
# Cost Allocation Systems: Empirical Study in Libyan Manufacturing Companies

by

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## Declaration

I declare that no portion of the work referred to in the dissertation has been submitted in support of an application for other degree or qualification of this or any other university or other institute of learning. Further, all the work in this dissertation is entirely my own, unless referenced in the text as a specific source and included in the bibliography.

## Abstract

Following the lifting of the sanctions imposed on Libya by the UN in 2003, the need for developing cost allocation systems has become necessary. This includes aspects such as privatization, foreign industries, and competition. All these factors should be considered by the cost and management accounting practitioners of the Libyan industrial sector. Based on the findings of a questionnaire survey, supported by semi-structured interviews, this study has examined the state of cost allocation (CA) systems in terms of product costs of large and medium Libyan manufacturing companies (LMLMCs). A contingency theory approach is adopted and a frame-work is developed in order to investigate the accuracy of the product costs.

The study revealed that the majority of the LMLMCs are influenced by the financial accounting mentality. Almost all of them are using simplistic traditional CA methods. A few of them have already contracted to develop (up-date or redesign) their CA system. In fact, almost all of them calculate inaccurate product costs when companies produce various products. The full cost-plus pricing method is rejected by almost all the surveyed companies that face high levels of competition. Instead, they traced the mechanism of market price or comparing product cost with the prevailing market prices. On the other hand, almost all the public companies are facing very low competition which enabled them to adopt the cost-plus pricing method. In contrast, almost all privately-owned companies are facing very high or high levels of competition. In terms of preparing cost information on time, some the LMLMCs do not prepare overhead budgets. Most of them prepare cost information annually and the majorities are preparing cost information in irregular periods. According to the important factors that influence the accuracy of product costs, it was found a strong negative relationship with the level of product diversity and accuracy, a strong negative relationship between the level of intensity of competition and the level of use of cost-plus pricing and a strong negative relationship between the level of ownership and the level of use of the cost-plus pricing method. Finally, the factors that constrict the CA development are as follows; absence of any internal leadership; lack of specialist managerial accountants; lack of top management support; lack of active training programs; centralization of decision-making; it is extremely expensive to develop the CA systems; absence of professional cost or managerial accounting bodies in Libya. With regards to the organization's size factor, lack of financial ability; lack of an independent cost accounting department are important. In relation to the organization's ownership factor, it was found only the low level of competition is important. While most previous studies focused on the implementation of ABC in Western developed countries, this study has contributed further evidence to the value of studying CA systems in terms of product costs with a managerial emphasis in the Libyan context. In addition, this research describes the degree of accuracy and preparing cost information on time. However, it determined contingency factors that restrict the cost allocation system development and influenced the accuracy of product costs in the LMLMCs.

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## Abbreviations

| | |
|---|---|
| **AAA** | **American Accounting Association** |
| **AC** | **Absorption Costing** |
| **AICPA** | **American Institute of Certified Public Accountants** |
| **CA** | **Cost Allocation** |
| **GAAP** | **Generally Accepted Accounting Principles** |
| **GAOPCEU** | **General Authority for Ownership of Public Companies and Economic Units** |
| **GPCIEM** | **General People's Committee for Industry, Electricity and Minerals** |
| **LBMC's** | **Libyan Public Manufacturing Companies** |
| **LJMU** | **Liverpool John Moores University** |
| **LMLMCs** | **Large Medium Libyan Manufacturing Companies** |
| **LSE** | **Libyan Stock Exchange** |
| **PhD** | **Doctor of Philosophy** |
| **MA** | **Management Accounting** |
| **MBA** | **Master's of business administration** |
| **SPSS** | **Statistical Package for the Social Sciences** |
| **UK** | **United Kingdom** |
| **UN** | **United Nations** |
| **USA** | **United States of America** |
| **VC** | **Variable Costing** |

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# Chapter 1

# Introduction

## 1.1 Introduction

The purpose of this study is to examine the influence of potential explanatory variables on the design of product costing systems in terms of accurate product costs and the factors that constrict the cost allocation (CA) development in the LMLMCs. However, the main objective is continuing and extending the research that has taken place in product costing practice. By using a research questionnaire and then interviews, the focus will be on the costing of physical products produced and the use of these costs in decision-making in general and pricing-decisions in particular. The main aim of this chapter is to provide a general introduction to the thesis. It provides the background to the study and highlights how traditional management accounting (MA) techniques are criticized as inefficient to generate accurate product costs used for decision-making. It will outline briefly the research problems and research objectives. In addition, the theoretical framework of the study is examined. Finally, it presents the structure of the thesis.

## 1.2 Background to the Study

For over two decades, empirical research concerning product costing systems had focused on investigating different costing methods such as variable or absorption costing, the accuracy of product costs, and the influence of financial accounting mentality on selected costs for decision-making purposes as well as activity-based costing (ABC) implementation, failure or success. This growth of research may be attributed to two main factors, the environment in which product costing is undertaken has undergone substantial change (this includes change in information technology, cost structure and manufacturing and competitive environment) and the criticisms that have emerged by the late 1980's of traditional MA techniques (Guilding, et al, 2005).

The ability of traditional cost and MA techniques to generate accurate and relevant cost information for decision-makers was criticized. In today's changed industrial environment, the relevance of the simplistic traditional volume-based CA methods has been criticized by many authors (e.g. Kaplan, 1983; 1984a; 1984b; 1986; Johnson and Kaplan, 1987). Johnson and Kaplan (1987) highlight that MA tools might have been relevant in the past, when the industrial manufacturing environment was simple, organizations producing products lacked diversity and complexity, the manufacturing activities were labour-intensive, and the level of competition was low. In such an environment, overheads were low and volume allocation bases such as labor costs\hour

could be justified for calculating reasonably accurate product costs to be used for managerial accounting purposes.

In the same vein, Horngren et al. (2000) highlight that using traditional volume-based CA methods to allocate overhead costs based on the assumption of existence of a proportional relationship between volume and overhead costs. Therefore, each time a unit of product is produced or sold, it is assumed that costs are incurred. In fact, these systems were developed in a period when technology was stable, the diversity of products was limited, and direct costs were the largest proportion of production costs.

On the other hand, Cooper and Kaplan (1988a) argue that companies using traditional allocation bases in an environment with increased product diversity and complex production processes in which most activities that cause costs are not volume-related activities. In this case and by use of traditional CA systems, cost information might be distorted and could not be used for decision-making purposes. Moreover, Kaplan (1984b) claims that many companies still use the same managerial accounting systems that were developed decades ago for a very different competitive environment from that of today. Therefore the challenges of the competitive environment in the 1980's should encourage managers to re-evaluate their traditional cost and MA techniques.

Moreover, many authors have recognized that the existence of a gap between the theory and practices of MA (e. g. Edwards and Emmanuel, 1990; Drury et al., 1993; Drury and

Tayles, 1994; Ashton et al., 1995; Drury, 1996). Anthony (1989) argues that the information about MA practices are very poor and that almost all related information is anecdotal. He claims that there is a need for further survey research concerning MA practices. In the same vein, Drury and Tayles (2000) highlight that these criticisms of MA practices were based mainly on informal observations obtained from a very small number of companies and not from large scale surveys.

Since then, and perhaps in response to these criticisms, researchers have developed a number of innovative MA techniques, however, the most notable contributions are activity-based systems, activity based budgeting and activity based management (Abdel-Kader and Luther, 2003). The activity-based costing system was asserted to have the ability of providing accurate cost information while eliminating distortions in product/service pricing and customer profitability analysis in a complex manufacturing environment (Cooper, 1988a, 1988b; and Cooper and Kaplan, 1988b, 1992, 1998). The new innovative techniques including ABC are designed to support modern technologies and management processes, such as total quality management and just-in-time production systems, and the search for a competitive advantage to meet the challenge of global competition.

Drury and Tayles (2005) indicate that, for more than two decades most organizations have been facing significant environmental changes in their business environment. These

changes such as increasing global competition, decreasing information costs, increasing product diversity and the development of integrated enterprise-wide information systems have encouraged many organizations to implement more sophisticated product costing systems (ABC).

In fact, using the volume and unvalued related allocation bases (ABC system) were supported and recognized as a system that overcame the weaknesses of the traditional volume CA systems and described as a method that can calculate more accurate product costs (e. g. Cooper and Kaplan, 1988a; Cooper et al., 1992; and Kaplan and Cooper, 1998), also many researchers (e.g., Cooper and Kaplan, 1991; Nicholls, 1992; Malmi, 1996; and Lukka and Granlund, 1996) concluded that they have gained multi-benefits. On the other hand, many problems associated with the introduction of ABC system were reported by Green and Amenkhienan (1992) (more details will be presented in subsection 2.2.3.10).

Finally, the ABC system is considered as the common topic in MA research which reached about 355 published papers over the period from 1987 to 1998 (Bjørnenak and Mitchell, 2000). However, the diffusion of ABC rate in the developed countries has been quite low in Europe (Brierley et al., 2001). According to Askarany and Yazdifar (2011), there are inconsistent research results in past concerning the diffusion of ABC. The diffusion rate was fluctuated from less than 10 per cent up to 78 per cent both within and

between countries. This matter could become more complex when some ABC adopters decided to stop the implementation after a short period. Thus, this situation could cause uncertainty on the ABC ability as suitable technique for improving organisational performance, productivity and profitability and might influence some companies that wash to adopt this system in the future.

### 1.3 Rationale and Motivation for the Study

Several reasons have motivated the researcher to conduct research relating to CA systems in medium and large Libyan manufacturing companies (MLLMCs). Firstly, according to Edwards and Emmanuel (1990), MA research even in developed countries has had very little impact on practice. In addition, Abernathy et al. (2001) highlight that there is a need for further empirical research into the factors influencing the choice of product costing system's design.

Secondly, Drury and Tayles (2005) state that over the three decades, most of the research focused on cost system design has concentrated on studying ABC systems. Previous studies have assumed that cost systems consist of two alternatives, either traditional or ABC systems. On the other hand, researchers in developing countries, assert that there is a lack of knowledge concerning the current state of MA practice in developing countries (Joshi, 2001). Secondly, studies regarding contingency factors to MA practices in developing countries are limited (see Haldma and Laats, 2002). Some researchers have

acknowledged the need for developing knowledge of MA practices in developing countries (Drury and Tayles 1992).

Thirdly, regarding the benefit of contingency theory, many researchers examined product cost systems design have used explanatory frameworks, including contingency theory. These studies are undertaken in both developed and developing countries. Research conducted in developed countries, for instance, Drury and Tayles (1995); Chenhall and Langfield-Smith (1998); Laitinen (2001); Drury and Tayles (2000); Abernethy et al (2001); Brierley et al. (2001); Gerdin and Greve (2004); Guilding et al (2005); Al-Omiri and Drury (2007); Brierley et al (2006) and Brierley (2008) applied contingency theory by investigating MA in terms of product costs which are seen as very helpful for understanding MA. On the other hand, research carried out in developing countries such as Alebaishi (1998); Khalid (2005) and Hutaibat (2005) in Saudi Arabia and Sithambaram (2002) in Malaysia applied contingency theory have provided useful insights.

Finally, from the literature review and to the best of the researcher's knowledge, no empirical study has been undertaken with reference to CA system design in terms of product costs in the LMLMCs. This is concerning both private and public companies which produce transfer products. Although, MA in terms of product cost system design

was investigated in Libya by Abulghasim (2006), but his study investigates MA practices in only public manufacturing companies and used only descriptive analyses.

This study recognized both public and private Libyan manufacturing companies. In congruence with that, it used the contingency theory and descriptive analyses. In addition, in terms of CA systems, the state-owned and the privately-owned companies were compared in this study. Based on the literature review, there is no evidence indicates that these aspects had been investigated by previous studies in the Libyan context. Addressing these issues provided a major contribution to the knowledge and gave motivation for undertaking this study in the LMLMCs.

Leftesi (2008) examined the diffusion of Western MA practices in terms of the current and future state of MAPs in Libyan manufacturing companies and the factors influencing their diffusion. This research study is different from the current study. Firstly, Leftesi (2008) does not investigate MA practices concerning the CA systems in terms of product costs in managerial emphasizes. Secondly, his study was used different methodology based on the new institutional sociology and innovation diffusion theories. Thirdly, the collected data was based on 71 industrial manufacturing companies (e. g. food, chemical and metal) and 10 of oil and gas industrial companies. The first group are manufacturing transferred products, while, the second group produce extractive oil products. Thus the two groups which are producing heterogeneous products involve apply different cost and

management accounting principles and techniques. Finally, no standard was selected by the researcher to distinguish between small, medium and large companies in Libya before the issued date of law No. 9 in 2009. The law No. 9 was issued to organize medium and large Libyan manufacturing companies. This will affect the readability of the collected data which may include small-sized companies, for this reason and the above reasons the current study could not be compared to Leftesi (2008) study.

### 1.4 Research Problem:

The rationale for conducting this study stems from a gap in the literature about CA systems in the Libyan context. Firstly, according to Agnaia, (1996) about three decades ago, the Libyan government allocated a great amount of money in order to establish many different industries. All Libyan companies were owned by the government, which meant they were very sensitive to any change in the government's policies regarding economic, political and social matters (Agnaia, 1997). In that time, the Libyan Manufacturing Companies were working in a protected environment (Abulghasim, 2006). Since 1999 following the lifting of the United Nations sanctions imposed on Libya, there was the introduction of privatization by the government. In addition, local and foreign investors have been encouraged to set-up business in order to help Libya's economic growth and reduce its heavy dependence on oil revenues (Salama and Flanagan, 2005).

Secondly, many researchers (e. g. Bait-El-Mal et al., 1973; Kilani, 1988; 1997 and Buzied, 1998) report that the Libyan accounting profession and education system has been influenced and developed by foreign companies, texts and accountants from the UK and the US. Moreover, many Libyan accountants were educated overseas. The Libyan accounting profession is mostly occupied with preparing external financial accounting reports and external auditing which is stipulated by the law.

Finally, Abulgasim (2006) has not covered some aspects concerning product cost system design such as the sort of cost information\data-base systems used to obtain product costs for decision making and what sort of product costs are used to obtain product costs for pricing-decisions in the LMLMCs. It can be argued that the MA systems are affected by their business environment. As a result, any change in the business environment will cause change in MA systems (Kaplan, 1985). Therefore, these reasons are considered as gaps to be investigated in the present study.

Moreover, the Libyan government has changed their policies and started to privatize industrial companies aiming to liberalize the Libyan market and encouraging the private sector. As the business environment is changing, the improvement of MA systems should become a high priority for Libyan businesses. Thus, this study seeks to provide empirical evidence about the CA system design presently in use in Libya as a developing country (investigating cost-plus pricing, the frequency with which product costs are used in

decision-making, how many companies have adopted ABC and determining factors influencing product costing system's design) will be covered by this study. The results can be used as a basis of knowledge to assess the suitability or the sophistication of current MA techniques in order to provide useful recommendations and to identify the barriers that may face the LMLMCs developing their CA systems.

### 1.5 Research Aims and Objectives:

This study aims at investigating the Libyan manufacturing companies' CA system design in terms of product, factors influencing the level of accuracy of their product costs and the factors that restrict their CA development. The focus will be on the costing of physical products produced in the LMLMCs and the uses of these costs in decision-making in general and pricing-decisions in particular. To achieve the aim of the study the following six objectives are formulated:

1. To examine the extent of using full product cost in decision-making especially in pricing decisions;

2. To analyse the impact of the financial accounting mentality on product costs used in decision-making in general and pricing decisions in particular.

3. To examine the ability of the LMLMCs to generate accurate product costs to use for decision-making purposes;

4. To identify the important factors restricting CA development in the LMLMCs;

5. To investigate the important factors influencing the accuracy of product cost calculation in the LMLMCs;

6. To make recommendations based on the findings of this study to introduce effective CA system with the LMLMCs that help Libyan decision-makers improve their strategic decisions.

**1.6 Research Questions:**

In order to achieve the main aim of this study, the following questions were formulated:

1. What is the extent of use of cost-plus method in pricing-decision in the LMLMCs?; What types of product costs are used? And how these costs could be used?;

2. What type of cost information\data-base systems are used to obtain product costs for decision-making in the LMLMCs? And why are these cost information\data-base systems used?;

3. What sorts of CA systems are used in calculating product costs to use for decision making?; what is the extent of use of ABC?; and why have the LMLMCs not adopted this new system?

4. What are the most important contingency factors influencing the LMLMCs to calculate accurate product costs to use for decision-making purposes?;

5. What important factors restrict CA development in the LMLMCs?;

6. What recommendations can be made to help Libyan decision-makers improve their strategic decisions?

### 1.7 Research Methodology:

For the purpose of this study, it is appropriate to use multi-methods which involve the use of both the contingency theory and the descriptive theory as well. According to the research method, a methodological triangulation is adopted in which questionnaires as the main tool and semi-structured interviews as a secondary tool are used. The features of research design could be summarized as flows:

1. With regards to the purpose of this research, this study can be classified as descriptive and statistically based.
2. According to the type of investigation this study is classified as a causal study.
3. In relation to the study setting this study is classified as a field study because it is conducted in an actual environment (Libyan context).
4. In terms of time horizon, this study is considered as cross-sectional research.

5. The business unit of analysis in this study focuses on the medium and large Libyan manufacturing companies that produce transferred products.

   The research methodology will be further discussed in chapter four.

**1.8 Structure of the Thesis:**

This thesis contains eight chapters and is structured as follows:

- Chapter one introduces the background of this study. It provides also the research rationale and justification for undertaking this study. It covers the research objectives and sets the research questions and briefly, the research methodology is discussed.

- Chapter two represents the critical review of the contextual and theoretical considerations of cost allocation system design literature themes.

- Chapter three provides an overview of the literature related to prior empirical research of CA systems, Libyan context and formulated the research hypotheses.

- Chapter four discusses the research methodology. It provides the justifications for the research approach chosen and the methodology adopted to achieve the research objectives.

- Chapter five presents the descriptive statistical analyses and discussion of the questionnaire findings.

- Chapter six shows a comparison between the research variables.

- Chapter seven demonstrates the hypotheses testing and related statistical data analyses.

- Chapter eight provides conclusion and recommendations for further research which summarises the major findings of this study, discusses the contributions of this research to knowledge and its limitations as well as identifies the areas for future research.

# Chapter 2

# Critical Review of the Contextual and Theoretical Considerations of CA Systems Literature Themes

## 2.1 Introduction

This chapter aims to examine three issues that require further research in the field of cost allocation (CA) system in terms of product costs. According to Drury and Tayles (1995) there are five issues that require further research as follows, extensive use of full costs for decision-making, accuracy of product costing systems, financial accounting mentality, implementation of the controllability principle, and changes in MA systems. However, the final two issues are not included in this study, because this study is not concerned with control, and as the research is cross-sectional, it is not concerned directly with changes over time. In addition, the study investigates another issue concerning the contingency factors influencing the level of accuracy of CA's which will be discussed later in this study.

## 2.2 The Research Themes:

In order to understand the CA system in terms of product costs to aid decision-making, it is categorized into three themes as follows:

1- The extensive use of full costs for decision-making;

2- The preeminence of the financial accounting manager's mentality;

3- The accuracy of product costing systems.

The first theme (the extensive use of full costs for decision-making) will be related to the following questions:

- *What is the extent of use of cost-plus method in pricing-decision in the LMLMCs?; What types of product costs are used? And how these costs could be used?;*

The second theme (the preeminence of the financial accounting manager's mentality) will be related to the following questions:

- *What type of cost information\data-base systems are used to obtain product costs for decision-making in the LMLMCs? And why are these cost information\data-base systems used?;*

The third theme (the accuracy of product costing systems) will be related to the following questions:

- *What sorts of CA systems are used in calculating product costs to use for decision making?, what is the extent of use of ABC?; and why the ABC system has not been adopted yet?*

The remaining questions (what are the most important contingency factors influencing the LMLMCs to calculate accurate product costs to use for decision-making purposes?; What important factors restrict CA development in the LMLMCs?) will be discussed in the next chapter.

### 2.2.1 The First Theme: The Extensive Use of Full Costs for Decision-Making:

Kaplan (1988) argues that the product costing systems that are maintained by many companies have been described as insufficient for decision making purposes and operational control. Product costs that were initially prepared for financial accounting purposes are unlikely to provide accurate and timely information for internal decision-making.

Moreover, Drury and Tayles, (2000) state that conventional wisdom advocated that different costing systems exist depending on what costs are assigned to cost objects and their level of sophistication. Cooper and Kaplan (1988b) suggest that product costs are important in decision-making. However, there is disagreement about whether all overheads included in product costs (as calculated by the absorption costing system) or part of them (as calculated by variable costing system) should be included in product

costs. Thus in order to understand the different types of product costs that are used in decision-making and how they could be calculated, the following sub-sections (variable costing, absorption costing, relevant costs and previous studies relating to the extensive use of full costs for decision-making) were formulated.

### 2.2.1.1 Variable Costing:

The variable costing (VC) system is known as marginal or direct costing systems. Variable costing is defined by the Chartered Institute of Management Accountants (2005: 11) as:

> ***"variable costing assigns only variable costs to cost units while fixed costs are written off as period costs. Also known as marginal costing and, especially in the US, as direct costing"***

Drury (1996: 199-200) argues that this system is called direct costing or marginal costing when only variable manufacturing costs are assigned to products and should be called a variable costing system. He stated that:

> ***"... since neither direct costs nor marginal costs are quite the same as variable costs. Direct costs are those that can be specifically identified with a product; they include direct labor and materials but in many situations direct labour may not vary in the short term with changes in output. So to use the term 'direct costing' when it specifically includes a non-variable item (that is, direct labour) is not at all appropriate. The term 'marginal costing' is also inappropriate, since economists use this term to describe the cost of producing one additional unit...Many accountants use the term 'marginal cost' to mean average variable cost. Because marginal cost may be interpreted in different ways by accountants and economists, it is better not to use the term when referring to stock valuation"***

Because VC system assigns only variable costs to cost objects, thus gross income that arises from matching sales revenues and variable costs is defined as contribution to fixed costs and profits. In manufacturing organizations, only short-term variable costs (direct materials and labor costs) are included. The disadvantage of variable costing systems is that avoidable fixed costs are not assigned to cost objects. Such exclusion of costs may be appropriate for decision-making purposes.

In addition, this system cannot be used for financial accounting purposes due to the requirements of GAAP in most countries. On the other hand, the advantage of this costing system is that it is appropriate to use for decision-making where indirect fixed costs are a low proportion of total product costs (Drury and Tayles, 2000). Kaplan (1990b) states that short-term variable costs are appropriate for decision-making purposes because, these costs vary with product complexity and diversity. Since most decisions such as product discontinuation, product mix and make-or buy are related to the firm's long-term capacity rather than to the short-term.

#### 2.2.1.2 Absorption Costing System:

The absorption costing (AC) system is also known as a full costing system (Arnold and Turley, 1996). An absorption costing system traces direct costs and absorbs all or part of overheads by means of one or more overhead absorption rates to cost objects (products). Usually overhead absorption rates are calculated by means of dividing the overheads that

are incurred during a period of time on an appropriate denominator level (such as direct labor hours or machine hours and so on). The absorption costing system is defined by the Chartered Institute of Management Accountants (2005: 10) as:

> ***"Absorption costing assigns direct costs and all or part of overhead to cost units using one or more overhead absorption rates"***

Also, the absorption rate is defined by Chartered Institute of Management Accountants (2005: 20) as:

> ***"A means of attributing overhead to a product or service, based for example direct labour hours, direct labour cost or machine hours"***

It is argued that the AC system is called a full costing system since a part of product costs (e.g. non-manufacturing costs) are not included in product costs as stated by the Chartered Institute of Management Accountants (2005:10):

> ***"Sometimes referred to as full costing although this is a misnomer if all costs are not attributed to cost units"***

However, Drury (1996) stresses that this system is required by GAAP in most countries to calculate product costs to meet external financial accounting requirements. So, only manufacturing costs which are incurred during a certain period should be distributed between cost of goods sold, and closing inventories. Non-manufacturing costs should be charged directly to the profit and loss account. For financial accounting purposes, the absorption costing system is considered to be appropriate. It is therefore unnecessary to allocate non-manufacturing to products.

On the other hand, for managerial accounting purposes especially in pricing decisions, it may be preferable not to allocate all non-manufacturing costs to products. However, adding a percentage profit margin to each product, it provides a profit contribution and a contribution to non-manufacturing costs. Arnold and Turley (1996) suggest that the debate on which method (VC or AC) is more appropriate depends on the purpose of using product costs in decision-making. However, for pricing decisions, VC system is more consistent with the relevant costs (differential future cash flows) than AC system.

#### 2.2.1.3 Relevant Costs:

Conventional MA wisdom in most text books has advocated that for decision-making purposes, incremental costs that predict future cash flows arising from decisions should be used. Such costs are also called relevant costs, avoidable costs, marginal costs, attributable costs and contribution costs (when incremental costs are matched with incremental revenues, it produces contribution to fixed costs) (Drury et al., 2000).

Arnold and Turley (1996) highlight that the organizations should adopt only future incremental costs and revenues which are relevant for decision-making. However, the choice depends on decision-makers objectives and upon the decision models. Costs and benefits that can be affected by the decision are relevant costs for all decision models. So, firstly, only future costs are relevant, but past costs should not be fully ignored. They may be useful to predict future costs because are not in themselves relevant costs for aiding

decision-makers. Secondly, only incremental costs should be included. Finally, only cash flows arising from decisions should be used. However, for pricing decisions, only differential future cash flows arising from decisions should be considered.

Drury et al (1993) indicate that organizations should not adopt only short-term planning which assumed that fixed costs are to remain constant whatever future decisions are taken. They also argue that the relevant cost for short-run decisions (e.g. introducing new product, discontinuing products and product pricing) are variable costs which represent only the incremental costs. Therefore they believe that these decisions are dependent only on those incremental costs and revenues that are expected to vary with a particular decision should be rejected. Instead, they suggest that both the short-run and long-run consequences are important and those fixed costs that could be avoided in the longer-term should be assigned to a product if the particular product were discontinued. As a result, the emphasis is only on short-run planning for decision-making purposes in many textbooks and this is also frequently required by the examinations set by the UK professional accountancy bodies and may be mistaken. Instead, they suggest that both the short-run and long-run consequences are important and those fixed costs that could be avoided in the longer-term should be assigned to a product if the particular product were discontinued.

Moreover, Drury and Tayles (2000) point out that this approach is appropriate for highly simplistic circumstances assumed in textbooks when companies produce a small number of products, thus, special studies could be done easily. On the other hand, they argued that in the real world, when companies produce hundreds of products, the range of possible decisions to investigate undertaking special studies is unmanageable. In this regard, Cooper and Kaplan (1988b) suggest that the variable costing systems may be appropriate for decision making, especially when these costs represent a relatively high proportion of total manufactured costs and the companies produce their products with limited product diversity.

According to Cooper and Kaplan (1991), in order to estimate the incremental costs, for example changes in the support activities is necessary to undertake special studies for each product for which a decision is essential. The special studies would report the long-term incremental costs and revenues. In terms of pricing decisions, Drury (1996) argues that neither using full product costs (which are prepared by irrelevant financial accounting principles) nor using only incremental costs are appropriate for pricing decisions. Instead, when a company produces specific goods to a customer's order, each order will be unique and the accountants should adopt estimated short-term incremental costs. In such circumstances, this cost will reflect the minimum price to accept the order and only short-run decisions or special pricing decisions should be adopted. On the other hand, because specific incremental fixed costs, other than direct labor, may not be

attributable to specific order. In fact, estimated short-term incremental cost is not appropriate for long-run decisions. Therefore, long-run decisions should be considered and long-term costs should be calculated to be used for pricing decisions.

### 2.2.1.4 Prior Studies to the Extensive Use of Full Product Costs:

Mills (1988) investigated the UK manufacturing and service companies and found that the full absorption costing rules were the main basis for setting prices under normal conditions. Drury et al. (1993) concluded that the UK organizations use a combination of cost information for decision-making in a flexible manner. The following product costs are often\always used for decision-making such as product mix and make or buy. 52 per cent use variable manufacturing costs; 46 per cent use total manufacturing costs as used for stock valuation; 34 per cent use total variable\incremental costs and 31 per cent use total costs. The following product costs often\always use product cost for pricing decisions. 41 per cent use variable manufacturing costs; 52 per cent use total manufacturing costs as used for stock valuation; 28 per cent use total variable\incremental costs and 47 per cent use total costs. Also, the results indicated that the surveyed companies use both incremental and full costs in a flexible manner in pricing decisions. Cost-plus pricing methods are used selectively for pricing decisions (84 per cent use cost-plus pricing, but flexible) and the narrow use of fixed mark-ups is not widespread.

Drury and Tayles (1994) investigated the product costing practices used by UK manufacturing companies to provide evidence to ascertain the extent to which recent criticisms of product costing can be judged and to compare and comment upon the theory and practice of product costing. The study found that the majority of firms used both full costs and variable costs for decision-making and the findings suggest that product cost information is used in a more flexible manner than that depicted by previous studies.

Cinquini et al. (1999) examined the cost calculation methods which are used in cost information systems in Italian medium size-large companies and also investigated the relationships between several internal and external features of the Italian companies and their attitude towards ABC. The study found that 53 per cent of the respondents answered that always or often use full product costs for setting their companies' prices. The relevance given to full product costs for price setting in our study is that the full manufacturing costs are considered the more reliable cost information for pricing. This preference for full manufacturing cost could be driven by the large use of this cost for other purposes like inventory/stock valuation, in accordance with generally accepted accounting principles.

Govender (2000) found that the majority (74, 5 per cent) of the firms use full costs, while, only 25.5 per cent use variable costs for pricing their products. Drury and Tayles (2000) investigated the cost system design and profitability analysis in UK companies.

They found that 15 per cent of respondents allocated only direct costs to cost objects, and the remaining 85 per cent allocated both direct and indirect costs. Cost-plus pricing was used in a flexible way by 60 per cent of the responding companies. Abulghasim (2006) investigated MA techniques in Libyan public manufacturing companies (LBMC's). The study found that no company adopted variable costing, only absorption costing was the dominant method in LBMC's. Most products were priced by full product costs.

### 2.2.2 The Second Theme: the Financial Accounting Mentality:

Kaplan (1988) highlights that the product costing systems are maintained by many companies have been described as insufficient for decision making purposes and operational control. Product costs that are initially prepared for financial accounting purposes are unlikely to provide accurate and timely information for internal decision-making. Therefore, Kaplan and Cooper (1998) suggest that the designers of costing systems should recognize that there are three different cost information systems for different purposes as flows, to allocate costs between cost of goods sold and stocks for stock valuation and profit measurement; to provide cost information to assist decision making; to provide data for planning, control and performance evaluation.

However, Kaplan and Cooper (1998) suggest that in a simple industrial environment (e. g. limited product diversity and production process simplicity), maintaining a single cost information system may be sufficient to satisfy all the three purposes. In contrast, in

complex industrial environments (e. g. substantial product diversity and production process complexity), maintaining a single system may not be enough to generate accurate product costs for decision-making and operational control.

Moreover, Johnson and Kaplan (1987); and Kaplan and Cooper (1998) highlight that distorted product costs are used in decision-making and profitability analysis. They point out that decades ago when companies produced a limited range of products of a simple industrial nature, dealing with a low degree of competition and the processing of data costs were high. Then, using simplistic allocation bases (e. g. machine hours or labour hours\costs) in calculating product costs were sufficient to satisfy manager's needs for all the three purposes (financial accounting, managerial decision-making and operational control).

Furthermore, Johnson and Kaplan (1987) state that these simplistic allocation bases were designed initially for financial accounting purposes. Drury (2004) argues that simplistic methods such as a blanket overhead rate is not a suitable method at all, however, it could only be justified when all products consume departmental resources in about the same proportions. In addition, Krumwiede and Roth (1997) indicate that traditional CAS by using volume related bases such as direct-labour hours were sufficient when products had higher direct labour content and competition was less severe. Thus, in order to understand how financial accounting mentality affected the MA practices, we should understand

what is accounting, what the differences are between the three branches of accounting (financial, cost and MA) and why the need for using different cost information for different purposes for which product cost information is used. These issues will be discussed in the following sections.

#### 2.2.2.1 Accounting:

Accounting is defined by the American Accounting Association (1966: 1) as:

> ***"the process of identifying, measuring and communicating economic information to permit informed judgments and decisions by users of the information"***

Crowther (1996) states that there are two groups (external and internal users) using accounting information with different objectives. Accounting has two different branches intended to serve the different users depending upon their objectives. The financial accounting branch serves external users such as shareholders, investors and creditors in business and government. On the other hand, MA provides relevant information for internal users within the organization such as managers.

#### 2.2.2.2 Management Accounting:

Management accounting (MA) is created mainly to serve users of information within the organization such as the managers and rarely to serve users outside the organization. MA is defined by Atkinson, et al (2007: 3):

> ***"Management accounting systems provide information, both financial and non-financial, to managers and employees inside an organization. Management accounting information is tailored to the specific needs of each decision maker and is rarely distributed outside the organization"***

MA is concerned with providing managerial information primarily to assist managers in satisfying the goals of the organization as defined by Horngren et al (2005: 5):

> ***"Management accounting measures and reports financial information as well as other types of information that are intended primarily to assist managers in fulfilling the goals of the organisation"***

The Chartered Institute of MA in the UK (CIMA) provided a comprehensive definition of MA. Therefore, MA is described as an essential element in aiding management functions especially their strategic plan. It is defined by CIMA (2005: 18) as follows:

> ***"... Management accounting is an integral part of management. It requires the identification, generation, presentation, interpretation and use of relevant information to: Inform strategic decisions and formulate business strategy; Plan long, medium and short-run operations; Determine capital structure and fund that structure; Design reward strategies for executives and shareholders; Inform operational decisions; Control operations and ensure the efficient use of resources; Measure and report financial and non-financial performance to management and other stakeholders; Safeguard tangible and intangible assets; Implement corporate governance procedures, risk management and internal controls"***

As noted, all the writers unanimously defined MA and its important functions being to aid management strategies.

### 2.2.2.3 Cost Accounting:

Cost accounting is considered as the function of aggregating and assigning of costs to cost objects; preparing budgets, standard costs and actual costs of operations, processes,

activities or products; and the analysis of variances, profitability or the use of resources.

CIMA (2005: 10) defines cost accounting as:

> ***"Gathering of cost information and its attachment to cost objects, the establishment of budgets, standard costs and actual costs of operations, processes, activities or products; and the analysis of variances, profitability or the social use of funds. The use of the term costing is not recommended except with a qualifying adjective, for example standard costing, batch costing, continuous operation costing, contract costing, job costing, service costing, specific order costing, marginal costing"***

Moreover, Horngren et al. (2005: 5) defines cost accounting as:

> ***"Cost accounting measures and reports financial and non-financial information related to the organisation's acquisition or consumption of resources. It provi6des information for both management accounting and financial accounting"***

Both the above definitions defined cost accounting as providing relevant financial and non-financial information for both MA and financial accounting. In contrast, Drury (1996) suggests that cost accounting is concerned with providing useful cost information for external financial accounting reports, while MA is regarded as a function for supporting and assisting the internal decision-makers' tasks in order to make rational decisions. However, Drury (1996: 17) stressed that most texts books use the terms cost and MA and the distinctions between them is not clear:

> ***"Cost accounting is concerned with cost accumulation for stock valuation to meet the requirements of external reporting, whereas management accounting relates to the provision of appropriate information for people within the organization to help them make better decisions. An examination of the major texts in cost and management accounting indicates that the distinction between management accounting and cost accounting is extremely vague, with some writers referring to the decision-making aspects in terms of 'cost accounting' and other writers using the term 'management accounting'; the two terms are often used synonymously"***

From the previous definitions, it is clear that, it is difficult to distinguish between the two terms (cost accounting and MA) due to the deep interaction between them. Therefore, this study has adopted the Horngren et al. (2005) definition which suggests that the cost accounting task is to provide information for both MA and financial accounting.

#### 2.2.2.4 Financial Accounting:

Financial accounting is concerned with external accounting information for use outside the organization. Crowther (1996) argues that financial accounting is concerned with the provision of external information about the business, with the determination of profit, and with the production of the final accounts which a business needs to produce on an annual basis as required by GAAP in many countries.

Consequently, Drury (1996) states that financial accounting requires that we match costs with revenues in order to calculate profit. So during a given period, any unsold finished goods or work in progress will not be included in the cost of goods sold. In an organization that produces a wide range of different products, it will be necessary for stock valuation purposes, to charge the costs to each individual product. The total value of the stocks of unsold completed products and work in progress plus any unused raw materials forms the basis for determining the stock valuation to be deducted from the current period's costs when calculating profit. This total is also the basis for determining the stock valuation to be included in the balance sheet. So for financial accounting

requirements, costs are traced to each individual product in order to allocate the costs incurred during a period between cost of goods sold and closing inventory.

With regard to the Libyan context, the Stock Market (SM) was established in 2006 with Act no. 134 (http://www.lsm.ly/ARABIC/LEGA%20DEPARTMENT /Pages/). This situation required that the Libyan listed companies adopted many requirements of the international accounting standards (IAS) (http://www.pal-stu.com/vb/showthread.). According to paragraph 9 of IAS no.2, industrial companies should measure their inventories at the lower of cost and net realisable value (Alfredson, et al. 2009). The cost of inventories included all costs of purchase, costs of conversion and other costs which should only be recognised as those costs that have been incurred in bringing the inventories to their present location and condition.

In addition, paragraph 11 of IAS 2 states that the costs of purchase of inventories contain the purchase price, import duties and other taxes, and transport, handling and other costs directly attributable to the acquisition of finished goods, materials and services. Trade discounts, rebates and other similar items are deducted in determining the costs of purchase. Moreover, paragraph 12 of IAS 2 conditions that the costs of conversion of inventories consists of direct costs (e.g. direct labour), also include a systematic allocation of fixed and variable production overheads that are incurred in converting materials into finished goods. Variable production overheads are those indirect costs of production that vary directly, with the volume of production (e.g. indirect materials and indirect labour). Fixed production overheads are those indirect costs of production that

remain relatively constant regardless of the volume of production (e.g. depreciation and maintenance of factory buildings and equipment).

