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The Factors Influencing Cost and Management Accounting Practices in Manufacturing in Saudi Stock Exchange

Abstract

Cost and Management accounting practices are generally used by management at various levels. Such tools provide managers with the freedom of choice as they generally present no constraints, other than the cost of information collected relative to benefits of improved management decisions. Previous studies have concluded that there are factors that may affect cost and management accounting practices. The objective of this research is to study the impact of these factors on cost and management accounting practices in KSA. The study involves a total of 49 respondents from KSA- industrial Joint-Stock manufacturing. A questionnaire has been used to collect information about the use of cost and management accounting tools in practices.

The results of the study revealed the importance of cost information; intensity of the competitive environment; size of the firm; the quality of information technology; extent of the use of Total Quality Management approaches; extent of use of lean production techniques (including JIT techniques); **perceived environmental uncertainty**; and qualification of cost and management accounting staff have significant relationships with cost and management accounting usage.

Keywords: importance of cost information, the quality of information technology, competitive environment, Total Quality Management, lean production techniques, uncertainty and accounting staff.

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ملخص البحث

يستخدم المدراء غالبا تطبيقات وادوات المحاسبة الإدارية والتكاليف عند مستويات إدارية مختلفة. تقوم هذه الأدوات والتطبيقات بتوفير حرية كبيره للمدراء في الاختيار بين القرارات المختلفة لأنها ترفع القيود عن المدراء وتوفر في تكلفة المعلومات المجمعّة ذات العلاقة بتطوير قرارات المدراء.

توصلت الدراسات السابقة الى انه يوجد هناك عوامل قد تؤثر في تطبيقات المحاسبة الإدارية والتكاليف. هذه الدراسة تهدف الى بيان أثر هذه العوامل على تطبيقات المحاسبة الإدارية والتكاليف في المملكة العربية السعودية. اشتملت الدراسة على ٤٩ عينة من الشركات الصناعية المدرجة في سوق الأسهم السعودي. تم خلال الدراسة توزيع استبيان للحصول على إجابات عن استخدامات الأدوات والتطبيقات الخاصة بالمحاسبة الإدارية والتكاليف.

نتائج الدراسة أوضحت مدى أهمية كل من (معلومات التكاليف، حدة المنافسة في السوق، حجم الشركة، جودة نظام المعلومات في الشركة، مدى تطبيق اسلوب إدارة الجودة الشاملة، مدى تطبيق أساليب التصنيع الحديثة بما فيها أسلوب التصنيع بالطلب، بيئة عدم التأكد الملاحظة، المستوى التعليمي للمحاسبين الإداريين بالشركات) وعلاقتهم الواضحة باستخدامات المحاسبة الإدارية والتكاليف.

الكلمات المفتاحية: أهمية معلومات التكاليف، جودة تكنولوجيا المعلومات، البيئة التنافسية، إدارة الجودة

الشاملة، أساليب التصنيع الحديثة، عدم التأكد، المحاسبين الإداريين.

1. Introduction

Several researchers have claimed that there has been a proliferation of management and cost accounting tools have in the last few decades. The reason behind this increase is that global business needs these tools to enhance their positions in the market. The importance of the information which is generated from management and cost accounting plays a crucial role in enhancing profitability through continuous waste reduction and effective resource utilization (Ahmad, 2012).

Changes in the global business environment have driven transformation in the direction of sustainability by focusing on cost efficiency. Management accounting literature continues to suggest that there are benefits in adopting management accounting practices in improving business sustainability. Such literature also proposes that management accounting practices provide various tools, techniques and valuable internal information, including details for budgeting, profit planning, and performance evaluation. It is also shaped by management accounting information system (Azudin & Mansor, 2017).

Waweru, Houge, and Uliana (2005) state that the effect of the market economy, intensified competition, globalization, limited resources, change and complexity in the business environment, and accelerating technological changes drive organizations to realize the need to have objective information. These factors also make them aware of the need for more detailed cost information. Managers have the responsibility to continuously ensure that their organizations can compete nationally and internationally in order to remain sustainable in the market (Sunarni, 2014). This is a statement supported by Johnson & Kaplan (1987) who state:

With vigorous global competition, rapid progress in product and process technology, and wide fluctuations in currency exchange rates and raw material prices, an organization's management accounting system must provide timely and accurate information to facilitate efforts to control costs, to measure and improve productivity, and to devise improved production processes (Johnson & Kaplan, 1987, p4).

The same authors add:

The management accounting system must also report accurate product costs so that pricing decisions, introduction of new products, abandonment of obsolete products, and response to rival products can be made with the best possible information on product resource demands (Johnson & Kaplan, 1987,p4).

In recent years most organisations have faced dramatic changes in their business environment. Such changes like deregulation, increasing levels in global competition, and reductions in product life cycles arising from technological innovations have intensified the challenges for managers. Considerable changes have also taken place within the manufacturing environment with the emergence of advanced manufacturing technologies that have resulted in greater automation and changes in cost structure involving direct labour costs being replaced by overhead costs. New management practices have also emerged, such as the just-in-time management philosophy, lean production techniques, and total quality management practices (Al-Omiri & Drury, 2007).

Towards the late 1980s, considerable publicity was given to the criticisms of management accounting, particularly with the publication in 1987 of *Relevance Lost* authored by Johnson and Kaplan (1987).The authors claimed that management accounting practices that were developed in the 1920s had remained unchanged and were still the dominant practices of the 1980s. They state:

Given the radical changes in the competitive environment ...and rapid worldwide movement of technology and capital, it is unlikely that the cost accounting and management control systems devised for the 1925 environment can still be useful sixty years later (Johnson and Kaplan, 1987, p.205).

