

# THE USE OF MANAGEMENT ACCOUNTING INFORMATION AND ORGANIZATIONAL PERFORMANCE: THE CASE OF AKWA IBOM STATE

By

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## **Summary**

This paper analyses the relationship between the use of management accounting information by managers of companies in Akwa Ibom State and organizational performance. Several hypotheses concerning the relationship between the use of management accounting information and organizational performance are developed. It is argued that information use for decision-making influences and has a positive impact on organizational performance both directly and indirectly. The proposed relationships are tested using structural equation modeling (SEM). The data are derived from an empirical survey among managers companies (sample size of 29 responses). The results indicate that management accounting information use for decision making have different effects on organizational performance.

## **1. Introduction**

Most industries undergo substantial change, either driven by customers, competitors, or technology suppliers (Achrol 1991; Williams 1992). This change creates continuous pressure for companies to adapt products and services to the changing needs of their customers as no competitive advantage is save from being overhauled by competitors (Bhide 1986; Ghemawat 1986; Williams 1992). Thus, it is not surprising that executives and scholars alike see information use as a necessary prerequisite for lasting organizational performance (Choe 2002; de Geuss 1988; Kloot 1997).

The importance of information for managers has been documented extensively (Macintosh 1994; Mintzberg 1973; Tushman & Nadler 1978; Walsh 1995). While managers can choose from a wide range of internal or external information sources, one of the main sources within organizations is the management accounting system (Auster & Choo 1993; Macintosh 1994; Mintzberg 1973).

The use of management accounting information by chief executive officers (CEOs) is particularly important as they perceive and interpret information for the

entire company and take action based on this information (Daft & Weick 1984; Hambrick & Mason 1984). Due to their position they have the greatest capacity to affect their company's behavior and thus, performance (Tripsas & Gavetti 2000; Vandenbosch & Higgins 1996).

A model of the relationship between management accounting information use by CEOs and organizational performance has not yet been fully developed. Our objective in this paper is to develop such a model. More specifically, we investigate the following research question: How do the use of management accounting information in companies in Akwa Ibom State influence organizational performance?

This raises the following hypotheses:

- H1a: Management accounting information use for decision-making by CEOs is positively related to efficiency.
- H1b: Management accounting information use for monitoring by CEOs is positively related to efficiency.
- H1c: Management accounting information use for scanning by CEOs is positively related to efficiency.
- H2: Efficiency is positively related to financial performance.
- H3a: Management accounting information use for decision-making by CEOs is positively related to effectiveness.
- H3b: Management accounting information use for monitoring by CEOs is positively related to effectiveness.
- H3c: Management accounting information use for scanning by CEOs is positively related to effectiveness.

In a study on executive support systems Vandenbosch (1993) analyzed the relationship between the use of executive support systems, learning of senior executives and organizational performance in Canadian and US-companies (see also Vandenbosch & Higgins 1995, 1996; Vandenbosch & Huff 1997). Her model describes the process by which executive support systems lead to different types of learning and increased organizational performance. It also proposes that the type of information use determines the type of learning that is possible.

While we base our analysis in large parts on Vandenbosch's research model, it is important to keep in mind that her field of research was executive support systems which are different from management accounting systems in at least two respects: a) executive support systems are computer-based tools, b) executive support systems usually comprise more types of information than the management accounting systems we are looking at. In addition, the cultural context of senior executives in Canadian and US-companies eleven years ago might be considerably different from the context of Akwa Ibom CEOs today. So

care has to be taken when comparing the results of the two studies. Furthermore, we propose two extensions of Vandenbosch's research model that aim at making it more suitable for our field of research. The remainder of the paper describes our research and its results. It is divided into three sections.

In the first part, we describe different types of information use. We then develop our hypotheses concerning the relationship between information use and organizational performance. The second section of our paper describes the empirical methods used and the results. Finally, the last section discusses our research findings and the limitations of the study.

## **2. Theoretical framework**

This investigation is founded on the cognitive theories of learning. Accordingly, learning emerges from the interaction of a stimulus and the mind of the recipient, and results in a change of the recipient's mental model (Piaget 1974; Wessels 1994). This construct found its way into management from psychology and clinical neurology (Schaffer and Steiners, 2004). Since human beings are boundedly rational, they form mental models as simplified representations of their environment based on prior experience in order to process information more efficiently (Daft & Weick 1984). As a result, mental models are "the images, assumptions, and stories which we carry in our minds of ourselves, other people, institutions, and every aspect of the world. Like a pane of glass framing and subtly distorting our vision, mental models determine what we see" (Senge 1990, p. 235f.). They direct the gathering and interpretation of information and this information, in turn, helps to reinforce or change mental models. Based on the works of Piaget (1974) and Vandenbosch (1993), two distinct types of learning are distinguished:

1. In mental model maintenance, existing mental models are (believed to be) appropriate to a given situation. New information fits into them and confirms existing assumptions, attitudes and beliefs.
2. Mental model building refers to the process of rearranging, redefining or developing mental models to interpret and incorporate new or contradictory information that puts existing assumptions, attitudes and beliefs into question.

