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Advanced Management Accounting Techniques in Manufacturing Firms in Ethiopia

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Declaration

I hereby declare that the work, which is being presented in this thesis, entitled "Advanced Management Accounting Techniques in Manufacturing Firms in Ethiopia", is original work of my own, has not been presented for a degree of any other university and all the resources of materials used for the thesis have been duly acknowledged.

Ermias Bogale
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22/06/2011
Date

This is to certify that the above declaration made by the candidate is correct to the best of my knowledge.

Dr. Degefe Duressa
(Thesis Advisor)

Date

Abstract

In order to survive and remain competitive the manufacturing firms are under increasing pressure to become more efficient in managing and controlling their costs. This paper examines the level of advanced management accounting practices in manufacturing firms of Ethiopia and it examines the relationship of some theoretical factors that influencing the usage AMATs. The usage or its level of advanced management accounting techniques increased in the last five years and this implies that the manufacturing has awareness about this techniques. To examine the relationship of theoretical factors that might affect the usage of AMATs the paper used Pearson correlation and cross tabulation. As the Pearson correlation coefficient indicates usage of AMATs and usage of advanced manufacturing technology has strong relationship. In the regards of the Traditional Management Accounting Techniques, it uses widely and increased in the last five years. To keep pace with the world changing management accounting environment, Ethiopian manufacturing firms should use the newly developed techniques.

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Acronyms

AMATs	Advanced management Accounting Techniques
MACS	Management Accounting Controlling System
TMATs	Traditional Management Accounting Techniques
JIT	Just In Time
ABC	Activity Based costing
TQM	Total Quality Management
AMT	Advanced Manufacturing Technology
CIM	Computer Integrated Manufacturing
TC	Target Costing
LCC	Life Cycle Costing
WTO	World Trade Organization
BSC	Balanced Scorecard
ICT	Information Communication Technology
ETB	Ethiopian Birr

Chapter One: Introduction

Advanced Management Accounting Techniques (AMATs) defined as multidimensional composite of planning and controlling subsystems that aims to provide information for managerial decision-making and to enhance an organization's performance (Birnberg and Snodgrass, 1988). Modern management accounting has a rich history going back almost 200 years. The need for cost accounting and tools for planning, coordinating and control first arose during the industrial revolution (Johnson, 1987). Since the early 1980s a number of innovative management accounting techniques have been developed such as activity based management, strategic management accounting, balanced scorecard and others. These new techniques have been designed to support modern technologies and new management processes, such as total quality management and just-in-time production systems and the search for competitive advantage to meet the challenge of global competition.

This new techniques affected the whole process of management accounting planning, controlling, decision making, communication and have shifted its focus from a simple role of cost determination and financial control to a sophisticated role of creating value through enhanced use of resources (Robert Luther, 2006). The aim of the study is to see whether the manufacturing business firms in Ethiopia are using Advanced Management Accounting technique and the extent or degree of such use. These techniques are more useful for managers in order to assist information relevant to decision making and day-to-day operational activities. The next section will discuss about the background of the study.

1.1. Background of the study

Management accounting techniques can be used by organizations to become more efficient and effective. Management accounting in the words of Robert S. Kaplan is a system that collects, classifies, summaries, analyses and reports information that will assist managers in their decision-making and control activities. Management accounting is largely concerned with providing economic information to managers for achieving organizational goals. Managers at each level must have a clear understanding about the objectives and goals assigned and receiving flow of relevant information. It is important to note that excess of irrelevant information is as bad as lack of relevant information.

In the past two decades, the business environment has changed dramatically. Trade liberalization and advancements in manufacturing and information technologies have significantly intensified competition, both in the domestic and the international markets. In order to remain competitive and survive, organizations need to be active and responsive to market changes, which require them to constantly review and revise their strategies (Mia and Clarke, 1999). The changes in the manufacturing strategies and processes often necessitate appropriate changes in their management accounting practices to take into account of the changing production cost structure. Organizations undertake structural changes that include information and communication networks such as Management Accounting and Control Systems (MACSs) to achieve targeted business performance (Williams and Seaman, 2002).

Advanced management accounting techniques in developing countries including Ethiopia and developed countries have recently received more publicity than usual. Outdated

management accounting systems were found to produce misleading cost numbers and performance measures. Radical changes in manufacturing technology and philosophy combined with intensified global competition, had made many traditional systems obsolete. In response, significant efforts have been made in both industry and academy to conceive and apply new costing systems that meet the requirements of the changed environment (Holzer and Norreklit 1991).

For decades, scholars and practitioners have shown a considerable amount of interest in issues related to appropriate the management accounting practices for manufacturing firms in manufacturing environment. Numerous debates have been held questioning the capability of the traditional management accounting techniques (TMATs) in providing adequate, relevant, timely and accurate information to management for planning, control and decision making purposes in the new manufacturing environment (Waldron and Everett, 2004). The next section deals with problem statement.

1.2. Statement of the problem

Information needed by managers vary with the type of business and their role within the organization. A lot of management accounting information is based on quantitative and financial measures but some of it is non-financial and some of it is qualitative. A quantitative approach emphasizes the subjective nature of the social world it attempts to understand from the frame of reference of those being studied. Given the current state of understanding of how management accounting control techniques operate in the rich variety of organizational context, the qualitative or grounded approach appears to have much to recommend it as a means of making progress (Hoque, 1991).

Managers for decision-making have commonly used some quantitative traditional measures, namely full costing, standard costing, job order costing, and process costing and others. But in order to support rapidly changing technologies as well as to meet the challenges of strong global competition they need to use some developed new management accounting techniques such as Activity based costing (ABC), target costing (TC) , life cycle costing (LCC), Just-in-time (JIT) , Total quality management (TQM), Keizen costing and others. Therefore, in the context of Ethiopia to what extent do the manufacturing firms are practice advanced management accounting techniques in producing the relevant information to the management in creating a competitive advantage for the firms.

A number of studies have been conducted for increasing the efficiency of manufacturing firms in Ethiopia. Mengistu (2006) on his study of the use of management accounting information for decision making in Ethiopian manufacturing organization, the result shows that there is very little practice of using management accounting information in decision making.

Mengistu (2006) found that the main reason for the very little practice of using management accounting information in decision making in manufacturing industry is that first, mangers are not willing to depend on management accounting information in making several decisions since they have no adequate knowledge of accounting. Second, the accountants are busy in routine accounting activities and do not have time to prepare management accounting information for most of the decision to be made. Thirdly he also pointed out, the decision of most of the middle managers are influenced by higher level

managers and as result the managers may not want to depend on management accounting information in making decisions due to the involvement of other in their decisions. He also recommended, the managers should create awareness to the importance of management accounting in decision making or giving short-term training on management accounting to all managers that are involved in decision-making process.

In 2008, Belete in his study of group technology for Ethiopian manufacturing industries suggests that manufacturing industries should constantly search for improved manufacturing methods enable to produce high quality products at lower costs. Group Technology is a manufacturing philosophy in which parts having similar Geometry and/or manufacturing process are grouped together to achieve higher level of integration between the design and manufacturing functions of a firm. Group technology achieves advantages on the basis of these similarities. Similar parts are arranged into part families. Each family possesses similar design and manufacturing characteristics. Efficiencies result from reduced setup times, lower in-process inventories, better scheduling, streamlined material flow, improved quality, improved tool control, and the use of standardized process plans.

Belete (2008) conclude that one of the advanced manufacturing systems that help to decrease the production cost by reducing material handling and other tangible or intangible costs is Group Technology. Hence, he recommends to realize the effects of the system in all areas of application the management should create awareness to the overall employees of the company and appropriate trainings should prepare for employees of design engineering and manufacturing departments. Without strong support from top

management, implementation of group technology will be difficult. Finally, he suggests also all management personnel should be supportive and dedicated about installation of the system.

On 2011, Eyerusalem and Söderbom on their study of the performance of new firms' evidences from Ethiopia's manufacturing sector, they investigate the relative importance of technological and demand constraints for firm performance using dataset of Ethiopian manufacturing sector (1996-2006). They compare various components of productivity across firms, using product and firm fixed effect estimation, reveals that entrants have lower demand and output prices than established firms. However, they did not found a strong difference in efficiency between entrants and established firms. Young and small firms' survival using probit regression reveals that firms' access to secure market is more important determinant of survival than productivity. They conclude young and small firms are also found to be most vulnerable to demand constraints.

Mengistu's study were related to usage of management accounting information for decision-making and Belete's, Eyerusalem and Söderbom studies were more on usages of technological aspects. AMATs designed to support modern technologies and new management process. Therefore, this study focused on the advanced management accounting techniques in manufacturing firms operating in Ethiopia and to what extent Ethiopia manufacturing firms are practicing AMATs in producing the relevant information to the management in creating a competitive advantage for the firms.

1.3. Objective of the Study

The main objective of the study is to see whether the manufacturing business firms in Ethiopia are using Advanced Management Accounting technique and the extent or degree of such use. These techniques are more useful for managers in order to assist information relevant to decision making and day-to-day operational activities. In broader sense the objectives covered under the study are:

- To examine the level of advanced management accounting practices in manufacturing companies operating in Ethiopia.
- To examine the relationships between product varieties, complexity of production process, overhead expenses and usage of advanced management accounting practices.
- To examine the relationship between level of competition and usage of advanced management accounting practices.
- To examine the relationship between company size and usage of advanced management accounting practices

1.4. Hypotheses

To achieve the objectives of the study the following hypotheses are tasted in the study.

H1: AMATs usage has no relationship to higher level of perceived market competition. Intensifying market competition induces firms to continually reevaluate their existing competitive strategies as well as their management control system. Studies have shown mixed result on the impact on market competition on management control. Khandwalla (1977) found a positive relationship between market competition and reliance on

management accounting information while others such as Mia and Clarke (1999) management accounting information mediated the relationship between competition and performance.

H2: Firm's size will be positively related to its usage of advanced management accounting techniques. Size was measured in terms of total sales (revenue).

H3: Firms with higher overhead in related to total cost uses AMATs than those with small overhead portion.

H4: The complexity of an organization's production process will be positively related to its usage of advanced management accounting techniques.

It is generally recognized that the evolution of management practices bears implications for change in management accounting systems (Simons, 1990). Numerous researchers have encouraged the accounting profession to develop new accounting techniques that better meet the timeliness and relevance requirements of management (Drury and Tayles, 1995).

H5: An organization's level of product variety will be positively related to the usage of advanced management accounting techniques.

Cooper (1996) and others have proposed several hypotheses about the relationship between the accounting technique chosen and various factors such as number of products, complexity of the production process and proportion of overhead expenses.

1.5. Significance of the study

This study helps the manufacturing firm to use AMATs for planning and controlling to enhance organization performance and to meets its objectives. Although, this study useful for organizations to undertake structural changes which include information and communication network such as, Management Accounting Controlling System (MACS) to achieve targeted business objective. The study also use as a reference for other researchers. In addition, this study also helps the organization to change its costing method with that of more related to its operation.

1.6. Limitations of the Study

This study is subject to the usual limitations associated with survey research but there are at least some limitations to the study that need to be addressed. Firstly, this study covers only manufacturing firms. The contextual factors and their effects on management accounting practices may be different for other types of industries such as service industries. Secondly, the types of AMATs and the measurements used in this study may be limited and not exhaustive enough. Thirdly, the scope was limited to Addis Ababa and neighborhoods town or industry zones. Finally, there may be other important predicting variables that could be added to theoretical framework to improve its explanatory power.

1.7. Organization of the study

This paper has five chapters. Chapter 1 deals with Introduction; in this section, it presents Background of the study, statement of the problem, objective of the study, significance of the study and limitation of the study. In chapter two review of the related literature discussed briefly. The third chapter discusses about the methodology part. The fourth

chapter presents about the data analysis and interpretation of the results. Finally, the last chapter discusses the conclusion and recommendation.

Chapter Two: Literature Review

A number of researchers have studied the vital role of advanced management accounting information with respect to the manager's work. Mangers in any organization carry out three major activities: - planning, directing or motivating and controlling. Planning involves selecting a course of action and specifying how the action will be implemented. Directing and motivating involves mobilizing people to carry out plans and run routine operations. Controlling involves ensuring that the plan is actually carried out and is appropriately modified as circumstances changes (Garrison and Noreen, 2003).

Implementing these activities particularly in planning and control functions requires periodical information from the management accounting department. The difference between management accounting and financial accounting is, management accounting is concerned with providing information to mangers. On the other hand, financial accounting provides information to external users. Management accounting includes two types of techniques; (1) traditional techniques: these techniques include the full costing, standard costing, process coting and job order costing (2) Advanced techniques or modern techniques such as activity based costing, Activity based management, target costing, just in time and Balanced score card and others (Chennhall and Langfield, 1998).

