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INTEGRATING ENVIRONMENTAL COST ACCOUNTING USING ACTIVITY BASED COSTING SYSTEMS: NIGERIAN MARCH TO SUSTAINABLE COMPETITIVENESS IN THE GLOBAL ECONOMY.

KEYWORDS: environmental accounting, activity based costing, global competitiveness

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ABSTRACT *Changes in business environment triggered by global competition and Technological advancement has necessitated demands for relevant cost data and performance in organization's activities, processes, products, services and customers. The paper therefore aims at integrating environmental cost accounting using activity based costing systems: Nigerian march to sustainable competitiveness in the global economy. Data was collected from stakeholders' across-industrial lines in Aba, Enugu, Nnewi and Onitsha in the south east of Nigeria. These cities are fast developing industrial hub in Nigeria. Data collected were analyzed using multiple linear regression. The study revealed an extreme low practice of Activity-based costing (ABC) among corporations. Secondly, it also showed that non-application ABC is the cause of our poor product costing comparable to international standard. Consequent upon these, the paper majorly recommended that manufacturing firms should properly integrate environmental costing using ABC to fully capture all the needed cost in their product pricing which would afford them global competitiveness.*

1.0INTRODUCTION

In the past decades, many developing countries, especially in East Asia, have demonstrated tremendous success in developing their economic conditions from a lower-income to higher-income brackets. Regrettably, at the same time many developing countries, mostly in sub-Saharan Africa, Central and South Asia and Latin America, have not yet been successful to tackle the problem of poverty (Egwu, 2012).

Cross-country difference in economic growth performance in developing countries is caused by many factors such as institutional inefficiency, environment degradation, negative impact of globalization and trade liberalization, misuse of foreign aid, technological backwardness, non-competitive financial sector; inefficient utilization of natural resources and, above all, government failure and corruption (Mahmud, 2008).

Ironically, in this era of intense global competitiveness, many of these countries are still ignorant about accurate information on product costs and performance measurement systems that aid effective product costing strategy which are central for firms' survival and sustained profitability as a way to poverty reduction. This change in manufacturing operations and processes often necessitated appropriate accounting practices. Scholars and Practitioners have questioned the need to adequately capture environmental cost hitherto unreported in accounting reports and publications. The inadequacy of the traditional accounting system providing information need on concisely, timely and accurate reports for managerial intervention is worrisome (Isa and Foong, 2005).

Developments in the Delta and other riverine areas of Nigeria where oil and gas prospecting have taken the center stage have caused Increasing pressures and incentive for the adopting of cleaner production environment or pollution prevention processes, proper integration of these environmental cost are major concern of the government, academician and practitioners because of their obvious environmental implications on operations, product and services. According to Okafor (2009), environmental risk cannot be ignored; they are now as much as part of running a successful business as product design, marketing and sound financial management. Poor environmental management has a colossal consequence on both the firms and its finances.

Nigerian quest to join the league of top 20 economies of the world by 2020 can only materialize if academics, scholars, practices and the government enthrone appropriate accounting structures and systems that are appropriate for economic development (Egbunike, 2009). Therefore, fusion of environmental cost accounting using activity based cost accounting (ABC) is one such measure and capacity which will enable us properly trace and cost our products and services in the fashion achieved by these advanced economies. Manufacturing firms in Nigeria need to constantly review and revise their manufacturing strategies to stay competitive. This provides a better option to the nation's competitiveness in the global economy since goods and services manufactured are comparably internationalized.

Prompted by this, the researcher made the following propositions:

Ho; Environmental cost accounting practices is not low in Nigeria.

Hi: Environmental cost accounting practice is low in Nigeria,

Ho: Non-application of ABC model in product costing in Nigeria is an impediment to our competitiveness in the global economy.

Hi: Application of ABC model in product costing in Nigeria is an impediment to our competitiveness in the global economy.

The remainder of this paper is organized in the following manner: Section 2 provides the development of theoretical framework that depicts the relationship under investigation. The results of the empirical findings follow in section 4. Finally, conclusions and recommendations are presented in section 5.