Therefore as a manager uses a piece of accounting information, either of the two types of learning are expected to occur; the information is integrated into the existing mental model or used in modifying the existing model.

### **2.1 Management accounting information use**

Following Horngren, Sundem and Stratton (2000) we define management accounting systems as "formal mechanisms for gathering, organizing, and communicating information about an organization's activities" (p. 6). While more traditional management accounting systems used to focus on financial and historic

information about events within the organization, modern management accounting systems also provide external, non-financial and future-oriented information (Atkinson et al. 2000; Chenhall & Morris 1986; Mia & Chenhall 1994).

Vandenbosch (1993) argues that information can be used in two fundamental ways: Scanning and focused search. Scanning is the behavior executives exhibit when they browse through information without a particular question to answer or problem to solve (e.g. to understand trends or sharpen their general understanding of the business), while focused search occurs when executives actively search for information, often in response to actual or suspected problems or opportunities (e.g. to verify performance results or to look up a specific piece of information).

Based on Huber (1991) and extending Vandenbosch's model we find it useful to distinguish between two sub-types of focused use. If a manager actively searches for information to choose between possible courses of action, to set goals or to determine an adequate level and mix of resources to achieve those goals, he is using information for decision-making (Simons 2000). The manager can also actively search for information after a decision has been implemented. In that case he uses information to benchmark actual against planned results to ensure that input, processes, and output are aligned to achieve organizational goals (Simons 2000). We call this type of focused information use monitoring. The distinction between the two types of focused use enables us to take into account specific performance effects of monitoring use that were neglected in the study of Vandenbosch (1993). In the next section we turn to the relationship between the three types of information use and organizational performance.

## **2.2 Information use and organizational performance**

The distinction of monitoring and decision-making as two types of focused information use enables us to take account not only of the indirect but also of the direct impact of monitoring activities on organizational performance. While all three types of information use indirectly influence organizational performance, monitoring also influences performance directly. This is due to the fact that monitoring by a supervisor can influence the behavior of subordinates. If a subordinate realizes that his work is monitored by a supervisor he will usually put more effort into achieving planned results (Merchant 1985; Schäffer 2003).

The classic Hawthorne studies show that the mere presence of observers is sufficient to influence the performance of groups, even if nothing in the work environment is changed (Schaffer and Steiners 2004). In a series of studies Churchill and Cooper (1961; 1964; 1966) also show, that monitoring, the announcement of monitoring activities or the existence of a monitoring authority influences the behavior of people in an organization.

This leads to the proposition that the use of management accounting information by CEOs influences the behavior of subordinate managers and increases their individual performance (e.g. by ensuring that the right goals are pursued and that all goals are achieved with a minimum level of resources). This

increase in individual performance should finally lead to an increase in organizational effectiveness and efficiency. Effectiveness and efficiency of organizational action are both seen as necessary preconditions for organizational performance:

“... highly efficient firms that are not effective in producing the goods and services demanded by customers do not survive. Equally, firms that are highly effective in the production of the requisite goods and services but have overly high costs, and thus are not efficient, do not survive. They are overtaken and replaced by firms with better cost structures” (Reed 1991, p. 60).

Management accounting systems can be interpreted as rule sets (Roberts & Scapens 1996; Simons 1987). From this perspective, they are similar to the models. Like models they provide a simplified world view. They contain assumptions about what information is important and which characteristics of the environment are essential. As they cannot include all information, the representation is partial, an interpretation through a particular framing of reality (Dent 1991; Hedberg & Jonsson 1978). A necessary consequence is that management accounting systems often only represent the status quo and do not contain enough and/or relevant information that indicates environmental changes: “Current information – and accounting – systems do more to stabilize organizations than to destabilize them. They filter away conflicts, ambiguities, overlaps, uncertainty, etc. and they suppress many relevant change signals and kill initiatives to act on early warnings” (Hedberg & Jonsson 1978, p. 47). This point of view would lead to the conclusion that management accounting information use leads to Efficiency.

