criterion		4.997962
Sum squared resid	1226.711	Schwarz criterion		5.116803
Log likelihood	-376.3441	F-statistic		5.567008
Durbin-Watson stat	2.16401	Prob(F-statistic)		0.000100

Source: e-view output

Table five above shows the multiple regression analysis for shareholders satisfaction and simulation model. The result suggests that shareholder satisfaction, agent based model and system based model with p-values of 0.0033, 0.0206 and 0.0363 are less than the critical value of 0.05.Hence, we deduce that there is a significant relationship between shareholder satisfaction and simulation model in the banking industry. The R^2 (coefficient of determination) of 0.318414 and adjusted R^2 of 0.285935 shows that the variables combined determines about 32% and 29% of accounting services provided by professional accountants. The F-statistics and its probability shows that the regression equation is well formulated explaining that the relationship between the variables combined of accounting services are statistically significant (F-stat = 5.567008; F-pro. = 0.000100).

Model Three

Table 6: Breusch-Godfrey Serial Correlation LM Test:

F-statistic	6.929189	Probability	0.121336
Obs*R-squared	13.34731	Probability	0.101264

Source: e-view output

Table six above shows the Breusch – Godfrey Serial Correlation LM test for the presence of auto correlation. The result reveals that the probability values of 0.12 (12%) and 0.10 (10%) is greater than the critical value of 0.05 (5%). This implies that there is no evidence for the presence of serial correlation.

Table 7: White Heteroskedasticity Test:

F-statistic	0.942165	Probability	0.496821
Obs*R-squared	9.519861	Probability	0.483577

Source: e-view output

Table seven above shows the White Heteroskedasticity test for the presence of heteroskedasticity. The econometric result reveals that the probability values of 0.496 (50%) and 0.483 (48%) are considerably in excess of 0.05 (5%). Therefore, there is no evidence for the presence of heteroskedasticity in the model.

Table 8: Ramsey RESET Test:

F-statistic	0.067894	Probability	0.794795
Log likelihood ratio	0.071133	Probability	0.789695

Source: e-view output

Table three above shows the Ramsey RESET test for misspecification. The econometric result suggests that the probability values of 0.794 (79%) and 0.789 (79%) are in excess of the critical value of 0.05 (5%). Therefore, it can be seen that there is no apparent non-linearity in the regression equation and so it would be concluded that the linear model for the accounting services is appropriate.

Table 9: Augmented Dickey-Fuller Unit Root Test

Variable	ADF	1%	5%	Test for Unit root
Customer service	-3.31952	-3.0246	-2.4105	I(0)
Agent based model	-3.59500	-3.0246	-2.4105	I(0)
System based model	-4.92345	-3.0246	-2.4105	I(0)

Source: e-view output

Table nine above shows the Augmented Dickey-Fuller unit root test for stationarity of the variables. The result suggests that shareholder satisfaction, agent based and system based models with ADF of -3.31952, -3.59500, and -4.92345 less than 1% of -3.0246 and 5% of -2.4105. The result reveals that the variables are stationary at I(0). Therefore, ordinary least square can be applied in the analysis of data when data is stationary at I(0) (Greene, 2002; Wooldridge, 2006; Asterious and Hall, 2007; Brooks 2008; Gujarati and Porter, 2009; Kozhan, 2010).

Table 10:Dependent Variable: AS
Method: Least Squares
Date: 03/26/13 Time: 21:19
Sample: 1 112
Included observations: 112

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.583118	2.116285	2.165643	0.0319
CS	0.296186	0.096798	3.059837	0.0026
ABM	0.261935	0.095624	2.739228	0.0069
SBM	0.121734	0.113386	1.073624	0.0247
R-squared	0.512473	Mean dependent var		12.81169
Adjusted R-squared	0.426310	S.D. dependent var		3.065237
S.E. of regression	2.837936	Akaike info criterion		4.962213
Sum squared resid	1191.974	Schwarz criterion		5.080536
Log likelihood	-376.0904	F-statistic		6.098042
Durbin-Watson stat	1.901941	Prob(F-statistic)		0.000036

Source: e-view output
The table above shows the multiple regression output for model three. The result suggests that customer service, agent based and system based models with p-values of 0.0026 (0.26%), 0.0069 (0.69%), 0.0247 and (2.5%) is less than the critical value of 0.05. Hence, we deduce that there is a significant relationship between customer service and simulation models. . The R^2 (coefficient of determination) of 0.512473 (51%) and adjusted R^2 of 0.426310 (43%) shows that the variables combined determines about 51% and 43% of customer service of banks.. The F-statistics and its probability shows that the regression equation is well formulated explaining that the relationship between the variables combined are statistically significant (F-stat =6.098042; F-pro. = 0.000036).
Model Four
Table 11: Breusch-Godfrey Serial Correlation LM Test:

