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Activity-Based Costing Adoption Rates in Tanzanian Manufacturing and Service Sectors: A Comparative Study

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Abstract

The overall objective of this study was to ascertain the difference in ABC adoption rates between the manufacturing and service sectors in Tanzania. Based on the cross-sectional survey design, primary data were collected from 188 companies located in Dar Es Salaam, Arusha and Dodoma regions. The inferential statistics from chi-squared (χ^2) test results revealed that, p= 0.692 in country-wide was greater than 0.05, hence failed a condition to reject a null hypothesis (H_0). It was therefore concluded that, the difference in ABC adoption rates between the Tanzanian manufacturing and service sectors was not statistically significant. This conclusion was consistent in all the three research areas including Dar es Salaam (p= 0.622), Arusha (p= 0.193) and Dodoma (p= 0.986). The results give the implication that, a policy to be developed by a Tanzanian government to address the problem of low rate of 1.1% ABC adoption, should be uniform to both the manufacturing and service sectors. It is also important to note that, the results suggested an equal allocation of resources across both sectors in fostering companies to adopt the system.

Keywords: Activity-Based Costing; Adoption Rates; Manufacturing Sector; Service Sector; Comparative Study

Introduction

Activity-based costing (ABC) dates back to 1980s when it was introduced for the first time to replace the traditional costing system in management accounting operations of manufacturing companies (Saeed, Widyaningsih & Khaled, 2023). A continual improvement of it's features led to the diffusion of system to other different sectors such as the general service, oil and gas, minerals, engineering, agriculture and tourism (Elghaish, Abrishami, Hosseini & Abu-Samra, 2021; Engelen, Chau, Young, Mackey, Jeyapalan & Bauman, 2019; Carli, Canavari & Grandi, 2014). The system's increased popularity across different sectors as time went by was attributed to businesses' need of an advanced system to handle the intricate cost structures that proliferated in the World of growing automation (Elghaish et al., 2021). A persistent increase of overheads in the manufacturing operations in particular, caused a great shift of cost structures which rendered a traditional costing being considered an obsolete system (Quesado & Silva, 2021).

It was Robert Kaplan and William Burns who worked on the concept of ABC system at the first place in 1987, and then later involved Robin Cooper in devising the innovation into applications (Berg & Madsen, 2020). The motive behind was to have a costing system that relies on activities in cost assignment, rather than the consuming departments as it used to be with the traditional costing system (Sanchez-Rebull, Ninerola & Hernandez-Lara, 2023). Another distinctive development fused in ABC was the application of multiple cost drivers, as opposed to traditional system that relied on a single or fewer cost drivers in cost allocation (Latorre, Petruzzelli, Uva, Ranaudo & Semisa, 2021). These two distinctive features were deemed indispensable in overcoming the limitations of traditional costing system (Shihab & Prasad, 2022).

ABC as the new innovation by then, was introduced to improve accuracy in cost allocation as it provides a more precise cost per unit (Hansen, Mowen & Hitger, 2022). Apart from accuracy in cost allocation, manufacturing companies are compelled to switch from traditional system to ABC for better pricing and sale strategies which both are regarded as competitive advantages in business. ABC on the other hand,

enhances management to make better business decisions with regard to cost management and control based on detailed and accurate cost information (Zadorozhnyy, Muravskyi, Semaniuk & Gumenna-Derij, 2022). More importantly, by focusing on both the fixed and variable costs, ABC serves as an advanced tool for understanding cost behavior which is an important information in the control mechanism (Costa & Lucena, 2021).

Statistics show that, despite several advantages offered by ABC over the traditional costing system, adoption in both the manufacturing and service sectors was still below the expectations and standard of 50% (Jackson & Allen, 2023). In a global perspective, the average rate of adoption among the companies ranged between 17% and 33% (Hamad, Yousif & Fatehaerrhman, 2020; Neto, Agostinho, Almeida, Garcia & Giannetti, 2018). These rates accounted for both the developed and developing countries with those of the former being higher than the latter, although the differences were reported in several studies not to be statistically significant (Al-Dhubaibi, 2021). Studies conducted exclusively in Africa, reported more or less the same average rate of adoption of 17% among companies in both the manufacturing and service sectors. This average rate was a reflection of a number of rates in different African countries that ranged from 12% to 25% (Makhaza, 2022; Ogbuu, Nweke, & Mlanga, 2018; Ahmad, Zabri & Teng, 2017). In East African countries, the adoption rates were similarly lower as compared to other African countries with the same average of 17% (Daniel, 2022; Heckert, Leroy, Olney, Richter, Iruhiriye & Ruel, 2020). There was however limited information regarding the exact adoption rate in Tanzania before the conduct of this study. Previous studies conducted in the country including Esajee (2019) and Mafung'a (2012), implicitly reported low rate of adoption by referring to the prevailed situation in other East African countries.

