Exploring structures of product costing systems adopted by Sri Lankan listed companies: focusing on traditional vs. activity based costing systems

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Abstract

As the business environment has been changing continuously, it is critical to ensure that an appropriate MA system is adopted in organizations for intended purposes. The main objective of this study is to investigate patterns of adopting management accounting (MA) techniques by Sri Lankan listed companies for product costing purposes. This study applies Mixed Method Research approach. Accordingly, data were collected from 42 listed companies representing five industry sectorsin Sri Lanka: Food Beverages & Tobacco, Chemicals & Pharmaceuticals, Diversified Holdings, Manufacturing, and Plantation, through interviews and discussions supplementary to the survey.The main tools of analysis for quantitative data were frequency tables, Pie charts, bar charts and Fisher's exact testsusing SPSS software, and thematic analysis and content analysis for descriptive data.

The findings suggest that Traditional Costing (TC)systems are still popular among all selected industry sectors/companies except for Plantation sector who apply TC by 25% of companies, as they all apply ABC instead. Considering multiple costing systems, the most popular combination is the application of TC with an activity based costing (ABC) system, as complements or alternatives to one another. The study concludes that listed companies are satisfied with the MA techniques adopted for product costing as either single or multiple systems, regardless of whether they are traditional or modern techniques. Even though Sri Lankan listed companies are functioning with sufficient resources and well-equipped staff that require adoption of modern MA techniques i.e. ABC, most reveal that they still see no need to adopt such techniques because they are satisfied with existing systems and applications.

Keywords - M*anagement accounting techniques; Product costing; ABC systems; listed companies; Industry sectors.*

1. Introduction

As the modern business world is highly competitive, business firms must become more competitive on a global basis in order to survive in businesses (Indrani and Herath, 2009). Also, changes in business environment triggered by global competition and technological innovation have led to innovations in the use of both financial and non-financial information within the organization (Soekardan, 2016).

Review of the literature reveals that effective Management Accounting (MA) systems provide managers with useful information to make sound decisions relating to all functions of management and hence improve organizational performance (Interna tional Federation of Accountants - IFAC, 2005). Further, MA literature proposes that effective planning and control are vital in attaining organizational goals and objectives (Herath and Indrani, 2007). In this respect, Sulaiman, Ahmad and Alwi (2004) suggest that to succeed in the present dynamic business environment, tools such as activity based costing (ABC), target costing would greatly enhance the ability of corporations to meet global competition.

In this circumstance, enhancing the quality of product cost information seems to be an imperative target in the MA.Soekardan (2016) also stated thatnew environments within organizations demand for information and relevant data on costs and performance of activities, processes, products, services and customers. However, many companies do not gain a competitive advantage from improved costing systems because they rely on information from the costing systems that were designed for simple technology when the competition was local and not global, and as a result, they do not have valid and accurate information to make their strategic decisions about processes, products, services and customers. Thus, managers need to rethink about their managerial practices and must reshape their current accounting systems, especially their MA systems. In response to such changes, researchers have turned their research for investigating changes and innovations in MA practices.

Accordingly, it is factual that with increased global competition, more accurate cost information that can be derived through ABC systems is vital as this affects positively managerial decisions in an organization. In contrast, distorted cost information derived from traditional costing (TC) systems lead to

poor management decisions. In view of ABC systems compared to traditional approach for product costing, it is stressed that these two methods represent a trade-off between accuracy of information and complexity of producing that information.

In this context, authors have used various terms to describe modern MA techniques including: modernMA techniques; contemporary MA tools; recently-developed MA practices; and advanced MA practices. For instance, Waweru, Hoque & Uliana (2005) defined these MA techniques as either traditional or modern; Sulaiman et al. (2004) termed them as traditional or contemporary tools; and Chenhall and Langfield-Smith (1998) used the terms of traditional and recently-developed MA practices. In consideration of this variety of terms, this study adopted the terms: traditionalandmodern to describe these MA techniques

Considering these two types of MA techniques, literature review evidenceson different views that in some settings TC systemsare still widely used particularly in developing countries i.e. Rahman, Omar & Abidin (2003); Sulaiman, et al.(2004); Mclellan,Ain and Moustafa (2013), while ABC systems are popular in developed countries i.e. Chenhall and Langfield-Smith (1998); Wijewardena and De Zoysa (1999); Sulaiman et al. (2004). Based on a study in a Portuguese company, Almeida and Cunha (2017) also emphasize that the ABC system provides relevant and useful information for the decision-making process in various domains, such as the definition of cost and sales prices of products, the identification of processes where greater effort is needed to improve or adapt them to the new realities and needs, and the restructuring of some areas of the industrial unit.

Rasiah (2011) comparing ABC model and traditional costing method in Malaysia expressed somewhat different thoughts that ABC system can be considered as an alternative model to traditional cost-based accounting systems. Most operations managers believed that their present cost systems were adequate for decision making. In certain circumstances, operations managers evaluated their cost systems as more effective than those using other cost systems. ABCsystems were evaluated as somewhat more useful, but no relevant literature was found to indicate that either the external or internal environment of the firm was correlated with the choice of cost system. Eventually, Rasiah dignified ABC system and TC system asequally competing product costing methods.

In turn, Soekardan (2016) reported that ABC system has practical short comings: there will be some costs that cannot be traced, for example, costs of academic staff of head quarters which requires arbitrary allocation. Thus, MA literature has recently focused more on the management side of ABC costing rather than technical aspects alone. Meanwhile, Waweru, et al.(2005), through a survey of MA practices in South Africa, illustrate rather different thoughts: using modern MA techniques together with the traditional MA techniques, business firms have been striving to reduce waste in their production processes and to move towards eliminating non-value-added activities and hence waste reduction.

