PERFORMANCE MEASUREMENT PRACTICES IN SELECTED ERITREAN MANUFACTURING ENTERPRISES

By

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ABSTRACT

Performance measures in the past primarily focused on production and were aimed at attaining increased short-term operational efficiency in terms of financial indicators. This type of measurement is too narrowly focused as it ignores critical measurement indicators that makes or breaks the company such as human capital, processes, customer interface, etc. In this regard most African countries are finding it extremely difficult to compete in the dynamic and changing global business environment.

This study aims to assess to what extent Eritrean manufacturing enterprises use integrated performance measures, extent of its utilization and perceived relevance related to their actual financial results. In this regard an integrated model such as the balanced scorecard approach (financial, customer satisfaction, internal process/operational and employee satisfaction measures) was selected as reference for the study.

A survey was done to gather data. Qualitative and quantitative techniques were employed for analyzing the data. The specific methods of data analysis include descriptive statistics such as tabulation, cross tabulation, computations of frequencies, and computations of percentages as well as correlation and regression analysis. The relative importance of financial as well as non-financial measures in relation to the performance evaluation process in the context of manufacturing enterprises was investigated. The result of the analysis indicated that the majority of respondent enterprises primarily focus on financial measures, using historical data, accounting profits and financial ratios which are compared with industrial trends. The financial measures are considered as having great importance in the respondent enterprises. Despite the fact that the non-financial measures are as important as the financial measures - little or no attention is being paid to non-financial dimensions. The result of the analysis revealed that there is a clear and strong relation between the financial performance and the non-financial

performance measures (customer satisfaction, internal process/operational and employee satisfaction). In addition, empirical findings suggested that the non-financial measures are significant explanatory factors of financial performance. More importantly, findings show that manufacturing plants that consistently employed both financial and non-financial measures performed better than those that do not.

Based on the results of the study important policy recommendations are outlined. Manufacturing enterprises have to invest in re-training employees to get motivated and competent people to produce customer perceived product quality as well as continuous improvement of operational processes, which may help the enterprises to compete in today's dynamic business environment. Generally the study has collected essential numerical evidence for the future development of manufacturing enterprises. Knowledge and understanding of the critical factors underpinning enterprises' performance can lead to further improvements. In turn this will help the overall development of the national economy.

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LIST OF SYMBOLS AND ABBREVIATIONS

ABC	Activity Based Costing
AICPA	American Institute of Certified Public Accountants
ANOVA	Analysis of Variance
BNQA	Baldrige national quality award
BPM	Business Performance Measurement
BSC	Balanced Scorecard
CE	Capital employed
CFROI	Cash flow return on investment
COGS	Cost of goods sold
EFQM	European foundation quality management
EHRD	Eritrean Human Resource Development
EPS	Earnings per share
EQA	European quality award
ERN	Eritrean Nakfa
EVA	Economic value added
MCT	Manufacturing cycle time
MVA	Market value added
NOPAT	Net operating profit after taxes
NOPAT	Net operating profit after taxes
P/E	Price/ earnings
PBT	profit before taxes
PE	Process efficiency
R^2	Coefficient of determination
ROA	Return on total assets

ROE	Return on equity
ROI	Return on investment
ROIC	Return on investment capital
SERVQUAL	Service Quality
TQM	Total quality measures
UDRAW	Unit for the Development of Rhetorical and Academic Writing
WACC	Weighted average cost of capital

CHAPTER ONE

1.1 Introduction

Modern manufacturing industries have undergone massive technological changes and most organizations have become larger and more complex. As the result, sophisticated technologies and production processes have led to a new demand on companies' systems of control. In this regard Nudurupati (2003) remarks that performance measurement is essential for business as the basis for continuous improvement and for designing an adequate information system. Kaplan & Norton (2001:22) suggested performance measurement such as the Balanced Scorecard (BSC) is essential for business as a basis to define strategic objectives that integrate lagging and leading indicators, as well as a vehicle for cultural change. Zairi (1996:31) state "performance measures are the life blood of organizations, since without them no decisions can be made".

According to H. James Harrington as quoted by Schiemann & Lingle (1999:1)

> ***(m)easurement is the first step that leads to control and eventually to improvement. If you can't measure something, you can't understand it. If you can't understand it, you can't control it, you can't improve it.***

Epstein (1997:28) emphasizes performance measurement as a systematic attempt to learn how responsive organizations' products and services are to the needs of the customer and the organization's ability to improve effectiveness. Measuring performance offers an effective method of determining whether or not an organization is meeting its goals and achieving its mission (Brown, 1996:11).

All these and other theorists argue the main point, namely that companies have to adopt effective and strategic performance measurement tools to obtain the stated benefits. For the full benefit of measurement to be exploited,

it is important for organisations to maximise the appropriateness and effectiveness of measurement activities at all levels of their operations. This is true for all African companies including Eritrea's manufacturing enterprises as a case study. The need of these enterprises is the rationale for this study, in which balanced performance measurement approaches will be used as a reference to analyze and evaluate their present performance measurement.

Literature regarding performance measurement of Eritrean enterprises is scant. The research undertaken in this dissertation will contribute to document the situation more comprehensively. With respect to practical purposes, the findings may be utilized by decision makers in Eritrean manufacturing enterprises for the formulation of new strategies as well as strategy reforms.

1.2 Background of Eritrean manufacturing enterprises

Eritrea is located in the Horn of Africa, bordered to the North and West by Sudan, to the South by Ethiopia, to the Southeast by Djibouti and to the Northeast by the Red Sea. It has a population of 4,362,254 with a total land area of 121,320 km sq (CIA, 2003).

The history of modern manufacturing industries in Africa began with colonialism. In the case of Eritrea, it started in the 1930s with the advent of Italian colonialism. Eritrea had well-developed and competitive manufacturing sectors in the early 1950s. Since the late 1950s, however, an uncertain political environment created by Ethiopian colonialism had negatively affected the industrial process in Eritrea. The military government of Ethiopia nationalized the existing foreign and domestic manufacturing enterprises, while banning new private investments (Teclegiorgis, 1993).

After three decades of armed struggle for independence, Eritrea became formally independent following an internationally supervised referendum in April 1993. During the war Eritrea's markets and manufacturing enterprises were disseminated. Inadequate technological input, lack of supplies and raw

materials, inadequate manpower and poor management resulted in poor productivity. The manufacturing and service industry was operating at a low level (Gov. State of Eritrea, 1998). Like the economy of many African nations, the economy of Eritrea is largely based on subsistence agriculture, with 80% of the population involved in farming and herding (CIA, 2003).

Notwithstanding the poor conditions at the time of independence, Eritrean business enterprises' long-term development prospects are good. Given the good prospects, a committed and motivated workforce (competent, educated and trained), favourable natural resources to population ratio, Eritrea has the potential for achieving rapid and sustainable economic growth (Gov. State of Eritrea, 1994:12).

1.3 Statement of the problem

According to Olve, Roy & Wetter (2001:13) financial measurements failed to provide adequate guidance for long-term strategic development and competitive strategies. For this reason business leaders began to realize that both financial and non-financial indicators should be considered in measuring performance.

Furthermore, recent literature studies related to manufacturing performance measurement point to the increasing relevance of financial as well as non-financial measures in the evaluation of manufacturing organization. For example, the conference board of the Canadian Institute of Chartered Accountants (CICA as cited in Sim & Koh, 2001:18-27) recommend that strategically oriented performance measurement systems should measure non-financial as well as financial outcomes. Likewise, a report by the American Institute of Certified Public Accountants (AICPA) revealed that companies should disclose leading, non-financial measures on key business processes such as product quality, cycle time, innovation, and employee satisfaction (AICPA Report, 1994:143).