Literature Review

Activity-Based Costing (ABC)

ABC is an upgraded version of traditional costing system of which the latter became less accurate in computation of cost object following a tremendous increase of overheads in advanced production processes (Quesado & Silva, 2021). The system was promulgated by Cooper and Kaplan in 1987, primarily focusing on improving the cost management by companies with multiple products during the era of products proliferation, complexity and diversification (Zamrud & Abu, 2020; Almeida & Cunha, 2017). It's introduction was likewise propelled by the fact that, reliance on a single or fewer cost drivers in cost assignments made a traditional costing unreliable system for profitability analysis (Cidav, Mandell, Pyne, Beidas, Curran & Marcus, 2020). According to Dorota, Wiecek and Dulina (2020), a switch from fewer cost drivers to multiple cost drivers and the focus of attention to activities rather than departments as cost centres, were considered the effective moves for efficient apportionment of cost pools to different products.

Putri, Bastian and Fitriyani (2023) described ABC as the two-step approach comprised of five (5) stages of implementation. The first step which is not implemented at traditional system, involves the allocation of resources to activities to create the activity costs (Babaaddoun & Ait-Mohammed, 2023). Implementation stages associated with this step include the identification of activities, grouping of similar activities and assigning resources to such groups to create activity costs (Saeed et al., 2023). All the activities undertaken from the inception of production process up to completion stage of obtaining the final products are recognized at this step (Sarokolaei, Bahreini & Bezenjani, 2013). The identified activities are assigned with the resources to determine how much cost each activity consumed during its execution (Hoozee & Hansen, 2018). According to Namazi (2016), the allocation of resources to activities is done using the resource cost drivers. The second step involves the assignment of costs to cost objects which is implemented in both systems, with the difference drawn on the number of cost drivers. This step entails two implementation stages including the identification of cost

drivers and their applications in cost assignment (Babaaddoun & Ait-Mohammed, 2023). Cost drivers are determined based on different factors that induce changes in activity costs (Hansen, et al., 2022). Such cost drivers are subsequently applied on cost pools in order to allocate related portions of overheads to specific cost object (Gisario, Kazarian, Martina & Mehrpouya, 2019).

The objective of this study was to compare the ABC adoption rates between the Tanzanian manufacturing and service sectors at all five stages of implementation as highlighted above. The ultimate purpose was to get answers as to whether sectoral affiliation had got anything to do with the ABC adoption at different places in the country. The results were useful to Tanzanian government in developing the policy to address the challenge of low adoption of ABC in the manufacturing and service sectors.

Manufacturing Sector in Tanzania

Companies that deal with the convention of raw materials to finished goods with the aid of labour, tools and other technologically enabled equipment are said to belong to manufacturing sector (Sharma, Luthra, Joshi and Kumar, 2021). Depending on the legal status on ownership, Tanzanian manufacturing sector is comprised of companies belonging to five (5) major groups (Wangwe, Mmari, Aikaeli, Rutatina, Mboghoina and Kinyondo, 2016). Such groups include publicly listed companies (Xu and Hou, 2021), private limited companies (Bacci, Cirillo, Mussolino and Terzani, 2018), cooperatives (Tanimizu and Kambara, 2021), partnership (Khan, Ahmed and Irshad, 2022) and others. The largest portion of manufacturing sector was occupied by the privately limited companies with 75.5% while cooperatives had the lowest proportion of 2%.