Johnson and Kaplan argue that a revolution in management accounting was required to match the revolution that has taken place in the manufacturing environment. Based on criticisms from many other commentators besides Johnson and Kaplan's (1987), the view that management accounting was in crisis started to emerge. As a result of the various criticisms, the Chartered Institute of

Management Accountants commissioned an investigation to review the current state of management accounting and the various claims made about it. The findings were published in a report titled *Management accounting: Evolution, not Revolution*, authored by Bromwich and Bhimani (1989).

The authors concluded that:

The evidence and argument advanced by advocates of wholesale changes in management accounting were not yet sufficient to justify the wholesale revision of management accounting. Evidence of the benefits of new accounting techniques and the continued benefits of some conventional techniques is only beginning to emerge. No general crisis has been identified within the management accounting profession vis-a-vis a changing manufacturing environment, and therefore, no radical reforms are recommended at this stage.

Five years later, Bromwich and Bhimani (1994) updated their report with a second report titled *Management Accounting: Pathways to Progress*. They reviewed the literature and research and focused on the broader array of opportunities facing the management accounting field. They concluded that, in the UK, no one school of opinion yet dominated the views on the nature of reforms which might be appropriate for management accounting. The case for wholesale reform has not been accepted in practice.

In response to the criticisms, considerable attention was given during the 1990s to modifying accounting techniques and implementing innovations that would enable management accounting to regain its relevance. In particular, changes have been made to provide managers with the information they need to compete in today's changing business environment. Recognition of the changes have been acknowledged by Kaplan (1994), who states:

The past ten years have seen a revolution in management accounting theory and practice. The seed of the revolution can be seen in publications in the early to mid-1980s.....that identified the failings and obsolescence of existing cost and performance measurement systems. Since that time we have seen remarkable innovations in management accounting; even more remarkable has been the

speed with which the new concepts have become widely known, accepted and implemented in practice and integrated into a large number of educational programmes'. (Kaplan, 1994, p.247)

Johnson and Kaplan (1987) place some of the blame for this lack of relevance on business schools and academic accountants (Scapens, 1991, p. 215). Since this publication, academics, accountants in businesses and consultants have sought to develop new management accounting systems and advanced management accounting techniques to provide managers with relevant information to cope in today's environment (Bums & Vaivio, 2001). In this context, Bums and Scapens (2000, p.3) state that:

The environment in which management accounting is practised indeed appears to have changed, with advances in information technology, more competitive markets, different organizational structures, and new management practices (see for example Ezzamel et al., 1993, 1996). Although some might claim that the fundamental nature of management accounting systems and practices has not changed (e.g. Drury et al., 1993), there is evidence that the use of accounting within the management process has changed (Bromwich & Bhimani, 1989, 1994). Managers now appear to be using their accounting systems and routine financial reports more flexible, and in conjunction with a range of other performance measures, both financial and nonfinancial (Miller & O'Leary, 1993).

2- The need for this study

The motivation for this study comes from the fact that there is a dearth of research in the area of management and cost accounting techniques practice in developing countries. In this regard, previous research has pointed out that the application of management accounting in less developed countries remains inadequate and studies on this area are not many in the literature (Lin & Yu, 2002; Sleihat et al., 2012). Several scholars agree that studies in management accounting have been mainly conducted in the western world (Abdel-Kader & Luther, 2006, 2008; Uyar, 2010; Van Triest & Elshahat, 2007).

Based on the dearth of the application of management accounting research in the developing world, this paper attempts to fill this gap by examining cost and management accounting techniques practices in a developing country. The KSA is the research context. This study will provide empirical evidence on the existence and use of cost and management accounting techniques in the context of emerging industry market in KSA.

3-Aims of the study

This study aims to:

- Provide a view of the current role of cost and management accounting techniques practices in KSA environment;
- Identify the extent of usage of management accounting techniques practices in KSA environment;
- Discover the diffusion of management accounting techniques practices in KSA environment;
- Determine the level of advance in cost and management accounting techniques practices in KSA environment;
- Investigate the relationship between the contextual factors and the level of use of cost and management accounting techniques practices in KAS environment.

4-Previous studies

Management accounting research can generally be categorised into four streams which are discussed in detail below.

4.1 The first stream

The first aspect comes from the International Federations of Accountants (IFAC). In 1998, IFAC (Financial & Committee, 1998) determined four stages of management accounting development.

- Stage1: Before 1950, this stage was called *Cost determination and financial control*. The main focus of this stage was on determining costs and financial control processes by using financial statements data.
- Stage 2: This stage (Between 1950 & 1965), is called *Information for management planning and control*. The central focus of this stage was the use of traditional management accounting techniques that support decision analysis and responsibility accounting.
- Stage 3: This stage (from 1965 to 1985) is called *Reduction of waste of resources in business processes*. The main focus of the stage was on the reduction of waste of resources used in the business process by eliminating "non- value-added activities".
- Stage 4: this stage (from 1985 to 2000) is called *Creation of value through effective use of resources*. Because of significant business uncertainty and technological innovation, companies started to implement management accounting tools that assess economic value. The advanced management accounting such as *Just in Time* (JIT), *Balanced Scorecard* (BSC) and strategic management accounting were used extensively at that time. (See Sunarni, 2014).

4.2 The second stream

With regards to the second stream, which follows closely to the first as described above, Waweru (2010) mentions that the academic literature traces the origin of management accounting from two different perspectives. One perspective takes *the economic approach* and is supported by authors such as Chandler (1977), Kaplan (1984), and Johnson and Kaplan (1987). The other approach is supported by authors such as Miller and O'Leary (1987), Hoskin and Macve (1988) and Ezzamel et al. (1990) and is referred to as *the non-economic approach* (Luft, 1997).