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2.0 Review of Related Literature

2.1 Theoretical Framework

Today's business environment is in a state of flux, where competition is the name of the game. Organizations that fail to change may be forced to changed from existence to non- existence; hence survival is the panacea (Ukenna and Ijeoma, 2010). Trade liberalization and advancement in manufacturing and information technologies have significantly intensified competition, both in the domestic and the international market. In response to the escalation in market competition, manufacturing firms are constantly reviewing and revising their manufacturing strategies to stay competitive (Isa and Foong, 2005). Obviously, these drastic changes in today's competitive business environment and advancement in manufacturing technology have a number of implications for accounting practices

2.2 TRADITIONAL ACCOUNTING SYSTEM

Conventional accounting system developed in the early part of the century to deal with product costing in a typical factory which then existed (Adeniji, 2004). Then, industry was labour intensive, there was no automation, product variety was small and overhead in manufacturing firms were generally very low compared to today. Standard was developed for tracing and controlling direct labour activities and indirect costs were allocated across products units. In those years, there were narrow ranges of products incurred, mostly variable costs (Sheu and Kovar, 2001).

Today business environment has witness changes. In order to stay competitive, manufacturing firms are constantly reviewing and revising their manufacturing strategies. These changes necessitated appropriate switch to new management accounting practices to take into account the changing production cost structure (Isa and Foong, 2005).

Numerous debates have been held among scholars and practitioners in providing adequate, relevant, timely, and accurate information to management for planning, control and decision-making purposes in the new manufacturing environment (Bjornenak and Olson, 1999, Cooper 1996, Cooper and Kaplan, 1988, Drury and Tayles, 1995; Johnson and Kaplana, 1987; Kaplan, 1984 as cited in Isa and Foong, 2005). It is for these reasons that Kaplan (1996) stated:

Traditional accounting practices……..simply the wrong measures. They move the company in the wrong direction, reward managers for damaging business and provide incentive for improvement. The best we can do is to switch them off, just stop doing them.

In related criticism, Goldralt(1983) as cited by Sheu and Kovar (2003) describe traditional cost accounting in this way:

Cost accounting was a powerful solution; did not change the behavior and performance of industrial companies. Then technology pulled the rug from underneath cost accounting.

Continuing, Hardly and Hubbard, (1992) as cited by Rivero and Emblemsvag (2007) observed the traditional accounting system cannot trace- overhead costs buts but simply distribute as butter on bread as it were without estimating the effect of all the complexities and identify the root cause of costs (Eiler and Ball, 1997). The assumptions on which cost accounting were based are no longer valid. Many companies are already facing the disaster from following an obstructed solution. They are too late, too aggregated and too distorted.

However, empirical studies have shown that the traditional accounting system are still widely use across firms possible due to lack of the knowledge of other powerful and modern management accounting system like activity based cost system.

2.3 ACTIVITY BASED COSTING SYSTEM

Change in the business environment, sparked off by global competition and technological innovations, have led to a new demand on relevant, timely information and data about cost and performance within the organizations activities, process, products, services and customers. According to Kaplan and Cooper (1998), companies are increasingly using their cost systems to

Design products and services, improve quality, efficiency and speed, guide product mix and investment decisions etc.

Activity-based costing system emerged to meet the need for these accurate information about cost of resources demand by individual products, services and customers and the systems enable indirect and support expenses to be driven first to activities and processes and then to products, services and customers. In this regard, managers and accountants will have deep knowledge of the economics of their operation to improve decisions (Cardos and Pete, 2011) collaborated by Emblemsvag (2001) when they observed that Activity based cost represents a symbol of improved costing system that has gained more and more grounds than conventional methods (Brinker, 1994) due to both more correct cost assessments and superb tracing of the costs. In view of this superiority, Cooper (1990) noted two clear distinctions between convention a costing and activity-based costing system:

-In ABC system, it is assumed that cost objects (products, services, and so forth) consume activities while the conventional cost method assumes that theobjects consume resources

In the words of O'Quinn, 1990 reports that product cost estimates from a conventional costing system can differ by several hundred percent compared to an ABC system.

Generally, Activity-base costing (ABC) improves the internal company cost calculation by allocating costs typically found in overhead costs to the polluting activities and products. ABC as it applies to environmental costs distinguishes between environment related cost and environment driven costs. The former are attributed to joint environment cost centers example incinerator or sewage plant. The latter are hidden in the general overhead costs and do not relate directly to joint environmental cost center e.g. increased depreciation or higher cost of staff (Okafor, 2009).