Manufacturing is among the key sectors that played a great role in the country's industrialization move notwithstanding its unfruitful fate (Mazungunye and Punt, 2021; Kasoga, 2020). Other major economy contributing sectors in Tanzania are mining, construction (Okangi, 2019) and agriculture (Mushi, Serugendo and Burgi, 2022). Oil and natural gas was an emergent sector which was under nurturing to becoming among

the country's economy driving sectors by 2025 alongside the service sector (Bishoge and Mvile, 2020; Magoti and Mtui, 2020). According to Kafuku (2019), the manufacturing sector was in the lead in terms of a number of constituent companies, which were 53% of all companies in Tanzania with the annual average growth rate of 4%. The World bank in particular reported that, the manufacturing sector contributed about 8.2957% to country's GDP (World Bank, 2022). It was food processors that represented a largest percentage of 24.5% of manufacturing companies in the country (Wangwe, et al., 2016). According to the study, companies that dealt with the machinery and equipment production and assembly had the lowest representation of 2% in the manufacturing sector. Other reported products with their percentage representation in brackets include textiles (10.2%), chemicals (10.2%), plastic and rubber (18.2%), non-metallic products (4.1%), basic metals (6.1%), fabricate metal products (2.0%), electronics (4.1%) and other products (18.4%).

Historically, Tanzania had been struggling for quite sometime to improve its economic performance by trying to boost the performance of manufacturing sector (Mwinuka & Mwangoka, 2023). As enshrined in the integrated industrial development strategy 2011-2025, the country was ambitious to increase the share of manufacturing sector in its GDP to 25% by improving among other things its export competitiveness (Misati & Ngoka, 2021). However, poor conditions of the supply-side over demand-side exports including a slow diffusion of innovations was a main constraint in the performance of country's export competitiveness (Lugina, Mwakalobo & Lwesya, 2022). According to Bigambo, Marandu and Elias (2023), challenges in supply-side export were attributed mainly to cost mismanagement which was the results of low rate of ABC adoption in the Tanzanian manufacturing sector.

The industrialization strategy was promulgated in 2010 and its implementation started effectively in 2011, which among other things was a guide for economic switch from agricultural dependence to industrialized economy. The prospect of this strategy required strong manufacturing sector for processing the agricultural and merchandised products (Mwinuka & Mwangoka, 2023; Joseph, 2022). One of the

indicators of strengths of the sector is the financial performance which is measured through its contribution to country's GDP (Chepachenko, Leontiev, Uraev & Polovnikova, 2020; Cicea, Popa, Marinescu & Stefan, 2019; Ahmad et al., 2017). Manufacturing companies are highly recommended to adopt ABC as the replacement of traditional costing system in order to improve their cost management which in return improve not only their financial performance but also boosts the supply-side conditions for export's competitiveness (Han, Yan & Piroozfar, 2023). The priority of the country on manufacturing sector with regard to the prospects of its contribution to country's GDP en route to attaining its industrialization goal was the main reason for choosing the Tanzanian manufacturing sector to be a case in this study.

Service Sector in Tanzania

A company that offers service to customers which is intangible in nature instead of a physical product for payment is said to belong to service sector (Andretsch, Kritikos & Schiersch, 2020). There were three (3) general categories of service sector in any particular country including consumer service, business service and public service companies (J. Trischler & J.W. Trischler, 2021). Based on the diversity of services offered by companies in Tanzania, the delivery of each service adhered to specific national policy including national health policy, 2017, national education policy, 2021, national tourism policy, 1999 and its updates, and monetary policy, 2020 to mention the few.

Over the years, much had been done in Tanzania to link the operationalization of the manufacturing sector with service sector, as the former could hardly exist in isolation (World Bank [WB], 2019; Mkonda and He, 2016). The focus was on the private companies, which were believed to be the engine of industrial revolution as strategized in the country's national development vision 2025. These interventions were deemed intrinsic to address the challenges behind the continual decline of sectoral contribution to GDP from 7.3% in 2005 to 5.6% in 2014 (Essays, 2018; Mwang'onda, Mwaseba & Juma, 2018). Ineffectiveness in manufacturing cost control and management as well as in profitability

analysis were mentioned in such studies as among the major challenges faced by the sectors.

Studies that were conducted in Tanzania on the subject of service sector tried to excavate the status of the sector and its contributions to country's economy in general (Hussein, 2021; Anderson and Sanga, 2018). One of the service sub-sectors is health that was a case of ABC adoption in previous studies including Kesale, Mohonge and Muhanga (2022). Similarly, there are studies that were conducted in Kenya that covered the subject of ABC adoption in service sector including Kihuba, English, Bozzani, Gheorghe and Griffiths (2015). By comparison, there were more manufacturing companies which adopted the system than the service companies in Kenya, hence making the difference in adoption rates being statistically significant (Saeed et al., 2023). The same observation was reported in the case of Ugandan manufacturing and service sectors by Molela, Kasoga and Ismail (2024) and Maelah and Ibrahim (2007). Adoption status in these two sectors in the neighbouring countries and the tendency of some studies of combining such sectors in exploring ABC adoption created a knowledge gap in Tanzanian context.

