

THE ALLOCATION OF OVERHEADS IN THE CONSTRUCTION INDUSTRY IN SOUTHERN AFRICA: TRADITIONAL COSTING OR ACTIVITY BASED COSTING?

Mushonga, E¹. and van der Poll HM²

[1emushonga@polytechnic.edu.na](mailto:emushonga@polytechnic.edu.na) and [2vdpolhm@unisa.ac.za](mailto:vdpolhm@unisa.ac.za)

Corresponding author:

*Prof Huibrecht M van der Poll; Unisa Graduate School of Business Leadership,
University of South Africa, South Africa, Tel. 011 652 0251; email:
vdpolhm@unisa.ac.za*

ABSTRACT

Purpose: Recent literature suggests that many companies are moving away from traditional costing (TC) systems in favour of activity based costing (ABC) systems which provide more accurate cost information among other benefits. The literature also reports low assimilation and abandonment of the ABC system by the companies which had adopted it owing to several weaknesses of the ABC system. These conflicting findings of high adoption of the ABC system on one hand and low assimilation on the other hand, formed the basis of this paper. The paper sought to clarify the applicability of the ABC system to the construction industry in Southern Africa. It tests whether or not the ABC system is a viable alternative to the TC systems.

Methodology: A literature survey and primary data obtained from two questionnaires; one addressed to construction companies and the other to consultants, were used. The sample of the respondents was obtained from the register of contractors and construction industry companies. The researcher sent the links to the Lime survey by email to all the respondents.

Findings: According to the respondents the use of traditional costing (TC) systems produces distorted project cost results while the ABC system produces more accurate project cost results when used in the construction industry. However, contractors had not fully adopted the ABC system but used TC systems despite producing distorted project costs.

Value of the research: Contrary to the widely held view that TC systems have no place in modern management accounting, this research found that TC systems are still popular in the construction industry in Southern Africa, and that users of TC systems were generally satisfied with their system's performance. However, this finding has implications in the light of the current view that TC systems are dysfunctional. The study revealed the benefits of TC systems reported by their users, such as the fact that they produce accurate costs, are simple to use, and allow real time reporting. TC systems may have been improved by computer systems to the point where they are able to provide reliable cost data and efficient reporting. This study has furthermore established that continued calls by advocates of the

ABC system to implement this system because of its ability to provide more accurate product costs than TC systems may be misplaced and may not in fact increase the assimilation of ABC.

KEYWORDS

Activity-based costing, traditional costing, construction industry.

INTRODUCTION

Several researchers [9, 56, 67] suggest that the current trend in accounting is that more and more companies are moving away from traditional costing (TC) systems in favour of the activity based costing (ABC) system. This is since TC systems produce inaccurate and misleading cost information [26] to such an extent that a company using a TC system may end up trading in loss making products as a result of acting on the misleading information supplied by the system [28, 37]. Traditional costing entails according to Turney [64] any of the older costing systems which use direct material where labour is consumed as the primary means of apportioning overheads. On the other hand the ABC system is “a method for measuring the cost and performance of activities, products and customers” [64]. Therefore, proponents of the ABC system [10, 34, 54] recommend that companies should implement it in order to avoid the problems which arise from the application of TC systems.

However, other researchers [69, 2, 49] have found that more companies still use TC systems than the ABC system despite the cost distortions which result from their use. Furthermore, the number of companies showing interest in the

ABC system has dropped as that of companies abandoning implementation has risen [71]. On the other hand Stratton, Desroches, Lawson and Hatch [62] refuted the assertions that ABC is being abandoned by finding that only 2.8% of their respondents had abandoned ABC. Evidently, there is no consensus among researchers regarding the adoption of TC and ABC systems. As a result, the debate regarding which costing method is more appropriate for overhead allocation continues in the management accounting community [14].

The ABC system has been applied in many industries and business sectors of all sizes [57]. This paper looked at the applicability of the system to the construction industry in Southern Africa. The objective was to determine whether the ABC system is more suitable for the accumulation of construction project costs than TC systems. It sought to establish whether the use of the ABC system would remove product cost distortions and lead to more accurate project cost in the construction industry. There are conflicting findings in the literature regarding which overhead allocation system is being used by organisations. These conflicting results therefore, justify further research since managers are confused about which costing system is more suitable to deal with overhead allocation.

This paper focuses on the construction industry since the industry is important as it accounts for a significant share of economic activity of a country and it is also a catalyst for other sectors [43]. A study of overhead allocation in the

construction industry helps in the determination of total costs; costs accumulation; cost management and pricing of projects [19]. In a construction company an unsuitable costing system may result in management failing to measure the projects' performance accurately which might lead to strategic decisions being made on the basis of wrong project costs. A contractor needs to maintain a proper costing system with mechanisms for the accurate allocation, apportionment of overhead costs for them for example to bid competitively for projects and furthermore during project execution (payments and final accounts). However, companies in the construction industry are failing to deal with the problem of allocating overheads leading to financial losses and bankruptcy [60]. Therefore determining an appropriate costing system guarantees the survival of construction companies by improving profitability [64] and competitive advantage [63].