However, in view of previous studies undertaken in relation to developing countries, no studies were found with regard to exploring patterns of adopting TC vs. ABC systems by business entities. Thus, this study mainly focuses on exploring structures of product costing systems practiced by listed companies in a developing country, like Sri Lanka: whether they are practicing TC systems vs. ABC systems as a single system or; combination of more than one costing system as a complement or an alternative, one to another; and if so, identifying nature of such combinations in relation to different industry sectors.Consequently, literature review together with MA changes, intense debates, greater interest of researchers shown at international level in recent past which was elicited by global competition and technological innovation, encouraged the authors to develop this paper contributing to the MA literature in the phenomena under investigation.

2.Literature Review

When considering application of traditional vs. modern MA techniques, Rahman et al. (2003), through a survey undertaken in Malaysia found that the actual application of MA techniques in Malaysian companies is still very low and mostly they use only traditional MA techniques such as budgetary control and variance analysis. In the sense, it convinces that adoption of modern MA techniques will lead Malaysian companies to compete globally in future (Rahman et al., 2003). Supporting to these outcomes, Sulaiman, et al.(2004), through a literature review of four Asian countries: Singapore, Malaysia, China and India, illustrate that traditional MA techniques are seen to be less useful in the present-day manufacturing setting. It concludes with evidence that the use of modern MA tools is lacking, while the use of traditional MA tools remains strong in these four countries (Sulaiman et al., 2004).

Concentrating on costing systems applied by business entities, Waweru et al.(2005)in relation to South African firms, present supportive findings to the above results. That is, South African firms depict a widespread use of simple cost allocation methods, regardless of the high proportion of indirect costs, which contrasts with that in developed countries, where a high proportion of indirect costs has resulted in the widespread use of activity-based cost allocation methods. Wijewardena and De Zoysa (1999) also find somewhat similar situations in Japanese and Australian firms, in that, despite the decreased labour components in manufacturing cost structure, manufacturing companies in both countries seem to allocate factory overheads mainly based on direct labour. On average, direct labour percentages of total manufacturing costs are 16.3% and 22.1% in Japanese and Australian firms, respectively. Regarding costing systems, Australian companies indicate a higher percentage use of standard costing systems (69%) than Japanese companies (31%); on the other hand, Japanese companies indicate a higher percentage use of actual costing systems (48%) than their Australian counterparts (31%) (Wijewardena and De Zoysa, 1999).

Considering local and foreign companies,Tuanmat and Smith (2011) indicate somewhat different views compared to Abdul-Rahman, Omar, & Taylor (2002) findings that foreign companies often use modern MA practices and local companies are still largely using traditional methods, that both local and foreign manufacturing companies in Malaysia increasingly used modern MA practices. Tuanmat and Smith (2011) further emphasize that this result is interesting because local companies need to be more aggressive in managing their business in order to compete globally.

Supporting to above views, Mclellan, et al., (2013) also find that companies in the Arab Gulf Co-operative Countries rely on more traditional MA practices such as budgeting than the recently developed strategically focused tools such as activity-based management and balanced scorecard. However, Waweru et al. (2005), through a survey of MA practices in 52 listed companies in South Africa, illustrate rather different thoughts: using modern MA techniques together with the traditional MA techniques, business firms have been striving to reduce waste in their production processes and to move towards eliminating non-value-added activities and hence waste reduction.

Considering adoption of ABC systems, Sulaiman et al. (2004) state that recent surveys have reported the increasing use

of ABC, particularly amongst Western enterprises; in Asian countries percentage use of ABC is lower. Conversely, amongst foreign firms and foreign-partnered joint-venture firms, ABC usage is much higher. Similarly, Wijewardenaand De Zoysa (1999), find that ABC appears to be more popular among Australian companies, but it is rarely used in the Japanese companies.

In view of the importance of adopting ABC systems, Almeida and Cunha (2017) relating to a coffee production process of a Portuguese company, realized that ABC system facilitated obtaining, analyzing and reflecting about a set of information of high importance for the organization. This provides high level of details and specificity of the information, allowing a broad analysis of the various components of the cost of the product under investigation. However, as this company produces several products simultaneously sharing a wide range of resources, the correct allocation of those resources to the various products can be complex and ineffective. Finally, they conclude that the implementation of the ABC system led the management to obtain a wide set of information, with high details, relevance and usefulness, indicating that this is a costing system that adapts to the needs of this company (Almeida and Cunha, 2017).

However, somewhat diverse argument is that ABC systems and TC systems symbolize two competing product costing methods. TC systems use only the unit-level drivers to assign costs to cost objects (products) while ABC systems utilize more cost pools and more cost drivers in the process of cost allocation.Comparing ABC model and TC methods in Malaysia, Rasiah (2011) indicates that most operations managers believed that their present costing systems i.e. TC systemswere adequate for decision making. In certain circumstances, operations managers evaluated their costing systems as more effective than those using other costing systems. Generally in Malaysia, many small and medium size companies useTC systems which are inclined by their simplicity and inexpensiveness to manage the system (Rasiah, 2011).In the sense, as cited by Rasiah (2011), ABC is being extensively implemented as an alternative to TC systems (Andrade, Filho, Maia and Qassim, 1999).

Kumar and Mahto (2013), defined ABC as a methodology that measures the costs and performance of activities, resources and cost objects. Based on a case study undertaken in an Automobile parts manufacturing company, Kumar and Mahto (2013) disclosed that compared to TC method, ABC method gives true costs of the parts and hence, the company can get benefited by

increasing its sales according to the demand of the products in view the true costs of the parts which is calculated by ABC method and not the TC method. Also, it can easily decide that which item or part is to be produced more to achieve its goal. ABC system can thus, be considered as an alternative method to TC systems.

The ABC hierarchy highlights the relationship between activities and resource consumption. TC systems look at what was spent, while ABC look at what was done in terms of activities. From the point of view of the latter, it was much easier to identify opportunities to reduce costs and improve performance, while maintaining the quality of care provided (Rasiah, 2011). ABC is different from TC in terms of the number of cost pools and the number and type of cost drivers. The activity cost pool represents the total cost associated with an activity. In this respect, a cost driver denotes a phase that stems direct influence on the cost and performance of the activities. As cited by Rasiah 2011, the cost drivers presented the ultimate explanation on why costs in an activity cost pool altered over time (Kennedy, 1996).

