

**CHAPTER ONE**  
**INTRODUCTION**

# **SECTION ONE**

## **INTRODUCTION**

### **1.1 The background of Study**

Global competition, technical change, and computerized information system development have changed the profile of company cost structure. An overhead cost which is shared by many products and services become more significant dominant portion of total product costs rather than direct labour costs. Therefore, traditional costing systems which use direct labour as a principle cost allocation base, may distort product cost information; causing some products to appear to cost more and other appear to cost less than they actually do. Distorted knowledge of product cost makes it difficult for management to know how to best employ the resources available. Moreover, they lead management to misunderstand the true cost and profits from particular products or customers. Activity-based costing (ABC) was developed by Cooper and Kaplan in 1980s to overcome the limitations of traditional costing systems and to enhance its usefulness to strategic decision-making by assigning overheads costs to activities using multiple cost drivers rather than one or two cost driver, and then allocating costs to products based on each product's use of these activities. ABC system allows managers to improve performance by reducing costs through designing products and processes that consume fewer activity resources, increasing the efficiency of existing activities, eliminating activities that do not add value to customers.

The benefits of ABC system over traditional costing systems have motivated both practitioners and researchers to investigate various aspects of

ABC such as the practice of ABC system adoption; factors influence the success of ABC application; Problems and difficulties associated with ABC adoption and reasons for non-adoption; a comparison between ABC and traditional costing systems; and Association between ABC application and company's performance. Therefore, this study is step on this direction by integrating abroad range of above issues into one study. The study investigates the impact of ABC system on enhancing financial performance by examining some enabling factors which influence the application of ABC system. In addition, the study also looks for the difficulties and problems associated with application and non -application of ABC system by SMCs.

## **1.2 The Statement of problem**

Despite the benefits of ABC system and its positive impact on company performance, a review of literature on activity-based costing system (ABC) revealed that the practice of ABC system still was done in developed countries and very little has been done in developing country, especially in Africa context. More specifically, in the Sudan, recent literature revealed that a majority of Sudanese manufacturing companies still using the same traditional costing systems as a product costing that were developed decades ago to serve the accountancy function not the needs of the decision makers; and ABC system is not being adopted or implemented by many companies yet. This was one of the major obstacles preventing better business financial performance. Therefore, Sudanese manufacturing companies (SMCs) in new competitive environment have a critical need to apply more sophisticated costing system such as ABC system to enhance the accuracy of cost information which provides significant opportunities for enhancing performance. In addition, recent literature highlights great attention towards the factors affecting the application of ABC system and the influence of the

variables that drive towards higher levels of performance such as technical, organizational and other contextual factors; however, there is no generally accepted agreement on the determinants of successful development and implementation of ABC system. On the other hand, the application of ABC system appears to offer significant benefits to those companies which have adopted it. However, there is also evidence that the application of the system poses significant difficulties. The following questions may shed some light upon the existing problem:

- a. Do SMCs apply ABC system?
- b. Do factors of (cost structure, importance of cost information, product diversity, and competition) influence the application of ABC system?
- c. Does application of ABC system enhances financial performance compared with traditional costing systems by SMCs?
- d. What are problems and difficulties associated with application and non-application of ABC system by SMCs?

### **1.3 The objectives of Study**

The main objective of this study is to examine the impact of activity based costing (ABC) system on improving financial performance in SMCs. This objective is divided into the following sub-objectives:

- a. Extending the existing literature on ABC system and providing an up-to-date description of adoption of ABC system by SMCs.
- b. Examining the impact of some factors on the application of ABC system by SMCs.
- c. Comparing the results of ABC system with traditional costing systems with regard to the financial performance.
- d. Highlighting the difficulties and problems associated with application of ABC system and reasons for non-application by SMCs

## **1.4 The importance of Study**

The importance of this study appears in three aspects are as follow:

First, this study makes a contribution to the limited available research and existing knowledge in the area of adoption and implementation of activity based costing system, especially in African developing countries such as Sudan. In addition, this research adds further evidence to the value of studying cost and management accounting, and more specifically new changes in cost and management accounting practice.

Second, the critical need of Sudanese industrial sector as one of the main economic sectors to cope with the requirements new business competitive environment for new costing system such as ABC system to provide more accurate product cost information which improves decision making; focuses manager's attention; and improves insights towards activities that have the largest opportunities for improvement and contribution to profitability.

Third, the study seeks to identify if some factors (cost structure, importance of cost information, product diversity, and competition) which were found previously influence the application of ABC system affect the adoption of ABC system in SMCs. In addition, the study seeks to determine the significant problems associated with application and non application of ABC system by SMCs.

## **1.5 The hypotheses of Study**

To answer the study questions and achieve the study objectives, the following hypotheses were developed:

H1: SMCs do not apply ABC system.

H2: There is a positive relationship between some influential factors and

application of ABC system by SMCs.

- H2a: There is a positive relationship between cost structure and application of ABC system by SMCs
- H2b: There is a positive relationship between importance of cost information and application of ABC system by SMCs
- H2c: There is a positive relationship between product diversity and application of ABC system by SMCs
- H2d: There is a positive relationship between competition and application of ABC system by SMCs

H3: There is a positive relationship between application of ABC system and enhancement in financial performance

H4: There are problems and difficulties associated with application and non-application of ABC system by SMCs.

## **1.6 The methodology of Study**

### **1.6.1 The population & sample of Study**

The population of this study defined as industrial sector. The target industrial sector for this study was manufacturing (conversion) sector which comprise eight manufacturing sub-sectors according to the international statistics in United Nation. The sample of study is purposive sample which consists of four manufacturing sub-sectors which represent about (50%) of manufacturing (conversion) industry sub-sectors (four of eight sub-sectors).

### **1.6.2 The Methods of study**

The study depends on three methods: (a) **Historical method** in ordering the periods of the previous studies (b) **Deductive method** for picking the facts. (c) **Descriptive analytical method** for the analyzed data which include quantitative data (archive accounting) and qualitative data (interview)

### **1.6.3 Data Collection Sources**

The study depends on two types of sources for data; primary data and secondary data. **Primary data** which consists of all data (qualitative data) related to variables identified in this study was collected via semi-structured-in-depth interview. **Secondary data** consists of two parts, first, theoretical part which was collected from references, books, periodicals, published thesis, dissertations, reports and international scientific conferences. Second, empirical part which includes demographic data; and archive accounting data (cost sheets) related to SMCs the sample of this study.

Two types of data were collected for this study; Quantitative data were collected from archive accounting data (cost sheets) for the year 2012 related to dependant variable. Qualitative data were collected by using semi-structured interviews for most appropriate representatives members that have enough knowledge about ABC system such as financial managers, and cost accountants) for the study's sample (SMCs).

The interview data include questions related to general information about the company's costing system, current status of adoption of ABC system; reasons for ABC adoption; factors influence the adoption of ABC system; problems and difficulties associated with adoption of ABC system and reasons for non-adoption.

### **1.7 The Structure of Study**

This study is organized as follow: The first Chapter represents the introduction which consists of two sections. The first section represents the introduction which introduces the research's background, problem statement and its questions, objectives, importance, hypotheses, and study methodology. Also research structure is included in this section. The second section presents the previous research

The second Chapter provides a theoretical framework in five sections. The first section provides an overview of costing system. Section two: traditional costing systems. Section three: Activity-based costing system (ABC). Section four: Financial performance; and section five presents application of ABC system and financial performance. Chapter three presents empirical study in two sections. First section: Methodology. And second section is Data analysis, findings discussion. Chapter four presents a conclusion which includes findings, recommendations and future research.



## **SECTION TWO**

### **PREVIOUS STUDIES**

The selected previous studies in this study were collected from prominent refereed accounting research journals, theses and dissertations in the field of costing systems-Activity based costing (ABC). These studies related to five areas: (a) The application of ABC system ; (b) Factors influence the application of ABC system; (c) Difficulties and problems associated application of ABC system ; (d) A comparison between traditional costing systems and ABC system; (e) Association between application of ABC system and company's performance. In addition, this section includes the gaps from previous studies.

#### **2.1 The Application of ABC system**

##### **2.1.1 Study of (Bjornenak, 1997)<sup>1</sup>:**

This study investigates the diffusion of ABC and different variables (cost structure, competition, existing costing system and product diversity) related to (Planned or actual) adoption in Norway. The study based on a questionnaire survey, incorporating data from 75 of the large Norwegian manufacturing companies with response rate %57. The findings of this study were: (a) large numbers of manufacturing companies have adopted ABC as on idea, i.e. they have implemented ABC or planted to do so 40%; 31% non-adopters and 29% were without ABC knowledge. (b) Just only cost structure

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<sup>1</sup>. Bjørnenak, T., Diffusion and Accounting: The Case of ABC in Norway, *Management Accounting Research, And Academic Press limited*, Vol.8, No.1, 1997, pp. 3-17.

was found to be statistically significant. (c) Companies which had knowledge of ABC were significantly larger than the other. However, size did not significantly discriminate between adopters and non-adopters within the group with ABC knowledge.

