



Activity Based Costing And Operational Decision Making: A Relevance Determination Analysis

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Abstract:

This current study sought to determine the operational decision usefulness of the activity-based costing information system paradigm. This was against the background of the submission by some studies that an ABC information system is entirely irrelevant for short term decision making. The study applied the inferential statistical tools of effect size and estimated omega squared to test data obtained for this purpose, from a sample size of eighty-two firms listed on the floor of the Nigerian Stock Exchange (NSE). It was observed that ABC information input into operational decision making significantly affects the work-in-progress inventory and finished goods inventory values. But it has a very weak bearing on cycle time and number of jobs in the shop as measurable outputs of operational decision making. Thus, the study inferred that the ABC information framework is not completely irrelevant for operational decision making. It can generate information to support short term decisions in some instances, given that the long term is nothing other than an aggregation of short terms. Hence, short term decision makers should endeavour to draw from all information bases available to support a system-based approach to decision making. This way the overall impact of operational short term decisions are better weighed.

Key words: *Activity-based Costing Information, Operational Decision-making, finished goods inventory, work in progress, cycle time, number of jobs.*

1.Introduction

The centrality of decision useful accounting information has been properly documented in the literature. This is because management is all about decision making. In contributing to the place of decision-making, Stevenson (1999) observed that the chief role of the operations manager is that of a decision-maker. It is the fundamental process of management. Managers are required to make decisions to solve organizational problems as espoused by Dubrin and Ireland (1993). Further, today's competitive challenges require management's ingenuity in decision-making. Given this scenario therefore, Duncan (1989) observed that managers are quick to telling us that effectiveness as a decision maker requires time, energy and a never-ending commitment to improve one's decision-making skills. Thus, making decisions, communicating them to others, and monitoring their implementation are some of the hallmarks of a successful manager (Simon, 1987).

The decisional roles of the manager can be anchored on four dimensions - as an entrepreneur who must make decisions relating to new opportunities and initiate necessary actions; as a disturbance handler he must address issues that tend to limit the attainment of organizational goals; as a resource allocator, he must ensure that the human, financial, physical and informational resources are well managed to beat competition and attain goals; and finally as a negotiator who must bargain with employees, suppliers, customers, and other parties important to the firm's success(Dubrin and Ireland,1993; Sellers,1990; Luthans,1988; Steingraber,1990; Rodgers,1990; Kirkland,1991; McLaughin,1989; Schwartz,1989; Reich,1991; and Womack et al, 1990). This makes it inevitable for the accounting system to continually evolve tools that would provide relevant and timely information to aid management planning and control. Further, Gaither and Frazier (2002) noted that in recent years, automated production systems have replaced a great deal of direct factory labour and as such generating decision useful information has become more imperative. Thus, management decision-making quality is dependent on the quality of the information on which they base the decision.

Historically, Accounting Information was generated and maintained to measure the financial success of the firm [s] for which the accounting information was kept. In the latter half of the twentieth century, technology provided management with increasing volumes of data with which to make decisions. This same technology allowed managers to measure product cost with increasingly microscopic detail. However, to this point in time, technology has provided managers with more data, not information, which has

tended to give the illusion of possession of relevant facts leading to better decisions. In the past decade, this growing morass of data has sparked the interest of Management and Management Accounting Researchers. Several researchers (Atkinson et al., 1997; Cooper, 1996; Johnson and Kaplan, 1987; Johnson, 1992; Kaplan, 1990; Kaplan and Norton, 1996; Khadem and Lorber, 1998; Lynch and Cross, 1991), amongst others, concluded that management must have better decision-making information from the volumes of data they have available to them. However, there is no agreement on how to coalesce that data, how to present it, or how to use it beneficially.

As the volume of data available to managers has increased, there has been growing interest in measuring firm performance at all levels within the organization. Researchers seem to agree that items that the firm measures tend to trend positively over time (Kaplan, 1990; Kaplan and Norton, 1996; Brown, 1996; Hronec, 1993). It does appear therefore, that firms should be careful in establishing what they measure, because people tend to perform to those measurements. Establishing the wrong measurements can lead to exactly the opposite effect on overall firm performance than was intended. The goal of a plant is to make money, and the measurements we are seeking should measure progress towards that goal. The result is that our cost accounting measurements have caused either a loss in throughput or an increase in inventory or operating expense – not consistent with the goal of the organization. Measurements should provide incentives for the plant to run more smoothly, but these cost accounting measurements seem to have the opposite effect (Goldratt, 1983).