In TC systems, normally the cost allocationis based on labour hours or machine hours which are hard to disclose the actual cause and effect relationship between indirect costs and distinct products.Thus, in order to turn up with better product costing and pricing, companies have been replacing theirTC systems with ABC systems which can provide a vibrantsight of how a firm's diverse products, services, and activities contribute to the firm's outcome. Even though developing and implementing an ABC system is expensive and time consuming, many firms found that the benefits exceed the cost of installing an ABC system. Thus, ABC represents the symbol of improved competitiveness and efficiency in every organization. In this setting, to be successful, management accountants need to cooperate with engineers, and manufacturing and operating managers to form a design team (Jeyaraj, 2015).Supporting to these opinions, Lu, Wang, Wu and Cheng (2017) based on a bicycle parts company found that TC system with single cost driver yields distorted cost allocation, in comparison; implementation of ABC is able to account for the resources consumption by each bicycle part and therefore, yield more accurate cost allocations.

In response to drawbacks experienced with TC systems, in recent years, companies have reduced their dependency on TC systems by developing activity based cost management systems. The ABC is designed to assign costs to activities

which enable to produce more accurate cost information. ABC exposes the links between performing particular activities and the demands those activities make on the organization's resources, so that it gives managers a clear picture of how parts, brands, customers, facilities, regions, or distribution channels generate revenues and consume resources. The profitability picture that emerges from the ABC analysis helps managers focus their attention and energy on improving activities (Kumar and Mahto, 2013).

Chenhall and Langfield-Smith (1998), through a survey focusing on the relative adoption and benefits obtained from both traditional and modern MA practices in large Australian manufacturing firms, reveal that, although the adoption rates for many modern MA practices such as ABC are higher than those reported in surveys from other countries, overall the adoption rates of traditional MA practices are higher than those of modern MA techniques. Also, the benefits obtained from traditional MA techniques are higher than those of modern MA techniques. However, many firms intend to place greater emphasis on modern MA techniques in future, particularly on activity-based techniques and benchmarking.

Tuanmat and Smith (2011) further investigated whether modern MA practices should be used to complement or substitute for traditional MA practices, which is an important issue because business firms have to make suitable changes in their MA practices to maintain effectiveness. Firms recognize that, as technology becomes more advanced, existing MA practices need to be replaced with new techniques that can cope with the changes in production processes as well as cost structures. The findings reveal that those companies largely change both traditional and modern MA practices either as a replacement, a new introduction or a modification of the use of an existing system. This implies that modern and traditional MA practices can potentially be perceived as both complements and substitutes for each other, and thus they recommend using both modern and traditional MA practices as complements and as substitutes. They further suggest that, in situations where the traditional system is inadequate in providing sufficient information, but still able to provide useful information, an advanced system should be adopted to provide more information for decision making purposes. However, once the traditional systems are no longer able to cope with changes in information requirements, and fail to provide useful information, then they

should be replaced with more advanced systems (Tuanmat & Smith 2011).

In turn, Soekardan (2016) reported that ABC system has practical shortcomings: there will be some costs that cannot be traced, for example, costs of administrative staff headquarters which requires arbitrary allocation. Thus, MA literature has recently focused more on the management side of ABC costing rather than technical aspects alone. Soekardan (2016) concludes that method of calculating product cost using ABC has weaknesses that can make management decisions only oriented to long term decisions alone. He argued that in companies that have a long history of success by relying on traditional cost calculations, it will be difficult to convince management that a new costing system is needed. In such a situation, Soekardan (2016) recommended, as a solution for this problem, to continue to use the TC system which is already known, and experiment with ABC separately by using it first for one product line, the facility, or a category of expenses such as service departments.

Similarly, Ghanbari, Khorasani, Manesh and Khoshnava(2016) reveals that majority of organizations used ABC as the modern method of costing, however, many small and medium companies have preferred to use the TC systems. They concluded that while many companies have turned to ABC systems, some companies still use TC systems which have been developed decades ago in this new era of globalization.In such circumstance, their recommendation is that before selecting costing methods to use, it is important to clearly verify what they need; and for this purpose organizations need to study pros and cons of each costing system and then apply the most suitable method/s for their intended costing purposes.

However, despite the implementation of ABC offering advantages over the TC systems, it remains challenges for companies to adopt ABC due to high implementation costs incurred in data collection for first-stage allocation. In the sense,application of ABC was not beneficial due to the high costs of implementation (Kaplan and Anderson, 2007). Thus, anew approach 'Time-Driven Activity Based Costing System (TDABC)' was introduced by Kaplan and Anderson (2007) to address the problem of high implementation costs of ABC systems (Cited by Huang 2018).Thus, as Sulaiman, et al. (2004) suggested an interesting area to address in future research is the obstacles to ABC implementation in Asian firms.

In such a setting, concentrating on TC systems against the ABC systems, this

study focuses on exploringstructures of costing systems adopted by Sri Lanka Listed companies towards achieving their product costing purposes.

3.Research Problem, objectives and methodology

3.1. Research Problem

Tuanmat and Smith (2011) emphasize that, as the business environment has been changing continuously, it is critical to ensure that an appropriate MA system is practiced in organizations. This is important because effective MA systems can help managers to better coordinate business activities and provide useful information for them to make decisions, and this process will ultimately improve organizational performance. However, there is no regulatory framework in relation to the practices of MA, so that adopting MA practices for business entities is mostly flexible, unaudited and voluntary in nature. Nevertheless, as Burritt, Hahn and Schaltegger (2002) state, MA systems should be designed to satisfy the needs of different managers seeking different types of information (Schaltegger & Burritt 2000). In the sense, it is realized that the adoption of MA techniques for product costing purposes by Sri Lankan business entities is also not bound by legislation, and as a result, those entities may adopt appropriate techniques for costing purposes according to their particular interest and requirements. Thus, it is vital to investigate structures of costing systems adopted by Sri Lankan listed companies focusing on traditional vs. ABC systems and on specific circumstances faced by different industries.