### **2.1.2 Study of (Al-Basteki & Ramadan, 1998)<sup>2</sup>:**

This study seeks to identify and highlight ABC practices in Bahraini manufacturing companies with respect to extent, motives, difficulties of implementations and reasons as to why some companies have not yet considered ABC, and to compare the practices found in Bahraini companies with those reported by studies in developed countries.

The study addressed the following questions:- (a) To what extent manufacturing companies operating in Bahraini have implemented or plan to implement ABC system? (b) What are the factors or reasons that motivated Bahraini manufacturing companies to implement ABC system? (c) What are the design and implementation difficulties that were encountered by the companies which adopted ABC system? (d) What are the reasons that some Bahraini companies to reject ABC system after considering it? And (e) What are the reasons for not considering ABC system by some companies in Bahraini?

The study based on a questionnaire survey, incorporating data from 75 of the large Bahraini manufacturing companies with response rate %57.

The Finding of this study showed the following results: (a) The majority of the manufacturing companies in Bahraini uses single cost allocation rate. Units produced are the most commonly used allocation

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<sup>2</sup> . Al-Basterki, H. & S. Ramadan: A survey of Activity-based Costing Practices in Bahraini manufacturing firms, *JKAU: Ecom & Adm*, Vol.11, 1999, pp.17-29.

method, followed by direct labor hours and prime cost. (b) A small percentage of manufacturing companies in Bahraini is using ABC system as a supplementary and not as a replacement to the traditional volume system. That is, ABC is used as a stand alone outside the accounting system. (c) The most important motives for implementing or considering ABC are that it provides insight into cost causation which helps in cost reduction and control; It provides more accurate information for pricing decisions, product profitability analysis, departments/ centers customers analysis, inventory valuation, and income determination. (d) The most important difficulties facing adapters are: The identification of the activities and cost drivers; selling the ABC concept to line employees; lack of clear understanding of ABC on the part of production supervisors and accountants; increased workload of accounting personnel with respect to data collection, analysis, and reporting; and accountants' reluctance to change traditional accounting methods. (e) The most important reasons as to why some Bahraini companies did not consider ABC are: satisfaction with the existing costing system; ABC system is not a priority for their managements; and nobody in these companies has initiated consideration for introduction of ABC system.

The recommendations of this study were as follow: (a) examining the association between a company's manufacturing characteristics and the use or implementation of ABC system. (b) Using a field research methodology such (case study or field study) to examine motives, benefits, and difficulties associated with implementation of ABC by the eight Bahraini companies that had implemented ABC system.

### 2.1.3. Study of (Innes et al., 2000)<sup>3</sup>:

This study reviews the results of two U.K. surveys of activity-based costing (ABC) in the U.K.'s largest companies. The first survey was completed in 1994 and the second in 1999. The study aims to assess the changes that have been occurred in the ABC adoption status of companies over a recent 5-years period for the ABC users and the non-users. For the ABC users: the nature of the ABC systems in use, their designers, the uses to which they have been putting and the levels of success and importance that participants attribute to them). For the non-users: the reasons for their lack of commitment to ABC are explored.

The study used a questionnaire survey. To ensure comparability, the 1999 survey mirrored the design of the first survey in 1994 study reported in Innes and Mitchell (1995). The survey was conducted in January and February 1999 and involved two mailings questionnaire. A total response of 44.9% was achieved. The usable questionnaires were provided by finance directors/company secretaries (54 respondents) and accounting staff (102 respondents), with other business staff (21 respondents) providing the remainder. Respondents had, on average, 9.4 years experience of employment in their organization.

The findings of this study were: (a) both use of and interest in ABC has shown no increase over the past 5 years. Indeed, there is a marginal decline in the proportion of ABC users and those currently considering ABC adoption, having both fallen to 17.5% and 20.3% from 21.0% and 29.5%, respectively. In addition, a slightly higher proportion claimed to

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<sup>3</sup>. Innes, J, F. Mitchell, & D. Sinclair, Activity-Based Costing in The U.K.'S Largest Companies: A Comparison of 1994 and 1999 Survey Results, *Management Accounting Research*, <http://www.idealibrary.com>, Vol.11, No.3, 2000, pp.349–362.

have rejected ABC after assessment in 1999. However, there were also a higher percentage of companies that had not even considered its use (46.9) in 1999 compared with (36.1) in 1994. (b) The support of top management has a strong impact on explaining the success rating of ABC. (c) The major benefits perceived for ABC comprised improvement in product cost/profitability information; better cost control information; knowledge of customer profitability; superior decision-making information and improvements in performance measurement. (d) The factors constraining ABC adoption were: the costly demands that ABC development would place on staff and other resources; the prioritization of other competing initiatives, the need to address difficult technical issues, such as the identification of cost drivers, and the need to provide accurate cost apportionment; and behavioural problems, such as changing well-established practice and employee suspicion about the motives for using ABC. (e) The most common reasons given for making no assessment of ABC were its lack of relevance/suitability to the respondents' business, the existence of a cost/cost management system that operated satisfactorily, the absence of the necessary expertise and resources to undertake an assessment and the lack of top management interest/support, and the its perceived administrative and technical complexity, and the fact that the costs of implementation and use would exceed its benefits.

#### **2.1.4 Study of (Baird et al., 2004)<sup>4</sup>:**

This study examine the extent of adoption of activity management practices (Activity Analysis, Activity cost analysis & Activity-based costing) and it also examines the association between extent of adoption and selected organizational factors of size and decision usefulness of cost information, and business unit culture dimensions of (innovation, outcome orientation, and tight versus loose control). The study aims to achieve the following objectives:- (a) Examining the extent of adoption of activity management at each of three levels of Activity Analysis, Activity cost Analysis and activity-based costing. (b) Examining organizational factors previously found to be associated with adoption of activity management generally (specifically, business unit size, decision usefulness of cost information) for their association with the extent of adoption of activity management at each three levels. (c) Examining business unit culture dimensions (specifically, innovation, outcome orientation, and tight versus loose control) for their association with the extent of adoption of activity management at each three levels.

The study mailed a survey questionnaire to the financial controller (or equivalent) of a random sample (stratified by size) of 400 Australian business units chosen from the Kompass Australia (2001) directory.

The findings of this study were: (a) Activity management practices are widely used by Australian business units with adoption rates considerably higher than those in prior studies, 86%.of Activity Analysis, and 78% Activity based costing form. (b) All factors (size and decision usefulness of cost information, and business unit culture dimensions of

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<sup>4</sup>. Baird, K.M., G.L. Harrison, & R.C. Reeve, Adoption of Activity Management Practices: A Note on The Extent Of Adoption and The Influence of Organizational And Cultural Factors, *Management Accounting Research*, Vol.15, No.4, 2004, pp. 383-399.

(innovation, outcome orientation, and tight versus loose control)) were found to be associated with all activity management practices. In particular, business unit size and all three business unit culture dimensions were found to be associated with extent of adoption of activity Analysis, and Activity cost Analysis (ACA), while decision usefulness and the cultural dimensions of outcome orientation and tight versus loose control were associated with Activity-based costing.

The recommendations of this study as follow: (a) Further research should investigate the effects of business units culture in activity management practice (activity analysis (AA), Activity cost analysis (AA) and activity based costing (ABC)). (b) Also, further research could be directed at unraveling the relative effects of different cultural combinations where the dimensions (innovations, outcome orientation, tight versus loose control) compete for their importance in combination in a particular context rather than complement each other.

### **2.1.5 Study of (Cohen et al., 2005)<sup>5</sup>:**

This study examines the adoption rate of ABC by Greek companies that belong to all three sectors of the Greek economy, i.e. manufacturing, retail and services, as well as investigating the reasons that influence a company's decision to change its current management accounting system.

The study used a questionnaire survey during 2003 on a sample of 177 leading Greek companies and four company categories were identified in respect to their perceptions towards ABC (ABC adopters, ABC supporters, ABC deniers and ABC unawares). A total of 88

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<sup>5</sup> . Cohen., S., G. Venieris, & E. Kaimenaki, ABC: Adopters, Supporters, Deniers And Unawares, *Managerial Auditing Journal*, Vol. 20, No. 9, 2005, pp.981 – 1000.

completed questionnaires were received and analysed, which represent a response rate of 49.7%.