On the other hand, with regards to the paragraph no. 16 of IAS 2, it was stated that the following costs should be recognized as period expenses when they are incurred in bringing the inventories to their present location and condition. For example, it may be appropriate to include non-production overheads in the cost of inventories. Examples of costs excluded from the cost of inventories and recognised as expenses in the period in which they are incurred are: abnormal amounts of wasted materials, labour or other production costs; storage costs, unless those costs are necessary in the production process before a further production stage; administrative overheads that do not contribute to bringing inventories to their present location and condition; and selling costs (Alfredson et al. 2009).

#### 2.2.2.5 Management Accounting and Financial Accounting Differences:

The financial accounting system is considered primarily as providing accounting information for external users such as shareholders, investors and creditors to the business and government departments, while MA primarily provides relevant information for internal users within the organization and rarely provide information to outside users. However, differences existed between management and financial accounting attributed to the differences in their objectives.

Atkinson et al., (2007) point out that in terms of product cost calculation, financial accountants and management accountants define and think about costs very differently. The different product cost definitions are reflected in the different objectives between financial and MA. Thus in terms of product costs, there are two major differences between financial and MA as follows:

- Firstly, in the field of financial accounting, the financial accountant is concerned with the aggregate value of inventory, which helps evaluate how well management has used the organization's resources, therefore, the focus is on determining the total cost of all inventory. On the other hand, MA gives attention to providing decision makers with relevant information about product costs, therefore, the focus is usually on the cost of an individual unit of inventory.
- Secondly, in financial accounting, financial accountants adopt the conservatism principle, which requires reporting on the assets for which future benefits could be estimated in a systematic way. Then, expenditure like advertising, research and development, and product improvement are not reported in product costs because these costs are seen as too subjective and difficult to estimate. Therefore, inventory cost includes only manufacturing costs. On the other hand, for managerial accounting purposes especially in profitability analyses, management accountants provide, for existing and potential products, information that is needed to estimate the total costs of developing, introducing, making, and supporting a product that will

be sent to the market so that decision-makers can evaluate product profitability. Therefore, inventory or product costs should include all product-related costs, such as research and development, marketing, advertising, and selling.

For general comparison between financial accounting and MA differences, Drury (2002: 5) shows three different basic features as follows:

- Firstly, financial accounting focus and reports on the entire business of the organization, while, MA provides more details on the organization.
- Secondly, financial accounting in preparing their financial reports considered mainly the historical costs. On the other hand, MA is concerned with future predictions as well as past information.
- Finally, financial accounts are published annually or less detailed accounts may be published semi-annually. While, MA reports on various activities may be prepared at daily, weekly or monthly intervals depended on management needs.

### 2.2.2.6 The Need for Using Different Cost Information for Different Purposes:

According to Atkinson et al. (2007) conventional MA wisdom in text-books has pointed out the need for using different cost information for different purposes for which the product cost information is used. He suggests that there is no formal way to calculate the cost of something; therefore, the way that a cost will be used defines the way it should be computed. Cooper and Kaplan (1998) and Kaplan and Cooper (1998) indicates that the

non-manufacturing overheads which are excluded from product cost for financial accounting purposes (as required by GAAP), however, may be relevant for decision-making purposes. Drury (1996) supports the idea that non-manufacturing costs are unnecessary to be included in product costs to use for external reporting purposes. However, for internal managerial accounting purposes especially pricing decisions, it is common for many organizations to set their selling price depending on estimates of total cost or even actual cost. Thus for pricing decision-making purposes, non-manufacturing costs may be appropriate to be included in product costs.

For instance, Drury (2004) argues that not all costs are relevant to all decisions. For example, sunk costs such as depreciation of factories and machines are irrelevant costs to a decision such as discontinuing a product. Moreover, historical costs are used to report on the organization's position and income for external use, however, for internal decision-making purposes, the replacement costs or alternatives may be more relevant. So management accountants should compute costs that reflect decision-making needs (Cooper and Kaplan, 1998; and Kaplan and Cooper, 1998).

These are different needs of cost information system by different users. Kaplan and Cooper (1998) assert that the designers of costing systems should recognize that there are three different accounting systems for three different purposes. Costing system is required for three purposes as follows, to allocate costs between cost of goods sold and

stocks for stock valuation and profit measurement; to provide information to support decision making; to provide data for planning, control and performance evaluation.

They argue that most organizations use a single costing system that are initially designed to meet financial accounting needs to be used for managerial accounting tasks. Therefore, in terms of product costs, managers should maintain two separate costing systems for each purpose (one for external financial accounting and another one for internal decision-making purposes). Alternatively, they highlight that organizations may develop a fully integrated database system that enables managers to satisfy their needs for each purpose. Arnold and Turley (1996) state that there is no reason in principle why organizations should not use different conventions and cost measurements, However, the cost and potential uncertainty benefits associated with maintaining two systems may be difficult to be justified.

### 2.2.2.7 Prior Research Concerning the Preeminence of the Financial Accounting Manager's Mentality:

Drury and Tayles (2000) investigated the cost system design and profitability analysis in UK companies. They found that more than 90 per cent of the respondents indicated that a single database is used to obtain appropriate cost information for both stock valuation and decision-making purposes. Brierley et al. (2001) examined how product costs are calculated and how they are used in decision making in manufacturing industry in the

UK. For 42 per cent of the surveyed companies, they have taken product costs from a single cost information system that is used for financial accounting and decision-making as well, while, 16 per cent subsequently adjusted the product costs to use for decision-making.

Brierley (2008) examined the types of cost system used to obtain product costs in British manufacturing industry. They found that 44.8 per cent obtain product cost from a single costing system for both financial accounting and decision-making purposes. In addition, 0.8 per cent obtained their stock valuation from an adjustment to the product cost system that was used for decision-making. Drury and Tayles (1994) examined the product costing practices used by UK manufacturing companies to provide evidence to ascertain the extent to which recent criticisms of product costing can be judged and to compare and comment upon the theory and practice of product costing. The study found that product costs computed to meet inventory valuation requirements are widely used for decision-making and internal profit measurement.

### 2.2.3 The Third Theme: The Accuracy of Product Costing Systems:

Different costing systems exist depending on what costs are assigned to cost objects and their level of sophistication. Some authors argued that cost systems designed initially for financial accounting requirements are unlikely to provide accurate and timely information for managerial accounting purposes. There is no agreement about whether product costs

should be measured at full cost or variable costs. However, it is asserted that the problem with using product costs in decision making is associated with the level of the accuracy of product costs (Cooper and Kaplan, 1988a).

Moreover, Johnson and Kaplan, (1987) assert that the costing system should provide accurate product costs to use for decision-making such as introducing a new product, discontinuing unprofitable product\segment, pricing decisions. Drury (2004: 58-59) states that the need for CA system is to calculate product costs for two purposes:

> ***"first, for internal profit measurement and external financial accounting requirements in order to allocate the manufacturing costs incurred during a period between cost of goods sold and inventories; secondly, to provide useful information for managerial decision-making requirements"***

He emphasized that for financial accounting purposes, product costs may not need to be accurately traced to individual units, but, for managerial accounting tasks it should be measured accurately enough.

Many researchers (Drury et al., 1993; Drury and Tayles, 1994, 1995, 2000; and Kaplan and Cooper, 1998) highlight that accurate product costs are needed for decision making to distinguish between profitable and unprofitable activities. If the cost system does not capture accurate enough measurements of resource consumption by products, then product costs may be distorted and managers may drop profitable activities and continue unprofitable activities. Thus, in order to understand the accuracy of product costing systems, we should distinguish between the types of CA system sophistication (one and

two-stage CA system), why the need for sophisticated CA System, compression between two-stage traditional costing and ABC, weaknesses of traditional CA systems and the benefit of contemporary CA system and prior research to the accuracy of product costing systems. These issues will be discussed in the following sections.

### 2.2.3.1 One-Stage CA System:

A single CA system is also called a blanket or plant-wide overhead. In this method, indirect costs are not aggregated in cost centres (e.g. departments) but a single overhead rate is established for the entire factory to charge indirect costs to cost objects. Drury (2004) stresses that the weakness of this method is that, it is not a suitable method and leads to distorted measurements in a situation where a factory consists of a number of different production centres and produces products of different kinds and sizes. In contrast, the advantages of this method are that it is simple and can be used for reasonably accurate product costs in a situation when factories consist of more than one production department and their products consume resources in the same proportions or when only one product is produced.

### 2.2.3.2 Two-stage CA method:

This method consists of two stages, in the first stage; overheads (indirect costs) are aggregated and assigned in cost centres (production and service centres which represent

departments or work units within a department). In the second stage the costs accumulated in cost centres are allocated to cost objects (usually products) using selected allocation rates (recovery rates) (Drury, 2004). Although the two-stage traditional CA method is more sophisticated than a blanket overhead tool, however, both of them are considered as simplistic CA methods. Johnson and Kaplan (1987) point-out that traditional CA methods (single and two-stage) distribute costs to products by simplistic and arbitrary measures, usually a few volume-related allocation bases (direct labor-based), that do not represent the demands made by each product on the firm's resources.

### 2.2.3.3 The Traditional Two-Stage CA System:

This method has been investigated in the literature review as a two stage allocation method, in fact, it comprised two stages as highlighted by Drury (1996: 86). The procedure is as follows, allocate all factory overheads to production and service cost centres; reapportion service centre costs to production cost centres; calculate separate overhead rates for each cost centre; absorption of cost centre overheads to products. Stages 1 and 2 comprised stage one while 3 and 4 in stage two of the overhead assignment procedure (See figure 1).

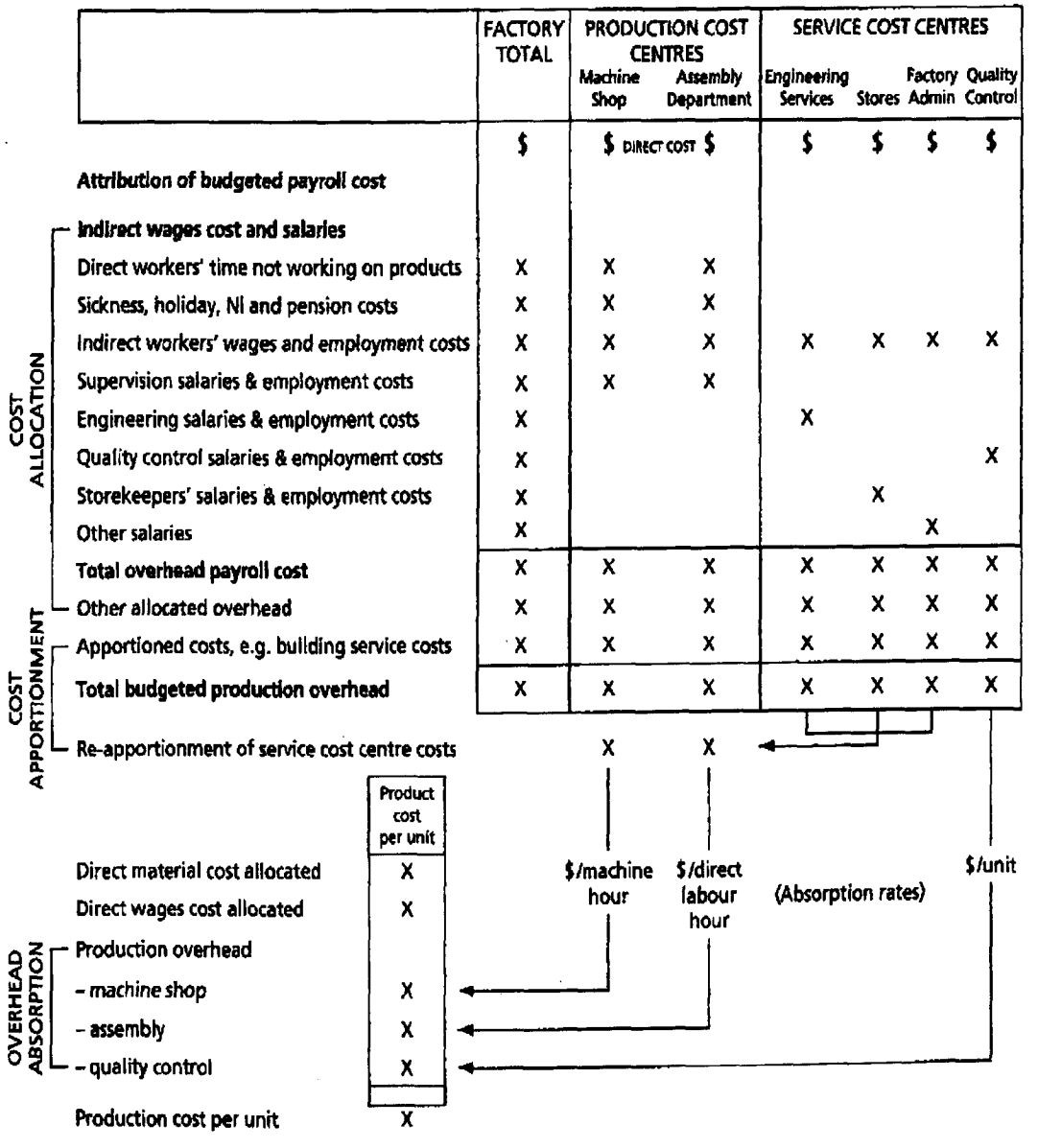


**Figure 2-1 Cost Allocation, Apportionment and Absorption System**
*(Source, CIMA 2005:2)*

In fact, when traditional CA systems were designed, accountants believe that a direct relationship exists between direct (machine or labor) hours and overheads. However, the nature of costs was changing and direct costs and overheads were becoming more and more negatively correlated over time (Garrison, 2006).

### 2.2.3.4 Two-stage CA system by ABC:

According to Cooper and Kaplan (1988b), the ABC system was designed in the USA during the 1980's. It redesigned costs to be classified as more direct; using mass cost pools (activities) and cost drivers (bases). This is in order to calculate more accurate product\service costs. Arnold and Turley (1996) argue that it still involves two stages in measuring product costs by ABC. In the first stage, costs are aggregated initially into cost pools associated with individual activities. In the second stage, costs of activities are allocated to individual activities by means of cost drivers. ABC as a general framework suggests that production activities could be divided into four levels as unit-level, batch-level, product-level and facility level. Cooper (1990b) points out those activities into different levels and highlights that cost behaviour differs depending on the activity hierarchy. Unit-level activities are performed each time a unit of product or service is produced. Therefore, the volume of activity is directly associated with the number of products produced.

Consequently, the cost driver in the (e.g. number of products produced or number of machine hours) batch-level activities which are performed each time a batch of products is produced. This level is directly associated with the number of batches and should be allocated by means of batch-related cost drivers (e. g. number of purchase orders, materials handling or number of set-ups). Product-level activities which are those performed to support the production and the sale of individual products. This level is directly associated with the number of product-level activities (e.g. number of active part numbers, number of engineering change notices). Facility-level (sustaining-level) activities which are performed to support activities that facilitate production and support all the organization. Arnold and Turley (1996) state that these costs (e. g. administrative or plant depreciation) which are described as indirect costs, these costs are not incurred as a result of the volume of production process.

#### 2.2.3.5 Compression Between two-stage traditional costing and ABC:

Drury (2000) indicates that both traditional costing and ABC systems are two-stage CA systems. In the first stage TCSs assign overheads to cost centres (usually departments), whereas ABC systems assign overheads to activities (cost pools). Usually the number of activities is greater than departments; therefore, the first advantage of ABC systems is that they distribute overheads to a greater number of cost pools. The second stage of cost assignment system is allocating overheads from the cost centres\cost pools to cost objects. Traditional CA systems use of volume-based CA bases, while the ABC systems

apply multi transaction-bases. Consequently, traditional CA systems use of limited volume-based CA bases such as direct labour hours/cost, machine hours or materials costs, therefore, the second advantage of ABC systems use of mass transaction bases.

Cooper (1990b) highlights that traditional CA's, by using volume-based allocation bases, initially assumed that all or most consumed products or resources related to volume-activities. The weakness of traditional CA's is that, the non-related-activities (such as set-up, handling and purchasing) which are significant costs in the new industrial environment are ignored, while, in ABC systems such costs are recognized. So this system is only appropriate for allocating the costs of unit-level activities to cost objects. Drury (1990) argues that traditional volume-related bases of allocating overheads to products are unlikely to distort product costs when a firm produces a limited range of products.

Cooper and Kaplan (1988a); and Cooper (1988b) state that the traditional volume-related allocation bases may not be appropriate to allocate overheads and may distort product costs when companies produce a diverse range of products. There are many overheads that are not related to volume; however, they are related to the number of batches and product diversity (un-volume-related activities). Therefore, considering sophisticated CA system when companies have some characteristics (e.g. high competition level, product diversity, production process complexity, and high percentages of overheads), product costs could be measured relevant for decision-making purposes. In contrast, in simple

industry (e. g. where there is no or low competition level, no product diversity, no production process complexity, and low overhead percentage), simplistic allocation methods are enough to calculate reasonably accurate product costs.

### 2.2.3.6 The Need for Sophisticated CA System:

Johnson and Kaplan (1987) suggest that traditional volume allocation bases especially direct labour base caused distortions in calculating product costs. Costs are shifted from less labour-intensive products to more labour-intensive products, even when cost centers use a flexible budget which separates costs into variable and fixed. Variable costs are assumed to vary with direct labour activities. Although the assumption may be appropriate for some cost categories, however, other variable costs vary with other activities related to the diverse nature of the products produced. These include the machine hours, number of set-ups, material movements, number of inspections and handling materials. Hence, products with somewhat low direct labour hours (low-volume non-standard products) that require few direct labour hours to produce them and a significant number of production set-ups, material movements, inspections and purchase orders to be raised will have a relatively low level of overheads assigned to them. On the other hand, high-volume standardized products which use a considerable number of direct labour hours will be charged with high overheads.

Cooper (1988b) indicates that the higher the relative number of un-volume related activities, the higher is the distortion caused by using only volume-related cost drivers to allocate the overheads of these activities to products. Johnson and Kaplan (1987) assert that the challenge for today's competitive environment, developing new and more flexible approaches to the design of effective cost accounting, management control, and performance evaluation systems are needed. In response to the enormous criticisms of traditional MA techniques, ABC system was developed. In the late 1980s the activity-based costing system (ABC) was developed to overcome the weaknesses' of traditional CA systems (Cooper and Kaplan, 1988a). The most notable contribution in the field of CA system (CAS) is ABC technique. Cooper and Kaplan (1988b) stated that the ABC technique has been designed to support modern technologies, management processes and the search for a competitive advantage to meet the challenge of global competition. Moreover, Fei, and Isa (2010) highlight that in today's advanced manufacturing and competitive environment, accurate costing information is essential for all the kinds of businesses. ABC system is one of the strategic tools to aid managers for better managerial decision.

### 2.2.3.7 Brief Prior Research Concerning the Accuracy of Product Costing Systems:

According to Samaha and Abdallah (2011), the recent literature indicates that traditional cost accounting systems systematically generate serious product cost distortions, which

lead to inappropriate strategic decisions. On the other hand, ABC provides an alternative approach that is generating more accurate and traceable cost information.

Al-Bastki and Ramadan (1998) investigated the extent, motives, difficulties of implementation and reasons as to why some companies have not yet considered ABC system in Bahraini's manufacturing firms. The study found that the majority (61.3 per cent) of the surveyed companies used a single cost allocation rate (unit of production; direct labor hours and costs; machine hours and prime cost). Of the 38.7 per cent companies using multiple cost allocation rates, 19.3 per cent companies use two cost allocation rates, 12.9 per cent companies use three rates, one company uses four rates, and one company uses five rates. The most commonly used methods in allocating overheads are the direct labor hours method and units of production method.

Drury et al. (1993) investigated how accounting information is reported to management in UK manufacturing companies. They found that some (20 per cent) of the surveyed companies use simplistic cost allocation methods (blanket overhead rates). Direct labour based methods were the most widely used allocation bases for automated activities, whereas 44 per cent never use machine hours and only 13 per cent have implemented or intended to implement ABC systems.

Banker et al. (1995) investigated the empirical validity of the claim that overhead costs are driven not by production volume but by transactions resulting from production

diversity. The results indicated that a strong positive relation between manufacturing overhead costs and both manufacturing transactions (number of engineering change orders, level of purchasing and production planning, shop floor area per part and number of quality control and improvement personnel) and production volume. Most of the variation in overhead costs is explained by measures of manufacturing transactions, not volume.

Cinquini et al. (1999) investigated the cost calculation methods which are used in pricing decisions with Italian medium size-large firms. They have concluded that the surveyed companies use full product cost systems for decision-making purposes and the direct labour hour's basis is used extensively in allocating overheads to products.

Drury and Tayles (2000) investigated the cost system design and profitability analysis in UK companies. They found that the number of different types of cost driver rates were used to allocate overhead costs as follows, 50 per cent used more than 10 separate types of cost driver rates; 27 per cent used between 7-10 separate types of cost driver rates; 23 per cent used between 4-6 separate types of cost driver rates; 50 per cent used more than 50 cost pools; 27 per cent used between 21 and 50 cost pools, and 23 per cent used between 11 and 20 cost pools

Brierley et al. (2001) examined how product costs are calculated and how they are used in decision making in manufacturing industry in the UK. They found that a variety of

allocation bases are used in allocating overhead costs. The majority (84 per cent) use direct labour based rates, machine hour, units produced and production time. Different bases are used to calculate the denominator of overhead rates. The most popular basis is the current year's budgeted capacity. With regard to non-manufacturing costs, 79 per cent of the respondents supplied details of the treatment of such costs, 47 per cent include them in product costs, 27 per cent allocate them to products based on the manufacturing cost of each product and 20 per cent use direct labour hours, 6 per cent used budgeted sales as the cost driver for each type of non-manufacturing overhead cost.

Triest and Elshahat (2007) examined the use of costing information in Egypt. A questionnaire survey was carried out 40 Egyptian privately held companies in four sectors (pharmaceutical, foodstuff, chemical, and packing and wrapping industries) and the survey results are complemented by interviews and field visits. The study found that the uses of sophisticated costing systems are limited. No advanced accounting techniques seem to be applied. However, ABC concepts are largely unknown. The most important function of costing information is pricing decisions (using a cost-plus method), rather than performance measurement, process improvement or cost reductions.

#### 2.2.3.8 Brief Prior Research Concerning ABC Diffusion:

ABC emerged at the end of the 1980s in the USA (Bhimani et al., 2007; and Gosselin 2007) and it rapidly diffused all over the world. Early in the 1990s, academics and

practitioners who observed in ABC implementation, found that there were other advantages, such as an improvement in allocating overhead costs, evaluating product profitability and managing operating costs (Baird et al., 2007; Cohen et al., 2005). Although, there were approximately 355 published papers in ABC related topics over the period from 1987 to 1998 (Bjørnenak and Mitchell, 2000), the diffusion of ABC rates in the developed countries have been described as quite low in Europe 10 years ago (Brierley et al., 2001). According to Askarany et al., (2007), despite the claimed benefits of ABC, the level of ABC adoption rate is still lower than those of traditional MA techniques.

Moreover, Askarany and Yazdifar (2011) state that there are inconsistent research results in past concerning the diffusion of ABC. The diffusion rate was fluctuated from less than 10 per cent up to 78 per cent both within and between countries. In the UK, Innes and Mitchell (1991) found only 6 per cent; and Drury et al. (1993) reported only 13 per cent of the surveyed companies have implemented or intend to implement on ABC system. An increased adoption rate (19.5 per cent) was reported by Innes and Mitchell (1995). However, the adoption rate has decreased as reported by Drury and Tayles (2000) that only 15 per cent of the organisations had implemented a full ABC system, 5 per cent indicated partial implementation and a further 3 per cent were actually in the process of implementing it.

In Canada, Armitage and Nicholson (1993) found about the same proportion (14 per cent) of Canadian companies have adopted or were adopting it. In Ireland, Clarke et al. (1999) examined the adoption of ABC in Irish companies. Only 12 per cent had implemented ABC. In Belgium, a slightly higher rate (19 per cent) was reported by (Bruggeman et al., 1996) and only 2 per cent diffusion rate in Finnish companies (Malmi, 1999). In the USA, an increased adoption rate was reported by many studies, which reported a higher diffusion rate in contrast in European countries. 27 per cent of USA companies had fully or partially implemented ABC as reported by Shim and Sudit (1995). The adoption rate is increased to 53 per cent as reported by Hrisak (1996).

In Australia the adoption rates is increased from17 per cent to 56 per cent as reported by Teoh and Schoch (1993); and Chenhall and Langfield-Smith (1998) respectively. In Jordan, low diffusion rate was reported by Nassar et al. (2011), only six companies used ABC by the end of 2005, which had shown a rise above the level of implementation of the previous years. The 2005 level was then sustained or increased in the following three years with at least three companies implementing ABC in each year. Then, in 2009, only one company implemented ABC. Also, Sartorius et al. (2007) evaluated the extent of ABC implementation in South Africa. They found that the ABC diffusion rate was only 12%.

### 2.2.3.9 Brief Prior Research Concerning Benefit of ABC:

According to Grahovac and Devedzic (2011), ABC recognizes as cause-effect relationships between allocated objects costs. It assigns costs to products/services based on the resources they consume. ABC system aggregates costs for activity centers in multiple cost groups at a variety of levels and then allocates these costs using multiple cost drivers. Therefore:

- Costs are allocated more accurately.
- Managers can focus on controlling activities that cause costs rather than trying to control the costs that result from the activities.
- It should provide a more realistic picture of actual production costs than has traditionally been available.
- Managers have more success in understanding how organization is using its own capital by assigning costs for defined activities using the ABC system.
- It identifies opportunities to improve business process "effectiveness" and "efficiency" by determining the "true" cost of a product or a service.
- Although ABC typically provides better cost estimates than the traditional CA system, but, it is not universal remedy for all managerial aspects. This is the point where an expert system can takes a part.

Moreover, according to Fei, and Isa, (2010: 144):

> ***"the benefits of ABC system and its impacts on companies' performance have motivated numerous empirical studies on ABC system and it is considered as***

***one of the most-researched management accounting areas in developed countries."***

Wegmann, and Gabriel (2010) investigated the strategic management accounting concept with an instrumental point of view. The study concluded that the current developments reveal that the ABC logic remains a good way to improve management accounting systems to drive strategic decisions. ABC system was supported and recognized as a system that overcomes the weaknesses of the traditional CA systems. In addition, it is described as a technique that can calculate more accurate product costs.

However, many researchers have concluded that there are several companies have gained multiple-benefits. In the UK, a study by Nicholls (1992) found that the 65 per cent of the respondents said that the most important reason for adopting ABC is to obtain a better understanding of product costs. In USA, Cooper and Kaplan (1991) concluded that this system significantly helps in achieving the cost reduction by reducing set up cost; is more efficient in making production scheduling and material handling; and reducing the number of parts required to meet final customer product demand.

In Finland, Malmi (1996) found that the ABC system is used to support the production function for production and process development decisions and pricing decisions as well. Lukka and Granlund (1996) found that ABC is important in the following aspects, more timely, accurate and relevant for supporting managerial decisions and profitability purposes.

### 2.2.3.10 Brief Prior Research Concerning Problems or Failure in Implementing ABC:

In fact, a small number of studies have investigated the problems of the ABC failures and little is known about what causes failure (Malmi, 1997). According to Pattison and Arendt (1994); and Player and Keys (1995), although, ABC system is better than traditional CA systems, but it could not succeed due to implementation problems. The promise of top management to push the idea of the ABC implementation will reduce the risk of rejection (Brown et al., 2004).

Many articles have investigated the implementation problems of ABC, some important studies are presented below:

- In the UK, Bright et al. (1992) highlight that the most important difficulties with the introduction of the ABC system are as follows cost of change, lack of relevant skills, and the quality of existing systems.
- Jayson (1994) concluded that the most common problem in implementing ABC system was the difficulty in identifying the activity cost drivers.
- In India, Joshi (2001) investigated the degree to which Indian manufacturing companies have adopted certain traditional and contemporary MA practices, the benefits received, their extent of future emphasis in these practices, and compared the results to the findings of the Chenhall and Langfield-Smith (1998) study in Australia. They concluded that the Indian companies widely use traditional MA

techniques and the adoption rates of contemporary techniques have been rather low and slow. The study reveals that in most of the cases, higher benefits were derived from the traditional practices compared to the contemporary techniques.

- Sulaiman et al. (2004) examined the use of traditional and advanced MA techniques in four Asian countries (Singapore, India, Malaysia and China). They found that the benefits that accrue from using traditional MA practices were very high. Therefore, the traditional MA techniques are still used, while, advanced MA techniques are not used. The reasons for that are as follows, high cost of implementation, the lack of awareness of advanced techniques, and lack of top management support.
- In Saudi Arabia, Khalid, (2005) evaluated the degree of ABC implementation and the reasons that could drive companies away from ABC. In relation to the companies which never considered ABC or rejected it after evaluation, the study found that, the main reasons given by them was their satisfaction with the existing traditional costing system and the lack of relevance to the firms' operations environments. To a lesser extent, some of the non-ABC firms have shown about the credibility of ABC in the light of unsuccessful cases experienced by other firms in the past.
- In Libya, Abulghasim (2006) studied MA techniques in Libyan public manufacturing companies. He found all Libyan public manufacturing companies use of traditional costing systems and the major reasons for not introducing ABC

were the low level of awareness which were compounded by the lack of external consultants, the role models and the low competitive environment.

**2.2.3.11 Brief Prior Research Concerning Important Factors that Associated with ABC Success:**

With regard to the important factors that are associated with ABC success, in USA, McGowan and Klammer (1997) concluded that there are four important factors that are positively associated with ABC success (top management support, performance evaluation, sufficiency training and training resources, user interest in implementation and their perception of the quality of information produced by the system).

In UK, Friedman and Lyne (1999) found that ABC success was associated with a clearly recognized need for it at the outset, broad based support for it beyond the accounting function, adequate resourcing and its synergistic links with other activities (e. g. TQM). Moreover, a survey by Innes et al. (2000) concluded that only top management support had a significant impact in explaining ABC success. In France, Rahmouni and Charaf (2010) explored the impact of organizational and technical factors on the success of an ABC system. It was found that the success of ABC implementation depends mostly upon two factors: training and the perceived complexity of the information technology. According to our interviews, French cost controllers believe that the ABC approach is too complex as a management accounting system compared to the "Section Homogène"

method and, thus, is a potential reason why the ABC system was dumped immediately once it has been implemented and others use it for a while and then dumped it.

In China, Lana, et al. (2007) investigated some factors affecting the success of ABC implementation within a Chinese organisational and cultural setting. It was found that a major success factor is the level of top management support. In Australia, Brown et al., (2004), found a positive relationship between top management support successful ABC implementation.

In Malaysia, Ruhanita et al. (2006) examine that factors influencing ABC success. They found the significant factors were cost distortion, information technology, organizational factors and decision usefulness. Moreover, it was found that the decision usefulness, top management support, link ABC to performance evaluation and compensation affected the ABC success significantly.

**2.3 Summary:**

In conclusion, MA definitions and principles are different from financial accounting which does not give attention to providing decision makers with relevant information about product costs. Moreover, most text books have advocated that for decision-making purposes, incremental costs that predict future cash flows arising from decisions should be used and supported using the contribution approach. On the other hand, from the

review of the previous studies related to cost allocation systems in developed and developing countries, which revealed that, distorted product costs are generated by financial accounting systems which use simplistic cost allocation methods are still commonly used by practitioners. All of these aspects are considered as relevant to investigating CA systems in Libya as a developing country.

# Chapter 3

# Review of Prior Empirical Research of CA Systems Literature and the Formulation of Research Hypotheses

## 3.1 Introduction

As mentioned in chapter one, studies on factors influencing MA practices in developing countries are limited. Some researchers have acknowledged the need for moving ahead our knowledge of MA practices in developing countries. This chapter examines the contingency factors that influence cost and MA practices.

However, slight attention is now being applied to analyse product costing practices to identifying the factors that explain the content of product costing systems (Al-Omiri and Drury, 2007). In fact, a few studies have examined the CA system in terms of product costs. Contingency theory advocates that there is no best design framework for a MA information system; all depends upon the situational contingency factors (see section 3.2). Therefore, this chapter aims to review the literature concerning the concept of contingency theory and contingent factors that influence the design of cost and MA practices in order to formulate the research framework and hypotheses. In addition, this chapter aims to analyse briefly the factors that influenced the development of accounting in Libya from the Ottoman's occupation (1551) until the year 2009.

## 3.2 The Concept of Contingency Theory:

Efficient organizational structures and processes are contingent on an organization's environment (Waterhouse and Tiessen, 1978). Moreover, the contingency theory in MA is based on the idea that there is no universally appropriate accounting system applying equally to all organizations in all circumstances (Otley, 1980; Emmanuel et al., 1990; Drury, 2000; and Haldma and Laats, 2002). However, Otley (1980: 413) suggests that:

> ***"particular features of an appropriate accounting system will depend upon the specific circumstances in which an organisation finds itself. ".***

Researchers applying contingency theory face difficulties due to the lack of a fixed classification related to the independent and dependent variables. Chenhall (2003) states that contingency approaches are difficult to determine and describe the contingent variables and the purpose of the accounting system. This is due to the lack of consistent classification between them. Therefore, the following sections will critically review and discuss the particular contingent factors that the current study will examine.

## 3.3 The Contingency Theory Framework:

A contingency theory framework was applied to examine the relationship between the identified contingency factors and aspects of the product costing system design. Based on the literature review in the previous sections, the contingency theory model is developed in this section. In addition, most of the literature review which applied a contingency theory framework has investigated accounting control systems rather than CA systems in

terms of product costs. A few studies by Drury and Tayles (2000) and Sithambaram, (2002) have investigated product cost systems. This current study seeks to apply contingency theory to adopt a wider perspective in order to obtained better understanding of the Libyan environment.

According to Drury et al (1993: 12) theory suggests that the design of a sophisticated CA system is affected by the following factors:

1. *Information processing costs;*
2. *The degree of competition faced;*
3. *The diversity of products;*
4. *The number of products produced;*
5. *The proportion of overhead costs that cannot be directly assigned to products.*

Because the more sophisticated CA system leads to calculating more accurate product costs (Drury et al, 1993). However, this study has developed a contingency framework in terms of accuracy rather than degree of sophistication in order to achieve the research objectives. The rationale behind this is that Libya as a developing country is different from any of the developed countries where most previous studies have been undertaken and it is expected to use only unsophisticated CA systems.

Based on the literature review, contingent factors have been identified as influencing the level of accuracy of the product costs as follows; cost structure of the firm; competition,

product diversity; type of ownership; size of the company; product diversity and customized products (see Figure 2). The possible influence of the above explanatory variables will be discussed in later sub-sections and the formulation of hypotheses specifying the relationship between each variable and the level of cost system sophistication presented. Figure 1 provides a diagrammatic illustration of the relationship between the above contingent variables and the aspects of the product costing system (i.e. the level of accuracy of the product costs). However, the factors that are determined in this framework could not be considered as comprehensive because of the extent and limited scope of this study.

| **Characteristics of product costing systems** | | **Identified contingent variables** |
|---|---|---|
| 1. Cost structure of the company<br>2. Type of ownership<br>3. Size of the company<br>4. Competition<br>5. Customized products<br>6. Product diversity | → | Accurate\inaccurate product costs |

**Figure 3-1 A Proposed Contingency Theory Framework:**

The possible influence of the above explanatory variables will be discussed in the following sub-sections and the formulation of hypotheses specifying the relationship between each variable and the level of cost system sophistication presented. Figure 3.1 provides a diagrammatic illustration of the relationship between the above contingent variables and the aspects of the product costing system (i.e. the level of accuracy of the

product costs). However, the factors that are determined in this framework could not be considered as comprehensive because of the extent and limitations of this study. In order to achieve the main aim a contingency theory framework is adopted while additional objectives were formulated, investigated and classified as descriptive practice-oriented research.

### 3.4 Contingency Variables and Research Hypotheses:

In the previous section contingency factors were determined (cost structure of the firm, competition, product diversity, type of ownership, size of the company, product diversity and customized products), however, this section is intended to develop the research hypotheses built on the mentioned variables.

#### 3.4.1 Cost Structure and Competition:

In the later decades of the 20th century and into 21st century, companies have dealt with a changing industrial environment which has affected the product cost structure. Companies use high automation levels when producing a wide range of products. This situation has caused an increasing overhead proportion and decreasing in labour costs which became a small fraction of product costs (Cooper and Kaplan, 1991). It is argued that the challenges created by increased local and global competition increased the need to improve the costing techniques in order to measure more accurate product costs (Cooper, 1988b).

Moreover, Garrison and Noreen (1999) stress that organizations deal with a changed innovative industrial environment and combined with facing high global competition levels, this situation involves competitive strategies such as low prices, and high quality products that necessarily need more accurate MA information. Cost structure has a significant role in choosing the level of sophistication of CA system design especially when combined with a high level of competition. Johnson and Kaplan (1987) assert that indirect costs within manufacturing companies are now the dominant costs in the product cost structure. Companies that use simplistic CA methods with one or a few volume related CA bases lead to products costs being distorted and measured inaccurately. They concluded that the main reasons for failure of U.S. organizations to be competitive were that the cost and MA information was not relevant, not timely, and inaccurate. Moreover, Kaplan (1984) indicates that the challenges of the competition should encourage us to re-examine costing and managerial control systems.

In decision making more accurate cost information is required to make the right decisions. Drury and Tayles (1994) point out that the accuracy of product cost measurements is required for decision-making purposes to distinguish between profitable and unprofitable products and activities. As a solution, Cooper and Kaplan (1988a) state that a sophisticated CA system (ABC) reports a higher level of accuracy in calculating product costs to be used for decision making purposes. Thus, the higher the level of the

sophistication of the CA system used, the higher the level of accuracy of product costs reported.

In contrast Brierley (2001) stresses that material costs tend to be higher than overhead costs and, in some industries, direct labour is a minority of costs and is added to overhead costs, therefore, more research is needed to assess the extent to which product cost structures vary between industries. If overheads represent a small proportion of total costs in some industries then it may not be useful to use sophisticated CA methods to allocate overheads in these industries. Brierley et al (2006) assert that in terms of product costing, it could be argued that as the level of competition increases and for companies to compete effectively in competitive markets, it is necessary for them to get hold of necessary data to make rational decisions. In order to accomplish this, different types of management information is depended upon which includes product cost information. If this is not done, competitors may take advantage of errors that may arise from poor decisions based on inefficient cost information systems. On the other hand, Cobb et al. (1993) argue that where organizations which report a relatively insignificant overhead proportion of total costs, to calculate product costs, it may not be appropriate to design a sophisticated costing system (ABC) in order to calculate accurate product costs.