3.2 Objectives of the Study

The main objective of this study is to investigate structures of costing systems focusing on traditional vs. modern MA techniques adopted by Sri Lankan listed companies for product costing purposes. In this end, it initially efforts on identifying the level of adoption of traditional vs. modern MA techniques i.e. ABC systems for product costing purposes and then examines whether they are applying as single or multiple costing systems: either traditional or modern, or both traditional and modern techniques together. It also concerns about application of ABC, exploring itsrelationship with company/industry characteristics and analyzing the proportion and patterns of assigning indirect cost to products. Further it examines influencing factors for not adopting ABC by Sri Lankan listed companies.

3.3 Methodology

3.3.1Applying a Mixed Method Research (MMR) approach

This study applies MMR approachbased on the MMR designs made by Morse (2010), to obtain a rich dataset that is essential for competently addressing the research questions. There are strengths and weaknesses in both quantitative and qualitative research methods, so that one possible response to this is to propose combining them in 'mixed methods research'. Such a strategy would seem to allow the various strengths to be capitalized upon and the weaknesses offset (Bryman & Bell, 2007).In view of research methods associated with qualitative and quantitative research, Bryman and Bell (2007) state that the amount of combined research has been increasing since the early 1980s, and combined research is especially popular in business and management research.Collis and Hussey (2003) also state that it is not unusual in business research to take a mixture of approaches, particularly in the methods of collecting and analyzing data. As they pointed out, mix methodologies allow researchers to take a broader and often complementary view of the research problem or issue.

MMR have been defined as qualitative and quantitative data collection, data analysis, and the mixing of qualitative and quantitative approaches within a single study, with data integrated at some stage (Creswell & Plano Clark, 2007). Bryman (2006a, 2006b) also emphasizes that the qualitative and quantitative data deriving from MMR research should be mutually illuminating. The researcher was motivated to use MMR approach in this study as it helps produce complete and expressive analysis and thorough interpretation on findings. This approach thus, supports the researcher in analyzing both quantitative and qualitative data to obtain meaningful findings, and hence reach sound conclusions.

3.3.2Theoretical Drive, Core Component and Supplemental Component

In this study, according to the MMR designs of Morse (2010), the theoretical drive which is the complete method is identified as quantitative (indicated as QUAN) that best answers most of the research question. Then the part of the question that cannot be answered by the selected quantitative method is addressed by either a qualitative or quantitative strategy, conducted at the same time (called simultaneous, shown with a + sign) or else immediately following the core component (called sequential, an arrow →) . Thus, the core component is identified as 'QUAN' and

supplemental component as 'qual' for this study. Considering the major types of simultaneous and sequential mixed methods deigns depicted by Morse (2010, p. 341) this research is concerned with two paradigms (out of eight paradigms) in respect of methods and strategies applied simultaneously and subsequently to the survey, indicated as:

QUAN + *qual* and QUAN → *qual*

Here, the theoretical driver is indicated with 'uppercase' and supplemental strategy with 'lowercase'.

3.3.3.Population and Sample

By applying the multi-stage purposeful random sampling technique, this study first, selected five industry sectors out of a total of 20 sectors listed in the Colombo Stock Exchange (CSE) in Sri Lanka, and then carefully chosen 42 companies: Food Beverages & Tobacco - F & B (8/22), Chemicals & Pharma ceuticals - CHEM (3/12), Diversified Holdings DVS (5/16), Manufacturing –MNF (18/39), and Plantation- PLT (8/20). Accordingly, the population denotes 109 listed companies and the sample (42 companies) from five industry sectors consists of manu facturing and manufacturing-related industries. Individual companies were chosen by applying random sampling and non-random sampling methods such as snowball sampling, convenience sampling and purposeful sampling considering factors such as accessibility to companies, relevance of businesses to the research area, and nature of data and information required.

3.3.4.Data collection

Data collection was undertaken using three instruments: questionnaire survey, interviews and discussions. The researcher,applying a 'personal visit approach' visited each and every company for the survey (for collecting Core data for QUAN),and conducted interviews and discussions (for collecting supplementary *qual* data) concurrently (QUAN + *qual*) and subsequent to the survey (QUAN → qual).In the first phase, QUAN + *qual* includes of face-to-face questionnaire surveys together with interviews and discussions with respondents of 42 companies.Then, QUAN → *qual* approach was applied where necessary, depending mainly on situations and issued identified through the survey, necessity, accessibility to further in formation, time constraints/ preference of respondents to provide detailed descriptive information. The researcher also accessed company policy documents and sources mainly annual reports.

In the data collection process, the researcher tried as maximum as possible to get involved with senior management (finance executives) signifying approximately 80% of respondents, and the rest included middle level manage ment i.e. Management Accountants/ Financial Accountants. Because senior management is typically competent to provide more descriptive analytical answers to questions with their vast knowledge and experience, not only in the specific area of concern i.e. accounting but also in the other areas of the business, and hence facilitated the researcher to have meaningful findings and discussion. This process, followed in the data collection, helped build trust and mutual understanding between the researcher and respondents, so that the researcher could maintain a 100% response rate by motivating respondents to provide all required data with adequate accuracy and completeness and with proper understanding about the questions and context.

3.3.5. Data tabulation and analysis

The survey data were tabulated and analyzed using SPSS software, frequency tables, bar charts, pie charts, and Chi- square with cross tabulation (Fisher's exact test),while employing 'thematic analysis' and 'Content analysis' for descriptive data. A coding system was applied to identify companies industry-wise, but also protecting their anonymity. This study is concerned with analyzing both quantitative and qualitative data and information. The point of interface for this study is determined at the point where the two components meet in the analysis.

As depicted by Morse (2010), there are two points of interface available in MMR design for integrating core (QUAN) components and supplemental (qual) components to form a meaningful complete analysis and interpretations: 'analytical point of interface' that concerns with transforming qual data into numerical form; and 'results point of interface' that adding qual data to QUAN results. Accordingly, the researcher identified 'results point of interface' as the suitable position for integrating these two components (core component 'QUAN' and supplemental component 'qual'). Because the qualitative data and information could not be transformed into numerical form, but they are suitable for adding to QUAN results to provide descriptive meaningful complete analysis and interpretations for the study. In most instances, core data derived through the survey were analyzed first and then reinforced such analysis and situations using supplemental qual data with more details, evidence and examples.

