

CONTINGENCY THEORY PERSPECTIVE OF MAS DESIGNS AND PERFORMANCE IN NIGERIAN MANUFACTURING COMPANIES

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ABSTRACT: This study, aimed at providing information to help address the lingering problem of poor performance of the manufacturing sector in Nigeria, it therefore seeks to find out whether relationships exist between the MAS designs adopted, the companies' context and their performance. Adopting the Contingency theory framework, the study proposes three contingency variables; technology, decentralisation and perceived environmental uncertainty as major influences on the relationship between the MAS designs and companies' performance. The model developed is tested using empirical data collected through a questionnaire survey of managers of one hundred and forty-four randomly selected manufacturing companies. Statistical tools operating in Nigeria used are means, correlations and regression analyses. The results provide support for the expectation that contingency variables constitute significant influences on the relationship between MAS designs and performance in the companies sampled. Findings suggest that adopting MAS designs tailored to the specific context of businesses will help improve their performance.

Keywords: Mas designs, contingency theory, technology, perceived environmental uncertainty, decentralisation, companies' performance

INTRODUCTION

Although, the primary focus of economic planning and management in Nigeria over the years has been the transformation of the economy through industrialisation, desired results are yet to be obtained. The Nigerian economy is far from being fully industrialized and the manufacturing sector is yet to take a prominent place in the scheme of things (Ayodele & Falokun, 2003). The country has not been able to shift its export base, from crude oil and agriculture to manufactures. On the average, the manufacturing sector's contribution to exports has been insignificant and contribution to gross domestic product (GDP) has been less than desirable (Marchat *et al.*, 2002).

This sector's unimpressive performance has continued to be a cause for concern among policy makers and researchers. Increase Company level efficiency has been a dominant suggestion offered as the key to reversing this poor performance. Soderbom and Teal (2002) argued that a key policy issue the Nigerian government should face is to understand and address the factors that will enable increased efficiencies of companies and consequently their competitiveness. Ayodele and Falokun's (2003) suggestion for moving the economy forward also from the bordered on the efficiency of these companies. They suggested this through the adoption of a combination of suitable management techniques, suitable technology and other resources.

Literature is replete with suggestions of the importance of the Management Accounting (MA) as one of such management techniques that can help to ensure such efficiency in the use of companies' resources and thus achieve the goals of the organisation. Amey and Egginton (1973, p. 8) suggested that, "the purpose of MA is to ensure as far as possible, that the business expectations are realised, by seeing that decisions are consistent with the enterprises' plan and with each other, that their implementation is controlled, by management comparing its own performance with its expectations".

The Management Accounting Practices Committee of the National Association of Accountants (1987 as cited in Needles, Anderson & Julius, 1988, p. 173) also opined that, "the use of MA is to assist management to plan, evaluate and control within an organisation and to assure appropriate use of and

accountability for its resources". IFAC (1998) described MA as one of those important management techniques, which distinctly adds value, by continuously probing whether resources are used effectively by people and organisations, in creating value for customers and shareholders, or other stakeholders.

Adelegan (2001) also citing other researchers concluded that information produced by the management accounting system (MAS) and the way it is used, can support or hinder change in organisations, assisting managers to identify the appropriate steps to meet their objectives.

Traditionally, the MAS provide information for costing products and for promoting efficiency in the use of labour and materials (Johnson & Kaplan, 1987). The systems use such practices and techniques as standard costing and flexible budgeting for cost control; cost allocation and product cost measurements; incremental analysis for decision-making; measurement of profit, contribution and return on investments for performance monitoring; and the full integration of internal cost accumulation systems with the external financial reporting systems (Shillinglaw, 1989).

However, while these systems have been in use for a long while, there have been increasing criticisms regarding their relevance in the new competitive environment. Critics have suggested that the information produced is not only distorted but produced too late to be relevant. They have therefore argued for more sophisticated systems, meant to counter the distortions in product cost and performance information provided by the traditional MAS (Kaplan, 1983; Goldratt 1983, cited in Edward & Heard, 1984, p. 44; Johnson & Kaplan, 1987; Lawrence and Ratcliffe 1990). Sophisticated MAS designs have been advocated by researchers as alternatives to the traditional MAS design in attempts to find ways of improving companies' competitive advantage in the more competitive global market.

The presumption has been that these more sophisticated systems will help to measure costs and performance more accurately and thus assist in efficient management and control of resources; they will provide more broad scope (detailed and timely) information, both financial and non-financial that will help management to react more proactively, to the demand of its task environment and thus move the organisation towards the achievement of its objectives (IFAC, 1998; Simon, 1990).