Methodology

The study employed the cross-sectional survey design as part of observational design for primary data collection. Based on the recommendations by Boru (2018), the survey design was deliberately opted based on its appropriateness in collecting a huge amount of data at one point in time and from a widely dispersed population. Data collection exercise was executed in Tanzania from the three selected regions namely Dar es Salaam, Arusha and Dodoma. The population of this study was comprised of 1,118 private companies engaged in manufacturing and service delivery activities in the country.

Sampling procedure involved two major steps in obtaining the representative sample from a target population. Such steps followed the patterns of multi-stage stratified sampling technique which was employed to solve the problem of diversity within a population. The first step was to divide the population into six (6) mutually exclusive groups

called strata. The groups were comprised of the manufacturing companies in Dar es Salaam, manufacturing companies in Arusha, manufacturing companies in Dodoma, service companies in Dar es Salaam, service companies in Arusha and service companies in Dodoma. The second step was to conduct simple random sampling without replacement within each stratum to obtain the sampling units in equal proportion. Sample size was computed using the formula put forward by Krejcie and Morgan (1970) which is credited for handling large population size. The method takes into consideration the population proportion (p= 0.5) of maximum value, model fitness estimated by chi square (χ^2= 3.8416), degree of precision (d) expressed as a proportion (0.05) and population size (N).

$$n = \frac{\chi^2 * \mathrm{N} * p(1-p)}{d^2 * (N-1) + \chi^2 * p(1-p)}$$

$$n = \frac{3.841 * 1{,}118 * 0.5(1-0.5)}{0.05^2 * (1{,}118-1) + 3.841 * 0.5(1-0.5)}$$

$$n = 286.07$$

The computed sample size of 286 companies was then subdivided into six (6) strata as per the percentage proportion in the population.

Table 1: Sample Size Division among the Six (6) Strata (n = 286)

COMPANIES	DAR ES SALAAM	ARUSHA	DODOMA	TOTAL
Manufacturing (%)	147 (65.0)	27 (54.5)	8 (74.4)	182 (63.6)
Service (%)	79 (35.0)	22 (45.5)	3 (25.6)	104 (36.4)
TOTAL (%)	**226 (79.0)**	**49 (17.0)**	**11 (3.5)**	**286 (100.0)**

Source: Author (2024)

The exercise of data collection started with the circulation of questionnaires to 286 sampled companies of which only 188 responded accordingly. Sataloff and Vontela (2021) regarded this response rate of 66% as very good as it fell within the acceptable range of 45% to 75%. The study asserted that, the rate above 75% was regarded as outstanding with reference to recommendations by various American journals which accepted the minimum response rates of 65%.

H_0 was tested using Pearson chi-squared test ($\mathcal{X}^2$) to compare the rates of ABC adoption in the manufacturing and service sectors. $\mathcal{X}^2$ test was a preferred test because of the nature of variables which were

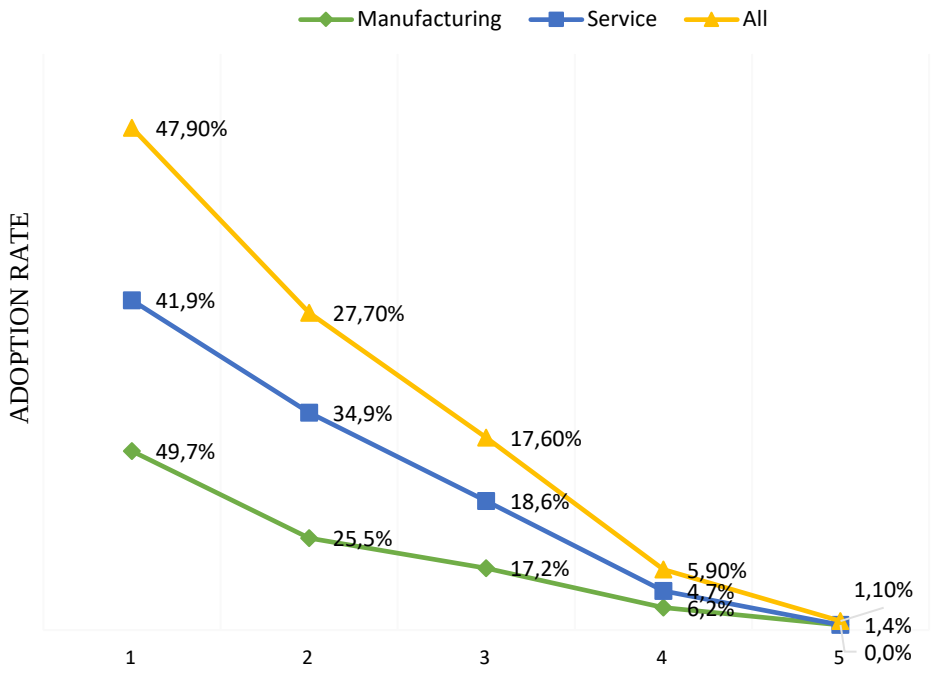
categorical and not continuous to meet the condition for *t*-test and Analysis of Variance (ANOVA) (Levine, Stephan, Krehbiel and Berenson, 2008).