4.Characteristics of the sampled companies

4.1 Size of companies: Large and medium scale

All companies in the sample deal with manufacturing and selling of different types of products for local and/or export markets. Out of 42 sampled companies, the majority (31 companies - 73.8%) is large size and 11 companies (26.2%) are medium size:all companies in the DVS and PLT sectors are large, whereas in the other sectors the majority is large. This study demarcates large and medium scale companies according to the 'National Policy Framework for Small and Medium Enterprises (SME)' in Sri Lanka - the size in the manufacturing sector is based on the number of employees (51- 300 medium size and more than 300 – large size) and annual turnover (Rs.mn. 251- 750 medium size and more than Rs mn. 750 – large size) (www.industry.gov.lk. 2015).

4.2 Structure of the sample, industry sector-wise

The combination of industry sectors in the sample can be demonstrated in a pie chart as shown in Figure 1.

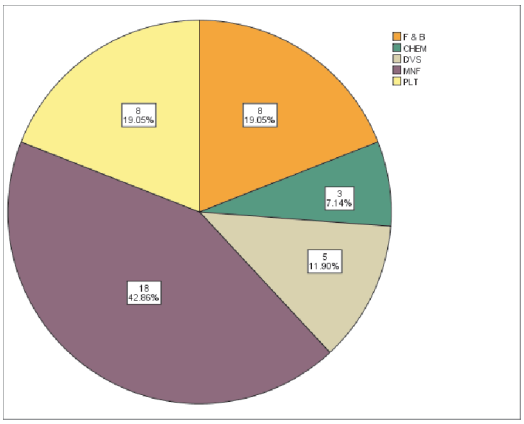

Figure 1 Industry sectors to which a company belongs

4.3 Personnel involved in MA practices:

Considering MA systems applied, all companies use both management accounting systems (MASs) and Financial Accounting Systems (FASs) and most integrate them to a degree, perhaps depending on their own information requirements and available facilities. Some respondents stated that they integrate MASs into FASs, and MAS acts as a sub-system of FAS. However, they all mostly rely on MASs in obtaining information forproduct costing purposes and for managerial decision making. In this setting, 73.8% (31 companies) employed specialists, i.e., management accountants while others (11 companies) function with financial accountants (only 2 - F & B, 1- PLT and 8 - MNF companies). However,

the MA practices of all companies are monitored well under the close supervision of senior management (Finance executives) i.e. the finance director, chief financial controller, finance manager, so that they have been able to handle their MA practices in a healthy manner even in a situation where management accountants are not available for the function.

5.Findings and Discussions

5.1 Level of adopting MA techniques for product costing: traditional vs. modern techniques

The data analysis initially focuses on the level of adopting MA techniques for product costing by responding companies in terms of comparative figures and/or percentages.For this purpose, traditional techniques indicated commonly as traditional product costing (PC) systemsinclude traditional costing (TC), batch costing, process costing, job costing and standard costing, and modern techniques include ABC systems.The study shows that except for the PLT sector, all sectors apply traditional PC to the maximum (100%). The main reason for the rather low usage of traditional PC (25%) in the PLT sector is the highest application of ABC (100%). The average usage of ABC across five sectors appears52% even though the whole PLT sector applies it, implying that the application of ABC by others is really confined to low levels: F&B-38%, CHEM-33%, and MNF- 28%; only the DVS sector represents a comparatively high level of usage (60%). Of five in the DVS sector, three companies apply ABC: one is a multinational company regulated by the parent company in the UK, and the other two are higher-level leading companies, and all of them run their businesses with great reputation for their brands in the Sri Lankan market and perhaps in foreign markets too.

Supporting these findings, Chenhall and Langfield-Smith (1998), relating to large manufacturing firms in Australia, reveal that, although the adoption rates for many recently developed MA practices such as ABC were higher than those reported in surveys from other countries, overall, traditional MA practices were somewhat higher-applied than recently developed ones. In line with the popularity of traditional MA practices, as disclosed in this study, Abdel-Kader and Luther (2006) suggest that MA systems employed in many UK companies representing the food and drink sector were not particularly sophisticated, and concluding that traditional MA is very much alive and sound. Sulaiman et al. (2004), in a

literature review in relation to four Asian countries (Singapore, Malaysia, China and India), suggest that the use of contemporary MA tools is lacking, while the use of traditional MA tools remains strong in the four countries studied.

5.2 Structure of product costing systems:Adopting traditional vs. ABC systems

Regarding the product costing function, the most common feature identified (see Table 1) is that some companies depend on one costing system, while others use more than one at once, in most instances including TC. This combination may be attributed to the necessity of different costing systems for companies depending on the nature of business processes,their diversified product categories and according to the different information needs.

Table 1 Structure of product costing systems by industry sectors

Industry	Number of Companies											Total
	a	b	c	d	a, b	a, c	a, d	a, b, c	a, b, d	a, c, d	a, b, c, d	
F&B	1	0	1	0	2	2	0	1	0	1	0	8
CHEM	2	0	0	0	1	0	0	0	0	0	0	3
DVS	1	0	0	1*	2	0	0	0	0	0	1	5
MNF	7	0	1	0	2	3	1	2	1	1	0	18
PLT	0	6	0	0	2	0	0	0	0	0	0	8
Total	**11**	**6**	**2**	**1**	**9**	**5**	**1**	**3**	**1**	**2**	**1**	**42**

Notes: 1. (a) - Traditional costing (TC); (b) - ABC; (c) - Batch costing; (d) - Others (Job costing, Process costing, Standard costing)
2. * A company that depends on two other systems: Job costing & Standard costing

The findings show that 19 companies (45%) used to depend on one costing system – mostly on TC (26%, most of them in the MNF sector) and ABC (14%, represented only by the PLT sector). The remaining 5% use batch costing, with two companies from the F&B and MNF sectors. Thus, this suggests that companies in Sri Lanka mostly rely on these three MA techniques (TC, ABC and batch costing) for product costing purposes.