The rest of the paper is set out as follows: in the next section the literature is presented and this is followed by the problem statement and the research methodology. The data analysis and discussion are presented next and followed by the conclusions. The paper concludes with suggested future research.

LITERATURE REVIEW

In 1987, Johnson and Kaplan [34] disapproved traditional management accounting systems for three main weaknesses:

1. Management accounting reports are produced too late and are too

distorted to be relevant for managers' decision making;

2. It is of little importance to cost reduction and productivity improvement; and
3. The management accounting system does not provide accurate product costs.

Subsequently, researchers have found empirical evidence of product cost distortions [28, 37]; product cross-subsidisation [28, 29, 37] and misinformation regarding pricing decisions [29, 33] arising from the use of TC systems. Johnson and Kaplan [34] saw the role of a management accounting system as to provide timely and accurate information in order to control costs, to measure and improve productivity and design more improved production processes. TC systems are irrelevant for this role since they assume that indirect costs vary proportionally with direct labour [10]. Therefore the ABC system fulfils the role of management accounting systems since it provides more accurate product costs and gives an insight into what drives costs [13].

Reeve, Warren and Duchan [59] define ABC as an accounting framework which is based on relating the cost of activities to final cost objects, such as products or customers. Moreover, Zawawi and Hoque [73] state that it is a modern accounting system that measures the use of resources by activities. The system assumes that products demand activities, which consume resources and the resources cost money [57]. On the other hand TC systems are any of the older costing systems which use direct

material and labour consumed as the primary means of apportioning overheads [64].

The advent of the ABC system

The advent of ABC can be traced to global changes in technology, increased competition and rapid changes in products during the past 20 years [49, 68]. These changes in the business sector rendered the design of many costing systems irrelevant [70]. TC systems became invalid for facilities producing diversified products [10]. However some researchers have found that ABC and TC systems are complimentary. For example, Cokins [13]; and Benjamin, Muthaiyah and Marathamuthu [3] found that ABC is basically an extension of TC systems. The system is used to supplement the company's costing system and not as a replacement to it [22]. They found that many companies which use ABC have another costing system for external reporting. De la Villarnnois [17] also established that TC systems are widely used alone or supplemented by the ABC system. Therefore the literature although in conflict, supports the continued use of TC systems supplemented by ABC and also the adoption of ABC as a replacement to TC systems.

Overhead allocation and construction production theory

Construction indirect overheads are conveniently classified into two perspectives: the home office and the project perspective [37]. The home office perspective deals with assigning office overheads to different projects.

These overheads are incurred even if there are no projects under construction [24]. The project perspective deals with assigning overheads to each section of the job. Project overheads are a factor of the project's duration and complexity and therefore do not vary with project progress [24]. According to Chao [8], these overheads are required for the running of the project as a whole. In the construction industry, resource based costing (RBC) and volume based allocation are used to allocate indirect costs to cost objects [38]. However, studies have shown that the ABC system produces significantly more accurate and valuable information than TC systems [56].

ABC principles are applicable to all types of business sectors [12]. However research on ABC application has concentrated more on the manufacturing sector and the service sector to a lesser extent. This is probably since the ABC system itself has its roots in the manufacturing sector and its application to other business sectors is still less significant [47]. The construction industry is however a very important business sector since it accounts for 10 per cent of the GNP of many countries according to Bertelsen [4]. Its impact affects the social wellbeing of human populations as evidenced by various social housing projects [21] such as Namibia's mass housing project [53] and the Reconstruction Development Programme (RDP) of South Africa [25].

Bertelsen [4] states that a small improvement in performance in the construction industry would greatly

impact the economy. This performance may be achieved if construction companies could move away from their current costing systems to implement an ABC system. This view is supported by Zimina and Pasquire [74] who posited that traditional arrangements do not generally comply and hamper the full exploitation of construction production techniques such as lean construction. This is important since any costing techniques to be used in the construction sector may need to align with construction production theory and not conflict with theories which have been developed to achieve efficiency in the industry.