Researchers in the area of the economic approach argue that management accounting practices originated from the private sector to support business

operations. In this regard, Johnson and Kaplan (1987) state that the origins of modern management accounting can be traced to the emergence of managed, hierarchical enterprises in the early nineteenth century (see Drury 2013). During this period, the need to gain more efficiency in production was realized. Factory owners started hiring workers on a long-term basis in a centralized workplace and hence, the development of hierarchical organizations. Factories were frequently located in a considerable distance from the head office of the owners. Hence, information systems were required to increase and judge the efficiency of the managers and workers at the factory. Before this time (the industrial revolution period) workers were hired on a short-term basis and paid only for work done, while factories were owner-managed. The role of accounting was, thus, limited to record-keeping (Waweru, 2010).

Researchers of *the non-economic approach* argue that in the Nineteenth Century and early Twentieth Century, control through measuring individual performance and analysing it by comparison with norms or standards was developed in governmental institutions such as the military (Hoskin & Macve, 1988). Offices that collected national health statistics (Hacking, 1990) also introduced these measures before they were common in firms. These scholars argue that management accounting practices were developed for disciplinary and academic evaluation purposes and were not meant to support business as argued by the proponents of the economic approach (see Waweru, 2010).

4.3 The third stream

The third stream classifies research on management accounting into three types. The first type investigates the level of use of management accounting techniques in practices in different countries: United Kingdom (Drury et al., 1993), Singapore (Ghosh and Chan, 1997), Australia (Dean et. al., 1991), Finland (Hussain, Gunasekaran & Laitinen, 1998), Nigeria (Adelegan, 2000), India and different Asian countries (Sulaiman et. al., 2004, Mahfar and Omar ,2004). The research in this type reports on the management accounting techniques that are used by different organizations in different countries.

The second type focuses on comparing management accounting techniques in practices among countries, with a particular focus on Japan. Hayes and Abernathy (2007) note that the US companies' performance is lower than Japanese counterparts. Based on this finding, several researchers made comparisons of management accounting practices across countries. For Example, Shields et al. (1991) compared similarities and differences in management accounting practices between the US and Japan. Furthermore, Wijewardena and De Zoysa (1999) compared the use of management accounting techniques between Australia and Japan. Their study indicated that Australian companies widely adopted management accounting techniques relating to cost control during the manufacturing process. However, management accounting techniques relating to cost control at the design of the product stage was widely adopted by Japanese companies. Also, Luther and Longden (2001) compare the use of management accounting practice between South Africa and the United Kingdom. The results indicated that there were differences in the use of management accounting techniques and the factors influencing the use of management accounting.

The final type includes studies that aimed to examine the relationship between contextual variable and observed management accounting techniques in practices. For instance, Haldma and Lääts (2002) examined the effect of the change on ownership (public vs private), technology, and market structure on the use of management accounting techniques. The results indicated that such relationship exists whoever there was no determination on a specific set of management accounting techniques. Furthermore, Wu et al. (2007) examined the relationship between management accounting practice and institutional variables in terms of the type of ownership (i.e. stated-owned or joint ventures). The results indicated that the type of ownership influenced perceived current and future benefits of management accounting practices (See Sleihat et al., 2012; El-Shishini, 2017).

4.4 The fourth stream

It could be said that the fourth new stream of research in management accounting emerged in the last few decades. Examples of frameworks within this stream include the contingency theory, institutional theory, and actor-network theory. Some recent studies have adopted the contingency theory approach. It is a theoretical framework derived from organisational studies and is based on the claim that the use of management accounting practices depends on certain factors. Examples of such factors include **environmental uncertainty**, **competition**, technology, size, and **organizational structure**. The basic idea behind the contingency theory is that no universally appropriate accounting system fits all organisations in all circumstances (Otley, 1980; Otley 2016; Emmanuel et al., 1990; Islam & Hu, 2012; Oates, 2015). As captured in contingency theory, organisational structures and systems are a function of environmental and firm-specific factors (Anderson & Lanen, 1999; Chenhall, 2003; Gerdin, 2005; Gerdin & Greve, 2004; Haldma & Laats, 2002, Cadez & Guilding, 2008; Islam & Hu, 2012).

Another framework in management accounting research is the institutional theory. This theory has three frames: new institutional economics (NIE), old institutional economics (OIE); and new institutional sociology (NIS) (Scapens, 2006). The new institutional economics (NIE) encompasses a broad range of economic approaches which have developed out of neoclassical economics, NIE uses economic reasoning to explain diversity in the forms of institutional arrangements. It focusses on the structures that govern economic transactions.

The old institutional economics (OIE) work explores how habits, rules and routines structure economic activity, and importantly how they evolve through time. By adopting an OIE perspective, management accounting can be conceptualised as the rules and routines which shape organisational activity. The OIE is concerned with institutions that impact upon thought structures of individual human agents. On the other hand, new institutional sociology (NIS) work tends to emphasise the structural nature of institutions. In other words, it deals with how institutional forces mould organisations. These are forces which

are external to the organization. The NIS deals with the institutions that shape organisational structures in the organisational environment (Scapens, 2006).

The Actor-Network Theory (ANT) is a research approach which focuses on how human and non-human elements (“actants”) form more or less stable alliances (“networks”) in order to create knowledge (“facts”) or innovations (“machines”) (Lukka, 2012). The ANT originates from the sciences and takes a new approach to investigate relationships between actants. Thus, it is not necessarily a theory but rather an ontological approach that has been extensively applied in accounting (Justesen & Mouritsen, 2011). It does not engage in the how and why questions but instead seeks to analyse the ties within a network, where a network can be comprised of humans and non-humans (Ahrens & Chapman, 2006; Justesen & Mouritsen, 2011; Whittle & Mueller, 2010). The network with the most substantial ties will be the most successful, thus deserves attention (Whittle & Mueller, 2010). Scientific truth arises out of the robust network around a scientific theory, by investigating the actors and researching the ways they relate to each other (Al-Htaybat and Al-Htaybat, 2013).