2.4 ENVIRONMENTAL COSTING SYSTEM

Environmental costs are impacts, monetary or non-monetary incurred by a firm or organization resulting from activities affecting environmental quality. This includes any such cost, direct or less tangible with short or long-term internal consequences for the form. Organizations naturally should reflect these environmental factors (costs) in their accounting processes through proper identification of environmental cost to products, processes and services. However, this

Volume : 5 | Issue : 2 | Feb 2015 | ISSN - 2249-555X

is not the case in Nigeria where the knowledge of environmental costing is at infancy stage. The conventional costing system mainly in use among firms simply attribute the environmental costs to the general overhead accounts. As a result of this development, managers are unaware of these costs and do not have information on how to manage them and no incentive to reduce them (UNDSD, 2003) following this, many organizations knowingly or unknowingly underestimate the cost of poor environmental behavior or overestimate in other cases. This goes a long way in distorting or misrepresenting environmental factors which aids in wrong decisions in the organization as well as the environmental. This scenario was better explained by Okafor (2009) when she quoted Frost and Wilmburst (2000) to the effect that by failing to reform management accounting practices to incorporate environment concerns, companies are unaware of the impact on profit and loss account and balance sheet impact of environment related activities. In this attempt, it miss out identifying cost reduction and other improvement opportunities, employ incorrect product/service pricing, mix and development decisions which often times failed to capture the customer value and other investment risk.

2.5 APPLYING ENVIRONMENTAL ACCOUNTING TO COST ALLOCATION USING ABC

The traditional volume based approach of allocation of production overhead costs to products and service practiced by traditional cost accounting system is criticized as over-simplistic and does not reflect the complexities of products i.e. actual cost of product (Kaplan, 1984).

However, new approaches such as environmental accounting which ensures that environmental cost is drawn to the attention of corporate stakeholders who may be motivated to identify ways of reducing or avoiding those cost while at the same time improve environmental quality. This can be done by putting some environment costs out of overhead in corporate cost accounting system and allocating those environmental costs to the appropriate accounts. By this direct allocation to the products, process or facility that generate them, a company can be encourage to find creative pollution prevention alternatively that lower those costs and enhance profitability. Obviously, where overhead is allocated incorrectly, a product may be an overhead allocation greater than warranted while another bear an allocation smaller than its actual contribution. The result is poor product costing which can affect pricing and profitability.

Alternatively according to US EPA (1995) some overhead costs may not be reflected at all in product cost and price. In both cases, managers cannot perceive the true cost of producing products and thus internal accounting reports provide inadequate incentive to find creative ways of reducing those costs. Environmental costs once identified should be separated as a matter of urgency from the overhead costs and allocate them to appropriate product, process, systems, and facility directly responsible. This is critical because business will have accurate estimates of production costs for different product lines and processes but also to help managers target cost reduction activities that can also improve environmental quality.

Most companies are identifying and measuring direct environment costs by revising allocation bases so as to separate out indirect environment costs using ABC. ABC when applied to environmental costs distinguishes between environment related costs normally attributed to joint environment cost center (incinerator or sewage plant) and environment driven costs which can be direct, indirect, and contingent which are hidden in the general overhead. In applying ABC, model, environmental costs are expunged from the overhead costs and traced to products and services by identifying the resources, activities and attendant costs and quantities used to produce the output. This in effect reduce the potential or cross subsidization of dirty or environmentally damaging products, processes, sites and departments (Domil, Peres and Peres, 2010).It involves the allocation of the usual production costs such as pollution control and the use of raw materials and energy as well as such as capital costs such as emissions monitoring and testing procedures plus liability costs and removing their environmental cost form overhead costs and accurately allocating them to specific products results in few distortions in product costing. In this way, manufactures have obtained a clearer picture of the economics of their operations and could improve their decisions.