A leading construction production theory is Lean Production which was first established by Womack and Jones [4, 72]. Lean Construction (LC) however, was pioneered by Koskela who founded the International Group for Lean Construction (IGLC) and developed the transformation flow view (TFV) theory of construction [54]. According to Kramer et al. [41] LC tries to manage and improve construction processes at low cost and maximum value through a consideration of customer value. LC emphasises the acceleration of activities to improve productivity and cost cutting through elimination of waste [41]. Similarly ABC determines the productivity of each activity and eliminates the non-value adding or wasteful activities [51]. Emuze [20] argued that non-value adding activities (NVAAs) need to be addressed in order to improve the performance related problems of the South African construction industry and their

performance related problems. This includes waste of materials and waste is defined in LC as available costs within activities, which include reworking substandard works or delays and extended activity duration along the critical path [30]. Womack and Jones [72] concur that lean thinking is mostly about the elimination of waste. They define waste as any human activity which consumes resources without creating any value. Therefore, both the LC and the ABC systems focus on the elimination of non-value adding activities in the construction and production process.

LC theory and ABC systems emphasise customer value addition and product quality. According to Howell and Ballard [29], the primary objectives of lean thinking are the value to the customer and throughput. Lean thinking focuses on elimination of waste to improve productivity and client satisfaction according to Jylhä and Junnila [35]. Khataie and Bulgak [36] added that lean manufacturing focuses on the approaches that can help an organisation to reduce the waste factors in its processes. Similarly, one of the first steps in developing an ABC system, according to Garrison et al. [22], is Process Value Analysis (PVA) which helps the manager to eliminate non-value added activities in the company and improve quality. Therefore, the ABC system could be used effectively to reduce wastage by contractors who have implemented lean construction.

On the other hand TC systems are based on the transformation view of production which views production as a

conversion of inputs to outputs [37, 41]. This perception of production may have led to the tracing of resources directly to outputs as if output varies with resource consumption. However, resource consumption varies with demand for activities, which is made by the products [5, 28, 29]. In other words, products do not exert demand for resources but for activities which (activities) consume resources. By taking a transformation view on resource allocation, TC methods might assume that all resources have been consumed by products. In fact not all resources are converted to output but some resources are consumed as waste [37]. Hence, TC systems may produce distorted cost information since they are premised on the wrong view that production varies with resource consumption.

Whereas the current practice in construction is based on the transformation view [39], the ABC system takes the flow view of production. Production as a flow is seen as a series of value adding and non-value adding activities [4]. He furthermore states that there is plenty of wastage in the production process as non-value adding activities exceed the value adding. The fact that the construction process involves a lot of wastage is also confirmed by the findings of Hammerlund and Ryden [27] that two thirds of the Swedish plumbers' working time on a construction site

constitute wastage as effort is largely directed to non-value adding activities. A way to eliminate this waste is using a fully integrated Lean Production System [31]. Therefore, the objective of optimising the process under the flow view is to eliminate or reduce the non-value adding activities while optimising the value adding ones [4]. The flow view of construction production, favours the use of the ABC system as it accepts that the construction process also involves waste.

ABC/TC application to the construction industry

Kim and Ballard [37] illustrated the typical problems associated with the use of TC systems in a construction set-up. They analysed the reports of a company constructing an industrial project of five buildings. Table 1 shows a comparison of the total job cost results reported by the resource based costing system and that produced by an ABC system for the company. The cost disparities between the two systems show that the total costs for buildings one and two are 8% and 13% higher respectively, when reported by an RBC system rather than an ABC system. Whereas building three's total costs are 41% higher under the ABC system than the RBC system. This is since an RBC system over-costs projects with a higher volume of direct labour and under-costs projects with low volume of direct labour.

Table 1: A comparison of RBC and ABC cost results D-890

			RBC		ABC		
	Direct Material	Direct Labour	Overhead	Total	Process Costs	Total	Variation %
Building 01	\$11,000.00	\$10,400.00	\$16,406.00	\$37,806.00	\$23,872.00	\$34,872.00	8%
Building 02	\$6,000.00	\$5,200.00	\$8,203.00	\$19,403.00	\$11,135.00	\$17,135.00	13%
Building 03	\$4,500.00	\$3,100.00	\$4,890.00	\$12,490.00	\$13,193.00	\$17,693.00	41%
Total	\$21,500.00	\$18,700.00	\$29,500.00	\$69,700.00	\$48,200.00	\$69,700.00	0%

Source: Kim and Ballard [37]

The results summarised in Table 1 confirm the view of Horngren et al. [25] that TC systems cause product cross subsidisation by over-costing a product with a high resource consumption and under-costing that with a low resource consumption because of the use of an inappropriate allocation base [47].

Hicks [28] further confirms the costs distortions which arise when TC

systems are used for overhead allocation. This study showed disparities between total costs obtained from TC systems and from ABC of between 127% and 33%. Contracts with high volumes of assembly hours were over-costed and those with low volume under-costed. Table 2 compares the total costs obtained from the use of the two methods.