There have been many studies of traditional techniques of management accounting, which have been used already in the organizations a long time ago. Nevertheless, these

techniques are not sufficient to provide managers with the information they require particularly in the changing business environment.

Garrison and Noreen (2003) and others such as Zimmermen (2003) point out that the last two decades have been a period of remarkable change in the business environment, including the explosive development of the internet, competition in many industries which has become international in scope, as well as the pace of innovation in products and services has accelerated.

Since the early 1980s, many companies have gone through several waves of improvement programs, starting with Just In Time (JIT), passing on to Total Quality Management (TQM) and Business process Reengineering (BPR). Hence, adopting these improvement programs could improve quality, shrink cost, amplify output, reduce delays in responding to customers and finally increase profits. Accordingly, advanced management accounting techniques considerably changes in its techniques to be able to supply managers with information to assist them continually in the strategic planning and decisions making process (Garrison and Noreen 2003).

2.1. What is manufacturing?

In Late Latin, these were combined to form the word "manufactus" meaning 'made by hand' or 'hand- made'. Indeed, the word factory was derived from the now obsolete word manufactory. In its broadest and most general sense, manufacturing is defined as the conversion of stuff into things (Scallan, 2006).

However, in more concise terms, it is defined in the Collins English Dictionary (1998) as processing or making a product from raw materials, especially as a large-scale operation using machinery. In a modern context as of Scallan, 2006, this definition can be expanded further to: the making of products from raw materials using various processes, equipment, operations and manpower according to a detailed plan. During processing, the raw material undergoes changes to allow it become a part of a product or products. Once processed, it should have worth in the market or a value. Therefore, manufacturing is 'adding value' to the material. The value added to the material through the processing must be greater than the cost of processing to allow the organization to make money or a profit. Therefore, added value can be defined as the increase in market value resulting from an alteration of the form, location or availability of a product, excluding the cost of materials and services.

Finally, the income of an organization, calculated by deducting the total costs from the sales revenue, is also sometimes referred to as the added value or value added. In fact, in the past, organizations have used bonus or incentives schemes for employees based on this definition of value added. Therefore, using this definition, manufacturing firms will only be successful if it not only makes products, but also sells them. This allows manufacturing to be future defined as the making of products from raw materials using various processes, equipment, operations and manpower according to a detailed plan that is cost effective and generates income through sales (Scallan, 2006).

2.2. Theoretical Overview

AMATs adoption often results in drastic changes in manufacturing processes and cost structures that often entail appropriate MACS changes in firms (Yakou and Dorweiler, 1995). It has been argued that in an AMAT environment, MACSs need to change in order to continue to remain relevant in providing relevant, timely and accurate information to management for planning, control and decision-making purposes. The following are some of the advanced management accounting techniques (Walther and Skousen, 2009).

2.2.1. Activity Based Costing (ABC)

ABC refers to product and service costing techniques in which costs are first assigned to activities in the production process and then either directly traced to products/service or allocated by using the cost driver that most accurately captures variations in the cost activity. ABC emphasizes the homogeneity of costs in establishing cost pools and the identification of cost drivers for allocating cost pools to products (Cooper 1998).

ABC is an accounting methodology that assigns costs to activities rather than products or services. This enables resources and overhead costs to be more accurately assigned to products and services that consume them. It assigns cost-to-cost objects such as products or customers based on their use of activities. In traditional costing overheads are first related to cost centers or Production and Service Centers and then to cost objects or products. In ABC, overheads are related to activities or grouped into cost pools depending on the terminology preferred. Then they are related to the cost objects, for example for products. The two processes are very similar but the first stage is different as ABC uses activities instead of functional departments or cost centers. The problem with

functional departments is that they tend to include a series of different activities, which incur a number of different costs that behave in different ways. Activity costs tend to behave in a similar way to each other that is they have the same cost driver. Therefore, ABC gives a more realistic picture of the way in which costs behave (Barfield, Raiborn and Kinney, 2003).

As the study conducted by the institute of chartered accountant of India (N.D), factors prompting the development of ABC system include.

- Growing overhead costs because of increasingly automated production.
- Increasing market competition that necessitated more accurate product costs.
- Increasing product diversity to secure economies of scope and increased market share.

Benefits and shortcoming of Activity Based Costing

Initially companies switched from traditional absorption costing to ABC in order to produce more accurate cost information for products. ABC is particularly needed by organizations for product costing where:

- Production overheads are high in relation to direct costs.
- There is a great diversity in the product range.
- Products use very different amounts of the overhead resources.
- Consumption of overhead resources is not primarily driven by volume.

Stages in ABC

The different stages in activity based costing are listed below.

1) Identification of the activities that may take place in an organization.
2) Assigning costs to cost pool for each activity.
3) Support activities are then spread across the primary activities.
4) Determine the cost drivers for each activity.
5) Assigning the costs of activities to products according to product demand for activities (Atkinson, Banker, Kaplan and Young, 1997).

The following are shortcomings of ABC techniques. First, ABC requires a significant amount of time and thus, cost to implement. If implementation is to be successful, substantial support is needed throughout the firm. An environment for change must be created that requires overcoming a variety of individual, organizational, and environmental barriers. Individual barriers are typically related to (1) fear of the unknown or shift in status quo, (2) potential loss of status, or (3) a necessity to learn new skills. To overcome these barriers, a firm must first recognize that these barriers exist; second, investigate their causes; and third, communicate information about the "what," "why," and "how" of ABC to all concerned parties (Barfield, Raiborn and Kinney (2003).

Another problem with ABC is that it does not conform specifically to generally accepted accounting principles (GAAP). ABC would suggest that some non-product costs such as those in research and development be allocated to products, whereas certain other traditionally designated product costs such as factory building depreciation not are allocated to products.

Therefore, most companies have used ABC for internal reporting, while continuing to maintain their general and subsidiary ledger accounts and prepare their external financial statements on the basis of a more "traditional" system requiring two product costing systems and causing even more costs to be incurred. As ABC systems become more widely accepted, more companies may choose to refine how ABC and GAAP determine product cost to make those definitions more compatible and, thereby, eliminate the need for two costing systems. One final criticism that has been leveled at activity based costing is that it does not promote total quality management (TQM) and continuous improvement (Barfield, Raiborn and Kinney (2003).

In summary, ABC is an improved cost accounting tool that helps managers to know how the score is kept so that they can play the game more competitively.

2.2.2. Total quality management (TQM)

TQM is a "management approach of an organization, centered on quality, based on the participation of all its members and aiming at long-term success through customer satisfaction, and benefits to all members of the organization and to society. Thus, TQM has three important tenets: First, it necessitates an internal managerial system of planning, controlling, and decision making for continuous improvement. Second it requires participation by everyone in the organization and finally it focuses on improving goods and services from the customer's point of view to (Barfield, Raiborn and Kinney,2003).

The emergence of Total Quality Management (TQM) has been one of the major developments in management practice. TQM began to be introduced in the US around

1980, primarily in response to severe competitive challenges from Japanese companies. The recognition of TQM as a competitive advantage is widespread around the world, especially in Western countries, and today very few especially manufacturing companies can afford to ignore the term TQM (Dean and Bowen, 1994). On the other hand, innovation has also received considerable attention as having a crucial role in securing sustainable competitive advantage in today's competition. In today's business environment, there is no executive task more vital and demanding than the sustained management of innovation and change to compete in this ever-changing environment, companies must create new products and services (Tushman and Nadler, 1986).

2.2.3. Target-Costing

Target costing is defined as "a structured approach to determining the cost at which a proposed product with specified functionality and quality must be produced, to generate a desired level of profitability at its anticipated selling price". A critical aspect of this definition is that it emphasizes that target costing is much more than a management accounting technique. In this sense, the term "target costing" is a contradiction: it is not a product costing system, but rather a management technique aimed at reducing a product's life cycle costs (Institute of Chartered Accountants of India, N.D). Target costing is emerged and practiced in Japan in 1960s as a response to difficult market conditions. This made Japanese companies particularly, effective in the areas of product design and development, where they were able to identify all relevant elements to formulate a holistic management approach, in order to achieve performance levels to meet the firm's objectives (Cooper and Kaplan, 2006)

According to various studies on target cost, it describes the uses and features of this technique. Target costing is most useful in situations where the majority of product costs are locked in during the product design phase. This is the case for most manufactured products, but few services. Another situation where target costing results in less value is the production of raw materials, such as chemicals. In this case, there are no design features for a design team to labor (Smith, 2006). Uses of Target Costing are:

1. It reinforces top-to-bottom commitment to process and product innovation and is aimed at identifying issues to be resolved, in order to achieve some competitive advantage.
2. It helps to create a company's competitive future with market driven management for designing and manufacturing products that meet the price required for market success.
3. It uses management control systems to support and reinforce manufacturing strategies; and to identify market opportunities that can be converted into real savings to achieve the best value rather than simply the lowest cost.

The studies also describes its Features

1. Target costing is viewed as an integral part of the design and introduction of new products. As such, it is part of an overall profit management process, rather than simply a tool for cost reduction and cost management.
2. For any given product, a target-selling price is determined using various sales forecasting techniques. Critical to setting the target-selling price are the design specifications or reflecting certain levels of functionality and quality of the new

product. These specifications are based on customer requirements and expectations and are often influenced by the offerings of competitors.

3. Integral to setting the target-selling price is the establishment of target production volumes, given the relationship between price and volume. The expected targets volumes are also critical to computing unit costs, especially with respect to capacity related costs such as tooling costs, as product costs are dependent upon the production levels over the life cycle of the product (Smith, 2006).

Target costing system results in clear, substantial benefits in most cases, it has a few problems that one should be aware of and guard against (Cooper,1998). These problems are as follows: The first problem is that the development process can be lengthened to a considerable extent since the design team may require a number of design iterations before it can devise a sufficiently low cost product that meets the target cost and margin criteria. The second problem with target costing is that a large amount of mandatory cost cutting can result in finger pointing in various parts of the company, especially if employees in one area feel they are being called on to provide a disproportionately large part of the savings.

Finally, having representatives from number of departments on the design team can sometimes make it more difficult to reach a consensus on the proper design because there are too many opinions regarding design issues. This is a major problem when there are particularly stubborn people on the design team who are holding out for specific product features. Resolving out is difficult and requires a strong team manager, as well as a long

term commitment on the part of a company to weed out those who are not willing to act in the best interests of the team (Cooper,1998).

Target costing improves profitability in two ways. First, it places such a detailed continuing emphasis on product costs throughout the life cycle of every product that it is unlikely that a company will experience runaway costs; also, the management team is completely aware of costing issues since it receives regular reports from the cost accounting members of all design teams. Second, it improves profitability through precise targeting of the correct prices at which the company feels it can field a profitable product in the marketplace that will sell in a robust manner (Institute of chartered accountant of India (N.D).

Implementing a Target-Costing

A target costing initiative requires the participation of several departments. Because there are so many participants in the process from so many departments, some of whom have different agendas in regard to what they want the program to produce. Design projects can be delayed by squabbling or by an inability to drive down design or production costs in a reasonably efficient manner. This delay may lead to serious cost overruns in the cost of the design team itself, which can lead to unexpected termination of the entire targets costing system by the management team. However, these problems can be mitigated or completely eliminated by ensuring that the steps listed here are completed when the target costing system is first installed (Institute of chartered accountant of India (N.D).

1. Create a project charter: The target costing effort should begin with a document, approved by senior management that describes its goals and what it is authorized to

do. Written approval of this document by the senior management group provides the target costing effort with a strong basis of support and direction in all subsequent efforts.

2. Obtain a management sponsor: This should be an individual who is well positioned near the top of the corporate hierarchy, believes strongly in the goals of target costing, and will support the initiative in all respects obtaining funding, lobbying other members of top management, working to eliminate road blocks, and ensuring that other problems are overcome in timely manner. This person is central to the success of target costing.
3. Obtain a budget: The target costing program requires funds to ensure that one or more well-staffed design teams can complete target costing tasks. The funding should be based on a formal allocation of money through the corporate budget, rather than a parsimonious sub allocation grudgingly granted by one or more departments.
4. Assign a strong team manager: This manager should be a full-time employee, so that his or her complete attention can be directed toward the welfare of the project.
5. Enroll full-time participants: It may even be necessary to permanently assign them to a target costing program, providing them with a single focus on ensuring the success of the target costing program because their livelihood are now tied to it.
6. Use project management tools: Target costing can be a highly complex effort especially for high-cost products with many features and components (Institute of chartered accountant of India (N.D).

2.2.4. Throughput Accounting

Throughput Accounting (TA) is a method of performance measurement that relates production and other costs to throughput. Throughput accounting product costs relate to usage of key resources by various products. It assumes that a manager has a given set of resources available. These comprise the existing buildings, capital equipment and labor force. Using these resources, purchased materials and components must be processed to generated sales revenue. To achieve this, maximum amount of throughput is required with the financial definition (Matthias,2000).