As it has been stated in recent studies, reliance on financial information such as accounting profit helps to measure the performance of a firm in achieving its short-term goals. If a firm earns profits in the short run it might be concluded that it is performing well, whereas there might be a decrease in its long-term economic value. That is why at present, emphasis is shifted to long term rather than short term profits, global rather than local, delivering quality rather than quantity and to customer satisfaction.

Despite the recent emphasis, performance measures in the past primarily focused on production measures that were aimed at attaining increased short-term operational efficiency in terms of financial indicators. This type of measurement is too narrowly focused as it ignores critical measurement indicators. In this regard most African countries are finding it extremely difficult to compete in the dynamic and changing global business environment. As most African countries Eritrean manufacturing enterprises have such difficulties to determine their long-term profitability, to meet their customers' needs, to increase the demand for their products, motivation of their employees and move their business forward.

Therefore, based on the above stated difficulties, the study identifies the problem that it seems to be a lack of an integrated performance measurement system in the manufacturing enterprises that could improve their processes and practices to better meet the expectations of their customers for higher quality, lower production cost, and improved service. These may in turn threaten the enterprises' performance and sustainability.

1.4 Objectives of the study

The study aims at examining the existing performance measurement practices in Eritrean manufacturing enterprises and identifying to what extent Eritrean enterprises use the integrated performance measures, their extent of utilization and perceived relevance related to their actual financial results. In this regard an integrated model such as the balanced Score Card (BSC)

approaches (financial, customer satisfaction, internal process/operational and employee satisfaction measures) will be taken as reference for the study.

Specific objectives of the study are:

(i) To examine the use of financial and non-financial measures in selected Eritrean manufacturing enterprises.
(ii) To assess the relationship between the financial performance and non-financial measures.
(iii) To assess relative importance of determinants of financial performance.
(iv) To evaluate the importance of balanced scorecard performance measurement as an appropriate performance measurement model.

1.5 Relevance of the study

Managers can use the result of this study to apply integrated performance measurement tools to obtain the best financial and non-financial information for effective decision making as well as to suit their managerial needs.

Stockholders, potential investors, and business partners will be assisted in their understanding of performance measurements and the way in which to determine the progress of the companies.

The concerned government bodies will be assisted in determining how well the companies operate, how efficiently domestic resources are utilized, and how tax and other similar issues should be handled.

Finally, it would be helpful for academic studies on performance evaluation of manufacturing industries in developing countries.

1.6 Research methodology

Literature study

The study will use secondary data, such as those in published and unpublished reports, articles, academic journals, books, internet, and other publications focusing firmly on performance measurement and balanced scorecards.

Data set and collection

The primary data to be used in this study will be collected by means of structured questionnaires. The questionnaire survey will gather qualitative as well as quantitative data pertaining to profitability, customer satisfaction, employees' satisfaction, operations, and product quality measures of the selected Eritrean manufacturing enterprises. Sample selection will be done using a random sampling method.

Data analysis

Specific methods of data analysis such as tabulation, cross tabulation, computations of frequencies computations of percentages through descriptive statistics correlation and regression analysis will be employed to analyze the data. In this way the statistical relationship amongst the different elements (financial performance, customer satisfaction, operational measures, and employee satisfaction) will be shown.

1.7 Outline of the study

This study is divided into seven chapters:

Chapter 1 Chapter 1 summarizes the introduction of the study, the problem statement, the objectives of the study, the relevance and methodology used.

Chapter 2 reviews the general conceptual framework of performance measurement, the historical development, the concepts and definitions of

performance measurement, the need of performance measurement along with its characteristics, the overall strategic performance model and the problems of implementing strategic based performance measurement.

Chapter 3 presents the different relevant performance measurement approaches (frameworks), discuss the traditional financial measures, modern financial performance measures, the need for non-financial measures, the non-financial measures, and the need for integrated performance measurement, along with the balanced scorecard performance measurement.

Chapter 4: This chapter reviews the literature on the need for balanced performance measurement, the development of balanced scorecard performance measurement frameworks, which provide a balanced picture of the business and the balanced scorecard perspectives along with the common pitfalls of organizations in implementing BSC.

Chapter 5: Overviews the research area and the methodology to be used, focuses on the overview of research area, and methods used as a guideline for the empirical study.

Chapter 6: Discuses the results of the study. In this chapter the data is analysed and interpreted to examine whether Eritrean industry practices are keeping track with the international trends regarding performance measures identified in the literature study. The first part of this chapter presents the general profile of the respondent enterprises, the second part is the profile of financial performance of the sampled enterprises, and the third is the descriptive, correlation and regression analysis comparing the financial performance of the respondents with the extent to which they also use non-financial measures. The final part presents the management approaches to strategic performance measurement.

Chapter 7: Presents the conclusion of the research as well as recommendations for the betterment of performance measurement practices presented.

CHAPTER TWO

Conceptual framework of performance measurement

2.1 Introduction

It has been well documented that there has been a revolution in performance measurement in the last two decades. This has manifested itself in practitioner conferences and publications as well as in academic researches (Neely, 1998:6). These discussions emphasize the need for business enterprises to measure performance as they encounter increasing competition from an ever-changing business environment (Olve, *et al.* 2001:13).

Furthermore, in order to more effectively cope with the significant competitive issues of increasingly sophisticated customers and management practices, accelerating globalization and product differentiation, a number of proposals have been put forward with regard to developing more appropriate performance measurement systems.

A study conducted by Schiemann & Lingle (1999:41) interviewed eight hundred executives about the measures to arrive at a result for an argument "is measurement worth?" and found that companies utilizing effective performance measurement systems as the basis for management decisions succeed better than those that did not.

For this benefit to be realised, it is necessary for organisations to implement an effective performance measurement system that "enables informed decisions to be made and actions to be taken, because it quantifies the efficiency and effectiveness of past actions through acquisition, collection,

sorting, analysis, interpretation and dissemination of appropriate data" (Neely, 1998: 5-6).

This chapter reviews the general concept of performance measurement, the historical development, and subsequently the concept of performance measurement, and the need of performance measurement along with its characteristics, the overall strategic performance model and problems of implementing strategic based performance measurement.

2.2 Historical development of performance measurement

Financial performance measurement systems go back a long way in their origin and applications. It is thought, for instance, that double entry bookkeeping was first used around the fourteenth century. Kaplan & Norton (1996:21) remarked that historically, the measurement system for business has been financial. Indeed, accounting has been called the 'language of businesses'. Bookkeeping records of financial transactions can be traced back thousands of years, which had been used by Egyptians, Phoenicians, and Sumerians to facilitate commercial transactions. A few centuries later, during the age of exploration, the activities of global trading companies were measured and monitored by accountants' double entry books of accounts (Kaplan & Norton, 1996:21).

The industrial revolution in the nineteenth century led to the creation of more comprehensive financial measurement systems to meet the requirement of enterprises. Moreover, in the information age environment, the early twentieth century, enterprises understood the importance of reporting and evaluating of business unit performances, in order to find new capabilities for competitive success (Olve, *et al.* 2001:13).

In the last decade there has been a growing criticism of traditional measurement control systems as being too narrowly focused on financial measures. The reason is that conditions today are no longer the same as

when traditional measurement systems emerged. In addition, markets fluctuate, customers appear ever more demanding, and investors are requiring more transparent reporting (Ashton, 2001:80).