Guilding, et al (2005) point out that it is widely distinguished in the text-books that cost information can play a significant function in setting selling prices. However, many companies show that their prices are considered as a function of market forces, they have

insignificant discretion in setting their prices. Also, small companies have little influence on prices where prices are set by the dominant market leaders. For such companies, the cost-plus pricing method is probably limited in use and it is to be expected that cost information is considered mainly as a key factor to be taken into account when attempting to optimise the output and mix of products and services in accordance with market prices.

Moreover, Guilding et al (2005) assessed the relative importance of cost-plus pricing and determination of factors that might affect the degree of importance attached to cost-plus pricing. A mailed survey was used for collecting data in UK and Australian companies. The study found that manufacturing companies which faced high competition attach a relatively low degree of importance to cost-plus pricing. The significant factor that might affect the degree of importance attached to cost-plus pricing is competition intensity.

However, Brierley et al ( 2006) stress that in terms of product costing, it can be argued that as the level of competition increases and for companies to compete effectively in competitive markets, it is necessary for them to get hold of necessary relevant and accurate data to make rational decisions. Therefore, competitors measure more accurate product costs, they will be expected to take advantage of any errors arising from other managers having to rely on distorted product costs. On the other hand, it was asserted that one of the significant factors that influence the choice of the cost-base for pricing decisions is materiality of fixed overhead costs (Govender, 2000). Moreover, Sartorius, et

al. (2007) assert that the increasing of fixed costs leads to the need for more accurate CA methods such as ABC.

Because there is no evidence found that indicated the LMC's have developed their costing system, and based on the above discussion the following hypotheses will be tested:

Hypothesis 1 (H1): The higher the level of the proportion of indirect costs within a firm cost structure, the lower the level of accuracy of product costs.

Hypothesis 2 (H2): The higher the level of intensity of competition, the lower the level of accuracy of product costs.

Hypothesis 3 (H3): The higher the level of intensity of competition, the lower the use of cost-plus pricing method.

### 3.4.2 Product Diversity:

In terms of product costs, Drury (2004: 58-59) highlights that the need for CA system is to calculate product costs for two purposes:

> ***"first, for internal profit measurement and external financial accounting requirements in order to allocate the manufacturing costs incurred during a period between cost of goods sold and inventories; secondly, to provide useful information for managerial decision-making requirements"***

He emphasizes that for financial accounting purposes, product costs may not be necessary to accurately trace costs to individual units, but, for managerial accounting tasks it should be measured accurately enough. Many writers (e. g. Drury et al., 1993;

Drury and Tayles, 1994, 1995, 2000; and Kaplan and Cooper, 1998) assert that accurate product costs are needed for decision-making to distinguish profitable and unprofitable activities. If the cost system does not capture accurate enough measurements of resource consumption by products, then product costs may be distorted and managers may drop profitable activities and continue with unprofitable activities.

Cooper (1988a) argues that product diversity has increased which led to accountants to measure inaccurate product costs, when using traditional CA methods. The diversity of products are considered as important factors that influence the level of sophisticated costing system design choice. Kaplan (1990a) suggests that when companies produce a high range of different products, then, there is a need to use sophisticated CA system (ABC). ABC can measure the resources consumed by products, with a higher number of production centres (pools) and cost drivers.

In addition, an empirical study in USA by Banker et al. (1995) indicates that overhead costs are driven not by production volume but by transactions resulting from production complexity. Cooper (1988b) suggested that a variety of types of diversity such as, production volume diversity, size diversity, complexity diversity, material diversity and set-up diversity. Bjørnenak (1997: 11) argues that:

> ***"One would therefore expect to find that the companies with the highest product diversity were among the adopters of ABC. It is however very difficult to find operational definitions of product diversity, especially when more than one industry is included in the population."***

Therefore product diversity is considered as a variable for measuring diversity. Based on the above discussion the following hypotheses will be tested:

Hypothesis 4 (H4): The higher the level of product diversity within a firm, the lower the level of accuracy of product costs.

Hypothesis 5 (H5): The higher the level of product diversity within a firm, the higher the level of resources consumed differently.

### 3.4.3 Product Customization:

The adopters of sophisticated CA systems (ABC) make a significant number of semi-standardized products. The degree of customized and standardized products is investigated by Bjørnenak (1997: 11). He found that:

> ***"Highly customized production normally means high product diversity, especially complexity diversity, material diversity and set-up diversity. However, customized production also normally increases the cost of developing a costing system. The importance of costing systems may also be affected by the degree of customized production. This may explain the findings. One possible interpretation of the result is that ABC is adopted by companies with a high number of semi-standardized products"***

In this regard, Guilding et al (2005) suggest that companies with characteristics of highly customized products or a market leader may have some discretion in setting their prices. On the other hand, many companies state that their prices are considered as a function of market forces, they have insignificant discretion in setting their prices. Also, small companies have little influence on prices where prices are set by the dominant market

leaders. For such companies, the cost-plus pricing method is probably limited and it is to be expected that cost information is considered mainly as a key factor to be taken into account when attempting to optimise the output and mix of products and services in accordance with market prices.

It was found that most LBMCs are producing standardized products and dealing with a low level of automation. According to Abulghasim (2006), 82.9 per cent of Libyan public manufacturing companies are producing totally standardized products and 87.8 per cent dealing with a moderate level of automation. This industrial environment is similar to the developed countries' industrial environment sixty years ago when authors developed simple cost and management techniques in a simple industrial environment. Kaplan (1984b) states that simple cost and MA techniques were developed sixty years ago when companies used mass production of standardized products and deal with a low level of automation. Because there is no evidence found which indicates that the LMLMCs have developed their costing system, or developed the industrial environment, therefore, and, based on the above discussion the following hypothesis will be tested:

Hypothesis 6 (H6): The higher the level of customization within a firm, the lower the level of accuracy of product costs calculated.

### 3.4.4 The Ownership Proportion:

State-owned companies have different objectives to those of privately-owned companies. State-owned organizations have objectives such as helping society with their problems. On the other hand, privately-owned companies are intending to maximise profit. This means that the latter should be more motivated to maintain sophisticated CA systems than the former in order to generate more accurate product costs to achieve more competitive advantages to cope with highly competitive markets. Many studies have reported the state-owned Chinese companies which have used inappropriate MA information for decision-making (Scapens and Yan, 1993).

Because there is no evidence which indicates that the LMLMCs have developed their costing system, and based on the above discussion the following hypotheses will be tested:

Hypothesis 7 (H7): The ownership of the firm has a significant influence on the level of accuracy of product costs.

Hypothesis 8 (H8): The ownership of the firm has a significant influence on the use of cost-plus pricing.

### 3.4.5 Size of Firm:

Many studies investigated the factors that influenced ABC as a sophisticated method and concluded that there is a positive relationship between size and the adoption rate of ABC (e.g. Bjørnenak, 1997; Clarke et al., 1999; and Damanpour, 1992). Innes and Mitchell (1995) point out that the organization size is considered as an influencing factor for adopting new innovations. Bjørnenak (1997) states that large companies have greater access to resources and internal communications rather than smaller companies. Also, they are likely to be experimenting with the implementation of innovations (Roger, 2003).

Moreover, Lucas (2003) investigated pricing decisions and the neoclassical theory of the firm. He found that many accountants appear to have accepted the existence of a reality gap between MA's conventional wisdom, and actual business practice. The former recommends the use of a decision relevant approach to pricing decisions based on the neoclassical economic theory of the firm; the latter is supposed to be dominated by a (full) cost-plus pricing method. He argues that both are strongly supported by conflicting empirical evidence and asserts the need for future research to assess whether empirical evidence supports neoclassical price theory or (full) cost plus pricing.

On the other hand, in practice, Mills (1988) stresses that the primary basis for determining prices is full cost-plus pricing method calculated by the absorption costing

system. According to Govindarajan and Anthony (1983) found that most (74 per cent) companies applied the full cost-plus pricing method in determining prices. According to Guilding et al (2005), company size is positively related to importance attached to cost-plus pricing and it is commonly expected. And also it is expected that large companies have a greater ability to influence prices charged and could act as price makers. Therefore, they will have a superior basis to draw on cost information when pricing their goods and services. On the other hand, price takers companies, when pricing their products or services, will have less opportunity to draw on cost information, as prices are determined by market forces.

Drury (1996) points out that, in general, cost information could be computed by using either traditional or contemporary costing systems (ABC). Lere (2000) argues that the use of traditional volume-related CA systems in calculating product costs for decision-making is appropriate. He concludes that activity-based costing is a powerful tool for pricing. Drury (1996: 23) concludes that cost may vary with something other than traditional volume-related CA systems can make ABC a powerful tool for industrial marketers in three ways:

> ***"yielding cost estimates for use in pricing that reflect significant differences among product specifications; providing the industrial marketer with guidance as to which product specifications may be adjusted in negotiations to yield significant cost reductions; and indicating areas in which to change company operations to yield cost reductions that will allow the company to satisfy customer wishes better"***

According to Govender (2000) one of the significant factors that influence the choice of the cost-base for pricing decisions is size of the company. Moreover, previous studies have reported the existence of a positive relationship between company size and MA systems sophistication (Guilding, 1999; and Merchant, 1981). Based on the above discussion the following hypotheses will be tested:

Hypothesis 9 (H9): The larger the size of the firm, the higher the level of accuracy of product costs.

Hypothesis 10 (H10): The larger the size of the firm, the higher the use of cost-plus pricing method.

### 3.5 Factors Influencing Accounting Development in Libya:

This section aims to analyse briefly the factors that influenced the development of accounting in Libya from the Ottoman's occupation (1551) until the year 2009. The Ottoman occupation was chosen as the starting point because Libya was recognised as a State only after the establishment of the Ottoman Khelapha (Kilani, 1988). On the other hand, the year 2009 was chosen as the closing point to the current research objectives, since; it was around that period that Libyan policies and economic strategies began to change (this point will be discussed later in section 2.2.2). Thus building on the forth coming factors, the study will formulate additional research hypothesis.

There are many factors which have had a direct or indirect bearing on Libyan accounting practices in the past. The past two decades are considered as the most important period of time to achieve the current research objectives. For more than a decade, Libya faced great problems of UN sanctions which were imposed on Libya in 1992 and were lifted in September 2003. This action was followed by lifting of US unilateral sanctions in the spring of 2004 and all sanctions were removed by June 2006. Since then, Libya started to liberalize the socialist-oriented economy. The primary steps including applying for WTO membership, reducing some subsidies, and announcing plans for privatization laying the groundwork for a transition to a more market-based economy (http://www.indexmundi.com/libya/economy_profile.html). The following sections aim to highlight some of the factors to support the understanding of the research theme.

### 3.5.1 Economic and Political Factors before 1969:

Before the oil discovery (1959) Libya had many economic political and social difficulties (Fraley, 1971). During that time, Libya was described as the poorest country in the world (Higgins, 1968). However, Buzied (1998) states that accounting in Libya during the period from the Ottomans' occupation in 1551 until the year 1911 was described as at book-keeping levels. According to Kilani (1988) the only law that influenced Libyan economic affairs was the teaching of the Islamic rules (e. g. Zakat). However, the initial starting point in developing accounting in Libya started in 1923, when the Italian

government transferred the Italian tax law to become the regular accounting provision in Libya.

Moreover, the first evaluation of accounting started in 1932 at some meaningful level by the Italian government, when income tax was required to be calculated. In fact, accounting was practiced only by Italian accountants. Until 1945, there is no evidence to indicate that cost or MA was applied in the Libyan context and all accountants applied financial accounting systems which were regulated by the Italian accounting profession and law which stayed in effect until 1968.

Libyan accountants had not been able to provide an adequate level of accounting. Libyan accountants have had to rely on foreign support. So, foreign accountants, accounting firms and teachers were needed to fill the gap. Companies and individual traders continued to prepare financial statements. According to Agnaia (1997) the Libyan economy was an agriculture-based economy with no industry until relatively recently. In the early 1970's, the government began establishing industrial public enterprises according to the economic development requirements.

### 3.5.2 Economic and Political Factors from 1969 to 2003:

The period from 1969 to 2003 is characterized with many improvements in the area of accounting education, economic policies and industries. However, it was restricted by the UN sanctions. Following the year 1969, Libya achieved the most notable growth of

income per capita. In the period of time between 1969-1975, the income per capita was raised from 107 Libyan Dinar (LYD) in 1969 to 642 LYD in 1970, and continued to increase to 1369 LYD in 1975 (Libyan Secretariat of Planning, 1980).

According to Agnaia, (1996) during the period of the 1970s and 1980s, the oil revenues played a major role in the export sector. The percentage of oil exports to the total exports ranged from 90 per cent to 99.9 per cent. It indicated that the Libyan economy still depends on the oil revenue as the main income. Also, it is worth noting that Libya still faces difficulty in being able to produce enough capital goods and consumer goods to achieve what is called "self-sufficiency" and "self-reliance". As the economy was growing, accounting education started to improve through establishing universities and students being sent abroad to study accounting. As a result, Libyan education has achieved some progress. During the 1970s, although the country allocated a great amount of money in order to establish many different industries, this sector suffered from many problems concerned with training and development activity (Agnaia, 1996).

All Libyan companies were owned by the government and therefore they were very sensitive to any change in the government's policies regarding economic, political and social matters. The Libyan government was motivated and desired to demonstrate its ability, as a result of oil revenue, to achieve fast development (Agnaia, 1997). In the late 1980's, the deregulation of the Libyan economy started in order to transform the centrally planned system to a market based mechanism (Alkiza and Akbar, 2005). This is followed

by the issuing of Act No. 5. in 1997 concerning investment regulations. Despite, the fact that during this period the Libyan economy had started deregulation, it was interrupted by the United Nations' sanctions in 1999. The Libyan accounting profession and education system were hindered.

The Libyan authorities attempted to develop with the industrial sector, but, the sector faced many problems. Therefore, in 2006, a team was set-up by the General People's Committee for Industry, Electricity and Minerals (GPCIEM) (equal to Ministry of Industry, Electricity and Minerals) and its dependent organization the General Authority for Ownership of Public Companies and Economic Units (GAOPCEU). However, the most important weaknesses of the period from1973 to 2000 which reported by GPCIEM (2006) are summarised as follows:

1. Monopoly market was demonstrated by the public sector companies for a period of up to three decades, that resulted in inadequate attention to programs of development of human resources, marketing, developed management or preparing administrative leaders.

2. Lack of interest in product development programs to maintain their competitiveness in the market and no attention has been given to the technological development, on the other hand dealing with fixed assets (no active maintenance), that have resulted in faster assets consumption.

3. Prices were set by the government, which takes several months to be issued.

4. The unexpected liberalization of currency exchange rates, which impacted on the manufacturing cost.

5. The government has discontinued spending on the industrial sector since 1987, which led to the deterioration of machinery and the production capacities were decreased in most plants.

6. Some companies paid a high cost for local raw materials and services (such as energy costs, royalties on quarries, ethylene, polyethylene and internal transport costs) which led to high product costs.

7. Multiplicity of the controller bodies without material usefulness, in addition, their intervening (directly or indirectly) have constrained the companies' management, and involved high administrative burdens and waste of time and effort.

8. Protection on particular products combined with the lack of quality control of the overseas goods in the same time authorities have not taken into account the available local capacities in the industry to meet the needs of the market for those goods.

9. The inability of the control bodies to complete the auditing of balance sheets and financial reports on time, which led to a negative impact on the administrative and

financial transactions of companies, and led to the inability to know the real state of affairs, so necessary decisions could not be taken.

In fact, the purpose of the report was to assess the weak position of industrial companies in order to sell all underperforming companies and starting the private sector.

### 3.5.3 Economic and Political Factors from 2003 to 2009:

The period from 2003 until recent times (2009) is also characterized with many improvements reflected by accounting education, and economic policies, however, it is below the target level. Nowadays the oil revenues are the main source of the Libyan economy, which contribute about 95 per cent of export earnings, 25 per cent of GDP, and 60 per cent of public sector wages. Libya with a small population, gives it one of the highest per capita GDPs in Africa. The non-oil manufacturing sectors account for more than 20 per cent of GDP. This sector has extended from processing mostly agricultural products to include the production of petrochemicals, iron, steel, and aluminum (http://www.theodora. com/wfbcurrent/libya/libya_economy.html).

By the end of UN sanctions in September 2003, the Libyan political and economic strategies have started to change. This is followed by Act Number 7 in 2003, which was issued as an amendment to Act No. 5 of 1997. This action is followed by the decision to lift US unilateral sanctions in the spring of 2004 and all sanctions were removed by June 2006. Since then, Libya has started liberalizing the socialist-oriented economy. In this

vein, local and foreign investors have been encouraged to take a more prominent role in order to help privatize some of the state run-industries, the attention in privatization aims to help Libya's economic growth and reduce its heavy dependence on oil revenues (Salama and Flanagan, 2005).

It was reported by the GPCIEM (2006) that the important problems and difficulties faced the industrial sector during the period from 2001 to 2005 as follows:

1. Lack of administrative stability in most of the companies and the workforce number is inflated.

2. Lack of accurate and integrated systems for cost accounting.

3. Low level of quality for some goods, which require the development of programs to raise the level of product quality.

4. Decrease in the rates of production and low production efficiency which is caused by the old machinery (the operation process rates did not exceed the proportion of 45 per cent during the last five years).

5. Lack of spending on asset replacement, maintenance and development which is caused by poor financial position of companies.

6. Inadequate attention to the sufficiency of development of human resources in order to raise the efficiency that reflects negatively on the management and production process.

7. Non-use of technical development communication technology to link the operational and planning process which impact negatively on the strength and soundness of the decision-making.

8. Delay in preparing and auditing the financial reports.

9. Lack of specialized institutions and bodies which provide financial support and technical advice for both public and private sectors.

It could be noted that Libyan industrial companies still face many serious problems which need to be addressed in order to perform effectively and efficiently.

In 2005 an interview was conducted with Governmental officials in Tripoli and it was highlighted that a five-year economic policy plan was drawn-up. The general objectives are to free the economy from state control, motivate the development of private enterprise, and build up the country's infrastructure. A total of 360 state companies (steel mills, cement plants, and engineering firms to food factories, truck and bus assembly lines, and state farms) were targeted to be transferred to the private sector in three phases, due for completion by 2008 (http://www.summitreports.com/pdfs/libya2.pdf), However, it was reported that only hundred and ten small (medium and large companies) were

privatized or under privatization process during the period from 08/11/2004 to 11/01/2009 (GAOPCEU, 2009).

According to Nassar et al. (2011), there are important reasons for non-implementation of contemporary CA systems (ABC) in the Jordanian industrial sector, a lack of local consultants; the high cost of ABC implementation; the high cost of consultants; a lack of journals, conferences, and seminars about ABC in Jordan; and a lack of accounting bodies. In addition, Hassabelnaby et Al. (2003) point-out that there is a strong relationship between the environmental factors and accounting development in Egypt and that this relation varies with time. The level of the economy and the political environment are positively correlated to the accounting development in Egypt. Moreover, the effect of the environmental factors on accounting development differs over time reflecting the different stages of democracy and economic reform.

Because there is no evidence to indicate that the LMLMCs have developed their costing systems, and based on the above discussion, the following hypothesis will be tested:

Hypothesis 11 (H11): Libyan environmental factors have restricted the cost allocation system design development.

**3.6 Summary:**

This chapter examined the contingency factors that influence CA system design. Although, over the last three decades the contingency theory approach has been adopted

to investigate factors influencing cost and MA practices, but, the focus was on MA control systems. A few studies have examined CA system design in terms of product costs. Contingency theory advocates that there is no best design framework for a MA information system. It all depends upon the situational contingency factors. Therefore, this chapter has investigated the literature review concerning the concept of contingency theory and contingent factors that influence the design of cost and MA practices and formulated a research framework and hypotheses as follows:

Firstly, the research framework:

1. Cost structure of the company
2. Type of ownership
3. Size of the company
4. Competition
5. Customized products
6. Product diversity

Secondly, the research hypotheses:

H1. The higher the level of the proportion of indirect costs within a firm cost structure, the lower the level of accuracy of product costs.

H2. The higher the level of intensity of competition, the lower the level of accuracy of product costs calculated.

H3. The higher the level of intensity of competition, the lower the use of cost-plus pricing method.

H4. The higher the level of product diversity within a firm, the lower the level of accuracy of product costs.

H5. The higher the level of product diversity within a firm, the higher the level of resources consumed differently.

H6. The higher the level of customization within a firm, the lower the level of accuracy of product costs.

H7. The ownership of the firm has significant influence on the use of cost-plus pricing method.

H8. The ownership of the firm has significant influence on the level of accuracy of product costs.

H9. The larger the size of the firm, the higher the level of accuracy of product costs.

H10. The larger the size of the firm, the higher the level of accuracy of product costs.

In addition, this chapter investigated many factors which have had a direct or indirect bearing on Libyan accounting practices in the past. Before the oil discovery (1959) Libya faced many economic, political and social difficulties. During that time, Libya was described as the poorest country in the world. The Libyan economy was an agriculture-based economy with no industry until the maid 1970s. The accounting profession during the period from the Ottoman in 1551 until the year 1911was described as book-keeping levels. The most dominant factor which may have influenced accounting development was the Italian tax law which stayed in effect until 1968.

The Libyan accounting profession and education system was affected and developed through foreign support, but, the Libyan accounting profession was still limited to preparing external financial accounting reports and external auditing regulated by Libyan law until the late 1990s. In the 1970s, the Libyan government was started new strategies in order to develop the Libyan economy, reduce the dependence on the oil sector and achieve a greater degree of self-sufficiency. One of the most important strategies was establishing industrial public enterprises. Despite the importance of the extent of industrial strategy, the sector faced many problems and the success in achieving their objects is very little.

The deregulation of the Libyan economy was launched aiming to transform the centrally planned economy to a market based system. The Libyan government after lifting the United Nations sanctions in 2003 placed emphasis on encouraging foreign investors to

take a more prominent role in order to help privatize some of the state run-industries. The privatization policy aims to help Libya's economic growth and reduce its heavy dependence on oil revenues. Because there is no evidence to indicate that the Libyan manufacturing companies have developed their costing system, and based on the above discussion, the following hypothesis was formulated: H11 There are external and internal environmental factors that have restricted the LMLMCs cost allocation development.

# Chapter 4

# Research Methodology

## 4.1 Introduction

Chapters two and three have provided a literature review on the CA system in terms of product costs. The orientation towards this particular area was motivated by the need to explore and point-out more about the CA systems and address the CA problems facing LMMC's. In general, research is carried out for two purposes, to solve a currently existing problem, and to contribute to the general body of knowledge in a particular area of research. The former kind of research is called applied research, while the latter kind of research is called basic research (Sekaran, 2003). Based on the above classification, this study falls within basic research, because it aims to understand more about the factors that influence the design of product costing systems in the LMLMCs in terms of accurate product costs, the factors restricting CA systems development in the LMLMCs and gain more insights in describing the LMLMCs.

The purpose of this chapter is to discuss the research philosophy and methodology adopted by this study. It starts with a brief outline of the research paradigm (philosophy). This is followed by discussing the research design, the research population and sampling procedures, the data collection methods, questionnaire design and pre-testing. Finally, the chapter ends with a discussion of the statistical methods used in this research.

## 4.2 Research Paradigms:

Collis and Hussey (2003: 46) state that a paradigm:

> ***"refers to the progress of scientific practice based on people's philosophies and assumptions about the world and the nature of knowledge; in this*** *context,* ***about how research should be conducted"***

Moreover, Remeny et al (1998) stress that a paradigm is no more than conventional wisdom of the subject. It is impossible to carry out empirical research in a good way without adopting a specific theoretical perspective. Consequently, research should be basically rooted in theory. However, Easterby-Smith et al. (2002) suggest that there are three important reasons concerning why researchers should understand the research paradigm philosophy as follows:

1. Determine the general clarification of the research design;
2. Decide which is the suitable design and its limitations;
3. Identify how to adapt research designs to different environments.

Collis and Hussey, (2003) determine two fields of paradigms that the research design could be undertaken. These paradigms are positivism and phenomenological.

### 4.2.1 Positivism:

Easterby-Smith et al (2009: 57) state that the positivistic approach is that:

> ***"the social world exists externally and that its properties should be measured through objective methods, rather than subjectively through sensation, reflection or intuition"***

In the same vein, Collis and Hussey (2003) stress that the positivistic paradigm is based on the approach used in the natural sciences, however, it seeks the facts of social phenomena, with slight regard to the subjective position of the individual.

### 4.2.2 Phenomenological:

Owing to the existing limitation of the positivism assumption paradigm, the phenomenological has emerged. The main reason was the inability of the positivistic paradigm to deal with people in terms of social environment. On the other hand, the phenomenological paradigm is concerned with people rather than with objectivity and external environment. Therefore, the focus will be concentrated on trying to understand what people think, feel and communicate with each other (Easterby-Smith et al., 2002). Moreover, Arksey and Knight (1999) indicate that positivism (quantitative approach) does little to help us to understand why people do something, while, phenomenological (qualitative approach) can answer what people think, what happens and why.

## 4.3 Qualitative and Quantitative Approaches:

Quantitative and qualitative approaches are defined by Collis and Hussey (2003: 13) as:

> ***"quantitative approach which is objective in nature and concentrates on measuring phenomena. Therefore, a quantitative approach involves collecting and analyzing numerical data and applying statistical tests... qualitative approach, which is more subjective in nature and involves examining and reflecting on perception in order to gain an understanding of social and human activities"***

According to Creswell (2003) researchers could adopt any appropriate one of three research methodology approaches. These approaches are quantitative, qualitative, and mixed methods. However, Rudestam and Newton (2001) claim that quantitative research is normally built on an 'objectivist' convention that comprehension is only of meaning if it is based on observations of external reality. On the other hand, Ragin (1994) describes the quantitative approach as the more scientific approach than the qualitative approach.

Nevertheless, it is often argued that no approach is better than another, both quantitative and qualitative approaches are essential and both have their strengths and weakness (Punch, 2000). It all depends on the research problem and purpose, the research methods will be mainly appropriate or not (Ghauri and Gronhaug, 2002). Easterby-Smith et al. (2002) state that in general there is no agreement about determining the most appropriate paradigm for all research. Therefore, understanding the advantages and disadvantages of both paradigms could be useful in supporting the researcher's selection. According to Hussey and Hussey (1997), they prefer not to use the classifications into quantitative and qualitative, instead, the positivistic and phenomenological terms should be used, because, it is possible for the positivistic paradigm to generate qualitative data and vice versa.

### 4.3.1 Advantages of Quantitative Approach:

Johnson (1994) states that quantitative approach is concerned with aggregating data in which most of it are assigned numerical values; however, it is based on fixed accepted

classifications, which enable researchers to build on generalized statements. According to Robson (2002) quantitative research challenges or eliminates the personal researcher's influence on the investigated phenomena as far as possible. Patton (2002) highlights that the quantitative approach enables the researcher to gather mass data about a large number of respondents during a limited set of questions, thus simplifying data comparison and data collection. Moreover, more additional advantages have been suggested by Johnson and Onwuegbuzie (2004) as follows; hypothesis research could be built and tested; research findings could be generalized; allowed to obtain quantitative predictions; by means of some quantitative tools, it could be quicker and faster for collecting research data; it is considered as less time consuming in analyzing data.

### 4.3.2 Disadvantages of Quantitative Approach:

Robson (2002: 23) states that quantitative research limits experience in two directions:

> ***"first by directing research to what is perceived by the senses; and second by employing only standardized tools, based on quantifiable data, to test hypotheses"***

Moreover, Johnson and Onwuegbuzie (2004) point out that researchers by focusing on the research hypotheses test rather than the research hypotheses generalization, the phenomena might be missed out.

### 4.3.3 Advantages of Qualitative Approach:

Arksey and Knight (1999) highlight that while quantitative approaches do little to help us to understand why people do something, which qualitative approaches could do so to discover what people think, what happens and why. Ghauri and Gronhaug (2002) state that the qualitative approaches are commonly accepted for such exploratory and inductive research. Also appropriate for studying a limited number of cases that require in-depth understanding of the research phenomenon. According to Johnson and Onwuegbuzie, (2004) it could be very helpful when the researcher intends to describe complex limited phenomena.

### 4.3.4 Disadvantages of Qualitative Approach:

According to Moore (2000) qualitative research is limited to develop a full understanding of the individual's observation, attitudes and behavior. Because, qualitative researches depend primarily on engaging in personal contact, it is criticized and described as too subjective (Patton, 2002). Also, their outcomes cannot be tested, and they have to be taken on trust (Arksey and Knight, 1999). However, Finch (1986) suggests that these weaknesses of quantitative and qualitative approaches could be overcome by use of mixed methods.

## 4.4 Assumptions of the Paradigms:

Collis and Hussey (2003) state that a paradigm refers to the development of scientific practice based on people's philosophies and assumptions about the world. According to Creswell, (1994) each paradigm has its assumptions (see Table 4-1).

**Table 4.1 Assumptions of the Two Paradigms:**

| Assumption | Question | Quantitative | Qualitative |
|---|---|---|---|
| Ontological | What is the nature or reality? | Reality is objective and singular, apart from the researcher | Reality is subjective and multiple as seen by participants in a study |
| Epistemological | What is the relationship of the researcher to that researched? | Researcher is independent from that being researched | Researcher interacts with that being researched |
| Axiological | What is the role of values? | Value-free and unbiased | Value-laden and biased |
| Rhetorical | What is the language of research? | Formal based on set definitions<br>Impersonal voice Use of accepted quantitative words | Informal evolving decisions<br>Personal voice<br>Use of accepted qualitative words |
| Methodological | What is the process of research? | Deductive process<br>Cause and effect<br>Statistic design- categories isolated before study<br>Context-free<br>Generalizations leading to prediction, explanation, and understanding<br>Accurate and reliable through validity and reliability | Inductive process<br>Mutual simultaneous shaping of factors<br>Emerging design- categories identifies during research process<br>Context-bound<br>Patterns, theories developed for understanding<br>Accurate and reliable through verification |

*Source: Creswell (1994): 5.*

### 4.5 Implications of Paradigms:

Hussey and Hussey (1997) point out that determining the research paradigm has important implications for research methodology and researchers have to determine their research paradigm before starting the research design. According to Easterby-Smith et al. (2009) there are two main research implications of paradigms, positivistic and social constructionism (phenomenological) which are presented in Table 4.2.

**Table 4.2 Important Implications of Positivistic and Social Constructionim:**

| | Positivism | Social constructionism |
|---|---|---|
| The observer | Must be independent | Is part of being observed |
| Human interests | Should be irrelevant | Are the main drivers of science |
| Explanations | Must demonstrate causality | Aim to increase general understanding of the situation |
| Research progress through | Hypotheses and deductions | Gathering rich data from which ideas are induced |
| Concepts | Need to be defined so that they can be measured | Should incorporate stakeholders perspectives |
| Units of analysis | Should be required to simplest terms | May include the complexity of 'whole" situations |
| Generalizations through | Statistical probability | Theoretical abstraction |
| Sampling requires | Large number selected randomly | Small numbers of cases chosen for specific reasons |

*Source: Easterby-Smith et al. (2009: 59).*

### 4.6 Inductive and Deductive Research:

Rudestam and Newton (2001) point out that qualitative research is more likely to be related the stream of inductive research rather than deductive research. Moreover, Moore (2000) states that qualitative research is all about developing a full understanding of the

individual's observations, attitudes and behaviour. On the other hand, Rudestam and Newton (2001) stress that qualitative research involves the form of words. Thus qualitative data are usually summarized to ideas or groups and evaluated subjectively.

### 4.7 Research Methods:

Hussey and Hussey (1997) point out that some writers do not distinguish between research methodology and research methods and use them interchangeably. According to Collis and Hussey (2009) research methodology is the general approach to the research process from the theoretical keystone to data collection and analysis, while, methods not only refer to techniques and procedures used to obtain and analyze data but also includes questionnaires, observations and interviews as well as both quantitative and qualitative analysis skills.

#### 4.7.1 Questionnaire:

The questionnaire survey is one of the most common techniques. This method could be applied for both descriptive and explanatory research. By using descriptive research, it could allow the researcher to describe the variability in different phenomena. On the other hand, in explanatory research, it could allow the researcher to examine and explain relationships between variables (Saunders et al., 2009; and Innes and Mitchell, 1997).

There are many advantages of using a questionnaire; some important features are as follows:

1. The risk of bias or mistakes in interviews could be minimized by the questionnaire survey (Owen and Jones, 1994).
2. It is considered low cost in conducting questionnaire surveys in order to study a large population (Owen and Jones, 1994).
3. Provides more ambiguity to the respondent (Kumar, 1999)

However, there are many disadvantages of using a questionnaire; some important features are as follows:

1. One of the main weaknesses of a postal questionnaire is the low response rate (Owen and Jones, 1994; and Kumar, 1999).
2. The difficulty in clarifying any issue which may be confusing to the respondent (Innes and Mitchell, 1997).
3. Responses cannot be supplemented with other information (Kumar, 1999).

### 4.7.2 Semi-Structured Interview:

According to Saunders et al. (2009) and Anderson and Lanen (1999) semi-structured interviews could be conducted for the following purposes:

1. Enable and facilitate the researcher to observe the respondent's answering.
2. Obtain more information and suggestions.

3. Confirm the questionnaire's validity and reliability. By conducting a statistical test to check whether there were significant differences between answers obtained from interviews and the postal survey

Kumar (1999) points out that there are many advantages and disadvantages of using the semi-structured interview, some important features are as follows:

1. Minimise the non-response rate of the study.
2. Enable the researcher to observe the respondent answering.
3. Information can be supplemented with other data such as that obtained by observation during the interview.
4. The researcher can explain questions, answer any enquiries and clarify terms.

The semi-structured interviews have some disadvantages which are summarized as follows:

1. It is time-consuming and expensive.
2. It may introduce researcher's bias.
3. It needs more experience and skills from the researcher.
4. It needs specific time from the participant which may not be offered in one go.

### 4.8 Mixed Methods:

When both quantitative and quantitative methods are applied in collecting data, it is called a triangulation method (Easterby-Smith et al, 2009). It is defined by Denzin, (1978: 291) as:

> ***"the combination of methodology in the study of the same phenomenon."***

Mixed methodology has been considered as a better method (Arksey and Knight, 1999). According to Dugdale and Jones, (1997) it could develop a deeper understanding of change in accounting systems, but, no single method in itself should be regarded as perfect. Furthermore, Collis and Hussey (2003: 77) suggest that:

> ***"a questionnaire survey providing quantitative data could be accompanied by a few in-depth interviews to provide qualitative insights and illuminations"***

Moreover, Johnson and Onwuegbuzie (2004) point out that using a mixed methodology is a logical and intuitive application and an increasing number of researchers are using it to carry out their studies. It is highlighted that there are four basic types of triangulation as identified by Denzin (1978) as follows:

1. Methods triangulation: use of multiple methods to study a single problem.
2. Data triangulation: use of a variety of data sources in a single study.
3. Investigator triangulation: use of several different researchers.
4. Theory triangulation: use of multiple theories to interpret a single set of data.

According to Saunders et al. (2009), it is common in research agenda that researchers can organize for triangulating of quantitative and qualitative methods, one of them will serve as primary tool and the other will be secondary.

### 4.9 Research Design:

Research design is defined by Ghauri and Gronhaug (2002: 47) as:

> ***"the overall plan for relating the conceptual research problem to relevant and practicable empirical study"***

Research design is considered as the science and art of planning procedures for carrying out research studying in order to obtain best results (Hussey and Hussey, 1997; and Collis and Hussey, 2009). Moreover, research design serves as a plan or an outline that aids the researcher to solve problems or difficulties (Yin, 2003). It also provides a plan that shows to answer the research questions (Saunders et al. 2009). Although, research design is discussed by many authors from different aspects, however, they explain it in the same stream.

Research design is considered as one of the most important beginning stage in the research agenda. It should design a general plan of theoretical research problem to be relevant to the empirical study. Therefore, the appropriate selection of the research design has significant effects on the entire research process (Hussey and Hussey, 1997; Ghauri and Gronhaug, 2002; Easterby et al. 2002; Collis and Hussey, 2003; and Creswell, 2003).

Kinnear and Taylor (1996) state that research designs are typically classified according to the nature of the research objectives and types of research. Thus, researchers have to determine and understand the research paradigms before drawing the research design (Collis and Hussey, 2003).

Based on the above discussion, it was decided to apply a mixed approach of positivist and phenomenological paradigms in order to achieve an in-depth understanding and support the research objectives. The rationale behind this selection of mixed research methods are as follows:

Firstly, Collis and Hussey (2003) indicate that the positivist paradigm is the dominant theory in business research studies. For this research design, it was decided to apply mixed approach, positivist theory as the main paradigm and phenomenological theory as the subsidiary paradigm. In actuality, it is common in the field of MA research agenda especially in developing countries to use mixed paradigms, see for example Alebaishi, 1998; Hutaibat, 2005; Abulghasim, 2006; and Rahmouni and Charaf, 2010.

Secondly, according to Brinberg et al. (1990), each method has strengths and weaknesses; however, they suggest that MA researchers should employ multiple methods to investigate MA phenomena. Moreover, triangulation of methods is considered as useful tools to overcome the potential bias of a single method approach (Collis and Hussey, 2003).

Finally, Brierley (2008) state that the previous research has emphasized which types of cost systems are used, but have not considered why these cost systems are used. The latter research question is best addressed using qualitative research methods (field or interview), rather than quantitative methods (questionnaire).

### 4.10 Type of Research Design:

Research could be classified based on its purpose as exploratory, descriptive, explanatory or analytical research (Collis and Hussey, 2003). Since analytical research does not concern the current study objectives, therefore, the focus will be only on the other types of research (exploratory and descriptive).

#### 4.10.1 Exploratory Research:

Exploratory research is concerned with the situations when not much information is available about its circumstances, or when there is not enough information on how previous similar research problems have been covered in the past (Sekaran, 2003). Zikmund (2000) states that there are three purposes for exploratory research as follows, diagnosing a situation, screening alternatives, and discovering new ideas. Moreover, Collis and Hussey (2003) point out that such as case studies, observation and historical analyses which draw on both quantitative and qualitative data, are common in use in exploratory studies.