However, there is yet no consensus as to whether these new systems provide greater performance benefits for the organisation (Chenhall, 2005). Some studies have even provided empirical evidence suggesting that benefits from traditional MA techniques might indeed be higher than those derived from the newer techniques (Chenhall and Langfield-Smith, 1988). The apparent conflict in the findings and opinions of the proponents and critics of the different MAS designs has stimulated research of the systems devoted to examining their functioning within organisations. Such research has adopted both traditional and emergent theoretical perspectives to offer differing insights into aspects of MAS in trying to explain the sources of the discrepancies in the findings (Hoque, 2006).

The traditional perspective has offered the Contingency theory as a dominant paradigm with a large stand of research providing evidence supporting its propositions (Dent, 1990; Fisher, 1995). The contingency approach has been argued to have a greater potential importance over other theoretical approaches in that it would allow certain questions to be examined which could only be posed with difficulty in the other approaches.

Such questions include: How important are MAS/MCS relative to other means of exercising management control? What properties of the organisation or its environment increase the reliance placed on formal MAS/MCS? How does the distribution of power and authority within an organisation affect the distribution of discretionary resources within the organisation? (Waterhouse & Tiessen, 1978, p. 66). Evidence abounds in literature on the relationships between the different designs of MAS and properties of organisations. Much of these literatures have concluded that systems whose designs are adapted to fit the levels of the factors identified will lead to better performance without empirically demonstrating the link to companies' performance. Where some such evidence has been provided, link to managerial performance rather than companies' performance has been the focus. Furthermore, such evidence has been mainly from the developed countries.

In spite of the existence of a large body of research concerned with the investigation of the environmental and organisational variables influencing the design and functioning of MAS, Adelegan's (2001) observation that there had not been much empirical work on the role of MAS in organisations in Nigeria remains valid. Very few studies have examined the impact of contingencies on MAS in Nigeria.

This study therefore proposes a contingency model incorporating multiple variables in the organisation's context in studying the relationship between MAS designs and companies' performance in manufacturing companies in Nigeria. The paper suggests that the contingency theory approach is relevant to the study of MAS and their functioning in the companies and argues that certain properties of the companies and their environment influence the designs of MAS and their effectiveness in improving companies' performance. A major research question answered in the study is whether contingency factors of perceived environmental uncertainty, technology and decentralisation influence MAS designs and moderate the impact of the designs on performance in Nigerian companies?

The rest of the paper proceeds as follows; the next section provides a review of the contingency theory and its applications in MA research, section three details the methodology, section four presents the results, section five presents a discussion of the findings and section six concludes the paper.

Contingency Theory Perspective

The contingency theory perspective adopted in the study of MAS took its roots from the contingency theory of organisations, which in its simplest form, contends that what constitutes effective management is situational, depending upon the unique characteristics of each circumstance (Woodward, 1980). The contingency theory of MAS in providing explanation of their organisational functioning, views the systems as decision facilitating mechanisms, which should be tailored to an organisation's circumstance, suggesting that a fit between MAS and organisation's structural, environmental and strategic factors will bring about good organisational performance (Gordon & Narayanan, 1984). Empirical evidence of the relationship of MAS with these factors abounds in literature (Downey *et al.*, 1975; Chenhall, 2003).

Contingency studies of MA have offered a variety of suggestions on what specific contingencies should result in particular configurations of MAS. Some of the suggestions were based on findings from empirical work while others emanate from theoretical speculations based on the results of work in organisational theory.

Variables thus, examined have included: organisational size; technology; strategy; structure and the external environment (Khandwalla, 1972; Bruns & Waterhouse, 1975; Gordon & Miller, 1976; Khandwalla, 1977; Waterhouse & Tiessen, 1978; Macintosh, 1981; Merchant, 1981; Flamholtz, 1983; Gordon & Narayanan, 1984; Merchant, 1984; Govindarajan & Gupta, 1985; Chenhall & Morris, 1986; Simons, 1987; Govindarajan & Fisher, 1990; Gul, 1991; Gul & Chia, 1994; Chenhall & Morris, 1995; Gosselin, 1997; Haldma & Laats, 2002; Jermias & Gani, 2004; Gerdin, 2005).