Findings and Discussion

Descriptive Statistics

Descriptive statistical results disclosed the downward trend of ABC adoption from lowest through the highest level as indicated in a line graph below. A large percentage of companies whose plans were afoot to start the first stage of ABC implementation or discarded the system were at level 1. 47.9% of all companies were found to be at this level with 41.9% and 49.7% ascribed to representatives of service and manufacturing companies respectively.

27.7% of companies really started the implementation of the first stage by identifying the activities in the production process. They likewise, went further to allocate the resources to implement such activities. Companies that implemented these activities were said to be in level 2 of ABC adoption. On sector-wise, it was only 34.9% of service companies that adopted level 2 of ABC system while only 25.5% of manufacturing companies were at this level. Level 3 of ABC was adopted by 17.6% of companies in Tanzania that progressed further to assigning the activity costs to cost drivers. For the case of service companies, it was 18.6% that were at this level while only 17.2% of the manufacturing companies made it to this level as well.



Graphic 1: Adoption Trend Across ABC Implementation Levels
Source: Descriptive Statistical Results

The adoption rates went further down at level 4 of ABC system where the companies that reached the stage of identifying cost drivers to be applied to different cost pools were 5.9%. The percentage rate for manufacturing companies was higher than that of service companies by 0.5%. Application of cost drivers to cost pools in a course of obtaining the contribution of indirect costs to cost object leads to the last and highest level of ABC adoption.

It was 1.1% of all Tanzanian companies that managed to complete the implementation circle by reaching the highest 5th level of ABC adoption. There was no single service company that was found to have reached at level 5 of ABC adoption except 1.4% of the manufacturing companies. From this finding, it was deduced that only 1.1% of companies fully adopted the ABC system in Tanzania.

Inferential Statistics

The objective of the study was to compare the ABC adoption rates between the manufacturing and service sectors in Tanzania. Null hypothesis (H_0) which assumed the difference in ABC adoption rates was not statistically significant between the Tanzanian manufacturing and service sectors was tested using chi-squared ($\mathcal{X}^2$) test model. Evaluation of independence of variables and model goodness of fit was done by carrying out the Fisher's exact and likelihood ratio tests respectively.

Fisher's Exact Test for Independence

It was imperative to determine the association between the two sectors as the prior condition for further analysis under $\mathcal{X}^2$ test arrangement (Kudanga, Nzuza & Stainbank, 2023). According to the study, the two sectors as the explanatory variables had to satisfy the elementary condition of independence so as not to affect the final results to be drawn from the response variable. The test was conducted to assess the independence of variables at every research area, with the condition that the calculated *p*- values had to be less than 0.05 for the results to be statistically significant. Table 2 below gives the summary results from $\mathcal{X}^2$ test.

Table 2. Chi-Squared Test Results

Location	Test	Value	df	*P*- value
ARUSHA	Pearson Chi-Square ($\mathcal{X}^2$)	4.726[b]	3	0.193
	Likelihood Ratio	5.039	3	0.169
	Fisher's Exact			0.038
	N of Valid Cases	32		
DAR ES SALAAM	Pearson Chi-Square ($\mathcal{X}^2$)	2.626[c]	4	0.622
	Likelihood Ratio	4.210	4	0.378
	Fisher's Exact			<0.001
	N of Valid Cases	132	2	
DODOMA	Pearson Chi-Square ($\mathcal{X}^2$)	0.029[d]	2	0.986
	Likelihood Ratio	0.028		0.986
	Fisher's Exact			0.009
	N of Valid Cases	24	4	