Quee (1999) suggests that exploratory research could be used when the research objective concerns one or more of the following issues, generating new creation ideas, realizing additional insight to the problem, developing hypotheses, increasing researcher's familiarity with the problem area, identifying and formulating a problem, establishing the main concern for further research, identifying population of interest and pre-testing outline questionnaire.

### 4.10.2 Descriptive and Statistical Research Tools:

Descriptive techniques are the transformation of raw data into a form that would provide information to describe a set of factors in a situation (Sekaran, 2003). In using descriptive research, the research problem should be well structured and well understood (Ghauri and Gronhaug, 2002). Also researchers tend to answer the question what is going on (David de Vaus, 2001). Sekaran (2003) claims that the purpose of using descriptive research is to describe the research phenomena in order to draw a picture or report that the researcher wishes to study from an individual, organizational, industry-oriented or other perceptions. Collis and Hussey (2003) argue that to discover and know information about the characteristics of the problem, descriptive research could be used, because frequently, the collected data is quantitative and statistical means are usually used in summarizing the information. De-Vaus (1993) points out that the use of descriptive research is useful in comparing results between two or more phenomena and groups. Based on the above discussion, this study is considered a descriptive study.

On the other hand, statistical tools are used in this study. Statistical research is designed for breadth rather than depth. It attempts to capture a population's characteristics by making inferences from a sample characteristic. Hypotheses are tested quantitatively. However, it is widely recognised that the correlation test provides a standard to measure the power point or the weakness of a relationship between a pair of variables. It is widely used in social research where variables are measured on scales since it provides a stronger approach to investigating the relationships between variables. The second method is to use parametric and non-parametric tests to measure if the differences in scores between two or more groups are statistically significant. Parametric tests are recommended when the scores are measured on an interval scale and nonparametric tests when the scores are measured on an ordinal scale or where the variables are categorical (Bryman and Cramer, 2001).

In statistics, correlation can be used as statistical relationships between two or more of observed data values. The well-known examples of dependent phenomena include the correlation between the physical figures of parents and their issue, and the correlation between the demand for a product and its price. Correlation is useful because they can indicate a predictive relationship that can be used in practice (http://en.wikipedia.org).

The Mann-Whitney test is recognized as the most appropriate non-parametric test for ordinal data since it compares the number of times a score from one sample is ranked higher than a score from the other sample (George and Mallery, 2003). In statistics, the

Mann–Whitney test (also called the Mann–Whitney–Wilcoxon or Wilcoxon rank-sum test) is one of the most well-known non-parametric significance tests which can be used for assessing whether two independent samples of observations have equally large values (http://en.wikipedia.org). Based on the above illustrations, the study used all the statistical analyses tests of Correlation, Mann-Whitney and Wilcoxon which are considered as appropriate statistical tools in order to analyze, interpret and achieve good research results.

### 4.11 Features of Research Design:

Sekaran (2003) states that there are several features of research design as follows, the purpose of the study, the type of examination, the extent of researcher intrusion with the study, the study setting, unit of analysis, and time horizon.

#### 4.11.1 Purposes of this Study:

According to Johnson (1994) it is important to identify the research focus itself and its particular purpose prior to deciding on a research methodology. The purpose of this study can be classified as descriptive and other aspects as hypothesis testing. The essential difference between these types of studies lies in their objectives (Cooper and Schindler, 2003). The main aim of descriptive studies is to describe the characteristics of the

variables (Sekaran, 2003), whereas the objective of hypothesis testing is to explain the nature of certain relationships.

Three of the aims of this study (to examine the extent of using full product cost in decision-making especially in pricing decisions; to analyse the impact of the financial accounting mentality on product costs used in decision-making in general and pricing decisions in particular and to examine the ability of the LMLMCs to generate accurate product costs to use for decision-making purposes) could be classified as a descriptive study. On the other hand, two of the research aims (to identify the important factors restricting CA development in the LMLMCs and to investigate the important factors influencing the accuracy of product cost calculation in the LMLMCs) could be classified to be a hypothesis testing study.

### 4.11.2 The Study Setting:

Studies can be classified as laboratory or field studies. Laboratory studies are usually conducted in a simulated environment. On the other hand, field studies are conducted in the actual environmental circumstances. This study is therefore classified as a field study because it is conducted in the actual environment (Libyan context).

### 4.11.3 Unit of Analysis:

The unit of analysis refers to a related data collection environment such as individuals, groups and so on (Hussey and Hussey, 1997). The business in Medium and large Libyan manufacturing companies that produce transferred products are considered as the unit of analysis of this research.

### 4.11.4 Time Horizon:

Descriptive studies which are dynamic in nature investigate the relationship among variables by using either a cross-sectional or longitudinal design (Churchill, 1999). Collis and Hussey (2003) state that the cross-sectional studies are a positivistic methodology and often associated with studying characteristics of a large number of people or organizations. It could be reduced in scope in cases when researchers face limited time or resources. Sekaran (2003) argues that in such theses, the data are collected just one time, may last days, weeks or months. Kumar (1999) states that such a type of study design is comparatively cheap to conduct and easy to analyze. It could be used in survey research, which may be the most important and common type of research design (Edwards and Talbot, 1999), therefore, this study is considered as cross-sectional research.

## 4.12 Questionnaire Pre-Testing:

According to Easterby-Smith et al. (2009), before the research is carried out, instrument and questionnaire items should measure variables with sufficient accuracy and stability,

which mostly will be achieved through pre-testing instruments. Therefore, measures of reliability are important to assess how far each instrument can be depended upon generate the same score for each opportunity that is used. It also measures the external validity to ensure whether the patterns observed from the sample data will also hold true in other contexts. Positivistic tools (e.g. questionnaire survey) are mainly related to confirm that results accurately reflect the reality. Therefore, it should be distinguished between internal and external validity as illustrated by Easterby-Smith et al. (2009: 87):

> ***"the former relating to systematic factors of bias and the latter being concerned with how generalizable a conclusion is across all types of person, settings and times"***

According to Remeny et al. (1998), the questionnaire pre-test could be achieved by two ways, by discussing opinions with experts such as friends, colleagues, or by carrying out a pilot study in order to gather the phenomenal comments. In the same vein, the questionnaire is pre-tested by asking an expert or group of experts to comment on the questionnaire to establish validity and enhance the reliability of the data (Saunders et al., 2009). Therefore, in this study six stages were considered to pre-testing the questionnaire as follows:

- Firstly, the questionnaire questions were built and designed through the literature review and many questions adopted from prior studies such as Drury, et al. (1993); Drury and Tayles, (1994); (2000); Alebaishi, (1998), Hutaibat, (2005); and Abulghasim, (2006).

- Secondly, the questionnaire draft was discussed in a focus group with 4 PhD students at Liverpool John Moores University and members of teaching staff in Libyan universities as well. All the students have good experience of Libyan environment and are specialists in accounting. The focus group suggested useful amendments which covered all the aspects of the questionnaire.
- Thirdly, the draft was returned to the supervisory team, hence assessed and confirmed to be piloted in March 2008.
- Fourthly, the questionnaire draft including the covering paper was translated into Arabic by legal experts in accounting.
- Fifthly, the questionnaire draft in both languages was handed to my colleagues (three members of teaching staff who have long experience in accounting and have a good background in English as well) at Gharian Accounting College in Libya in order to get their recommendations. Some suggestions were received and considered as helpful.
- Finally, 45 copies of the draft questionnaire were piloted in fifteen Libyan manufacturing companies in April 2008. The questionnaire was handed out by the researcher himself, who explained the aims, purposes and usefulness of the research study in order to make the task easier and increase the response rate. Thirty completed questionnaires were returned with a response rate of 67 per cent. The remaining questionnaires (15) were not returned and different apologies were received. The questionnaire was designed to give an opportunity to the

participants to give their recommendations about all aspects of the questionnaire. Useful feedback was received from the respondents, who commented that the questionnaire was understandable and easy to complete. Nevertheless some of them gave some useful comments which have been considered by the study in order to produce the final draft of the questionnaire (see Appendix B). Thus, the questionnaire draft including the covering paper was translated into Arabic (see Appendix D and E) by legal experts in accounting.

### 4.13 Reliability and Validity:

According to Sekaran (1992: 173) reliability indicates the stability and consistency with which the instrument is measuring the concept and helps to evaluate the quality of a measure. Stability is concerned with whether or not a measure is stable over time (Bryman and Bell, 2007). Stability test can be evaluated by applying test-retest reliability and parallel-form reliability. In the test-retest method the measurement is repeated with the same instrument at a later time. (Van der et al., 2004). Since this study is a cross-sectional study with data collected in a limited time, the test-retest reliability could not be applied. Instead, the correlation test was used in this study between two questions about the measurement of the same meaning.

The Spearman Correlation test is applied between questions B.1.1 concerning product diversity and B.1.2 concerning overhead consumption. Spearman Correlation gave a

result value equal to positive number (.985) with significant number (.000) less than 0.05 (P value). Since in the real world the two variables (product diversity and overhead consumption) too much related variables, the Correlation test confirmed the action and gives us the evidence of the stability of the respondents' answers and therefore the reliability of data collection (see section 4.12).

With regards to the result's consistency, since the most acceptable test of internal consistency among the items is Cronbach's Alpha coefficient (Sekaran, 2003; and Saunders et al., 2009). The acceptable level of the Cronbach's Alpha test to measure the reliability is determined differently. While George and Mallery (2003) determined .7 as an acceptable value, (Pallant, 2007) goes to state that a value more than 0.6 is regarded as a satisfactory level. In this study, to enhance the reliability, Cronbach's Alpha test was used for all items in scales and get average value equal to .791 (see Appendix G).

**4.14 Validity:**

There are two types of validity, external and internal. According to (Cooper and Schindler, 2003) external validity refers to the extent of generalizability of the research results across persons, setting, and time. In a large population, the sample selected randomly and the precision is measured by the standard error of estimate. In this study, the population is too small, therefore, all medium and large manufacturing companies in Libya which produce transferred products were targeted and covered as a sample for this

research. The high survey response rate achieved is a good indication that the sample is representative of the population, thus establishing external validity. Moreover, most of the variables in the research model have a standard error of estimate of less than one. It can therefore be concluded from the above that it is possible to generalise the findings of this study to the entire population.

On the other hand, internal validity is defined by Cooper and Schindler (2003) as the ability of a research mechanism to measure what it is designed to measure. To meet the external validity requirements in this study, an extensive appropriate literature review was undertaken to define the topic and much effort was spent to carefully design a simplified clear questionnaire to be understood by the respondents. Many questions used in the study questionnaire were adopted from relevant previous studies. In addition, the overall questionnaire items were pre-tested with the assistance of several doctoral students and a group of academic experts. As a result of this it was concluded that the validity of this research was established.

### 4.15 Content and Sources of the Final Version of the Questionnaire:

The final version of the questionnaire consisted of 12 pages, including the front covering letter page (see Appendix A), and the last page left blank for the respondents to make any additional comments. The questionnaire was split into six sections in order to be easier to answer as follows:

Section A contains 9 questions. The objective of this section is to obtain general information and background about respondents and their companies. Section B included 5 questions. The purpose of this section is to understand the nature of the Libyan business environment. Section C included 7 questions; this section aims to assess the financial accounting effect on managerial decision-makers minds. Section D included 7 questions; the objective of this section is to understand the CA system design in calculating product costs to aid decision makers. Section E included 3 questions, the objective of this section is to understand the costing systems that are applied in the LMLMCs for pricing decisions and the accuracy of calculating product costs for decision making purposes in general. Section F included 5 questions, this section aims to determine whether the LMLMCs use traditional or contemporary CA systems for decision-making purposes, any developments, and the satisfaction of decision makers, and identify the constraints that affect the development of CA systems in the LMLMCs. Throughout the questionnaire, the researcher has done the best he could in order to make it easier and well understood by all the respondents.

### 4.16 Population Sample:

The population of this study is defined as all medium and large Libyan manufacturing companies which produce transfer products. Surveys were targeted on 98 industrial companies. 93 manufacturing companies (see Appendix F) were determined by the Documentation and Information Center of Industries and Economics in Misurata which is

accountable to the GPCIEM (equal to a Ministry) and five oil refineries (Arab Oil and Gas Directory, 2009). As it may be assumed that the smallest companies lack systematic cost accounting, therefore, the survey dealt with large and medium-sized companies only (Malmi, 1999).

The main reasons for selecting medium and large manufacturing companies are as follows; firstly, these companies which produce transferred products are expected to be relevant to the research objectives due to these companies being a homogeneous group which applied the same cost and MA rules. This is different from accounting in other activities such as extractive industries, agriculture, and service sector. Secondly, this study is a cross-sectional study, so it has limited time. Finally, it is common in an accounting research study to include medium and large organizations (see for example Malmi, 1999, 2008; Joshi, 2001; and Cinquini et al, 1999)

The size of capital of each manufacturing company is used to classify them into medium and large size. Although the issue of law No. 109 in 2006 defined medium and large size organizations by the number of employees and amount of capital, however, this study has chosen the latter one as a standard in order to distinguish between large and medium-size companies. The rationale behind this is the availability of industrial organization's capital information rather than number of employees. Libyan authorities and organizations (e. g. Algd Business Center, Documentation and Information Center of Industries and Economics, and General Authority for Investment and ownership) have not maintained a

complete list of the industrial companies organized or classified by the number of employees. On the other hand, companies are classified by their capital amount.

### 4.17 Research Sample and Respondents:

In order to select the sample for research the entire population may be used depending on the size of the study and the size of population (Collis and Hussey, 2003). For small populations (e.g., 200 or less) a census is attractive to use. The advantages of a census are eliminating the sampling error and providing data on all the individuals in the population. In addition, some costs such as questionnaire design and developing the sampling frame are fixed that is, they will be the same for samples of 50 or 200. Finally, actually it is desirable to achieve a high level of precision (http://edis.ifas.ufl.edu/pd006). In this study the whole population is targeted as a sample as the number of medium and large manufacturing companies in Libya which produce transferred products are relatively small (98) therefore it is used as a targeted sample.

### 4.18 Administration of the Questionnaires and the Interviews:

The final draft of the questionnaire was produced and a list of telephone and\or fax numbers of all the target companies were identified by the Documentation and Information Center of Industries and Economics in Misurata which is accountable to the GPCIEM (equal to a Ministry). To develop an accurate meeting or posting, all companies were contacted by telephone or fax, then the names and addresses of business units were

identified, as well as the names of the eligible persons within each business unit to complete the survey. 98 of the LMLMCs were telephoned in order to arrange for faxing the questionnaires or distributing them by the researcher himself. Most of the respondent's companies were personally administered and a few were faxed. These were typically financial directors, managers or heads of cost accounting. These steps were considered important to increase the accuracy of the survey responses in a Libyan context as a developing country. The survey questionnaires were distributed and collected during the period from 17th May to 17th September 2009. The respondents received the documents including an introductory letter explaining the purpose of the research, a copy of the questionnaire and the supporting letter. In order to increase the response rate, the respondents were informed by the objectives, benefit and the related issues to the research. 98 identical questionnaires were distributed and 41 questionnaires were not returned, with the main reasons given for non-completion being lack of work pressure or company policy not to give permission for their employees to participate in research projects. A total of 57 questionnaires were returned, 10 of them which had missing data so were excluded, thus leaving a usable response rate of 48 per cent (see Table 4.4).

**Table 4.3 Response Rate of Questionnaire:**

| No. of distributed questionnaires | Unreturned questionnaires | Returned questionnaires | Questionnaires missing data | Response rate |
|---|---|---|---|---|
| 98 | 41 | 57 | 10 | 48 % |

The response rate is considered to be very satisfactory when compared with the other similar surveys carried out in the study area of MA (Drury et al., 1993; Drury and Tayles, 1994; Tayles et al., 2000; Alebaishi, 1998; Sithambaram, 2002; Hutaibat, 2005; and Abulghasim, 2006). In addition, the population is homogeneous with regards to the number of companies that operates in the same industry. Because all the population was known and the majority of homogeneous companies are small numbers, therefore, the researcher has felt that additional distribution will be a waste of time.

The responding companies in Libya represented different types of industries as follows, motor and vehicles (assembly industry); food; engineering; chemical, T.V and communication equipment (assembly industry); electrical equipments; building materials; metal; furniture and tobacco (see Table 5.2). The categories of information that have been included in the survey cover the following aspects: background, CA systems design in terms of product costs that are used for decision making in general and pricing in particular and barriers that constrained the CA system design development.

According to the interviews, semi-structured interviews were conducted to support the questionnaire survey. The respondents were asked in the questionnaire if they were willing to be interviewed and gave opportunity to fill their contact details. Each selected interviewee was contacted by telephone to arrange a meeting at the time and place convenient to him/her for conducting the interview. At the beginning of each interview, the interviewee was told about the total confidentiality of the data collection and asked to

give permission for recording the interviews. The interviews were wide ranging and covered all aspects of product costing. They were conducted at the interviewee's the LMLMCs, were semi-structured and tape recorded, and lasted on average for one hour and half.

Of the 47 questionnaire respondents, 25 indicated that they were willing to make themselves available to discuss their questionnaire responses in more detail. Only 15 selected interviews were conducted with the financial managers and heads of cost accounting in the LMLMCs. All interviews were conducted face-to-face. Interviewees were asked the reasons for the particular responses made on the questionnaires. The fifteen interviews were considered satisfactory for the purpose of this study.

The main aim of conducting the interviews was to investigate some issues that were included in the questionnaire, and to give the respondents a chance to express their opinion about any relevant issues to the research especially the questions concerning the following questions:

- What type of cost information systems are used to obtain product costs for decision making in your company? And why are those cost information systems used?;
- If your company uses the cost-plus pricing method, how does your company adopt this method?;

- If your company uses full product costs in pricing their goods, how could your company adopt this method?;
- If your company applied volume cost allocation systems, why has your company not adopted the ABC system?

Because, the interviews are semi-structured thus allowed more in-depth discussion and more questions were investigated with the interviewees.

All the semi-structured interviews were translated and transcribed onto sheets. The transcript sheet was prepared and grouped according to the interviewees' perceptions of CA system design in the LMLMCs. These sheets were used to put each document in context (Miles and Huberman, 1994). These interviews took place over a period of about two months (17th September to 17th November 2009). The interviews consisted of a semi-structured set of questions. Questions were open-ended in nature and permitted the interviewees to express their own views and emphases. As highlighted by Emsley (2001), face-to-face interviews were considered the most appropriate way to gather data which enabled the questions to be repeated until achieving the objective.

Finally, because the interview data is qualitative in nature and it does not have a standardised approach to be analysed, it was done informally by converting the qualitative data into numerical data. This is could be done particularly when the aim or

objective is to count the frequency of certain events that have been given by interviewees (Collis and Hussey, 2003; and Saunders et al., 2007).

Content analysis represents a formal approach to qualitative data analysis (Collis and Hussey, 2003). Moreover, according to Patton (1990), analysing the interviews could be achieved by a cross-interview analysis. The cross-interview analysis means grouping together answers from different people to analyze different point of views on the central topic. Therefore, the answers from different people were grouped by topics and from the guide (see Appendix H). In this study, a content analysis tool was used to analyse and interpret the qualitative data. Content analysis was used manually, because the size of the interview sample was small (fifteen interviews) and was easy to be managed and analysed.

### 4.19 Summary:

To conclude, this chapter has discussed the importance of research methodology in general and, in particular, the research methodology selected. For the purpose of this study and to achieve the research aims and objectives, the theory triangulation (contingency theory and descriptive theory) and the research methods are methodological triangulation (questionnaire as a main tool and semi-structured interview as a secondary tool) have been adopted. In this study six stages were undertaken as important procedures in order to pre-test the questionnaire data, and the feedback and recommendations

received from them were used to produce the final version of the questionnaire. In terms of the features of research design, this study can be classified as descriptive and explanatory study. It is concerned with Libyan medium and large manufacturing companies that produce transferred products.

# Chapter 5

# Descriptive Statistical Analyses and Discussion of the Questionnaire Findings

## 5.1 Introduction

Chapters two and three discussed the literature review which will be used in this chapter in order to discuss the questionnaire findings. Chapter four discussed the methodology used to carry out this research. It suggested two research methods, the questionnaire and semi-structured interview. Therefore, the main purpose of this chapter is to analyze statistically the data gathered by the questionnaire survey in order to highlight the issues that this study is attempting to address. In the first sections (A), general information about the participants and their companies are presented. In the next section (B), the industrial environment of the LMLMCs are then discussed, followed by a discussion on the CA systems which are currently used by the LMLMCs in section (C). In the next section (D) investigated the relationship between MA and financial accounting. Section E discussed the cost system design for calculating product costs for pricing decisions and the accuracy of calculating product costs for decision making purposes in general. Finally, the degree of progress and development and factors restricting the CA development are investigated in section (F). The following sub-sections provide a brief summary of the responses.

## 5.2 General Information about the Respondents:

Section A of the research questionnaire aims to focus on the personal information about the respondents and their companies. Sections (A1-A5) were organized to ask the respondents to provide information about their organisational position (job title), academic qualifications, field of qualifications and experience. The collected data related to those completing the questionnaire are shown in Table 5.1. The main objective of these sections is to increase the level of accuracy and ensure that the questionnaire was completed by the right person.

**Table 5.1 General Information About the Respondents:**

| Job title | | D. F. M. A. * | F. M. ** | H. C. A. D*** | | |
|---|---|---|---|---|---|---|
| | | F | F | F | F | % |
| **Highest academic qualification** | Postgraduate | 5 | 8 | 0 | 13 | 27.6 |
| | Bachelor degree | 6 | 5 | 20 | 31 | 60 |
| | High institute diploma | 0 | 0 | 1 | 1 | 2.1 |
| | Intermediate diploma | 0 | 0 | 2 | 2 | 4.2 |
| | Total | 11 | 13 | 23 | | 47 |
| **Field of qualification** | Managerial accounting | 1 | 0 | 0 | 1 | 2.1 |
| | Cost accounting | 3 | 6 | 1 | 10 | 4.5 |
| | Financial accounting | 6 | 6 | 22 | 34 | 72.3 |
| | Economic | 1 | 1 | 0 | 2 | 4.2 |
| | Total | 11 | 13 | 23 | 47 | 100 |
| **Experience** | 5-10 | 0 | 0 | 0 | 0 | |
| | 11-15 | 4 | 4 | 6 | 14 | 30 |
| | 16-20 | 3 | 1 | 5 | 9 | 19 |
| | 21-25 | 3 | 5 | 9 | 17 | 36 |
| | More than 26 | 1 | 3 | 3 | 7 | 15 |

*Director of Financial Management and Accounts; ** Financial Manager and ***Head of Cost Accounting Department.

It was found that 51 per cent of the respondents were Heads of Cost Accounting Departments, 32 per cent were Financial Managers and 17 per cent Directors of Financial Management and Accounts. The majority of them (60 per cent) hold a bachelor's degree as their highest qualifications, some (13 per cent) hold a master's (MS), a master's of business administration (MBA) or doctor of philosophy (PhD) degree. Only two participants hold an intermediate diploma (Less than high institute diploma), and only one holds a high-school level certificate.

In terms of the field of the participant's qualifications, most of the respondents (72.3 per cent) specialized in financial accounting, a few (4.5 per cent) in cost accounting, only two in economics and one in managerial accounting. In terms of professional certificate in cost or managerial accounting, the collected data established that there is only one participant who holds a professional certificate in managerial accounting. All the respondents of the sample of the study had 11-25 years of work experience. Moreover, 15 per cent of them had work experience exceeding twenty six years. The collected data indicated that few were specialists in cost or managerial accounting. All accountants processed and prepared costing data for decision-making purposes by using their practical experience rather than their academic or professional qualifications.

### 5.3 General Information about the Responding Companies:

Also in Section A, subsections A6 to A9 of the questionnaire were organized to ask the respondents to provide information about their companies regarding ownership, business,

capital, factories and the number of employees with their academic qualifications. The collected data related to those questions are shown in Table 5.2. The main objective of these subsections is to know the characteristics of the Libyan responding companies.

**Table 5.2 General Information about the Responding Companies:**

| Ownership | Medium-sized | | Large-sized | | | |
|---|---|---|---|---|---|---|
| | F | % | F | % | F | % |
| State-owned | 0 | 0 | 17 | 36.2 | 17 | 36.2 |
| Privately-owned | 13 | 27.6 | 17 | 36.2 | 30 | 63.8 |
| Total | 13 | 27.6 | 34 | 72.3 | 47 | 100 |
| Type of industry | | | | | | |
| Motor and Vehicles | 0 | 0 | 1 | 2.1 | 1 | 2.1 |
| Food | 3 | 6.3 | 8 | 17 | 11 | 23.4 |
| Engineering | 1 | 2.1 | 2 | 4.2 | 3 | 6.3 |
| Chemical | 7 | 14.8 | 8 | 17 | 15 | 31.9 |
| T.V and communication equipment | 0 | 0 | 1 | 2.1 | 1 | 2.1 |
| Electrical equipment | 0 | 0 | 1 | 2.1 | 1 | 2.1 |
| Building materials | 0 | 0 | 7 | 14.8 | 7 | 14.8 |
| Metal | 0 | 0 | 1 | 2.1 | 1 | 2.1 |
| Furniture | 0 | 0 | 1 | 2.1 | 1 | 2.1 |
| Paper and packing | 2 | 4.2 | 1 | 2.1 | 3 | 6.3 |
| Tobacco | 0 | 0 | 1 | 2.1 | 1 | 2.1 |
| Oil refineries | 0 | 0 | 2 | 4.2 | 2 | 4.2 |
| Total | 13 | 27.6 | 34 | 72.3 | 47 | 100 |
| Number of factories | | | | | | |
| One factory | 13 | 27.6 | 17 | 36.1 | 30 | 63.8 |
| From 2-3 factories | 0 | 0 | 7 | 14.8 | 7 | 14.8 |
| From 4-5 factories | 0 | 0 | 4 | 8.4 | 4 | 8.5 |
| From 6-7 factories | 0 | 0 | 2 | 4.2 | 2 | 4.2 |
| From 8-9 factories | 0 | 0 | 3 | 6.3 | 3 | 6.3 |
| more than 10 factories | 0 | 0 | 1 | 2.1 | 1 | 2.1 |
| Total | 13 | 27.6 | 34 | 72.3 | 47 | 100 |
| Academic qualifications | | | | | | |
| Highest institute diploma in financial accounting | 9 | 4.3 | 39 | 18.8 | 48 | 23.1 |
| Bachelor degree in financial accounting | 16 | 7.7 | 79 | 38.1 | 95 | 45.8 |
| Postgraduate in cost accounting | 0 | 0 | 15 | 7.2 | 15 | 7.2 |
| Postgraduate in management accounting | 0 | 0 | 3 | 1.4 | 3 | 1.4 |
| Other | 0 | 0 | 6 | 2.8 | 6 | 2.8 |
| Total | 24 | 100 | 183 | 100 | 207 | 100 |

The collected data indicated that the majority (63.8 per cent) is privately-owned, 34 per cent state-owned and only one participant indicated other (50 per cent state-owned and 50 per cent foreign-owned). All the Libyan state-owned companies (16) are large size, while the private companies are mixed (thirteen are medium and seventeen are large).

With regard to the type of business, most of the responding companies (31.9 per cent; 23.4 per cent) manufacture chemicals and food respectively. Few of them (14.8 per cent) are building materials industries. A small population of them (6.3 per cent, 6.3 per cent) is engineering and paper and packing respectively. Only two are oil refineries. While the remainder include only one participating company from: motor and vehicles; metal, T.V and communication equipment; electrical equipment; tobacco and furniture. All medium-sized companies (13) and half of the large companies (17) own only one factory. The remainder (17 companies) owned between two to nine factories and only one company owns more than 10 factories. With regard to the number of the employees and their highest qualifications, most of them (41 per cent) hold Bachelors in financial accounting and some of them (24.1 per cent, 23.1 per cent) hold an intermediate diploma and higher diploma in financial accounting respectively. Seven percent of the employees in the large-sized companies hold a postgraduate certificate in cost accounting and about one per cent in managerial accounting.

Section B of the questionnaire was designed to collect data about the contingent factors (product diversity, degree of customization, type of industry, size of the firm and the competition) that influence the accuracy of product costs in the LMLMCs.

### 5.3.1 Product Diversity:

In section B of the questionnaire, question B.1.1 is aimed to focus on product diversity. The respondents were asked on a five point scale (from strongly agree to strongly disagree) questions to specify if their companies produce the same products (the size and kind). The results are presented in Table 5-3.

**Table 5.3 Product Diversity:**

| Scale options | F | % |
|---|---|---|
| Strongly agree | 8 | 17.0 |
| Agree | 18 | 38.3 |
| Neither disagree nor agree | 4 | 8.5 |
| Disagree | 15 | 31.9 |
| Strongly disagree | 2 | 4.3 |
| Total | 47 | 100.0 |

The answers in Table 5-3 indicated that the majority (55.3 per cent) of the respondents agreed or strongly agreed that their companies produce about the same products (no diversity). 36.2 per cent of the respondents disagreed or strongly disagreed that their companies produce the same size and kind of products, that's a mean of 36.2 per cent of the respondents agreed or strongly agreed to the existence of product diversity.

With regard to the majority (55.3 per cent) of the Libyan companies that produce about the same products, the results indicated a decrease in the level of diversity. According to the survey study by Abulghasim (2006) the majority (61 per cent) of the respondents of the Libyan public manufacturing companies indicated that they produce slightly or no diversity. According to Nassar et al. (2011) 31.1 per cent of the Jordanian's industrial companies were producing less than 20 products and that 36.1 per cent were producing between 20 and 50 products. The majority of Jordanian industrial companies (67.2 per cent) produce less than 50 products.

However, according to Johnson and Kaplan, (1987) when the industrial manufacturing environment is simple (e. g. organizations produce products with no diversity and complexity; the manufacturing activities are labour-intensive; and the level of competition is low), then, overheads are low and volume allocation bases (e. g. labor costs\hour) could be justified for calculating reasonably accurate product costs. Therefore, the majority (55.3 per cent) of the LMLMCs may calculate reasonably accurate product costs.

On the other hand, with regard to some (36.2 per cent) of the Libyan companies that produce different products may not calculate accurate products. According to Cooper and Kaplan (1988a), companies using traditional allocation bases in an environment with increased product diversity and complex production processes in which most activities that cause costs are not volume-related activities. In this case and by use of traditional CA

systems, cost information might be distorted and could not be used for decision-making purposes.

### 5.3.2 Overhead Consumption:

In section B of the questionnaire, question B1.2 is set to find out about the effect of the overhead consumption. The respondents were asked on a five point scale (from strongly agree to strongly disagree) to indicate if overheads (set-up, store, purchasing, and so on) are consumed by products at the same rate. The results are presented in Table 5-4.

**Table 5.4 Overhead Consumption:**

| Scale options | F | % |
|---|---|---|
| Strongly agree | 7 | 14.9 |
| Agree | 20 | 42.6 |
| Neither disagree nor agree | 3 | 6.4 |
| Disagree | 15 | 31.9 |
| Strongly disagree | 2 | 4.3 |
| Total | 47 | 100.0 |

From Table 5-4 we can note that the majority (57.5 per cent) of the respondents agreed or strongly agreed that overhead costs are consumed at the same rate. 36.2 per cent of the respondents disagreed or strongly disagreed that overhead costs are consumed at the same rate. This means that (36.2 per cent) the respondents agreed or strongly agreed that overhead costs are consumed differently. For the majority (57.5 per cent) of the surveyed companies which are producing about the same products might need simplistic methods

to allocate overhead costs. On the other hand, for 36.2 per cent of the surveyed companies which their products consume products differently, they might need a sophisticated CA system. According to Kaplan (1990), when companies produce a high range of different products, then; there is a need to seek for an accurate CA system to measure the differences of resources consumed by products, with a higher number of production centres (pools) and cost drivers.

### 5.3.3 The Competition:

In section B of the questionnaire, question B2 is designed to find out about the competition level. The respondents were asked on a five point scale (from very low to very high) questions to indicate the level of their companies' competition. The results are presented in Table 5.5.

**Table 5.5 The levels of competition:**

| Scale options | F | % |
|---|---|---|
| Very low | 16 | 34.0 |
| Low | 4 | 8.5 |
| Moderate | 1 | 2.1 |
| High | 4 | 8.5 |
| Very high | 22 | 46.8 |
| Total | 47 | 100.0 |

From Table 5.5 we can note that the majority (55.3 per cent) of the participants indicated that their companies are facing very high or high levels of competition, while 42.5 per cent are facing very low or low levels of competition. The low levels of competition

could be interpreted by the interviewees that they asserted that their companies are working in a protected environment.

With regard to the majority (55.3 per cent) of the LMLMCs which are facing very high or high levels of competition, their managers should reevaluate the CA systems to ensure that they are using relevant sophisticated CA methods. According to Kaplan (1984b), the challenges of the competitive environment in the 1980's should encourage managers to re-evaluate their traditional cost and MA techniques.

### 5.3.4 The level of Customized Products:

In section B2 of the questionnaire, question B3 aims to find out the way that companies market their products. The respondents were asked on a five point scale (from highly standardized to totally customized) question to indicate which most appropriately describes the whole range of products that are marketed by their company. The results are presented in Table 5.6.

**Table 5.6 The Level of Customized Products:**

| Scale options | F | % |
|---|---|---|
| Highly standardised | 18 | 38.3 |
| Slightly standardised | 14 | 29.8 |
| Moderately standardised and moderately customised | 2 | 4.3 |
| slightly customised | 6 | 12.8 |
| Totally customised | 7 | 14.9 |
| Total | 47 | 100.0 |

Table 5.6 showed that the majority (68.1 per cent) of the respondents indicated that they marketed a highly or slightly standardized product. 27.7 per cent of the respondents indicated that they are marketing a slightly or totally standardized product. In addition, according to subsection 5.4.1, the majority of the Libyan companies produce about the same products, the results confirm that the majority of the LMLMCs companies deal with a simple industrial environment.

### 5.3.5 The level of Automation:

In section B3 of the questionnaire, question B4 is set to find out about the automation level. The respondents were asked on a five point scale (from highly manual to fully automated) to indicate the level of their companies' automation. The results are presented in Table 5.7.

**Table 5.7 The level of Automation:**

| Scale options | F | % |
|---|---|---|
| Totally manual | 0 | 0 |
| Slightly manual | 3 | 6.4 |
| Moderately automated and moderately manual | 6 | 12.8 |
| Slightly automated | 37 | 78.7 |
| Fully automated | 1 | 2.1 |
| Total | 47 | 100.0 |

Table 5.7 showed that most of the respondents (78.7 per cent) indicated that they are using a slight automation level and some (19.2 per cent) indicated that they maintained

moderate automation or slightly manual system. Only one company used a fully automated level. The results confirm the GCISEM, (2006) report that the Libyan manufacturing companies managers have not give attention to technological development. It is expected and not surprising that a developing country has a low level of automation. Libya as a developing country is investing in a low level of automation and producing mass standardised products (subsection 5-3-4). According to Kaplan (1984b), simple cost and MA techniques were developed sixty years ago when companies used mass production of standardized products and deal with a low level of automation.

### 5.3.6 The Cost Structure of the Company:

In section B.4 of the questionnaire, section B5 aims to find out the level of competition. The respondents were asked to indicate the approximate percentage of their companies' cost structure in terms of direct and indirect costs. The results are presented in Table 5.8.

**Table 5.8 The Cost Structure of the Company**

| Descriptive Statistics | | | | | |
|---|---|---|---|---|---|
| | **Total** | **Minimum** | **Maximum** | **Mean** | **Std. Deviation** |
| All direct costs | 47 | 62.00 | 93.00 | 81.5319 | 7.69204 |
| All indirect costs | 47 | 7.00 | 38.00 | 18.4468 | 7.68626 |

Table 5.8 showed that the averages of all direct costs are averaged 81.53 per cent (between minimum and maximum averages 62 per cent and 93 per cent), while, the

average of all indirect costs is 18.44 per cent (between minimum and maximum averages 7 per cent and 38 per cent). It is consistent with the findings of the survey of Libyan public manufacturing companies (Abulghasim, 2006). He found that the average of all direct costs are 79 per cent (between minimum and maximum averages 45 per cent and 70 per cent) and the average of indirect costs equal to 19.8 per cent (between minimum and maximum averages 10 per cent and 32 per cent). In Jordan, Nassar, et al. (2011) found that the overhead rate to total cost in 31.1 per cent of the companies, the level of overhead was less than 20 per cent of total cost; in 41 per cent of the companies, the level of overhead was between 21 per cent and 40 per cent of total cost; and, in 16.4 per cent of companies, the level of overhead was between 41 per cent and 60 per cent of total cost.

As stated by Johnson and Kaplan (1987), the indirect costs are now the dominant costs in product cost structure of the firm, therefore, managers need to modify their costing systems in order to measure more accurate product costs. In this study the LMLMCs that reported around 38 per cent of indirect costs should invest in sophisticated CA systems. In this regard, Askarany (2006) states that industrial companies decided to change their costing systems according to the changes in the cost structure.

### 5.4 The Relationship Between Management and Financial Accounting:

Section C of the questionnaire is designed to collect data about the relationship between management and financial accounting.

### 5.4.1 Preparing Overhead Budgets:

In section C of the questionnaire, section C1 is set to find out about the preparing of overhead budgets. The respondents were asked if they prepare overhead budgets. The results are presented in Table 5.9.

**Table 5.9 Preparing Overhead Budgets:**

| Respondent's answers | F | % |
|---|---|---|
| No | 14 | 29.8 |
| Yes | 33 | 70.2 |
| Total | 47 | 100.0 |

Table 5.9 showed that most of the respondents (70.2 per cent) indicated that their companies prepare overhead budgets. Also Binomial test is applied and showed a significant number (.008) which confirms that most of the responding companies prepare overhead budgets. For the remaining companies (29.8), the reason behind not preparing overhead budgets could be interpreted by two reasons. 12.8 per cent of them have already contracted to develop (up-date or redesign) their CA system (see section 5.7.4), while the remaining companies is influenced by some environmental factors which restricted the CA system development in the LMLMCs (see section 7.3).