Table 2: Cost reports of Small Manufacturers Ltd

	Traditional Costing	Activity based Costing	Cost Difference
Contract 01	103,899	107,743	3.7%
Contract 02	86,142	101,664	18.0%
Contract 03	234,699	252,406	7.5%
Contract 04	129,722	172,603	33.1%
Contract 05	102,874	118,293	15.0%
Contract 06	153,783	122,018	-20.7%
Contract 07	127,464	126,910	-0.4%
Contract 08	246,776	217,502	-11.9%
Contract 09	181,239	162,742	-10.2%
Contract 10	165,330	151,291	-8.5%

Adapted: Hicks [28]

Therefore, it seems that TC systems may tend to over-cost high volume labour intensive contracts and under-

cost low volume machine intensive contracts.

ABC Assimilation

Prevailing literature shows conflicting findings regarding the assimilation of the ABC system. Innes and Mitchell [32] established that more than half (97 companies) of the 187 companies in their survey had not seriously considered ABC implementation, one third (60 companies) were vetting it while four per cent (seven companies) had totally rejected it. Only six percent (11 companies) had commenced implementation of the system. Caplan [7] also found no evidence of ABC assimilation as 50 per cent of the companies used variable costing and the other 50 per cent used absorption costing for internal reporting. In the Gulf Cooperation Council (GCC) Mclellan and Moustafa [49] found that companies still relied on traditional accounting systems and not the modern tools and in South Africa Sartorius and Kamala [60] found that ABC implementation was still very low.

On the other hand Kuo and Yang [42] maintain that over the past two decades, ABC has spread across many industries among many countries. In addition Abbas and Wagdi [1] found that many Egyptian companies are adopting ABC as 56% were using the ABC system, with only 5.3% applying TC and 38% other systems. Vij [66] established that the hotel sector in India had implemented ABC in order to benefit from improved cost allocation, higher levels of accuracy, customer profitability analysis and cost reductions.

Moreover, it is not clear from the international literature whether the benefits of the ABC system outweigh

the costs associated with its implementation. Some of the disadvantages of ABC are indicated next. The ABC system demands too much detail and a considerable amount of data collection [32, 60]. Its implementation produces a cost database rendering the existing one obsolete [18]. It is not easy to operate compared to other systems [11] and requires a substantial investment in the company's resources [46]. In Jordanian companies, the greatest barrier to the adoption of the ABC system was its high cost of implementation as well as the high cost of ABC consultancy and computer staff time [52] whereas the system was abandoned by many users in France because of its complexity according to Levant and Zimnovitch [45]. Therefore despite being more accurate in allocating overheads, the ABC system is a costly alternative to the TC system [44].

PROBLEM STATEMENT

The problem outlined in this paper emanates from the need to allocate indirect overheads to projects in order to determine total project costs. Traditionally, construction companies applied a single volume based allocation basis to deal with the problem of allocating indirect costs to cost objects [37]. However the use of a single volume based absorption rate (OAR) is no longer appropriate since several changes have occurred in the business sector [25, 67]. For example labour intensive production has been replaced by machine intensive production to such an extent that companies have reduced their reliance on direct labour according

to Ratnatunga and Waldmann [57] and Gervais, Levant and Ducrocq [22]. Consequently the continued usage of direct labour produces distorted product cost results according to Ratnatunga and Waldmann [57] and Gervais, Levant and Ducrocq [22]. This paper is important since it clarifies part of the assimilation of the ABC system in which international literature shows conflicting findings and determines which costing is therefore appropriate for the construction industry in southern Africa.

RESEARCH METHODOLOGY

The research used two structured questionnaires for collecting data. One questionnaire was addressed to consultants who work with construction companies and the other to accountants and managers of construction companies. Structured questionnaires were used since they are simple and relatively inexpensive to administer and analyse [39]. The questionnaires were dominated by close ended questions and included less open ended questions. Close ended questions avoid ambiguity in the responses and are also likely to elicit responses from the interviewee who sees them as easy and less time consuming than open ended questions. Open ended questions however were used in order to obtain

responses requiring expansive answers [65].

The questionnaires were designed to answer the following questions:

- Do TC systems produce distorted costing results when employed in the construction industry in Southern Africa?
- What are the causes of cost distortions in TC systems?
- Does the ABC system prevent cost distortions when employed in the construction industry?
- To what extent has the ABC system been adopted by construction companies in Southern Africa?
- Which costing system is most suitable for the construction industry?

The target population was the fifteen Southern Africa Development Community (SADC) member states. A sample was therefore drawn from three of the fifteen countries namely Namibia, South Africa, and Zimbabwe representing an accessible population of twenty percent of Southern Africa. The three countries were chosen since they have different development stages of the construction industry which is characteristic of the region. The sampling process is summarised in Figure 1.