In general, it could be said that cost and management accounting systems are used as a tool to facilitate successful organisational reforms and help organisations to survive through such rapid changes (Hopwood, 2009). Demand for management accounting information leads to inevitable changes to management accounting (Quinn, 2014; Pavlatos & Kostakis, 2015). However, the pace of such changes may be slower than changes observed in, say manufacturing operations, and it may vary across different countries (Chenhall & Langfield-Smith, 1998; Hyvönen, 2005; Joshi et al., 2011). Existing literature (Innes & Mitchell, 1992; Zairi, 1992; Atkinson et al., 1995) documents an increased interest in new accounting methods and techniques, with many success stories. On the other hand, the evolutionary history of cost and management accounting shows that its practices evolve in a clear association with the environmental changes and the society’s needs (Clarke, 2004). Some authors relate the use of accounting techniques with the strategic priorities of the firm (Chenhall &

Langfield-Smith, 1998). Nonetheless, the level of management accountancy practice and its effects on KSA companies remains unknown.

Therefore, it can be said that this research will add some value to the knowledge about cost and management accounting practice in KSA environment.

5- Variables

- Importance of cost information
- Intensity of the competitive environment
- Firm size
- The quality of information technology
- Extent of the use of Total Quality Management approaches
- Extent of use of lean production techniques (including JIT techniques)
- Perceived environmental uncertainty
- Qualification of Cost and Management Accounting Staff

5.1 Importance of cost information

Even if sophisticated cost systems could substantially reduce product cost distortions, it is not likely to be helpful unless a firm can actually utilise better cost information in its decision-making process (Cagwin & Bouwman, 2002). Firms mainly relying on cost information for inventory valuation/profit measurement rather than decision-making purposes may rely on less accurate cost information derived from simplistic costing systems (Kaplan & Cooper, 1998). According to Anderson (1995) and Estrin et al. (1994), the differing needs by organizations for accurate cost data for strategic decisions and cost reduction may affect Activity-based costing (ABC) adoption. A review of some studies relating to the importance of cost information shows that there is a difference in the needs of firms for accurate cost data for decisions and cost reduction may affect ABC adoption (Anderson, 1995; Krumweide, 1998; Baird et al., 2004; Pavlatos & Paggios, 2009; Ismail & Mahmoud, 2012). Factors affecting the decision usefulness of cost information include the firm's use of cost data in

pricing decisions, cost reduction efforts and the need for individual cost studies. The following hypothesis is, therefore tested:

Hypothesis 1(H1): There is a positive relationship between the justification of cost information and the use of cost and management accounting practices.

5.2 Intensity of the competitive environment

The competition is a crucial situational factor in the total number of factors that comprise the firm's environment. Studies by Libby and Waterhouse (1996) and Simons (1990) suggest that companies facing intensely competitive market environments tend to employ relatively more sophisticated management accounting systems. These views are also consistent with Khandwalla's (1972) finding of a positive relationship between sophisticated management controls and competition intensity. Bruns and Kaplan (1987) identify competition as the most important external factor for stimulating managers to consider redesigning their costing systems. Cooper (1988b) has also argued that organizations facing fierce competition should implement ABC. Prior contingency studies (e.g. Hemmer, 1996; Hoque & Hopper, 1997; Khandwalla, 1972, 1974; Krishnan, 2005; Krishnan et al., 2002; Libby & Waterhouse, 1996; Merchant, 1984) suggest that today's firms need management accounting and control systems that can provide timely, accurate and relevant information on a wide range of issues, including product costs, productivity, quality, customer service, customer satisfaction, and profitability. Kaplan (1995, p.6) suggests that “*The new competitive environment demands much more accurate cost and performance information on the firm's activities, processes, products, services, and customers.*” Kaplan (1995, p. 6) further argues that in competitive environments, managers must also have timely and accurate information to guide their learning and improvement activities information that will help make processes more efficient and more customer-focused.

Some argue that more sophisticated management accounting systems are likely to be deployed by firms operating in intensely competitive market environments (See, for instance, Khandwalla, 1972; Libby & Waterhouse, 1996;

Simons, 2000; Al-Omiri & Drury, 2007). Competition is identified as the most important external factor for stimulating managers to consider redesigning their costing systems (Bruns & Kaplan, 1987; Cooper, 1988; Al-Omiri & Drury, 2007).

Companies facing intensive competition also have a greater impetus to find ways to differentiate their products and services from those provided by competitors (Guilding & McManus, 2002). This requirement frequently results in a higher number of product and service lines. Also, it results in differentiation sought through increased customization of products and services in order to meet specific customer desires. In these circumstances, companies require sophisticated costing systems to measure the costs of increased variety and customization accurately. They will then be able to ascertain whether the strategy adopted results in the generated revenues exceeding the higher costs associated with the increase in variety and customization. Companies facing relatively intensive market conditions are also likely to have products and services with low-profit margins due to pressure to match or under-cut prices charged by competing firms. Thus, there is a greater need for accurate cost systems since there is a danger that inaccurate systems may significantly over cost or under cost products/services to such an extent that incorrect decisions will be made. For example, under costing may lead to a company incorrectly continuing with low margin products which could lead to losses. Conversely, over costing may result in the mistaken discontinuation of reported loss-making products or services, which are really generating low-profit margins. Thus, organizations facing intense competition have a greater need for accurate cost information (Al-omiri & Drury, 2007). Based on the above discussion, the following hypothesis is tested:

Hypothesis 2(H2): There is a positive association between the intensity of competition and the use of cost and management accounting practices.