### 5.4.2 Classifying Costs:

In section C of the questionnaire, section C2 aims to find out the cost classifications. The respondents were asked to determine their companies' cost classifications. The results are presented in Table 5.10.

**Table 5.10 Classifying Costs:**

| Costs classification | F | % |
|---|---|---|
| Direct and indirect and also Fixed and variable costs | 24 | 51.1 |
| Direct and indirect costs | 16 | 34.0 |
| Variable and fixed | 7 | 14.9 |
| Total | 47 | 100.0 |

Table 5.10 showed that the majority of the respondents (51.1 per cent) indicated that their companies classify costs into direct, indirect, variable and fixed. While 34 per cent of them classify costs into direct and indirect. A few (14.9) are classifying costs to variable and fixed costs. Companies which have not classified cost to variable and fixed costs really are affected by the Financial Accounting Manager's and designer's mentality (will be discussed in more detail in the coming sections).

### 5.4.3 Type of Cost Allocation System:

In section C of the questionnaire, section C3 set to find out about the type of cost allocation (CA) system. The respondents were asked to indicate the type of CA system which is adopted to calculate product costs for decision making purposes. The choices were absorption costing (manufacturing and\or non-manufacturing costs are assigned to products) and variable costing (variable costs assigned to products and fixed costs are treated as period expenses). The results are presented in Table 5.11.

**Table 5.11 The Type of Cost Allocation System:**

| | Type of CA system | F | % | V. P | C. P. |
|---|---|---|---|---|---|
| Valid | Absorption costing | 47 | 100.0 | 100.0 | 100.0 |
| Total | | 47 | 100.0 | | |

From Table 5.11, we can note that all of the participants indicated that they are using the traditional absorption costing system. This result is consistent with the findings of the McLellan, and Moustafa (2011) study. They investigated the use of MA tools by companies in the Arabic Gulf Cooperation Council (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates). They found that the six Arabic companies rely on the more traditional MA practices based on divisional profits rather than the more recently developed strategically focused tools such as activity based management, and ABC systems. Furthermore, Abdel-Al and McLellan (2011) found that Egyptian manufacturing companies still maintain and believe in the benefits derived from using traditional MA practices. However, they have started recognizing the benefits of some of the more advanced MA practices.

On the other hand, this result is inconsistent with the conventional MA wisdom in most text-books which advocated that, for decision-making purposes, incremental costs that predict future cash flows arising from decisions are relevant and should be used. Such costs are also called relevant costs, avoidable costs, marginal costs, attributable costs and contribution costs (when incremental costs are matched with incremental revenues, it produces contribution to fixed costs) (Drury et al., 2000).

### 5.4.4 Type of Cost Information:

In section C of the questionnaire, section C4 aims to find out the type of cost information\data-base to be used in decision making. The respondents were asked to indicate how their company extracts the product costs to use routinely in decision-making. The results are presented in Table 5.12.

**Table 5.12 Type of Cost Information:**

| Type of Cost Information | F | % |
|---|---|---|
| Single cost information system designed mainly for financial accounting purposes and also used for decision-making | 5 | 10.6 |
| Single cost information system designed mainly for financial accounting purposes and subsequently adjusted to be used for decision-making | 41 | 87.2 |
| A separate cost information system is used for decision making | 1 | 2.1 |
| Flexible database to serve both financial accounting and for decision-making purposes | 0 | 0 |
| Total | 47 | 100.0 |

Table 5.12 indicates that most (87.2 per cent) of the respondents revealed that their companies maintained a single cost information system designed mainly for financial accounting purposes and subsequently adjusted to use for decision-making. While 10.6 per cent of them maintained single cost information system designed mainly for financial accounting purposes and also used for decision-making. Only one company (2.1 per cent) maintained a separate cost information system to use for decision making.

According to the interviews, all the interviewees in the public sector (46.7 per cent) could not interpret why they are using fixed or an adjusted single cost information system and

asserted that they had used these systems for a long time. On the other hand, with regards to the private sector, their answers were different as follows, some of them (33.3 per cent) could not interpret why they are using fixed or an adjusted single cost information system and no interpretation could be added, few (13.3 per cent) of them said that these systems are suggested by the external designer. Only one interviewee said that our company is organizing to design a new data-base system in the near future.

### 5.4.5 Including Fixed Asset Depreciation in Product Costs:

In section C of the questionnaire, question C5 is set to find out about the sort of product costs that are used in decision making. The respondents were asked to indicate whether their companies include fixed asset deprecation expenses in product costs when they prepare product costs for decision making (e.g. product mix, abandonment of unprofitable product or add a new product or make or buy decisions). All the respondents indicated that their companies include fixed asset deprecation expenses in product costs when preparing product costs for decision making.

### 5.4.6 Calculating Fixed Assets Depreciation:

In section C of the questionnaire, section C6 is set to find out about the calculation of fixed assets depreciation when preparing product costs for decision making. The respondents were asked to indicate how their companies determine the age of fixed assets in order to calculate the fixed assets depreciation to be used for decision making

purposes. The respondents were given two choices (by tax law or by expert's opinions). The results are presented in Table 5.13.

**Table 5.13 Method of Calculating Asset Depreciation Expenses:**

| Mean of calculation | F | % |
|---|---|---|
| By tax law | 13 | 27.7 |
| By expert's opinions | 34 | 72.3 |
| Total | 47 | 100.0 |

Table 5.13 indicates that the majority (72.3 per cent) of the respondents indicated that their companies used the expert's opinions while 27.7 per cent used the tax law.

### 5.4.7 Considering the Real Age of Fixed Assets:

In section C of the questionnaire, question C7 is set to find out about the real age of fixed assets when calculating expenses. The respondents were asked to indicate if the tax law considered the real age of fixed assets. The results are presented in Table 5-14.

**Table 5.14 The Real Age of Fixed Assets:**

| | F | % | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| No | 13 | 27.7 | 100.0 | 100.0 |

Table 5.14 indicates that the respondents (27.7 per cent) who used the tax law in calculating fixed assets depreciation indicated that the tax law has not given consideration to the real age of the fixed assets. According to the subsection 5.4.6, it is clear that 27 per cent of the surveyed companies calculate distorted product costs due to use of irrelevant fixed assets expenses.

## 5.5 The Cost System Design for Calculating Product Costs for Decision-Making:

Section D of the questionnaire was organized to collect data about the cost system design for calculating product costs to aid decision-makers.

### 5.5.1 The Sort of CA Method:

In section D of the questionnaire, question D1 is set to find out about the type of CA method that is used for decision making purposes. The respondents were asked to indicate which method is applied to aggregate and allocate indirect costs to cost objects (products) in preparing cost information for decision-making. The results are presented in Table 5-15.

**Table 5.15 Type of CA Method:**

| Cost allocation method | F | % |
|---|---|---|
| One CA stage * | 32 | 68.1 |
| Two CA stages ** | 6 | 12.8 |
| Two CA stages *** | 8 | 17.0 |
| Two CA stages **** | 1 | 2.1 |
| Total | 47 | 1.0 |

*Indirect costs are not aggregated in cost centres but a single overhead base is established for the entire factory to charge indirect costs to products.
**2-in the first stage overhead (indirect) costs are allocated to cost centres (departments). In the second stage overhead allocation bases (recovery rates) are established for each department to assign overheads to products.
***3-in the first stage overheads are allocated to cost centres (represents work unit within department). In the second stage overhead allocation bases (recovery rates) are established for each work unit to assign overheads to products.
****In the first stage indirect costs are allocated to cost pools (activities). In the second stage overhead allocation bases (cost drivers) are established for each activity to assign overheads to products)

From Table 5-15 we can note that most (68.1 per cent) of the respondents indicated that their companies are using blanket-overhead rates (plant-wide). 17 per cent of them are using two CA stages (in the first stage overhead costs are allocated to cost centres which represent work units within departments. In the second stage overhead allocation bases are established for each work unit to assign overheads to products). 12.8 per cent of the responding companies are using two CA stages (in the first stage overheads are allocated to cost centres which represents departments. In the second stage overhead allocation bases are established for each department to assign overheads to products).

In this regard, Kaplan (1990a) suggests that when companies produce a high range of different products, then, there is a need to use sophisticated CA system (ABC). The ABC can measure the resources consumed by products, with a higher number of production pools and cost drivers. In addition, an empirical study in USA by Banker, et al. (1995) indicates that overhead costs are driven not by production volume but by transactions resulting from production complexity.

### 5.5.2 Number of Cost Centres:

In section D of the questionnaire, question D2 is set to find out about the number of cost centres. The respondents were asked to indicate how many cost centres are used to aggregate costs in order to allocate them to products. The results are presented in Table 5-16.

**Table 5.16 Number of Cost Centres:**

| Number of cost centres | F | % |
|---|---|---|
| The entire factory is the cost centres | 32 | 68.1 |
| Less than 5 | 5 | 10.6 |
| From 5 to10 | 2 | 4.3 |
| From 11 to 15 | 5 | 10.6 |
| From 16 to 20 | 3 | 6.4 |
| Total | 47 | 100.0 |

Table 5.16 indicates that most (68.1 per cent) of the respondents indicated that their companies are not aggregating costs in cost centers. 31.9 per cent maintained from less than five to twenty cost centres. It is clear that all the surveyed companies maintained simple CA systems. In this regard, Cooper (1989) states that it is essential that the sophisticated ABC system contains about 30 to 50 cost pools and many different types of cost drivers in order to calculate more accurate product costs.

### 5.5.3 Number of CA Bases:

In section D of the questionnaire, question D3 the number of allocation bases (cost drivers). The respondents were asked to indicate how many different types of allocation bases exist to allocate overheads to products in the final stage of CA system. The results are presented in Table 5-17. Table 5.17 indicates that most (91.5) of the respondents indicated that their companies are using less than five allocation bases. 6.4 per cent use 5-10 allocation bases, 2.1 per cent use 16-20 allocation bases.

**Table 5.17 Number of CA Bases:**

| Number of CA bases | F | % |
|---|---|---|
| less than 5 | 43 | 91.5 |
| 5-10 | 3 | 6.4 |
| 16-20 | 1 | 2.1 |
| Total | 47 | 100.0 |

### 5.5.4 The Allocation Bases Used for Automation and Manual Centres:

In section D of the questionnaire, section D4 is set to find out about the CA bases which are used in the final stage of allocating indirect costs to products. The respondents have shown the list of allocation bases (direct labor hours\costs, direct materials costs, direct machine hours, weight of output, size of output, no. of out-puts (products), expert's opinion, transaction bases) and asked to indicate which of the following CA bases (recovery rates) are used in the final stage of allocating indirect costs to products for decision-making purposes. The results are presented in Table 5-18. From Table 5-18 we can note the following results, firstly, for automation centers, the majority (51.1 per cent and 40.4 per cent) of the respondents indicated that their companies used the experience and weight of output respectively. Secondly, for manual centers, the majority (51.3 per cent and 35.9 per cent) of the respondents indicated that their companies used the experience and weight of output respectively.

**Table 5.18 The Allocation Bases Used for Centres:**

| The allocation bases used for automation centers\entire factory | | | |
|---|---|---|---|
| Type of CA bases | Using the base | F | % |
| Direct labor hours\costs | Used | 10 | 21.3 |
| | Not used | 37 | 78.7 |
| Direct materials costs | Used | 6 | 12.8 |
| | Not used | 41 | 87.2 |
| Direct machine hours | Used | 1 | 2.1 |
| | Not used | 46 | 79.9 |
| Weight of output | Used | 19 | 40.4 |
| | Not used | 28 | 59.6 |
| Size of output | Used | 7 | 14.9 |
| | Not used | 40 | 85.1 |
| No. of products | Used | 4 | 8.5 |
| | Not used | 43 | 91.5 |
| Based on expert's opinions | Used | 24 | 51.1 |
| | Not used | 23 | 48.9 |
| Transaction bases (ABC system) | Used | 1 | 2.1 |
| | Not used | 46 | 97.9 |
| Others | Used | 2 | 4.3 |
| | Not used | 45 | 95.7 |
| **The allocation bases used in labor-intensive centers\entire factory** | | | |
| Direct labor hours\costs | Used | 10 | 25.6 |
| | Not used | 29 | 74.4 |
| Direct materials costs | Used | 5 | 12.8 |
| | Not used | 34 | 87.2 |
| Direct machine hours | Used | 0 | 0 |
| | Not used | 39 | 100 |
| Weight of output | Used | 14 | 35.9 |
| | Not used | 25 | 64.1 |
| Size of output | Used | 6 | 15.4 |
| | Not used | 33 | 84.6 |
| No. of the produced products | Used | 3 | 7.7 |
| | Not used | 36 | 92.3 |
| Based on expert's opinions | Used | 20 | 51.3 |
| | Not used | 19 | 48.7 |
| Transaction bases (ABC system) | Used | 1 | 2.6 |
| | Not used | 44 | 97.4 |

According to Table 15, it is apparent that 21.3 per cent of the respondent companies are calculating wrong and distorted product costs due to use of direct labor hours\costs in automation centers. Also, the finding is consisted with Al-Bastki and Ramadan (1998) study in Bahrain which showed that the majority (61.3 per cent) of the surveyed companies are using single CA rates.

### 5.5.5 Allocating of Non-Manufacturing Cost:

In section D of the questionnaire, question D5 aims to find out the sort of non-manufacturing CA bases that are used in CA systems for decision making purposes. The respondents were asked to indicate how the following non-manufacturing expenses (administrative, selling and distribution) are normally dealt with (if any). The respondents were given six choices (allocated to products on the basis of the selling price of each product, allocated to products on the basis of employee numbers, allocated to products on judgment bases (by accountant's experience), allocated to products on basis of transactions (ABC system), not allocated to products (charged to profit and loss account), and others). The results are presented in Table 5-19. From Table 5-19, we can note that most (46.8 per cent) of the respondents indicate that they commonly use the judgment bases (experts opinions) to allocate administration costs. 27.7 per cent use the basis of the selling price of each product, 8.5 per cent use the basis of employee numbers, 8.5 per cent charging them to profit and loss account, 2.1 per cent by means of transactions and 6.4 per cent use other methods. For selling expenses, the respondents

indicated that the most (44.4 per cent) common allocation base is the expert's opinions (judgment bases). 38.9 per cent use the basis of the selling price of each product, 8.5 per cent use the basis of employee numbers, 8.3 per cent charging them to profit and loss account, 2.8 per cent by means of transactions, 5.6 per cent use other methods. For distribution expenses, the respondents indicated that the most (42.1 per cent) common allocation base is the expert's opinions (judgment bases). 36.8 per cent use the basis of the selling price of each product and 15.8 per cent charge them to profit and loss account.

**Table 5.19 Using of Administrative Allocation Bases:**

| **Administrative allocation bases** | **F** | **%** |
|---|---|---|
| Allocated to products on the basis of the selling price of each product | 13 | 27.7 |
| Allocated to products on the basis of employee numbers | 4 | 8.5 |
| Allocated to products on expert's opinions (judgment bases) | 22 | 46.8 |
| Allocated to products on basis of transactions (ABC system) | 1 | 2.1 |
| Not allocated to products (charged to profit and loss account) | 4 | 8.5 |
| Others | 3 | 6.4 |
| **Selling allocation bases** | F | % |
| Allocated to products on the basis of the selling price of each product | 14 | 38.9 |
| Allocated to products on the judgment basis (by accountant's experience) | 16 | 44.4 |
| Allocated to products on basis of transactions (ABC system) | 1 | 2.8 |
| Not allocated to products (charged to profit and loss account) | 3 | 8.3 |
| Others | 2 | 5.6 |
| **Distribution allocation bases** | F | % |
| Allocated to products on the basis of the selling price of each product | 7 | 36.8 |
| Allocated to products on the judgment bases (expert's opinions) | 8 | 42.1 |
| Allocated to products on basis of transactions (ABC system) | 1 | 5.3 |
| Not allocated to products (charged to profit and loss account) | 3 | 15.8 |

### 5.5.6 Preparing Cost Information for Decision Making Purposes:

In section D of the questionnaire, question D6 aims to find out the preparation time of cost information for internal decision-making purposes. The respondents were asked to indicate the period of time that the company prepares cost information for internal decision-making. The results are presented in Table 5-20.

**Table 5.20 Preparing Cost Information for Decision-Making Purposes:**

| Preparing time | F | % |
|---|---|---|
| Monthly | 6 | 12.8 |
| Quarterly | 22 | 46.8 |
| half annually | 2 | 4.3 |
| Annually | 39 | 83.0 |
| In irregular periods | 25 | 53.2 |

Table 5.20 indicates that the respondents indicated that their companies preparing cost information as follows, 83 per cent annually, 53 per cent in irregular period, 46.8 per cent quarterly and 12.8 monthly.

### 5.6 Pricing Methods and the Level of Accuracy:

Section E of the questionnaire is designed to collect data about the pricing methods and the accuracy of CA systems in calculating product costs for decision making purposes.

### 5.6.1 Pricing Method:

In section E of the questionnaire, question E1 aims to find out the products pricing method that is in use by the LMLMCs. The respondents were asked on a five point scale

(from never used to used always) question to specify the pricing method used. Three pricing options (by cost-plus pricing; tracing market prices or comparing product cost with the prevailing market prices and directed by Libyan governmental authorities) were represented in the question. The results are presented in Table 5-21.

**Table 5.21 Pricing Methods:**

| **By cost-plus pricing** | **F** | **%** |
|---|---|---|
| Never or rarely used | 20 | 42.6 |
| Sometimes used | 5 | 10.6 |
| Used often or always | 22 | 46.8 |
| **Tracing market prices or comparing product cost with the prevailing market prices** | **F** | **%** |
| Never or rarely | 23 | 48.9 |
| Sometimes | 3 | 6.4 |
| Often or always | 21 | 44.7 |
| **Directed by Libyan governmental authorities** | **F** | **%** |
| Never or rarely | 36 | 76.6 |
| Often or always | 11 | 23.4 |
| Total | 47 | 100.0 |

From Table 5.21 we can understand that the respondents indicated that 46.8 per cent of the respondents always or often used the cost-plus pricing method. In contrast, 44.7 per cent often or always trace market prices or compare product cost with the prevailing market prices. Only a few (23.4 per cent) often or always base their products prices as directed by Libyan governmental authorities.

According to the interviews, all the public companies (46.7 per cent) said that they are facing very low competition and there is a shortage in the local market, therefore, their companies can adopt cost-plus pricing method. On the other hand, in relation to the private sector, only the interviewee of the building materials said that their company is facing very low competition and confirmed there is a shortage in the local market, therefore, their company can price their products by means of the cost plus pricing method.

### 5.6.2 The Type of Product Costs that Are Used in Pricing Decisions:

In section E of the questionnaire, question E2 aimed to find out the type of product costs that are used in the cost-plus pricing method or in comparing product cost with the prevailing market prices. The results are presented in Table 5-22.

**Table 5.22 The Sort of Product Costs that Are Used in Pricing Decisions:**

| | Type of product cost | F | % |
|---|---|---|---|
| Valid | Total cost (manufacturing and non-manufacturing costs) | 36 | 76.6 |
| | Total cost minus fixed asset depreciation | 6 | 12.8 |
| | Manufacturing cost | 3 | 6.4 |
| | Total | 45 | 95.7 |
| Missing | System | 2 | 4.3 |
| Total | | 47 | 100.0 |

Table 5.22 indicates that most of the responding companies (80 per cent) use total costs (manufacturing and non-manufacturing costs). Some (13.3 per cent) are using total costs

or cost minus fixed asset depreciation. A few (6.7 per cent) are using manufacturing costs. While, none of the responding companies, are using variable\incremental costs. According to the interviews, it was noted that all of the interviewees in the public sector (46.7 per cent) said that we should calculate full product costs for pricing decisions and the reasons behind that are as follows, for companies which produce fuel and pasta said that the government provides financial support to absorb the gap between the product costs and the market prices of any unprofitable product. And companies which produce motor vehicles (assembly industry), tobacco, cement, building materials and metal said that they are facing very low competition and there is a shortage in the local market. The reason behind that is that their products are protected by the government.

On the other hand, in relation to the private sector, only the interviewees from the building materials companies said that full product costs are used in pricing decisions, however, they also gave the same reasons as the public sectors, that they are facing very low competition and there is a shortage in the local market. Only one of the interviewees in the chemical company who said they are using full product costs minus fixed assets depreciation and working with high quality in order to be able to operate in the competitive market.

### 5.6.3 The Accuracy of CA System:

In section E of the questionnaire, question E3 is aimed to find out the level of accuracy of CA system in allocating overhead to product. The respondents were asked in a five point scale (not accurate at all to extremely accurate) questions to specify the level of accuracy of their costing system in allocating overheads to products. The results are presented on Table 5-23.

**Table 5.23 The Accuracy of CA System:**

| Scale options | F | % |
|---|---|---|
| Not accurate at all | 5 | 10.6 |
| Low level of accuracy | 13 | 27.7 |
| Moderately accurate | 2 | 4.3 |
| Slightly accurate | 23 | 48.9 |
| Highly accurate | 4 | 8.5 |
| Total | 47 | 100.0 |

According to Table 5-23 the majority (57.4 per cent) of the respondents indicated that they reported use of slightly or highly accurate costing systems. In contrast, 38.3 per cent reported no accuracy at all or a low level of accuracy.

## 5.7 The Company's Progress in Allocating Costs to Products:

Section F of the questionnaire is designed to collect data about the company's progress in allocating costs, and the important factors that may restrict the development procedures:

### 5.7.1 The level of Using Computerized Systems:

In section F of the questionnaire, question F1 aimed to find out the level of using computerized systems in preparing cost information. The respondents were asked on a five point scale (from totally manually to highly computerized systems) questions to specify the level of using computer system in preparing cost information. The results are presented in Table 5-24.

**Table 5.24 The Level of Using Computerized Systems:**

| Level of computerized system | F | % |
|---|---|---|
| Slightly manually | 29 | 33.0 |
| Moderately manually | 3 | 3.4 |
| Slightly computerized | 12 | 13.6 |
| Highly computerized | 3 | 3.4 |
| Total | 47 | 53.4 |

Table 5.24 indicates that the majority (61.7) of the respondents indicated that they use a slightly manual level of computerized system in preparing their costing systems. While a few (6.4 per cent) who indicated that they had used a high level of computerized system.

### 5.7.2 The ABC Adoption Rate:

In section F of the questionnaire, question F2 aims to find out the adoption level of ABC system. The respondents were asked to specify if the ABC system has been adopted. The results are presented in Table 5-25.

**Table 5.25 The ABC Adoption:**

| ABC adoption | F | % |
|---|---|---|
| Not adopted | 46 | 97.9 |
| Adopted | 1 | 2.1 |
| Total | 47 | 100.0 |

Table 5.25 shows that the majority (98 per cent) of the respondents indicated that they had not adopted ABC, while only one company (2 per cent) has already adopted this system. The results are consistent with the findings of the survey by Sulaiman et al. (2004), who found that the use of traditional management tools is still strong in four Asian countries (Singapore, Malaysia, China and India), but the use of contemporary techniques is lacking. In addition, Triest and Elshahat (2007) found that the use of sophisticated costing systems in Egypt is limited. No advanced accounting techniques seem to be applied. However, activity-based costing concepts are largely unknown.

### 5.7.3 Planning to Adopt ABC:

Section F1 is followed by another question (F2), asking if ABC system is to be implemented in the near future. All the respondents indicated that system is not targeted for implementation. According to the interviews regarding the reasons for not adopting ABC system, some of the interviewees (33.3 per cent) have no knowledge about what is ABC system. The majority (66.667 per cent) of the interviewees who have knowledge about this system gave different answers as follows:

- For 20 per cent of the state-owned interviewees they have knowledge about this

system, however, they said that the external local designers prefer designing traditional cost allocation system and encouraged us to adopt it.

- For 33.3 per cent of the privately-owned interviewees have knowledge about this system, however, they asserted that this system is not common in our country.
- For 13.3 per cent of the privately-owned interviewees have knowledge about this system, however, they highlighted that most managers are engineers and not specialized in accounting and they do not understand the benefit of contemporary CA systems.

The results are not consistent with the findings of the recent study by Khalid (2005) in Saudi Arabia. He found that the respondents who never considered ABC or rejected it after evaluation, are satisfied with their traditional costing system and contemporary management techniques are considered as irrelevant to the firms' operations environments. To a lesser extent, some of the non-ABC firms have considered the credibility of ABC in the light of unsuccessful cases experienced by other firms in the past.

### 5.7.4 The Current State of Developments in the Company's CA Systems:

In section F of the questionnaire, question F3 aims to find out the current state of developments in the company's CA system. The respondents were asked to select the appropriate statement that describes the current state of developments in their company's CA system. The question contained four options (during the past five years, our company

has made significant developments; our company has already contracted to develop (up-date or redesign) their CA system and currently, our CA system is suffering weaknesses and needs development. The results are presented in Table 5-26.

**Table 5.26 The Current State of Developments of the Company's CA System:**

| The current state of developments | F | % |
|---|---|---|
| Yes, during the past five years, our company has made significant developments (up-date or redesign) | 5 | 10.6 |
| No | 42 | 89.4 |
| Yes, our company has already contracted to develop (up-date or redesign) their CA system | 6 | 12.8 |
| NO | 41 | 87.2 |
| Yes, currently, our CA system is suffering weakness and needs developments (up-date or redesign) | 39 | 83.0 |
| NO | 8 | 17.0 |
| Total | 47 | 100.0 |

Table 5.26 indicates that the majority (89.4 per cent) have not made any significant developments during the past five years. 83 per cent they said that currently, our CA system is suffering weaknesses and needs development. Only 12.8 per cent of the respondents indicated that their company has already contracted to develop (up-date or redesign) the CA system.

## 5.8 Summary:

The collected data indicated that there is a lack of specialists in managerial accounting. In fact, all accountants processed and prepared costing data for decision-making purposes by using their practical experience rather than their academic or professional

qualifications. The majority of the LMLMCs maintained a fixed single cost database for both stock valuation and subsequently adjusted to use for decision-making. Overhead budgets are not used by some of the surveyed companies. A few of the LMLMCs have already contracted with external designers to up-date or redesign their CA methods. Some of the surveyed companies reported significantly accurate product costs, on the other hand failed to provide their managers with information on time. Almost all the LMLMCs are using traditional CA methods, but, only one company is using ABC system. These simple methods calculated significantly accurate product costs for most companies that produce standardized products.

On the other hand, the LMLMCs which calculate less accurate product costs are dealing with complex industrial environment, use of labour hours for automation centres or using wrong tax rates in calculating the fixed assets depreciation. The cost-plus pricing method is rejected by all the surveyed companies that use full cost-plus pricing method and facing high level of competition. Instead, these companies are tracing the mechanism of the current prices or comparing their costs with the prevailing market prices to determine their prices.

# Chapter 6

# A Comparison Between the Research Variables

## 6.1 Introduction

Chapters five discussed and analyzed statistically the data gathered by the questionnaire survey in order to describe the LMLMCs' work environment and CA system in general. However, in order to get in depth understanding of the research phenomenon, a comparison analysis is applied between the research variables.

Therefore, the following variables are compared. In the first sections concerned the competition, customization and pricing methods. It is followed by comparing the competition, and the use of costing system (cost-plus pricing method). The next variables were comparison, CA sophistication, product diversity and the accuracy of CA systems. Finally, the ownership of the companies and the other research variables (accuracy, completion way of marketing products and cost-plus pricing method) are compared.

## 6.2 Comparing Competition, Customization and the Use of Pricing Method:

In general, the Crosstabulation descriptive technique is used to compare competition, level of customization and the use of pricing method. The results are presented in Table 6.1.

**Table 6.1 Customisation Between Competition, Level of Customization, and Use of Cost-Plus Pricing or Tracing Market Prices:**

| The level of Customization | | | Competition | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Very low or low | | Moderate | | Very high or high | | Total | |
| | | | F | % | F | % | F | % | F | % |
| Highly or slightly standardised | Cost-plus | Never or rarely used | 0 | 0 | 0 | 0 | 18 | 38.2 | 18 | 38.2 |
| | | Some-times used | 0 | 0 | 0 | 0 | 1 | 2.1 | 1 | 2.1 |
| | | Always or often used | 11 | 23.4 | 0 | 0 | 2 | 4.2 | 13 | 27.6 |
| | | Total | 11 | 23.4 | 0 | 0 | 21 | 44.6 | 32 | 68.0 |
| Moderately standardised | Cost-plus | Some-times used | 0 | 0 | 1 | 2.1 | 0 | 0 | 1 | 2.1 |
| | | Always or often used | 1 | 2.1 | 0 | 0 | 0 | 0 | 1 | 2.1 |
| | | Total | 1 | 2.1 | 1 | 2.1 | 0 | 0 | 2 | 4.2 |
| Totally or slightly customised | Cost-plus | Never or rarely used | 1 | 2.1 | 0 | 0 | 1 | 2.1 | 2 | 4.2 |
| | | Some-times used | 1 | 2.1 | 0 | 0 | 2 | 4.2 | 3 | 6.3 |
| | | Always or often used | 6 | 12.7 | 0 | 0 | 2 | 4.2 | 8 | 17.0 |
| | | Total | 8 | 17.0 | 2 | 4.2 | 5 | 10.6 | 13 | 27.6 |
| Highly or slightly standardised | Tracing market prices | Never or rarely used | 11 | 23.4 | 0 | 0 | 2 | 4.2 | 13 | 27.6 |
| | | Some-times used | 0 | 0 | 0 | 0 | 1 | 2.1 | 1 | 2,1 |
| | | Always or often used | 0 | 0 | 0 | 0 | 18 | 38.2 | 18 | 38.2 |
| | | Total | 11 | 23.4 | 0 | 0 | 21 | 44.6 | 32 | 68.0 |
| Moderately standardised | Tracing market prices | Never or rarely used | 1 | 2.1 | 0 | 0 | 0 | 0 | 1 | 2.1 |
| | | Always or often used | 0 | 0 | 1 | 2.1 | 0 | 0 | 1 | 2.1 |
| | | Total | 1 | 2.1 | 1 | 2.1 | 0 | 0 | 2 | 4.2 |
| Totally or slightly customised | Tracing market prices | Never or rarely used | 6 | 12.7 | 0 | 0 | 3 | 6.3 | 9 | 19.1 |
| | | Some-times used | 1 | 2.1 | 0 | 0 | 1 | 2.1 | 2 | 4.2 |
| | | Always or often used | 1 | 2.1 | 0 | 0 | 1 | 2.1 | 2 | 4.2 |
| | | Total | 8 | 17.0 | 0 | 0 | 5 | 10.6 | 13 | 27.6 |

From Table 6.1, we can understand that when competition is high, 38.2 per cent of the respondents indicated that they are marketing highly standardized or slightly standardized products and never or rarely use cost-plus pricing method in setting their prices when

competition is very high or high. As an alternative way, they always or often trace the mechanism of market prices or comparing their costs by the current market prices. On the other hand, when the LMLMCs are facing very low or low competition, 23.4 per cent of the respondents indicated that they always or often set their prices by means of the cost plus pricing method when they sell highly standardized or slightly standardized products. While, when they sell highly customized or slightly customized product, a few (2.1 per cent) of the respondents indicated that they can always or often set their prices by means of the cost plus pricing method when competition is very high or high.

According to Guilding et al (2005), it is widely distinguished in the text-books that the cost information can play a significant function in setting selling prices. However, companies with characteristics of highly customized products or a market leader may have some discretion in setting their prices. On the other hand, many companies stated that their prices are considered as a function of market forces and they have insignificant discretion in setting their prices. Also, small companies have little influence on prices where prices are set by the dominant market leaders. These companies are not able to use cost-plus pricing and it is to be expected that cost information is considered mainly as a key factor to be taken in account when attempting to optimise the output and mix of products and services in accordance with the extant market prices.

Brierley (2008) asserts that companies producing customized products are using different components and expected to have a different product cost. Therefore, when a company

produces a variety of customized products, there is a need to use product cost information frequently in decision making to ensure that appropriate product related decisions are made.

From the literature review, the most important function of costing information in Egypt is pricing decisions by means of cost-plus method (Triest and Elshahat 2007). Therefore, the LMLMCs that produce customized products face low level of competition have the opportunity to set their prices by means of cost-plus pricing. In contrast, companies that produce standardized products and facing high level of competition are tracing the mechanism of market prices or comparing their costs by the current market prices in setting their product's prices. This situation confirms that they cannot achieve accurate product costs in order to use it in the competitive markets.

### 6.3 Comparing the Pricing Method and Competition:

Cost-plus pricing, tracing market prices or comparing costs by current market prices and competition are compared. The results are presented in Table 6.2. It is found that the 40 per cent of the responding companies never or rarely use cost-plus pricing method when competition is very high or high; instead, they trace market prices or compare their costs with the current market prices. On the other hand, 37.7 per cent of the responding companies use cost plus pricing method when competition is very low or low.

**6.2 Crosstabulation Between Pricing Method and Competition:**

| Competition | Pricing Method | | Total | |
|---|---|---|---|---|
| | | | F | % |
| Very low or low | By cost-plus pricing | Never or rarely | 1 | 2.2 |
| | | Sometimes | 1 | 2.2 |
| | | Always or often | 17 | 37.7 |
| Moderate | By cost-plus pricing | Sometimes | 1 | 2.2 |
| Very high or high | By cost-plus pricing | Never or rarely | 18 | 40 |
| | | Sometimes | 3 | 6.6 |
| | | Often or always | 4 | 8.9 |
| | | Total | 45 | 100 |
| Very low or low | Tracing market prices or comparing costs by prices | Never or rarely | 17 | 37.7 |
| | | Sometimes | 1 | 2.2 |
| | | Always or often | 1 | 2.2 |
| Moderate | Tracing market prices or comparing costs by prices | Sometimes | 1 | 2.2 |
| Very high or high | Tracing market prices or comparing costs by prices | Never or rarely | 5 | 11.1 |
| | | Sometimes | 2 | 4.4 |
| | | Often or always | 18 | 40 |
| | | Total | 45 | 100 |

This situation could be interpreted that the 40 per cent of responding companies cannot use their costing systems to determine their product's prices due to their inability to calculate accurate product costs. Also, these analyses confirm that they cannot achieve accurate product costs in order to use it in the competitive markets. According to GPCIEM (2006), Libyan market was controlled and demonstrated by the public sector companies for a period of up to three decades, that resulted in inadequate attention to programs of development of human resources, marketing, developed management or preparing administrative leaders. Moreover, according to the personal interviews, all the

interviewees of state-owned companies disclosed that their companies are still working in a protected industrial environment. Therefore, they can use of inaccurate product costs in determine their prices.

### 6.4 Comparing the CA Sophistication, Product Diversity, and Accuracy:

The CA sophistication, product diversity and the level of accuracy are compared. The results are presented in Table 6.3.

**Table 6.3 Crosstabulation Between Diversity, Accuracy and CA Method:**

| CA Method | Product Diversity | | Accuracy | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Inaccurate or low accuracy | | Mode-rate | | Slightly or extremely accurate | | Total | |
| | | | F | % | F | % | F | % | F | % |
| One cost allocation stage * | Diversity | strongly agree or agree | 1 | 2.1 | 1 | 2.1 | 15 | 31.9 | 17 | 36.1 |
| | | Neither disagree nor agree | 1 | 2.1 | 0 | 0 | 1 | 2.1 | 2 | 4.2 |
| | | Disagree or strongly disagree | 13 | 27.6 | 0 | 0 | 0 | 0 | 13 | 27.6 |
| Two CA stages ** | Diversity | strongly agree or agree | 0 | 0 | 0 | 0 | 3 | 6.3 | 3 | 6.3 |
| | | Neither disagree nor agree | 0 | 0 | 1 | 2.1 | 0 | 0 | 1 | 2.1 |
| | | Disagree or strongly disagree | 2 | 4.2 | 0 | 0 | 0 | 0 | 2 | 4.2 |
| Two CA stages *** | Diversity | Strongly agree or agree | 0 | 0 | 0 | 0 | 5 | 10.6 | 5 | 10.6 |
| | | Neither disagree nor agree | 0 | 0 | 0 | 0 | 1 | 2.1 | 1 | 2.1 |
| | | Disagree or strongly disagree | 1 | 2.1 | 0 | 0 | 1 | 2.1 | 2 | 4.2 |
| Two CA stages **** | Diversity | Strongly agree or agree | 0 | 0 | 0 | 0 | 1 | 2.1 | 1 | 2.1 |

*Indirect costs are not aggregated in cost centres but a single overhead base is established for the entire factory to charge indirect costs to products.

**In the first stage overhead (indirect) costs are allocated to cost centres (departments). In the second stage overhead allocation bases (recovery rates) are established for each department to assign overheads to products.

***in the first stage overheads are allocated to cost centres (represents work unit within department). In the second stage overhead allocation bases are established for each work unit to assign overheads to products.

****in the first stage indirect costs are allocated to cost pools (activities). In the second stage overhead allocation bases (cost drivers) are established for each activity to assign overheads to products).

It was found that the majority 57.4 per cent of the respondents indicated that their costing systems have a very high or high level of accuracy in calculating product costs, 31.9 per cent of them adopted the blanket-overhead method, and produce products with little or no product diversity at all. Only, 19.1 per cent of them adopted the two stage CA method producing their products with little or no product diversity at all. On the other hand, 38.2 per cent of the respondents indicated that their costing systems offer little or no accuracy at all, 27.6 per cent of them adopted the blanket-overhead method and they produce products with very high or high product diversity. While 6.7 per cent of them adopted the two-stage allocation method and produce their products with very high or high product diversity.

Thus, those companies which adopt blanket-overhead method and producing different products reported distorted product costs due to their overheads being consumed by products differently. Drury (2004) points out that a blanket-overhead rate is not a suitable method and leads to distorted measurements in a situation where a factory consists of a number of production centres and departmental overheads are consumed differently. In contrast, blanket-overhead could only be justified when all products consume resources in the same proportions.

Moreover, Samaha, and Abdallah (2011: 41) highlight that the weak points of volume-based costing are assigning the overheads by direct labor-hours or machine-hours as a cost driver (blanket-overhead method). They concluded that:

> ***"volume based costing under-costs low-volume product (i.e. products requiring fewer direct labor hours in total), while it over-costs high-volume products (i.e. products requiring more direct labor-hours in total), and thus, a product is subsidized at the expense of others. In cost accounting this is called cross-subsidization. However, activity-based costing traces overhead consumption by each product and thus provides a more accurate per-unit overhead cost."***

In fact, for 27.6 per cent of the LMLMCs that their costing systems offer little or no accuracy at all, use of blanket-overhead method and produce very high or high level of divers' product, they should adopt sophisticated costing systems.