TOTAL	Pearson Chi-Square ($\mathcal{X}^2$)	2.238[a]	0.692
	Likelihood Ratio	2.648	0.618
	Fisher's Exact		<0.001
	N of Valid Cases	188	

Source: Chi-Squared Test Results

Test results as given in the synopsis above confirmed the independence of explanatory variables in Arusha (p= 0.038), Dar es Salaam (p<0.001) and Dodoma (p= 0.009) all together as the p- values were all less than 0.05. The condition was as well met in country-wise as epitomized in the total results, where the overall p<0.001 was less than 0.05, indicating that the independence was statistically significant.

Goodness of Model Fit Test

There are several models that could be employed to test the null hypothesis including student's *t*-test, analysis of variance (ANOVA) and Pearson chi-squared ($\mathcal{X}^2$) test to mention the few (Khanna & Kaur, 2023; Molela & Ismail, 2020). The fundamental criterion that was first considered in selecting the $\mathcal{X}^2$ test was based on the nature of explanatory variables which is categorical. The second criterion was the model fit to data results obtained from the likelihood ratio tests at different research areas. It was important to test the goodness of model fit so as to validate the $\mathcal{X}^2$ model's assumptions by determining the statistical significance of the differences between the observed and expected values (Pekgor, 2023). If the wrong model was chosen instead of the $\mathcal{X}^2$ test model, then the analysis would produce the misleading results which could lead to misleading conclusions.

The rule of thumb was to have the calculated p- value exceeding 0.05 which was set as the standard. *P*- values for Arusha (p= 0.169), Dar es Salaam (p= 0.378) and Dodoma (p= 0.086) were all greater than 0.05, hence null hypotheses (H_0) which assumed the model did not statistically fit the data, failed to be rejected. With this regard, the assumptions by alternative hypotheses (H_1) were upheld that $\mathcal{X}^2$ test model statistically fitted the data collected from all the three research areas. The same conclusion was reached when results from all the three research areas

were aggregated to give a general picture in the country-wide. Failure to reject H_0 as p= 0.618 was greater than 0.05, resulted into upholding the assumption for H_1 that $\mathcal{X}^2$ test model statistically fitted the data.

Differences in ABC Adoption Rates Between the Tanzanian Manufacturing and Service Companies

The Difference in Adoption Rates

The main aim of the objective was to find out if the difference in ABC adoption rates between the manufacturing and service companies in Tanzania was statistically significant. $\mathcal{X}^2$ test model was employed for this objective where test results for the Tanzania as a whole and for each region individually were compared with 0.05 standard. The calculated p-value (p= 0.692) at country level was greater than 0.05, leading to a failure to reject a null hypothesis (H_0) which assumed no statistical significant difference in rates between the manufacturing and service companies in Tanzania. It was therefore concluded that, the difference in rates of ABC adoption between the manufacturing and service companies in Tanzania was not statistically significant as predicted in H_0.

Let β_{mi} and β_{si} be the correlation coefficients for the rates of ABC adoption by the manufacturing and service companies respectively, H_0 is mathematically expressed as hereunder;

$$H_0 = \beta_{mi} = \beta_{si} = 0 \text{ .....i}$$

In region-wise, the similar findings were produced by $\mathcal{X}^2$ test with p- values for Arusha (p= 0.193), Dar es Salaam (p= 0.622) and Dodoma (p= 0.986) being greater than 0.05. The respective H_0 at these places were not rejected, leading a conclusion that, the differences in rates of ABC adoption by the manufacturing and service companies in Arusha, Dar es Salaam and Dodoma were as well not statistically significant.

Assuming β_{m_ARi}, β_{m_DAi} and β_{m_DOi} are the correlation coefficients for the rates of ABC adoption by the manufacturing companies in Arusha, Dar es Salaam and Dodoma respectively. Likewise, β_{s_ARi}, β_{s_DAi} and β_{s_DOi} are the correlation coefficients for the rates of ABC adoption by the service

companies in Arusha, Dar es Salaam and Dodoma respectively, then H_0 were mathematically expressed as hereunder;

$$H_0 = \beta_{m\_ARi} = \beta_{s\_ARi} = 0 \text{ ……ii}$$

$$H_0 = \beta_{m\_DAi} = \beta_{s\_DAi} = 0 \text{ ……iii}$$

$$H_0 = \beta_{m\_DOi} = \beta_{s\_DOi} = 0 \text{ ……iv}$$

The percentage differences in adoption rates presented in table 3 below at different levels were all not statistically significant as revealed through the $\mathcal{X}^2$ test results discussed above. Summary results indicate that, rate of adopting level 1 ABC was higher for manufacturing companies (49.7%) than for service companies (41.9%) in Tanzania.