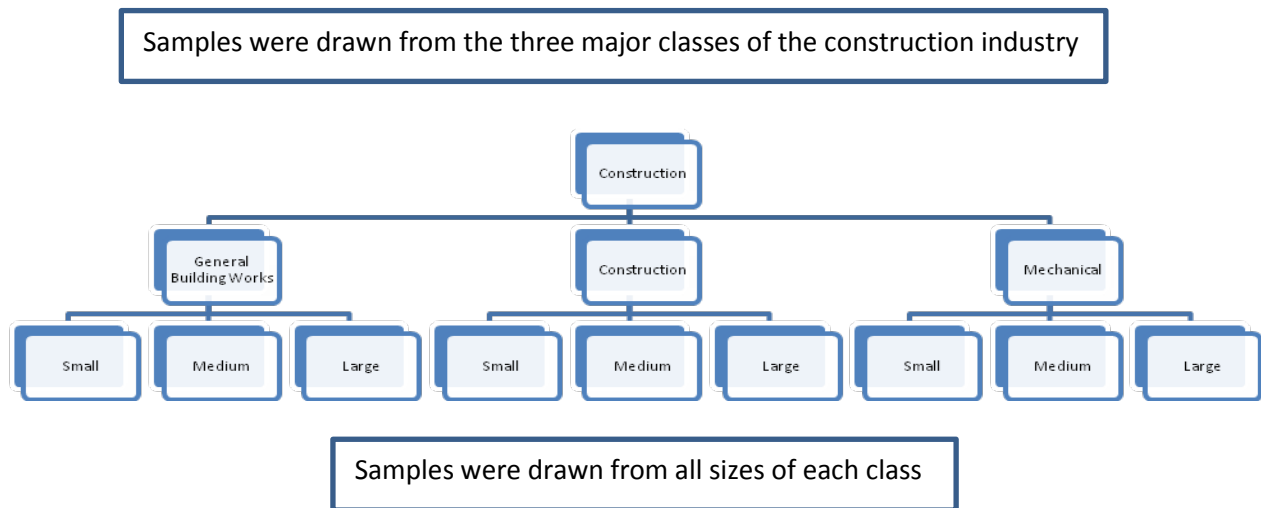


Figure 1: The sampling process

The sample was randomly drawn from the three major sectors of the construction industry namely General Building works (G.B); Civil Engineering works (C.E); and Mechanical Engineering works (M.E) as shown in Figure 2. Details of contractors were obtained from the regulatory bodies such as the Construction Industry Development Board (CIDB); Master Builders Association (MBA) [47] and the Construction Industry Federation of Zimbabwe (CIFOZ), [15] and stratified according to their class of specialty. Each class of contractors was further divided by size of the contractor in order to obtain responses from small,

medium, and large construction companies of each class. From each stratum, a sample was randomly drawn. From every size (small, medium, and large contractors) of class of contractors were randomly drawn as shown in Figure 2.

DATA ANALYSIS AND DISCUSSION

Distribution of contractors by size

Table 3 shows the distribution of contractors by company size. The distribution of respondents by size was important since large companies would be expected to lead in the implementation of new costing systems rather than small companies.

Table 3: Analysis of responses by contractor size

Contractor Grade	Common Grading	Number of respondents	Response Rate (%)
1-3	Small contractor	6	11.5
4-6	Medium	11	21.2
7-9	Large	31	59.6
Uncompleted		4	7.7
Totals		52	100%

The highest response rate (59.6%) was from large contractors followed by medium contractors (21.2%) and small contractors (11.5%). Therefore, it is implied that large contractors may have greater interest in costing systems than small and medium contractors.

Average number of contracts

The number of contracts a contractor executes at a given time may be important in determining the need for

overhead allocation. If a contractor works on a single project at a given time, they would simply allocate the period costs for the company to that particular project. Similarly if a contractor works on very few projects at a time, the effect of arbitrarily allocating overheads would be more negligible than if they had many projects. Figure 2 depicts the distribution of respondents by size and number of projects.