The findings of this study were as follow: (a) ABC diffusion in Greece is quite satisfactory with adoption rates, 40.9% have already implemented ABC, while 59.1% were non-ABC adopters (31.9% had rejected ABC, 13.6% considering the implementation of ABC, and 13.6% were not considering ABC implementation. (b) With respect to ABC implementation benefits, the findings grouped the benefits into six categories: Cost accounting benefits which include calculation of actual product cost; more accurate costing information; and more accurate allocation of overheads; identification of activities costs. Cost management benefits include: identification of the factors that are reasonable for cost creation; overhead decrease; more realistic budgets preparation; and cost reduction. Performance measurement benefits include: analysis and control of product profitability; improvement of department's performance measurement; improvement of activity management efficiency; improvement of activities performance. Decision making benefits include: improvement of the decision making process in relation to product costs, preservation or discontinuance of activities; pricing policy, and abolition of "loss making" products. General management benefits: improvement of product quality; improvement of outsourcing procedures; support for TQM initiatives and ensuring JIT synergies. Relationships management reasons: improvement of customer management efficiency; motivation of the personnel that deal with cost accounting; identification of "loss making" customer and suppliers. Furthermore, the results present evidence that firms that have implemented ABC (ABC adopters) have experienced multidimensional



management facilitating benefits from the system. However, the adequacy of resources was found to be the variable that is positively and statistically correlated with the majority of problems encountered during ABC implementation process such as activities identification, identification of the proper cost drivers, software selection, personnel's resistance, prolongation of ABC timetable, lack of top management support. (b) The companies that include ABC in their future plans (ABC supporters) seem to be familiar with the corresponding expected benefits and potential problems of its adoption. The results present evidence that the possibility of future ABC adoption is related to the degree of satisfaction from the currently used cost accounting system. (c) Companies that do not intend to adopt ABC (ABC deniers) were found to be more satisfied with their existing cost accounting system in comparison to ABC supporters, lack of management support, ABC is no apriority, high cost of ABC implementation, Lack of adequate knowledge or/ and resources for ABC implementation, Employee will not accept ABC, ABC's perceived inadequacy to provide more accurate cost information, ABC takes time to assess, requirement to follow parent company's directives, including the selection of cost accounting system. (d) The results also report the characteristics of companies that still have complete ignorance of the ABC technique (ABC unawares).

### **2.1.6 Study of (Liu & Pan, 2007)<sup>6</sup>:**

This study examines implementation of ABC within a Chinese organizational and culture setting by investigating some key success

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<sup>6</sup>. Liu, L.Y.J.L. & F. Pan., The Implementation of Activity-Based Costing in China: An Innovation Action Research Approach, *The British Accounting Review*, [www.sciencedirect.com](http://www.sciencedirect.com), Vol. 39, No.3, 2007, pp. 249-264.

factors (technical, behavioral, organizational and contextual factors) pertinent to ABC implementation.

The study aims to contribute to the quest for the success factors of ABC implementation in China in two complementary ways: (a) with the adoption of an innovation action research approach. (b) Synthesizing the issues reported in the existing ABC literature with the actual implementation experience from this study.

The action research was carried out during the implementation period (2001-2003) with following-up research visits leading to December 2005. Data collection methods comprised interviews, observation and documentation at various implementations stages, and participation of management meetings, examination of organizational documents and archives, and scrutiny of external information (e.g., newspaper report and websites).

The findings of this study were as follow: (a) The most important success factors are: Sustained top management support, corporate culture of “top-down” instigation of the adoption of a series of management innovations (e.g. Economic-value Added, Balanced Scoreheads and six sigma) and its hierarchical command and communication structure, and Active involvement of a high proportion of dedicated professionals.

The recommendations of this study were as follow: (a) further research should add these contextual factors to the concerns over the future of the ABC system: The goal incongruence due to its organizational structure and arrangements which segregates business functions (i.e. sales, purchase and production); The continuous use of traditional financial accounting information in measuring financial performance and The dominance of market prices and customer demands. (b) Further research

should investigate: The application of ABC/M and associated influential factors; the integration of ABC with EVA (and/or KPIs) in evaluating divisional performance and promoting goal congruence.

### **2.1.7 Study of (Satorius et al., 2007)<sup>7</sup>:**

This study examines the design and implementation of ABC systems in South Africa, and comparing ABC implementation in South Africa to that in several developed/developing countries.

The main objective of this study is to test four principal research questions relate to: (a) The extent of ABC diffusion in South Africa. (b) Reasons for adopting ABC. (c) The problems associated with ABC adoption. (d) The critical success factors needed to ensure successful implementation.

A descriptive methodology was adopted to evaluate the extent of ABC implementation. A combination of survey and quasi-case study methodology was used to identify the reasons for ABC implementation / Non implementation, problems and critical success factors relating to implementation. Data were collected by using interviews, telephonic and e-mail survey of listed South Africa companies on the Johannesburg Securities Exchange (JSE). Further data were also collected from sources such as press releases, consultant reports and websites. The sample size of this study consisted is twenty (ten ABC consultants work in Gauteng-South Africa, five JSE listed companies that had implemented ABC, and five JSE listed companies that had not implemented ABC)

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<sup>7</sup>. Sartorius, K., C. Eitzen, P. Kamala, The design and implementation of Activity Based Costing (ABC): a South African survey, *Meditari Accountancy Research*, Vol. 15, No.2, 2007, pp. 1-21.

The findings of this study were as follow: (a) The extent of ABC implementation in South Africa is lower than that on developed countries (12%). (b) the reasons for implementing ABC in South Africa were: reasons mainly related to cost (more accurate costs, cost control and costs minimization, costs allocation, cost setting activities); Customer and product profitability analysis; A pressure from suppliers and competitors; Enhancing pricing decisions or simplifying negotiations; A response to corporate failure; The increase in computer power due to availability of computer at low prices. (c)The problems associated with implementing of ABC in South Africa are included : lack of top management support or/ management and employees resistance, Technical factors such as( the high level of cost, the difficulty with collection and accumulation data, the difficulty of defining cost pools, cost drivers and determining the level of details, lack of ABC skills & high staff turnover. (d) The reasons for non- implementation of ABC by companies in South Africa are: high level of cost, ABC is only suited to manufacturing; companies are doing so well they do not focus on cost; Other priorities like TQM, JIT programs; lack of adequate IT systems such as ERP; ABC is still new and will take time to assess, be accepted; ABC is unrealistic and inadequate marketing; Companies were still largely reliant on financial accounting-based data; business environment which displays both and third world characteristics, as well as to the lack of a distinct management accounting body (e) The critical success factors for implementing ABC in South Africa were: organizational factors (top management support; training for staff; non- accounting staff ownership; adequate resources of the right quality); and technical factors such as (the selection of a suitable ABC model proper IT back-up and compliance with other database; the

selection of the optimum groupings of activities; and the choice of a suitable cost drivers for each cost pool). (f) In general, however many of the reasons, problems, and critical success factors relating to ABC implementation in South Africa appear to be similar to those in other developed countries.

The recommendations of this study were as follow: (a) Determining the relationship between the use of ABC costing and financial performance, as well as, to certain in the new role of ABC in inter organizational transactions. (b) Investigating the diffusion levels of activity management at of three levels (Activity analysis, activity cost analysis, activity based costing) in South Africa. (c) Investigation should be done to determine exactly why ABC is more suited to some industries than to other.

#### **2.1.8 Study of (Majid & Sulaiman , 2008) <sup>8</sup>:**

This study examines the implementation of activity based costing in two companies in Malaysia. The study aims to document and highlight the problems and benefits of implementing activity-based costing (ABC) in two companies in Malaysia. A case study methodology was used to describe the process of ABC implementation in a Malaysian based multinational company as well as a Malaysian multinational company. The findings of this study were: (a) Although ABC is not widely adopted by companies in Malaysia; it is recognized as a valuable tool to improve the performance of these two companies. (b) Additionally, many of the problems that hinder the implementation of ABC are related to managerial factors rather than the

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<sup>8</sup> . Majid, J.A, & M. Sulaiman, Implementation of activity based costing in Malaysia: A case study of two companies, *Asian Review of Accounting*, Vol. 16, No.1, 2008, pp.39 – 55.

technical aspects of the tool itself. (c) Several factors are pertinent to ensure the success of ABC: top management support, simplifying the ABC implementation process, sourcing suitable ABC software, and finally, ensuring that all affected employees understand and actively support the implementation process.

### **2.1.9 Study of (Dhu et al, 2009)<sup>9</sup>:**

This study discusses the background, process, and result of implementing ABC system in a Taiwanese textile company. It integrates a broad range of issues into one study: diagnosing the existing costing system, designing and validating an ABC system, documenting the design and implementation of the ABC system, and identifying factors affecting the success or failure of such implementation. In so doing: the comparison of product costs under the two systems; and the comparison of correlations between manufacturing overhead and cost drivers are both included. The study attempted to answer these questions:- (a) Why does a company decide to adopt ABC? (b) How to design and to implement ABC? (c) How and why the cost does generated by ABC and existing cost system lead to different outcomes? (d) Why does ABC system implementation succeed or fail?