Table 3: Three Dimensional Cross Tabulation Results (N=188)

Location/ Sector			ABC Adoption					
			Level 1	**Level 2**	**Level 3**	**Level 4**	**Level 5**	
ARUSHA	Manufacturing	Count	11	5	2	2	0	20
		%	55.0%	25.0%	10.0%	10.0%	0.0%	100%
	Service	Count	2	5	3	2	0	12
		%	16.7%	41.7%	25.0%	16.7%	0.0%	100%
	Total	Count	13	10	5	4	0	32
		%	40.6%	31.3%	15.6%	12.5%	0.0%	100%
DAR ES SALAAM	Manufacturing	Count	51	27	21	7	2	108
		%	47.2%	25.0%	19.4%	6.5%	1.9%	100%
	Service	Count	12	8	4	0	0	24
		%	50.0%	33.3%	16.7%	0.0%	0.0%	100%
	Total	Count	63	35	25	7	2	132
		%	47.7%	26.5%	18.9%	5.3%	1.5%	100%
DODOMA	Manufacturing	Count	10	5	2	0	0	17
		%	58.8%	29.4%	11.8%	0.0%	0.0%	100%
	Service	Count	4	2	1	0	0	7
		%	57.1%	28.6%	14.3%	0.0%	0.0%	100%
	Total	Count	14	7	3	0	0	24
		%	58.3%	29.2%	12.5%	0.0%	0.0%	100%
TOTAL	Manufacturing	Count	72	37	25	9	2	145
		%	49.7%	25.5%	17.2%	6.2%	1.4%	100%
	Service	Count	18	15	8	2	0	43
		%	41.9%	34.9%	18.6%	4.7%	0.0%	100%
	Total	Count	90	52	33	11	2	188
		%	47.9%	27.7%	17.6%	5.9%	1.1%	100%

Source: Cross Tabulation Results for Chi-Squared Test

The average rate for both sectors when put together was 47.9% at level 1 which was the highest of all levels. Meanwhile, the rates differed remarkably across different regions with Arusha being 55% for manufacturing and 16.7% for service companies. Companies in Dar es Salaam exhibited a reverse order with service oriented ones having higher rate of 50% than that of manufacturing of 47.2%. Dodoma had more or less similar trend as portrayed in the country-wide where the manufacturing companies had higher rate (58.8%) of adoption than that of service companies which was 57.1%.

Adoption Rates Across Different Levels of ABC Implementation

Level 1 ABC was "the getting prepared" level where companies had not yet started implementing any stage of ABC activity but rather learning the possibility of adoption. It is at this level that companies used to find the clues about the appropriate cost accounting system by understanding the associated pros and cons. Acquaintance with the fundamentals of ABC was essential in determining the next move that companies would take. Across the regions, it was Dodoma which had manufacturing companies with the highest rate (58.8%) of level 1 ABC adoption and Arusha with service companies being the least in adoption rank with the rate 16.7%.

Contrary to level 1, it was service companies that had higher rate (34.9%) of level 2 ABC adoption than that of manufacturing companies (27.7%) in Tanzania. In region-wise, it was Dodoma which deviated from the general trend by having manufacturing companies with higher rate of 29.2% than that of service companies 28.6%. The rest of the regions followed the general trend with the rate of service companies exceeding that of manufacturing companies. Arusha region had 41.7% of service companies that adopted level 2 of ABC while only 25% of manufacturing companies did the same. In the case of Dar es Salaam, the adoption rate by service companies was 33.3% while that of manufacturing companies reading 25%.

Comparison across the regions, had manufacturing companies in Arusha with the highest rate (41.7%) and service companies in Arusha and Dar es Salaam with the lowest rate of 25%. It was at level 2 that companies were considered to have really started implementing the ABC

system by undertaking the initial task of identifying the activities. Contrary to traditional cost accounting system which deals with the allocation of costs to departments, it is level 2 that made ABC to depart from traditional system by dealing with activities instead. The proper demarcation of activities at this level guarantees the reliable cost object at the end of the process since overlapping activities would make difficult to apply the appropriate cost drivers at level 4.