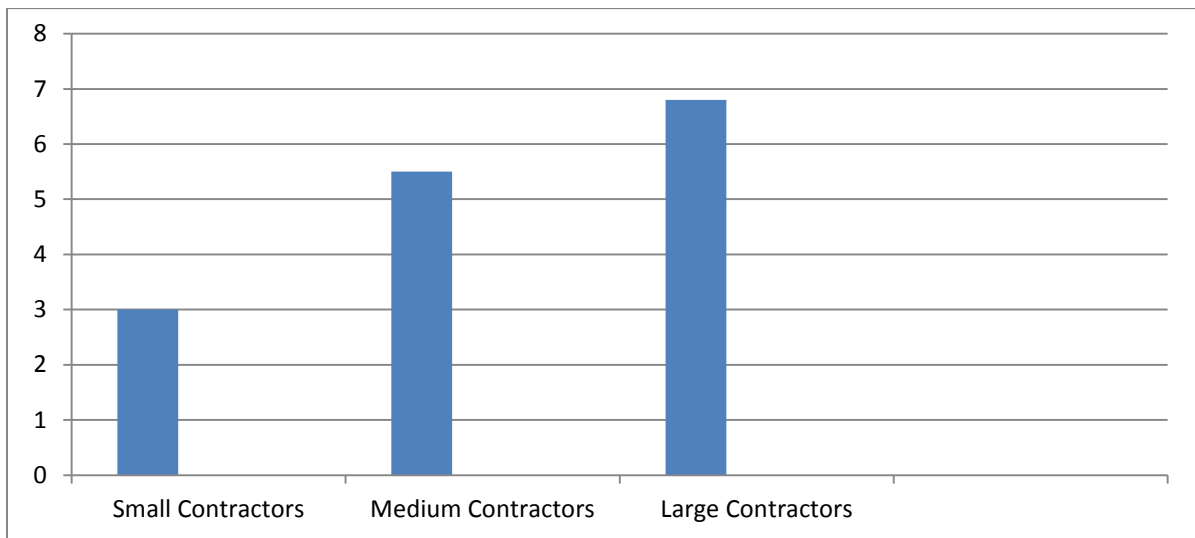


Figure 2: Distribution of respondents by size and number of projects at a time

The graph shows that large contractors run more projects at a given time followed by medium size contractors and small contractors. Therefore, the effect of improper allocation of overheads might be greater on large contractors than small contractors [6].

Allocation of head office overheads to projects

Out of the 52 respondents 28 or 53.8% stated that they allocate head office overheads to projects. 20 respondents representing 38.5% indicated that they do not allocate head office overheads to

projects. Therefore, it is implied that most contractors attempt to allocate head office overheads to projects. These results contradict the findings by Cokins [14] that most companies do not make an attempt to allocate overheads to cost objects.

System of allocating head office overheads to projects

The responses indicated that various bases are used to allocate head office overheads to the projects. Table 4 summarises these responses.

Table 4: Bases used to allocate head office overheads to projects

Bases Used	Number of respondents	Percentage
Value of contract basis	11	37.9
Administration costs incurred	3	10.3
Time taken on project	2	6.9
Value of work completed	2	6.9
Turnover of each contract	2	6.9
Direct labour hours	2	6.9
Activity-based system	1	3
Other (volume based) bases	6	21.2
TOTAL	29	100%

The responses show that most contractors (97%) use traditional volume based overheads allocation systems or some arbitrary system to allocate head office overheads to projects. These results support the findings by Kim and Ballard [37] that construction companies

use resource based costing and volume based allocation and the literature that most companies still use TC systems more than ABC system [7, 59] but contradicts the findings of Cooper and Kaplan [16] that most companies have reduced their dependency on TC

systems by developing ABC management systems.

Effectiveness of the current costing system

The research established how effective the users regard their system of allocating head office overheads to projects. The responses are summarised in Table 5.

Table 5: Effectiveness of the current system of allocating head office overheads

Responses	Number of respondents	Percentage of respondents
Poor	9	32%
Satisfactory	11	39%
Good	7	25%
Very good	1	4%

Therefore, the majority of the users of TC systems are pleased with their systems as only 32% of the respondents indicated that the effectiveness is poor. This, however, contradicts the findings by Cokins [14] that managers are not satisfied with their current systems.

Allocation of project overheads to work sections

Examples of project indirect overheads are foremen’s salaries, health officers’ salaries, and warehouse costs. Typical project sections for a general building project would be earthworks, masonry, roofing, electrical, painting, carpentry and ceiling. The responses as summarised in Table 6 indicates that most contractors (53%) do not allocate project overheads to their works sections.

Table 6: Allocation of project overheads to works (project) sections

	Yes	No
Do you allocate project indirect overheads to work sections?	23	25
	47%	53%

ABC produces more accurate project costs

Most respondents (91%) indicated that ABC produces more accurate project cost results than TC systems. Four respondents (9%) indicated that TC

systems produce more accurate project cost results than the ABC system.

Benefits of the current costing system

Contractors gave several benefits which they are enjoying from the current costing system. The most cited benefits

were that the system helps to assess projects accurately, is simple to use and cheap to implement. These responses show that although contractors perceive the ABC system as giving more

accurate project cost results, they also see several benefits in their current costing systems. These benefits are presented in Table 7.

Table 7: Summary of the benefits enjoyed from the current costing system

Benefit	Number of respondents
Simple and easy to use.	7
“Simplicity is our current choice over one requiring detailed analysis. Less cumbersome resulting in less cost of implementation”.	1
“We have quick and accurate costs to compare with the revenue. The costs are not in great detail but cover the main components that need to be controlled and can direct what items need to be corrected and attended to.”	1
Gives accurate assessment of project profitability.	1
Accurate costing of specific projects.	2
“Staff can understand it and are familiar with it”.	3
“Real time reporting”.	1
“Very integrated system if the resources are allocated up front at a click of a button you can have the following: reports, histograms, programmes”.	1

Hence, contractors may be enjoying several benefits from their current system of allocating overheads and therefore they may not want or need to change.