The study used an in-depth field investigation by collecting and analyzing 39 months of field data, gathering information from files and archives, direct observation, interviews, and statistical analyses was conducted.

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<sup>9</sup> . Dhu, R., T. W. lin, & W. Y. Wang, and G. C. H. Hung, The Design And Implementation Of Activity Based Costing (ABC): A Case Study Of A Textile Company, *International Journal Of Accounting And Information Management*, [www.Emeraldinsght.Com/1834-7649.Htm](http://www.Emeraldinsght.Com/1834-7649.Htm), Vol.17, No.1, 2009, pp. 27-52.

The findings of this study were as follow: (a) The Company's existing cost system adopted a volume-based cost driver to allocate overhead cost to products; Although the company tasks into account the degree of complexity and its cost relations in overhead allocation under the existing traditional volume-based cost system, the weakness in its design and application led to product cost distortions. (b) The existing cost accounting system fails to consider the impact of rework on the product costs and the various requirements of individual dyeing orders, and thus result in cost distortion. (c) The existing volume-based cost system overestimates the costs of high-volume products and underestimates the costs of products with high production complexity. (d) Adding complexity-related cost drivers to the volume-based cost driver increases the ability to explain variations in overhead costs. (e) The newly designed ABC system incorporates both volume-based and non-volume based drivers, which considers the effect of rework on product costs. (f) The company did meet some criteria for successful ABC implementation, such as: Recognizing the necessity for introducing ABC; Top support of senior management; Being equipped with software; Providing training and education. However, there are some other factors that prevent the company from successfully implementing ABC, such as lack of linkage to performance evaluation and incentives, an insufficient amount of MIS staff, and inadequate inventory management.

The recommendation of this study is to integrate production and operation management with product costing systems

### **2.1.10 Study of (Lado, 2010)<sup>10</sup>:**

This study investigates the adoption of activity-based costing technique in Sudanese Sugar Company Ltd. The study addressed the following hypotheses were as follow:

**H1:** There is significant variation in the degree of activity based costing adoption by the factories in the Sudanese sugar company.

**H2:** changes in different functional roles in a firm at the different stages of activity based costing implementation will vary significantly

**H3:** There will be significant differences between firms implementing and those abandoning activity based costing in their perceived reasons for adopting activity based costing.

**H4:** There will be significant differences in perceptions of the importance of behavioral and organizational variables at the different levels of activity based costing success.

The study used an exploratory, descriptive and analytical methodology. The study's data were collected by questionnaire and interviews instruments.

The findings of this study were as follow: (a) ABC is not adopted or implemented by Sudanese sugar factories due to higher priorities for other projects (such as ISO 9001, TQM and others) required by their customers, however, they expect that ABC will be next project because the top management in Sudanese Sugar Company realized that ABC information will support ISO 9001 &TQM. (b) Information control by the accounting department and the functional role of the accounting department has significant differences at different stages of the

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<sup>10</sup> . Lado, J.W.J, The Adoption & Implementation Of Activity-Based Costing Techniques In Sudanese Sugar Industry, unpublished PhD, Thesis in Accounting, Sudan, University of Juba, 2010, pp.1-221.



implementation of the management accounting innovations. In addition, the implementation of these innovations had made employees in non-accounting departments have more responsibility of collecting, reporting and using cost innovations. This finding indicates that employees in the Sudanese sugar factories had learnt to implement innovations such as ISO and TQM and changed their behaviors in accordance with the innovations.

(c) The Sudanese sugar factories detected mistakes of the traditional costing systems and corrected them by adopting the management accounting innovations. This finding shows that Sudanese sugar factories were learning in the double –loop mode. (d) The most reasons for not adopting ABC were: inherent difficulties with ABC design and implementation group such as:(the complexity and time –consuming, difficulties in selecting appropriate software package and collecting data on the cost drivers); High priorities of other changes or projects in the firms characteristics and business environment group; Lack of internal resources; Satisfaction with the current systems; Resistance from employees is little important reason for not adopting ABC. (e) The consensus and clarity of the objectives of the management accounting innovations’ implementation among the designers and users effected on the degree of innovations success. Although others variables (top management support, linkage of the innovations to competitive strategies, linkage of innovation and compensations, sufficient internal resources, training, non-accounting ownership) could not sufficiently explain the differences of the degree of innovations success, the results suggest that they were more important to successful implementation of the innovation, because of they all built environment to learn about the innovations and work with them.

The recommendations of this study were as follow: (a) It necessary for Sudanese sugar companies to adopt and implement activity-based costing in its firms by raising the level of awareness and importance of ABC, established and equipped all the concern officials and employees with the adequate necessary training facilities to enable them to adopt and implement these new innovation. (b) The Universities need to avail to the accounting professionals and academics the necessary literature on Activity-based costing that could help them, and other possible users in their endeavors to develop and advance this area with needed knowledge and practice.

#### **2.1.11 Study of (Al-Nieel, 2011)<sup>11</sup>:**

This study assesses the effectiveness and efficiency of modern cost accounting methods in the Sudanese petroleum production companies.

a. The main problem of this study is represented by the non-adoption of the Sudanese Oil-producing companies of the modern cost accounting techniques, which have become one of the requirements of the modern industrialization, especially under the conditions of sever competition.

The study aims to test the following hypotheses:-

**H<sub>1</sub>**: The development and change in modern management & production systems affects efficiency and effectiveness of traditional cost accounting techniques.

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<sup>11</sup>. AL-Nieel, A.H., Assessment of The Effectiveness and Efficiency of Modern Cost Accounting Methods in the Petroleum Production Companies in the Sudan, PhD, Dissertation in Cost & Management Accounting , SUST, 2011, pp.

**H<sub>2</sub>:** Apply of modern cost accounting techniques provide accurate cost information that will improve cost management and aids management in doing their functions.

**H<sub>3</sub>:** Applying one of the modern cost accounting techniques which is suited with the nature and size of Petroleum Company makes the techniques efficient & effective.

**H<sub>4</sub>:** The adoption of accurate and efficient financial accounting system in the petroleum company affects the application of ABC technique and makes it more efficient and effective.

**H<sub>5</sub>:** The application of ABC technique is suitable for Sudanese petroleum companies.

The study's population consisted of Sudanese petroleum companies as well as financial managers, financial and cost accountants and other parties have knowledge in area of accounting. The data collection tools were: questionnaire, interview and observations.

The most important study findings were: (1) The development and change in management and production systems affects the efficiency and effectiveness of traditional cost accounting systems. (2) The Sudanese petroleum companies did not apply the modern cost accounting techniques due to unavailability of accurate accounting information and they depend on the financial accounting system information. (3) The application of modern cost accounting techniques provide accurate cost information, which improves cost management and aids management in doing their functions (4) The modern cost accounting technique (ABC) is suitable with Sudanese petroleum production companies when its benefits outweigh costs.

The recommendations of this study were as follow: Future studies should investigate: The impact of costing awareness in promoting development in Sudan; The impact of costing techniques in petroleum agreements.

## **2.2 The Factors influence the application of ABC system**

### **2.2.1 Study of (Krumwiede, 1996)<sup>12</sup>:**

This study is empirically test the effect of certain factors on the adoption and infusion of activity-based costing (ABC) among members of the Cost Management Group of the Institute of Management Accountants. The study is motivated by the low adoption and infusion rates for ABC in spite of the improved product cost information it may provide.

The objectives of this study are: (1) to investigate whether certain rational factors affect the adoption of ABC, and (2) to assess whether infusion is also affected by these same factors or is more a function of organizational factors.

The study hypotheses stated in the alternate form as form as follow:

**H1:** ABC adoption is more likely to occur in environment where there is high potential for cost distortions and high decision usefulness of cost information.

**H2:** ABC adoption is more likely to occur as the implementation of total quality management and lean production practices increase.

**H3:** ABC adoption is more likely to occur as IT sophistication increase.

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<sup>12</sup> . Krumwiede, K.R, An empirical examination of factors affecting the *adoption* and infusion of *activity-based costing*, Ph.D., The University of Tennessee, UMI company, 1996, pp1-109

**H4:** For organizations that have adopted ABC, infusion of ABC is more likely to occur as IT sophistication increase.

**H4:** For organizations that have adopted ABC, infusion of ABC is more likely to occur as IT sophistication increase.

**H5:** For organizations that have adopted ABC, infusion of ABC is associated more with organizational factors than with rational factors.

The study used a mail survey instrument to collect data from members of the Cost Management Group of the Institute of Management Accountants in US.