According to Popesko (2009), contemporary managerial accounting techniques are affected by growing importance of effective overhead cost management, and influenced by several factors. The important factor for that the increased proportion of the company's overhead cost structure. This was changed from around a portion of 10 per cent in the 1950's to what it is today, potentially representing approximately 40 per cent of a manufacturing business's total costs. Another important reason is the pressure from competitors which force companies to extend the efficiency of their operations.

Furthermore, there is the factor of increasing diversity of operations. In order to overcome this problem, sophisticated costing methods (e. g. ABC) have been developed and suggested. Moreover, it has been argued that traditional MA techniques are unable to satisfy the mangers' needs in terms of providing them with timely and detailed information in complex industrial environment (Askarany et al., 2007). In addition, according to Kaplan and Anderson (2004), companies working in complex environment

that use traditional absorption costing systems are expected to make incorrect managerial decisions. According to Schoute (2011) product diversity, on average, is positively related to both ABC adoption and ABC use. However, these relationships are indeed reversed i.e., that they are positive up to a point and then begin to reject. He suggests that this latter finding means that firms are more likely to adopt and use ABC at moderate levels of product diversity.

### 6.5 Comparing the Competition, Size and Ownership:

The Crosstabulation descriptive technique is used to compare competition, paid-up capital (represents the size of the company) and ownership. The results are presented in Table 6.4.

**Table 6.4 Comparison Between Competition, Size and Ownership**

| | | Competition | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Very low or low | | Moderate | | Very high or high | | | |
| | | F | % | F | % | F | % | F | % |
| Medium-sized | Privately-owned | 2 | 6.6 | 0 | 0 | 11 | 36.6 | 13 | 43.3 |
| Large-sized | State-owned | 14 | 82.4 | 0 | 0 | 3 | 17.6 | 17 | 100 |
| | Privately- owned | 4 | 13.3 | 1 | 3.3 | 12 | 40 | 17 | 56.7 |

It was found that almost all (76.6 per cent) of the privately-owned companies (both large and medium sized companies) are facing very high or high level of competition. On the other hand, almost all (82.4 per cent) of the large state-owned companies are facing very

low or low level of competition. These confirm that almost all the state-owned companies are still working in a protected industrial environment.

The traditional CA system by using of simplistic allocation bases is recognized as generating of distorted cost information system (Qian and Ben-Arieh, 2008). On the other hand, decision-makers assume that cost information is relevant and preferable when achieved as more as accurate (Charles and Hansen, 2008). Since management accounting practices are positively and significantly affected by the company's ownership orientation and legal form and negatively and significantly by the factors related to size and sector. Overall, international ownership and incorporation tend to increase the use of many MA techniques (Mclellan 2011). Therefore, managers in the LMLMCs should develop their costing systems.

### 6.6 Comparing the Accuracy, Cost-Plus and Ownership:

The Crosstabulation descriptive technique is used to compare accuracy, cost-plus and ownership. The results are presented in Table 6.5. It was found that 29 per cent of privately-owned companies are reported slightly accurate product costs and they never or rarely use of cost-plus pricing method. On the other hand, 35 per cent of state-owned companies are reported slightly accurate product costs and always use of cost-plus pricing method. There is only one state-owned company which always uses cost-plus pricing method and reports extremely accurate product costs.

This could be interpreted as the LMLMCs do not update their costing systems in order to achieve more accurate product costs. However, the situation in Egypt is different; the most important function of costing information there is pricing decisions by means of cost-plus method, (Triest and Elshahat 2007).

**Table 6.5 Comparison Between Accuracy, Cost-Plus and Ownership**

| Cost-Plus Pricing, Accuracy and Ownership Crosstabulation | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Accuracy | | | | | | | | | | | |
| | | | Not Accurate at all | | Little Accurate | | Moderate | | Slightly Accurate | | Extremely Accurate | | | |
| Ownership | | | F | % | F | % | F | % | F | % | F | % | F | % |
| State-Owned | By cost-plus pricing | Never | 0 | 0 | 1 | .06 | 0 | 0 | 0 | 0 | 1 | .06 | 2 | .12 |
| | | Rarely | 0 | 0 | 1 | .06 | 0 | 0 | 1 | .06 | 0 | 0 | 2 | .12 |
| | | Sometimes | 0 | 0 | 1 | .06 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | .06 |
| | | Often | 1 | .06 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | .06 | 2 | .12 |
| | | Always | 1 | .06 | 1 | .06 | 1 | .06 | 6 | .35 | 1 | .06 | 10 | .59 |
| | Total | | 2 | .12 | 4 | .24 | 1 | .06 | 7 | .41 | 3 | .18 | 17 | 100 |
| Private-Owned | By cost-plus pricing | Never | 0 | 0 | 2 | .06 | 1 | .03 | 7 | .23 | 0 | 0 | 10 | .33 |
| | | Rarely | 1 | .03 | 2 | .06 | 0 | 0 | 2 | .06 | 1 | .03 | 6 | .20 |
| | | Sometimes | 0 | 0 | 1 | .03 | 0 | 0 | 3 | .10 | 0 | 0 | 4 | .13 |
| | | Often | 1 | .03 | 2 | .06 | 0 | 0 | 3 | .10 | 0 | 0 | 6 | .20 |
| | | Always | 1 | .03 | 2 | .06 | 0 | 0 | 1 | .03 | 0 | 0 | 4 | .13 |
| | Total | | 3 | .10 | .33 | .30 | 1 | .03 | 16 | .53 | 1 | .03 | 30 | 100 |

### 6.7 Comparing the Diversity, Accuracy and Ownership:

The Crosstabulation descriptive technique is used to compare diversity, accuracy and ownership. The results are presented in Table 6.6.

**Table 6.6 Comparison Between Diversity, Accuracy and Ownership:**

| Diversity, Accuracy and Ownership Crosstabulation | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Accuracy | | | | | | | | | | | |
| | | | Not Accurate at all | | Little Accurate | | Moderate | | Slightly accurate | | Extremely Accurate | | | |
| Ownership | | | F | % | F | % | F | % | F | % | F | % | F | % |
| Stately-owned | Diversity | Strongly agree | 0 | 0 | 0 | 0 | 0 | 0 | 1 | .06 | 0 | 0 | 1 | .06 |
| | | Agree | 0 | 0 | 0 | 0 | 0 | 0 | 6 | .35 | 2 | .12 | 8 | .47 |
| | | Neither disagree nor agree | 1 | .06 | 0 | 0 | 1 | .06 | 0 | 0 | 1 | .06 | 3 | .18 |
| | | Disagree | 1 | .06 | 3 | .18 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | .24 |
| | | Strongly disagree | 0 | 0 | 1 | .06 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | .06 |
| | Total | | 2 | .12 | 4 | .24 | 1 | .06 | 7 | .41 | 3 | .18 | 17 | .100 |
| Privately-owned | Diversity | Strongly agree | 0 | 0 | 1 | .03 | 0 | 0 | 5 | .17 | 1 | .03 | 7 | .24 |
| | | Agree | 0 | 0 | 0 | 0 | 1 | .03 | 9 | .30 | 0 | 0 | 10 | .33 |
| | | Neither disagree nor agree | 0 | 0 | 0 | 0 | 0 | 0 | 1 | .03 | 0 | 0 | 1 | .03 |
| | | Disagree | 3 | .10 | 7 | .24 | 0 | 0 | 1 | .03 | 0 | 0 | 11 | .37 |
| | | Strongly disagree | 0 | 0 | 1 | .03 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | .03 |
| | Total | | 3 | .10 | 9 | .30 | 1 | .03 | 16 | .53 | 1 | .03 | 30 | .100 |

According to the above table, it was found that there is no state-owned company reported extremely accurate product costs when produces variety of products. Only one privately-owned company that reported extremely accurate product costs when it produces variety

of products. This confirms that almost all the LMLMCs do not consider the importance of updating their costing systems in order to calculate accurate product costs, and capture more advantages of accurate CA systems to be competitive in high competition markets. In this regard, Banker et al. (2008) suggest that ABC system was designed to provide managers with accurate activity-based cost information by using cost drivers to assign activity costs to products and services. Therefore, ABC system is preferable to be adopted by the LMLMCs.

### 6.8 Comparing the Competition, Cost-Plus and Ownership

The Crosstabulation descriptive technique is used to compare competition, cost-plus pricing method and ownership. The results are presented in Table 6.7. It was found that 34 per cent of privately-owned companies are facing very high or high level of competition and they never or rarely use of cost-plus pricing method. On the other hand, 26 per cent of the LMLMCs of state-owned companies are facing very low or low level of competition and often or always using of cost-plus pricing method. The result confirm that 34 per cent of privately-owned companies are facing very high or high level of competition and never or rarely using of costing systems. This indicates that they are calculating inaccurate product costs.

**Table 6.7 Comparison Between Competition, Cost-Plus and Ownership**

| Cost-Plus Pricing, Competition, and Ownership Crosstabulation | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Competition | | | | | | | | | | | |
| | | | Very low | | Low | | Moderate | | High | | Very high | | | |
| Ownership | | | F | % | F | % | F | % | F | % | F | % | F | % |
| State-Owned | By Cost-Plus Pricing | Never | 0 | 0 | 1 | .06 | 0 | 0 | 0 | 0 | 1 | .06 | 2 | .12 |
| | | Rarely | 0 | 0 | 0 | 0 | 0 | 0 | 1 | .06 | 1 | .06 | 2 | .12 |
| | | Sometimes | 0 | 0 | 1 | .06 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | .06 |
| | | Often | 1 | .06 | 1 | .06 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | .12 |
| | | Always | 9 | .53 | 1 | .06 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | .59 |
| | | Total | 10 | .59 | 4 | .24 | 0 | 0 | 1 | .06 | 2 | .12 | 17 | .100 |
| Privately -Owned | By Cost-Plus Pricing | Never | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | .21 | 10 | .33 |
| | | Rarely | 0 | 0 | 0 | 0 | 0 | 0 | 2 | .06 | 4 | .13 | 6 | .20 |
| | | Sometimes | 0 | 0 | 0 | 0 | 1 | .03 | 0 | 0 | 3 | .10 | 4 | .13 |
| | | Often | 3 | .10 | 0 | 0 | 0 | 0 | 1 | .03 | 2 | .06 | 6 | .20 |
| | | Always | 3 | .10 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | .03 | 4 | .13 |
| | | Total | 6 | .20 | 0 | 0 | 1 | .03 | 3 | .10 | 20 | .66 | 30 | .100 |

### 6.9 Comparing the Accuracy, Way of Marketing Products and Ownership:

The Crosstabulation descriptive technique is used to compare accuracy, way of marketing products and ownership. The results are presented in Table 6.8. From the table 6-8 we understand that 24 per cent of the state-owned companies are marketing slightly standardized products and reporting slightly accurate products costs. While 23 per cent of the privately-owned companies are marketing highly standardized products and reporting extremely accurate products costs. Moreover, the data show that almost all the LMLMCs

are not calculating highly accurate product costs. Actually, Libyan decision makers do not consider the importance of calculating accurate product costs to capture more advantages in the competitive markets.

**Table 6.8 Comparing the Accuracy, Way of marketing Products and Ownership:**

| The Way of Marketing Products, Accuracy and Ownership Crosstabulation | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ownership | | | Accuracy | | | | | | | | | | | |
| | | | Not accurate at all | | Little accurate | | Moderate | | Slightly accurate | | Extremely accurate | | | |
| | | | F | % | F | % | F | % | F | % | F | % | F | % |
| State-owned | The way of marketing products | * | 0 | 0 | 1 | .06 | 1 | .06 | 1 | .06 | 1 | .06 | 4 | .24 |
| | | ** | 0 | 0 | 1 | .06 | 0 | 0 | 4 | .24 | 1 | .06 | 6 | .35 |
| | | *** | 0 | 0 | 0 | 0 | 0 | 0 | 1 | .06 | 0 | 0 | 1 | .06 |
| | | **** | 1 | .06 | 1 | .06 | 0 | 0 | 0 | 0 | 1 | .06 | 3 | .18 |
| | | ***** | 1 | .06 | 1 | .06 | 0 | 0 | 1 | .06 | 0 | 0 | 3 | .18 |
| | Total | | 2 | .12 | 4 | .24 | 1 | .06 | 7 | .41 | 3 | .18 | 17 | 100 |
| Privately-owned | the way of marketing products | * | 2 | .06 | 4 | .13 | 0 | 0 | 7 | .23 | 1 | .03 | 14 | .47 |
| | | ** | 0 | 0 | 3 | .10 | 1 | .03 | 4 | .13 | 0 | 0 | 8 | .27 |
| | | *** | 0 | 0 | 1 | .03 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | .03 |
| | | **** | 0 | 0 | 0 | 0 | 0 | 0 | 3 | .10 | 0 | 0 | 3 | .10 |
| | | ***** | 1 | .03 | 1 | .03 | 0 | 0 | 2 | .06 | 0 | 0 | 4 | .13 |
| | Total | | 3 | .10 | 9 | .30 | 1 | .03 | 16 | .53 | 1 | .03 | 30 | 100 |

*Highly standardised. **Slightly standardised. ***Moderately standardised and moderately customised. **** Slightly customised. *****Totally customised.

## 6.10 Summary

It was found that the LMLMCs are facing very high or high competition. 38.2 per cent of them are marketing highly standardized or slightly standardized products and never or rarely using cost-plus pricing method in setting their prices. Alternatively, they always or often trace the mechanism of market prices or compare their costs by the current market prices. On the other hand, when they sell highly customized or slightly customized product, a few (2.1 per cent) of the respondents indicated that they can always or often set their prices by means of the cost plus pricing method when competition is very high or high. This situation could be interpreted that the companies cannot use their costing systems to determine their product's prices due to their inability to calculate accurate product costs.

On the other hand, when the LMLMCs are facing very low or low competition, 23.4 per cent of the respondents indicated that they always or often set their prices by means of the cost plus pricing method when they sell highly standardized or slightly standardized products. This confirmed by all the interviewees of public-owned companies. Their companies are still working in a protected industrial environment.

On the other hand, 38.2 per cent of the respondents indicated that their costing systems offer little or no accuracy at all. 27.6 per cent of them adopted the blanket-overhead method and they produced products with very high or high product diversity. Thus, those

companies which adopt the blanket-overhead method and produce different products reported distorted product costs due to their overheads being consumed differently.

In addition, the results suggested that 34 per cent of the privately-owned companies are facing very high or high level of competition and never or rarely using costing systems in setting their prices. This indicated that they are calculating inaccurate product costs which could be interpreted as a weakness in the LMLMCs in updating their costing systems. Almost all the LMLMCs (privately-owned and state-owned) do not calculate highly accurate product costs. Actually, Libyan decision makers do not consider the importance of calculating accurate product costs to guarantee more advantages in the competitive markets.

# Chapter 7

# Hypotheses Testing and Related Statistical Data Analyses

## 7.1 Introduction

This chapter aims to analyze the research hypotheses concerning the CA system design in terms of product costs. The questionnaire survey was designed to collect data about the contingent factors that influence the accuracy of product costs in the LMLMCs. Statistical analysis tools (the Mann-Whitney and the Correlation Coefficient) were used in order to interpret the collected data. Section B of the questionnaire was designed to collect data about the contingent factors that influence the accuracy of product costs in the LMLMCs. Also section F is designed to collect data about constraints that currently obstruct the LMLMCs not to develop their CA systems which will be tested.

## 7.2 Testing of Hypotheses Concerning Factors Influencing the Accuracy of Product Costs in the LMLMCs:

Contingent factors (Product diversity, degree of customization, size of the firm and the competition) were tested by The Mann-Whitney and Spearman Correlation tests.

### 7.2.1 Cost Structure of the Company:

The Mann-Whitney test is applied between subsection B4.2 (concerning indirect costs) and E.4 (concerning accuracy). The result is shown in Table 7.1.

**Table 7.1 Indirect Costs of the Cost Structure:**

| Ranks | | | | |
|---|---|---|---|---|
| | Indirect costs | N | Mean Rank | Sum of Ranks |
| Accuracy | Less than average of 18 | 26 | 23.90 | 621.50 |
| | Above than average of 18 | 21 | 24.12 | 506.50 |
| | Total | 47 | | |

| Test Statistics | |
|---|---|
| | Accuracy |
| Mann-Whitney U | 270.500 |
| Asymp. Sig. (2-tailed) | .954 |
| a. Grouping Variable: indirect costs | |

From Table 7.1, it can be seen that the Mann-Whitney test showed an insignificant number (.954), which is above 0.05. So H1 [the higher the level of indirect costs, the lower the level of accuracy of product costs] should be rejected and confirm that the indirect costs have no influence on the accuracy of product costs.

### 7.2.2 The Intensity of Competition and the Level of Accuracy:

The Spearman Correlation test is applied between section B.5 (concerning competition) and E3 (concerning the accuracy of product costs). The result is shown in Table 7.2. From Table 7.2, it can be seen that the Spearman Correlation value is equal to a positive

number (.076) and the significant number (.612) is above 0.05 (P value). So it should be rejected that there is a relationship between the level of intensity of competition and the level of accuracy. Therefore, H2 (the higher the level of intensity of competition, the lower the level of accuracy of product costs) should be rejected.

**Table 7.2 The Intensity of Competition and the Level of Accuracy:**

| | | | Competition | Accuracy |
|---|---|---|---|---|
| Spearman's Correlation | Competition | Correlation Coefficient | 1.000 | .076 |
| | | Sig. (2-tailed) | . | .612 |
| | | N | 47 | 47 |
| | Accuracy | Correlation Coefficient | .076 | 1.000 |
| | | Sig. (2-tailed) | .612 | . |
| | | N | 47 | 47 |

### 7.2.3 Cost-Plus pricing and Competition:

The Spearman Correlation test is applied between section competition and cost-plus pricing method. The result is shown in Table 7.3.

**Table 7.3 Correlation Between Cost-Plus Pricing and Competition:**

| | | | Cost-plus | Competition |
|---|---|---|---|---|
| Spearman's test | Cost-plus | Correlation Coefficient | 1.000 | -.741** |
| | | Sig. (1-tailed) | . | .000 |
| | | N | 47 | 47 |
| | Competition | Correlation Coefficient | -.741** | 1.000 |
| | | Sig. (1-tailed) | .000 | . |
| | | N | 47 | 47 |
| **. Correlation is significant at the 0.01 level (1-tailed). | | | | |

From Table 7.3, it can be seen that the Spearman Correlation value equal to negative number (-.741) with significant number (.000) is less than 0.05 (P value). So it could be accepted that there is a strong negative relationship between the level of intensity of competition and the level of use of cost-plus pricing. Therefore, H3 which stated that the higher the level of intensity of competition, the lower the level of cost-plus pricing method used should be accepted.

### 7.2.4 Diversity and Accuracy:

The Spearman Correlation test is applied between subsection B1.1 (concerning diversity) and E.4 (concerning accuracy of product costs). The result is shown in Table 7.4.

**Table 7.4 Correlation Between Diversity and Accuracy:**

| | | | Accuracy | Diversity |
|---|---|---|---|---|
| Spearman's test | Accuracy | Correlation Coefficient | 1.000 | -.849 |
| | | Sig. (1-tailed) | . | .000 |
| | | N | 47 | 47 |
| | Diversity | Correlation Coefficient | -.849 | 1.000 |
| | | Sig. (1-tailed) | .000 | |
| | | Total | 47 | 47 |

From Table 7.4, it can be seen that the Spearman Correlation value equal to negative number (-.849) with significant number (.000) is less than 0.05 (P value). So it could be accepted that there is a strong negative relationship between the level of product diversity within a firm and the level of accuracy of product costs. As a result, the factor of diversity affected the level of accuracy of product costs. So the hypothesis H4 (the higher

the level of product diversity within a firm, the lower the level of accuracy) should be accepted.

### 7.2.5 Diversity and Overhead Consumption:

The Spearman Correlation test is applied between subsection B.1.1 (concerning diversity) and B.1.2 (concerning overhead consumption). The result is shown in Table 7.5.

**Table 7.5 Correlation Between Diversity and Overhead Consumption:**

| | | | **Diversity** | **Overhead consumption** |
|---|---|---|---|---|
| Spearman's test | Diversity | Correlation Coefficient | 1.000 | .984 |
| | | Sig. (1-tailed) | - | .000 |
| | | N | 47 | 47 |
| | Overhead consumption | Correlation Coefficient | .984 | 1.000 |
| | | Sig. (1-tailed) | .000 | - |
| | | N | 47 | 47 |

From Table 7.5, it can be seen that the Spearman Correlation value equal to a positive number (.985) with significant number (.000) is less than 0.05 (P value). So we could accept that there is strong positive relationship between the level of product diversity within a firm and the higher the level of resources consumed differently. As a result, the factor of diversity affected the consumption of overhead costs. So the hypothesis (H5) which states that the higher the level of product diversity within a firm, the higher the level of resources consumed differently should be accepted.

In this regard, Kaplan (1990) states that when companies produce a high range of different products, then, there is a need to adopt a sophisticated CA system (ABC). ABC can measure the resources consumed by products, with a higher number of production centres (pools) and cost drivers. On the other hand, the two questions concerning the product diversity within a firm and the overhead consumption are asked separately to the respondents, they replied with the same answers. This is confirmed by the strong positive correlation (.984).

### 7.2.6 The level of Customization and Accuracy:

The Spearman Correlation test is applied between section B.2 (concerning the level of customization) and E.4 (concerning accuracy). The result is shown in Table 7.6.

**Table 7.6 Correlation Between the Level of Customization and Accuracy:**

| **Correlation** | | | | |
|---|---|---|---|---|
| | | | **The level of customization and accuracy** | **Accuracy** |
| Spearm-an's rho | The level of customization and accuracy | Correlation Coefficient | 1.000 | -.087 |
| | | Sig. (1-tailed) | - | .280 |
| | | N | 47 | 47 |
| | Accuracy | Correlation Coefficient | -.087 | 1.000 |
| | | Sig. (1-tailed) | .280 | - |
| | | N | 47 | 47 |

From Table 7.6, it can be seen that the Spearman Correlation value is equal to a negative number (-.087) and the significant number (.280) is above than 0.05 (P value). So it could

be rejected that there is a relationship between the level of customization and the level of accuracy. Therefore, the H6 which states that the higher the level of customization within a firm, the lower the level of calculating accurate product costs should be rejected.

### 7.2.7 Ownership:

The Correlation test is applied between section A.6 (concerning ownership) and E.4 (concerning accuracy). The result is shown in Table 7.7.

**Table 7.7 Correlation Test Between Ownership and Accuracy:**

| Correlation | | | | |
|---|---|---|---|---|
| | | | Ownership | Accuracy |
| Spearman's rho | Ownership | Correlation Coefficient | 1.000 | -.092 |
| | | Sig. (2-tailed) | - | .541 |
| | | N | 47 | 47 |
| | Accuracy | Correlation Coefficient | -.092 | 1.000 |
| | | Sig. (2-tailed) | .541 | - |
| | | N | 47 | 47 |

From Table 7.7, it can be seen that the Spearman Correlation value is equal to a negative number (-.092) and the significant number (.541) is above than 0.05 (P value). So it could be rejected that there is a relationship between the level of ownership and the level of accuracy. So it should be rejected the H7 (the ownership of the firm, has significant influence on the level of accuracy of product costs) and could be accepted that the size has no relationship with the accuracy of product costs calculation.

### 7.2.8 Ownership and Cost-Plus Pricing:

The Correlation test is applied between section A.6 (concerning ownership) and E.1.1 (concerning cost-plus pricing). The result is shown in Table 7.8.

**Table 7.8 Correlation Between Ownership and Cost-Plus Pricing:**

| Correlation | | | |
|---|---|---|---|
| | | By cost-plus pricing | Ownership |
| By cost-plus pricing | Pearson Correlation | 1 | -.404** |
| | Sig. (2-tailed) | - | .005 |
| | N | 47 | 47 |
| Ownership | Pearson Correlation | -.404** | 1 |
| | Sig. (2-tailed) | .005 | - |
| | N | 47 | 47 |
| **. Correlation is significant at the 0.01 level (2-tailed). | | | |

From Table 7.8 it can be seen that the Spearman Correlation value is equal to a negative number (-.404) and with significant number (.005) is less than 0.05 (P value). So it could be accepted that there is a strong negative relationship between the level of ownership and the level of cost-plus pricing method. So H8 (the ownership of the firm, has significant influence on the level of cost-plus pricing) can be accepted.

### 7.2.9 Size of the Firm and the Accuracy:

The Correlation test is applied between section A.8 (concerning paid-up capital) and E.4 (concerning accuracy). The result is shown in Table 7.9. From Table 7.9, it can be seen that the Spearman Correlation value equal to positive number (.170) and the significant

number (.253) is above 0.05 (P value). So H9 should be rejected (the larger size of the firm, the higher the level of accuracy of product costs calculated) and can be suggested that the size has no influence on the accuracy of product costs.

**Table 7.9 The Correlation Test Between Size of the Firm and Accuracy:**

| Correlation | | | | |
|---|---|---|---|---|
| | | | Paid-up capital | Accuracy |
| Spearman's rho | Paid-up capital | Correlation Coefficient | 1.000 | .170 |
| | | Sig. (2-tailed) | - | .253 |
| | | Total | 47 | 47 |
| | Accuracy | Correlation Coefficient | .170 | 1.000 |
| | | Sig. (2-tailed) | .253 | - |

### 7.2.10 Cost-Plus Pricing and Size of the Firm:

The Spearman Correlation test is applied between section A.8 (concerning size of the firm) and E.1.1 (concerning the adoption of cost-plus pricing method). The result is shown in Table 7.10.

**Table 7.10 Correlation Between Cost-Plus Pricing and Size of the Firm:**

| Correlation | | | |
|---|---|---|---|
| | | Paid-up capital | By cost-plus pricing |
| Paid-up capital | Pearson Correlation | 1 | .242 |
| | Sig. (2-tailed) | - | .102 |
| | N | 47 | 47 |
| By cost-plus pricing | Pearson Correlation | .242 | 1 |
| | Sig. (2-tailed) | .102 | - |
| | N | 47 | 47 |

From Table 7.10, it can be seen that the Spearman Correlation value is equal to a positive number (.242) with significant number (.102) is above 0.05 (P value). So it could be rejected that there is a strong relationship between the level of size of the company and the level of use of cost-plus pricing. Therefore, H10 which stated that the higher the level of size of the company, the higher the level of cost-plus pricing method used, should be rejected.

## 7.3 Statistical Analyses of the Important Factors Restricting the CA Development:

The Wilcoxon test is applied between the important factors restricting the CA development and the assumed value ($\mu_0 = 3$).

### 7.3.1 Important Factors Restricting the CA System Development:

According to section F.4 in the questionnaire is designed to collect data about factors affecting the CA development. In order to determine the important factors the Wilcoxon test is applied. The results are presented in Table 7.11. From Table 7.11, we can note that the following reasons with high acceptance (the mean of statements excess 3) is statistically significant numbers (less than 0.05):

1- Absence of any internal leadership who drive the idea of developing your company's cost allocation system;
2- Lack of specialist managerial accountants in our company;

3- Lack of top-management support;

4- Lack of active training programs in the CA systems;

5- Centralization of decision-making;

6- It is extremely expensive to up-date or redesign current CA system;

7- Absence of professional cost or managerial accounting bodies in Libya.

**Table 7.11 Important Factors Restricting the CA Development:**

| The important reasons | N | Mean | Degree of acceptance | Wilcoxon | Sig. |
|---|---|---|---|---|---|
| Absence of any internal leadership who drive the idea of developing your company's cost allocation system | 40 | 4.725 | High | -5.789 | .000 |
| Lack of specialist managerial accountants in our company | 40 | 4.675 | High | -5.704 | .000 |
| Lack of top-management support | 40 | 4.625 | High | -5.619 | .000 |
| Lack of active training programs in the CA systems | 40 | 4.600 | High | -5.401 | .000 |
| Centralization of decision-making | 39 | 4.512 | High | -5.392 | .000 |
| It is extremely expensive to up-date or redesign current CA system | 40 | 4.375 | High | -5.006 | .000 |
| Absence of professional cost or managerial accounting bodies in Libya | 40 | 4.375 | High | -4.782 | .000 |
| Narrowness and insignificance of the indirect cost proportion | 40 | 3.100 | High | -.583 | .560 |
| Low degree of competition | 40 | 3.000 | High | -.444 | .657 |
| Lack of financial ability | 40 | 2.475 | Moderate | -2.056 | 000 |
| Lack of an independent cost accounting department in our company | 40 | 2.200 | Low | -3.065 | .002 |

*Wilcoxon Signed Ranks Test, Based on negative ranks.*

So the null hypothesis must be rejected (that is no significant difference between the above important reasons and the assumed value) and accept that there is a difference between them. The hypothesis 11, which states that external and internal environmental factors have an important impact on the Libyan cost allocation development, should be accepted, and believe that the above listed reasons are the important factors that affected the CA development in the LMLMCs in regardless of the organization's size or ownership.

### 7.3.2 The Effect of the Size of the Companies:

With regard to the organization's size, statistically, the Wilcoxon test is applied between the important factors that affect the CA development and the assumed value ($\mu_0 = 3$). The results are presented in Table 7.12.

**Table 7.12 Statistical Results Related to the Important Factors Effecting the CA Development in Medium-Sized Companies:**

| Statement | Company's size | N | Mean | Degree of acceptance | Wilcoxon | Sig. |
|---|---|---|---|---|---|---|
| Lack of financial ability | Medium | 12 | 4.000 | High | -3.145 | .002 |
| | Large | 26 | 1.6071 | Low | -4.124 | .000 |
| Low level of competition | Medium | 12 | 2.000 | Low | -.947 | .344 |
| | Large | 28 | 3.1429 | High | -.188b | .851 |
| Narrowness and insignificance degree of the indirect cost proportion | Medium | 12 | 4.000 | High | -.368 | .713 |
| | Large | 28 | 3 | Moderate | -.851 | .395 |
| Lack of an independent cost accounting department in our company | Medium | 12 | 4.000 | High | -2.425 | .015 |
| | Large | 28 | 1.3214 | Low | -4.614 | .000 |

*Wilcoxon Signed Ranks Test, Based on negative ranks.*

From Table 6.12, we can see that the following reasons with high acceptance (the mean of statements excess 3.5) reported statistically significant numbers (less than 0.05):

1- Lack of financial ability;

2- Lack of an independent cost accounting department.

3- So the null hypothesis must be rejected and accept that there is a difference between them. As a result, the above listed reasons are the additional important factors affecting the CA development in medium-sized companies.

### 7.3.3 The Effect of Ownership of the Companies:

With regard to the organization's ownership, statistically, the Wilcoxon test is applied between the important factors that affected the CA system's development, and the assumed value ($\mu_0 = 3$). The results are presented in Table 7.13.

**Table 7.13 The Effect of Ownership:**

| Statement | Company's size | N | Mean | Degree of acceptance | Wilcoxon | Sig. |
|---|---|---|---|---|---|---|
| Low level of competition | State-owned | 15 | 4.3571 | High | -3.069 | .002 |
| | Privately-owned | 25 | 2.2308 | Low | -2.040 | .041 |
| Narrowness and insignificance degree of the indirect cost proportion | State-owned | 15 | 3.6923 | High | -.243 | .808 |
| | Privately-owned | 25 | 3.1923 | High | -.884 | .377 |

*Wilcoxon Signed Ranks Test, Based on negative ranks.*

From Table 7.13, it could be seen that only one reason (low level of competition) with high acceptance (the mean of statements in excess of 3.5) is reported statistically significant numbers (less than 0.05). So we must reject the null hypothesis and accept that there is a difference between them. As a result, the above reason is the additional important factor that affected the CA system development in the state-owned companies.

**7.4 Summary:**

This chapter has analyzed the research hypotheses concerning the CA system design in terms of product costs. Statistical analysis tools (the Mann-Whitney and the Correlation Coefficient) were used in order to interpret the collected data. The analyzed data was concerned with the contingent factors that influence the accuracy of product costs in the LMLMCs. The results were as follows:

- Firstly, the Mann-Whitney test has rejected H1 [the higher the level of indirect costs, the lower the level of accuracy of product costs calculated] and confirm that the indirect costs have no influence on the accuracy of product costs.
- Secondly, the Spearman Correlation value has rejected that there is a relationship between the level of intensity of competition and the level of accuracy. Therefore, H2 (the higher the level of intensity of competition, the lower the level of accuracy of product costs) should be rejected.
- Thirdly, the Spearman Correlation test has accepted that there is a strong negative

relationship between the level of intensity of competition and the level of use of cost-plus pricing. Therefore, H3 which stated that the higher the level of intensity of competition, the lower the level of cost-plus pricing method used should be accepted.

- Fourthly, the Spearman Correlation test has accepted that there is a strong negative relationship between the level of product diversity within a firm and the level of accuracy of product costs. As a result, the factor of diversity affected the level of accuracy of product costs. So the hypothesis H4 (the higher the level of product diversity within a firm, the lower the level of accuracy) should be accepted.
- Fifthly, the Spearman Correlation test has accepted that there is strong positive relationship between the level of product diversity within a firm and the higher the level of resources consumed differently. As a result, the factor of diversity affected the consumption of overhead costs. So the hypothesis (H5) which states that the higher the level of product diversity within a firm, the higher the level of resources consumed differently should be accepted.
- Sixthly, the Spearman Correlation test has rejected that there is a relationship between the level of customization and the level of accuracy. Therefore, the H6 which states that the higher the level of customization within a firm, the lower the level of calculating accurate product costs should be rejected.
- Seventhly, the Spearman Correlation test has rejected that there is a relationship

between the level of ownership and the level of accuracy. So it should be rejected the H7 (the ownership of the firm, has significant influence on the level of accuracy of product costs) and could be accepted that the size has no relationship with the accuracy of product costs calculation.

- Eighthly, the Spearman Correlation test has accepted that there is a strong negative relationship between the level of ownership and the level of cost-plus pricing method. So H8 (the ownership of the firm, has significant influence on the level of cost-plus pricing) can be accepted.
- Ninthly, the Spearman Correlation test has rejected (the higher the larger size of the firm, the higher the level of accuracy of product costs calculated) and can be suggested that the size has no influence on the accuracy of product costs.
- Finally, the Spearman Correlation test has rejected that there is a strong relationship between the level of size of the company and the level of use of cost-plus pricing. Therefore, H10 which stated that the higher the level of size of the company, the higher the level of cost-plus pricing method used, should be rejected.

On the other hand, the Wilcoxon test has accepted that the flowing reasons or constraints are importantly obstructed the development of the CA systems in the LMLMCs:

1- Absence of any internal leadership who drive the idea of developing your company's cost allocation system;

2- Lack of specialist managerial accountants in our company;

3- Lack of top-management support;

4- Lack of active training programs in the CA systems;

5- Centralization of decision-making;

6- It is extremely expensive to up-date or redesign current CA system;

7- Absence of professional cost or managerial accounting bodies in Libya.

So the null hypothesis must be rejected (that is no significant difference between the above important reasons and the assumed value) and accept that there is a difference between them. The hypothesis 11, which states that external and internal environmental factors have an important impact on the Libyan cost allocation development, should be accepted, and believe that the above listed reasons are the important factors that affected the CA development in the LMLMCs regardless of the organization's size or ownership.

With regard to the organization's size, statistically, the Wilcoxon test has accepted that the following reasons significantly influence the CA systems in medium-sized companies:

1- Lack of financial ability;

2- Lack of an independent cost accounting department.

So the null hypothesis must be rejected and accept that there is a difference between them. As a result, the above listed reasons are the additional important factors affecting the CA development in medium-sized companies.

With regard to the organization's ownership (privately-owned and state-owned), statistically, the Wilcoxon test has accepted that the low level of competition is the only unique important factor that affected the CA development in state-owned companies.

# Chapter 8

# Conclusion and Recommendations for Farther Research

## 8.1 Introduction

The main aim of this research was to investigate the Libyan manufacturing companies' cost allocation (CA) system design in terms of product, factors influencing the level of accuracy of their product costs and the factors that constrict their CA development. The focus is on the costing of physical products produced in the LMLMCs and the uses of these costs in decision-making in general and pricing-decisions in particular. Therefore, this study has recommended the using of ABC system that calculate accurate product costs and can support the Libyan decision-makers' strategic decisions. In addition, variable or contribution costing system should be adopted by the LMLMCs which facing high levels of competition.

However, in order to achieve the aims and objectives of this study, review of theoretical and empirical literature was undertaken. Thus, the theoretical study framework emerged. In order to examine the factors that influenced the CA system design and development, the related hypotheses are formulated. A summary of the important findings of the descriptive statistical analyses was presented and relevant multivariate statistical techniques were used to analyse the factors and constraints that affected the CA system design and development.

## 8.2 Summary of the Research Findings:

This chapter will also explain the motivational factors that have encouraged the current study. The final section outlines the limitations of this research and the proposed future research directions. This section presents summary of the main research findings.

### 8.2.1 The Findings of the Descriptive Statistics:

The main aim of this research is to investigate the Libyan manufacturing companies' CA system design in terms of product. Firstly, descriptive analyses are used to understand the following objectives, the extent of using full product cost in decision-making especially in pricing decisions; the extent of calculating accurate product costs; the impact of the financial accounting mentality on product costs used in decision-making. Thus, the study achieved the following results:

Firstly, with regard to the industrial environment (product diversity, degree of customization, type of industry, size of the firm and the competition) in the LMLMCs, it is found that:

- The majority (55.3 per cent) of the LMLMCs produce about the same products (no diversity), while, 36.2 per cent produce different products.

- The majority (57.5 per cent) of the LMLMCs reported that the overhead costs are consumed at the same rate, while, 36.2 per cent of the overhead costs are consumed differently.
- The majority (55.3 per cent) of the participants indicated that their companies are facing very high or high levels of competition, while 42.5 per cent are facing very low or low levels of competition.
- Most of the respondents (68.1 per cent) indicated that they are marketing a highly or slightly standardized product, while, 27.7 per cent of the respondents indicated that they are marketing a slightly or totally standardized product.
- Most of the respondents (78.7 per cent) indicated that they are using a slight automation level.
- The average of all direct costs averaged 81.53 per cent (between minimum and maximum averages 62 per cent and 93 per cent). while, the average of all indirect costs is 18.44 per cent (between minimum and maximum averages 7 per cent and 38 per cent).