Nevertheless, information from an Accounting System is useful for external reporting; internal reporting for planning and controlling operations; and internal reporting for making special decisions and long range plans. The second and third purposes are management oriented in that information is provided to assist managers in making decisions. Concepts and techniques have been developed under the general headings of Management Accounting to meet the information requirements of management. Hence, this study is geared towards determining the usefulness of Management Accounting Information Systems in support of short term decision-making with particular emphasis on determining if Activity Based Costing (ABC) is totally irrelevant for short term decision making. Is it possible that activity based costing information system cannot generate any relevant information in support of short term decision making?

2.Activity-Based Costing System: An Overview

Several years after they first introduced ABC, Cooper and Kaplan (1999) argued that the ultimate aim of ABC is to increase profits. However, they summarized that Activity-based cost systems provide more accurate cost information about business activities, and processes, and of the products, services, and customers served by these activities. ABC systems focus on organizational activities as the key element for analyzing cost behavior in organizations, linking organizational spending on resources to the activities and business processes performed by these resources. Activity cost drivers, collected from diverse corporate information systems, then drive activity costs to the products, services, and customers that create the demand for (or are benefiting from) the organizational activities. These procedures produce good estimates of the quantities and the unit costs of the activities and resources deployed for individual products, services, and customers. ABC systems provide two important insights. First, the activities performed by many resources are not demanded in proportion to the total volume of units produced. The demands arise from the diversity and complexity of the product and customer mix. Second, ABC systems are not models of how expenses or spending varies in the short-term (Cooper and Kaplan, 1992). Cooper and Kaplan (1999) stated that the goal of a properly constructed ABC system is not to have the most accurate cost system but to have the best cost system, one that balances the cost of errors made from inaccurate estimates with the cost of measurement.

Kaplan and Atkinson (1998) found that while an ABC system provides more detailed product costs than traditional absorption costing systems, ABC systems are not without error. They state, without reference, that activity and process costs are accurate within a range of 5-10%. Building an ABC system that is more precise is cost prohibitive. Kaplan and Atkinson (1998) are not clear in defining what they mean by 5-10% accuracy. However, it appears that they are saying that ABC allocations (cost drivers) are 90 –95% accurate and that attempting to gain greater precision is not cost effective. The costs of operating such a system would greatly exceed the benefit in terms of improved decisions made with only slightly more precise information. Kaplan and Atkinson (1998) provide several cases demonstrating the superiority of ABC over traditional absorption costing methods in several major companies.

3.Prior Research

Enterprise Resource Planning [ERP] systems provide management accounting managers with the capability to provide almost effortless real-time management accounting information on a daily basis that once took days or weeks to prepare and was based on aggregate tedious month or quarter-ending closing. This freedom allows them to easily calculate and update cost drivers [overhead allocation bases] daily to provide a new level of finite costing, if necessary. However, the ABC system must aggregate costs across multiple cost and responsibility centers. Therefore accountants must calculate these costs infrequently to give the organization a stable standard cost system that adjust for daily, weekly, and even seasonal fluctuations (Cooper and Kaplan, 1998).

However, Ittner, Larcker, and Randall (1997) investigated the extent to which common measures of manufacturing activity were associated with the cost hierarchy classifications proposed in ABC literature and examined the extent to which operational measures corresponding to this hierarchy explained both costs and revenues. A significant finding in their research was that total costs increased with the number of unit-related cost drivers and the number of product offerings, while some of the individual cost pool expenditures also increased with batch size and variability in batch size. Additional findings suggest that because of the offsetting cost and revenue effects of the cost hierarchy, management accounting research should move away from its primary focus on the role of ABC in decision-making and begin identifying the drivers of overall profitability. On their parts, Ellram (1994), Argyris and Kaplan (1994) came up with ways of implementing ABC.