The findings of this study were: (a) Strong support is found for the hypothesis that ABC adoption is more likely to occur in environments where there is high potential for cost distortions and high decision usefulness of cost information. (b) Also, larger organizations are found to have a higher adoption rate than smaller units. (c) Infusion is found to be significantly related to two organizational factors, top management support and training, although a negative relationship between training and infusion is contrary to what was expected. However, an important finding of this study is that IT sophistication is also associated with ABC infusion. The association is found to be strongest for firms that have reached a high level of IT sophistication.

The recommendations of this study were: (a) determining whether certain ABC implementations require more training than others (b) determining if certain firms need those organizational factors such as non accounting ownership and specificity of objectives more than others.

### **2.2.2 Study of (Maelah & Ibrahim, 2007)<sup>13</sup>:**

This study investigates the status of ABC adoption among manufacturing organizations in Malaysia, and the Factors influencing its adoption. The study aims is to increase understanding on ABC adoption in manufacturing organizations in Malaysia. Specifically, these objectives are as follow: (a) To estimate the percentage of ABC adoption among manufacturing organizations in Malaysia. (b) To investigate if certain Factors (Cost distortion, decision usefulness of cost information, IT, top management support, non-accounting ownership, training and performance measurement) have influence on ABC adoption.

The hypotheses of the study were as follow:-

**H<sub>1</sub>**: There is a positive relationship between high potential of cost distortion and ABC adoption.

**H<sub>2</sub>**: There is a positive relationship between decision usefulness of accounting information and ABC adoption.

**H<sub>3</sub>**: There is appositive relationship between organization support and ABC adoption.

**H<sub>4</sub>**: There is a positive relationship between training and ABC adoption.

**H<sub>5</sub>**: There is a negative relationship between IT Quality and ABC adoption.

**H<sub>6a</sub>**: There is a significant positive relationship performance (learning and growth) and ABC adoption.

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<sup>13</sup>.Maelah, R., & D.N. Ibrahim, Factors Influencing Activity-Based Costing (ABC) Adoption in Manufacturing Industry, Investment Management and Financial Innovations, Vol. 4, No.2, 2007, pp.113-148.

**H<sub>6b</sub>:** There is a significant positive relationship between performance measurement (internal measures) and ABC adoption.

The study used a mail survey questionnaire of manufacturing companies listed on the Kuala Lumpur Stock Exchange and multinational manufacturing companies operating in Malaysia. The questionnaires were directed to the accountants of selected manufacturing companies. The data analysis includes descriptive analysis, test of response rate bias, factor analysis, test of reliability, and logistic regression.

The Findings of this study showed the following results: (a) Most manufacturing companies in Malaysia do not adopt ABC as their overheads costing system, just 36% adopted ABC of 108 manufacturing companies. In addition, it is also found that among those that adopt ABC, many are still at the initial stage of implementation. (b) Decision, organization support and internal measures have significant on the adoption of ABC among manufacturing organizations in Malaysia.

The recommendations of this study were: investigating similar issues presented in this study with differentiating the different stages of adoption process on the entire population in Malaysia and view and opinions of other interested parties inside the organizations such as the management and the other employees.

### **2.2.3 Study of (Cinquini et al., 2008)<sup>14</sup>:**

This study explores the factors (contextual factors: cost structure, importance of cost information, and product diversity) influencing the diffusion of advanced costing techniques (activity based costing and target

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<sup>14</sup>. Cinquini, L., P. Collini, A. Marelli, A.Tenucci, An Exploration of The Factors Affecting The Diffusion of Advanced Costing Techniques: A Comparative Analysis of Two Surveys (1996-2005), The 31<sup>st</sup> Annual Congress of the European Accounting Association Campus of the Erasmus University, Rotterdam (NL) April, 23<sup>rd</sup> to 25<sup>th</sup>, 2008, pp.1-17.

costing) of a comparative analysis of two surveys conducted in a length of ten years (1996 and 2005) on large Italian manufacturing firms.

The objective of this study is to contribute in this field of management accounting research by applying a contingency model based on information provided by a comparison of two survey conducted in a ten years.

The hypotheses of this study were as follow:

**H<sub>1a</sub>:** There is a positive relationship between the importance of cost information and the costing sophistication (both in 1996 and 2005).

**H<sub>1b</sub>:** The relationship between importance of cost information and costing sophistication is positively higher in 2005 than in 1996.

**H<sub>2a</sub>:** In companies with a prevalence of indirect costs the costing sophistication is higher than in companies with a prevalence of direct costs (positive relation between variables both in (1996 and 2005).

**H<sub>2b</sub>:** The relation between cost structure and costing sophistication is positive higher in 2005 than in 1996.

**H<sub>3a</sub>:** The higher is the level of product diversity (Process complexity) the higher is the costing system sophistication (positive relation between the variables both in 1996 and 2005).

**H<sub>3b</sub>:** The relation between product diversity and costing sophistication is more positive in 2005 than in 1996).

The study is based on the comparison of the results provided by the respondents of a survey carried on in 1996 on large Italian manufacturing firms and reported in (Cinquini et al., 1999), with the respondents of a second survey, conducted in 2005, based on the same questionnaire and addressed to the respondents of the 1996 survey.



The findings of this study were: (a) An increase from 1996 to 2005 in the use of both activity based costing (ABC) and Target costing (TC). **ABC**: (10.7%) in 1996 to (17.9%) in 2005. **TC**: (14.3%) 1996 to (21.4%) in 2005. (b) The importance of cost information and cost structure among the contextual variables considered in the more recent survey responses, are positive and significant in relation with increasing in implementation of advanced costing techniques (ABC, TC).

The recommendation of this study is to assess whether or not adopters are moving from a “fad and fashion” behavior of the early stages, to more rational approach in which the matching between management needs and tools potentiality is maximized.

#### **2.2.4 Study of (Al-Omiri, 2011)<sup>15</sup>:**

This study examines the organizational and behavioral factors influencing the adoption and non-adoption of ABC, as well as the degree of success of ABC systems and the determinants of that success among largest Saudi Arabia manufacturing and service companies.

The study used a postal questionnaire survey to gather information from a random sample (1000) of the largest Saudi Arabia manufacturing and service companies with response rate 27%.

The findings of this study were as: (a) The ABC adopters by Saudi Arabia manufacturing companies is 51% of 153 respondents (b) The dominant motives for implementing ABC are the deficiencies relating to the existing costing system; the changing environment (competitive,

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<sup>15</sup>. Al-Omiri, M., A Survey Study of The Organizational an Behavioural Factors Influencing The Adoption and Success Of ABC in KSA Companies, Cost Management, Vol. 25, No. 2, Boston: 2011, pp. 38-48.

manufacturing, and sophisticated system) need to replace the existing systems; and the influence of external pressure groups (e.g. external auditors, consultants, cost structure, and government/ regulatory pressures). (b) The major reasons for not implementing ABC were: the perceived benefits of ABC did not justify the cost of implementing it; lack of top management support; resistance to change by the accounting function; lack of understanding (e.g., ABC was unlikely to improve the control of the cost; ABC systems are too complex and the limited ability to explain cost variability; the competitors are not introducing ABC); low overhead proportion; low product diversity; and inability to generate more accurate information. (c) The small size of the company, the competitive environment being factors influencing the decision not to adopt ABC. (d) The major determinants of ABC success were: the existence of widespread support for ABC within the company (i.e.); managers understand and are knowledgeable about ABC information; non-accounting ownership; managers are capable of using for decision-making and cost reduction; adequate resources; training; linkage ABC to performance measurement; linkage ABC to competitive strategy; clear objectives of ABC.

The recommendations of this study were: (a) More in-depth case studies should be undertaken to examine relevant issues that are appropriate to each stage of the process of ABC adoption stages. (b) Case studies that seek to explain why some firms have not seriously considered ABC or other accounting innovations would be appropriate. (c) Case study research to study the factors responsible for companies that had implemented ABC later abandoning it.

### 2.2.5 Study of (Nancy, 2011)<sup>16</sup>:

The study investigates empirically the impact of organizational and environmental determinants (Importance of cost information, product diversity, intensity of competition, and cost structure) on the level of costing systems sophistication; and its impact on manufacturing performance in the Egyptian companies in Cairo.

The main problem of this study is to extent prior studies which have discussed costing system design choices as varying along continuum according to level of complexity and to measure an organization's costing system's level of sophistication based on where it is located on the continuum.

The objective of this is study is to enhance the manufacturing performance of the organization through the selection of an effective product costing system. This objective is divided into the following sub-objectives:

- a. Understanding the level of sophistication of product costing systems in light of four factors that might affect the costing systems.
- b. Minimizing cost distortion which is caused by product diversity through the effective study of product costing systems sophistication.

The study hypotheses are as follow:

**H<sub>1</sub>**: There is no relationship between product diversity and the level of sophistication of costing systems chosen by the company.

**H<sub>2</sub>**: There is no relationship between competitive environment and the level of sophistication of costing systems chosen by the company.