5.3 Size of the firm

Several researchers have argued that organizational size facilitates innovation (Aiken & Hage, 1971; Kimberly & Evanisko, 1981; Ettlie *et al.*, 1984). Large

organizations tend to have more complex and diverse facilities that aid the adoption of a large number of innovations (Nord & Tucker, 1987). Previous empirical studies have noted a positive relationship between a company's size and the adoption of innovations (Blau & McKinley, 1979; Dewar & Dutton, 1986; Damanpour, 1992). In their review, Moores and Chenhall (1994) find that there is considerable evidence that size is an essential factor related to the adoption of more complex administration systems. Some studies have noted a positive relationship between company size and the adoption of ABC systems (Innes & Mitchell, 1995; Bjornenak, 1997; Malmi, 1999).

Some authors argue that larger firms have higher advantages over smaller firms, especially in terms of the ability to afford more resources to facilitate the adoption of a new technique (Baird, 2007; Bjornenak, 1997; Brown et al., 2004; Innes & Mitchell, 1995). Several studies have supported a link between size and the adoption of management accounting techniques such as ABC (Damanpour, 1992; Drury & Tayles, 1994; Moores & Chenhall, 1994; Innes & Mitchell, 1995; Libby & Waterhouse, 1996; Bjornenak, 1997; Gosselin, 1997; Langfield-Smith et al., 1998; Booth & Giacobbe, 1998; Krumwiede, 1998; Baird et al., 2004; Brown et al., 2004; Pierce, 2004; Al-Omiri & Drury, 2007a; Al-Omiri & Drury, 2007b; Baird, 2007; Abdel-Kader, 2008). Most of these studies suggest that larger firms are more likely to adopt ABC than smaller firms. For example, Al-Omiri and Drury (2007b) find a significant association between business size and the adoption of ABC in UK organizations. Innes et al. (2000) find that the adoption of ABC is significantly higher (26.3%) in larger organizations than in smaller organizations (15.8%). Pierce's (2004) findings also confirm that the adoption of ABC is significantly higher among larger organizations than smaller firms. Similarly, Brown et al. (2004) find a significant positive association between organizational size and the adoption of ABC. Also, Abdel-Kader (2008) found a significant association between business size and sophisticated cost systems. Abdel-Kader and Luther (2008, p.7) cite some studies which have concluded that large organisations tend to adopt more advanced MAPs when compared to smaller organisations. For instance, Otley (1995) is

cited as providing proof of how size affects control methods in studies of the role played by MASs after a merger or a takeover. For Haldma and Laats (2002), the advanced level of budgeting systems and cost accounting tends to escalate as the size of a firm gets bigger. However, a few studies have different results regarding the impact of business size on the adoption of a cost system such as ABC. Such studies claim that there is no statistically significant association between size and the adoption of ABC (Libby & Waterhouse, 1996; Gosselin's, 1997; Cohen et al., 2005; Baird, 2007; John, 2014).

It can be concluded that larger organizations have more resources to develop more innovative systems and hence, there is a higher likelihood that they implement more sophisticated costing systems. Therefore, the following hypothesis is tested.

Hypothesis 3 (H3): There is a positive relationship between the size of the organization and the use of cost and management accounting practices.

5.4 Extent of the use of Total Quality Management approaches

Top management is motivated by fulfilling the needs of customers, which are the main objective of total quality management. Total quality management brings improvement in quality and innovation in an organization. Organizations which are using TQM get more advantages in terms of loyal customers, best quality products, and introducing innovations in products (Zehir et al., 2012). However, this results from significant efforts to investigate the cost of modern management practices and the overall management of quality (Shahzadi et al., 2018).

Available evidence suggests that firms that are more innovative in technical areas also tend to be more innovative in administrative areas, and vice versa (Damanpour & Evan, 1984). Thus, firms that have implemented total quality management approaches are likely to be more technologically innovative than other firms and therefore tend to adopt more administrative innovations in cost and management accounting like ABC. Cagwin and Bouwman (2002) note that because ABC often provides more and better information about processes, it may

be more beneficial if other initiatives are employed concurrently. This linkage provides direction to the ABC implementation and a ready application for the ABC information once it becomes available (Swenson, 1998). Other studies have also reported that ABC fits in well with the cost of the quality framework. Krumwiede (1998) has also suggested that firms often link ABC to their formal quality management practices. Therefore, the following hypothesis is tested.

Hypothesis 4 (H4): There is a positive relationship between the application of total quality management and the use of cost and management accounting practices.

5.5 Extent of use of lean production techniques (including JIT techniques)

Firms adopting Just in time (JIT) production techniques establish production cells that are dedicated to the manufacturing of a single product or family of similar products. Hence, many of the support activities can be directly traced to the dedicated cells. Therefore, the benefits of implementing sophisticated costing systems may be lower in JIT organizations. Also, given that JIT production is oriented towards process and time, it is likely to be supported by traditional costing methods that are based on how long the product is in the process. The pursuit of lean production techniques and the JIT philosophy that focuses on eliminating waste or non-value-added activities also motivates firms to derive a better understanding of what is creating the firm's product and support costs and what the cost drivers are. The focus on activity analysis makes the implementation of sophisticated costing techniques based on activity costing and the identification of appropriate cost drivers easier to implement (Al-Omiri & Drury, 2007). The implementation of JIT reduces many entries which are very helpful in accounting system (Dalci, 2006). Based on the conflicting relationship on the impact of lean production techniques, the following null hypothesis is formulated.

Hypothesis 5(H5): There is no relationship between the implementation of lean production techniques and the use of cost and management accounting practices.