Performance measurement has become very topical since the late 1980s. The increasing interest has been driven by the increased rate of change in the business environment in both the private and public sectors. This rapid change has led to general dissatisfaction with traditional issues of performance measurement systems, identifying their shortcomings and arguing for change (Neely, 1998:3).

According to Zairi (1996:390) "today's management accounting information, driven by procedures and cycles of the organizations financial reporting system, is too late, too aggregated, and too distorted to be relevant for managers planning and control decision. Managers need clear, timely and relevant signals from their internal information systems to understand root causes or problems to initiate corrective action and to support decisions at all levels of the organization".

Furthermore, today's industry has undergone massive technological change, and most organizations have become larger and more complex. Sophisticated technologies and production processes have led to new demands on company systems of control. Financial measures showed the effect of decisions already taken (Olve, *et al.* 2001:13). Therefore, management control must take account of non-financial factors and be broadened to include strategic information, which will indicate whether or not the business will continue to be competitive. For these reasons new strategic based measurement approaches became more essential for effective and strategic decisions.

2.3 The concept of performance measurement

Since a Business Performance Measurement system (BPM) measures performance, it is important to define what performance is. Lebas & Euske (2002:65) provide a good definition of performance as "doing today what will lead to measured value outcomes tomorrow". BPM then is concerned with measuring this performance relative to some benchmark, be it a competitor's performance or a preset target.

Specifically, performance measurement and control systems are the formal, information-based routines and procedures managers use to maintain or alter patterns in organizational activities. A typical performance measurement helps businesses in continually setting business goals and then providing feedback to managers on progress towards those end results or goals (Parker, 2000: 63-66).

Measurement systems are comprised of a multiple of measures. According to Litman *et al*. (1999:15) a measure (or metric) is a quantitative or qualitative value that can be used for purposes of comparison. Simons (2000) explained that a specific measure can be compared with itself over time, compared with a preset target or evaluated along with other measures. Since a measure is used for the purpose of comparison, it need not represent an absolute value. For example, in measuring customer profitability, knowing the relative difference in profitability between two customers may be as valuable (and more easily gotten) than knowing the absolute value of a customer's profitability. Moreover, many BPM systems normalize a measure into a value that promotes comparison not just with itself, but also with other measures.

Viewed in the above manner, performance measurement exhibits the following conceptual definitions (Simons, 2000):

Measurement can be *objective* or *subjective*. Objective measures can be independently measured and verified. Subjective ones cannot. Measures are

also typically classified as *financial* or *non-financial*. Financial measures are typically derived from or directly related to the chart of accounts and found in a company's profit and loss statement or balance sheet, such as inventory levels or cash on hand. Non-financial measures are measures not found in the chart of accounts, such as customer satisfaction scores or product quality measures.

Measures are also classified as *leading* or *lagging.* Lagging measures give feedback on past performance, such as last month's profit, and typically do not provide insight into future performance. Leading indicators, by contrast, are designed to measure future performance, and more often than not, future financial performance. Some leading indicators to future performance might include customer defection rate, customer satisfaction scores or changes in consumer confidence.

Measures are either *complete* or *incomplete*. Complete measures capture all the relevant attributes of achievement, whereas incomplete measures do not.

Measures are also *responsive* or *not responsive*. Individuals can influence responsive measures, whereas non-responsive measures are outside the influence or control of an individual (such as consumer confidence).

Measures may be related *to inputs* into a process, feedback on the performance of a process itself or they may be related to the *outcomes* or *outputs* of the process.

Measures may be related to *human* performance, *process* performance or *market* conditions.

Some, but not all, measures are directly related to the firm's strategy and are critical for its successful execution of its strategy. These are called *critical* or *key* performance indicators.

Finally, measures can refer to *tangible* things, often recorded in the chart of accounts, such as inventory levels, accounts receivable balances, employee headcount, or can refer to *intangibles* such as level of skill or knowledge, creativity and innovation.

Kaplan & Norton (1996:21) state an organization's measurement system strongly affects the behaviour of people both inside and outside the organization. If companies are to survive in the information age, they must use measurements and management systems derived from their strategies and capabilities.

2.3.1 Performance measurement defined

As is so often the case for many concepts, performance measurement has no generally accepted definition. In recent literature, it has been suggested that performance measures are the lifeblood of organizations, since without them no decision can be made. According to Zairi (1996:31) measurement is the first step to control and improvement. Resources in any organization are limited and scarce. Performance measurement provides management with the opportunity to make the right allocation of resources and to set the right priorities for improvement.

Performance measurement is a key word pertaining to all discussions about new dynamic performance measurement. Performance is a broad concept; it has various meanings for different audiences and in different context.

Schiemann & Lingle (1999:185) confirmed their strong belief on the concept of performance measure as "measures that link strategy to action" and defined: "Performance measurement as a strategic and integrated approach to delivering sustained success to organizations by improving the performance".

Armstrong & Baron (1998:15) noted that: “Performance should be defined as accomplishment, achievement or the outcomes of work because they provide the strongest linkage to the strategic goals of the organization. Strategic in a sense that it is concerned with the broader issues facing the business if it is to function effectively in the environment and with the general direction in which it intends to go to achieve longer term goals”.

According to the recent authors and researchers such as Litman, Ustad, Tychan , Denett, Welch, Pratsch, and Hopf (1999:5)[1] there are also a wide range of definitions for performance measure, performance measurement, performance objective, performance goal, and performance management. To frame the dialogue and to move forward with a common baseline, Litman, *et al.* (1999:5-6) defined certain key concepts to be clearly understood as follows:

Performance measure is quantitative or qualitative characteristic of performance. In addition by measures we mean compact descriptions of observations summarized in numbers or in words. For example the measures summarized certain attributes of the subject concerned usually description is numerical, as with blood pressure or profit. However sometimes, the measure may be verbal, as when student receive the grade of “Excellent”.

Performance measurement is the process of assessing progress toward achieving predetermined goals, including information on the efficiency with which resources are transformed into goods and services (outputs), the quality of those outputs (how well they are delivered to clients and the extent to which clients are satisfied) and outcomes (the results of a program activity compared to its intended purpose), and the effectiveness of companies’ operations in terms of their specific contributions to program objectives.

[1] This material was drawn from, http://oamweb.osec.doc.gov/bsc/guide.htm (accessed May 15, 2004)

Performance objective is a critical success factor in achieving the organization's mission, vision, and strategy, which if not achieved would likely result in a significant decrease in customer satisfaction, system performance, employee satisfaction or retention, or effective financial management.

Performance goal is a target level of activity expressed as a tangible measure, against which actual achievement can be compared.

Performance management is the use of performance measurement information to effect positive change in organizational culture, systems and processes, by helping to set agreed-upon performance goals, allocating and prioritizing resources, informing managers to either confirm or change current policy or program directions to meet those goals, and sharing results of performance in pursuing those goals.

2.3.2 The need for performance measurement

These times, business enterprises adopt performance measurement systems for a variety of reasons, chiefly to determine how well their products and services are responsive to the needs of the customers and to know how well organizations are capable to improve effectiveness. For these benefits it has been broadly discussed the need of performance measurement for business success. Schiemann & Lingle (1999:2) confirmed their strong belief on the need for strategic performance measures to drive organizational success. Kaplan & Norton (2001:22) suggest performance measurement as a basis for defining strategic objectives, for continuous improvement as well as a vehicle for cultural change. Measuring performance offers an effective method of determining whether or not an organization is meeting its goals and achieving its mission (Brown, 1996:180).