Throughput is influenced by selling price, direct purchase price, usage of direct materials, volume of throughput. Constraints on throughput might include the existence of an uncompetitive selling price, the need to deliver on time to particular customers, the lack of product quality and reliability, the lack of reliable materials suppliers, and the existence of shortage of production resources. It becomes management's task to eliminate these constraints. Shortages of resources are usually termed bottlenecks and their elimination often only moves a problem from one location to another. Thus, the careful planning to minimize and eliminate all bottlenecks becomes very important (Goldratt 1990).

2.2.5. Balanced Scorecard

BSC is first introduced by Kaplan and Norton in the early 1990s; it can be used for organizations at multiple levels: top management, subunit, and even individual employees. Additionally, it can be used by not-for-profit organizations as well.

Regardless of the level of use, the scorecard approach directly links its measurements to the organization's strategies and values (Cited in Tilaye Kassahun, 2010).

BSC allow measurement of data to be disaggregated into four segments that reflect past performance and provide indicators of investments in future performance. The financial measures of the balanced scorecard should be designed to reflect shareholder relevant issues of profitability and organizational growth. Such measures can include subunit operating income, bottom line net income, cash flow, change in market share and return on assets. Balanced scorecard measures of the customer perspective should indicate how the organization is managing relative to customer issues of speed, quality, service and price (both purchase and after purchase). These measures can be internal or external and should help an organization to assess its future success in the eyes of its customers (Sekhar, 2006).

Business process measures should focus on the internal things that the organization needs to do to make certain that it is meeting customers' needs and expectations. Other measures in this area include manufacturing or service cycle efficiency, time to market on new products, on time delivery and cost variances. The final category of the scorecard should indicate those measures that the organization can use to help judge continuous improvement and predict longevity. These measures focus on using the organization's intellectual capital to adapt to changing customer needs or influence new customer needs and expectations through product or service innovations. Measures such as number of patents or copyrights applied for, percentage of research and development projects resulting in patentable products, average time of research and development project from

conception to commercialization and percentage of capital investments on high technology projects can help an organization ascertain its ability to learn, grow, improve and thus survive. Regardless of whether organizational management decides to use a balanced scorecard approach to performance measurement, some method of assessing performance must be developed. A variety of decisions must be integrated into a performance management system (Walther and Skouseb, 2009).

BSC has brought a revolution into performance measurement as it provides the following benefits:

- Helps to clarify and gain consensus about strategy;
- It improves communication of the organization's Vision and Strategy
- It links strategic objectives to long-term targets and annual budgets;
- It increases focus on organizational strategy and results;
- It improves organizational performance by measuring what matters.
- It aligns organization strategy with the work people do on a day to day basis, align departmental and personal goals to the strategy;
- It focuses on the drivers of future performance;
- It encourages organization perform periodic and systematic strategic reviews;
- It helps to prioritize projects/initiatives; and
- It helps organizations to obtain feedback to learn about and improve strategy (Kaplan and Norton, 1996).

2.2.6. Just In Time

Just-in-time (JIT) is a philosophy about when to do something. The "when" is as needed and the "something" is a production, purchasing or delivery activity. The JIT philosophy is applicable in all departments of all types of organizations. JIT's three primary goals are as follows (Atkinson, Banker, Kaplan and Young, N.D):

1. Elimination of any production process or operation that does not add value to the product/service,
2. Continuous improvement in production/performance efficiency, and
3. Reduction in the total cost of production/performance while increasing quality.

These goals are totally consistent with and supportive of the total quality management program. Just-in-time manufacturing originated in Japan where a card, or kanban (pronounced "kahn-bahn"), was used to indicate a work center's need for additional components. A just-in-time manufacturing system attempts to acquire components and produce inventory units only as they are needed, minimize product defects, and reduce cycle/setup times for acquisition and production (Barfield, Raiborn and Kinney, 2003).

2.2.7. Kaizen costing

Kaizen costing (Kaplan and Cooper, 1998) is an approach to develop a costing system to support continuous improvement activities in a company. It aims to motivate operators to drive costs down, rather than to record historic costs and variances for middle manager accountability. Kaizen costing is less concerned with accuracy and more concerned with

putting information necessary for good decision making in the hands of the people doing the work (Walther and Skouseb, 2009)..

Kaizen costing is generally carried out by the team itself, who are provided with the basic hourly rates and other cost accounting data. The team will then be asked to produce weekly product costs against target that could be decreased over time. Kaizen costing is usually related only to operational measures, such as changeover times, power used, inventory levels, etc. 'Kaizen costing is about beating the current cost levels, not matching standards and explaining variances' (Bicheno, 2000).

2.2.8. Life cycle costing

Life cycle costing is the "accumulation of costs for activities that occur over the entire life cycle of a product, from inception to abandonment by the manufacturer and consumer." (Berliner and Brimson,1988). Manufacturers would base life cycle costing expense allocations on an expected number of units to be sold over the product's life. Each period's internal income statement using life cycle costing would show revenues on a life-to-date basis. This revenue amount would be reduced by total cost of goods sold, total research, development project costs, total distribution, and other marketing costs. If life cycle costing were to be used externally, only annual sales and cost of goods sold would be presented in periodic financial statements. But all preproduction costs would be capitalized and a risk reserve could be established "to measure the probability that these deferred product costs will be recovered through related product sales." The risk reserve is a contra asset offsetting the capitalized preproduction costs. This contra asset

represents the estimated portion of the preproduction costs expected to be unrecoverable through future related product sales (Peavy,1990)..

Life cycle costing is especially important in industries that face rapid technological or style changes. If substantial money is spent on development, but technology improves faster or customer demand diminishes more rapidly than that money can be recouped from total product sales, was the development investment worthwhile? Periodic external financial statements may make a product appear to be worthwhile because its development costs were initially expensed. But, in total, the company may not even have recovered its original investment. Thus, over the product or service life cycle, companies need to be aware of and attempt to control the total costs of making a product or providing a service. One way of creating awareness is to evaluate all activities related to a product or service as value added or non-value-added at relatively frequent intervals (Barfield, Raiborn and Kinney, 2003).

2.2.9. BackFlush Costing

Backflush costing is a product costing system generally used in a just-in-time inventory environment. Backflush costing delays the costing process until the production of goods is completed. Costs are then "flushed" back at the end of the production run and assigned to the goods. This eliminates the detailed tracking of costs throughout the production process, which is a feature of traditional costing systems (Walther and Skousen, 2009).

Investopedia explains Backflush Costing is eliminating work-in-process accounts; Backflush costing simplifies the accounting process. However, this simplification and

other deviations from traditional costing systems mean that Backflush costing may not always conform to generally accepted accounting principles (GAAP). Another drawback of this system is the lack of a sequential audit trail. Backflush costing is a streamlined cost accounting method that speeds up, simplifies, and minimizes accounting effort in an environment that minimizes inventory balances, requires few allocations, uses standard costs, and has minimal variances from standard. During the period, this costing method records purchases of raw material and accumulates actual conversion costs. Then, at a predetermined trigger point such as (1) at completion of production or (2) on the sale of goods, an entry is made to allocate the total costs incurred to Cost of Goods Sold and to Finished Goods Inventory using standard production costs (Walther and Skousen, 2009).

2.3. Traditional Management Accounting

2.3.1. Full costing

Full costing is a managerial accounting method that describes when all fixed and variable costs, including manufacturing costs, are used to compute the total cost per unit. Full costing includes these costs when computing the amount of money it takes to produce and distribute one unit of output. Full costing is also known as "full costs" or "absorption costing" (Walther and Skousen, 2009).

Full costing is how firm expenses its production and distribution costs will affect the structure of internal income statements. Because all costs incurred to sell a product are included with cost of goods sold, the firm's gross margin will be lower under the full costing method than the absorption costing method (Collin, 2007).

2.3.2. Process Costing

Process costing is a method of cost accounting applied to production carried out by a series of operational stages or processes. Its characteristics are that costs are accumulated for the whole production process and that average unit costs of production are computed at each stage (Collin, 2007).

Process costing systems separate costs into cost categories according to the timing of when costs are introduced into the process. Often, only two cost classifications, direct materials and conversion costs, are necessary. Direct materials are frequently added at one point in time, often the start or the end of the process, and all conversion costs are added at about the same time, but in a pattern different from direct materials costs (Horngren, (2002).

2.3.3. Standard Costing

The chartered institute of management accountant (CIMA) has defined standard cost as "a predetermined cost which is calculated from management's standards of efficient operations and the relevant necessary expenditure." They are the predetermined costs on technical estimate of material labor and overhead for a selected period of time and for a prescribed set of working conditions. In other words, a standard cost is a planned cost for a unit of product or service rendered (Atkinson, Banker, Kaplan and Young, 1997).

It is a system of cost accounting that is designed to find out how much should be the cost of a product under the existing conditions. The actual cost can be ascertained only when production is undertaken. The predetermined cost is compared to the actual cost and a

variance between the two enables the management to take necessary corrective measures (Horngren, (2002).

2.3.4. Job Order Costing

In Job order costing system costs are traced to the jobs and then the costs of the job are divided by the number of units in the job to arrive at an average cost per unit. It is used in situations where many different products are produced each period. For example clothing factory would typically made many different types of jeans for both men and women during a month. It is also extensively used in service industries like Hospitals, law firms, movie studios, accounting firms, advertising agencies and repair shops all use a variety of job order costing system to accumulate costs for accounting and billing purposes. The same concept and procedures are used by many service organizations (Atkinson, Banker, Kaplan and Young, 1997).

The record keeping and cost assignment problems are more complex in a job order costing system when a company sells many different products and services than when it has only a single product or service. Since the products are different, the costs are typically different. Consequently, cost records must be maintained for each distinct product or job. For example, a clothing factory would keep separate track of the costs of filling orders for particular styles, sizes and colors of jeans. A job order costing system requires more effort than a process costing system. Companies classify manufacturing costs into three broad categories :(1) direct materials, (2) direct labor, (3) manufacturing overhead and how each of these three types of costs is recorded and accumulated (Horngren, 2002).

2.4. Categories of manufacturing system

There are two basic categories of manufacturing system (Scallan, 2006):

1. Discrete parts manufacturing and
2. Continuous process manufacturing.

Discrete parts manufacturing involves the manufacture of individual items and can be further classified into:

- Project manufacture;
- Jobbing shop manufacture;
- Batch manufacture;
- Mass/Flow manufacture.

However, in recent times another system of manufacture has been developed called cellular manufacture. In cellular manufacture, process are grouped according to the sequence and operations required to make a particular product. In effect, this is another discrete parts manufacturing system (Belete, 2006).

2.4.1. Project manufacture

The defining feature of project manufacture is the type of layout employed and the fact that there is a small number units produced with very low production rate. The layout is known as a fixed position layout. In the fixed position layout, the product remains at the same location that is a fixed position, usually due to the size/weight of the product. The workers and all tools and equipment are then brought to the product to carry out work. It

should be noted that component parts, sub-assemblies might be manufactured elsewhere and then brought to the product location (Scallan, 2006).

The workers are usually highly skilled and material handling is high. It is also common for products manufactured using this layout to be one of a kind, for example, ships, aircraft, space vehicles, bridges, buildings and others.

2.4.2. Jobbing shop manufacture

The jobbing shop's distinguishing feature is the production of a wide variety of products. Manufacture is very often specific to customer order and specification. This usually means very small lot sizes and very often the production of one of kind. However, some job shops manufacture to fill finished goods inventories. As a wide variety of products are produced, a wide variety of manufacturing process is required. The product variety also means that the workforce must be highly skilled in order to fulfill a range different work assignments. Typical products of job shops are special purpose machine tools, fabricated sub-assemblies and components for the aerospace industry (Scallan, 2006).

With job shops, production equipment is usually general purpose and generally arranged according to the general type of manufacturing process. For example, the lathes are in one department, milling machines in another and drill presses in still another and so forth. This is known as a process-focused layout and allows the job shop to make such a wide variety of products. Each different part requires its own unique sequence of operations and therefore requires to be routed through the manufacturing system by means of a routing sheet. In general, forklifts and handcarts are used to move material from one

place to another. It is estimated that as much as 75 percent of discrete part manufacture is made in lots of 50 or less. Thus, the job shop system is an important method of manufacture (Horngren, 2002).

2.4.3. Batch manufacture

The main feature of batch manufacture is the production of medium size lots of a production of medium size lots of a product in either single runs or repeated runs at given times. The lot size range is approximately 5 – 1000 and even possibly more. Again, as the product variety can be high, the number of processes required is high and therefore the equipment is general purpose. Similar to job manufacture, the workforce must be skilled and flexible to cope with the high product variety. The process-focused organization of the job shop is also equally applicable for batch production. Therefore job and batch manufacture are often confused, because they have the following common characteristics (Scallan, 2006):

- The flow of manufacture will be intermittent;
- Some parts will be for customer orders and others for stock;
- Schedule control of orders will be required to ensure delivery times are met;
- There is a high product variety.