Improved MAS designs have been advocated by researchers as alternatives to the traditional MAS design in attempts to find ways of improving companies' competitive advantage in the more competitive global market. The presumption has been that these more sophisticated systems will help to measure costs and performance more accurately and thus assist in efficient management and control of resources (IFAC, 1998; Simon, 1990); they will provide more broad scope (detailed and timely) information, both financial and non-financial that will help management to react more proactively, to the demand of its task environment and thus move the organisation towards the achievement of its objectives.

Evidence abounds in literature on the relationships between the different designs of MAS and factors in the task environment of organisations. Much of these literatures have concluded that systems whose designs are adapted to fit the levels of the factors identified will lead to better performance without empirically demonstrating the link to companies' performance. Where some such evidence has

been provided, link to managerial performance rather than companies' performance has been the focus. Furthermore, such evidence has been mainly from the developed countries.

Not much MAS contingency theory studies are available in Nigeria, although, Inegbenebor (1995) had noted some relationship between subsystems of MAS and companies' performance in a contingency theory based study of the effect of size and structure on the performance of Nigerian manufacturing enterprises.

The study, although not an MAS study, included the use of sophisticated control systems (standard costing, budgeting and responsibility accounting) as part of the elements of structure examined. The results supported the impact of the use of sophisticated control systems on companies' performance. The study concluded that when the enterprise is large, decision-making authority must be decentralised and corresponding sophisticated control mechanisms installed, also suggesting the relationship of decentralisation and MAS variables. The study was however, limited in that it employed a small sample size of forty-one manufacturing companies consisting of only small to medium scale enterprises. Further, the study did not specifically involve a test of the effect of the variables on MAS but provided an indication of a possible link between MAS and companies' performance and between decentralisation and sophistication in MAS designs.

Following this lead, Ajibolade *et. al.* (2010) examined the impact of environmental contingency variable noted in other studies on MAS designs and functioning on a larger sample of manufacturing companies. The study focused on the environment as a factor based on widely accepted importance of the influence of the external environment in literature and considerable empirical evidence supporting the proposition that the task environment has a major impact on both the organisational structure and information systems.

The study found a significant impact of perceived environmental uncertainty (PEU) on MAS designs and a significant moderating influence of PEU on the relationship between MAS design and performance.

The findings in these earlier studies, separately indicating the influence of decentralisation and PEU on MAS and performance and the proposition in Kwandallah (1977) that environmental uncertainty affects the technology of operations of a company, which in turn affects the extent to which a company tends towards decentralisation informed the choice of the contingency variables in the current study.

This study focuses on three variables namely: external environment, decentralisation and technology which are proposed to impact on MAS designs and their effectiveness in improving performance.

suggestions from literature that the underlying production process used is somehow related to the type of cost systems (Cooper, 1988). The basic assumption is that the complexity of the production process has an impact on the choice of the costing system. The more complex the production process, the more complex the costing systems, which models it. Complexity is said to be driven by level of automation, whether processes are mass, batch, single product or project producers, whether they make to order or to stock and whether they mainly make customised or standard products. Sophisticated MAS are therefore required in order to effectively measure the resources consumed in such complex production setting. Such sophisticated systems would feature more cost pools and assignment bases as in the ABC systems, would provide financial and non-financial information for measuring efficiency of the process and would report such information at high frequencies. Accounting literature has also suggested that more sophisticated systems are better suited for organisations characterised by modern production technologies (Malmi, 1999). It would then be expected that companies with higher level of automation, more mass production oriented and using advanced manufacturing technologies classified as more complex technologies are therefore likely to employ more sophisticated MAS.

Environmental uncertainty is said to influence the need for accurate MAS information. High level of competition is believed to increase the level of environmental uncertainty. Industries operating in such highly competitive environment would require more accurate cost information produced by more sophisticated systems, as mistakes made while relying on the wrong cost information are likely to be exploited by competitors immediately (Cooper, 1988, 1989; Gordon & Miller, 1976). It would therefore be expected that companies facing high environmental uncertainty would find more sophisticated MAS more useful.

Research Method

This study is a cross sectional survey designed to enable the examination of a wide range of variations among a large random sample of the population, in their organisational setting. The data used for the study are part of the data collected from a larger study of manufacturing companies (see Ajibolade, 2008) using a questionnaire as instrument.

Relationships were proposed between five variables, namely Decentralisation (DEC); Technological complexity (TECH); Perceived environmental uncertainty (PEU) and Seven (7) hypotheses as stated below were formulated and tested to examine the relationships proposed. While Hypotheses 1-4 were tested using both correlations and simple linear regressions, hypotheses 5-7 were tested using moderated regression analysis (MRA).