Planning, control and evaluation: The process of analyzing measurement in order to make decisions is known as "evaluation" (Zairi, 1995). Simons (2000)

stated that the measurement process is central to the operation of an effective and efficient planning, control, or evaluation system.

Communication: Daniels & Rosen (1988) suggest that measurement is required to reduce emotionalism and increase constructive problem solving, increase influence, monitor progress, and give feedback and reinforce behavior. Juran (1992) suggests that vague terminology is unable to provide precise communication. It becomes necessary to say it in numbers.

Measurement and *improvement:* One of the reasons for measuring performance is to support and enhance improvement. If measurement is not part of continuous improvement, then the critical linkage between performance and evaluation is broken. Zairi (1996:31) states "performance measurement provides a scorecard to report how well improvement efforts are working. Performance measurement is an integral part of continuous improvement". Harrington, 1991 (as cited in Schiemann & Lingle, 1999:1) states that "measurement is the beginning of improvement, because if you cannot measure an activity, you cannot control it. If you cannot control it, you cannot manage it. Without dependable measurements, intelligent decisions cannot be made". Accordingly, these concepts are clearly defined as follows (Schiemann & Lingle, 1999:1):

Control: Measurements help to reduce variation. The purpose is to reduce expense overruns so that agreed-to objectives can be achieved.

Self-Assessment: Measurements can be used to assess how well a process is doing, including improvements that have been made.

Continuous Improvement: Organizational efforts towards continuous improvement should be focused on creating performance measurement systems that provide relevant, factual information on core business processes and key activities used to identify opportunities for improvement.

Management Assessment: Without measurement, there is no way to be certain that the organization is effective and efficient.

Moreover, according to Schiemann & Lingle (1999:5) business performance measurement has a variety of uses, such as to:

- monitor and control
- reward and discipline
- drive improvement
- maximize the effectiveness
- achieve alignment with organizational goals and objectives.

Simons (2000) looks at business performance measurement as a tool to balance five major tensions within a firm:

- profit, growth and control
- short-term results against long-term capabilities and growth opportunities
- performance expectations of different constituencies
- opportunities and attention
- the motives of human behaviour.

Looking at the firm as a complex organism seeking to survive or thrive in its competitive environment, performance measurement systems serve as a key contributor to the perceptual and coordination/control capabilities of the firm. Firms use performance measurement systems to help monitor and control specific activities, to predict future internal and external states, to monitor state and behaviour relative to its goals, to make decisions within needed time frames, and to alter the firm's overall orientation and/or behaviour.

2.3.3 Characteristics of an Effective Measurement System

According to various authors' (such as Brown, 1996:4-9; Artley, 2001:19; Kaplan & Norton, 1996:163; Reisinger, *et al.* 2003:430; Parker: 63-66) point of

view enterprises that have been successful at performance measurement have generally developed measurements based on the following characteristics:

Performance measures need to be aligned with the organisation's strategy - The starting point is to determine what to measure. While this sounds very simple, it is often one of the most difficult tasks. It is not sufficient to create a wide range of measures that covers all of the organisation's activities - this is too wasteful of resources and can be distracting. There must be a focus on those things that are really important - the measures adopted must be selective. This depends on the organisational vision, mission and strategy (Parker, 2000:63).

***Vital few versus the trivial many* -** Determining inappropriate measures may let the firms focus to unnecessary activities and determine the priorities wrongly (Reisinger, *et al.* 2003:430). Focusing to inappropriate activities may prevent firms to maintain required improvements in firms. Gunesakaran, *et. al* (2001:72) stated that the firms that use fewer measures can evaluate their performance better. Similarly, Kaplan & Norton (1996:163) conclude that designing few and improved measurement system may save time and arrive at specific goals and objectives for success. If companies don't know what to measure, they measure too much and no individual can monitor and control many variables on a regular basis. The key to having a successful set of metrics is paring down organizations' database to the vital few key metrics that are linked to success.

Linkage to vision, values, and key success factors - Along with having a reasonable set of metrics, another key to success is to select measures that are linked to organizational success factors. Identifying vision where you want to be and to know how to link measures with the key success factors is essential in today's competitive environment (Litman, *et al.* 1999:15). They thus incorporate a circular model linking performance measures and strategy.

Metrics should focus on the past, present, and future – Measures (*metrics)* should be long-term oriented as well as simple to understand and implement (Kaplan & Norton, 1996:38). The problem with most measures is that they focus on the past. Measuring the most recent period's performance is critical for any organization. However, if this is all they measure, the organization may not be around in the next five years. Past and present metrics are the easiest to come up with, because future measures help predict success over a longer term than next month or next quarter (Artley, 2001:19).

Metrics should be linked to the needs of the customers, shareholders, and employees – When selecting the right performance measures, it is important to ensure that they link directly to the needs of customers, shareholders, and employees. The measures must focus on the outcomes necessary to achieve the organizational vision and the objectives of the strategic plan (Brown, 1996:6). This is well illustrated that the set of measures used by an organization has to provide a "balanced" picture of the business and reflect the external measures for shareholders and customers, and internal measures of critical business processes, innovation, learning and growth to obtain necessary information from all parts of the organization (Kaplan & Norton, 1996:9).

Metrics should flow down to all levels and should be consistent – According to Brown (1996:6) metrics need to be defined for the highest level of the organization first and then flow down to all levels and functions. Similarly, Parker (2000: 64) clarify that the measurement at sub-unit level must be consistent with the measures at the organisational level, and should furnish the raw data for the level of aggregation. Defining performance measures in this manner may ensure that the measures at all levels of the organization to be consistent.

Multiple measures can be combined into several overall indices of performance - One way of reducing the number of measures to a reasonable number is to assign a weight to each individual measure in a family of metrics and develop an index that is an aggregate statistic. This practice of aggregating data into a single statistic is risky, because the aggregate statistic often hides trends that might be noticed in the subsidiary measures (Reisinger, *et al*. 2003:430).

Metrics should be changed as your strategy and situation changes – Metrics may be added or deleted based on the needs of customers, changes in the market place, the nature and size of business etc. According to Kaplan & Norton (1996:22) point of view, measures must change dynamically with the strategy as the basis for continuous improvement and for designing an adequate information system. Moreover, as the environment is very dynamic, the measures can't be considered as static. Ghalayini *et al.* (1996) stated that one measure that is significant for the firm today doesn't mean that it will be significant tomorrow. Performance measures should be modified when there is a change in the organizations objectives.

Measures must be reliable -The benefit of measurement is often dependent on the reliability and comparison of measures over time. It is therefore important to identify measures, which can be made reliably and consistently over the desired time period (Parker, 2000:63).

Metrics need to have targets of goals based on research – Goals need to be based on research about what key competitors are doing. A graph of a measure without knowing the target or goal is meaningless data that does not help manage performance (Brown (1996:9). Measures or indicators should be tied to company performance requirements and should represent a clear basis for aligning all activities with the company's goals. Arbitrary goal is stupid. Organizations have to design their target to shoot for challenging, worthwhile, and achievable goals (Litman, *et al.* 1999:5-6).