To differentiate between job and batch manufacture, it is not the number of components that is the deciding factor, but the organization of the manufacture itself. For example, consider the manufacture of one lot of five components. These could be made by five operators with each making a component outright. This is what would normally happen in a job shop. However, each component could be passed from operator to operator with

each specializing and completing a particular operation. In this case, the manufacture would be classified as batch production (Scallan, 2006).

2.4.4. Flow/Mass manufacture

The main characteristic of flow line manufacture is the high volume of products produced. It is usually referred to as mass manufacture due to the very large quantities of products manufactured. It is also common for mass manufacture for system to have high production rates. Concerning the process equipment this tends is of a specialized nature, with processes being dedicated to a particular product. In fact, very often processes are designed exclusively to produce a particular product. This means that investment in specialized machines and tooling is high. The skill level of the work force tends to be lower than that of both job and batch manufacture. This is due to the fact that the manufacturing skill is transferred from operator to machine through the specialist nature and design of equipment (Scallan, 2006).

Products flow through a sequence of operations by material-handling devices such as conveyers and other transfer devices. They move through the operations one at a time with the time at each process fixed. In flow line manufacture, the organization of the process equipment is product focused. In this type of manufacturing system, the equipment is arranged in order of the product's sequence of operations. This means that equipment is arranged in a line with generally only one of each type of process. The exception to this is where duplicates are needed to balance the time taken for a particular product. The line is organized to make a single product or a regular mix of products (Scallan, 2006).

2.4.5. Continuous/Process manufacture

Continuous/Process manufacture involves the continuous production of a product and often uses chemical as well as physical and/or mechanical means, for example, sugar production, fertilizer production and the like. The main characteristics of continuous manufacture, sometimes referred to as process manufacture, is the fact that the equipment is in operation 24 hours a day weeks or even months without a halt. However, this rarely happens due to equipment breakdown and/or planned maintenance. There is no discreet product manufactured. Instead, the product being made is manufactured in bulk and output is likely to be measured in physical volume or weight (Scallan, 2006).

The process equipment will be highly specialized, probably highly automated, and thus very expensive and will be organized in a product-focused arrangement. However, the workforce is likely to be varied in skill level depending on their role, which is, semi-skilled plant operators, skilled maintenance technicians, etc. Continuous processes tend to the most efficient but the least flexible of the manufacturing systems (Scallan, 2006).

Very often high-volume flow manufacturing is confused with continuous manufacture because of the following common characteristics (Barfield, Raiborn and Kinney, 2003):

- Manufacture is usually continuous in both;
- Manufacture is in anticipation of sales;
- The rate of flow of manufacture will be strictly controlled;
- There is a small product range.

The way to differentiate between the two is by the fact that in continuous manufacture the product physically flows, for example, oil, food processing, chemical processing, steel making, and so forth.

2.4.6. Cellular manufacturing

A cellular manufacturing system is usually composed of a number of linked cells. The cells themselves usually compose of a number of grouped processes. These are normally grouped according to the sequence and operations needed to make a particular component, sub-assembly or product. The arrangement within the cell is much like that of a flow system, but it is more flexible. Cells are normally laid out in a U-shape so that workers can move from machine to machine, loading and unloading parts. Usually there are high levels of automations within cells, including all machines being capable of running unattended and switching themselves off after the machining cycle is complete. This is also allows the operators to carry out manual operations such as finishing and inspection or walk from machine to machine (Scallan, 2006).

To implement a cellular manufacturing system, the current system must be converted in stages. This will entail taking parts of the current system and converting it into cells. The cells should be designed in such a way that allows the manufacture of specific groups or families of parts, that is, parts that have the similar geometrical features and require the same manufacturing processes to make. One method used in converting traditional manufacturing, particularly the jobbing shop, to cellular manufacturing is group technology. This technique helps group parts into compatible families.

Cellular manufacturing has many features that make it different from the traditional manufacturing systems. Parts usually move one at a time from machine to machine instead of in batches. When a cell worker completes a journey round the cell a part should have been completed. Set-up times also tend to be shorter than for traditional systems. The lead times for parts and products also tend to be shorter. This is because the machine can run unattended and thus more than one operation at a time can be carried out. In general, cells are more flexible and more responsive, allow for shorter set-up and lead times and can provide higher productivity (Scallan, 2006).

2.5. Changes in the Manufacturing Industry

Market competition has become more global-based as a result of trade liberalization under World Trade Organization (WTO) through multilateral trading system. World Trade Organization (WTO) is the only international organization dealing with the global rules of trade between nations. Its main function is to ensure that trade flows as smoothly, predictably and freely as possible. As of the official site of WTO still now Ethiopia is not a member of this organization or the country is included only as observer country. Adoption of advanced manufacturing technologies (AMTs) has revolutionized manufacturing processes. This in turn leads to permanent changes in the production cost structure that include significant increase in overhead costs and decrease in labor costs. Advances in Information and Communications Technology (ICT) have changed the manner in which data and information are being collected, measured, analyzed and disseminated within and between organizations (Atkinson *et al.*, 1997). In order to cope with the unrest and uncertainty in the marketplace, it has been argued that organizations

need to equip themselves with appropriate responses to the threats and opportunities and ensure that they design and use appropriate control systems for this purpose (Khandwalla, 1972).

The growing concern among accounting professionals and academics on the adequacy of the TMATs in meeting the current information needs of the firms, has led to a number of "new or claimed to be new" or advanced management accounting techniques (AMATs), such as new product costing techniques, strategic cost analysis, quality management and others (Libby and Warehouse, 1996). These new costing approaches are argued to result in more accurate tracing of costs to products and thus should result in improved decisions. The traditional volume based approach of allocation of production overhead costs to products and services is criticized as over simplistic and does not reflect the complexity of products (Kaplan, 1986).

The TMATs such as full costing, standard costing and job order costing and process costing are still commonly used by companies (Waldron and Everett, 2004). Today, advanced management techniques such as activity based costing, activity based management, target costing, value added accounting, back flush costing and life cycle costing are gaining increased attention. These techniques have benefits and advantages but different techniques might be suitable for certain circumstances (Waldron and Everett, 2004). However, empirical research has shown that the traditional management accounting practices are still widely used in firms, possibly due to the lack of knowledge of the other alternatives and the high financial costs of changing the existing costing systems (Johnson and Kaplan, 1987). Companies surveyed in United Kingdom (UK) and

United States of America (USA) (for example Drury *et al.,* 1993 and Cohen and Paquette, 1991) used standard costing systems with an adoption rate of more than 80%. In more recent studies that were carried out in Australia (Chenhall and Langfield-Smith, 1998) and in New Zealand (Guilding *et al.*, 1998), the researchers documented similar findings. In both countries, standard costing systems were still widely used with adoption rates of over 70%.

As firms production become more automated, direct labor is increasingly engaged in setup and supervisory functions rather than performing the work on the product and no longer represents a reasonable surrogate for resource demands by products. Labor frequently works on several different products at the same time that makes it difficult to assign labor hours intelligently to products (Coopers and Kaplan, 1998). As indirect costs becoming more important and increasingly larger, they need to be traced more accurately to products if strategic decisions are to be based on the 'best' information. For this purpose, activity costing could be one of the best solutions as it aims to achieve better product costing by cutting across conventional, functional boundaries.

Computer-integrated manufacturing (CIM) system automates manufacturing through integrating the manufacturing processes by using Information Communication Technology (ICT) to allow information flows between people and equipment. Activities including product design, development, engineering, manufacturing, inventory control, marketing, sales, field support, and service can be fully integrated and automated. CIM can significantly improve quality, reliability and manufacturing flexibility (Kaplan, 1986). He argues that the manufacturing flexibility attribute allowed for in CIM enables

such IT investment a longer useful life than traditional manufacturing process investments. Furthermore, investments in AMT offer other benefits, tangible and intangible, such as reduced inventory levels, savings in floor space, lower throughput and lead times, and acceleration of the learning phase. The following portion will discuss about the implication of management accounting practices.

2.6. Management Accounting Practices

Generally, the fundamental objectives of management accounting in an advanced manufacturing environment remain the same as in the traditional manufacturing setting which are to cost products, value inventory and measure performance and make investment decisions (Jeans and Morrow, 1989). However, while the TMATs may be still useful under certain circumstances, the new manufacturing environment has posed new challenges to these systems. The drastic changes in today's competitive business environment and advancements in manufacturing technology have a number of implications for accounting. There are five implications for accounting: changes in cost patterns and cost behavior, reduced inventory and reduced emphasis on inventory accounting, declining relevance of standard costing systems, changing nature of capital investments, and the increasing importance of non-financial performance indicators. These implications point toward the need for new management accounting practices to meet the challenges of the new manufacturing environment (Clarke, 1995).

The studies were conducted in Singapore and Malaysia, respectively; found there is no relationship between perceived market competition and change in management accounting systems (Isa and Foong, 2005). An earlier study in Canada found perceived

market competition and usage in management accounting techniques were has relationships. This study was based on a sample of Canadian manufacturing firms that were of Anglo-American cultural value and in an advanced economy (Libby and Waterhouse, 1996).

In this intensely competitive environment, accurate information about product costs and a performance measurement system that allows effective monitoring of a firm's strategy are critical for survival and sustained profitability. Automating the manufacturing processes requires large-scale capital investments and as a consequence, drastic changes in the firm's production cost structure; costs are shifting from being mostly variable to mostly fixed, and the amount of direct labor shrinks significantly, while costs for indirect and highly skilled labor increase significantly. The growing amount of fixed costs requires the management to have a better understanding of the cause-effect relationship between resource consumption and level of activity. Thus, the idea of using multiple overhead application rates, such as those used in an ABC system is gaining popularity (Cooper and Kaplan, 1998).

AMT adoption leads to changing manufacturing operations and information needs, and changes to the traditional MACS are required to meet those needs (Johnson and Kaplan, 1987). MACS play an important role in providing the information needed for companies to formulate strategies to meet the rapid changes in the business environment. New management accounting practices, such as ABC and non-financial performance measurement indicators, can enhance the quality and relevance of information needed by management. When environment changes and the level of AMT adopted increase,

managers are expected to make a greater and more frequent use of management accounting information for decision-making. It is conjectured that a higher level of AMT adoption is associated with a more extensive use of new costing systems, such as ABC, and non-financial performance measure indicators.

2.7. Empirical overview

Globalization and increasing competition are favoring technology intensive production and skilled labor. Automation and advances in information technology are reducing the importance of the low-skill, labor-intensive occupations in sectors such as manufacturing.

The Ethiopian industries are operating in business environment characterized by unprecedented global competition and technological change. Furthermore, their efforts fail to result in improved tools, equipment and services reaching the community. For the industries to survive and be competitive it is essential that they have to consciously link with higher education and research institutions so as to optimally use the available scarce resources of county (Belete, 2008).

As per Belete the existence of scientific and technological institutions in the country does not guarantee the provision of appropriately skilled workers and relevant research output to satisfy the immediate needs of the industry.

The proposed Center, in this study, is to discuss about the level and usage of advanced management accounting techniques in this sector that is manufacturing sector. The various techniques that discussed in theoretical overview is significantly use for manufacturing sector to improve and to scale their competence and reduce their cost that

leads to get high profits. The next portion will discuss about the historical background of Ethiopian manufacturing firms.

2.7.1. Background of the Manufacturing Industries in Ethiopia

Ethiopia faces a number of developmental challenges, including weak infrastructure, lack of adequate investments, skills shortage, political instability, inequitable global market, skewed trade regulations and others. The industry sector should be seen in light of these complex challenges rather than in isolation to the broader socio-political and economic context. In recent years, the Government has made the move towards a more privatized, open-market economy. The industry sector is positioned strategic in the country's medium term competitive strategy objectives. The ultimate goal of the government is to create a good business environment for the private sector to compete, boost domestic economic activities and increase the country's exports (Ministry of Trade and Industry, 2004).

Modern manufacturing was introduced to the Ethiopian economy towards the end of 19th century, with the emergence of a strong central government and political stability. Its introduction was said to have been facilitated by the completion of the Ethio – Djibouti railway.

Increased demand for manufactured goods by the Ethiopian elite, existence of entrepreneurial capacity of foreign citizens from America, Greece, Italy and India and the increased problems associated with imported commodities.