**H<sub>3</sub>**: There is no relationship between the proportion of indirect costs

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<sup>16</sup>. Nancy, M.M.A, Organizational and Environmental Determinants of Costing Systems and Its Impact on Corporate Performance: An Empirical study, *Cairo University, Faculty of Commerce*, MSc, Thesis in accounting, 2008, pp.1-101.

within organization's cost structure and the level of sophistication of costing systems.

**H<sub>4</sub>:** There is no relationship between the importance of cost information and the level of sophistication of costing systems.

**H<sub>5</sub>:** There is no relationship between the product costing system the manufacturing performance of the organization.

The study used a questionnaire survey to collect data from managers in Egyptian organizations in Cairo. The study used simple and multiple regressions to test the hypotheses.

The findings of this study were as: (a) Costing systems in Egypt varies between simplistic traditional costing systems and simplistic ABC. They are still in a development stage in Egypt and; approximately 65% of the sample does not know ABC and cost accounting concepts such as cost pools and resource consumption seem unfamiliar to the respondents. However, 33% considered ABC and rejected it as a cost assignment method. Just only 2% simplistic ABC with more than three cost pools and single cost allocation base. (b) Importance of cost information has a positive significant relationship with costing system sophistication level. (c) Costing information is widely used in Egyptian manufacturing organizations in cost reduction, in taking decisions such as pricing decision, make or buy, producing new products, redesigning , adding or deleting products, product line or department, customer profitability analysis, entering new markets. (c) Whereas, product diversity, intensity of competition, and cost structure have no significant relationship with costing sophistication level. (d) Furthermore, organization's size and type of industry do not have significant relationship with level of costing sophistication.

The recommendations of this study were: (a) investigating differences between the private and the public sector in terms of procedures for costing systems in emerging country of Egypt. (b) Carrying out longitudinal studies that investigate the improvement in manufacturing performance before and after the implementation of highly sophisticated costing systems.

## **2.3 The Difficulties and problem associated with the application of ABC system**

### **2.3.1 Study of (Dayfullah, 2007)<sup>17</sup>:**

This study aims to identify the problems and difficulties faced by the Jordanian industrial companies in the application of ABC system.

The problem of the study is “the majority of Jordanian industrial companies are lacking to the application of ABC system, especially in cost reduction”. The hypotheses of this study were:

**H<sub>1</sub>:** The Jordanian industrial companies don't face any difficulties in applying ABC system.

**H<sub>2</sub>:** The difficulties that faced Jordanian industrial companies don't difference with the difference in Company's establishment history, capital, Number of branches, products, proprietor rights, international certificates, accountants, and department of cost accounting.

The study depends on descriptive methodology for both primary and secondary data. A questionnaire survey was used to collect data from Jordanian industrial companies.

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<sup>17</sup> . Dayfullah, .R.M., :The difficulties faced by the application of the ABC system in Jordan industrial companies, *Journal of accounting, management and insurance, Cairo University, faculty of commerce*, Vol. 46 , No.68, 2007, pp. 665-701.

The findings of this study were: There are some of difficulties were highly as in the case of: no committed accounting legislations to apply advanced costing systems; no guiding role from auditors in enlightening the management about the importance of ABC system. Furthermore, some difficulties were medium as in the case of: no accounting rules & standard related to Jordanian environment; the high cost of ABC application; Insufficient resources (Experts, computers programmers); the belief of companies' management that traditional costing system outputs are accurate, and the replacement of ABC system may increase the tax percentage because of the changes in cost structure.

### **2.3.2 Study of (Abusalama, 2008)<sup>18</sup>:**

The study investigates empirically the barriers of adopting Activity-Based Costing Systems (ABC) by Irish companies using Cluster analysis. The study suggests that in the adoption of ABC, two distinct sets of variables are at work. The 'Contingent Variables' which likely render it appropriate or useful for the company to adopt ABC, and the company's ability, or willingness to address the 'Barriers' and difficulties associated with ABC adoption. The study attempts to answer two main interrelated questions: (a) Is the adoption of ABC by Irish companies associated with firm-specific characteristics, namely industry sector, firm size, nationality, product diversity, type of competition, cost structure and business unit culture? (b) What is the extent of the technical difficulties encountered during the implementation of ABC system?

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<sup>18</sup>. Abusalama, F.A., Barriers to Adopting Activity-Based Costing Systems (ABC): An Empirical Investigation Using Cluster Analysis, PhD, Thesis in accounting, *Dublin Institute of Technology*, 2008, pp.1-101.

The study aims to develop a model of ABC adoption to achieve the following objectives: (a) To incorporate contingency theory relating to a set of variables which will be identified from the literature as likely to be influential in ABC adoption such as product diversity, cost structure, firm size, competition, and business unit culture (b) To establish which of these three sets of factors (organizational, behavioral, and technical) influencing ABC adoption constitutes the dominant barriers to ABC implementation.

The study used a mail questionnaire survey. The survey undertaken comprised all firms listed in Business and Finance (2004) Irelands Top 1000 Companies (just 925 were only in the list). 218 questionnaires were returned, generates a 23.6% response rate. The quantitative data were processed using a SPSS program.

The study shows the follow findings: (a) Small percentage (26.3%) of Irish companies adopted ABC. (b) The most cost management techniques are budgeting, followed by standard costing and return on investment (ROI). (c) The significant reasons for ABC adoption are: inability of the traditional systems to provide relevant cost information, increasing competition, increasing range of product/ service, increasing overhead. In addition, the significant five areas of ABC application success were: product and service pricing; budgeting; cost reduction; performance measurement; and customer profitability Analysis. (d) The results show a strong significant association between six of those contingent variables namely (product diversity, cost structure, firm size, types of competition, company sector and business unit culture) and the adoption of ABC and mentioned that the contingent variables alone may not of themselves adequately explain the actual take up of ABC systems, however, the company's ability, or willingness to address the barriers and difficulties associated with ABC adoption. (c) the most

common factors militating against ABC adoption within companies who are rejecting and actively considering its adoption are technical Issues such as (Difficulty in selecting cost drivers; Difficulty in defining activities; Difficulty in assigning activity's costs to cost objects; Data collection difficulties; High costs of ABC implementation ( for large companies). And, Satisfied with current system; ABC is not relevant to our business; Uncertainty of ABC benefits; and Small percentage of overhead costs (for small companies).

## **2.4 The comparison between ABC system & Traditional costing systems**

### **2.4.1 Study of (Akyol, 2005)<sup>19</sup>:**

This study analyses a comparison between activity-based costing system and traditional costing systems in Turkish Sanitaryware Company. The main objectives of this study are: (a) To illustrate an application of ABC method; and (b) To compare the results of ABC with traditional costing methods.

The study used a case study methodology in one of the leading sanitaryware companies in Turkey. An S-Curve obtained is used to identify the undercosted and overcosted products of the firm.

The results of the application highlight the weak points of traditional costing methods as follow: (a) Products undercosted by traditional costing: The costs of these products are higher than the “process costing”.By the help of the ABC study, people noticed this “hidden loss” and pricing decisions are examined. (b) Products overcosted by the traditional methods. These

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<sup>19</sup>. Akyol , D. E, G. Tuncel, & G. M.Bayhan, A comparative analysis of activity-based costing and traditional costing, World Academy of Science, Engineering and Technology, Vol. 3, 2005, pp. 44- 47.



products are the ones which have smaller values than the value 100 of y-axis. By the help of the ABC, firm realized that, the costs of these products are lower than the costs obtained by process costing. A “hidden profit zone” occurs for these products. Without any intention, a hidden benefit is gained from these products by traditional costing. But noticing the real ABC costs of these products, the firm can re-price these outputs and can gain a competitive advantage. (c) Products which are costed almost the same: These are the products whose costs result nearly the same by using the two methods. A narrow band of  $\pm 20$  percentage (%80-%120) can be accepted for this region. From the ABC analysis, it is seen that while some of the products are undercosted, and overcosted, some of them give nearly the same results. In the analysis, the cost calculations of the bulk preparation department are performed using traditional costing method. When the outputs of the processes are identical or nearly identical, then ABC must be avoided to implement. Because ABC consumes lots of time, data and efforts, implementation of it has also a cost. For identical outputs, both ABC and traditional give the same results, so it is not logical to implement ABC.

#### **2.4.2 Study of (Myers,J.K, 2009)<sup>20</sup>:**

This study compares traditional costing systems with activity based costing in A Defense Electronics Manufacturing Company. The study examines how one company’s traditional costing system might be improved to reflect its current operating environment. The categorical research questions which concern how overhead should be allocated to products are as follows: (a) How can activities which consume resources be more directly

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<sup>20</sup>. Myers, J. K., Traditional versus Activity-based Product Costing Methods: A Field Study In A Defense Electronics Manufacturing Company, Proceedings of ASBBS, Vol. 16 No. 1, ASBBS Annual Conference: Las Vegas, 2009, pp. 1-9.

assigned to individual product lines? (b) For common costs not directly assignable, what transactions drive the consumption of overhead costs, and therefore, constitute defensible bases for overhead allocation?