Secondly, according to the relationship between management and financial accounting this study found the following results:

- Most of the respondents (70.2 per cent) indicated that their companies prepare overhead budgets.

- All of the participants indicated that they are using an absorption costing system.
- The majority (51.1 per cent) of the respondents indicated that their companies classify costs into direct, indirect, variable and fixed. A few (14.9 per cent) are classifying costs to variable and fixed costs
- Most the LMLMCs (87.2 per cent) maintained a single cost information system designed mainly for financial accounting purposes and subsequently adjusted to use for decision-making. While 10.6 per cent of them maintained single cost information system designed mainly for financial accounting purposes and also used for decision-making.
- According to the interviews, all the interviewees in the public sector (46.7 per cent) could not interpret why they are using fixed or an adjusted single cost information system and asserted that they had used these systems for a long time. On the other hand, with regards to the private sector, their answers were different as follows, some of them (33.3 per cent) could not interpret why they are using fixed or an adjusted single cost information system and no interpretation could be added, few (13.3 per cent) of them said that these systems are suggested by the external designer. Only one interviewee said that our company is organizing to design a new data-base system in the near future.
- All the respondents indicated that their companies include fixed asset deprecation expenses in product costs when preparing product costs for decision making,

while, 27.7 per cent are using irrelevant tax law rates in calculating the fixed assets depreciation expenses.

Thirdly, with regards to the cost system design for calculating product costs to aid decision-makers needs the following results are concluded:

- Most (68.1 per cent) of the respondents indicated that their companies are using blanket-overhead rates (plant-wide). 17 per cent of them are using two CA stages (in the first stage overhead costs are allocated to cost centres which represents work unit within department. In the second stage overhead allocation bases are established for each work unit to assign overheads to products). 12.8 per cent of the responding companies are using two CA stages (in the first stage overheads are allocated to cost centres which represents departments. In the second stage overhead allocation bases are established for each department to assign overheads to products).
- Most of the respondents (68.1 per cent) indicated that their companies are not aggregating cost in cost centers. 31.9 per cent maintained from less than five to twenty cost centres.
- Most (91.5 per cent) of the respondents indicated that their companies are using less than five allocation bases. 6.4 per cent using of 5-10 allocation bases, 2.1 per cent using of 16-20 allocation bases.

- According to the automated centres, the majority (51.1 per cent and 40.4 per cent) of the respondents indicated that their companies used the experience and weight of output respectively. The remaining are as follows, 21.3 per cent for direct labor hours\costs, 12.8 per cent for direct materials costs, 2.1 per cent for direct machine hours, 7 per cent for size of output, 8.5 per cent for no. of outputs (products), 2.1 per cent for transaction bases (ABC system). With regards to the manual centers, the majority (51.3 per cent and 35.9 per cent) of the respondents indicated that their companies used the experience and weight of output respectively. The remaining are as follows, 25.6 per cent for direct labor hours\costs, 12.8 per cent for direct materials costs, 15.4 per cent for size of output, 7.7 per cent for no. of out-puts (products) and 2.6 per cent for transaction bases (ABC system). It is apparent that 21.3 per cent of the respondent companies are calculating wrong and distorted product costs due to use of direct labor hours\costs in automated centers.
- According to the non-manufacturing costs, different cost allocation bases are used as follows:

- To allocate administrative costs, the respondents point out that they commonly use expert's opinions. Most (46.8 per cent) of the respondents indicate that they commonly use the judgment bases (experts opinions). 27.7 per cent use the basis of the selling price of each product, 8.5 per cent use the basis of employee numbers, 8.5 per cent charging them to profit and loss account, 2.1 per cent by

means of transactions and 6.4 per cent use other methods.

- To allocate the selling expenses, the respondents indicated that the most (44.4 per cent) common allocation base is the expert's opinion. 38.9 per cent use the basis of the selling price of each product, 8.5 per cent use the basis of employee numbers, 8.3 per cent charge them to profit and loss account, and 2.8 per cent by means of transactions, 5.6 per cent use other methods.
- To allocate the distribution expenses, the respondents indicated that the most (42.1 per cent) common base is the expert's opinions. 36.8 per cent use the basis of the selling price of each product, 8.5 per cent using the basis of employee numbers, 15.8 per cent charge them to profit and loss account and 5.3 per cent by means of transactions.

  - According to the preparation time of cost information system, the respondents revealed that their companies prepare cost information as follows, 83 per cent annually, 53 per cent in irregular periods, 46.8 per cent quarter and annually and 12.8 per cent monthly.
  - With regard to the use of cost-plus pricing, the answers indicated that 46.8 per cent of the respondents always or often used the cost-plus pricing method. In contrast, 44.7 per cent often or always trace market prices or compare product cost with the prevailing market prices. Only a few (23.4 per cent) often or always base their products prices as directed by Libyan governmental authorities.

- According to the interviews, all the public companies (46.7 per cent) said that they are facing very low competition and there is a shortage in the local market, therefore, their companies can adopt cost-plus pricing method. On the other hand, in relation to the private sector, only the interviewee of the building materials said that their company is facing very low competition and confirmed there is a shortage in the local market, therefore, their company can price their products by means of cost plus pricing method.

- Most of the responding companies (80 per cent) use total costs (manufacturing and non-manufacturing costs) in cost-plus pricing. Some (13.3 per cent) use total cost minus fixed asset depreciation. A few (6.7 per cent) use manufacturing costs. None of the responding companies use variable\incremental costs.

- According to the interviews, it was noted that all of the interviewees of public sector said that they should calculate full product costs for pricing decisions and the reasons behind that as follows, for companies which produce fuel and pasta said that our government provide financial supports to fill the gap between the product costs and the market prices of any product that does not cover its cost percentage of profit. And companies which produce motor vehicles (assembly industry), tobacco, cement, building materials and metal said that they are facing very low competition and there is a shortage in the

local market. On the other hand, in relation to the private sector, only the interviewees of the building materials said that full product costs are used in pricing decisions because facing of very low competition. Only one of the interviewees in the chemical company who said they are using full product costs minus fixed assets depreciation and working with high quality in order to be able to work in the competitive market.

- In terms of accurate product costs, the majority (57.4 per cent) of the respondents showed that they reported extremely high or highly accurate costing systems. In contrast, 38.3 per cent reported no accuracy at all or a low level of accuracy.

Finally, concerning the Company's Progress in Allocating Costs to products, the findings are as follows:

- The majority (61.7) of the respondents indicated that they use slightly manually level of computerize system in preparing their costing systems. While a few (6.4 per cent) who indicated that they had used high level computerized system.
- Most of the respondents (89.4 per cent) have not made any significant developments during the past five years. For 83 per cent of them said that currently their CA system is suffering weaknesses and needs development. Only 12.8 per cent of the respondents indicated that their company has already

contracted external designers in order to develop (up-date or redesign) their CA system.

According to the interviews, some of them (33.3 per cent) have no knowledge about what ABC system is. The majority (66.667 per cent) of the interviewees have knowledge about this system is.

Different answers have given for not adopting the ABC system as follows:

- About 20 per cent of the state-owned interviewees have knowledge of ABC system. However, they said that the external local designers prefer designing traditional cost allocation system and encouraged them to adopt it.
- For 33.3 per cent of the privately-owned interviewees have knowledge of this system but they asserted that such system is not common in Libya.
- For 13.3 per cent of the privately-owned interviewees have knowledge of this system but they highlighted that most managers were engineers and not specialized in accounting and they did not understand the benefit of contemporary CA systems.

**8.2.2 Comparing the Research Variables:**

According to the comparison analysis between the research variables:

- It was found that the LMLMCs are facing very high or high competition. 38.2 per

cent of them are marketing highly standardized or slightly standardized products and never or rarely using cost-plus pricing method in setting their prices. Alternatively, they always or often trace the mechanism of market prices or compare their costs by the current market prices.

- On the other hand, when they sell highly customized or slightly customized product, a few (2.1 per cent) of the respondents indicated that they can always or often set their prices by means of the cost plus pricing method when competition is very high or high. This situation could be interpreted that the companies cannot use their costing systems to determine their product's prices due to their inability to calculate accurate product costs.
- When the LMLMCs are facing very low or low competition, 23.4 per cent of the respondents indicated that they always or often set their prices by means of the cost plus pricing method when they sell highly standardized or slightly standardized products. This confirmed by all the interviewees of public-owned companies. Their companies are still working in a protected industrial environment.
- On the other hand, 38.2 per cent of the respondents indicated that their costing systems offer little or no accuracy at all. 27.6 per cent of them adopted the blanket-overhead method and they produced products with very high or high product diversity. Thus, those companies which adopt the blanket-overhead method and produce different products reported distorted product costs due to

their overheads being consumed differently.

- In addition, the results suggested that 34 per cent of the privately-owned companies are facing very high or high level of competition and never or rarely using costing systems in setting their prices. This indicated that they are calculating inaccurate product costs which could be interpreted as a weakness in the LMLMCs in updating their costing systems.
- Almost all the LMLMCs (privately-owned and state-owned) do not calculate highly accurate product costs. Actually, Libyan decision makers do not consider the importance of calculating accurate product costs to guarantee more advantages in the competitive markets.

### 8.2.3 Findings of the Statistical Analyses

Firstly, the Findings of the Statistical Analyses of Important Factors Influencing the Accuracy of CA System Design:

- The Mann-Whitney test has rejected that there is a relationship between the proportion of indirect costs and the level of accuracy of product costs. So hypothesis 1 (the higher the level of indirect costs, the lower the level of accuracy of product costs calculated] should be rejected and accept that the cost structure has no influence on the accuracy of product costs.
- Also the Spearman Correlation has rejected that there is a relationship between

the level of intensity of competition and the level of accuracy. Therefore, the hypothesis 2 which stated that the higher the level of intensity of competition, the lower the level of accuracy of product costs calculated should be rejected.

- The Spearman Correlation has accepted that there is a strong negative relationship between the level of intensity of competition and the level of use of cost-plus pricing. Therefore, the hypothesis 3 which stated that the higher the level of intensity of competition, the lower the level of cost-plus pricing method used should be accepted.
- The Spearman Correlation has accepted that there is a strong negative relationship between the level of product diversity within a firm and the higher the level of accuracy of product costs. So the hypothesis 4 which stated that the higher the level of product diversity within a firm, the lower the level of accuracy, should be accepted.
- The Spearman Correlation has accepted that there is a strong positive relationship between the level of product diversity within a firm and the higher the level of resources consumed differently. So the hypothesis 5 which stated that the higher the level of product diversity within a firm, the higher the level of resources consumed differently, should be accepted.
- The Spearman Correlation has rejected that there is a relationship between the level of customization and the level of accuracy. Therefore, the hypothesis 6 (the higher the level of customization within a firm, the lower the level of calculating

accurate product costs), should be rejected.

- The Spearman Correlation has rejected that there is a relationship between the level of ownership and the level of accuracy. So hypothesis 7 (the ownership of the firm, has significant influence on the level of accuracy of product costs), should be rejected and believe that the size has no relationship with the accuracy of product costs.
- It was found that that there is a strong negative relationship between the level of ownership and the level of cost-plus pricing method. So H8 (the ownership of the firm, has significant influence on the level of cost-plus pricing), should be accepted.
- The Spearman Correlation test has rejected that there is a relationship between the size of the firm and the level of accuracy. So we must reject hypothesis 9 (the larger size of the firm, the higher the level of accuracy of product costs) and believe that the size has no influence on the accuracy of product costs.
- It was rejected that there is a strong relationship between the level of size of the company and the level of use of cost-plus pricing. Therefore, the H10 which stated that the higher the level of size of the company, the higher the level of cost-plus pricing method used, should be rejected.

Secondly, the Findings of Statistical Analyses of Important Factors Restricting the CA Development:

As for the important factors affecting the CA development in both large and medium Libyan manufacturing companies, the study found that the following reasons are highlighted (the mean of statements excess 3) and statistically significant (less than 0.05):

- Absence of any internal leadership who drive the idea of developing your company's cost allocation system;
- Lack of specialist managerial accountants in our company;
- Lack of top-management support;
- lack of active training programs in the CA systems;
- Centralization of decision-making;
- It is extremely expensive to up-date or redesign current CA system;
- Shortage of professional cost or managerial accounting bodies in Libya.

With regard to the organization's size, it was found that only two reasons are statistically significant concerning the medium-sized companies:

- Lack of financial capability;
- Lack of an independent cost accounting department.

With regard to the organization's competition, it was found that only one reason is statistically significant concerning the public manufacturing companies:

Only one reason (low level of competition) with high acceptance (the mean of statements in excess of 3) and statistically significant numbers (less than 0.05).

**8.3 Contribution to Knowledge:**

According to the research objectives, this study contributes to knowledge in several ways concerning the cost allocation system design in terms of product costs with managerial emphasis. Firstly, from the literature review, there is no empirical study that has been undertaken with reference to cost allocation system design in terms of product costs in LMLMCs, for both private and public companies that produce transfer products. Although, management accounting in terms of product cost system design was investigated in Libya by Abulghasim (2006). However, his study has not included MA practices in private manufacturing companies and only focused on only descriptive analyses. This study investigates and compares both public and private in the LMLMCs. Moreover, a contingency theory and descriptive analyses were applied. Therefore, this research contributes to knowledge by comparing and highlighting the current problems and difficulties that private large and medium manufacturing companies are facing in CA practices.

Secondly, according to Brierley (2008), despite the fact that there are many studies that have been undertaken to examine the extent to which product costs are used in decision making, however, many studies of product costing practice have not considered the frequency with which product costs are used in decision-making. Consequently, this

study has covered this aspect and provided useful information for academics and practitioners.

Finally, according to Guilding et al. (2005), over the last two decades, there is a scarcity of studies investigating cost-plus pricing. They stated there are only two empirical studies with an exact focus on cost-plus pricing. As a result, this study has considered cost plus pricing in the LMLMCs.

Finally, Drury and Tayles (2005) state that over the three decades, most of the research has focused on cost system design and has concentrated on studying ABC systems. Previous studies have assumed that cost systems consist of two alternatives, either traditional or ABC systems. On the other hand, researchers in developing countries, assert that there is a lack of knowledge concerning the current state of management accounting practice in developing countries (Joshi, 2001). According to Haldma and Laats (2002), studies relating contingency factors influencing MA practices in developing countries are limited. Some researchers have acknowledged the need for moving ahead progressing knowledge of MA practices in developing countries (Drury and Tayles 1992). Therefore, this study will contribute to theoretical knowledge. On the other hand, this study will allow future Libyan decision-makers to make appropriate decisions such as improving their CA systems in order to calculate accurate relevant product costs. In addition, strategic decisions such as pricing, producing and marketing could be improved.

## 8.4 Limitations of the Study:

Although, this research has achieved its aim and objectives, however, in general any research has some limitations and this study is no exception. In terms of product costs, Drury et al. (1993) point-out that the need for CA systems are to generate product costs for two purposes (allocating the manufacturing costs incurred during a period between cost of goods sold and inventories for external profit measurements and providing useful information to help managers make rational decisions). Therefore, this study has focused on the problems associated with CA systems in terms of product costs in order to calculate accurate and relevant product costs to help managers make better decisions. Also the importance of preparing cost information on time is considered. The limitations of this study can be summarized up as follows:

- Information concerning product costs which is needed for external profit reporting, internal planning, control or performance measurement is not covered.
- The research has focused on the LMLMCs which are producing transfer products. These companies are a homogeneous group which applied the same cost and management accounting rules. Therefore, the other different forms of the accounting and types of activities such as extractive industries or agriculture have not been covered. It would be beyond the scope of this study to cover all firms of a country.

- Only Libyan large and medium Libyan manufacturing companies are covered in this study. Therefore, this research has not considered the small companies.
- All companies that demonstrated by foreign owners have not covered. However, their managers have rejected to participate giving the reason that previous researchers have made problems for them.
- Moreover, it was highlighted that the cost structure of manufacturing and nonmanufacturing companies are different (Clarke et al. 1999), especially the direct material costs which are usually the largest cost reported by manufacturing companies (Brierley et al., 2001). Given these differences it would be much more difficult to design a questionnaire that would be applicable to companies in both the manufacturing and non-manufacturing sector. However, non-manufacturing companies are not covered by this research.
- In this study, the most obvious limitation was the small number of interviewees. In fact, this is due maybe to the fact that in each developing Arab country, cultural and political freedom is a rarity. Therefore, people experience constraints and intimidation of all sorts, and Libya is no exception. Moreover, employees were terrified of their bosses which led to the decrease in the participation rate of the study survey. Thus, some employees refuse to give their opinions in any opinion poll. Therefore, very few Libyan employees were willing to be interviewed. Hence, the results of the data of interviews could not be generalised (out of 25 auditors contacted; only 15 were interviewed).

- Because, of the low communication and the irregularity of the postal infrastructure and facilities which usually create delays the communications service in Libya, most of the questionnaires were personally distributed and rarely used the public postal service. Because Libyan geographic area is huge, all the companies were contacted by telephone or fax by the researcher by supporting the Head Manger of the Documentation and Information Center of Industries and Economics in Misurata. Only a few companies agreed to receive the questionnaire survey by post or fax. Then, the influences of the personally administered questionnaire or faxed could exist in this study. Difficulties in contacting potential interviewees were exacerbated through telecommunication limitations. The use of web-site surveys were tried by the researcher, however, unfortunately there were no respondents which may be attributed to poor internet networks which are considered less important.
- The research depended on a questionnaire survey as a main method of collecting data and the quantitative data were analysed statistically; therefore, the disadvantages of using this tools (see 4.3.2) will be considered as a limitation of this research.
- The number of interviews was limited to those respondents who have provided their contact details and mentioned to participate in this research, thus, the availability of interviewees was only at a certain time which could be considered as an additional limitation.

## 8.5 Conclusion and Recommendations:

A contingency theory approach is adopted and a frame-work is developed in order to investigate the accuracy and the relevance of product costs. The majority of the LMLMCs are characteristic with simple industrial environment with high portion of direct costs. It was found that the majority of the LMLMCs are influenced by the financial accounting mentality, as a result of the shortage of specialist managerial accountants. A few the LMLMCs have already contacted external designers to develop their CA methods. Almost all of them are using traditional CA methods, as only one company is using activity based costing (ABC) system. However, ABC is not targeted to be adopted. Some the LMLMCs reported delay in preparing their costing systems.

In terms of the type of CA and cost information systems, all the LMLMCs are using an absorption costing system, 51.1 per cent of them are classifying costs into direct, indirect, variable and fixed and 14.9 per cent is classifying costs to variable and fixed costs. Most the LMLMCs (87.2 per cent) are maintaining a single cost information system designed mainly for financial accounting purposes and subsequently adjusted to use for decision-making. According to the interviews, all the interviewees in the public sector (46.7 per cent) could not interpret why they are using fixed or an adjusted single cost information system and asserted that they had used these systems for a long time. On the other hand, the private sector, their answers were different as follows, some of them (33.3 per cent) could not interpret why they are using fixed or an adjusted single cost information system

and no interpretation could be added, few (13.3 per cent) of them said that these systems are suggested by the external designer. Only one interviewee said that our company is organizing to design a new data-base system in the near future.

In fact companies that use of single cost information system really use of inaccurate cost information system which will affect all their strategic managerial decisions. Also some other the LMLMCs (27.7 per cent) that use of irrelevant tax law rates in calculating fixed assets depreciation expenses that included in product costs, are affected by the financial accounting manager's and designer's mentality. They calculate of distorted product costs unsuitable for decision-making purposes. In addition, some other companies (34 per cent) are not classifying costs to variable and fixed costs, they also will lost any opportunity to benefit from specific decisions such as pricing their products in commutative market.

In terms of pricing methods, the full cost-plus pricing method is rejected by almost all the surveyed companies that face high levels of competition. Instead they traced the mechanism of market price or comparing product cost with the current market prices to determine their prices. According to the important factors, it was found a strong negative relationship with the level of product diversity and accuracy, a strong negative relationship between the level of intensity of competition and the level of use of cost-plus pricing and a strong negative relationship between the level of ownership and the level of cost-plus pricing method.

According to the interviews, all the public companies (46.7 per cent) said that they are facing very low competition and there is a shortage in the local market, therefore, their companies can adopt cost-plus pricing method. On the other hand, in relation to the private sector, only the interviewee of the building materials said that their company is facing very low competition and confirmed there is a shortage in the local market, therefore, their company can price their products by means of cost plus pricing method. Most of the responding companies (80 per cent) use total costs (manufacturing and non-manufacturing costs) in cost-plus pricing. According to the interviews, it was noted that all of the interviewees of public sector said that they should calculate full product costs for pricing decisions and the reasons behind that as follows:

For companies which produce fuel and pasta said that our government provides financial supports to fill the gap between the product costs and the market prices of any product that does not cover its cost percentage of profit. And companies which produce motor vehicles (assembly industry), tobacco, cement, building materials and metal said that they are facing very low competition and there is a shortage in the local market. On the other hand, in relation to the private sector, only the interviewees of the building materials said that full product costs are used in pricing decisions because facing of very low competition. Only one of the interviewees in the chemical company who said they are using full product costs minus fixed assets depreciation and working with high quality in order to be able to work in the competitive market.

Most of the respondents indicated that their CA system is experiencing difficulties and struggling to cope. This suggests that there is an urgent need to develop their CA systems. The factors that constrict the CA development are as follows; absence of any internal leadership; shortage of specialist managerial accountants; lack of top management support; lack of active training programs; centralization of decision-making; it is extremely expensive to develop the CA systems; absence of professional cost or managerial accounting bodies in Libya. With regards to the organization's size factor, lack of financial ability; lack of an independent cost accounting department are important. In relation to the organization's ownership factor, it was found only the low level of competition is important.

In terms of preparing cost information on time, this study found that 29.8 per cent of the LMLMCs do not prepare overhead budgets. 12.8 per cent of the them have already contracted to develop (up-date or redesign) their CA system. The remaining companies have different that may affect the CA system development as stated below. According to the preparation time of cost information system, the respondents revealed that their companies prepare cost information as follows, 83 per cent annually, 53 per cent in irregular periods, 46.8 per cent quarter and annually and 12.8 per cent monthly. This situation may delay in preparing cost information system and lost the opportunity to tack right decisions on time.

Building on the study conclusion, firstly, this study strongly recommends that the Libyan decision-making should direct the focus in the future on the development of managerial accounting theory and practice. Secondly, the LMLMCs should adopt the ABC system in order to enhance their decision-makers' strategic decisions especially in companies that produce multiple products. Thirdly, variable or contribution costing system should be adopted by the LMLMCs that face high levels of competition. Finally, the LMLMCs should consider the importance of upgrading their CA systems from time to time especially when any economic, social, or policy changes taken place in the Libyan industrial environment.

## 8.6 Suggestions for Further Research:

Further research, in terms of product costs, and from the researcher point of view, some useful suggestions for further research concerning and relevant to the Libyan environment research could be summarized as follows:

- Research concerning the Libyan manufacturing companies which are producing heterogeneous products which applied different cost and management accounting techniques such as extractive industries or agriculture should be targeted in the future research.
- Research concerning the small Libyan manufacturing companies and enterprises should be covered in the future.

- Libyan service organizations should be covered in future.
- The possibility of the replication of this study in other industries in Libya or other countries, which will increase the possibility of generalising the findings and develop the understanding of the research issues.
- More research is required to investigate the CA systems in Libya using in-depth case studies or a larger number of interviews.

Further research needs to be undertaken within Libya to identify and develop solutions to address the limitations of the various infrastructure systems.

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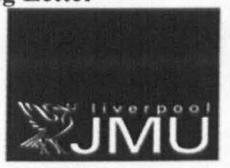
**Appendix A: Questionnaire Covering Letter**




**Questionnaire Survey** **Date: 07\04\2009**

Dear respondents

I am currently engaged in research for a PhD at Liverpool John Moores University in UK and preparing a thesis titled "cost allocation system: empirical study in Libyan manufacturing companies". Because, nowadays Libyan industrial environment has been facing many innovations such as privatization which normally create difficulty such as increased competition, therefore, the purpose of this survey is to make recommendations for developing the cost allocation systems that are currently used by the Libyan manufacturing companies in order to support them to be more competitive in the new business environment.

The research objectives could only be achieved by your and other respondent's co-operation, therefore, I would like to invite you to participate in this research by completing this questionnaire which should take no longer than 25 minutes to complete.

The researcher welcomes your views and comments that might contribute in improving this research. So, please attempt to answer all the questions and do not hesitate to contact me at the address below for any extra explanations. Please note that if you think someone else should answer the questions, please pass the questionnaire to the appropriate colleague within your company. Finally, I would like to assure you that all the information that will be collected by this questionnaire will be kept confidential and only used for the research's purposes.

Yours faithfully

**Jamal Mohamad Aboshagor, PhD. candidate in Business School at Liverpool John Moores University.**

**Contact address: E-mail: J.M.Aboshagor@2007.ljmu.ac.uk , Tel: No: 0926652921.**

**Appendix B: The final draft of the Questionnaire**

## Section- A About you and your company: (Please tick one box ☑ or fill the gap)

**A.1- Your job title is:**

Director of Financial Management and Accounts [ ]

Financial Manager [ ]

Head of Cost Accounting Department [ ]

Other .....

**A.2- Your highest qualification is:**

Postgraduate (e.g. MS, PhD) [ ] Bachelor degree [ ]

High institute diploma [ ] Less than high institute diploma [ ]

Other specify.....

**A.3- Your field of qualification is:**

Managerial accounting [ ] Cost accounting [ ]

Financial accounting [ ] Economics [ ]

Other specify.....

**A.4- Your experience of work in the field of cost or managerial accounting is: (in years)**

Less than 5 [ ] From 5-10 [ ] From 11-15 [ ]

From 16-20 [ ] From 21-25 [ ] More than 26 [ ]

**A.5- Please indicate your cost or managerial accounting professional certificates (if any):**.....
.....

| **A.6- Please indicate the type of your company's ownership:** | |
|---|---|
| Companies completely owned by state or more than 50 per cent of the company's shares are owned by the state sector | [ ] |
| Companies completely owned by the private sector or more than 50 per cent of the company's shares are owned by the private sector. | [ ] |
| Companies completely owned by the foreign owners or more than 50 per cent of the company's shares are owned by the foreign owners. | [ ] |
| Other specify..... | [ ] |

**A.7- Please indicate which type of business does your company belong to?**

Motor and Vehicles [ ] Food [ ]

Engineering [ ] Chemical [ ]

T.V and communication equipment [ ] Electrical equipment [ ]

Building materials [ ] Metal [ ]

Furniture [ ] Paper and packing [ ]

Tobacco [ ] Oil refineries [ ]

Other specify.....
.....

**A.8- Please indicate the paid-up capital: (in millions Libyan Dinars):**

From 2.5 to less than 5 million [ ] More than 5 million [ ]

| A.9- How many employees hold the following qualifications in your company? | |
|---|---|
| **The field of qualification** | **Number of employees** |
| Intermediate diploma in the field of financial accounting | [ ] |
| High institute diploma in the field of financial accounting | [ ] |
| Bachelor degree in financial accounting | [ ] |
| MS, MBA or PhD in the field of cost accounting | [ ] |
| MS, MBA or PhD in the field of managerial accounting | [ ] |
| Other specify..... | [ ] |

## Section-B- About the industrial environment concerned your company:

**B.1 The scale below relates to outputs diversity and complexity, the scale are ranged as (1= strongly agree, 2= agree, 3= neither disagree nor agree, 4= disagree, 5= strongly disagree) please indicate the best statement that describes the whole range of products produced by your company?**

| | The statement | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| B.1.1 | Products are produced about the same size and kind | [ ] | [ ] | [ ] | [ ] | [ ] |
| B.1.2 | Overheads (set-up, store, purchasing, and so on) are consumed by products about the same | [ ] | [ ] | [ ] | [ ] | [ ] |

**B.2 The scale below relates to output products, please indicate the point on the scale, which most appropriately describes the whole range of products marketed by your company:**

| Highly standardised (100 per cent) | Slightly standardised | Moderately standardised (50 per cent) and moderately customised (50 per cent) | Slightly customised | Totally customised (100 per cent) |
|---|---|---|---|---|
| [ ] | [ ] | [ ] | [ ] | [ ] |

**B.3 On the scale below, indicate the level of automation\manually in your company:**

| Highly manual (100 per cent) | Slightly manual | Moderately automated (50 per cent) and moderately manual (50 per cent) | Slightly manual | Fully automated (100 per cent) |
|---|---|---|---|---|
| [ ] | [ ] | [ ] | [ ] | [ ] |

| **B.4 Please provide an approximate percentage breakdown of your product cost structure by entering the percentages in the approximate spaces below? (use the product with the highest production level as an example)** | | |
|---|---|---|
| | **Item of cost** | **Percent** |
| B.4.1 | Direct costs | [ ] |
| B.4.2 | Indirect costs | [ ] |
| **Total** | | **100** |

| **B.5 The scale below relates to the competition level, for your major products produced, please indicate the extent of the competition level?** | | | | |
|---|---|---|---|---|
| Very low | Slightly low | Moderate | Slightly high | Very high |
| [ ] | [ ] | [ ] | [ ] | [ ] |

**Section C- Related to the relationship between management accounting and financial accounting:**

**C.1 Does your company prepare overhead budgets?**

**Yes [ ]** **No [ ]**

**C.2 Your company is classifying costs into: (please tike only one box)**

Direct and indirect and also Fixed and variable costs [ ]

Only direct and indirect [ ] Only fixed and variable costs [ ]

Other specify.....

| **C.3 Please indicate the sort of cost allocation system which is adopted to calculate product costs for decision making purposes? (you can tick more than one box)** | | |
|---|---|---|
| **C.3.1** | Absorption costing system (manufacturing and\or non-manufacturing costs are assigned to products) | [ ] |
| **C.3.2** | Variable costing system (variable costs are assigned to products and fixed costs are treated as period expenses ) | [ ] |
| **C.3.3** | Other specify..... ..... | [ ] |

| **C.4 How does your company extract the product costs to use routinely in decision-making purposes (e.g. product mix, abandonment of unprofitable product or add a new product)?** | | |
|---|---|---|
| C.4.1 | Single cost information system designed mainly for financial accounting purposes and also used for decision-making aspects | [ ] |
| C.4.2 | Single cost information system designed mainly for financial accounting purposes and subsequently adjusted to be used for decision-making aspects | [ ] |
| C.4.3 | A separate cost information system are used for decision making purpose | [ ] |
| C.4.4 | Flexible database to serve both financial accounting and for decision-making purposes | [ ] |
| C.4.5 | Other specify..... ..... | [ ] |

**C.5 For decision-making purposes (e.g. product mix, abandonment of unprofitable product or add a new product), does your company include fixed assets depreciation in product costs?**

**Yes [ ]** **No [ ]**

**C.6 If you answer to (C.5) is yes, how does your company determine the age of fixed assets depreciations?**

By expert's opinions [ ] By tax law [ ]

Other specify.....

**C.7 If your answer is by tax law, is the tax law considered the real age of fixed assets?**

**Yes [ ]** **No [ ]**

## Section-D About the Cost System Design for Calculating Product Costs for decision-Making purposes:

| **D.1 For typical manufacturing plant in your company, for decision-making purposes, please indicate which method is applied to aggregate and allocate indirect costs to cost objects (products)?** | | |
|---|---|---|
| D.1.1 | One cost allocation stage (overheads are not aggregated in cost centres but a single overhead base is established for the entire factory (as a cost centre) to charge indirect costs to products) | [ ] |
| D.1.2 | Two cost allocation stages (in the first stage overheads are allocated to cost centres (departments\). In the second stage overhead allocation bases (recovery rates) are established for each department to assign overheads to products) | [ ] |
| D.1.3 | Two cost allocation stages (in the first stage overheads are allocated to cost centres (represents work unit within department). In the second stage overhead allocation bases (recovery rates) are established for each work unit to assign overheads to products) | [ ] |
| D.1.4 | Two cost allocation stages (in the first stage indirect costs are allocated to cost pools (activities). In the second stage overhead allocation bases (cost drivers) are established for each activity to assign overheads to products) | [ ] |
| D.1.5 | Other specify..... ..... ..... | |

**D.2 If you answered to E.1 two cost allocation stages, approximately how many cost centres (pools) are used to aggregate cost in order to allocate them to products?**

**There entire factory is the cost centre [ ]** **Less than 5 [ ]**

**From 5-10 [ ]** **From 11-15 [ ]**

**From 16-20 [ ]** **More than 21 [ ]**

**D.3 Please indicate how many different type of overhead allocation bases (cost drivers) are used in the final stage of cost allocation system?**

**Less than 5 [ ]** **From 5-10 [ ]** **From 11-15 [ ]**

**From 16-20 [ ]** **More than 21 [ ]**

**D.4 For decision-making purposes, please indicate which the following cost allocation bases (recovery rates) are used in the final stage of allocating indirect costs to products? (You can tick more than one choice)**

**First for automated production centres:**

Direct labor hours\costs [ ] Direct materials costs [ ]

Direct machine hours [ ] Weight of output [ ]

Size of output [ ] No. of out-puts (products) [ ]

Expert's opinion [ ] Activity related bases (ABC system) [ ]

Other specify.....

**Continued (D.4) - Second for non-automated (manual) production centres (if any):**

Direct labor hours\costs [ ] Direct materials costs [ ]

Direct machine hours [ ] Weight of output [ ]

Size of output [ ] No. of out-puts (products) [ ]

Expert's opinion [ ] Activity related bases (ABC system) [ ]

Other specify.....

**D.5 How are the following non-manufacturing costs normally dealt with?**

| | Treatment of non-manufacturing costs | Administration | Selling | Distribution |
|---|---|---|---|---|
| D.5.1 | Allocated to products on the bases of the selling price of each product | [ ] | [ ] | [ ] |
| D.5.2 | Allocated to products on the basis of employee numbers | [ ] | [ ] | [ ] |
| D.5.3 | Allocated to products on the judgment bases (by accountant's experiences) | [ ] | [ ] | [ ] |
| D.5.4 | Allocated to products in bases of transactions (ABC system) | [ ] | [ ] | [ ] |
| D.5.5 | Not allocated to products (charged to profit and losses account) | [ ] | [ ] | [ ] |
| D.5.6 | Other specify..... ..... | [ ] | [ ] | [ ] |

**D.6 Please indicates the period of time that your company prepares cost information for internal decision-making?**

Monthly [ ] Quarter annually [ ] Half annually [ ] Annually [ ]

In irregular periods [ ] Other specify .....

## Section-E about Pricing Decision and the Accuracy of Cost Allocation System in Calculating Product Costs.

**E.1 the a scale blow ranged as (1= never, 2= rarely, 3= sometimes, 4= often, 5= always), when your company is marketing its products, Please indicate how most products are priced? (you can tick more than one box)**

| | Means of pricing | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| E.1.1 | By cost-plus pricing | [ ] | [ ] | [ ] | [ ] | [ ] |
| E.1.2 | By tracing market prices or comparing product costs by market prices | [ ] | [ ] | [ ] | [ ] | [ ] |
| E.1.3 | Oriented by Libyan governmental authorities | [ ] | [ ] | [ ] | [ ] | [ ] |
| E.1.4 | Others specify..... ..... ..... | [ ] | [ ] | [ ] | [ ] | [ ] |

**E.2 Please indicate the extent to which the following types of costs are used routinely when computing product costs for pricing decisions or comparing product cost with the prevailing market prices?**

| | Type of costs | |
|---|---|---|
| E2.1 | Total cost (manufacturing and non-manufacturing costs) | [ ] |
| E2.2 | Total cost minus fixed asset depreciation | [ ] |
| E2.3 | Manufacturing cost | [ ] |
| E2.4 | Variable\incremental manufacturing cost | [ ] |
| E2.5 | Total variable cost | [ ] |
| E2.6 | Other specify..... ..... | [ ] |

| E.3 On the scale below, for decision-making purposes, please describe the accuracy of your costing system in allocating overheads to products? | | | | |
|---|---|---|---|---|
| **Inaccurate** | **Slightly accurate** | **Moderately accurate** | **Accurate** | **Extremely accurate** |
| | | | | |

## Section F About your company's progress in allocating costs, and the important reasons that may restrict the development procedures:

| F.1 On the scale below, relates to the way of processing costs, please indicate the level of using computerize\manually system in your company: | | | | |
|---|---|---|---|---|
| Highly manual (100 per cent) | Slightly manual | Moderately manual (50 per cent) and Moderately computerized (50 per cent) | Slightly computerized | Highly computerized (100 per cent) |
| [ ] | [ ] | [ ] | [ ] | [ ] |

**F.2 This question relates to activity-based costing system (ABC) (this system aggregates indirect costs in activities in order to allocate them to cost object (products) by means of cost drivers), have your company implemented such this system?**

**Yes [ ] No [ ]**

**F.3 If your answer to (F1) is (No), is ABC targeted to be implemented in the nearly time?**

**Yes [ ] No [ ]**

**F.4 Please select the appropriate statement that describes the current state of developments in your company's cost allocation system: (you can tick more than one box)**

| | | |
|---|---|---|
| F.1.1 | During the past five years, our company has made significant developments (up-date or redesign) | [ ] |
| F.1.2 | Our company has already contracted to develop (up-date or redesign) their cost allocation system | [ ] |
| F.1.3 | Currently, our cost allocation system is suffering weakness and needs developments (up-date or redesign) | [ ] |
| F.1.4 | Other specify..... ..... ..... | [ ] |

**F.5 If your answer to question (F.4) that currently, your cost allocation system is suffering weakness' and needs developments (up-date or redesign), continue, otherwise, please skip to next section. The scale below are ranged as (1= strongly disagree, 2= disagree, 3= neither disagree nor agree, 4= agree, 5=strongly agree), which important reasons affecting the development of your cost allocation system?**

| | The reasons | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| F.5.1 | Absence of any internal leadership who suggest and drive the idea of developing your company's cost allocation system | [ ] | [ ] | [ ] | [ ] | [ ] |
| F.5.2 | Lack of specialist in managerial accounting in our company | [ ] | [ ] | [ ] | [ ] | [ ] |
| F.5.3 | Lack of top-management support | [ ] | [ ] | [ ] | [ ] | [ ] |
| F.5.4 | Lack of active training programs in the cost allocation systems | [ ] | [ ] | [ ] | [ ] | [ ] |
| F.5.5 | Centralization of decision-making | [ ] | [ ] | [ ] | [ ] | [ ] |
| F.5.6 | It is extremely expensive to develop (up-date or redesign) current cost allocation system | [ ] | [ ] | [ ] | [ ] | [ ] |
| F.5.7 | Absence of professional cost or managerial accounting bodies in Libya | [ ] | [ ] | [ ] | [ ] | [ ] |
| F.5.8 | Narrow and insignificant of the indirect cost proportion | [ ] | [ ] | [ ] | [ ] | [ ] |
| F.5.9 | The low degree of competition | [ ] | [ ] | [ ] | [ ] | [ ] |
| F.5.10 | Lack of financial capability | [ ] | [ ] | [ ] | [ ] | [ ] |
| F.5.11 | Lack of an independent cost accounting department in our company | [ ] | [ ] | [ ] | [ ] | [ ] |
| F.5.12 | Other specify……<br>……<br>……<br>…… | [ ] | [ ] | [ ] | [ ] | [ ] |

**Note page: This information is optional**

Would you like to participate in future interviews, if yes, please give your details below:

Your name:.....