According to some source, by 1927 about 25 factories were established in Addis Ababa, and Dire Dawa, which includes 5 wood and Clay factories, 2 tanneries, 5 soap and edible oil plants, 2 ammunition factories, 1 brewery, 2 tobacco processing plants, 1 cement factory, 1 grains mill, and 2 salt factories. Except the printing press and ammunition plants, private entrepreneurs established all. Holleta grain mill was set up in 1896. During 1928 – 1941, about 10 manufacturing industries were set up, including the Dire Dawa Cement Factory and Dire Dawa Textile factory that were established by the Italians. The American and Greek settlers set up the remaining factories. During the immediate post war period of 1941 – 1959, the manufacturing sector increased rapidly and it was promoted for two main reasons:-

First, the government realized that the victory of Italy over Ethiopia was attributed to military superiorities, like superior mechanized armaments and weapons by Italy during 1935 – 1940, and thus the need for mechanization and economic development began to be perceived; and Second the close relationship of the Ethiopian government with the government of United States and United Kingdom, which encouraged social and economic development. The increase in the number of industrial establishments up to 1950 was nevertheless a result of a conscious and deliberate development policy and strategy (Ministry of Trade and Industry, 2004).

2.8. The Major Sub-Sectors

The classification is based on the study conducted by Central Statistics Agency (CSA, Report on Large and Medium Scale Manufacturing and Electricity industry survey, Addis Ababa, 2010).

2.8.1. Food, Beverages and Tobacco

Food, beverages and tobacco constitute the largest sub-sector in terms of value of output. Food processing industries mainly consist of flourmills, bakeries, pasta and macaroni factories, edible oil mills and sugar factories. The beverage industry is comprised of breweries, soft drink plants, mineral water plants, distilleries and wineries. The only cigarette producing factory is located in Addis Ababa and produces annually about three billion pieces of different brands of cigarettes. The factory gets leaf tobacco both from domestic plantations and from abroad.

2.8.2. Textiles and Garment

This is the largest sub-sector in terms of employment. In addition, there is also large number of cooperatives and individuals engaged in traditional weaving and tailoring. The textile and garment industries by and large cater for the domestic market. They are currently facing stiff competition from imported fabrics and used clothing.

2.8.3. Basic Metals and Engineering

As might be expected this sub-sector is at a low stage of development; but is fast developing. The range of products manufactured in the sub-sector includes galvanized roofing sheets, pipes, reinforcement bars, nails, window and doorframes, trusses, hand tools, implements, pumps, and various metal fabrications. In addition to the above products, there exist a couple of plants assembling trucks and tractors. There are strong indications of iron ore deposit in the western part of the country which may enable the setting up of an iron and steel complex in the future.

2.8.4. Leather and Footwear

Ethiopia has the largest livestock population in Africa and the ninth largest in the world. In order to take advantage of this enormous resource potential, the leather industry has established itself well. Finished leather is produced mainly for the domestic market. The main export markets are Europe and Japan. A number of tanneries and footwear and leather goods factories are being set up by private companies and the existing public ones are being privatized.

2.8.5. Chemicals

The chemicals industry produces toilet soaps and laundry soaps, detergents, paints and lacquers, various plastic products, car batteries and tires.

2.8.6. Non-Metallic Minerals

This category includes cement factories, bottles and tumblers, clay bricks and tubes, ceramics, tableware and wall and floor tiles.

2.8.7. Paper and Printing

Other industries in the sub-sector include paper-converting plants producing stationeries, packing materials and toilet papers, and a number of printing presses.

2.9. Cost of Imported Raw Materials

The high ratio of imported raw materials to the total cost of raw materials consumed is an indication of the dependency of large and medium scale manufacturing industries in the country, on imported raw materials. Manufacture of machinery and equipment, manufacture of motor vehicles, trailers and semitrailers, Manufacture of rubber and

plastic, Manufacture of chemicals and chemical products, manufacture of tobacco products and manufacture of paper, paper products and printing and manufacture of basic iron, consumed the highest proportion of imported raw materials, to that of the total cost of raw materials (annual report of CSA, 1997-1998 E.C).

2.10. Major Problems of Ethiopian Manufacturing Industries

The shortage of supply of raw material and absence of market demand stood as the first and second major reasons, respectively. In a similar note to the above, Absence of market demand and shortage of supply of raw materials emerged as the first and second major causes for underutilization of capacity (annual report of CSA, 1997-1998 E.C).

Generally, a number of inter-related problems are affected the growth and dynamism of the local manufacturing industries and some of the common problems that most industries would share are:-

- Market deficiency
- Shortage of raw material
- Large in-process inventory
- High material handling cost
- Poor product Quality
- Obsolete technology, machinery, and other.

Therefore, to stay in the business and competent in the recent market trend and global competition, local industries should concentrate how to avoid the above-interrelated problems. One of the strategies to overcome the difficulties is introducing and adapting

the improved and advanced manufacturing systems (annual report of CSA, 1997-1998 E.C).

2.11. Empirical studies

The growth and vitality of local manufacturing industries have greatly affected by market deficiency, shortage of raw material, obsolete technology and machinery, large in-process inventory, high material handling cost, poor product quality and other related reasons. Therefore, the influence of globalization and the increased speed of technology development has become a challenge to these industries.

Today, if products are not competitive in the global market, they will be out of business in the local market. The competition is with giant external companies that possess highly advanced technology, capital and management capability with strong market network, well-developed infrastructure, skilled professional workers and effective governmental services.

Mengistu, (2006) on the study of the use of management accounting information for decision making in Ethiopian manufacturing organization, the result shows that there is very little practice of using management accounting information in decision making. Mengistu also found that the main reason for the very little practice of using management accounting information in decision making in manufacturing industry is that first, mangers are not willing to depend on management accounting information in making several decisions since they have no adequate knowledge of accounting. Second reason that rose in his study is that, the accountant are busy in routine accounting activities and

do not have time to prepare management accounting information for most of the decision to be made. Thirdly he also point out, the decision of most of the mangers are influenced by higher level managers and as result the managers may not want to depend on management accounting information in making decisions due to the involvement of other in their decisions.

Hence, Belete recommends that to survive and sustain in this dynamic market and global competition, local manufacturing industries should have to improve their ability to produce high product variety with better quality and short delivery time, by introducing and adapting the improved and advanced manufacturing systems such as Group Technology (GT). Group Technology (GT) is a manufacturing philosophy in which parts having similar (Geometry and/or manufacturing process) are grouped together to achieve higher level of integration between the design and manufacturing functions of a firm.

GT achieves advantages based on these similarities. Similar parts are arranged into part families. Each family possesses similar design and manufacturing characteristics. Efficiencies result from reduced setup times, lower in-process inventories, better scheduling, streamlined material flow, improved quality, improved tool control, and the use of standardized process plans.

Eyerusalem and Siba Måns (2011), found that firms with favorable demand shocks are less likely to exit with no evidence that physical productivity improves prospect of survival. There is some evidence for increased prospect of survival and for catching up effect in closing demand gap with firm age. How long this process takes may matter as

firms might be forced to exit the market before they are able to catch up and compete with more established firms. Securing access to markets by creating backward and forward linkages during most vulnerable stage of firm entry may be the way to go in terms of policy implication. Sensitivity analysis of the results to product selection with regards to homogeneity, addressing potential sample selection bias and aggregation of physical productivity for multi-product firms are the natural next steps. One can also extend the analysis to firm growth and other performance measures.

Mulu (2009), on his study of Inactions and Spikes of Investment in Ethiopian Manufacturing Firms: Empirical Evidence on Irreversibility and Non-convexities study reveals the adverse effect of irreversibility and fixed adjustment costs on the investment decisions of Ethiopian manufacturing firms. A large number of potential investors tend to postpone their investments in an effort to avoid costly mistakes. This partly explains the paradox of the low investment but high profit rates documented. Hence, boosting investment requires policy intervention particularly in reducing uncertainty, improving the second-hand market for machinery and equipment, and providing better infrastructure since the effects of irreversibility and fixed adjustment costs are more pronounced when there are problems in these areas.

2.12. Conclusion and knowledge gap

Management accounting techniques play an important role in providing the information needed for companies to formulate strategies to meet the rapid changes in the business environment. New management accounting practices, such as ABC and non-financial performance measurement indicators can enhance the quality and relevance of

information needed by management. When environment changes and the level of AMT adopted increase managers are expected to make a greater and more frequent use of management accounting information for decision-making. It is conjectured that a higher level of Advanced Manufacturing Technology (AMT) adoption is associated with a more extensive use of new costing systems, such as ABC, and non-financial performance measure indicators.

AMATs play an important role in providing the information needed for companies to formulate strategies to meet the rapid changes in the business environment. On this case, it is necessary to know the level of AMATs in Ethiopia. A study conducted by Mengitu, 2006 the use of management accounting information for decision making in Ethiopian manufacturing organization, the result shows that there is very little practice of using management accounting information in decision making. However, this study focuses on the basis of advanced management accounting techniques and to know its level in Ethiopia manufacturing firms and to see the theoretical factors that influence the usage of AMATs.

An earlier study in Canada by Libby and Waterhouse (1996) a change in management accounting and controlling systems in a sample of Canadian manufacturing firms indicate that their sample organizations changed their controlling techniques during the period 1991-1993. The result of their study might be different to this study because of time frame as well as economic and cultural factors. In addition, the purpose of this study is based on the manufacturing firms of Ethiopia and to see its level of usage of AMATs.

Libby and Waterhouse study was based on a sample of Canadian manufacturing firms that were of North American cultural value and advanced economy.

The others like Williams and Seaman (2002) in Singapore and Ruhana and Kok (2006) study the usage of management accounting techniques in manufacturing firms in Malaysia. The contribution of this study is to carry out the different techniques of advanced management accounting their level and their relationship between theoretical and usage like usage of AMATs and perceived competition, complexity of production process and the like. This study also used both descriptive statistics and Pearson Correlation where used to discuss relationship of the dependents and independent variable. The findings, the time frame and in scope in assessing also differ in respect to other studies.

Chapter Three: Research Methodology

There are three approaches to research, these are Qualitative, Quantitative and mixed. The qualitative approach is that do not attempt to quantify results through statistical summary or analysis. In other words Qualitative approach is one in which the inquirer often makes knowledge claims based primarily on constructivist perspectives (the multiple meanings of individual experiences meanings socially and historically constructed, with an intent of developing a theory or pattern) or advocacy/participatory perspectives (political, issue-oriented, collaborative, or change oriented) or both. It also sues strategies of inquiry such as narratives, phenomenology's, ethnographies, grounded theory studies, or case studies. The researcher collects open-ended, emerging data with the primary intent of developing themes from the data (Creswell, 2002).

Quantitative research approach is the systematic and scientific investigation of quantitative properties and phenomena and their relationships. This means that a quantitative approach is one in which the investigatory primarily uses postpositive claims for developing knowledge or cause and effect thinking, reduction to specific variables and hypotheses and questions, use of measurement and observation, employs strategies of inquiry such as experiments and surveys, and collect data on predetermined instruments that yield statistics data (Creswell, 2002). This study also used this type of techniques.

Finally, a mixed methods approach is one in which the researcher tends to base knowledge claims on pragmatic grounds (e.g., consequence-oriented, problem-centered, and pluralistic). It employs strategies of inquiry that involve collecting data either

simultaneously or sequentially to best understand research problem. The data collection also involves gathering both numeric information (e.g., on instruments) as well as text information (e.g., on interviews) so that the final database represents both quantitative and qualitative information (Creswell, 2002).

In an attempt to meet the research purposes, a quantitative research was used for this study. The reasons for selecting this method is the study used the structured predetermined questionnaires for collecting data on and statistical tools like descriptive and correlation coefficient also used for analyzing the data.

3.1. The Survey Design

A survey design provides a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population. From sample results, the researcher generalizes or makes claims about the population (Creswell, 2002). The survey is preferred type of data collection for this study because in terms of economy and rapid turnaround in data collection. In the purpose of data collection self-administered questionnaire was used to collect empirical data. These facilitate access to large number of respondents and provide sufficient data for statistical analysis.

3.2. The Population and Sample

There are different types of sample designs based on two factors, the representation basis and the element selection technique. On the representation basis, the sample may be probability sampling or it may be non-probability sampling. Probability sampling is based on the concept of random selection, whereas non-probability sampling is non-random sampling (C.R.Kothari, 1990). This study was based on probability sampling

technique that is each individual firm in the population has an equal probability of being selected.

The total numbers of manufacturing firms in Ethiopia according to ministry of trade that have licensed at the federal level are 871. According to bureau of trade and industry of Addis Ababa city administration, firms that have a capital of more 500,000 ETB are 971. As mentioned in limitation part of the study due to time and financial constraints it was limited to Addis Ababa and neighborhood. The sample of 75 firms was selected for the study from the manufacturing firm in Addis Ababa. There is no a single right way for the determination of sample size (Fowler, 1984). From the sample the total of 43 usable response are used for analyzing because from the total sample 71 of them return the questionnaire but 43 of them only used the AMATs that is why the study only focus on those firms that use AMATs.