Of the 23 companies (55%) who apply more than one costing system, the most popular pattern is the application of TC with ABC, which is common for all sectors, with nine companies (21%), and

then batch costing with TC (12% or five companies), and combination of these three (TC, ABC and batch costing) (7% or three companies). Such a combination may be attributed to sophistication in applying rather complex systems in total (i.e., ABC), the need to ensure accuracy of costs derived through traditional systems, the nature of production processes and sales, and demand for multiple systems (i.e., batch costing, job costing) from diversified product lines. For example, one multi-national company in the DVS sector applies several costing systems (TC, ABC, batch costing and job costing) together, because they have grown steadily, diversifying into a number of areas not only in manufacturing sector but also in the service sector.

5.3 Ranking of costing systems/MA techniques with popularity

In total, the most popular method is TC (78.5%; 33 companies including two PLTs) and the second place goes to ABC, adopted in 20 companies (48%) and third place to batch costing (31%; 13 companies). It also depicts that nine companies (21.5%) do not apply TC; this comprises six companies in the PLT sector, which instead apply ABC, one F&B and one MNF, which apply batch costing, and another one from the DVS sector that manufactures garments and applies job costing and standard costing together. In turn, there is considerably lower demand for other methods that are practiced by only six companies (14%): one company - job costing, two companies - standard costing, one company - job costing and standard costing together, and two companies - process costing. Companies who apply multiple costing systems, including job costing, process costing and batch costing, mostly represent diversified companies with a range of products and also companies with products of a specific nature (typically, here, garments).

These findings suggest that TC remains the most widely used popular costing system in Sri Lanka, probably due to its simplicity, lower cost and its applicability for a variety of business processes. However, the PLT sector indicates a low application of TC (25%), as they all apply ABC instead. Waweru et al. (2005) also present similar findings that modern accounting techniques such as ABC and balanced score card-type performance measures are used together with traditional MA techniques such as budgeting and standard costing in South Africa.

Accordingly, the above findings demonstrate that listed companies mostly adopt suitable costing systems (single and multiple product costing

systems), considering their specific requirements, nature of businesses, different costing purposes and perhaps depending on management interest. Moreover, the findings reveal that typically they use more than one system for product costing purposes by incorporating both traditional and modern MA techniques, for example, of the 20 companies applying ABC, 14, representing all sectors, apply traditional product costing systems, i.e., TC, batch costing, job costing, together with ABC systems (Table 1). Of them, two PLT companies use ABC together with TC.

The findings suggest that they use more than one product costing system at once, integrating both traditional and modern MA techniques, as complements for and/or alternatives to one to another, and, depending on their own requirements, purposes and particular circumstances, that individual companies deal with. For example, a company in rehearsal stage on the application of ABC may concurrently use TC as a complement in order to verify the product costs derived through the new system. In turn, if a company applies ABC only for certain aspects of the costing system, because of their difficulties in applying ABC for the whole system (probably due to its high costs, complexity, lack of staff, or time constraints), then these two systems act as alternatives one to another. Consistent with these findings, Tuanmat and Smith (2011)recommend using both advanced and traditional MA practices as complements and as substitutes for each other.

5.4 Proportion and patterns of assigning indirect cost to products

All companies divide costs into fixed and variable costs, consistent with findings reported by Waweru et al. (2005) of 92% in South Africa and by Waweru et al. (2003) of 77% in Kenya. Abdel-Kader and Luther (2006) state that the separation of costs into variable/incremental and fixed/non-incremental is acknowledged as an important task by most of companies in the UK. With respect to the proportion of indirect costs to total operational costs of sampled companies, the findings reveal that the percentages range from 6% to 35%as illustrated in Figure2.

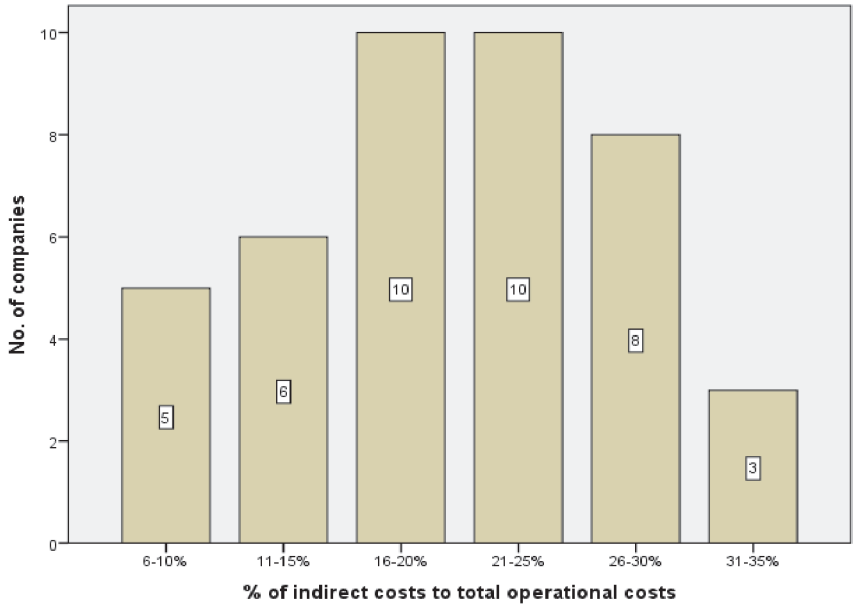

Figure 2. The proportion of indirect costs to total operational costs

Such a low proportion of indirect costs to total operational costs may be attributed to the extensive use of labour-demanding procedures in Sri Lankan companies that are experienced in developing countries, suggesting that this trend may discourage the adoption of complex costing systems like ABC. Nevertheless, regardless of such a low proportion of indirect costs, 48% of the sampled companies apply ABC. However, certain differences among industry sectors appears in these ranges: F&B = 6-35%, CHEM = 11-25%, DVS = 11-35%, MNF = 6-30%, and PLT= 16-30%.