2.4 Overall strategic performance measurement model

How can an organization establish performance measures that make sense? There are many variations to the theme particularly for ensuring that measures relate to the specific strategy and key success factors of organizations. Brown (1996:11) has proposed that the implicit strategic performance measurement model structure consists of five steps: The first step is defining what visions organizations do have for the future. Next, organizations should identify the key success factors that need to be concentrated to differentiate from their competitors. During this phase, organizations also identify important business fundamentals on which they must focus to maintain their success. From selecting key success factors followed selecting the right measures. Once organizations have defined all of the important measures, specific goals or objectives need to be set to achieve the overall vision. Once the goals have been set for the organization, appropriate individuals need to be called together to develop strategies to achieve the goals.

According to Brown (1996:11) the five steps of strategic model that has been found effective in practice is depicted in figure 2.1. The steps are broadly discussed in sub sections (2.4.1 to 2.4.5).

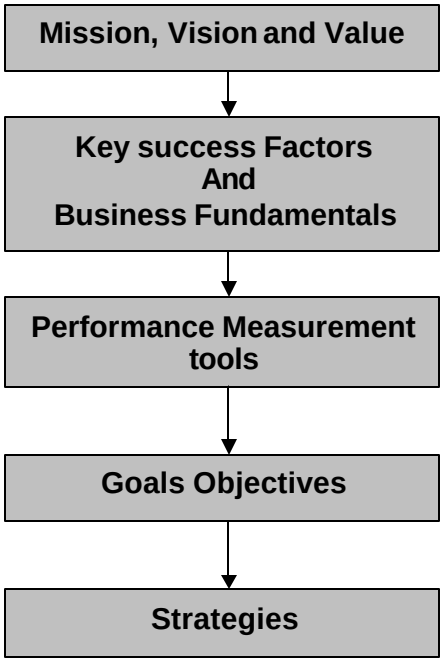

Figure 2.1 Strategic performance measurement model

2.4.1 Organizational mission, vision and value

Knowing where you are (by means of measurement) and vision of where you want to be (in terms of measurable goals) are essential in today's competitive environment (Litman, *et al.* 1999:15).

There is considerable discussion on the distinction between mission and vision. This distinction is perhaps best clarified by Denton (2001:309). He cites definition of vision as, "defining your destination ... (the) organization's aspirations for the future that appeal to the emotions and beliefs of organizational members. Mission, on the other hand, is similar to our identity and includes such concepts as an organization's purpose, competitive distinctiveness, market definition, principal economic concerns and core values".

This is well illustrated by Scandura, *et al.* (1996:48) a vision statement is developed by the top management of an organization to define the organization's future state or a dream. The mission statement reveals the

current reason for the existence of an organization on the basis of that stated vision.

Furthermore, as referred in the strategic model (Figure 2.1) organizations should begin to define their mission statement and explain that who they are, why they exist. Subsequently, they should identify their vision where to be in the future. It also helps employees visualize and understand the links between the performance measures and successful accomplishment of strategic goals. The key, as pointed out by Kaplan & Norton (1996:24) is firstly to identify where you want the organization to be in the near future. Moreover, Brown (1996:180) recommended that achieving vision requirement is essential to have a good set of measures.

Brown (1996:163) proposed that vision could encourage employees to work hard at improving quality. The research conducted by Bart & Baetz (1998:823) indicated that there is significant difference between firms with and without vision statements in terms of performance measures. Further a vision statement can influence organizational members' behaviours and improve resource allocation.

2.4.2 Critical business success factors

Identifying key success factors are the most difficult step in the process. It is not something to be done in an hour or two with a committee of executives. It takes all the way through and the right data to determine exactly what is going to be necessary to succeed in the future (Brown, 1996:164).

There are things that organizations must do right if they expect to survive in the future. These critical areas require constant care and attention on the part of management. According to Rockart (2004) in the Harvard Business Review, "Critical success factors for any business are the limited number of areas in which results, if they are satisfactory, will ensure successful competitive performance for the organization." Furthermore, Prahalad &

Hamel (as cited in Brown, 1996:163) stated “the key to sound business strategy is to do something that others cannot do, or do something well that others do poorly, or have great difficulty doing well”. These are the characteristics of all successful organizations.

Therefore, critical success factors represent performance areas that must meet expectations if the organization is to flourish. Measurements are used to track performance in each critical success area. Critical success factors are both internal and external. For example, comparison of budgets to actual results would be internal while percent of market share would be external.

One way to identify critical success factors is to go through a strategic planning process. A second or complimentary approach is to conduct competitive intelligence research. Look at the success factors of your competition. Collectively, organizations need to develop a set of critical success factors, which serves as the foundation for their performance measurement system. Consequently, critical success factors are an important link between strategic plans and performance measurement systems.

2.4.3 Selecting the right metrics

Since the role of performance measurement is a critical issue in today’s business environment, it is, however, very important to know what to measure and how to link measures with a strategy for success. Chaudron (2003:6) stated “success is a function of what measures you use. If you don't measure the right things and the measures don't reflect what is really going on, much will be done in an organization, but little will be accomplished”. Without understanding the value of measurement, companies waste their valuable time.

Furthermore, Anderson & Sedatole (1998:213) stated that organizations have to chose appropriate performance measurement that must be practiced in

conjunction with the strategic goals of the firm and enclose communication with the rapid changes occurring in the firm's process.

Artley (2001:11) suggested that inappropriate measures are often the result of random selection methods. For example, brainstorming exercises can get people thinking about what is possible and provide long lists of what could be measured. Unfortunately, such efforts by themselves do not provide reliable lists of what should be measured. Unless the measures are firmly connected to results from a defined process, it is difficult to know what corrective actions to take as well as be able to predict with confidence what effects those changes will have. In order to be able to identify effective corrective actions to improve products and services, results of all key processes must be measured. In this way, specific processes that need to change can be identified when progress is not satisfactory.

Companies that were truly proficient in measurement were not necessarily measuring the most things. They realized that, knowing what not to measure was just as important as knowing what to measure (Schiemann & Lingle, 1999:7). Kaplan & Norton (2001:23) add, "An effective organizational measurement involves measuring key components of the strategy ".

Identifying performance measures which is balanced, or which addresses an appropriate array of accomplishment facets, is an important performance measurement goal. To facilitate achievement of this goal, categories of metrics were identified from the various organizational performance standards and awards. Classifying metrics according to the subset of the categories that is applicable to the specific organization using the process can help users identify imbalances in their metrics sets. For example, if an organization's metrics all fall under the financial and market share categories, this might indicate that other areas of performance such as human resources, innovation, and learning/education may warrant additional attention (Kaydos, 2003:4).

Thus when selecting the right performance measures, it is important to ensure that they link directly to the strategic vision of the organization. The measures must focus on the outcomes necessary to achieve the organizational vision and the objectives of the strategic plan. Each objective within a perspective should be supported by at least one measure that will indicate an organization's performance against that objective (Litman, *et al.*1999:15).

When developing measures, it is important to include a mix of quantitative and qualitative measures. Quantitative measures provide more objectivity than qualitative measures. They may help to justify critical management decisions on resource allocation (e.g., budget and staffing) or systems improvement. Qualitative measures involve matters of perception, and therefore of subjectivity. Nevertheless, they are an integral part of the overall performance measures (Litman, *et al.* 1999:15).

In selecting the right measure questions to be considered are: Who is the user of information? What are the uses of the information? What critical questions must the users have answered? If the work environment involves professionals, be aware that intellectual work is very difficult to measure objectively, e.g., "ideas," "information," and "problems avoided" (Brown 1996:39).

Can current data supply a family of measures that serves both as an indicator of present performance and a predictor of future performance? What else is needed? It should also include the key business drivers or success factors that need to be focused on so as to differentiate one's organization from its competitors.