5.6 Quality and choice of information technology needed in the competitive market

The chosen level of cost system sophistication should be made on costs versus benefits criteria (Al-Omiri & Drury, 2007). Sophisticated costing systems become more beneficial as the cost of data collection and processing is reduced (Cooper, 1988b). The level of information technology can thus play an essential role in influencing cost system design. For example, the measurement cost associated with using additional cost drivers depends on whether the data required by that driver is already available or has to be specifically determined. Organizations with high-quality information systems can provide detailed data that is easy to access relating to the cost driver information that is needed by more sophisticated costing systems. In general, companies with shared databases that track the detailed operational data needed for resource and activity analysis have an easier time implementing and maintaining ABC (Reeve, 1995; Anderson, 1995). The following non-directional hypothesis is, therefore formulated.

Hypothesis 6(H6): There is a positive relationship between the quality of an organization's information technology and the use of cost and management accounting practices.

5.7 Perceived environmental uncertainty

External environments are all elements that exist outside the boundary of the organization and have a potential effect on the whole or parts of the organization (Daft, 2010:140; Robbins & Judge, 2012:499). The external environment is an influential contextual variable that is the foundation of contingency-based research in management accounting (Chenhall, 2003:137). The external environment creates uncertainty for the organization (Daft, 2010:59). Environmental uncertainty is an aspect that has been studied extensively in research in the field of management accounting (Chenhall, 2003:137).

Uncertainty can be defined as an individual's perceived inability to predict something accurately (Milliken, 1987:136). The similar definition was adopted by Hoque (2004: 90) and CIMA (2005:97) who focused on the concept of

perception. In many studies, environmental uncertainty is expressed in perceived environmental uncertainty (PEU). The use of perception rather than the objective reality of the external environment or the property itself has invited a lot of debate (Miliken, 1987:134; Sharfman & Dean, 1991:682). However, Miliken (1987:134) argues that the problem is not in the idea but on the execution of the idea.

PEU is one of the first contingent factors examined for their effect on the design of management accounting practices. Gull and Chia (1994) showed that when perceived environmental uncertainty is low, management can make relatively accurate predictions in the market. Abdelkader et al. (2008) found that firms that perceive a higher degree of environmental uncertainty adopt more sophisticated management accounting practices than firms that perceive low environmental uncertainty. The level of environmental uncertainty affects the level of improvement in management accounting practices (Amara & Benelfe, 2007). Researchers in management accounting and control systems argue that managers that realize the importance of environmental uncertainty give greater importance to management accounting systems (Al Malawi, 2015; Hoque, 2004). The contingency-based literature concludes that the external environment is a key influential factor in the choice of the design of control and performance measures (Chenhall, 2003; Fakhri, 2012). King et al. (2010, p.45) argue that “PEU is seen to be an important contextual factor in the design of MCS because increased PEU makes managerial planning and control more difficult”.

The findings from several studies (Gordon & Miller, 1976; Gul, 1991; Govindarajan, 1984; Schulz et al., 2010) report that high environmental uncertainty results in the use of broad scope information (i.e. financial and non-financial). Chenhall and Morris (1986) find a positive association between perceived environmental uncertainty and the demand for broad-based information systems incorporating non-financial indicators. Gosselin (1997) finds that environmental uncertainty influences the decision to implement activity-based costing. Ivey and Menor (2004) examined contingency factors affecting the adoption of the BSC using a combination of survey and archival data. From

these studies, they find that the adoption of BSC is significantly related to firm strategy, firm size, and environmental uncertainty. Banker et al. (2001) show, based on their study that firms employing a Balanced Scorecard to measure their performance face a reduced level of PEU. However, Verbeeten (2004), Zuriekat (2005), Zhu et al. (2009) and Jusoh (2010) have concluded that PEU has no significant influence on the use of MPMs.

Hypothesis7 (H7): There is a positive association between **the perceived environmental uncertainty** and the use of cost and management accounting practices.

5.8 Qualification of Cost and Management Accounting Staff

The level of qualification among accounting staff is defined as the knowledge obtained by an accountant to perform some activity in their organization (Nair & Nian, 2017). According to Abdel-Kader and Luther (2008), the level of qualification is essential and crucial for accountants. Qualified accounting staff are also crucial to an organization as the knowledge of accounting staff would affect the success, growth, and sustainability of the organization (Brown, Booth, & Giacobbe, 2004). Abdel-Kader and Luther (2008) examined the effect of the level of qualification of accounting staff on MAPs in the UK. The results indicated that the level of qualification of accounting staff would differ between the sophistication of management accounting and organization. Haldma and Laats's (2002) study on accounting staff on MAPs in Estonian manufacturing companies found that there is a significant relationship between the level of qualification of accounting staff and MAPs. Also, the authors found that there is a lot of accounting staff that did not have proper knowledge on how to use the accounting information. Ahmad (2012) examined the relationship between the level of qualification of accounting staff and MAPs in Malaysian SMEs. The author found that the level of qualification of accounting staff had a significant impact on MAPs in Malaysian SMEs. Furthermore, the study found that the education level of accounting staff significantly influenced the preparing and usage of accounting information.

Larger organizations typically have accounting and finance departments (Ismail & King, 2007). It could be said that large companies hire qualified accounting staffs to use MAPs for internal reporting and to assist top management in the decision-making process (Ismail & King, 2007). In terms of the SMEs context, MAPs applied by qualified accounting staffs may have a significant impact on the organization's productivity and growth (Collis & Jarvis, 2002). Consequently, the qualification of accounting staff is one of the factors that might affect the adoption of MAPs in an organization. On the other hand, the shortage of qualified accountants may serve as a crucial aspect, as far as the application of contemporary management accounting techniques is concerned.

Hypothesis 8(H8): There is a positive relationship between the *Qualification of Cost and Management Accounting Staff* and the use of cost and management accounting practices.