The MRA involves the running of two regression models for each hypothesis; the first model involving the main effects of MAS and each variable and the second model involving the inclusion of an interaction term. The statistical significance of the model that includes the interaction term; and the change in R^2 provide evidence of moderation effect.

The following are the hypotheses formulated:

- H₀₁: There is no significant relationship between MAS designs of companies and their level of decentralisation (DEC).
- H₀₂: There is no significant relationship between MAS designs of companies and the level of technological complexity (TECH).
- H₀₃: There is no significant relationship between MAS designs of companies and level of managers' perceived environmental uncertainty (PEU).
- H₀₄: There is no significant relationship between the performance of companies (PERF) and the level of sophistication in the MAS designs adopted.
- H₀₅: Higher level of perceived environmental uncertainty does not lead to a stronger relationship between MAS designs and performance.
- H₀₆: Higher level of technological complexity does not lead to a stronger relationship between MAS designs and performance.
- H₀₇: Higher level of decentralisation does not lead to a stronger relationship between MAS designs and performance.

Results

The results of the seven hypotheses proposed and tested are as presented below:

Correlation Analysis

Hypotheses 1-4 are tested using correlation and simple regression analyses. The results as shown in the correlation matrix in Table 1 reveal that the variables are each significantly positively correlated (at 0.01 level of significance) to MAS designs. DEC. shows a statistically significant but weak positive correlation with MAS design (correlation coefficient of 0.297), PEU and TECH both have strong positive correlations with MAS designs (correlation coefficients of 0.620 and 0.512 respectively) suggesting a rejection of the hypothesis of no significant relationship between MAS and DEC (H₀₁); and MAS and TECH (H₀₂) MAS and PEU (H₀₃).

The analysis also reveals a statistically significant positive correlation (0.626) between companies' performance and MAS designs. These results are indications of the existence of significant positive relationships between the companies' context, MAS designs adopted and companies' performance.

Table 1: CORRELATION MATRIX OF THE VARIABLES DENOTING COMPANIES' CONTEXT, MAS AND PERFORMANCE.

	PERF	MAS	TECH	DEC	PEU
Companies' performance index (PERF)	1	.626(**)	.491(**)	.432(**)	.511(**)
Management accounting systems index (MAS)		1	.512(**)	.297(**)	.620(**)
Technological complexity Index (TECH)			1	.500(**)	.549(**)
Decentralisation index (DEC)				1	.415(**)
Perceived environmental uncertainty index (PEU)					1

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

Regression Analysis

- i. Simple regression analysis: The results as presented in Table 2 corroborated the correlation results in Table 1. The tests suggest a rejection of the hypotheses of no significant relationships between the study's variables as stated in ($H_{01} - H_{04}$).

Table 2: RESULTS OF SIMPLE REGRESSION ANALYSIS

Model	Dependent Variable	Independent Variable	b_0	B_1	R^2	R^2 adjusted	F	P
H ₀₁	MAS design	Decentralisation	2.795	0.280	0.088	0.082	13.702	0.000
H ₀₂	MAS design	Technology	2.215	0.464	0.262	0.257	50.497	0.000
H ₀₃	MAS design	Perceived environmental uncertainty	1.610	0.606	0.385	0.380	88.709	0.000
H ₀₄	Performance	MAS design	-0.30	0.875	0.391	0.387	91.341	0.000

- ii. Moderated Regression Analysis (MRA): This analysis focuses on testing of the hypotheses of moderation effects of the study's contingency variables (H_{05} , H_{06} , and H_{07}). These null hypotheses were tested to provide evidence on whether organisation's context variables moderate the effect of MAS designs on companies' performance. Results of the MRA are as presented in Tables 3 – 6.

Test of H_{05} : Table 3 indicates that the model with the interaction term is statistically significant at $p < 0.05$ for PEU and explains 95.8% variation in performance. The change in R^2 explained by the interaction term also achieves statistical significance and explains a substantial variation in performance ($\Delta R^2 = 0.542$). These results suggest a rejection of the hypothesis of no moderation effect of Perceived environmental uncertainty.

Table 3: RESULTS OF THE MODERATION EFFECTS OF PECEIVED ENVIRONMENTAL UNCERTAINTY (PEU)

H_{05}										
Model	Dependent Variable	Independent Variable	Moderating Variable	b_0	b_1	b_2	b_3	R^2	R^2 Adj.	P-value

1	Performance	MAS design	PEU	3.068	.702	.273	-	.416	.408	.000
2	Performance	MAS design	PEU, MAS*PEU	2.12	.661	.283	.265	.958	.957	.000
p-value					0.000	0.000	0.000			
R ² change								.542		.000

Notes: MAS*PEU – Interaction term representing the moderating effect of perceived environmental uncertainty on the relationship between MAS and companies' performance.