Bases for classification of costs into fixed and variable

In this classification, two approaches seem to be equally important followed by Sri Lankan companies:i) a subjective basis with managerial experience (38%), and ii) classifying all overheads as fixed costs and direct costs as variable costs (40%). However, there has been comparatively low application of regression analysis on this classification, not only in this study (no one applies), but also in previous studies by Waweru et al. (2005) (4.2%), Clarke (1994) (1%), and Drury, Braund and Osborne (1993) (2%). Such a low application of regression analysis may be attributed to complexity of the

technique and its lesser importance for this function and hence complications in meeting cost/benefit criteria. Similarly, most South African firms use subjective methods based on managerial experience to classify these costs, and also use incremental costs with regard to decision making.

5.5 Consideration of overheads for product costing purposes

The findings specify that most companies (27 out of 42 companies) allocate both direct costs and a proportion of period/overheads to products, and nine companies allocate all costs to products, while six companies assign only direct costs to products (F&B – 2, DVS – 1, MNF – 3). This may be attributed to the high consideration of product costing and of its impact on pricing decisions in companies in Sri Lanka. It otherwise implies that all in the CHEM and PLT sectors, and most companies in other sectors, are undeniably concerned about both direct and indirect costs. This trend suggests that, except for specific circumstance such as prevailed in the PLT sector, in general, companies in Sri Lanka have recognized and taken into account the effects of product costing on product pricing. Whole PLT sector has to adopt prices for their products from respective auctions taken place fortnightly based on demand and supply and quality of brands and thus, companies in the PLT sector act as price takers not as price makers.

However, certain companies are in a view that individual product based cost allocation is somewhat difficult with their large volume of products. In this respect one in the CHEM sector commented:

"Individual product based cost allocation is very difficult due to our large volume of products and ranges. And it is impractical and time wasting to allocate all overheads using different bases. If someone does so, it has no value addition, i.e., allocating service department costs to other service departments. Thus, when processes are going on across divisions we charge overheads to particular divisions / centres at the time the costs incur. Accordingly, we identify all overheads as production overheads and selling overheads. Other overheads such as financial costs, legal costs are allocated among divisions based on budgeted sales".

5.6 Criteria/ bases used for assigning overheads to products

The findings reveal that 'cause and effect' and 'fairness and equality' have

become the most popular criteria across all industry sectors in assigning overheads to products. Most companies do not consider 'ability to bear' in this respect (only 10 % use it), because they feel that, as a company competing in the local/foreign markets, 'no-one is ready to earn profit for others'. Moreover, in certain instances, they do not worry much about allocating overheads, to the extent they concern on cost/benefit criterion.

Considering bases used in allocating overheads to products, the findings suggest a relatively high usage for unit of product/sales (69% of companies applied) and a low usage for direct labour hours (45%) and machine hours (38%). Comparatively higher usage for labour hours than for machine hours may justify the application of labour-demanding procedures in Sri Lankan companies in the PLT sector. However, Wijewardena and De Zoysa (1999) indicate somewhat different situations in Japanese and Australian manu facturing firms, where, despite decrea-sed labour components, they are likely to allocate factory overheads mainly on the basis of direct labour. Further, Waweru et al. (2005) report a widespread use of simple cost allocation methods, regardless of the high proportion of indirect costs that should have resulted in the widespread use of activity-based cost allocation methods.

The findings thus suggest that companies in Sri Lanka still apply such a simple method or bases in assigning overheads to products, rather than using fairly complicated bases, such as cost of activities (only 14 companies - 33% use it even though 20 companies implement ABC). The main reason is that most (14 of 20 companies) who apply ABC used to depend on more than one system in product costing (Table 1), and thus they prefer to use simple bases. However, all in the PLT sector (even if two use ABC with TC) use cost of activities for this purpose.

These findings are inconsistent with those of Waweru et al. (2005), who reveal a high use of cost of activities (45.5%) as a base for allocating indirect costs, suggesting a move towards ABC. However, other findings, such as Horngren, Foster, Datar and Uliana (1999), and Haldma and Laats (2002) suggest that many companies still prefer to use simple allocation bases, i.e., direct labour hour and machine hours, rather than other bases. In view of this, it can be suggested that, even though companies in developing countries are adopting ABC, most still prefer to use simple allocation bases such as units of production/sales, direct labour hours and machine hours for product costing, probably because of their appropriateness and simplicity and hence meeting a cost/benefit criterion.

5.7 Application of Activity Based Costing

The findings show, irrespective of the small proportion of indirect costs (ranging from 6% to 35%), a relatively high level of adoption of ABC (48% - 20 out of 42 companies) in Sri Lankan companies compared to what the literature reveals in relation to developing and developed countries. Moreover, 7 (17%) companies intend to introduce ABC in the future. In South Africa, for example, the use of ABC shows 32% of companies (Waweru et al., 2005) and 14% (Horngren et al., 1999), the UK 31% (Burns, Ezzamel, and Scapens, 1999) and 20% (Innes & Mitchell 1995), and India 20% (Joshi, 2001). In Australia, however, a low adoption rate of ABC is reported (Chenhall & Langfield-Smith, 1998). Sulaiman et al. (2004), but, state that recent surveys have reported increasing use of ABC; in Asian countries the percentage use of ABC is lower. But Sulaiman et al. (2004) also report that amongst foreign firms and foreign-partnered joint venture firms ABC usage is much higher. The findings of the present study, in contrast, reveal different views on adoption of ABC by foreign companies (multinational companies) as they tend to adopt both TC and ABC together.