6. Research design and data collection

A postal and e-mail questionnaire survey was used to gather the data. The targeted population was KSA manufacturing firms. A survey was designed to fulfil the aims of this study. The full questionnaire was developed based on those used in prior research. Before mailing the final version of the questionnaire, a pilot study was undertaken using a group of university academics, managers, and management accountants. Before the survey instrument was mailed to the organizations under investigation, its content validity was addressed by asking a group of experienced management accounting lecturers and postgraduate students to review the instrument for clarity and meaning and to refine the design and refocus the content. Based on the responses to the pilot survey, appropriate modifications were made to the final version of the questionnaire. These are mainly related to the clarity of the questions and the layout of the questionnaire. The final version of the questionnaire excludes the front covering page. The first page included guidance notes to facilitate answering some of the questions. The personalized letter requested the addressee to participate in the survey by answering the questionnaire themselves or for another knowledgeable

person to answer the questionnaire. Respondents were assured that their anonymity would be preserved. The procedure was undertaken to increase the response rate and the accuracy of the survey responses. A follow-up package was sent seven weeks later. Also, communication by email was used for most companies and was used to follow up process as well.

In KSA, a total of 49 questionnaires were returned from the 62 sent to companies in KSA. Therefore, the response rate = $49/62 \times 100 = 79\%$.

7. Demographic data of respondents

Table 1: The level of education for our respondents

Education	Frequency	%
PhD	4	8.2
Masters	8	16.3
Bachelor	29	59.2
Diploma	6	12.2
Other	2	4.1
Total	49	100.0

As can be noted from the table above, four respondents hold PhD 8.2 %; eight respondents have master 16.3 %; 29 respondents have a bachelor degree 59.2 %; six respondents have diploma 12.2% and two respondents indicated by other 4.1%.

Table 2: The respondents' Job

Respondent's job	Frequency	%
Financial Manager	17	34.7
Director of Production Management	10	20.4
Director of Costing Management	8	16.3
Management Accountant	8	16.3
other	6	12.2
Total	49	100.0

As can be noted from the table above, 17 respondents work as financial manager (34.7%); ten respondents work as director of production management (20.4%); eight respondents work as director of costing management (16.3%); eight respondents work as management accountant (16.3%) and six respondents titled by other (12.2%)

We concluded that our respondents have a high level of education, with good jobs. Therefore, they can adequately answer our questions.

Table 3: The capital of our firms

Capital	Frequency	%
Less than 50 m	16	32.7
50m –100 m	8	16.3
100–200 m	11	22.4
200–300m	3	6.1
300–500m	6	12.2
500–750m	2	4.1
Over 750m	3	6.1
Total	49	100

From Table 3, 16 firms less than 50 million (32.7%), 8 companies between 50 to 100 million (16.3%), 100 to 200 million (11 companies) (22.4%), three companies from 200 to 300 million (6.1%), six companies from 300 to 500 million (12.2%), two companies between 500 to 750 million (4.1%) and three companies more than 750 million (6.1%).

8. Measurement of the variables

Dependent variable:

The dependent variables contain fifteen from the cost and management accounting tools (Absorption Costing; Variable Costing; Activity-Based Costing; Activity-Based Budgeting; Activity Analysis; Life Cycle Costing; Target Costing; Benchmarking; Balanced Scorecard; Economic value-added; Cost control system; Value Chain Analysis; Transfer Pricing; Kaizen Costing; and Break-even Analysis). The questionnaire ascertained whether the respondents used Cost and management accounting practice in their firms based on a scale from 1 to 7 (1 denotes to never used, and seven denotes to extensively used). The results of the survey are presented in Table 4.

Table 4: Cost and management accounting techniques practices

Cost and Management Accounting Techniques	N	1&2%	6&7%	Mean	Std. Deviation	Cronbach's alpha
Absorption Costing	49	6.1	73.5	5.76	1.665	90
Variable Costing	49	4.1	75.5	5.98	1.493	
Activity-Based Costing	49	6.1	63.3	5.45	1.672	
Activity-Based Budgeting	49	6.1	65.3	5.41	1.914	
Activity Analysis	48	8.3	77.1	5.75	1.707	

Cost and Management Accounting Techniques	N	1&2%	6&7%	Mean	Std. Deviation	Cronbach's alpha
Life Cycle Costing	49	8.2	85.7	6.31	1.342	
Target Costing	49	8.2	75.5	5.86	1.399	
Benchmarking	49	4.1	55.1	5.53	1.487	
Balanced Scorecard	49	4.1	61.1	5.59	1.499	
Economic value added	49	4	71	5.78	1.418	
Management control system	49	4	71.5	5.90	1.342	
Value Chain Analysis	49	10.2	51	4.96	1.620	
Transfer Pricing	49	16.3	26.6	4.35	1.627	
Kaizen Costing	48	14.6	50.1	4.83	1.742	
Break-even Analysis	49	12.2	36.8	4.88	1.615	

The dependent variable was the cost and management accounting tools. The Likert scale was used. Objective data were used for size. *The size* was measured using the capital of the company (SR million for KSA) for the respondents' business unit. The other variables of interest required the use of perceptive measures, and thus multi-question Likert-type seven-point scales were used to derive a composite score for each variable. Where possible, the measures were based on prior literature. Details specifying the number of questions used and Cronbach's Alpha for the independent variables are shown in Table 5.