Ittner and Larcker (1998) concluded that more research is required on recent innovations in performance measurement and decision-making information systems. They based this conclusion on the findings that the implementation of more complex measurement systems, including Balanced Scorecard [BSC] systems, driven by ABC, can be quite costly while providing weak performance improvements. They suggest that the championship of senior-level managers for any performance measurement system selected may provide the same or superior results. Perhaps success with any performance measurement system is simply due to added senior management attention, with the specific performance measures being of little importance.

In an event study of 234 firms in the United Kingdom, Kennedy and Affleck-Graves (2001) found that firms that implement ABC systems (47) significantly outperformed firms who did not implement ABC (187) by approximately 27% over a three-year period

beginning on January 1 of the year that ABC was implemented. The study matched firms who adopted ABC with firms in the same industry with approximately the same market capitalization but using traditional (British) overhead allocations. No firms using TA were included in the study. After the matching process, there were about 37 pairs of match firms. Additionally, ABC firms showed a superior stock performance [increased stock prices] in the last half of the study period. The study evaluated firm performance before and after the implementation of ABC. This evaluation indicated that there was no performance difference between firms before the adoption of ABC. However, one of the four robustness tests conducted indicated that the proportion of ABC firms that outperformed their matched non-ABC counterparts was between 43 and 56%, which is not statistically significant at conventional levels. However, Kennedy and Affleck-Graves (2001) concluded their study with the caution that it is very difficult to determine whether the particular management actions that led to superior performance of our ABC firms is due to the [ABC] information system or some other related factors.

In the studies conducted by Hoque and James (2000), Ittner, Larker and Randall (1997), Ittner and Larker (1998), Kennedy and Affleck-Graves (2001), Chaffman and Talbot (1991), Davis and Darling (1996), Helmi and Tanju (1991) and Mangan (1995), discovered that ABC provides more accurate cost information for long-term (strategic) decisions but is not helpful in the short-term (tactical). ABC models were never intended for to be models for short-term (tactical) decision-making (Cooper and Kaplan, 1992). This position expressed above is not different from that anchored by Fremgren and Liao (1981), Noreen (1991) Argyris and Kaplan (1994), Brewer (1998) Shields and McEwen (1996), Shim and Stagliano (1997). But on the other hand MacArthur (1996), Ruhl (1997), Fritsch (1997), Spoede, Henke and Umble (1994), Salafatinos (1995), Kee (1997), Demmy and Talbot (1998), Spoede (1996) in their studies anchored the existence of a common ground for both throughput costing (TA) and ABC. In fact, they advocated for an integrated TA and ABC Management Accounting Systems. They observed that the real potential of ABC might be its ability to generate the data needed to support an integrated cost management system (ICMS). Supported by relevant ABC data, the TA approach provides an effective decision-making environment that fosters continuous improvement. This activity analysis should lead to increased throughput and a better systems level understanding of the business.

3.Hypotheses Development

Hoque and James (2000), Ittner, Larker and Randall (1997), Ittner and Larker (1998), Kennedy and Affleck-Graves (2001), Chaffman and Talbot (1991), Davis and Darling (1996), Helmi and Tanju (1991) and Mangan (1995), discovered that ABC provides more accurate cost information for long-term (strategic) decisions but is not helpful in the short-term (tactical). ABC models were never intended for to be models for short-term (tactical) decision-making (Cooper and Kaplan, 1992) juxtaposed against the position of Goldratt (1990) who depositioned that the long-term (strategic) is nothing more sophisticated than a series of short-terms brings to the fore the need to examine using measureable outcomes of operational decision making (Boyd, 1997, 1999 and Whittenberg, 2004) the relevance otherwise of ABC information in short term operational decision making which informed the understated hypotheses:

- H₁: Short term decisions made with an activity based costing information input significantly affects the values of work-in-progress inventories.
- H₂: Finished goods inventory values are significantly affected by short term decisions made on the basis of activity based costing information input.
- H₃: Reliance on activity based costing information input in short term decision making significantly affects cycle time measurement.
- H₄: Reliance on activity based costing information input in short term decision-making significantly affects the evaluation and determination of number of orders in the shop.