TC systems produce misleading project cost results

The respondents showed that 16 contractors (34%) strongly agree that

TC systems produce misleading project costs. 23 contractors (50%) agree, three contractors (6%) are neutral while five contractors (10%) disagreed that TC systems produce distorted project costs. Therefore, as found in the literature [14, 16] many contractors (84%) believe that TC systems produce misleading project costs. These results are summarised in Table 8.

Table 8: Do TC systems produce misleading cost results?

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
TC systems produce misleading cost results	16	23	3	5	0
	34%	50%	6%	10%	0%

TC systems produce misleading cost results since they use a single OAR such as direct labour to allocate indirect overheads [23]. However, this finding contradicts the findings above that contractors were happy with their current costing systems and that contractors were enjoying several benefits from their current costing system. This contradiction suggests that some respondents may have improved their current costing systems to become a multiple OAR system hence they were enjoying some benefits similar to the ABC systems.

Should ABC be used supplementary to a TC system?

The responses to this statement indicated that 13 respondents (28%) strongly agree and 14 respondents (30%) agree that ABC should be used supplementary to TC systems. Seven respondents were neutral while 8 disagreed (17%) and 4 strongly (9%) to ABC being used supplementary to TC system. These results are represented in Figure 3.

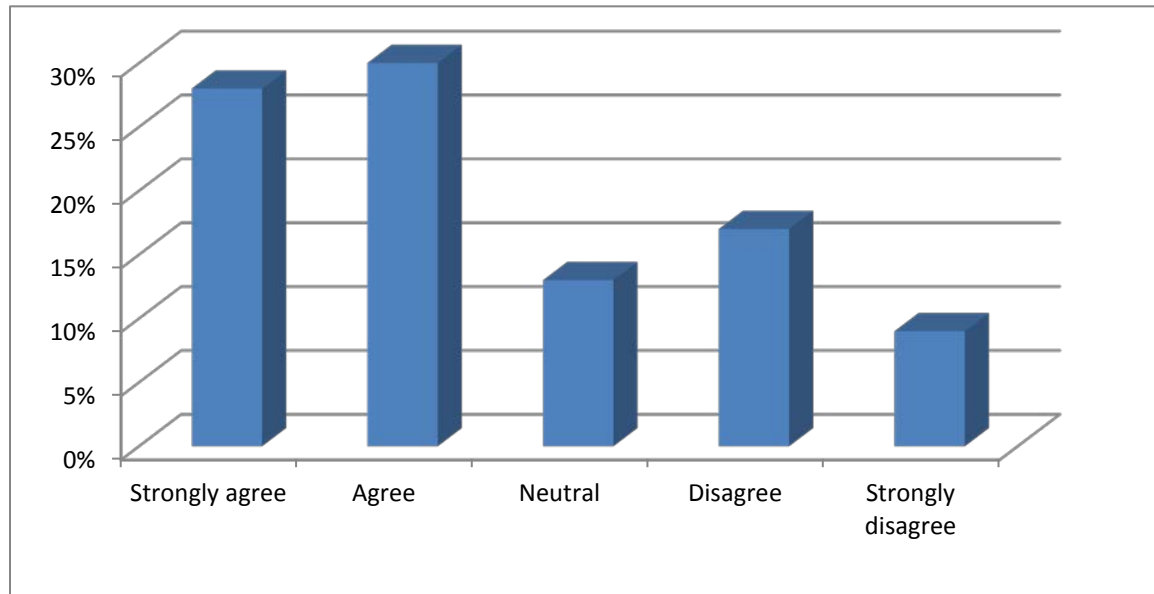


Figure 3: ABC should be used in supplementary to TC systems

These results support Cokins [13] and Cooper and Kaplan's [16] observation that companies need different reporting systems: one for periodic financial statements showing the cost of activities supplied each period and an ABC system showing the quantity and actual cost of activities used in the period.

ABC and Wastage

Table 9: ABC reduces non-value adding activities

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
ABC improves a company's profitability	6	26	9	5	0
	13%	57%	20%	5%	0%

Therefore, by eliminating non-value adding activities ABC reduces wastage and improves the company's profitability. The findings that ABC reduces non-value adding activities are consistent with the findings of Sartorius and Kamala [59] and Horngren et al. [28].

Can ABC be used in project pricing and bidding?