In this study the population is stratified and from each strata the chance being selected is equal because the manufacturing firms are different in size, capital and sales volume this helps me to meet the objective of the study. Stratification means that specific characteristics of individuals are represented in the sample and the sample reflects the true proportion of individuals with certain characteristics of the population (Fowler, 1988). When randomly selecting people from a population, these characteristics may or may not be present in the sample in the same proportions as in the population stratification displays their representation. Within each stratum, identify whether the sample contains individuals with the characteristic in the same proportion as the characteristic appears in the entire population.

3.3. Data Analysis

The study was used self-administered structured questionnaires for the selected manufacturing firms. For achieving the objective of the study Descriptive analysis, cross tabulation and the Pearson correlation were used to examine frequencies and the relationships between dependent variables and independent variable in the study. The SPSS software were used to analyze data.

3.3.1. Data types

The data types that were used for analyzing the questionnaires are as follows:

Independent variable: The independent variables used in the study are

X1 Product variability is defined by the number of product types produced in the firm

X2 Complexity of production process on this the complexity of the product is defined on scale from the least complex production system, Continuous production process, followed by Line, Batch and to the most job shop production process.

X3 Overhead portion of expense to the total manufacturing costs is defined on the bases of the ratio of overhead cost in terms of total cost of production

X4 perceived competition is defined as on the basis, product price, product quality, new product introduction, technological change, Advertising and promotion, after sales service.

X5 Company size is defined according to annual sales turn over

Dependent variable: The study has only one dependent variable that is usage of advanced management accounting techniques (Yi). AMATs define in terms of the number of techniques used in the manufacturing firms.

3.3.2. Method of Analysis

For achieving the objective of the study Descriptive analysis, cross tabulation and the Pearson correlation was used to examine frequencies and the relationships between dependent variables and independent variable in the study. In descriptive statistics; cross tabulation and percentage were used. To calculate the Pearson correlation SPSS software is used.

Correlation can be defined as the degree of association between two variables. The quantitative computation of the correlation was first derived in 1896 by Karl Pearson and is referred to as "Pearson's product moment correlation coefficient."

Pearson's Correlation Coefficient (r) has several different computational formulas for computing Pearson's r each result in the same answer except for rounding errors. The correlation coefficient should be rounded to three decimal places. Rounding in the middle of a calculation often creates substantial errors, therefore, round-off only at the last calculation.

Formula

Pearson's formula to calculate r follows:

$$r = \frac{\frac{\sum XY}{n} - (\frac{\sum X}{n})(\frac{\sum Y}{n})}{\sqrt{\frac{\sum X^2}{n} - (\frac{\sum X}{n})^2 * \frac{\sum Y^2}{n} - (\frac{\sum Y}{n})^2}}$$

Where:

n: represents the number of respondents in the sample

$\sum$: denotes the summation of the items indicated

$\sum X$: denotes the sum of all X scores or independent variable

$\sum X^2$: indicates that each X score should be squared and then those squares summed

$(\sum X)^2$: indicates that the X scores should be summed and the total squared or avoid confusing $\sum X^2$ (the sum of the X squared scores) and $(\sum X)^2$ (the square of the sum of the X scores

$\sum Y$: denotes the sum of all y-scores or dependent variables

$\sum Y^2$: indicates that each Y score should be squared and then those squares summed

$(\sum Y)^2$: indicates that the Y scores should be summed and the total squared

$\sum XY$: indicates that each X score should be first multiplied by its corresponding Y score and the product (XY) summed

The above formula will depend on the usage of independent variable under the study

Cross correlation and percentage

Cross-tabulation is defined as taking two variables and tabulating the results of one variable against the other variable. A cross-tabulation gives the basic picture of how two variables inter-relate or interdependent relationship between the two variables.

Percentage is a way of expressing a number as a fraction of 100 (percent meaning "per hundred" in Latin). It is often denoted using the percent sign, "%", or the abbreviation "pct". Percentages are also used to express how large or small one quantity is, relative to another quantity. The first quantity usually represents a part of, or a change in, the second quantity, which should be greater than zero.

3.3.3. Interpretation

The sign of the Pearson r correlation indicates the direction of association between X (the independent variable) and Y (the dependent variable). If Y tends to increase when X increases, the Pearson correlation coefficient is positive. If Y tends to decrease when X increases, the Pearson correlation coefficient is negative. A Pearson correlation of zero indicates that there is no tendency for Y to either increase or decrease when X increases. The Pearson correlation increases in magnitude as X and Y become closer to being perfect monotone functions of each other. When X and Y are perfectly monotonically related, the Pearson r correlation coefficient becomes 1. A perfect monotone increasing relationship implies that for any two pairs of data values X_i, Y_i and X_j, Y_j, that $X_i - X_j$ and $Y_i - Y_j$ always have the same sign. A perfect monotone decreasing relationship implies that these differences always have opposite signs.

Chapter Four: Data Analysis and Interpretation

Questionnaires were filled out to 71 manufacturing firms randomly selected from the total manufacturing firms in Addis Ababa. A total of 43 usable responses were received, that represents a response rate of 57% of the total sample size. The usable response is firms that use the advanced management accounting techniques. The respondents comprised the Accountants, Administrative, cost and budget division heads and finance heads.

The respondents' background or characteristics are summarized in Table 1. 8% percent of the respondents were management accountant, 38% were accountant, 30% of them are cost and budget head and 24% of them were finance head (managers). Major respondents are accountant and also most of firms have cost and budget department.

Table 1: Characteristics of the respondents

	Frequency	Percentage
Respondents position		
Management accountant	6	8
Accountant	27	38
Cost and budget heads	21	30
Finance head (managers)	17	24
How long they work in this position		
less than one year	17	28
one – two years	20	33
more than two years	34	56

4.1. Profile of Firms

Table 2 shows the profile of the sample firms. A largest proportion from the sample firms were food products and Beverages (27%), chemicals and chemical products were the next

larger proportion (24%), non-metallic mineral products were taking 21%. Manufacturing of tobacco is the only monopoly company in manufacturing of tobacco and it contribute about 1% of the sample proportion. In terms of ownership, a majority of the firms are locally owned firms that is about 93%, 4% of them are controlled by foreigners and the remaining 3% are owned by locally and foreigners that joint firms. Lastly in terms of firms product market in or sold in, the majority of the product that produced by firms were marketed in locally (83%), 11% of them sold for international market and 6% of the sold for international as well as local market.

Table 2: Profile of Companies

	Frequency	Percentage
Classification of the firms		
Food Products and Beverages	19	27
Manufacture of Tobacco Products	1	1
Textile products	2	3
Leather and footwear	5	7
Wood, paper products and printing	4	6
Chemicals and chemical products	17	24
Non-metallic mineral products	15	21
Metal and electrical	6	8
Manufacture of machinery and equipment		
Assembly of motor vehicles and trailers	1	1
	1	1
Owner of the firms		
Local	66	93
Foreign company	3	4
Share of foreigners and local	2	3
Firms product marketed in		
Local market	59	83
International market	8	11
Both local and international	4	6

4.2. Management Accounting Practices

In this section, management accounting practices and their relations with certain contextual factors were discussed. The objective of the study is to examine the level of AMATs in Ethiopia manufacturing firms. The other objective is to examine the relationship of some theoretical relationship between the usages AMATs. Descriptive analysis and the Pearson correlation were used to examine frequencies and the relationships between the contextual factors and management accounting practices.

Present and Past Usage of Management Accounting Techniques

Table 3 presents the results related to the present usage of management accounting techniques and the usage of the techniques during the past five years. With regard to the Traditional Management Accounting Techniques (TMATs) for the last five years, full costing used 30%, standard costing 34%, job order costing 21% and process costing 14%. For the last five year, the firms use most commonly standard costing, full costing and job order costing than process costing techniques. At present in the usage of TMATs job order costing and full costing increased by 3% and 7% respectively. In the other case Process costing and standard costing decreased by 8% and 3% respectively.

One of the purposes of the research objective is to examine the level of advanced management accounting techniques in manufacturing firms in Ethiopia. With regards to the AMATs, the table below indicates that Activity Based Costing was the most commonly used technique during the last five year but at present target costing increase the usage as compared to the other techniques of AMATs. At present period target costing increase in terms of frequency and percentage by 15 and 3% respectively.

Although, life cycle costing and just in time increased by 8% and 4% respectively. The AMATs like Activity Based Costing, Target Costing, Life Cycle Costing and Just in time are showed an increase in the usage. In this regard, these results suggest that there have been an increasing level of awareness. However, from the AMATs the following are not still used among any of the sample that I took for the study. These are Kaizen costing, Throughput Accounting, Balanced Scorecard, Activity Based management and Backflush costing. The results also indicate that while there has been an increasing application of certain AMATs, the emphasis on the TMATs remains equally important.

Table 3: Past and Present Usage of Management Accounting Techniques

Management Accounting Techniques	Past usage		Present usage		Difference
	Freq.	Percent	Freq.	Percent	
Traditional M. Accounting					
Full costing	23	30	28	37	7
Standard costing	26	34	23	31	3
Job order costing	16	21	18	24	3
Process costing	11	14	5	6	8
Advanced M. Accounting					
Activity Based Costing	12	43	20	29	14
Activity Based Management	0	0	0	0	0
Target Costing	9	32	24	35	3
Kaizen Costing	0	0	0	0	0
Life Cycle Costing	6	21	17	25	4
Throughput Accounting	0	0	0	0	0
Balanced Scorecard	0	0	0	0	0
Just In Time	1	4	8	12	8
Back flush Costing	0	0	0	0	0

4.3. Pearson Correlation

To investigate all the relationships between usage of advanced management accounting techniques and factors that influence the usage AMATs, a cross tabulation and the

Pearson correlation were used. The result of the Pearson Correlation is summarized in table 4 below and each relationship is discussed under the table.

The research objectives are, to examine the relationships between product varieties, complexity of production process, overhead expenses, perceived competition, company size and usage of advanced management accounting practices. This objectives and the hypothesis are tested by Pearson correlation coefficient.

Table 4: Pearson correlation

Factors influence AMATs	Advanced management accounting techniques
Perceived competition	**Pearson correlation**
Product price	0.094
Product quality	0.456
New product introduction	0.366
Technological change	0.479
Advertising and promotion	-0.078
After sales service	0.208
Perceived competition	**0.425**
Complexity of production process	
Batch	0.064
Continuous	0.122
Line	0.144
Overhead cost with the cost structure	0. 389
Total sale	0.038
Current capital	0.042
Product variety	0.275
Technological advancement	**0.600**

Complexity of Production Process and AMATs

From factors that might affect management accounting practices is complexity of manufacturing of production process. Complexity of production process was defined on a scale from the least complex production system, continuous production process, followed

by line, batch and to the most complex job shop production process. With regard to job shop production system, there is no firms used this type of system from the sample. It is argued that as when the complexity of production processes increases, the more usage of advanced the management accounting techniques. However, in the above table the relationship between complexity of the production process and usage of AMATs is not as such statistically significant. In other words, the relationship between Batch and usage of AMATs, is almost no because the Pearson relationship between them is 0.064 that is approach to zero.

The others like continuous and AMATS and Line and usage of AMATs are 0.122 and 0.144, respectively; this result shows that their relationship is weak. As indicated in the above the interpretation of the Pearson correlation coefficient when the result is approaches to zero there is no relationship between the variables. If the result is approaches to one there is strong relationship or when one variable increases the other also increases.

Product Variety and AMATs

The other factors that might affect the usage of AMATs is product variety. It is defined as by the number of product produced by the firm. In other words, if the firms produce more than one product type it will use variety of AMATs. On table 4, the Pearson correlation coefficient shows the relationship between product variety and usage of AMATs is 0.27 that implies their relationship is moderate.

Overhead Portion AMATs

In this case, when overhead portion increased in proportion to the cost structure of the product produce the firms' usage of AMATs will increase. In other words, when firms' overhead cost increases as proportion to total cost firms will use different types AMATs. As indicated in table 4 the Pearson correlations between overhead cost portion with the cost structure and usage of AMATs has 0.389 this implies that their relationship is positive and moderate.

Perceived Competition and AMATs

The instrument used in perceived market competition consisted of six items that is competition in product price, product quality, new product introduction, advertising and promotion, technological change and after sales service. Table 4 displays the Pearson correlation between perceived market competitions with usage of AMATs is 0.425, this result is the overall usage of the perceived competition and usage of AMATs their relationship is some moderate. From the above table, from the perceived competition product quality, technological change and new product introduction has 0.456, 0.479 and 0.366 this indicate they have moderate relationship. But the Pearson correlation between advertising and promotion and usage of AMATs is -0.078 almost they have no relationship because the Pearson correlation is approaches to zero.