Some authors argue differently. They propose that management accounting systems can also signal the need for effectiveness: “Information gathered by the management control system may be used to question the existing rationales for action and if the current strategies and structures are appropriate in a new environment” (Kloot 1997, p. 55). Hedberg and Jonsson (1978) note that management accounting information can stimulate curiosity, enable dialectical decision processes and help the organization to cope with environmental variety. Simons (1995) argues that the interactive use of management accounting information can question existing operating paradigms. From this perspective, management accounting information use can also lead to effectiveness.

As CEOs search for information to make a specific decision or monitor certain results, they will seldom encounter information that puts their existing assumptions and beliefs into question: “When executives are engaged in focused search, in most instances, they will see what they expect to see. Unless the information is widely different from their expectations, efficiency is most probable”

(Vandenbosch & Higgins 1996, p. 203). For example, in the decision-making process, CEOs may use management accounting information to analyze the impact of a change in the mix and level of resources on the cost structure and productivity of the organization while the underlying assumptions and policies are not questioned (Simons 2000). Similarly, in the monitoring process, the CEO may realize that actual results differ significantly from planned results. He may then try to analyze the reasons for that and take remedial action. However, if the underlying assumptions and policies are not questioned and the information is used to solve operating problems in a given context, monitoring use of management accounting information will lead to efficiency (Flamholtz, Das & Tsui 1985; Kloot 1997; Ouksel, Mihavics & Chalos 1997; Schäffer 2001). Even scanning (as unfocused information use) leads to efficiency if there is no new management accounting information that arises during the scanning process or if a CEO is not receptive to new and unusual information (Day 1994; Vandenbosch & Higgins 1996). Our argument is also supported by the findings of Vandenbosch (1993) who shows that focused use of executive support systems and scanning lead to efficiency. This supports hypothesis 1.

Since efficiency means low employment of resources (e.g. time and money) to achieve organizational goals it should have a positive impact on financial performance. This argument is also supported by Vandenbosch (1993) who shows that efficiency is weakly but significantly related to organizational performance. This provides a basis for hypothesis 2.

In the dynamic environment facing most organizations, effective action in the form of new products and services (Miles 1982) is expected to enable competitive advantage (Thomas, Clark & Gioia 1993). Decision-making, monitoring and scanning can also lead to effectiveness if CEOs encounter information that puts existing assumptions, attitudes and beliefs into question: For instance, the decision to add a new production line may depend on an analysis of accounting data that provides insight into the economics and profitability of the business (Simons 2000). In this case management accounting information can signal that existing assumptions and beliefs regarding the profitability of the product portfolio are no longer appropriate and that existing mental models need to be changed.

If expectations are not met during monitoring activities managers may also question their existing mental models (Hedberg 1981; Siegart & Menzl 1978). For example, management accounting information can indicate that expectations regarding the profitability of a product in a certain market are not met. An analysis of the variance between actual and planned results could lead to the insight that the product does not meet the customer's needs in that specific market. Managers have to change their existing mental model regarding the product and the market

as it does not correspond to reality any more. As a consequence of that insight the company might adapt its product to the customer needs or withdraw from the market (Siegwart & Menzl 1978).

Several authors argue that particularly scanning helps to identify blind spots, foster the user's creativity and therefore contributes to mental model building. For example, in a study investigating the change of mental models of MBA students El Sawy and Pauchant (1988) find a positive impact of scanning on mental model building. In a study investigating the decision making of CEOs, Eisenhardt (1989) draws the conclusion that managers who use information for scanning accelerate their cognitive processing which speeds decision-making. Daft, Sormunen and Parks (1988) show that CEOs in successful companies scan broader and more often than senior managers in less successful companies. They argue that scanning may be proactive in finding opportunities and detecting problems and therefore enables the organization to achieve a better strategic fit. In an investigation of budget information use by managers Macintosh and Williams (1992) observe that some managers scan through their budget information to pick up relevant changes in their environment early on. Thomas, Clark and Gioia (1993) found that CEOs who use high levels of information during scanning tend to interpret strategic issues as positive for the organization and feel they have more control over them. Finally, Vandenbosch (1993) also shows a positive impact of scanning on effectiveness of senior executives. This is the foundation for hypothesis 3. The next section describes the methods used to test the proposed hypotheses.

### **3. Methods**

#### **3.1 Sample**

A self-administered questionnaire was sent to the CEOs of 50 Small and Medium Scale Enterprises in Akwa Ibom State and 40 employees of these enterprises with accounting background. A total of 29 usable responses were received. The sample was tested for non-response bias by splitting it in three equally large parts according to the return date of the questionnaires (Armstrong & Overton 1977). The mean responses for 81 variables in the three groups were compared with one another. Only 2 significant differences were identified, providing some support for the absence of a non-response bias. The questionnaire from Schaffer and Steiners (2004) was used. All variables were measured on a five-point scale.