The research aimed to establish if ABC could help in project pricing and bidding. If the ABC system is a good basis for allocating office and project level overheads, it could be useful in pricing and determining a project's preliminaries and general fees for the contractor. Of the 47 respondents, six strongly agreed (13%) and 21 agreed (45%) that ABC can be used for competitive project pricing and bidding. Six respondents (13%) disagreed and two respondents (4%) strongly disagreed while 12

13% of the respondents strongly agreed and 57% agreed that ABC reduces non-value adding activities. Nine respondents (20%) were neutral. Only five respondents (11%) disagree and none strongly disagreed that ABC reduces non-value adding activities. These results are summarised in Table 9.

respondents (26%) were neutral. These results are summarised in Figure 4.

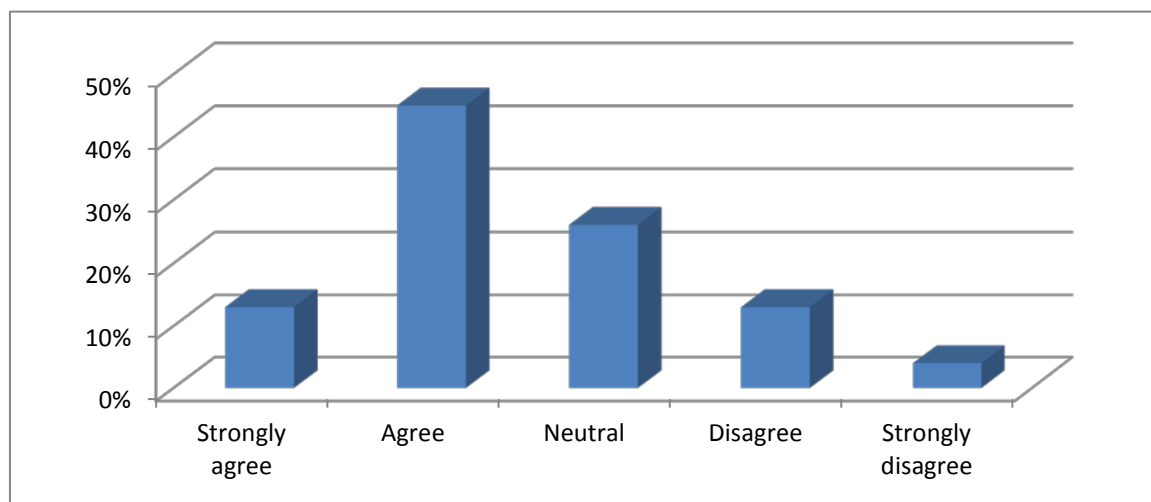


Figure 4: Should ABC be used in project pricing and bidding?

Most contractors (58%) believe that ABC can be used for project pricing and bidding. Only 17% of the respondents believe that ABC cannot be used for project pricing and bidding. This finding suggests that the ABC system may be useful to both accountants and quantity surveyors involved in pricing of construction projects.

Assimilation of the ABC system

Out of the 52 respondents, only 5 respondents indicated that they use an ABC system while 47 or (90%) use TC systems. 21 respondents (60%) had considered implementing ABC but abandoned it while 14 respondents (40%) never considered implementing it. Therefore, the ABC system may not have been widely adopted in the construction industry in Southern Africa. This agrees with the findings of Sartorius and Kamala [59] that ABC assimilation is still very low.

CONCLUSIONS

Most contractors attempt to allocate head office overheads to projects in order to establish the total cost of each project and measure supervisors' performance. The majority of contractors who allocate head office overheads to projects use TC systems. Most contractors believe that the ABC system produces more accurate project cost results. However, the paper finds that most contractors still use TC systems rather than the ABC systems despite the cost distortions arising from their use. The most important reasons for the continued use of TC systems are that TC systems are cheaper and simpler to use. The low assimilation of the ABC was also shown by the fact that 65% of the contractors are pleased with their current systems.

However, the paper established that most contractors do not to allocate project (site) overheads to works sections. This suggests that contractors

are not aware of the total cost or profitability of the individual sections of the project. The popular system of allocating both head office and site overheads in the construction industry are TC systems. Therefore, ABC assimilation is still very low, with only 10% of the respondents having adopted ABC.

Contractors believe that the ABC system reduces wastage by eliminating non-value adding activities. They also find the system suitable for project pricing and bidding. This paper finds that the ABC system is a supplementary system to TC systems rather than a substitute to them. It therefore recommends that contractors should adopt a hybrid cost system which uses the ABC system for internal reporting and decision making and the TC system for external reporting.

FUTURE RESEARCH

The findings of this research have exposed some loose ends that could not be answered conclusively by the data. Therefore, further research is recommended on the following aspects:

- The cost effectiveness of employing two costing systems, namely TC and ABC, in a company.
- The extent to which improvement in computer software has enhanced the performance of TC systems.

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