Size and AMATs

Another research objective seeks to explore whether firm size is related to the use of AMATs. Larger firms with bigger capital and other resources are more likely to use AMATs. As these advanced techniques are usually expensive and require large capital

outlay. The Pearson correlations result shows their relationship is 0.042. The result of these two variables is insignificant relation, which suggests that size and AMATs' usage were not related statistically related.

Total sale and usage of AMATs

In table 4 above the Pearson r shows, the relationship between annual sales of the firms and usage of AMATs is 0.038; this result implies that there is almost no relationship between the annual sales and usage of AMATs.

Usage of technological Advancement and AMATs

Factors that might affect the usage of AMATs are the usage of advanced technologies of the firms. Technological usage means that if the firms use this type of technologies such as Robotics, Computer aided manufacturing, Computer aided design, Computer aided engineering, Computer aided process planning, Testing machines and Computer integrated manufacturing. On this regard the Pearson r is 0.600 this implies that the relationship between usage of AMATs and usage of technological advancement is strong as compared to others factors. In other words, this implies when the firms uses advanced technology also use more AMATs.

4.4. Cross tabulation of perceived market competition and usage of AMATs

Among the factors that influence the usage of AMATs is perceived competition. In this factors there are product price, product quality, new product introduction, technological change, advertising and promotion and after sales service. In the AMATs Activity Based Costing, Target Costing, Life Cycle Costing and just in time are used among the sample of the manufacturing firms that is used for this study purpose.

From the table 5 below the firms that use product price for competition and use activity based costing is 16 from 43 firms or 37% of them use simultaneously ABC and product price. In other words 37% of firms that uses the product price for competition use directly ABC costing method. From the table also 4 firms that not use product price for competition also not use ABC costing method that is 9% of them. Firms that use product price for competition and not use ABC for their costing is 19 or 44%. As shown under table 6, the Pearson correlation result between product price and usage of ABC is -0.33; this implies the relationship is negatively related or if one increases, the other will decrease.

Firm that uses product price for competition and use target costing for controlling their cost is about 44% or 19 of them or 19 firms use simultaneously product price as well as target costing . The Pearson correlation of these two variables as shown in table 6 is around -0.064 it means that product price and target costing are negatively related.

Life cycle costing and product quality has a relationship of 0.326 as below in table 6 or has positively has moderate relationship. Firms that use product quality and use life cycle costing is about 40% or from the total 17 of them use product quality for their competition and use life cycle costing for controlling their cost.

On the regards of just in time firms that use product price and not use just in time are 28 or 65%. On the other hand there Pearson correlation coefficient shows in table 6, 0.075 that is statistically significant or have no relation with each other.

Table 5: Cross tabulation of perceived market competition and usage of AMATs

Factors Influence AMATs		Activity Based Costing		Target Costing		Life Cycle Costing		Just In Time	
Perceived competition		Not use	Use	Not use	Use	Not use	Use	Not use	Use
Product Price	Not use	4	4	3	5	6	2	7	1
	Use	19	16	16	19	20	15	28	7
Product Quality	Not use	3	3	3	3	6	0	6	0
	Use	20	17	16	21	20	17	29	8
New product introduction	Not use	6	7	5	8	11	2	13	0
	Use	17	13	14	16	15	15	22	8
Technological change	Not use	17	10	11	16	20	7	22	5
	Use	6	10	8	8	6	10	13	3
Advertising and promotion	Not use	14	11	12	13	14	11	19	6
	Use	9	9	7	11	12	6	16	2
After sale service	Not use	20	16	17	17	22	14	29	7
	Use	3	4	1	2	4	3	6	1

Table 6 shows that the Pearson correlation of each perceived competition and for each AMATs that are used in (activity based costing, target costing, life cycle costing and just in time) the sample. As shown below in the table, the relationship between target costing and product price, product quality, new product introduction, technological change, advertising and promotion and after sale service has -0.064, 0.047, -0,076, -0.90, 0.091 and 0.139 respectively. This result shows that statistically there is almost no relationship between them.

As the table below shows, the relationship between activity based costing and technological change is 0.247 has some moderate relationship. As compared with other Life cycle costing and technological has strong has strong relationship from the factors of perceived competition that influence AMATs or has value of 0.362.

Table 6: Pearson correlation of perceived competition and AMATs

	Activity based costing	Target costing	Life cycle costing	Just in time
Perceived completion				
Product price	-0.33	-0.064	0.142	0.075
Product quality	-0.028	0.047	0.326	0.193
New product Introduction	-0.097	-0.076	0.325	0.315
Technological change	0.247	-0.090	0.362	0.003
Advertising and promotion	0.059	0.091	-0.108	-0.163
After sales service	0.094	0.139	0.030	-0.049

4.5. Cross tabulation of AMATs and complexity of production process

From the table below 17 (40%) firms that use target costing use simultaneously continuous production system. However, 34 firms or around 79% firms that not use line production system also not use just in time techniques and also the Pearson r value of the two variables is -0.074 almost has no statistically relationship between them.

The Pearson correlation shows batch production system and life cycle costing has strong negatively related or -0.70. This result implies that when one usage of batch production system increase the usage of life cycle costing increase and vise-versa. The other moderate relation is between batch and activity based costing that is 0.295.

Table 7: Cross tabulation of AMATs and complexity of production process

Factors Influence AMATs		Activity Based Costing		Target Costing		Life Cycle Costing		Just In Time	
Complexity of production process		Not use	Use	Not use	Use	Not use	Use	Not use	Use
Batch	Not use	17	9	10	16	15	11	21	5
	Use	6	11	9	8	11	6	14	3
Continuous	Not use	6	6	5	7	9	3	10	2
	Use	17	14	14	17	17	14	25	6
Line	Not use	23	19	19	23	25	17	34	8
	Use	0	1	0	1	1	0	1	0

Table 8: Correlation complexity of production process and usage of AMATs

	ABC	TC	LCC	JIT
Complexity of production process				
Batch				
Continuous	0.295	-0.143	-0.70	-0.20
Line	-0.044	-0.032	0.185	0.031
	0.165	0.137	-0.125	-0.074

The table above shows the Pearson correlation result of from complexity of production process Batch, continuous and line and form AMATs ABC, TC, LCC and JIT. From those of all relationship result strong relationship is occurred between life cycle costing and usage of batch production system.

Chapter Five: Conclusions and Recommendations

5.1. Conclusions

The objectives of the study are to investigate the usage of AMATs in Ethiopia and to explore whether AMATs usage is related to product variety, complexity in production processes, overhead portion, perceived competition, usage of technological advancement and firm size (in terms of current capital and annual sale or revenue).

The findings of this study indicate that the present usage rates of the AMATs among Ethiopian manufacturers were higher compare to those of the past five years. However, the changes are relatively small despite the increasingly competitive business environment. The result shows the usage of AMATs is low because the firms that the study took as a sample use only four types (activity based costing, target costing, life cycle coting and Just in time).

From the result, Activity-Based Costing and target costing had the highest rate of changes, followed by life cycle costing and just in time. These results suggest that there have been an increasing level of awareness among the manufacturing firms about these AMATs. It is interesting to note that the rate of TMATs usage has also increased during the present period compared to those in the past. The results also indicate that while there has been an increasing application of certain AMATs, the emphasis on the TMATs remains equally important.

To test the hypothesis of the study Pearson correlation was used. The first hypothesis said usage of AMATs has no relationship to perceived competition. The result indicates that a

positive relationship is there between perceived competition and usage of AMATs. As indicated in the interpretation part this result is interpreted as when one variable increases the other also increases or when the firms uses different techniques of AMATs it uses simultaneously different techniques of perceived competition like product price, product quality and others. From the relationship between usage of AMATs and each of the items in the perceived competition, only the advertising and promotion has negative relationship but the rest items has positive relationship between with usage of AMATs.

The usage of technological advancement and usage of AMATs has strong relationship. This result implies that when firms use more advanced technology they use also different techniques of advanced management accounting techniques.

The second hypothesis was a positive relationship between the firm size and usage of AMATs. The firm size was measured by in terms of current capital and the annual sale. The result indicates the relationship is almost no relation, because the result is approach to zero. The third hypothesis is a firm with higher overhead in related to total cost uses AMATs than those with small overhead portion. The result indicates a positive relationship between them. In other words, when the firms overhead portion was higher the firm uses AMATs that those of small portion of overhead.

The fourth hypothesis is the complexity of production process of the firms and usage of AMATs. On the regards of complexity of production process batch with the usage AMATs is almost has no relationship between them. But line and continuous has some moderate positive relationships were found between them. On job shop order production

(more complex) process no firm was found in the sample that uses this type. These results however contradict the prediction that usage of AMATs has related to the more complex production processes.

The fifth hypothesis is the level of product variety and usage of AMATs has positively related. The result indicates that the relationship between these two variables was positively related but the significance level is not as such strong.

Finally, the relationship between perceived market competition and AMATs change, however, is consistent with the findings of previous studies. For example Williams and Seaman (2002) and Isa and Foong (2005), whose studies were conducted in Singapore and Malaysia, respectively, found negative relationships between perceived market competition and usage in management accounting systems. An earlier study in Canada by Libby and Waterhouse (1996) found both variables were positively related. These mix findings suggest that the exact nature of market competition and management accounting practices might not be as direct as expected. In addition, the results might be affected by differences in time frame as well as economic or cultural factors. Ethiopia is belong to the developing and emerging economies with its own cultural values, while Libby and Waterhouse's study was based on a sample of Canadian manufacturing firms which were of Anglo-American cultural value and in an advanced economy. Williams and Seaman (2002) had in fact argued that the inconsistent effects of competition on management accounting controlling systems change found in theirs and Libby and Waterhouse's studies could be due to the differences in the economic condition in Canada (severe recession) and Singapore (booming economy) that existed during the survey periods. The

inconsistent and inconclusive results suggest that more studies may need to be carried out to investigate the role of market competition in predicting management accounting change.

5.2. Recommendations

Based on the hypothesis of the literature survey and the findings of this research, the researcher recommended that:

- To keep pace with the world changing management accounting environment, I recommend Ethiopian manufacturing firms use the newly developed techniques. A well-balanced practice of those techniques irrespective of the sectors may be enhanced through compulsory enactment of cost and management accounting audit in Ethiopia.
- The researcher recommends that before choice, the manufacturing firms' first improve factors that influence choice of advanced management accounting practices such as timeliness, technology and effectiveness.
- After that, it is useful, for manufacturing firms to select the best-advanced management accounting techniques that fit and meet the objective of the firms. These techniques reduce cost and increase the efficiency of the company.
- In order to support the manufacturing firms, the researcher suggests higher institutions of the country give some cost controlling designs techniques that much with the capabilities of manufacturing industry in the country. In other words, give some orientations that reduce cost, time and increase the efficiency for firms.

- From the result indicate usage of advanced technology and usage of AMATs has a strong relationship, so the researcher recommend that when manufacturing firms uses modern technology they will also tend to use modern management accounting techniques that goes with this technology. This gives for manufacturing firms in Ethiopia to compete globally.
- Finally, the researcher invites other interested researcher to proceed the detail study of each AMATs in the manufacturing industry how they implement and use.