Taken as a whole, the set of measures should drive and predict the future direction of the system. Senior leadership's job becomes planning and managing improvement efforts to leverage the entire family of measures while

understanding the inter-relationships and trade-offs among them that are fixed by the current system.

2.4.4 Establishing appropriate goals/objectives

Companies need to develop specific goals or objectives at all levels of their organization to achieve the overall vision. Brown (1996:180) revealed that measures without goals are worthless. Strategic goal is defined as a long-range target that guides an organization's effort in moving towards a desired future state and strategic objective is a broad time-phased measurable accomplishment required to realize the successful completion of a strategic goals are (Litman, et al.1999:15).

Furthermore, according to Brown (1996:12) goals should be based upon research and should not be arbitrary to help organizations to achieve its overall vision. Care must be taken to make sure that the entire goals link up well with each other to achieve an improved performance. Once the goals or objectives have been established, strategies or action plans need to be identified.

Goals function as a "rudder" for steering the organization towards needed performance for profitability and survival. Arbitrary goals can actually be destructive. No further elaboration will be made here except to offer Brown's observations on five common mistakes in setting goals (Brown, 1996:181):

- Goals that are really projects, activities, or strategies
- Goals that are solely based on past performance
- Numerically arbitrary "stretch" goals
- Inconsistent short- and longer-term goals
- Inconsistencies in goals at different levels of the organization.

2.4.5 Linking measures to strategy

Artley (2001:11-12) discussed broadly the need for strategy focused performance measurement systems. He noted that performance measurement systems succeed when the organization's strategy and performance measures are in alignment and when senior managers convey the organization's mission, vision, values and strategic direction to employees and external stakeholders. The performance measures give life to the mission, vision, and strategy by providing a focus that lets each employee know how they contribute to the success of the company and its stakeholders' measurable expectations.

The goal of a performance measurement system is to help direct the allocation of resources, to assess and communicate progress toward strategy, or to evaluate managerial performance. However, a major challenge for companies is determining which of the hundreds, if not thousands, of measures to track (Ittner & Lancker, 2003:90).

Kaplan & Norton (1996:75) explicitly recognized the value of balanced set of performance measures to link a company's long-term strategy with its short-term action. They thus incorporate a circular model linking performance measures and strategy.

There seems to be almost universal agreement amongst researchers and writers about the need to link performance measures with organizational strategy in a broad based manner. This may necessarily be what is practiced by organizations in a study of over 800 United Kingdom based manufacturing firms. Neely & Adams, 1994 (as cited in O'Mara, 1996:23) examined the extent to which managers sought to use their performance measurement systems to influence the realiz ation of their manufacturing strategies. They found that the types of performance measures used in connection with specific competitive strategies were often inappropriate indicators of the effectiveness of those strategies. One possible reason for the use of

inappropriate performance measures could be the difficulty in determining what measures are appropriate.

A solid review of the literature relating to performance measurement system design was undertaken by Neely, *et al*. (1995:92). It is not only providing a valuable reference work for the field of performance measurement but poses many as yet unanswered questions. One of the findings of Neely, *et al*. (1995:93) was that "managers find it relatively easy to decide what they should be measuring". In fact, many found it too easy to list a great many measures. The type of measures that organizations might employ would include too many performance measures. This could result in unnecessary and/or inappropriate action on the part of the manager. Still others would initiate conflicting responses from department managers when not aligned with the organization's strategic objectives (Brown, 1996:10).

Finally the rationale underlying the literature review by Neely, *et al.* (1995:83) is that performance measures need to be positioned in a strategic context, as they influence what people do. Thus top-down approach to performance measurement system design fails to place sufficient emphasis on the process itself. It is essential in performance measurement system design that one does not lose sight of the business process. Peters (1994:30) in linking performance measures with quality improvements stated that this always involves some-way of addressing the business in terms of its key business process. Walsh & Dennis (1995:24) also asserts the only way to improve business as usual is to intervene in and change the underlying business process.

2.5 Problems of improper implementation of PMS

Establishing viable performance measures is critical for an organization. Making those measures work is even more important. Once the performance measurement system (PMS) is created or chosen, the next step is to implement it within the organization. The need to implement measures that

reflect and communicate an organization's strategies has been a consistent message in much of the recent literature on performance measurement. There is recognition of the need to communicate strategy, check that it is achieved and challenge whether it is correct (Kennerley & Neely, 2000). It is obviously clear that strategy should be built on corporate vision. Hacker (1998:19) argued that putting organizational vision into operation is a critical component of the strategy planning process and the starting point for an effective measurement system.

Ittner & Lancker (1998:228) argued about the failure to implement the right measurement, they noted that companies that use measurement are not measuring the right things. The problem is not just to determine what to measure but to know how to apply the measurement as well as the failure to identify, analyze, and act on the right measures may be even damaging.

The study of Hudson, *et al.* (2000) state that lack of resources is one of the main obstacles restraining the implementation process of a performance measurement system. Hannula & Rantanen (1998) also state that the main obstacles restraining productivity improvements in manufacturing companies are related to a lack of resources. Managers may not have enough time to complete the tasks required by their hectic day-to-day schedule. The time needed for the implementation of the PMS has to be realized. A certain amount of work is required to accomplish the PMS. It is the owner/manager's duty to supply the design team with adequate resources

2.6 Summary

In this chapter the literature on the general concepts of performance measurement, the importance and historical development of financial performance measurement systems, their origin and applications, and the need for the development in today's competitive and sophisticated technological changes, was argued. In addition, the conceptual framework of

performance measurement and the need of performance measurement to determine how well an organization is meeting its goals and achieving its mission for business success, as well as problems of improper implementation process of strategic based performance measurement system were also reviewed.

Having argued the general aspects of performance measurements in this chapter the next chapter will be the literature on different business performance measurement approaches.

CHAPTER THREE

Business performance measurement frameworks

3.1 Introduction

Within the substantial literature in the field of performance measurement, numerous frameworks are proposed that are designed to help organizations to identify a set of performance measures that appropriately reflects their objectives. These frameworks for measuring business performance have evolved from a variety of origins. Frameworks are approaches to measurement that businesses frequently adopted, often with significant diversity in their design and use.

Before the 1980s, the organizational performance measurement process was characterized by a cost accounting orientation, which emphasized selective financial indicators such as profit and return on investment. This approach received considerable criticisms due to focusing only on financial indicators. Critics argued that stressing on financial indicators only may lead to promoting short-term thinking (Kennerley & Neely, 2000:291).

In the late 1980s, some frameworks, which attempted to present a broader view of performance measurement, started to appear. Among the frameworks the performance pyramid system (Lynch & Cross, 1995), the performance prism (Neely & Adams, 2000), performance measurement matrix (Keegan, *et al.* 1989), the balanced scorecard (Kaplan & Norton, 1992) are globally known. It was the enormous growth in interest in performance measurement that brought widespread acceptance of the need for organizations to take a balanced approach to measurement.

This chapter discussed the traditional financial measures, modern financial performance measures, the need for non-financial measures, the non-financial measures, and the need for integrated performance measurement.

3.2 Traditional financial measure

There is a commercial need and usually a legal obligation to measure the financial performance of a business. Conventionally, and through legislature, this is done using the accounting performance measures. As it has been stated in recent studies, the accounting report that we have today, the historical cost-based numbers, management accounting procedures and techniques have long dominated the field of performance measurement. Most of such techniques were developed in the early years of the 14th century, and have largely remained unaltered (Creelman, 1998:11).