As shown in Table 4, the model with the interaction term for TECH. is statistically significant at $p < 0.05$. The model explains 41.9% variation in performance. A statistically significant change in R^2 is also obtained, although the magnitude of the change is very low ($\Delta R^2 = 0.012$). These results suggest a rejection of the hypothesis of no moderation effect of technology.

Table 4: RESULTS OF THE MODERATION EFFECTS OF TECHNOLOGY (TECH) H₀₆

Model	Dependent Variable	Independent Variable	Moderating Variable(s)	b ₀	b ₁	b ₂	b ₃	R ²	R ² Adj.	P-value
1	Performance	MAS design	Tech	3.070	.733	.137	-	.407	.398	.000
2	Performance	MAS design	Tech, MAS*Tech	3.052	.777	.140	.041	.419	.396	.000
p-value					0.001	0.605	0.047			
R ₂ change								.012		.000

Notes: MAS*Tech – Interaction term representing the moderating effect of technology on the relationship between MAS and companies' performance.

Table 5 indicates that although, the model that included the interaction term in the case of DEC. achieves statistical significance, the beta coefficient for the interaction term does not show statistical significance ($p = 0.061$). Also, the change in R^2 ($\Delta R^2 = 0.011$) accounted for by the inclusion of the interaction term is low and does not show statistical significance ($p > 0.05$). This appears to suggest that the hypothesis of no interaction effect of decentralisation and MAS on performance cannot be rejected.

Table 5: RESULTS OF THE MODERATION EFFECTS OF DECENTRALISATION (DEC) H₀₇

Model	Dependent Variable	Independent Variable	Moderating Variable(s)	b ₀	b ₁	b ₂	b ₃	R ²	R ² Adj.	P-value
1	Performance	MAS design	Dec	3.068	.763	.356	-	.458	.450	.000
2	Performance	MAS design	Dec, MAS*Dec	2.036	1.224	.952	.185	.469	.458	.029
p-value					0.000	0.007	0.061			
R ² change								.011		.568

Notes: MAS*Dec – Interaction term representing the moderating effect of decentralisation on the relationship between MAS and companies' performance.

DISCUSSION OF FINDINGS

In summary, the results of the correlation analyses (Hypotheses 1-3) which show a positive and strong correlation between MAS designs and technology; MAS and perceived environmental uncertainty and MAS and performance are indications of strong link between these two contingency variables and MAS designs on one hand; and MAS and performance on the other. A statistically significant correlation relationship between MAS designs and decentralisation is also found. However, the 0.297 correlation coefficient observed the lowest among variables studies appear to suggest a weak relationship.

The simple regression models also corroborate the correlation results as the models of the relationship of each of the three variables with MAS show statistical significance. However, the model of MAS and decentralisation provides evidence to suggest that the relationship is a weak one considering the amount of variation explained ($R^2 = 0.088$) at $p < 0.005$.

These results while providing strong support for the expectation in this study on the relationship between MAS designs, PEU and TECH, provide only a weak support for the expectations that decentralisation would influence the MAS designs adopted by companies. These results are not inconsistent with suggestions from literature that the underlying production process used is somehow related to the type of cost systems (Cooper, 1988).

The results of these tests, which gave only a weak support to this expectation are however not inconsistent with some prior findings. For instance, Chenhall and Morris (1986) found no significant direct effect of decentralisation on broad scope MAS information. Gerdin (2005) reported a relationship in contrast to the view in literature that higher decentralisation should be accompanied by increased sophistication in MAS designs. A significantly high proportion of traditional MAS (less sophisticated MAS) focusing more on financial measures were noted among highly decentralised structures (lateral units) facing reciprocal interdependence.

These results could be interpreted as evidence that technological complexity is a statistically significant influence on the MAS designs adopted by companies. This influence may be described as relatively stronger going by the higher correlation coefficient. The amount of variation explained by technological complexity (26.2%) although small is higher than that of decentralisation.

This is considered an indication of the relative importance of this variable. These results are in line with this expectation.

These results may be interpreted as evidence that perceived environmental uncertainty is a statistically significant influence on the MAS designs adopted by companies. As observed from the high correlation coefficient, the highest among all the variables and going by the amount of variation explained by perceived environmental uncertainty (38.5%), also the highest among all the variables, the influence of PEU may be interpreted as the strongest among all the variables.