- Importance of cost information
- Intensity of the competitive environment
- Size of the firm

- The quality of information technology
- Extent of the use of Total Quality Management approaches
- Extent of use of lean production techniques (including JIT techniques)
- Perceived environmental uncertainty
- Qualification of Cost and Management Accounting Staff

Table 5: the number of questions for the independent variables and Cronbach's Alpha

Variable	Number of questions	Cronbach's alpha
1-Importance of cost information	5	0.64
2-Intensity of the competitive environment	9	0.66
3-Size	1	Objective measure
4-The quality of information technology	4	0.77
5-Extent of the use of Total Quality Management approaches	4	0.75
6-Extent of use of lean production techniques (including JIT techniques)	5	0.82
7-Perceived environmental uncertainty	8	0.86
8-Qualification of Cost and Management Accounting Staff	5	0.855

It was necessary to discover whether there is a difference between low and high cost and management accounting practices usage regarding to the importance of cost information; intensity of the competitive environment; size of the firm; the quality of information technology; extent of the use of Total Quality Management approaches; extent of use of lean production techniques (including JIT techniques); **perceived environmental uncertainty** and

qualification of cost and management accounting staff . The firms were divided into two groups, low and high cost; and management accounting practices usage. The first group contained 22 manufacturing and the second group contained 27 manufacturing firms.

A non-parametric test (Mann–Whitney) was used for all variables expect size where T–Test was used. The *p*-values and summary statistics for each of the items examined for two groups are shown in Table 6. This table indicates that significant differences were observed between low and high cost and management accounting practices usage in respect of the Importance of cost information ; Intensity of the competitive environment; Size of the firm; The quality of information technology; Extent of the use of Total Quality Management approaches; Extent of use of lean production techniques (including JIT techniques); **Perceived environmental uncertainty** and Qualification of Cost and Management Accounting Staff.

Table 6: low and high usage of cost and management accounting practices

Variable	Mean	Std. Deviation	Mann–Whitney Test
1-Importance of cost information	4.64	0.92	0.001
2-Intensity of the competitive environment	4.47	0.90	0.002
3-Size *	10.53	0.72	0.000
4-The quality of information technology	4.28	1.33	0.000
5-Extent of the use of Total Quality Management approaches	4.88	0.77	0.000
6-Extent of use of lean production techniques (including JIT techniques)	4.80	0.97	0.000
7-Perceived environmental uncertainty	5.49	0.84	0.000
8-Qualification of Cost and Management Accounting Staff	5.78	0.95	0.000

– T. tset was used for Size variable

9. Conclusion, limitation and future research

Little attention has been given by previous research into examining the factors that affect cost and management accounting practices and the level of the usage of these techniques. Where these issues have been examined, the studies have relied on single response questions rather than Likert scale questions used in this study. Also, the paper has examined the degree of usage of cost and management accounting practices and the determinants of that level. Also, this study was inspired by the reality that there are a few research studies in the area of management and cost accounting techniques practice in developing countries. In this regard, previous research has pointed out that the application of management accounting in less developed countries remains inadequate and studies on this area are few in the literature (Lin & Yu, 2002; Sleihat et al., 2012). Studies in management accounting have been mainly conducted in the western world (Abdel-Kader & Luther, 2006, 2008; Uyar, 2010; Van Triest & Elshahat, 2007). Therefore, this paper attempts to fill this gap by examining management and cost accounting techniques practices in a developing country, using KSA as the research context. This study will provide empirical evidence on the existence and use of management and cost accounting techniques in the context of an emerging market: the KSA.

Table 7: the results of the examination of the hypothesis

Hypothesis number	The hypothesis	The relation's level (result)
1	There is a positive relationship between the justification of cost information and the use of cost and management accounting practices	significant
2	There is a positive association between the intensity of competition and the use of cost and management accounting practices.	significant
3	There is a positive relationship between the size of the organization and the use of cost and	significant

Hypothesis number	The hypothesis	The relation's level (result)
	management accounting practices	
4	There is a positive relationship between the application of total quality management and the use of cost and management accounting practices	significant
5	There is no relationship between the implementation of lean production techniques and the use of cost and management accounting practices	significant
6	There is a positive relationship between the quality of an organization's information technology and the use of cost and management accounting practices	significant
7	There is a positive association between the perceived environmental uncertainty and the use of cost and management accounting practices	significant
8	There is a positive relationship between the Qualification of Cost and Management Accounting Staff and the use of cost and management accounting practices	significant

Despite not using advance analysis, the tests that have been used show that there is a significant relationship between cost and management accounting practices and the factor of importance of cost information; intensity of the competitive environment; size of the firm; the quality of information technology; extent of the use of total quality management approaches; extent of use of lean production techniques (including JIT techniques); **perceived environmental uncertainty**; and qualification of cost and management

accounting staff. We concluded that all our hypotheses were confirmed by the results above. Due to time constraints, we have not used an advanced test for the current study. Therefore, future study may use an advanced statistic, like regression, to confirm our results.

Just like any other study, this study has its limitations. We used five items to measure the influencing of the qualification of cost and management accounting staff (*our accounting staff has ability for implementation of new techniques in accounting, our accounting staff has ability in finance knowledge, our accounting staff has ability of innovation orientation in management accounting, our accounting staff has ability in communication skills, our accounting staff has proper knowledge how to use the accounting information*). Some of the accountants answered (16 management accountants) these questions in our study. Therefore, this is a variable that may have a bias. However, some 33 respondents who answered these questions are not accountants. Also, the 15 cost and management accounting techniques have been grouped on one variable. However, based on the importance of every tool, future research may focus on one tool instead of grouping tools. This will be followed by undertaking a more in-depth case study to examine the effect of the independent variables and how they impact on the level of usage. Besides, future research may investigate the effect of these techniques of a firm's performance. This study has focused mainly on the manufacturing sector; future research may include other sectors like the services.

Despite the above limitations, this study has provided additional insights into areas relating to factors impacting on cost and management accounting practices usage. It has also extended the scope of future research. Considerable efforts have been taken to minimise the limitations and remedy the deficiencies of previous studies. It is hoped that this paper will motivate researchers to undertake further research in the areas suggested.

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