In our survey we rely on self-reported and perceptual measures. The CEO's perception was considered appropriate in this situation, compared to the use of more objective measures for several reasons. First, it is difficult (if not impossible) to measure objectively variables such as the different types of information use and the types of learning. Secondly, self-reported measures are the easiest and most efficient way to gather data from a large number of CEOs. Finally, several studies

show that self-reported and objective measures are highly correlated (Cagwin & Bouwan 2002; Dess & Robinson 1984; Robinson & Pearce 1988; Shortell & Zajac 1990). However, as dependent and independent variable data are collected from a single informant, common method bias can still be a potential problem (Podsakoff & Organ 1986).

### **3.2 Description of the measurement instruments**

**Decision-making** describes the extent to which management accounting information is used for supporting a specific decision respectively solving a particular problem. It was measured based on a scale used by Karlshaus (2000), Hunold (2003) and Sandt (2003).

**Monitoring** describes the extent to which management accounting information is used to compare actual against planned results and to supervise activities in their respective areas of responsibility. The measurement instrument was developed for this study.

**Scanning** describes the extent to which management accounting information is used without having a particular decision to make or problem to solve. It aims at increasing the user's knowledge base to improve future decision-making and monitoring. The measurement instrument was developed for this study.

**Efficiency** and effectiveness of organizational action was measured using measurement instruments developed by Vandenbosch (1993). Efficiency was measured by asking CEOs how far the management accounting system improves productivity, speeds decision-making and increases efficiency. Effectiveness was measured by asking in how far the management accounting systems facilitates innovation, determines which products and services to market, makes the organization more flexible and improves the organization's effectiveness.

For this study we consider one dimensions of organizational performance: **financial performance** (Schäffer & Willauer 2003). Financial performance was measured using sales on return and increase in company value. Sales on return have been used in several empirical investigations as a measure for financial performance (Dehler 2001; Dess, Ireland & Hitt 1990; Hatten, Schendel & Cooper 1978). In addition, reflecting the view that market or value-based measurements are more appropriate than are accounting based measures, we include increase in company value as a second indicator (Günther 1997).

### **3.3 Models**

Structural Equation Modeling (SEM) was used to analyze the proposed hypotheses as this technique has several advantages compared to the more commonly used regression analysis in management accounting. Firstly, SEM takes into account error variances associated with multi-item constructs. Secondly, it allows for a consideration of many relationships within a single analysis. Finally, it makes it possible to determine several measures of fit (Baines & Langfield-Smith 2003; Homburg 1992).

As recommended by Schumacker and Lomax (1996) a two-stage process was used. In the first stage, each latent variable was modeled as a separate measurement model. A measurement model relates observed variables to their latent variable. In this case the latent variables were decision-making, monitoring, scanning, efficiency, effectiveness, and financial performance. The second stage involved constructing the model by specifying the relationships between the latent variables.

Model fit was measured by using an adequate selection of fit indices as suggested by Schermelleh-Engel, Moosbrugger and Müller (2003):

- i. The  $\chi^2$ -test was used to test the significance of the proposed model. Due to the sensitivity of the  $\chi^2$ -test to sample size, the relative  $\chi^2$  (ratio of  $\chi^2$  and the degrees of freedom) was used. It should be 3 (2) or less for an acceptable (good) model.
- ii. The Rooted Mean Square Error of Approximation (RMSEA) and the Standardized Root Mean Square Residual (SRMR) were considered as descriptive measures of overall model fit. Both measures indicate to which extent a structural equation model corresponds to the empirical data. Both values should be below 0.1 for an acceptable and 0.05 for a good model fit.
- iii. The Nonnormed Fit Index (NNFI), the Comparative Fit Index (CFI) and the Adjusted Goodness of Fit Index (AGFI) were used as descriptive measures based on model comparisons. Comparison indices measure whether or not the model of interest is an improvement relative to an independent model. Values above 0.95 (0.97) for NNFI and CFI indicate an acceptable (good) model fit. The corresponding values for AGFI are 0,85 (0,90).