E-mail:.....

Your Tel.:.....

Your company name:.....

.....

The researcher would welcome any comments or additional information that you think may be useful to improve this questionnaire

**Comments**

.....

.....

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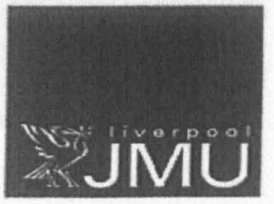
**Thank you very much for your cooperation**

## Appendix C: The Questionnaire Supporting Letter




**Student: Jamal Aboshagor** **Date: 1st.May.2009**

**TO WHOM IT MAY CONCERN**

**Dear Sir/Madam**

**This is to confirm that above named student is enrolled as an international student at Liverpool John Moores University to undertake research for a Ph.D. program at the Faculty of Business and Law. His research is titled "cost allocation system: empirical study in Libyan manufacturing companies". The above named student needs to collect data for the purpose of the main study during the expected period from 1st of May to 30th of October.**

**Thank you for your cooperation**

**Yours sincerely**

**Mr. Roger Pegum**
**Director of Studies**

**Research correspondent of LJMU, Business School.**
**Email: R.H.Pegum@ljmu.ac.uk**
**Address: John Foster Building, 98 Mount Pleasant**
**Liverpool, L3 5UZ**

**Appendix D: The Arabic Translated Covering Letter**


السيد /السيدة:

أنا مشغول حاليا في البحث للحصول على الدكتوراه من جامعة جون مورس بليفربول بالمملكة المتحدة وإعداد أطروحة بعنوان "نظام توزيع التكاليف : دراسة تطبيقية في بيئة التصنيع الليبية". ونظرا لأن بيئة التصنيع الليبية في الوقت الحاضر قد تواجه العديد من الابتكارات مثل الخصخصة التي تخلق عادة صعوبة مثل المنافسة المتزايدة ، وبالتالي ، فإن الغرض من هذه الدراسة هو تقديم توصيات لتطوير نظم توزيع التكاليف التي يتم استخدامها حاليا من قبل شركات تصنيع الليبية ومن أجل دعمها لكي تكون أكثر قدرة على المنافسة في بيئة العمل الجديدة. ونظرا لأن البحث العلمي لا يمكن تحقيق أهدافه إلا بك وبتعاون الآخرين، لذلك، أود أن أدعوكم إلى المشاركة في هذا البحث من خلال المشاركة بملأ هذا الاستبيان والذي لا يزيد مدته عن 25 دقيقة لاستكمال. الباحث يرحب بوجهة نظركم والتعليقات التي يمكن أن تسهم في تحسين هذا البحث. لذا يرجى المحاولة للرد على جميع الأسئلة وعدم التردد في الاتصال بالباحث على العنوان الموجود أسفله للحصول على أي توضيحات إضافية. يرجى ملاحظة أنه إذا كنت تعتقد أن شخص آخر ينبغي الإجابة على الأسئلة، يرجى تمرير الاستبيان إلى الزميل المناسبة داخل شركتك. وأخيرا ، أود أن أؤكد لكم أنه سيتم الحفاظ على كافة المعلومات التي سيتم جمعها بواسطة هذا الاستبيان بسرية تامة وتستخدم فقط لأغراض الأبحاث.

تفضلوا بقبول فائق الاحترام

العنوان: بريد الكتروني: M.Aboshagor@2007.ljmu.ac.uk \ هاتف: 0926652921

**Appendix E: The Arabic Translated Final Draft of the Questionnaire**

**القسم أ : معلومات شخصية: (من فضلك علامة ✓ داخل المربع أو أملئ الفراغات)**

**أ.1- وظيفتك هي:**

مدير الإدارة المالية والحسابات [ ] المدير المالي [ ]

رئيس قسم التكاليف [ ] أخرى

حدد.....

**أ. 2- أعلى شهادة أكاديمية تحصلت عليها هي:**

اقل من دبلوم عالي [ ] دبلوم عالي [ ]

بكالوريوس [ ] شهادة عليا ( e. g. Master's, PhDs) [ ]

أخرى حدد.....

**أ. 3- مجال تخصصك هو:**

محاسبة إدارية [ ] محاسبة تكاليف [ ] محاسبة مالية [ ] إدارة [ ]

اقتصاد [ ] أخرى حدد.....

**أ. 4- سنوات خبرتك في هذا المجال هي:**

أقل من 5 [ ] من 5-10 [ ] من 11- 15 [ ]

من 16-20 [ ] من 21- 25 [ ] من 26 فأكثر [ ]

أ. 5- من فضلك اذكر الشهادات المتحصل عليها من هيئات مهنية في مجال المحاسبة التكاليف أو الإدارية (إن وجدت):

.....

.....

.....

أ.6- ملكية شركتكم هي:

شركات ليبية مملوكة بالكامل للدولة أو أكثر من 50 per cent من ألأسهم مملوكة للدولة [ ]

شركات ليبية ملكية خاصة بالكامل أو أكثر من 50 per cent من ألأسهم ملكية ليبية خاصة [ ]

شركات أجنبية بالكامل أو أكثر من 50 per cent من الأسهم ملكية أجنبية [ ]

أخرى حدد.....

أ-7- من فضلك حدد مجال قطاع الصناعة التي تعمل به شركتكم:

| | | |
|---|---|---|
| المركبات ذات المحركات [ ] | الأغذية [ ] | الهندسية [ ] |
| الكيماوية [ ] | المعدات والأجهزة المرئية والاتصالية [ ] | الكهربائية [ ] |
| مواد البناء [ ] | المعدنية [ ] | الأثاث [ ] |
| النسيج [ ] | الورق والكرتون [ ] | التبغ [ ] |
| النفط والغاز [ ] | أخرى حدد..... | |

.....

| |
|---|
| أ. 8- رأسمال الشركة (بالدينارات الليبية) هو: |
| من 2.5 - 5 ملايين [ ] أكثر من 5 ملايين [ ] |

| أ. 9- من فضلك حدد عدد العاملين بشهادات أكاديمية ولهم علاقة بأعداد معلومات التكاليف: | |
|---|---|
| التصنيف | عدد العاملين |
| شهادات الدبلوم المتوسط في مجال محاسبة مالية | [ ] |
| شهادات الدبلوم العالي محاسبة مالية | [ ] |
| شهادات جامعية في مجال المحاسبة المالية | [ ] |
| شهادة عليا (MBAs, Master's, PhDs) في مجال محاسبة التكاليف | [ ] |
| شهادة عليا (MBAs, Master's, PhDs) في مجال المحاسبة الإدارية | [ ] |
| أخرى حدد..... ..... | [ ] [ ] |

## ألقسم ب: متعلق ببيئة التسويق والتصنيع بشركتكم:

| ب.1- المدى المبين أسفله له علاقة بمستوى التعقيد لمنتجات شركتكم و مرتب على أساس (1= غير موافق بشدة , 2= غير موافق , 3= لا أرفض ولا أوافق ,4= أوافق ,5= موافق بشدة), من فظلك اختار الجملة الإخبارية التي تصف بدقة حلة تصنيع منتجات شركتكم: | | | | | | |
|---|---|---|---|---|---|---|
| | الجملة الإخبارية | 1 | 2 | 3 | 4 | 5 |
| ب.1.1 | المنتجات التي تسويقها شركتكم ليست مختلفة (متساوية في الحجم والنوعية) | [ ] | [ ] | [ ] | [ ] | [ ] |
| ب.2.1 | تكاليف مراكز الخدمات (مثل التجهيز الآلي, شراء المواد, التخزين ...إلى آخره) تستهلك من قبل كل منتج بالتساوي. | [ ] | [ ] | [ ] | [ ] | [ ] |

| ج.2- ما هي طريقة التسويق الأكثر ملائمة لوصف كافة المنتجات التي تسوقها شركتكم؟ | | | | |
|---|---|---|---|---|
| كل المنتجات حسب متطلبات السوق (100 per cent) | أغلب المنتجات حسب متطلبات السوق | نصف المنتجات حسب متطلبات السوق (50 per cent) و نصف المنتجات حسب متطلبات الزبائن (50 per cent) | أغلب المنتجات حسب طلبات الزبائن | كل المنتجات حسب طلبات الزبائن (100 per cent) |
| [ ] | [ ] | [ ] | [ ] | [ ] |

| ب.3 - من فضلك حدد مستوى التصنيع الآلي إلى اليدوي لدى شركتكم: | | | | |
|---|---|---|---|---|
| كل عمليات التصنيع آلية (100) per cent | أغلب عمليات التصنيع آلية | نصف عمليات التصنيع آلية (50 آلية) و نصف عمليات التصنيع يدوية (50 per cent آلية) per cent | أغلب عمليات التصنيع يدوية | كل عمليات التصنيع يدوية (100) per cent |
| [ ] | [ ] | [ ] | [ ] | [ ] |

| ب. 4- من فضلك حدد نسبة كل عنصر من عناصر التكاليف الآتية إلى التكاليف الكلية للمنتج: (استخدم المنتج الأكثر إنتاجاً كمثال) | | |
|---|---|---|
| | عنصر التكلفة | النسبة |
| ب.1.4 | كافة التكاليف المباشرة | [ ] |
| ب.2.4 | كافة التكاليف الغير مباشرة (الصناعية و الغير صناعية) | [ ] |
| | | per cent 100 |

| ب. 5 - من فضلك حدد مستوى المنافسة التي تواجهها شركتكم حالياً وذلك لأغلب منتجات شركتكم: | | | | |
|---|---|---|---|---|
| شديدة الانخفاض | قليلة الانخفاض | منافسة متوسطة | عالية | عالية جدا |
| [ ] | [ ] | [ ] | [ ] | [ ] |

## القسم ج: هذا القسم متعلق بمدى العلاقة بين المحاسبة المالية و الإدارية:

ج.1 – هل يتم إعداد الموازنات التقديرية للتكاليف الصناعية الغير مباشرة ؟

نعم [ ] لا [ ]

ج.2 – التكاليف بشركتكم تصنف إلى: (يمكنك اختيار أكثر من إجابة)

مباشرة وغير مباشر وأيضا ثابتة ومتغيرة [ ] فقط مباشرة وغير مباشر [ ]

فقط ثابتة ومتغيرة [ ] أخرى حدد.....

| ج.3 – ما هو النظام المتبناة لتخصيص التكاليف على المنتجات بشركتكم؟ (يمكنك اختيار أكثر من إجابة) | | |
|---|---|---|
| ج.1.3 | نظام التكاليف الكلية (يتم تتبع وتخصيص كل التكاليف الصناعية) | [ ] |
| ج.2.3 | نظام التكاليف المتغيرة (يتم تتبع التكاليف الصناعية المتغيرة و التكاليف الصناعية الثابتة لا تحمل على المنتجات إنما تستقطع مباشرة من قائمة الدخل) | [ ] |
| ج.3.3 | أخرى حدد..... ..... | [ ] |

| ج. 4 –عند اتخاذ القرارات الداخلية ( مثل خلطة منتج , التخلص من منتج غير مربح أو إضافة منتج جديد) كيف يمكن الحصول على تكلفة المنتج بشكل روتيني؟ | | |
|---|---|---|
| ح.1.4 | نظام معلومات تكاليفي موحد مصمم أصلا للأغراض المحاسبة المالية ويستخدم كذلك للاتخاذ القرارات الداخلية | [ ] |
| ج.2.4 | نظام معلومات تكاليفي مصمم أصلا للأغراض المحاسبة المالية ويعدل جزئياً لاستخدامه في اتخاذ القرارات الداخلية | [ ] |
| ج.3.4 | نظام معلومات تكاليفي منفصل لخدمة كل من أغراض اتخاذ القرار الداخلية و المحاسبة المالية | [ ] |
| ج.4.4 | قاعدة بيانات مرنة لخدمة أغراض المحاسبة المالية وكذلك اتخاذ القرارات الداخلية كل حسب احتياجاته | [ ] |
| ج.5.4 | طريقة أخرى أذكرها.....<br>..... | [ ] |

**ج.5- لغرض اتخاذ القرار الإدارية ( مثل خلطة منتج , التخلص من منتج غير مربح أو إضافة منتج جديد), هل تكلفة المنتج تضمنت مصروف استهلاك الأصول الثابتة؟**

**نعم [ ]** **لا [ ]**

**ج.6- في حالة إجابتك بنعم, ما طريقة تقدير عمر الأصل الافتراضي؟**

وفق أراء الخبراء [ ] وفق قوانين مصلحة الضرائب [ ]

أخر حدد.....

**ج.7- في حالة الإجابة عن السؤال وفق قوانين مصلحة الضرائب. هل يتوافق هذا العمر مع العمر الحقيق للأصل الثابت؟**

**نعم [ ]** **لا [ ]**

**القسم د- هذا القسم متعلق بنظام تصميم تخصيص التكاليف لحساب تكلفة المنتج لاستخدامها في اتخاذ القرارات الإدارية:-**

| | | |
|---|---|---|
| **د.1- بشكل نموذجي لكل مصنع بشركتكم, ما هي الطريقة المستخدمة لتجميع وتخصيص التكاليف الصناعية الغير مباشرة على هدف التكلفة (المنتجات) لغرض اتخاذ القرارات؟** | | |
| **د.1.1** | تخصص التكاليف في خطوة واحدة (يتم تجميع التكاليف الغير مباشرة بكل المصنع (ولا يتم تجميعها في مراكز تكاليف) ثم يتم تخصيصها على كافة منتجات المصنع وذلك وفق معدل واحد للمصنع ككل). | [ ] |
| **د.2.1** | تخصص على المنتجات في خطوتين ( في المرحلة الأولى يتم توزع التكاليف الغير مباشرة على مراكز التكلفة (تمثل أقسام). وفي المرحلة الثانية يتم تخصيص هذه التكاليف الغير مباشرة على (المنتجات) وذلك وفق معدلات تخصيص التكاليف الغير مباشرة لكل قسم على حده). | [ ] |
| **د.3.1** | تخصص على المنتجات في خطوتين (في المرحلة الأولى يتم توزع التكاليف الغير مباشرة على مراكز التكلفة (تمثل وحدة عمل داخل كل قسم على حده). وفي المرحلة الثانية يتم تخصيص هذه التكاليف على (المنتجات) وذلك وفق معدلات تخصيص التكاليف الغير مباشرة لكل وحدة عمل داخل كل قسم على حده). | [ ] |
| **د.4.1** | تخصص على المنتجات في خطوتين (في المرحلة الأولى يتم توزع التكاليف الغير مباشرة على أوعية التكلفة (تمثل أنشطة). وفي المرحلة الثانية يتم إعداد أسس التخصيص (مسببات التكلفة) لتخصيص هذه التكاليف على (المنتجات) وذلك وفق معدلات تخصيص التكاليف الغير مباشرة لكل نشاط على حده). | |
| **د.5.1** | طريقة أخرى أذكرها..... ..... | [ ] |

**د. 2- كم عدد مراكز الإنتاج المستخدمة لتجميع وتخصيص التكاليف على المنتجات:**

كل المصنع يمثل مركز تكلفة [ ] أقل من 5 [ ] من 5-10 [ ]

من 11- 15 [ ] من 16-20 [ ] من 21 فأكثر [ ]

**د.3- لغرض اتخاذ القرارات, كم عدد مختلف الأسس المستخدمة لتخصيص التكاليف الغير مباشرة على المنتجات في المرحلة النهائية من التخصيص؟ أولاً: الأقسام الآلية (يمكنك اختيار أكثر من إجابة):**

أقل من 5 [ ] من 5-10 [ ] من 11- 15 [ ]

من 16-20 [ ] من 21 فأكثر [ ]

**د.3- لغرض اتخاذ القرارات, ما هي الأسس المستخدمة لتخصيص التكاليف الغير مباشرة على المنتجات في المرحلة النهائية من التخصيص؟ أولاً: الأقسام الآلية (يمكنك اختيار أكثر من إجابة):**

ساعات\تكلفة العمل المباشر [ ] تكلفة المواد المباشرة [ ]

ساعات العمل الآلي [ ] أوزان الوحدات المنتجة [ ]

أحجام الوحدات المنتجة [ ] عدد الوحدات المنتجة [ ]

أسس بالخبرة [ ] أسس متعلقة بالأنشطة (على نظام الأنشطة ABC) [ ]

أخرى أذكرها.....

**(يتبع ه.3) ثانيا: الأقسام اليدوية: (إن وجدت)**

ساعات\تكلفة العمل المباشر [ ] تكلفة المواد المباشرة [ ]

ساعات العمل الآلي [ ] أوزان الوحدات المنتجة [ ]

أحجام الوحدات المنتجة [ ] عدد الوحدات المنتجة [ ]

أسس بالخبرة [ ] أسس متعلقة بالأنشطة (على نظام الأنشطة ABC) [ ]

أخرى أذكرها.....

**د-4-لغرض اتخاذ القرارات, ما هي طريقة معالجة التكاليف الغير مباشرة والغير صناعي بشكل روتيني؟**

| | طريقة المعالجة | الإدارية | البيعية | التوزيعية إن وجدت |
|---|---|---|---|---|
| د.1.4 | تخصص للمنتجات على أساس سعر البيع لكل منتج | [ ] | [ ] | [ ] |
| د.2.4 | تخصص للمنتجات على أساس عدد العاملين | [ ] | [ ] | [ ] |
| د.3.4 | تخصص للمنتجات على أساس الخبرة | [ ] | [ ] | [ ] |
| د.4.4 | تخصص على أساس المعاملات (الأنشطة) | [ ] | [ ] | [ ] |
| د.5.4 | لا تخصص للمنتجات (تحمل لحساب الأرباح والخسائر) | [ ] | [ ] | [ ] |
| د.6.4 | طريقة أخرى حدد..... | [ ] | [ ] | [ ] |
| | ..... | [ ] | [ ] | [ ] |

**د. 5- متى يتم إعداد التقارير الداخلية لغرض اتخاذ القرارات بشكل روتيني؟ (يمكنك اختيار أكثر من إجابة)**

شهري [ ] ربع سنوي [ ] نصف سنوي [ ] سنوياً [ ]

في أوقات غير منتظمة [ ] أخرى حدد.....

## قسم- ه. متعلق بقرارات التسعير ودقة حساب تكلفة المنتج:

**ه.1 - المدى المبين أسفله مرتب على أساس (1= لا تستخدم على الإطلاق, 2=تستخدم قليلا,3= تستخدم أحياناً, 4=تستخدم غالبا, 5= تستخدم دائماً) عند بيع المنتج خارج الشركة, ما مدى استخدام الطرق الآتية في تسعير المنتجات وذلك عند تحديد السعر النهائي؟ (يمكنك اختيار أكثر من إجابة)**

| | الطريقة | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| ه.1.1 | وفق التكلفة زائد هامش ربح | [ ] | [ ] | [ ] | [ ] | [ ] |
| ه.2.1 | وفق تتبع أسعار السوق | [ ] | [ ] | [ ] | [ ] | [ ] |
| ه.3.1 | أسعار موجهة (تحدده جهة حكومي) | [ ] | [ ] | [ ] | [ ] | [ ] |
| ه.4.1 | أخرى حدد..... | [ ] | [ ] | [ ] | [ ] | [ ] |

**ه.2- ما نوع التكلفة المستخدمة في تسعير منتجات الشركة وذلك عند تحديد السعر النهائي أو مقارنتها بأسعا السلع المماثلة؟**

| | نوع التكلفة | |
|---|---|---|
| ه.1.2 | أجمالي التكاليف الصناعية والغير الصناعية | [ ] |
| ه.2.2 | أجمالي التكاليف الصناعية والغير الصناعية ناقصاً استهلاك الأصول الثابتة | [ ] |
| ه.3.2 | التكاليف الصناعية ناقصاً استهلاك الأصول الثابتة | [ ] |
| ه.4.2 | التكاليف الصناعية | [ ] |
| ه.5.2 | التكاليف الصناعية المتغيرة\المتزايدة (incremental) | [ ] |
| ه.6.2 | التكاليف الصناعية والغير الصناعية المتغيرة | [ ] |
| ه.7.2 | أخرى حدد..... | [ ] |

| ه.3- من فضلك حدد مستوى دقة حساب تكلفة المنتج لغرض اتخاذ القرارات الإدارية؟ | | | | |
|---|---|---|---|---|
| غير دقيقة | دقة قليل | دقة متوسط | دقيقة | دقة عالية |
| [ ] | [ ] | [ ] | [ ] | [ ] |

## القسم و: هذا القسم متعلق بمستوى تطور نظام تخصيص التكاليف وأهم أسباب إعاقة تطور تخصيص التكاليف بشركتكم:

| و.1- هذا السؤال متعلق بتحليل بيانات محاسبة التكاليف بشركتكم, ما مدى استخدام الكمبيوتر\النظام اليدوي لتحليل بيانات؟ | | | | |
|---|---|---|---|---|
| النظام يدوي بالكامل | أغلب النظام يدوي | نصف النظام آلي | أغلب النظام آلي | آلي بالكامل |
| [ ] | [ ] | [ ] | [ ] | [ ] |

**و.2- ه هذا السؤال متعلق بنظام تخصيص التكاليف على أساس الأنشطة وفيه بالمرحلة الأولى يتم توزع التكاليف الغير مباشرة على أوعية التكلفة (تمثل أنشطة), وفي المرحلة الثانية يتم إعداد أسس التخصيص (مسببات التكلفة) لتخصيص هذه التكاليف على (المنتجات) وذلك وفق معدلات تخصيص التكاليف الغير مباشرة لكل نشاط على حده) هل شركتكم تطبق مثل هذا النظام لتخصيص التكاليف؟**

نعم [ ] لا [ ]

**و.3 - في حالة أجابتك عن السؤال (و-2) بلا, هل شركتكم تستهدف تطبيق هذا النظام في المدى القريب؟**

نعم [ ] لا [ ]

| و.4- من فضلك اختار الجملة الملائمة لوصف النظام الحالي لتخصيص التكاليف بشركتكم: (يمكنك اختيار أكثر من إجابة) | | |
|---|---|---|
| و.1.4 | لقد تم تطوير (تحديث النظام أو تصميم\إعادة تصميم) للنظام الحالي لتخصيص التكاليف خلال الخمس سنوات الماضية | [ ] |
| و.2.4 | حالياً قد تم التعاقد على تطوير (تحديث النظام أو إعادة تصميم) النظام الحالي لتخصيص التكاليف بشركتنا | [ ] |
| و.3.4 | نظام تخصيص التكاليف بشركتنا لازال يعاني من قصور ويحتاج إلى تطوير (تحديث النظام أو إعادة تصميم) | [ ] |
| و.4.4 | أخرى<br>أذكر.....<br>..... | [ ] |

**و.5- في حالة أجابتك عن السؤال (و-4) نظام تخصيص التكاليف بشركتنا لازال يعاني من قصور ويحتاج إلى تطوير استمر, إجابة أخرى من فظلك انتقل فقرة الملاحظات , المدى المبين أسفله مرتب على أساس (1= غير موافق بشدة , 2= غير موافق , 3= لا أرفض ولا أوافق ,4= أوافق ,5= موافق بشدة) ما هي الأسباب التي أعاقت\أخرت تطور(تحديث أو إعادة تصميم) نظام تخصيص التكاليف بشركتكم ؟**

| | الأسباب | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| و.1.5 | عدم وجود شخص يدفع فكرة تطوير النظام من داخل المنظمة | [ ] | [ ] | [ ] | [ ] | [ ] |
| و.2.5 | عدم وجود محاسب متخصص في مجال المحاسبة الإدارية بشركتنا | [ ] | [ ] | [ ] | [ ] | [ ] |
| و.3.5 | عدم دعم الإدارة العليا | [ ] | [ ] | [ ] | [ ] | [ ] |
| و.4.5 | نقص برمج التدريب الفعالة في مجال محاسبة التكليف و الإدارية بشركتنا | [ ] | [ ] | [ ] | [ ] | [ ] |
| و.5.5 | مركزية اتخاذ القرار | [ ] | [ ] | [ ] | [ ] | [ ] |
| و.6.5 | الغلاء الفاحش لتكاليف تطوير (تحديث أو إعادة تصميم) نظام تخصيص التكاليف | [ ] | [ ] | [ ] | [ ] | [ ] |
| و.7.5 | عدم وجود هيئات مهنية تنظم تطبيقات محاسبة التكليف و الإدارية بليبيا | [ ] | [ ] | [ ] | [ ] | [ ] |
| و.8.5 | تدني وعدم أهمية نسبة التكاليف الغير مباشرة | [ ] | [ ] | [ ] | [ ] | [ ] |
| و.9.5 | قلة المنافسة التي تواجهها شركتنا | [ ] | [ ] | [ ] | [ ] | [ ] |
| و.10.5 | عدم المقدرة المالية لشركتنا | [ ] | [ ] | [ ] | [ ] | [ ] |
| و.11.5 | عدم وجود قسم تكاليف مستقل بشركتنا | [ ] | [ ] | [ ] | [ ] | [ ] |
| و.12.5 | عامل أخر ..... | [ ] | [ ] | [ ] | [ ] | [ ] |
| | ..... | [ ] | [ ] | [ ] | [ ] | [ ] |
| | ..... | [ ] | [ ] | [ ] | [ ] | [ ] |

قسم الملاحظات: (هذا المعلومات اختيارية)

الباحث يرحب بمشاركتكم في المستقبل عند إجراء المقابلات الشخصية, وفي حالة رغبتك في المشاركة يمكنك بالتفضل بكتابة اسمك وعنوانك أسفله:

اسم ألمشارك:.....

البريد الالكتروني:.....

رقم الهاتف:.....

أسم شركتكم:.....

.....

شكراً على المساعدة في مل هذا الاستبيان والباحث يرحب بأية ملاحظات أو تعليقات تراها أنت مفيدة لتطوير هذا الاستبيان.

التعليق

.....

.....

.....

.....

.....

.....

شكراً لك على التعاون

العنوان: بريد الكتروني: J.M.Aboshagor@2007.ljmu.ac.uk\ هاتف: 0926652921

## Appendix F: Manufacturing Companies Dependent to the Libyan General Public of industrial, Economic and Commercial:

اللجنة الشعبية العامة للصناعة والإقتصاد والتجارة — مركز المعلومات والتوثيق الصناعي والاقتصادي

الشركات والمصانع التابعة للجنة الشعبية العامة للصناعة والإقتصاد والتجارة

| ر.م | إسم الوحدة الإنتاجية | ر.م | إسم الوحدة الإنتاجية |
|---|---|---|---|
| 1 | شركة ابو عطني لصناعة المشروبات المساهمة | 27 | شركة وازن للصناعات البلاستيكية |
| 2 | الشركة العربية لصناعة المواد الكهربائية والمنزلية | 28 | شركة ليمبكس لصناعة الورق ومستلزمات الطباعة المساهمة |
| 3 | شركة الصناعات الصوفية بني وليد المساهمة | 29 | شركة ليبيا لصناعة الكوابل المشتركة |
| 4 | شركة بلغازي لصناعة الغازات الطبية والصناعية | 30 | شركة زاد الخير لصناعة الدقيق ومشتقاته |
| 5 | شركة المعمورة للتعليب الخضر والفاكهة | 31 | شركة جوتن ليبيا المساهمة |
| 6 | شركة الاسمنت الليبية المساهمة | 32 | شركة الزاد الطيب لصناعة الدقيق ومشتقاته |
| 7 | الشركة العامة للمطاحن والاعلاف المساهمة | 33 | شركة الاندلس لصناعة مواد البناء |
| 8 | شركة الانماء للصناعات الهندسية المساهمة | 34 | شركة اسامر ليبيا لصناعة مواد البناء المشتركة |
| 9 | شركة الانماء للاسلاك والكابلات المساهمة | 35 | الشركة الوطنية لتصنيع مواد البناء |
| 10 | شركة الانماء لصناعة الانابيب المساهمة | 36 | شركة النعمة للصناعات الغذائية المساهمة |
| 11 | الشركة الليبية للتبغ المساهمة | 37 | الشركة المتحدة لصناعة الأنابيب |
| 12 | شركة الانماء لصناعة المواسير المساهمة | 38 | الشركة الليبية الإيطالية للصناعات الخشبية الإستثمارية |
| 13 | شركة الانماء للزيوت النباتية المساهمة | 39 | الشركة العربية السبنية للصناعات الغذائية / الإستثمارية |
| 14 | شركة درنة لصناعة الأثاث ومنتجاته | 40 | الشركة العربية لصناعة الأدوية والمحاليل الوريدية المشتركة |
| 15 | شركة السنديان لصناعة الأثاث والأخشاب المساهمة | 41 | شركة الزيت الذهبي لتجميع وتكرير ومعالجة الزيوت المستعملة |
| 16 | شركة بلغازي لصناعة الأثاث ومكملاته | 42 | شركة الانماء للادوية والمستلزمات الطبية المساهمة |
| 17 | شركة توباكلس للصناعات النسيجية المساهمة | 43 | شركة الدار الوطنية لصناعة مواد البناء المساهمة |
| 18 | شركة ذات الرمال للصناعات الجلدية | 44 | شركة الخالدية لصناعة الدقيق المساهمة |
| 19 | شركة الإنماء للأدوية والمستلزمات الطبية المساهمة | 45 | شركة الجديدة للمشغولات المعدنية |
| 20 | الشركة الوطنية للأدوية البيطرية و المبيدات | 46 | شركة الإتحادية لصناعة الانابيب |
| 21 | شركة خيرات الوادي للمواد الغذائية المساهمة | 47 | الشركة الليبية الإيطالية لصناعة الالواح الخشبية المضغوطة |
| 22 | شركة الأنماء للإستثمارات الصناعية القابضة | 48 | الشركة الافريقية للصناعات الهندسية المساهمة |
| 23 | الشركة الأهلية للإسمنت المساهمة | 49 | الشركة الليبية لصناعة الدراجات المساهمة |
| 24 | شركة المجموعة التقنية للصناعات البلاستيكية | 50 | شركة الانطلاقة لصناعة الالمنيوم والمعادن المساهمة |
| 25 | شركة الزاكي للصناعات الغذائية المساهمة | 51 | الشركة الوطنية للصناعات الغذائية |
| 26 | شركة الكراعة الذابحة / مصنع الغسول للصابون | 52 | شركة زيتن للصناعات الغذائية المساهمة |

إدارة التخطيط والمعلومات بالمركز

**Continued: Appendix F:**

اللجنة الشعبية العامة للصناعة والاقتصاد والتجارة — مركز المعلومات والتوثيق الصناعي والاقتصادي

| ر.م | إسم الوحدة الإنتاجية | ر.م | إسم الوحدة الإنتاجية |
|---|---|---|---|
| 53 | الشركة العامة للإلكترونات | 75 | مصنع الفاكهة الجبل الأخضر |
| 54 | شركة الكراعية القابضة /مصنع كرتون الناصرية | 76 | شركة التعاون للصناعات المعدنية المساهمة |
| 55 | شركة الكراعية القابضة /مصنع مجمدات مصراتة | 77 | الشركة العالمية للصناعات الهندسية |
| 56 | شركة الكراعية القابضة /مصنع الأمل للثلاجات والافران | 78 | شركة الساحل الاخضر للصناعات الغذائية المساهمة |
| 57 | شركة المركز للخدمات التموينية المساهمة | 79 | شركة المهاري للصناعات الغذائية المساهمة |
| 58 | الشركة الليبية العالمية للصناعات الغذائية المساهمة | 80 | تشاركية المعمورة لصناعة أغذية الاطفال |
| 59 | شركة الحرية لانتاج الغازات الصناعية والطبية | 81 | الشركة الليبية للحديد والصلب |
| 60 | الشركة العامة للصناعات الكيماوية | 82 | شركة الشعلة لصناعة النضائد المساهمة |
| 61 | الشركة الوطنية للمقطورات | 83 | شركة النير للصابون ومواد التنظيف |
| 62 | الشركة الليبية للجرارات والمستلزمات الزراعية | 84 | مجمع القربوللي للدائن |
| 63 | شركة الشاحنات والحافلات | 85 | الشركة الليبية للتعدين |
| 64 | شركة المطاحن الوطنية (بنغازي) | 86 | شركة مصراتة لصناعة الدائن والأسفلج |
| 65 | شركة طرابلس للألبان والعصائر | 87 | شركة بنغازي للصناعات الجلدية |
| 66 | شركة مصراتة للصناعات الغذائية | 88 | مجمع الكريمية للصناعات البلاستيكية |
| 67 | شركة طرابلس لتعبئة المياه الصحية والمشروبات | 89 | شركة بنغازي للغزل والنسيج |
| 68 | شركة البريقة لتسويق النفط | 90 | مصنع المرج لصناعة البطاطين |
| 69 | شركة التقنيات الهندسية | 91 | الشركة العامة للمنسوجات والملابس |
| 70 | شركة الإتحاد العربي للمقاولات | 92 | شركة الجبل الأخضر المساهمة للأثاث |
| 71 | الشركة الوطنية للتنمية وصناعة مواد البناء | 93 | شركة الجبل الأخضر للألبان ومنتجاتها |
| 72 | شركة امان لصناعة الإطارات المساهمة | | |

إدارة التخطيط والمعلومات بالمركز

**Appendix G: Cronbach's Alpha if Item Deleted**

| The tested scale's variables | Cronbach's Alpha if Item Deleted |
|---|---|
| Product diversity | .788 |
| Overhead consumption | .790 |
| The way of marketing products | .801 |
| The level of automation | .799 |
| The competition levels | .812 |
| By means of cost-plus pricing | .815 |
| By means of tracing the mechanisms of market price or comparing product cost with the prevailing market prices | .800 |
| Directed by the Libyan governmental authorities | .817 |
| The accuracy | .815 |
| The level of using computerized system | .816 |
| Lack of active training programs in the CA systems | .748 |
| It is extremely expensive to up-date or redesign current CA system | .751 |
| Lack of top-management support | .743 |
| Lack of financial ability | .770 |
| The absence of professional cost or managerial accounting bodies in Libya | .748 |
| The absence of any internal leadership who drive the idea of developing your company's cost allocation system | .742 |
| The low degree of competition | .777 |
| The insignificance of the indirect cost proportion | .769 |
| Centralization of decision-making | .753 |
| Lack of an independent cost accounting department in our company | .775 |
| Lack of specialist in managerial accounting in our company | .743 |

**Appendix H: The Content Analysis of the interviews:**

**The following questions are used in the semi-structured interviews:**

a) Why are your company using fixed or adjusted cost information systems?;

b) If your company uses the cost-plus pricing method, how does your company adopt this method?;

c) If your company uses of full product costs in pricing their goods, how could your company adopt this method?;

d) If your company applying volume cost allocation systems, why your company has not adopted ABC system?

**The Content Analysis of the interview's answers related to the above questions:**

| Type of company | Answers of question A | Population group | per cent |
|---|---|---|---|
| Public companies | All of them cannot interpret why they are using fixed or adjusted single cost information system and asserted that they had used these systems for long time. | 7 | 46.7 |
| Private sector | They cannot interpret why they are using fixed or adjusted single cost information system and no interpretation could be added. | 5 | 33.3 |
| Private sector | Few of them said that these systems are suggested by the external designer. | 2 | 13.3 |
| Private sector | Only one interviewee said that our company is planning to design a new data-base system in the near future. | 1 | 6.7 |
| **Type of company** | **Answers of question B** | **Population group** | **per cent** |
| Public companies | All of them said that they are facing very low competition and there is a shortage in the local market. | 7 | 46.7 |
| Private sector | They are facing very low competition and confirmed there is a shortage in the local market. | 1 | 6.7 |

**Continued Appendix H:**

| Type of company | Answers of question C | Population group | per cent |
|---|---|---|---|
| public sector | All of them said that we should calculate of full product costs for pricing decisions. The reasons behind that as follows, for companies which produce fuel and pasta said that our government provide financial supports to fill the gap between the product costs and the market prices of any product that does not cover its cost percentage of profit. And companies which produce motor vehicles (assembly industry), tobacco, cement, building materials and metal said that they are facing very low competition and there is a shortage in the local market, so they can use of full product costs | 7 | 46.7 |
| private sector | Only one interviewee (building materials) said that full product costs are used in pricing decisions, however, they also answered the same reasons as the public sectors, that they are facing very low competition and there is a shortage in the local market. | 1 | 7 per cent |
| private sector | Only one of the interviewees in the chemical company who said they are using full product costs minus fixed assets depreciation and working with high quality in order to be able to work in the competitive market. | 1 | 7 per cent |
| **Type of company** | **Answers of question D** | **Population group** | per cent |
| Public sector | The interviewees have no knowledge about what is ABC system. | 3 | 20 |
| Private sector | The interviewees have no knowledge about what is ABC system. | 2 | 13.3 |
| Public sector | The interviewees have knowledge about this system, however, they said that the external local designers prefer designing traditional cost allocation system and encouraged us to adopt it. | 3 | 20 |
| Private sector | The interviewees have knowledge about this system, however, the asserted that such that this system is not common in our country. | 5 | 33.3 |
| Private sector | The interviewees have knowledge about this system, however, they highlighted that most managers are engineers and not specialized in accounting and they do not understand the benefit of contemporary CA systems. | 2 | 13.3 |