4.Methodology

Data for the current study was obtained from management accountants and operational managers randomly selected from 82 firms listed on the floor of the Nigerian Stock Exchange, and analysed based on the positivist's research paradigm. Hence, the ontological assumption of realism, epistemological assumption of positivism, and the deterministic assumption of human nature informed the choice of the methodology in the current study, which required the use of inferential statistical tools in testing the hypotheses to arrive at the findings and conclusions of the study.

5.Results, Conclusion and Implications

Hypotheses	t-statistic	Effect Size		Estimated Omega Squared	
		r	Remark	\hat{W}^2	Remark
H₁	42.32	.94	Very Strong	.88	Very Strong Association
H₂	-62.13	.97	Very Strong	.94	Strong Association
H₃	1.68	.14	Weak	.01	Very weak Association
H₄	5.14	.09	Weak	.31	Weak Association

Table 1: Effect Size (r) and Estimated mega squared Value of the t statistic

From the results of the t-test, effect size and estimated omega squared, a very interesting empirical pattern was revealed. While H₁ and H₂ did pan out, H₃ and H₄ did not pan out. This was considered significant in the sense that using the factory floor measures of cycle time and number of orders in the shop did show that ABC information is not relevant in short term decision making, while the factory floor measures of work in progress and finished goods inventory values showed a strong relevance of ABC information input into short term operational decision making. From the study's evidence and the literature, it can be seen that ABC as an information system has the capacity to impact on operational decision-making. The measures of work in process inventory values, and finished goods inventors values, showed a statistically significant result in the application of an ABC information system. Through enhanced costing information, operational managers can make decisions that would significantly affect corporate goals through its impact on the resultant outcomes of operating decisions.

Thus it can be inferred that the ABC information framework can provide decision useful information in support of short term decision. It cannot be said to be completely irrelevant in the sphere of operational decision making. The obvious implication arising from this inference is the fact that every strategic situation turns out in no time to be a tactical or short-term decision-making scenario, just as over time, fixed cost takes a variable form. Further, our inference finds a common thread in the submission of Goldratt (1990) who depositioned that the long-term (strategic) is nothing more sophisticated than a series of short-terms (aggregated short terms). The advocates of the idea that ABC is purely strategic and therefore not useful for tactical decision-making may not have considered all short decision making information requirements. They may not have considered decision-

making from the point of view of top management, and the firm as a whole. Because, if they did, they would have understood that tactical decisions are a product of strategic decisions. They draw their frame of reference from strategic decisions. Therefore, tactical decision-makers cannot ignore completely a strategic information base.

In outlining the process of strategic management, Thompson and Strickland (1998) underscored the role of tactical or operations managers as being the key to achieving strategic goals. They observed that the phase of implementing and executing the strategy, and monitoring and evaluation are anchored in the domain of operations managers (short term decision makers). They also observed that strategic goals must be devolved into tactical goals to allow for operations managers dexterity to accomplish. Furthermore, Newman (1991), Sellers (1990), Luthans (1988), Kirkland (1991) Rodgers (1990), Steingraber (1990) amongst several others, variously anchored the decisional roles played by operational managers in harnessing all organizational resources under their domain towards achieving corporate goals. In doing this, they must draw from the broad policy framework provided by top management, which sets the benchmark and as well as the boundaries of operational decisions. Thus, drawing from the strategic information base is a must for all successful operational managers. Ignoring with impunity the strategic information base is a surefire for managerial suicide.

At the basics, tactical information is strategic information broken down into bits. While, tactical actions are the very basic steps of strategic actions. Both are linked into an intricate and complex inseparable web. Attempts at drawing a clear divide and building visible boundaries to demarcate tactical from strategic is like an attempt at building a house without a foundation and a roof, plus supporting columns, which is not only a flawed strategy but is bound to cause collateral damage. Domesticating ABC entirely in the realm of strategic decisions without a link to the tactical is like decapitation. The strategic being the head and the tactical been the body. A systems total failure is the end result there from such a decapitation. ABC information cannot be completely domesticated in the strategic realm as postulated by some scholars as its relevance is anchored in charting a clear path for tactical actions. A parochial view of ABC by its proponents is a surefire for its early demise. Hence, short term decision makers should endeavour to draw from all information bases available to support a system's approach to decision making. This way the overall impact of operational short term decisions are better weighed.

6.Reference

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