The study used a case study methodology for a Defense Electronics Manufacturing Company. The data collection techniques consisted of interviews and archival data. The data were then analyzed to develop a product costing model based on the current theory which holds that costs should be directly assigned to product lines where feasible. When direct assignment is infeasible, costs should be allocated based on cost drivers which reflect organizational activities from the design through the manufacture, sale and shipment of product lines.

The findings of this study are as follow: The costing of the contracts using the study's model was compared to the Company's traditional system's contract costs. This comparison yielded a cross-subsidization of product lines which supports the literature's assertion that product cost distortions result from traditional accounting methods. Three contracts were overcosted and one was undercosted. ABC costing model supplies more meaningful product line cost information than traditional costing systems.

#### **2.4.3 Study of (Shevasuthisilp & Punsathitwong, 2009)<sup>21</sup>.**

This study is a case study conducted to apply ABC in an After Press Service company in Chiang Mai Province, Thailand. The results show that, the company use traditional costing systems information which generate losses because (6 out of 56 items) had a production costs higher than the selling price. The application of ABC helps executives receive accurate cost

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<sup>21</sup>. Shevasuthisilp, S., & K. Punsathitwong, Analysis of ABC in the after Press Services Industry, Proceedings of the International Multi Conferences of Engineers and Computer Scientists, 2009, pp. 18-20.

information, establish a sound pricing strategy; and improve the manufacturing process by determining work activities which have excessively high production costs. These actions increase overall sales and profits of the company, and allow more efficient use of its machinery.

#### **2.4.4 Study of (Rasiah, 2011)<sup>22</sup>**

The study compares activity-based costing (ABC) model and traditional costing method in Malaysia. The study's problem is many companies are still using the traditional based costing or using some other methods of costing in Malaysia. The study aims to compare activity-based costing (ABC) model and traditional costing method in Malaysia and to find out why activity based costing is still tagging behind traditional based costing in Malaysia.

The findings of the study indicated that: (a) most operations managers believed that their present cost systems were adequate for decision making. In certain circumstances, operations managers evaluated their cost systems as more effective than those using other cost systems. Activity-based costing systems were evaluated as somewhat more useful, but no relevant literature was found to indicate that either the external or internal environment of the firm was correlated with the choice of cost system.

### **2.5 The relationship between application of ABC system & financial performance**

#### **2.5.1 Study of (Kenndy & Affleck-Graves, 2001)<sup>23</sup>:**

This study examines the link between implementation of activity-based costing system and the shareholder value analysis. The prime purpose of this

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<sup>22</sup>. Rasiah| D., Why Activity Based Costing (ABC) Is Still Tagging Behind The Traditional Costing In Malaysia?, *Journal of Applied Finance & Banking*, Vol.1, No.1, 2011, pp.83-106

<sup>23</sup>. Kennedy, T. & J. Affleck-Graves: The Impact Of Activity-Based Costing Techniques On Firm Performance, *Journal of Management Accounting Research*, Vol.13, 2001, pp.19-45

study is to see whether the many documented successful cases study implementation of ABC are on average, translated into superior stock performance. The study aims to test the following general hypothesis:

***H<sub>0</sub>***: There is no difference in the performance of portfolio of firm adopting ABC when compared with a set of matched firms that don't employ ABC.

The population of the study of two sample survey of UK firms listed in London stock exchange between 1988 and 1996. One sample consisted of 47 firms adopted ABC and another of 183 firms that have not adopted before Feb 1996. The questionnaire mail survey was used to determine if ABC firms are outperform than matched counter non-ABC adapters over three years beginning on January 1 of the year in which the ABC system is first implemented.

The findings revealed that there is empirical evidence that the adoption of ABC significantly improves a firm's relative performance in terms of both market and accounting-based measures. The ABC firms clearly outperform matched counterparts by approximately 27% over the three years beginning on January 1 of the year in which the ABC techniques are first implemented; Also further analysis suggests that ABC adds to firm value through better cost controls and asset utilization, coupled with greater use of financial leverage.

### **2.5.2 Study of (Cagwin & Bouwman, 2002)<sup>24</sup>:**

This study investigates the improvement in financial performance that is associated with use of ABC and the enabling conditions, including concurrent use with strategic initiatives, under which benefits are

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<sup>24</sup>. Cagwin, D., Bouwman, M.J., The association between activity-based costing and improvement in financial performance, Management Accounting Research, Vol.13, No. 1, 2002, pp. 1-39.

obtained. In addition, this study tests the association between improvement in financial performance and previously used measures of ABC efficacy. The study aims to measure the improvement in financial performance that is associated with ABC use. The study's hypotheses were as follow:

**H<sub>1</sub>:** There is a positive association between the extent of using ABC and relative improvement in financial performance (compare to other firms in the industry).

**H<sub>2</sub>:** The association between the extent of use of ABC and relative improvement in financial performance is impacted by specific enabling factors, are: Importance of costs (Positive), IT sophistication (Positive), Business unit complexity (Positive), Level of intra-company transactions (Negative), Unused capacity (Negative), and Competition (Positive).

**H<sub>3</sub>:** A firm's relative improvement in financial performance (compared to other firms in the industry) is positively associated with the level of "success" of ABC. The specific measures of success examined in this study were: (1) Perceived success" of the ABC implementation. (2) Satisfaction with the cost system. (3) Expressed belief that ABC has been "worth implementing.

The study used a cross-sectional mail survey to collect the information. The questionnaire was distributed to 1,058 internal auditing professionals of "profit firms except auditors employed in the banking industry and governmental firms". The sample was reduced by 68 that were returned unopened. The sample is drawn from the population of those practicing members of ten geographically diverse U.S. chapters of the Institute of Internal Auditors (IIA) where information was available to

the researchers. Structural equation method was used to examine the relationship between ABC and financial performance.

The findings of this study were as: (a) There indeed is a positive association between ABC and improvement in ROI when ABC is use concurrently with strategic initiatives, when implemented in complex and diverse firm, when used in environment where costs relatively important, and which there are limited numbers of intra-company transactions; The enabling conditions (IT sophistication, absence of excess capacity, and competitive environment) affect the efficacy of ABC; There was some evidence that previously used measures of ABC success, satisfaction with ABC, and financial benefits obtain from ABC are predictors of improvement in financial performance.

The recommendations of this study were: Explaining the increased efficacy of ABC in smaller business units; Completing the link between identification of the conditions affecting the success of ABC implementation, to documentation of ABC's efficacy as a profit enhancing tool.

### **2.5.3 Study of (Ittner, et al., 2002)<sup>25</sup>:**

This study examines the association between ABC and plan-level operational and financial performance using large sample than others and comparing the performance of adopters and non-adopters in the USA.

The study used data from the 1997 PricewaterhouseCoopers and *industry week* Annual Census of manufacturers. The survey was sent to 25361 industry week subscriber, with response rate of 11%.

The findings of this study were as follow:-

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<sup>25</sup>. Ittner, C. D., W. N. Lanen, &D. F. Larcker, The Association Between Activity-Based Costing and Manufacturing Performance, *Journal of Accounting Research*, University of Chicago on behalf of Institute of Professional Accounting, Vol.40, 2002, pp.711-726.

(a) Extensive use of ABC system is associated with higher quality levels and greater improvements in cycle time and quality.

(b) Extensive ABC use is *indirectly* associated with manufacturing cost reductions through quality and cycle time improvements.

(c) Extensive ABC use has no significant association with return on assets (ROA). Instead, there is weak evidence that the association between ABC and accounting profitability is contingent on the plant's operational characteristics.

The recommendation of this study is to evaluate performance before and after ABC implementation.

#### **2.5.4 Study of (AL-Kadash & Ferdium, 2006)<sup>26</sup> :**

This study investigates the link between the practice of Activity-based costing (ABC), Just-in-time (JIT), and Total quality management (TQM) as strategic initiatives and the improvement in corporate financial performance of 56 industrial shareholding companies in Jordan. The study aims to achieve the following these objectives: (a) Providing an up-to-date description of the level of using ABC, JIT, and TQM in the industrial Jordanian shareholding companies. (b) Investigating the associations between companies' financial performance and the level of using ABC, JIT and TQM. The hypotheses of this study were as follow:

**H<sub>01</sub>:** Jordanian shareholding companies do not use strategic initiatives (i.e. ABC, JIT, and TQM).

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<sup>26</sup>. Al-kadash, H. & M. Feridum, The Impact of Strategic Initiatives in Management Accounting on Corporate Financial Performance: Evidence from Amman Stock Exchange, *Managing Global transitions*, Vol.4, No.4, 2006, pp. 299-312.