However, given that traditional measures continue to dominate, it is important to determine the extent to which such measures may be complemented by the contribution from intellectual capital resources such as customer satisfaction and human development (Williams, 2002:349). This is of particular importance for emerging economies that have often borrowed long-held financial models from developed economies, but are striving to strengthen their intellectual capital base to increase economic development.

Scheimann & Lingle (1999:5) states that in the 1970s and 1980s only a handful of companies were relying heavily on non-financial and non-operational measures. However, the need for organizations to adapt to today's dynamic and complex business environment, and to the competitive investment community, has increased the pressure on managers to deliver value, demanding more accurate and transparent performance measurement (Stewart, 1999:1).

Financial accounting measures show a concise picture of past performance, which is based on generally accepted accounting principles (GAAP). It is easy to agree when presented with a few generally accepted measures. However, most of the financial measures don't contain the necessary data that

managers need for decision-making. Financial records, rather, serve tax purposes (Brown, 1996: 49).

Fringo (2003:1) stated that financial measures known as accounting-based financial measures could contain many distortions. Many people have battled over how to 'replace' GAAP metrics. Replacing the metric won't serve the company well. Companies should design financial analysis by first defining the context of the analysis. Remember that cash flow and cash flow returns are incredibly important to measure, but beware of the limitations of reported GAAP-defined cash flow information. Respect the matching principle. Follow a set of guidelines, not a specific metric. Not only will your financial analysis improve, but also, more importantly, so will the strategic decisions and activities the analysis supports.

Every company has critical financial measures, financial figures, that have the biggest impact on success. For every company it is different. It is also dependent on a number of factors. It could be industry related, economy related, financially related, or business cycle related. Whether it is gross revenue, profit before taxes (PBT), debt to equity ratio, or cost of goods sold (COGS), this number could make or break companies (Business success profiles, 2003)[2].

Authors on corporate finance such as (Van Horne, 1995; Ross, Westerfield & Jaffe, 2002) refer to the financial measures (financial ratio analysis), such as: profitability measures, gross revenue, return on capital, return on investment, liquidity measures, financial leverage measures etc. are critical. Identifying these critical numbers are essential. It clarifies where you should focus your efforts, what business process need to improve and identify the weaknesses of organizations. But, according to Chaudron (2003:2), if senior management only focuses on the financial health of the organization, several consequences may arise. Olve, *et al.* (2001:136) add that one will therefore have to look further for integrating financial with non-financial measures in the competitive business environment for strategic decision-making.

[2] For a review, see business success profiles 1996-2003 available on line http://www.successprofiles.com, accessed 24 May 2004.

3.2.1 Financial performance indicators (FPI)

Financial ratio analysis is one of the tools used by financial analysts for making decisions regarding credit and investments (Correia, Flynn, Uliana & Wormold 2000:155; Ross, *et al*. 2002:31-34). This method utilizes the data found in financial statements to determine companies' standing. Analysts use to compare the company's ratios to its past performance, as well as to industry statistics to determine risks, trends, and to identify any peculiarities. This analytical tool facilitates inter-company as well as intra-company comparisons.

Furthermore, Van Horne (1995:759) concludes that analysis and interpretation of various ratios should give experienced and skilled analysts a better understanding of the financial condition and performance of the firm than they would obtain from analysis of financial data alone. Companies' financial ratios depend upon a variety of factors such as the industry, the business size, the accounting method utilized, or the business cycle (Correia, *et al*. 2000:155). For this reason, Ross, *et al*. (1999:31) and others, indicate the following ratio analysis for measuring businesses performances.

Liquidity ratios (short-term solvency): Liquidity ratios focus on a company's ability to repay debts. These ratios include the current ratio, quick ratio, sales/receivables, and cost of sales inventory, days' receivable, days' inventory, and cost of sales/payables, days' payable and sales/working capital.

Profitability ratios: Profitability ratios gauge a company's operating success over a given period of time. Profitability ratios measure the extent to which a firm is profitable and how well the business is utilizing its assets to generate profits. These include return on investment (ROI), return on total assets (ROA), return on equity (ROE) etc.

ROI or ROA is defined as the ratio of income to average total assets. It is a measure of managerial performance of a company. It reflects how well the company has been able to use its assets, regardless of how they have been financed. ROI is broken down into its basic components of net profit margin and asset turnover by the DuPont system of financial management (Gitman, 2000:147-148).

ROE is a measure of return that a company is able to yield on the book value invested in it. It is defined as the percentage of net profit after taxes to the book value of the average ordinary shareholders equity. The difference between ROE and ROI must be understood when comparing performances of different corporations. A highly leveraged firm could appear to increase the shareholders'/common equity, yet the corporation would not necessarily increase its ability to repay both debt and equity-holders.

Activity ratios: Activity ratios measure the efficiency, activity and changes in specific assets i.e. the ability of the firm to control its investment in assets. These include various turnover ratios such as capital asset turnover, total asset turnover, stock turnover.

Leverage ratios: Leverage ratios measure the extent to which a company relies on debt financing rather than equity. These ratios indicate the amount of debt a company has and how effective a company is in managing that debt. Too much debt can lead to higher probability of insolvency and financial distress. The most common leverage ratio is the debt to equity ratio.

Price/Earning ratio: Price/earnings (P/E) ratio of a company shows how much investors are willing to pay (e.g. per Rand) for reported profits (Brigham & Gapenski, 1996:630). P/E ratio is defined as current market price of a share divided by the earnings per share.

Cash flow ratio: Cash flow is the essence of any business. If the cash is inadequate, the firm will unable to meet its future obligations and may lead to financial distress. As a result, most analysts consider the analysis of cash flow as one of the best indicators of financial stability. Further, researchers

have constantly found that the cash flow ratio measures the cash flow generated from trading activities in relation to total debt (Correia, *et al.* 2000:154). The operating cash flow generated from the assets employed in the business consists of accounting operating profit before depreciation, amortisation and other non-cash items, and is adjusted for lease costs.

Correia, *et al.* (2000:159) concludes that ratio analysis is a very useful technique for evaluating financial performance. However, "applying ratio analysis blindly, using a procedural approach is dangerous as the effectiveness of the exercise depends upon the interpretations and skill of the analyst. If the analyst is open-minded and applies ratio analysis perceptively, ratios will provide useful insight in to firms' operations".

Besides, significant financial indicators vary depending on the line of business. They measure corporate performance based on historical data. Brown (1996:51) suggested that historical data is interesting to create wealth for its owners. Output measures or historical financial measures help the organization keep score of how well it is doing at creating wealth. According to Ittner & Larcker (1998: 205) all firms will want to emphasize financial measures to some degree, but it may be more effective to give additional weight to other non-financial measures.

3.2.2 Limitation of traditional financial measures

Performance measurement has become very topical and there is an ever-increasing interest in the subject. The increasing interest has been driven by the increased rate of change in the business environment in both the private and public sectors. Neely, *et al*. (1999:292) stated that this rapid change has led to a general dissatisfaction with traditional backward looking performance measurement systems.

According to Atkinson, *et al.* (1997:25) performance measurement systems based primarily on financial data lack the focus needed for internal

management and control. Moreover, as suggested by Kaplan and Norton (1996:2), they "worked well for the industrial era, but they are out of step with the skills and competencies companies are trying to master today". Today, the perceived limitations of traditional accounting-based measures are numerous and well known.

Critics argue that stressing on financial indicators may lead to only promoting short-term thinking (Kennerley & Neely, 2000:291). The authors emphasize the need for an integrated performance measurement approach. They contend that the cost accounting approach focused on the minimization of variance rather than continuous improvement.