F-statistic	6.929189	Probability	0.121336
Obs*R-squared	13.34731	Probability	0.101264

Source: e-view output
Table eleven above shows the Breusch – Godfrey Serial Correlation LM test for the presence of auto correlation. The result reveals that the probability values of 0.12 (12%) and 0.10 (10%) is greater than the critical value of 0.05 (5%). This implies that there is no evidence for the presence of serial correlation.
Table 12: White Heteroskedasticity Test:

F-statistic	0.942165	Probability	0.496821
Obs*R-squared	9.519861	Probability	0.483577

Source: e-view output
Table twelve above shows the White Heteroskedasticity test for the presence of heteroskedasticity. The econometric result reveals that the probability values of 0.496 (50%) and 0.483 (48%) are considerably in excess of 0.05 (5%). Therefore, there is no evidence for the presence of heteroskedasticity in the model.
Table 13: Ramsey RESET Test:

F-statistic	0.067894	Probability	0.794795
Log likelihood ratio	0.071133	Probability	0.789695

Source: e-view output
Table thirteen above shows the Ramsey RESET test for misspecification. The econometric result suggests that the probability values of 0.794 (79%) and 0.789 (79%) are in excess of the critical value of 0.05 (5%). Therefore, it can be seen that there is no apparent non-linearity in the regression equation and so it would be concluded that the linear model for the accounting services is appropriate.

Table 14: Augmented Dickey-Fuller Unit Root Test

Variable	ADF	1%	5%	Test for Unit root
Return on Shareholders Capital	-2.981846	-3.4752	-2.8809	I(0)
Agent Based Model	-3.430093	-3.4752	-2.8809	I(0)
System Based Model	-3.993630	-3.4752	-2.8809	I(0)

Source: e-view output

The table above shows the Augmented Dickey-Fuller Unit root test for variable stationarity. The result suggests that return on shareholders capital, agent based model and system based model with ADF of -2.981846, -3.430093, and -3.993630, and 1% of -3.4752 and 5% of -2.8809. The result reveals that all the variables are stationary at I(0) . Therefore, ordinary least square can be applied in the analysis of data when data is stationary at I(0) (Greene, 2002; Wooldridge, 2006; Asterious and Hall, 2007; Brooks 2008; Gujarati and Porter, 2009; Kozhan, 2010).

Table 15: Regression Analysis
Dependent Variable: AS
Method: Least Squares
Date: 03/30/13   Time: 08:15
Sample: 1 112
Included observations: 110
Excluded observations: 2

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.846169	1.926464	2.515578	0.0130
RSC	0.249475	0.087374	2.855268	0.0049
ABM	0.281822	0.083440	3.377545	0.0009
SBM	0.244593	0.107890	2.267059	0.0423
R-squared	0.686853	Mean dependent var		12.84868
Adjusted R-squared	0.676381	S.D. dependent var		3.106839
S.E. of regression	2.774416	Akaike info criterion		4.917431
Sum squared resid	1123.818	Schwarz criterion		5.036795
Log likelihood	-367.7248	F-statistic		8.670509
Durbin-Watson stat	2.204292	Prob(F-statistic)		0.000000

Source: e-view output

The table above shows the multiple regression output for model four. The result suggests that return on shareholders' capital, agent based model and system based model with p-values of 0.0049, (0.49%), 0.0009 (0.009%), and 0.0423 (4.23%), is less than the critical value of 0.05 (5%). Hence, we deduce that there is a significant relationship between return on shareholders' capital and simulation proxied with agent and system based models. . The R^2 (coefficient of determination) of 0.686853 and adjusted R^2 of 0.676381 shows that the variables combined determines about 69% and 68% of return on shareholders' capital of banks is as a result of the application of relevant management and accounting models.. The F-statistics and its probability shows that the regression equation is well formulated explaining that the relationship between the variables combined are statistically significant (F-stat =8.670509; F-pro. = 0.000000).

CONCLUSION AND RECOMMENDATIONS

The study examined the application of simulation in the management corporate strategy application in selected banks in Bayelsa State, Nigeria. The review of related literature provides strong evidence of the effectiveness of simulation models using agent based model and systems based to achieve shareholders satisfaction, customer service and return on shareholders' capital. Our research empirically substantiated the results of prior studies of the relationship between simulation models and corporate strategy in the banking industry. The study highlights the various variables in the simulation model and various management corporate strategy in terms of shareholders satisfaction, customer service strategy and return on capital employed. The empirical analysis provided a correlation between simulation models and long term corporate strategy in the banking industry. On the basis of the empirical result, the paper concludes that simulation models provides relevant, reliable and sufficient information for organizations to achieve short, medium and long term objectives. Therefore, banks should design relevant models that would provide sufficient information for management decision making. This

would ensure that relevant banking objectives are achieved for the growth and survival of banks as service provides in the Nigerian economy.

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