5.8 Relationship between application of ABC and company/industry characteristics

Concentrating on the relationship between industry sector and adoption of ABC, Fisher's exact test shows that there is a significant relationship between these two (significant at 97.4% confidence level (P = 0.026)). The findings show a substantial relationship between the PLT sector and adoption of ABC as all in the sector have implemented ABC, even though other sectors report a rather low level of application of ABC: F&B, 38%, CHEM, 33%, and MNF, 28%; only the DVS sector represents a comparatively high level of usage (60%). Therefore, an explicit situation can be seen in the PLT sector because all firms use ABC in a specific manner, arising from the sector's colonial history,according to executives of the companies. An executive (DGM Finance) of a leading company in the PLT sector stated his views and experience on the application of ABC:

"The origin and evolution of PLT sector came from British rule, as Sri Lanka (called Ceylon in that period) had been under British rule in the period 1796-1948. They initially structured and managed the PLT sector that had become the main component of the

economy of Ceylon in that period, in their own systems, policies, procedures and techniques. We believe that, from the colonial stage under British rule from 1796, the PLT sector might have applied ABC concepts in their accounting systems. As a result, at present, the whole PLT sector inevitably applies ABC in a way specific to that particular sector. Also, by viewing this accounting system, as executives of the plantation industry we strongly believe that ABC precisely matches this sector in managing all activities in an efficient manner, particularly relating to the manufacturing process sited in various geographical areas called 'estates'. Moreover, we experienced that recruiting people to the finance division as accountants or finance executives is somewhat difficult, as they assume that, unlike the ABC systems normally practicedby other industry sectors, this ABC system is a very complex system, implemented in a specific manner to that particular sector".

Moreover, there is no significant relationship between the age of the companies and adoption of ABC, as Fisher's exact test shows a 3.3% confidence level (P = 0.967). Using Chi-square tests in relation to South African studies, Waweru et al. (2005) report that there was no significant relationship between adoption of ABC and industry sectors or age of the companies, although the relationship between industry sector and adoption of ABC is significant at the 90% confidence level (P = 0.1).

Fisher's exact test shows a significant relationship between size of companies and adoption of ABC, with a 97.2% confidence level (P = 0.028) in this study, with adoption of ABC occurring in far more large size companies than medium-size companies. Out of 20 companies that implemented ABC, 90% (18 companies) were large and 10% (two companies) were medium size. These findings are broadly consistent with those of Waweru et al. (2005), who recognize a significant relationship, with large companies being far more inclined to use ABC. Innes and Mitchell (1995) report similar findings based on a study in the UK. This trend of adopting ABC mostly by large companies may be attributed to their high demand for such modern MA techniques to provide more accurate cost information relating to their large-scale operations most probably with diversified product lines, and their strengths and capability to invest more resources to develop advanced MA systems that can better respond to their decision making processes.

5.9 Influencing factors for not adopting ABC

In this respect, it also examined influencing factors for not adopting ABC in the remaining 22 companies. Accordingly, the most reliable possible factor underlying this is that they all entirely satisfied with the existing costing system: 86% (19 companies) with TC and 14% (3 companies) with: batch costing (1) and Job costing and process costing (2).Another important factor is that they prefer to apply simple methods (50% of the group not applied ABC). This further confirms that listed companies in Sri Lanka are functioning with sound resources, including talented staff and competing in local and possibly in foreign markets, so that it is unlikely that they would have faced lack of resources or trained staff in this regard. Moreover, this issue is not relevant for the whole PLT sector. Thus, the findings suggest that, even though Sri Lanka listed companies are functioning with sufficient resources and well-equipped staff required in adopting ABC systems, some still see no need to adopt ABC because they are satisfied with their existing costing systems.

Tuanmat and Smith (2011) emphasize that, as the business environment has been changing continuously, it is critical to ensure that an appropriate MA system is practiced in organizations. This is important because effective MAS can help managers to better coordinate business activities and provide useful information for them to make decisions, and this process will ultimately improve organizational performance. Thus, the results of this study also provide helpful insights and useful guidelines to organizations facing with such changes to make sure that their companies move on an appropriate direction.

6. Conclusion

The findings suggest that traditional MA techniquesfor product costing such as TC are still popular among all selected industry sectors/companies except for PLN sector in Sri Lanka, irrespective of their sector or nature of business, probably due to their necessity, relevance, lower cost and simplicity, in applying them to any type of business, rather than modern MA techniques. Even though Sri Lankan listed companies are functioning with sufficient resources and well-equipped staff that require adoption of modern MA techniques i.e. ABC, most reveal that they still see no need to adopt such techniques because they are satisfied with existing systems and applications.

Further, listed companies tend to adopt more than one costing system by

incorporating both traditional and modern MA techniques as complements or alternatives to one another, depending on their specific requirements, nature of businesses, different costing purposes and the interest of management. TC seems to be the most popular costing system in both situations: as a sole costing system and as a combination with other costing systems. The most popular combination is the application of TC with an ABC system. This argues that, in most instances, these two techniques can be suitably applied to any type of business processes to produce the information required for costing purposes. Such a combination may be attributed to sophistication in applying rather complex systems in total, such as ABC as a complement, and a need to ensure the accuracy of costs derived through traditional systems, as an alternative. As cited by Rasiah (2011), Andrea, Filho, Maia and Qassim (1999) found that ABC is being extensively implemented as an alternative to traditional costing. In this study, companies who apply multiple costing systems, including job costing, process costing and batch costing, mostly represent diversified companies with a range of products and also companies with products of a specific nature i.e. garments.

The study concludes that listed companies are satisfied with the MA techniques adopted for product costing, regardless of whether they are traditional or modern techniques, because they could achieve their goals and targets satisfactorily through such practices. This finally concludes that listed companies in Sri Lanka are functioning well by applying any of most appropriate costing system/s (either ABC or traditional costing systems) that are mostly compatible with their own purposes, product lines, associated processes and structures, and the needs of the company.

This study contributes to the literature on how and why different industries apply MA techniques for product costing purposes, as either single or multiple costing systems and/ or integrating traditional and modern MA techniques together, in accordance with their own purposes and circumstances. However, as this study limits to five sectors representing only large and medium size companies, and as the small business sector in Sri Lanka contributes strongly to gross domestic product (GDP), there is a need to focus on other industry sectorslisted in Colombo Stock Exchange and small business sector,to explore whether there have been any similarities or differences or specific situations in those sectors with regard to the phenomena under consideration.

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