In addition to these fit measures, Cronbach's  $\alpha$  was computed for all measurement models as it is one of the most often used measures for construct reliability (Carmines & Zeller 1979; Cronbach 1951). Values above 0.6 (0.7) indicate an acceptable (good) model fit (Malhorta 1993; Nunnally 1978). When evaluating model fit it has to be considered that not all fit indices have to be above the required levels for acceptable model fit. It is always possible that a model may fit although one or more fit indices may suggest bad fit (Homburg & Baumgartner 1998; Schermelleh-Engel, Moosbrugger & Müller 2003).

At the end of the second stage of our analysis as can be seen from Table 1 all fit indices indicate a good ( $\chi^2/df$ , RMSEA, NNFI, CFI) or acceptable (SRMR, AGFI) model fit.

**Table 1: Fit of model**

Fit indices	Value
$\chi^2$	678,81
df	408
$\chi^2/df$	1,66
RMSEA	0,038
NNFI	0,97
SRMR	0,07
CFI	0,97
AGFI	0,89

### 3.4 Results

The results from the structural model were used to test the hypothesized research model. Hypotheses 1a to c proposed that decision-making, monitoring and scanning have a positive impact on efficiency. These hypotheses are supported by the model. The paths from decision-making and scanning to efficiency are positive and significant at  $p \leq 0.01$ ; the path from monitoring to efficiency is also positive and significant at  $p \leq 0.05$ .

Hypothesis 2 predicted a positive impact of efficiency on financial performance. As the path coefficient from efficiency to financial performance is not significant the hypothesis is not supported.

In hypotheses 3a to c it was assumed that decision-making, monitoring and scanning are positively related to effectiveness. These hypotheses are also supported. The paths from decision-making and scanning to effectiveness are positive and significant at  $p \leq 0.01$  and the path from monitoring effectiveness is positive at  $p \leq 0.05$ .

A summary of the findings relating to the hypotheses is shown in Table 3.

**Table 3: Summary of hypotheses testing**

	Hypothesis	Support/ reject	Level of significance
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H1a	Management accounting information use for decision-making by CEOs is positively related to mental model maintenance.	supported	1%
H1b	Management accounting information use for monitoring by CEOs is positively related to mental model maintenance.	supported	5%
H1c	Management accounting information use for scanning by CEOs is positively related to mental model maintenance.	supported	1%
H2a	Management accounting information use for decision-making by CEOs is positively related to mental model building.	supported	1%
H2b	Management accounting information use for monitoring by CEOs is positively related to mental model building.	supported	5%
H2c	Management accounting information use for scanning by CEOs is positively related to mental model building.	supported	1%
H3	Mental model maintenance is positively related to efficiency.	supported	1%

#### 4. Discussion of Findings

The survey provides strong support for our research model on the relationship between management accounting information use and organizational performance. First of all, the results indicate that the use of management accounting information for decision making, monitoring and scanning enhances organizational effectiveness and efficiency by questioning existing assumptions, attitudes and beliefs. These findings support our first extension of Vandebosch's (1993) model: thus decision making and monitoring lead to efficiency and effectiveness.

The relationship between information use for decision-making and efficiency is stronger than the relationship between decision-making and effectiveness. This provides some evidence for Vandebosch's (1993) argument that focused search primarily leads to the verification of existing assumptions, attitudes and beliefs. However, monitoring is only weakly related to the two types of uses.

The relationship between scanning and effectiveness is stronger than the relationship between scanning and efficiency. That could indicate that if management accounting information is used for scanning, it is more likely to enhance efficiency. Therefore an increase in scanning would help CEOs to challenge their existing assumptions, attitudes and beliefs. Since a broad scope of management accounting information and flexible access are necessary prerequisites for scanning, CEOs have to make sure that they do not only get

reports with aggregated pieces of information but that they also have access to detailed information (e.g. by implementing computerized management information systems).

All three types of information use influence organizational performance indirectly. Our survey provides evidence that monitoring use of management accounting information by CEOs has a direct impact on efficiency and effectiveness of organizational action. The relationship between monitoring and efficiency is stronger than the relationship between monitoring and effectiveness. This corresponds to the prevailing opinion that management accounting information is primarily intended to increase organizational efficiency.

## **5.0 Conclusion**

In spite of all limitations, the results of this research should help CEOs to gain a better understanding of the potential management accounting systems have for improving organizational performance. Since mental model building influences organizational effectiveness and – indirectly – financial performance, CEOs should make sure that they use their management accounting system not only for focused search (i.e. decision-making and monitoring) but also for scanning. In addition, information use for monitoring can influence organizational performance not only indirectly but also directly due to the fact that monitoring by the CEO that stimulates subordinate managers and influences their behavior accordingly. These effects can help CEOs to adapt their organization's products and services to the changing customer needs and to ensure lasting organizational performance.

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