The overall rate of level 3 ABC adoption by service companies was higher by 1.4% than the rate by the manufacturing companies. It was only Dar es Salaam region whose manufacturing companies had the adoption rate (19.4%) surpassed the rate (16.7%) by service companies, but the rest of the regions followed the general trend. Companies in Arusha showed a huge discrepancy of 15% with 25% of service companies having adopted level 3 while only 10% of the manufacturing having done the same. In the case of Dodoma, the discrepancy was moderate where the rate by service was 2.5% more than the rate by the manufacturing companies.

Accumulating the related activity costs into cost pools was the major activity undertaken by companies at level 3 of ABC adoption. The activity is next to identification of separate activities which was the prime onus by the companies at level 2 of adoption. It is important to have cost pools with closely related activities in order to simplify the activity of identifying the appropriate cost drivers for such pools. It was discovered in the findings that, it was service companies in Arusha that had the highest percentage rate (25%) of level 3 ABC adoption. It was in the same region where the manufacturing companies were found to have the lowest percentage rate (10%) of level 3 ABC adoption of all regions.

Level 4 of ABC implementation was the second highest level of adoption that the companies could reach, which was marked by lower percentage rates for both manufacturing and service companies than the lower levels. It was at this level that no company was found to have adopted the ABC system in Dodoma. Similarly, neither of the service companies in Dar es Salaam had adopted this level while only 6.5% of the manufacturing companies in the region were at this level. The situation

was quite different in Arusha where both manufacturing and service sectors had some companies having adopted level 4 of ABC system with the rate of service companies (16.7%) being higher than that of manufacturing companies (10%). The general picture drawn in the country at large put the manufacturing companies ahead of service companies with respective rates of 6.2% and 4.7%.

Companies were considered to be at level 4 of ABC adoption only when they undertook the activity of cost drivers identification on top of the activities encompassed in levels 1,2 and 3. The main difference between the traditional and ABC system when referring to level 4 was the number of cost drivers to be applied to cost pools of which ABC tends to have more cost drivers than traditional cost accounting system. Service sector in Arusha had the largest representations of all manufacturing and service companies at level 4 of ABC adoption with the percentage rate of 16.7%. Both sectors in Dodoma and service sector in Dar es Salaam had no company implementing ABC system at this level making them the least in the list.

Dar es Salaam was the only region in Tanzania with the manufacturing companies implementing ABC system at level 5 of adoption with 1.9% rate. This was the highest level of adoption, where companies at this level were considered to have fully adopted the system. The ultimate goal of cost accounting is to determine the cost of a product or service by allocating the activity costs to cost drivers. It is at this level that, the costs of manufactured products or service delivered are determined for management purpose. None of the sectors in other regions had the representative companies at level 5 of ABC adoption making the overall rate of adoption at this level being 1.4% for the manufacturing and 0% for the service companies.

Implications to Policy in Tanzania

The Tanzanian government should develop the uniform policy in a move of encouraging companies from both the manufacturing and service sectors to adopt the ABC system. As contended by Saeed et al. (2023) of the importance of ABC in cost Management, it is imperative for the

Tanzanian government to develop policy that would be important in encouraging companies in manufacturing and service sectors to adopt it in heir operations. The policy to be developed would be uniform in both sectors that addresses the importance and need of adopting the system. The uniformity is backed by the fact that the adoption and implementation of ABC in both sectors did not differ significantly.

Likewise, based on the findings it is important for the Tanzanian government to allocate the resources equally the same to both sectors for raising awareness, training and extending supports in encouraging companies to adopt the system. The strategies employed to overcome barriers of adoption should be similar in both sectors including by not limited to addressing the challenges imposed by external forces as opined by Molela, Kasoga and Ismail (2023).

Conclusion

Chi-Squared ($\mathcal{X}^2$) test results gave the warrant that, the rates of ABC adoption between the manufacturing and service sectors in Tanzania were not statistically significant. The same results were confirmed in Dar es Salaam, Arusha and Dodoma regions which were the research areas. It was therefore concluded that, by combining the manufacturing and service sectors in assessing the factors affecting the ABC adoption in Tanzania could not produce different results had the sectors been separated. When the results are translated to practices, it gives the impression that, similar approaches should be employed across both sectors in fostering companies to adopt the system. Even the strategies to be adopted by the government to overcome barriers of adoption would be more or less similar in both sectors.

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