The findings of this study provided support for this expectation.

The results are consistent with earlier empirical evidence. For instance, Khandwalla (1972) concluded that the sophistication of an accounting information system was influenced by the intensity of competition faced by the manufacturing companies studied. Gul and Chia (1994) found that the effect of changing the degree of decentralisation on managerial performance was a function of each of the MAS characteristics and PEU. Gordon and Narayanan (1984) also provided evidence suggesting the strong influence of environmental uncertainty on control systems designs.

They found that both structure and control systems were dependent upon the state of the environment. The strong influence of PEU observed also seems to conform with Otley's (1980) observation that the major factors underlying control systems designs appears to be environmental unpredictability in its various guises.

This implies that the impact of MAS designs on performance will vary with the level of PEU facing the companies. Thus, companies facing higher level of PEU are likely to exhibit higher business performance if supported by more sophisticated MAS designs. The evidence is in conformity with earlier

evidence of strong moderating effect of PEU (Gordon & Narayanan, 1984; Govindarajan, 1984; Gul & Chia, 1994).

The test of H_{06} provided evidence of weak support for the proposition that technology moderates relationship with MAS designs. The model including the interaction term was statistically significant, however only minimal change in R^2 was observed. Furthermore, only a modest support was given to the moderation effect of technology. The interaction term accounted for a statistically significant but low increment in the explained variance ($\Delta R^2 = 0.012$ at $p < 0.05$).

This evidence differs slightly from expectations and from results in extant literature (Abernethy & Lillis, 1995). Perhaps the general low level of the use of very complex technologies made the moderation effect of technological complexity on MAS design less visible in these companies, or perhaps as Reid and Smith (2000) noted, going down from large company application to small company application, might limit the scope and emphasis of the contingency theory with a lesser influence of technological uncertainty at the small company level.

The test of H_{09} did not give support to the proposition that more sophisticated MAS designs under conditions of higher decentralisation, would result in higher performance. Decentralisation was not found to have a significant moderating effect on the relationship between MAS and performance. The interaction term did not achieve statistical significance ($p = 0.61$), although the model itself achieved significance. Furthermore, the change in R^2 was minimal and was not found to be statistically significant.

It is not clear however, how the lack of statistical significance of the interaction term between MAS and decentralisation should be interpreted. Perhaps, the lack of significance was as a result of the fact that small companies for whom decentralisation has been noted to have negative effect on performance were included in the sample together with the large companies. Size has been found to affect the likelihood of decentralisation having positive effect on performance (Inegbenebor, 1999). This result however, gave support to some earlier empirical evidence, which suggested that after controlling for the effects of the environment the relationship between an organisation's information system and structure is no longer significant (Gordon & Narayanan, 1984).

CONCLUSION

This study of MAS in Nigeria has yielded results that are compatible with research findings in the developed countries. The results were largely in conformity with predicted directions. Consistent with expectations, the findings of the study indicated that MAS design in terms of the level of sophistication is influenced by contingency factors of perceived environmental uncertainty, technology and decentralisation.

The evidence also indicates that sophistication in MAS designs is associated with higher performance and that this relationship is moderated by levels of PEU to a high extent and technological complexity to a modest extent. The results however, did not support the proposition that decentralisation moderates this relationship. The proposed interaction effect between MAS and decentralisation on performance was not found to be statistically significant.

The implication of these results is that companies facing high environmental uncertainty will likely reap great benefits from using more sophisticated MAS. Such MAS will help produce more broad scope financial and non-financial information for appropriately measuring performance and more detailed product cost information for proper pricing of products and would help highlight areas for cost control purposes.

This is in agreement with Nicholls' (1992) conclusion that companies that are able to identify true product costs in a more sophisticated system will be able to price their products more competitively and gain some advantage over their competitors who are unable to do so and Light's (2005) argument that measuring performance and cost control constitute pillars of performance.

No conclusive evidence has been found regarding the relationship between MAS design and level of decentralisation. Decentralisation although found to help predict the need for more sophisticated MAS, has not been found to moderate the relationship between MAS design and performance. Further research may be needed to reconcile this seemingly contradictory finding. More efforts should be put into improving management accounting practices in the manufacturing companies through seminars, workshops, conferences and publications supported by co-operation between the Manufacturing Association of Nigeria, the professional accounting bodies and management accounting researchers.

While The top management in the manufacturing companies should therefore be encouraged to seek improvements in their MAS with as much emphasis, as is being placed on their financial accounting systems.

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