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Appendix

abc

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	23	53.5	53.5	53.5
	1	20	46.5	46.5	100.0
	Total	43	100.0	100.0	

trc

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	19	44.2	44.2	44.2
	1	24	55.8	55.8	100.0
	Total	43	100.0	100.0	

lcc

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	26	60.5	60.5	60.5
	1	17	39.5	39.5	100.0
	Total	43	100.0	100.0	

jit

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	35	81.4	81.4	81.4
	1	8	18.6	18.6	100.0
	Total	43	100.0	100.0	

Count **Crosstab**

		abc		Total
		0	1	
bach	0	17	9	26
	1	6	11	17
Total		23	20	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.295	.146	1.977	.055[c]
Ordinal by Ordinal	Spearman Correlation	.295	.146	1.977	.055[c]
N of Valid Cases		43			

Count

		trc		
		0	1	Total
bach	0	10	16	26
	1	9	8	17
Total		19	24	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.143	.152	-.922	.362[c]
Ordinal by Ordinal	Spearman Correlation	-.143	.152	-.922	.362[c]
N of Valid Cases		43			

Count

		lcc		
		0	1	Total
bach	0	15	11	26
	1	11	6	17
Total		26	17	43

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.070	.151	-.450	.655[c]
Ordinal by Ordinal	Spearman Correlation	-.070	.151	-.450	.655[c]
N of Valid Cases		43			

Crosstab

Count

		jit		
		0	1	Total
bach	0	21	5	26
	1	14	3	17
Total		35	8	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.020	.151	-.127	.899[c]
Ordinal by Ordinal	Spearman Correlation	-.020	.151	-.127	.899[c]
N of Valid Cases		43			

Crosstab

Count

		abc		
		0	1	Total
cont	0	6	6	12
	1	17	14	31
Total		23	20	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.044	.153	-.279	.782[c]
Ordinal by Ordinal	Spearman Correlation	-.044	.153	-.279	.782[c]
N of Valid Cases		43			

Count

		trc		
		0	1	Total
cont	0	5	7	12
	1	14	17	31
Total		19	24	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.032	.152	-.202	.841[c]
Ordinal by Ordinal	Spearman Correlation	-.032	.152	-.202	.841[c]
N of Valid Cases		43			

Crosstab

Count

		lcc		
		0	1	Total
cont	0	9	3	12
	1	17	14	31
Total		26	17	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.185	.141	1.205	.235[c]
Ordinal by Ordinal	Spearman Correlation	.185	.141	1.205	.235[c]
N of Valid Cases		43			

Crosstab

Count

		jit		
		0	1	Total
cont	0	10	2	12
	1	25	6	31
Total		35	8	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.031	.148	.198	.844[c]
Ordinal by Ordinal	Spearman Correlation	.031	.148	.198	.844[c]
N of Valid Cases		43			

Crosstab

Count

		abc		
		0	1	Total
line	0	23	19	42
	1	0	1	1
Total		23	20	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.165	.083	1.074	.289[c]
Ordinal by Ordinal	Spearman Correlation	.165	.083	1.074	.289[c]
		43			

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.165	.083	1.074	.289[c]
Ordinal by Ordinal	Spearman Correlation	.165	.083	1.074	.289[c]
		43			

Crosstab

Count

		trc		
		0	1	Total
line	0	19	23	42
	1	0	1	1
Total		19	24	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.137	.070	.888	.380[c]
Ordinal by Ordinal	Spearman Correlation	.137	.070	.888	.380[c]
N of Valid Cases		43			

Count

		lcc		
		0	1	Total
line	0	25	17	42
	1	1	0	1
Total		26	17	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.125	.064	-.805	.425[c]
Ordinal by Ordinal	Spearman Correlation	-.125	.064	-.805	.425[c]
N of Valid Cases		43			

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.125	.064	-.805	.425[c]
Ordinal by Ordinal	Spearman Correlation	-.125	.064	-.805	.425[c]
N of Valid Cases		43			

Crosstab

Count

		jit		
		0	1	Total
line	0	34	8	42
	1	1	0	1
Total		35	8	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.074	.039	-.474	.638[c]
Ordinal by Ordinal	Spearman Correlation	-.074	.039	-.474	.638[c]
N of Valid Cases		43			

Crosstab

Count

		Activity Based Costing		
		0	1	Total
PP	0	4	4	8
	1	19	16	35
Total		23	20	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.033	.153	-.214	.831[c]
Ordinal by Ordinal	Spearman Correlation	-.033	.153	-.214	.831[c]
N of Valid Cases		43			

Crosstab

Count

		trc		
		0	1	Total
pp	0	3	5	8
	1	16	19	35
Total		19	24	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.064	.150	-.413	.682[c]
Ordinal by Ordinal	Spearman Correlation	-.064	.150	-.413	.682[c]
N of Valid Cases		43			

Crosstab

Count

		lcc		
		0	1	Total
pp	0	6	2	8
	1	20	15	35
Total		26	17	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.142	.140	.919	.363[c]
Ordinal by Ordinal	Spearman Correlation	.142	.140	.919	.363[c]
N of Valid Cases		43			

Crosstab

Count

		jit		
		0	1	Total
pp	0	7	1	8
	1	28	7	35
Total		35	8	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.075	.134	.482	.633[c]
Ordinal by Ordinal	Spearman Correlation	.075	.134	.482	.633[c]
N of Valid Cases		43			

Crosstab

Count

		abc		
		0	1	Total
pq	0	3	3	6
	1	20	17	37
Total		23	20	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.028	.153	-.180	.858[c]
Ordinal by Ordinal	Spearman Correlation	-.028	.153	-.180	.858[c]
N of Valid Cases		43			

Crosstab

Count

		trc		
		0	1	Total
pq	0	3	3	6
	1	16	21	37
Total		19	24	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.047	.154	.302	.764[c]
Ordinal by Ordinal	Spearman Correlation	.047	.154	.302	.764[c]
N of Valid Cases		43			

Crosstab

Count

		lcc		
		0	1	Total
pq	0	6	0	6
	1	20	17	37
Total		26	17	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.326	.073	2.205	.033[c]
Ordinal by Ordinal	Spearman Correlation	.326	.073	2.205	.033[c]
N of Valid Cases		43			

Crosstab

Count

		0	1	Total
pq	0	6	0	6
	1	29	8	37
Total		35	8	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.193	.051	1.256	.216[c]
Ordinal by Ordinal	Spearman Correlation	.193	.051	1.256	.216[c]
N of Valid Cases		43			

Crosstab

Count

		abc		
		0	1	Total
np	0	6	7	13
	1	17	13	30
Total		23	20	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.097	.152	-.623	.537[c]
Ordinal by Ordinal	Spearman Correlation	-.097	.152	-.623	.537[c]
N of Valid Cases		43			

Crosstab

Count

		trc		
		0	1	Total
np	0	5	8	13
	1	14	16	30
Total		19	24	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.076	.151	-.487	.629[c]
Ordinal by Ordinal	Spearman Correlation	-.076	.151	-.487	.629[c]
N of Valid Cases		43			

Crosstab

Count

		lcc		
		0	1	Total
np	0	11	2	13
	1	15	15	30
Total		26	17	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.325	.127	2.202	.033[c]
Ordinal by Ordinal	Spearman Correlation	.325	.127	2.202	.033[c]
N of Valid Cases		43			

Crosstab

Count

		jit		
		0	1	Total
np	0	13	0	13
	1	22	8	30
Total		35	8	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.315	.067	2.123	.040[c]
Ordinal by Ordinal	Spearman Correlation	.315	.067	2.123	.040[c]
N of Valid Cases		43			

Crosstab

Count

		abc		
		0	1	Total
tc	0	17	10	27
	1	6	10	16
Total		23	20	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.247	.148	1.630	.111[c]
Ordinal by Ordinal	Spearman Correlation	.247	.148	1.630	.111[c]
N of Valid Cases		43			

Crosstab

Count

		trc		Total
		0	1	
tc	0	11	16	27
	1	8	8	16
Total		19	24	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.090	.153	-.579	.565[c]
Ordinal by Ordinal	Spearman Correlation	-.090	.153	-.579	.565[c]
N of Valid Cases		43			

Crosstab

Count

		lcc		Total
		0	1	
tc	0	20	7	27
	1	6	10	16
Total		26	17	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.362	.146	2.483	.017[c]
Ordinal by Ordinal	Spearman Correlation	.362	.146	2.483	.017[c]
N of Valid Cases		43			

Crosstab

Count

		jit		Total
		0	1	
tc	0	22	5	27
	1	13	3	16
Total		35	8	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.003	.153	.018	.985[c]
Ordinal by Ordinal	Spearman Correlation	.003	.153	.018	.985[c]
N of Valid Cases		43			

Crosstab

Count

		abc		
		0	1	Total
ap	0	14	11	25
	1	9	9	18
Total		23	20	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.059	.152	.381	.705[c]
Ordinal by Ordinal	Spearman Correlation	.059	.152	.381	.705[c]
N of Valid Cases		43			

Crosstab

Count

		trc		
		0	1	Total
ap	0	12	13	25
	1	7	11	18
Total		19	24	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.091	.151	.582	.564[c]
Ordinal by Ordinal	Spearman Correlation	.091	.151	.582	.564[c]
N of Valid Cases		43			

Crosstab

Count

		lcc		
		0	1	Total
ap	0	14	11	25
	1	12	6	18
Total		26	17	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.108	.150	-.693	.492[c]
Ordinal by Ordinal	Spearman Correlation	-.108	.150	-.693	.492[c]
N of Valid Cases		43			

Crosstab

Count

		jit		
		0	1	Total
ap	0	19	6	25
	1	16	2	18
Total		35	8	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.163	.139	-1.061	.295[c]
Ordinal by Ordinal	Spearman Correlation	-.163	.139	-1.061	.295[c]
N of Valid Cases		43			

Crosstab

Count

		jit		Total
		0	1	
as	0	29	7	36
	1	6	1	7
Total		35	8	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.049	.140	-.314	.755[c]
Ordinal by Ordinal	Spearman Correlation	-.049	.140	-.314	.755[c]
N of Valid Cases		43			

Crosstab

Count

		icc		Total
		0	1	
as	0	22	14	36
	1	4	3	7
Total		26	17	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.030	.154	.192	.849[c]
Ordinal by Ordinal	Spearman Correlation	.030	.154	.192	.849[c]
N of Valid Cases		43			

Crosstab

Count

		trc		Total
		0	1	
as	0	17	19	36
	1	2	5	7
Total		19	24	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.139	.142	.896	.375[c]
Ordinal by Ordinal	Spearman Correlation	.139	.142	.896	.375[c]
N of Valid Cases		43			

Crosstab

Count

		abc		
		0	1	Total
as	0	20	16	36
	1	3	4	7
Total		23	20	43

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.094	.152	.604	.549[c]
Ordinal by Ordinal	Spearman Correlation	.094	.152	.604	.549[c]
N of Valid Cases		43			

1. **Industry Classification:**

- ☐ Food Products and Beverages
- ☐ Manufacture of Tobacco Products
- ☐ Textiles Products
- ☐ Leather and Footwear
- ☐ Wood Products and Furniture
- ☐ Paper, Paper Products and printing
- ☐ Chemicals and Chemical Products
- ☐ Chemicals and Chemical Products
- ☐ Non-metallic Mineral Products
- ☐ Metal and Electrical
- ☐ Manufacture of Machinery and Equipment
- ☐ Assembly of Motor Vehicles and Trailers
- ☐ Other (please specify)_____

2. **Type of Company (in terms of ownership) :**

- ☐ Local company
- ☐ Foreign company
- ☐ Share of foreigner and local

3. **Is there any separate department with responsibility to control costs**

- ☐ Yes
- ☐ No

If yes, please specify the name of the department _____

4. **What is your position in the organization**

- ☐ Management Accountant
- ☐ Accountant
- ☐ Others, please specify_____

5. **How long you work in this position?**

- ☐ Less than one year
- ☐ 1-2 years
- ☐ More than 2 years

6. **Your product is marketed in**

- ☐ Local market
- ☐ International market
- ☐ Both local and international markets

7. **Please indicate the competitive environment of your business in terms of which method**

- ☐ Product price
- ☐ Product quality
- ☐ New product introduction
- ☐ Other, please specify_____
- ☐ Technological change
- ☐ Advertising and promotion
- ☐ After sales service

8. **Please indicate the type of advanced technologies your business uses for its operation**

- ☐ Robotics
- ☐ Computer aided manufacturing
- ☐ Computer aided design
- ☐ Computer aided engineering
- ☐ Computer aided process planning
- ☐ Testing machines
- ☐ Computer integrated manufacturing
- ☐ Numerical control
- ☐ Other, please specify_____

9. **Please tick the type of management accounting techniques the company used for the last five year? (you can choose more than one methods)**

- ☐ Full Costing
- ☐ Standard Costing
- ☐ Job Order Costing
- ☐ Process Costing
- ☐ Activity-Based Costing
- ☐ Activity-Based Management
- ☐ Target Costing
- ☐ Kaizen Costing
- ☐ Life Cycle Costing
- ☐ Throughput Accounting
- ☐ Balanced Scorecard
- ☐ Just In Time
- ☐ BackFlush Costing
- ☐ Other specify _____

10. **Please indicate which one is the present usage of management accounting techniques your business. (you can choose more than one methods)**

- ☐ Full Costing
- ☐ Standard Costing
- ☐ Job Order Costing
- ☐ Process Costing
- ☐ Activity-Based Costing
- ☐ Activity-Based Management
- ☐ Target Costing
- ☐ Kaizen Costing
- ☐ Life Cycle Costing
- ☐ Throughput Accounting
- ☐ Balanced Scorecard
- ☐ Just In Time
- ☐ BackFlush Costing
- ☐ Other specify _____

11. What is the percentage of overhead cost within the cost structure of your business?

- ☐ Less than 25%
- ☐ 25%- 50%
- ☐ More than 50%

12. The firm produces the variety of products?

- ☐ Yes
- ☐ No

If yes, please specify there number _____

13. Please indicate your company production process.

- ☐ Batch
- ☐ Continuous
- ☐ Line
- ☐ Job shop order
- ☐ Other, please specify_____

14. Please indicate the annual sale of your company

- ☐ ETB 300,000
- ☐ ETB 600,000
- ☐ ETB 1,000,000
- ☐ Above 1,000,000

15. Please indicate the current capital of the firm

- ☐ ETB 1 million
- ☐ ETB 1 million to 3 million
- ☐ ETB more than 3 million

"End of questionnaire"

THANK YOU