**H<sub>02</sub>:** Financial managers of industrial Jordanian shareholding companies are not aware enough of the implementation of using strategic initiatives (i.e. ABC, JIT, and TQM).

**H<sub>03</sub>:** No significant relationship exists between the awareness level of financial managers of the important of using ABC, JIT and TQM and the level of adopting these initiatives.

**H<sub>04</sub>:** No significant relationship exists between the level of using ABC, JIT, TQM and the financial performance.

**H<sub>05</sub>:** No significant differences exists between the financial performance of industrial Jordanian shareholding companies which use at least one of the initiatives (i.e. ABC, JIT, TQM) and the those which do not use any of such initiatives.

The study used a questionnaire survey of 59 industrial Jordanian shareholding companies which are listed at Amman Stock Exchange by the end of 2003. The questionnaire was sent to the 59 companies and the financial managers were asked to answer some specific questions. The response rate is about 95%. The study used the descriptive statistical analysis (mean, standard deviation), also simple regression analysis is used to test the association between the level of awareness of the importance of using the initiatives and the level of adopting these initiatives. Multiple regression analysis is used to identify the improvement in ROA as a mean of financial performance which was associated with the initiatives. Furthermore one sample t-test is used to test hypothesis 5.

The findings of this study showed the following results: (a) There are 26.8% of the companies under consideration use at least one of the strategic initiatives. Moreover, the awareness level of the importance of



using the strategic initiatives is high among the financial managers, but such a high level is not associated with the level of adopting these initiatives. (b) Furthermore, there is strong evidence that there is a positive association between using ABC, JIT and TQM and improvement in financial performance.

The recommendation of this study is to replicate similar models on a larger sample and a longer time series for all parties in the company not just top executives to see whether these results continue to hold for the (Amman stock exchange (ASE), because this Study is dealing with the industrial sector and ignoring the other sectors in the ASE.

#### **2.5.5 Study of (Askarany et al., 2007)<sup>27</sup>:**

The study investigates the level of association between technological changes in manufacturing practices and the level of implementation of ABC to see whether (or not) implementation of technological changes may lead to the implementation of ABC. Then it tests the level of association between implementation of ABC and the level of satisfaction of ABC's users to see whether (or not) the adopters are more satisfied than non-adopters. This study suggests the following hypotheses as follow:-

**H<sub>1</sub>:** The diffusion of ABC is positively associated with the level of adoption of technological change in manufacturing practices.

**H<sub>2</sub>:** The level of satisfaction with implemented costing systems is positively associated with the level of diffusion of ABC.

The study designed a survey in 1997 to gather information on both technological changes in manufacturing practices and cost and

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<sup>27</sup>. Askarany, D. & M. Smith, H. Yazdifar, Technological Innovations, Activity Based Costing and Satisfaction, *Journal of Accounting – Business & Management*, Vol. 14, 2007, pp.53-63

management changes/innovations implemented in the targeted organizations. The survey was administered to all 200 manufacturing firms registered with the Australian Plastics and Chemicals Industries Association (PACIA).

The findings of this study were as follow: (a) There is a significant relationship between technological change in manufacturing practice and the diffusion of ABC. (b) There is no significant association between the diffusion of ABC and the level of satisfaction with implemented management accounting techniques. In other words, there was no perceived difference between the responses of firms implementing ABC and those which don't in terms of the level of satisfaction. No evidence support that ABC adopters are more satisfied than non-adopters.

The recommendation of this study is to investigate the influence of shortcomings of cost and management accounting innovations on their diffusion.

#### **2.5.6 Study of (Zaman, 2009)<sup>28</sup>:**

This study examines the impact of activity based costing on overall performance among Australian companies. The study addressed the following questions: (a) How executives perceive activity-based casting in terms of strategic cost allocation methods, and firms' efficiency and effectiveness? (b) To what extent the implementation of ABC affects the overall performance of the organization?

The objectives of this exploratory study were as follows: (a) To develop a scale that can measure the perception of ABC. (b) To develop a

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<sup>28</sup>. Zaman, M., The impact of Activity-Based costing on firm' performance: The Australian Experience, *International Review of Business Research Papers*, Vol. 5, No. 4, 2009, pp. 200-208.

regression model that predicts the impact of ABC on overall firm's performance.

This is an exploratory study, in nature. A preliminary study was conducted on the seventeen Australian companies listed by the ABC Learning Centers Ltd, (Australia 30/06/2006 Annual Report). The respondents for this study were the finance directors, chief financial officers, and cost and management accountants, and other senior executives from all of the seventeen selected companies.

The findings of this study were: (a) The company executives find that ABC implementation has helped them finding the major costs for each of the products thus it reduces the production cost and lowers the customers cost. The implementation of ABC helps companies to increase the managerial efficiency, effectiveness, and revenue. (b) The regression results are significant of the 5% level. These signifies that ABC as measures of strategic cost allocation method, increased efficiency, and increased effectiveness have positive and significant effect on overall firm' performance in Australia.

#### **2.5.7 Study of (Sanford, 2009)<sup>29</sup>:**

This study investigates the impact of ABC on organizational performance using contingency perspective as a theoretical basis for the study. The study addressed fundamental question as follow: *Does ABC improve organizational performance?*

The study used a random sample of 125 ABC and 125 non-ABC organizations U.S. publicly traded companies was selected out of the population to test the hypotheses. Therefore, the sample represented 90% of

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<sup>29</sup>. Sanford, R.A., The Impact of Activity-Based Costing on Organizational Performance, ProQuest LLC, PhD, Dissertation in business Administration, 2009, pp.1-332.

the population. Financial and stock information was collected for the Fiscal Years 2002–2006 using Provestor Plus Company Reports. The statistical package SPSS 15.0 was utilized for analyzing and testing during the study.

The findings of this study were as follow: (a) There is a significant negative relationship between firm strategy and the contingent factors of organization size, technology. (b) There is a significant positive relationship between firm strategy and the contingent factors of operating performance and competition. (c) There is no significant relationship between strategy and management accounting practice. (d) A significant positive relationship between management accounting practices and operating performance, as measured by market price and EPS. (e) A significant negative relationship was found between management accounting practices and asset turnover. (f) A significant relationship was not found between management accounting practices and a firm's performance, as measured by ROI, operating performance, debt equity management, and ROE. (g) The study found that management accounting practices could only significantly predict organizational performance, as measured by market price, EPS, and asset turnover. (h) The result indicated that ABC organizations have higher asset turnover than non-ABC organizations. However, non-ABC organizations have higher market price and EPS than ABC organizations. (i) The findings indicated that no statistically significant differences in operating performance when either ABC or non-ABC accounting practices are used with a low-cost strategy. (j) The results found no statistically significant differences in operating performance when ABC organizations use a strategy other than a low cost strategy. (k) There is no relationship between management accounting practices and firm performance, as measured by ROI, operating performance, debt-equity management, and ROE. (l) The

study found that lack of management commitment, lack of resources, clarity of objectives, perceived usefulness of the systems, difficulty in identify cost drivers, non accounting ownership, and training can create barriers to ABC implementation.

The recommendations of this study were as follow: (a) future research should identify the relationship between firm's strategy and organizational culture. (b) Future research should identify other types of management accounting practices were being used by non-ABC organizations. (c) The study was limited to organizations that trade on U.S stock exchange. Future research should expand the review to include organizations listed on international stock exchanges. (d) Future research should also consider organizations that are not listed on U.S or international stock exchanges.

## **2.6 Gaps from previous Research**

From the review of previous research, this section highlights the gaps from previous research. This study distinguishes from the previous studies conducted in Sudan in four areas: first, despite the benefits of ABC system over traditional systems, the results of previous studies about the relationship between ABC system and company performance are mixed; therefore, further investigation is needed by this study. Second, most of studies conducted in Sudan were on the area of the practice or adoption of ABC system; and comparison between ABC system and traditional systems; and none of the previous studies investigates the relationship between activity based costing and financial performance. Third, very little studies have been done on the impact of factors (cost structure or potential for cost distortion, importance of cost information, product diversity, and competition) on the adoption of ABC system which reflect positively on performance

enhancement; and highlight the difficulties and problems associated ABC adoption by Sudanese manufacturing companies. Fourth, almost most of previous studies conducted on ABC adoption in Sudan, are a case study, few are a survey. In addition, even survey studies were conducted on one sub-sector. This study conducted on four sub-sectors.

In general, none of the previous studies conducted a survey on the impact of activity based costing in enhancing the financial performance through examining factors (cost structure or potential for cost distortion, importance of cost information, product diversity, and competition) on the adoption of ABC system which will reflect positively on financial performance enhancement; and highlights the difficulties and problems associated with adoption and non-adoption of ABC system by SMCs.