In today's competitive environment, organizations require reliable cost system and relevant cost information to survive. By implementing an ABC system, managers will obtain accurate information about the true cost of products, services, processes, activities, distribution channels, customers segments, contracts and projects. (Carodos and Pete, 2011). ABC begins according to Hughes and Gjerde (2003) with companies' product, determines the activities the activities and used in the production and delivery of those products, and computers the cost of various activities. The cost of the activities are then assigned to the product on causal relationship. By this way ABC provides more informed not be "one off event, it demands a series of relentless and continuous improvements. Needy et al (2003) points out four critical processes for the implementation of ABC system;Cost system evaluation; ABC design; ABC implementation; and System evaluation and validation

Besides this, ABC plays significant role at the end of product life. This is not particularly observed in Nigeria where end products are discarded regardless of its environmental impact: it is important that take back and disposal of products at their end of the life are appreciated and the land used for production facilities are remediate. A comprehensive ABC model will help to identify all the activities and the total resources costs related to preventing and remediation expected environmental change. Environmental cost must be correctly attributed to both existing products and past product.

Comprehensive environmental cost analysis is key requirement in order to assess levels of environmental hazard and toxicity and their associated costs. Such analysis identifies and assigns key cost drivers and product consumption patterns thus permitting a good attribution of environmental cost to individual products. It is important to emphasis here that ABC initiatives do not naturally reveal environment driven costs-substantial inputs by environmental manager are required in order to ensure the costs of all environmental costs in the production process.

3.0 METHODOLOGY

A total of 200 copies of questionnaire were distributed to the respondents out of which 150 copies were returned as duly filed and usable. This represent 75% response rate which is considered quite high for a study of this nature. This high response rate was informed by the fact the researcher adopted the drop off and pick off method in distributing the questionnaire. After which multiple linear re-

Volume : 5 | Issue : 2 | Feb 2015 | ISSN - 2249-555X

gression was employed in testing the hypotheses and the result are shown below. The analysis was conducted the aid of computer software the SPSS statistics version 22

4.0RESULT AND DISCUSSION
REGRESSION
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	1.000(a)	.999	.999	.53012

Model(**ANOVA**)		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3194.933	143	22.342	79.509	.000(a)
	Residual	1.967	7	.281		
	Total	3194.900	150			

Model (**Coefficient**)		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	-38.060	2.280		-16.695	.000
	Q 1-5	3.931	.037	1.028	106.538	.000
	Q6-10	.597	.020	.282	29.235	.000

From the table of regression above, the model summary show the correlation is 1.000 which is very high. The R^2 is .999 and the adjusted R^2 is also .999. TheANOVA is significant at .000 which is lower than the .01. This shows that the model is a good fit. for the coefficients Q1-5 were summed significant at.000 which is lower than .01 hence the null hypotheses one is rejected and an alternative accepted that environmental cost accounting practices is low in Nigeria. Q6-10 were reduced to test hypothesis 2 and the coefficient is significant at .000 and lower than .01 and with this the null hypothesis were rejected while the alternative is accepted that non application of ABC model in product costing in Nigeria is an impediment to our competitiveness in the global economy.

4.1 IMPLICATION FOR THE STUDY

Nigeria is environmentally troubled nation with immense oil spillages across Niger-Delta region. Integrating environmental costing using new costing strategies such as ABC which captures product costing for improved decision –making, total revision in cost pattern and cost behavior, inventory will be heavily reduced, warehousing costs will reduce and a clear decline in standard costing system. However, there will be finally, investment in fixed costs/ capital investments and finally, accounting will wear more non-financial performance architecture. These implication points to the need for this nation to embrace the integration and meet global challenges.

5.0 CONCLUSION/RECOMMENDATION

Manufacturing sector of an economy is engine of growth, transformation and catalyst for economic revival. Close home, Nigeria with barely years to vision 2020, earns only 4% of her Gross Domestic product (GDP) from manufacturing sector. This situation when compared to economics such as Netherland, Turkey, Poland, Indonesia, Belgium which currently occupy 16th -20th position of the top 20 economics in the world showed a shocking relationship because manufacturing sector to these nations GDP range from 14%, 22%, 28% and 17% respectively. It is in this respect that the paper majorly recommend that there should be proper product costing strategies which will beachieve by integrating environmental cost recounting using ABC model to facilitate the nation's beneficial participation in the global process in order to achieve a high per capita GDP which will significantly reduce our poverty level.

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