Criticism of the traditional performance measurement approach and the limitations thereof can be summarized as follows (Creelman, 1998:9-12; Kaplan & Norton, 1996:38; Atkinson, *et al.* 1997:25):

- Traditional financial measures encourage local optimization.
- Tell companies how well they have performed in the past but provide few clues as to how the company will perform in the future.
- Do not provide adequate information for productivity measurement and improvement programs.
- Are lagged performance indicators because they are historical in nature, by definition reporting on activities that have occurred already.
- Are the result of management action and organizational performance, and not the cause of it.
- Have failed to measure and integrate all the factors critical to the success of a business.
- Are not externally focused.
- Are inappropriate in modern manufacturing settings.
- Say nothing about the factors such as customer service innovation, the percent of first-time quality, and employee development that actually help grow market share and profits.
- They lack the ability to guide the firm in its efforts to achieve manufacturing excellence.

In response to these criticisms, a large number of performance measurement systems (PMS) were proposed to broaden the performance measurement process. Furthermore, Ittner & Larcker (1998:205-238) state, “many managers feel that traditional accounting-based measurement systems no longer adequately fulfil the need in developing strategic plans, evaluating the achievement of organizational objectives, and compensating managers. Perceived inadequacies in traditional accounting-based performance measures have motivated a variety of performance measurement innovations ranging from ‘improved’ financial metrics such as ‘economic value’ measures to ‘balance scorecards’ of integrating financial with non-financial measures”.

3.3 Modern financial measures

The success of the firm depends on its management having theoretically sound and in practice operational tools for planning, decision-making and monitoring. Developing new management accounting and decision tools are very current subjects both in business and consultation practice as well as in academic research. During the last few years several new techniques and concepts of financial performance measurement have become popular. These include activity based costing (ABC), the economic valued added (EVA), and market value added (MVA) variants (Stewart III, *et al.*1995: 32-46).

3.3.1 Economic value added measures (EVA)

EVA has developed by the Stern Stewart Corporation as an overall measure of financial performance (Stewart, 1999:2). According to Wallace (1998: 1-15) and Ittner & Larcker(1998:205-238) traditional measures, conventional accounting principles of determining income, such as EPS (earnings per share) and ROI (return on investment), are the most common performance measures. However, they have been criticized for not taking into consideration the cost of capital and for being unduly influenced by external reporting rules.

Stewart (1991) trademarked an economic value measure and named it (EVA®). It is defined as adjusted operating income minus a capital charge,

and assumes that manager's actions only add economic value when the resulting profits exceed the cost of capital. The adjustments to profit and capital figures are meant to refine the basic economic profit (EP). Adjustments to the accounting data may be needed for activities such as spending on marketing, and research and development (R&D). These are added back to the balance sheet as an asset and amortized over a period expected to benefit from these expenditures (Arnold, 2002:724).

Most studies to date, such as Ittner & Larcker (1998:205-238) and Stewart (1999:2) have examined claims that EVA is a better predictor of stock returns than traditional accounting measures. In this regard, empirical research by O'Byrne (1996:125) concludes, "EVA, unlike NOPAT [net operating profit after taxes] or other earnings measures like net income or earnings per share (EPS), is systematically linked to market value. It should provide a better predictor of market value than other measures of operating performance". Uyemura, Kantor & Pettit (1996) and Chen & Dodd (1997:318) also arrived at similar conclusions. Moreover, Chen & Dodd (1997:331) concluded that EVA measures provide relatively more information than the traditional measures of accounting in terms of stock return, but that EVA should not entirely replace the traditional measures since measures such as E/P, ROA and ROE have incremental value in monitoring firm performance.

According to (Pettit, 1999:64; Hawawini, *et al.* 2003:5) EVA is a version of the residual income method that measures operating performance and provides a decision framework, performance measures, and incentives to motivate management to create value. The principal feature of this measure is that it reduces income by a change to the cost of capital that is employed to produce the income.

Mathematically EVA is expressed as follows:

$$EVA = NOPAT – WACC \times CE \quad (1)$$

Where:

NOPAT = Net operating profit after taxes

CE = Capital employed

WACC = Weighted average cost of capital.

Equation 1 can be rewritten as:

EVA = NOPAT – WACC x CE

NOPAT = ROIC x CE

Or

ROIC = NOPAT/CE

Therefore:

EVA = (ROIC x CE) – (WACC x CE)

EVA = (ROIC – WACC) x CE (2)

Where: ROIC = Return on investment capital

Strategy is about sustainable value creation, which occurs when the firm's activities deliver a return on invested capital (ROIC) over time that exceeds its weighted average cost of capital (WACC). This return spread (ROIC – WACC) measures the ability of the firm to create value per dollar of capital employed (CE).

If ROIC is greater than WACC, economic profit per dollar of capital employed is positive and the firm creates value. The opposite is true when ROIC is smaller than WACC (Stewart, 1999:2). In this last equation, EVA is scaled for size and implicitly shows that the ability of the firm to add value, irrespective of size, depends on its ability to earn a positive return spread. Profitability describes corporate performance as the degree to which a firm's revenues exceed costs.

Cash flow return on investment (CFROI): CFROI is an economic profit based corporate performance/valuation framework used by portfolio managers and corporations on an economic profit (EP) basis. CFROI focuses on economic value and cash flow. It is based on the ability of the firm

to generate cash over its life, relative to risks undertaken. Normally calculated on an annual basis and is compared to an inflation-adjusted cost of capital to determine whether a corporation has earned returns superior to its costs of capital (Ittner & Larcker, 1998:205-238).

3.3.2 Market value added (MVA)

MVA measures the change in market value of the company's stock through its operations. This is an important measurement for organizations that seek to maximize shareholders' return and illustrate to their stockholders how their investment has performed (Hawawini, *et al.* 2003:5). It is has to be computed, multiplying the value of the company's stock by the amount of shares outstanding, and then subtracting the equity invested by shareholders. Market evaluation concentrates on the degree to which a firm's market value exceeds its book value (Brigham & Gapenski, 1996:21).

MVA = [(value of stock per share) x (Shares outstanding)] – Total shareholders Equity.

Or

MVA = $\sum$ net present value of future EVA

A study by O'Byrne (1996:125) has shown that both EVA and MVA have characteristics that make reporting them very useful for firms. Companies with the ability to increase the value of equity are attractive to investors. If the amount of value added to a company's equity is above the cost of capital in a particular year, which is positive, then its MVA is increased, and if the EVA is negative, it is a clear signal that the stock price was headed for a fall, thus companies could have avoided large loses (Brigham & Gapenski, 1996:22).

3.3.3 Activity based costing (ABC)

ABC was developed to provide better insight into how overhead costs should be allocated to individual products or customers (Stewart, 1999:1). Typically, businesses make simple adjustments to allocate overhead costs that do not

accurately model how the product or cost consumes those overhead activities (Cooper & Kaplan1998:109).

Furthermore, ABC is an attempt to retain financial measures (which are important) but to address some of the shortcomings of 'traditional' measures. it allows the attribution of costs to activities and products much more accurately than conventional accounting methods. The traditional approach has been to allocate indirect overhead type expenses based on some broad brushed factor (e.g. direct labour hours). This rarely reflects the cause-and-effect relationship between the indirect overhead expense and the product, service or customer that is consuming the cost (Stewart, 1999:2).

Besides, Stewart (1999:3) noted that the problem with the traditional approach could be very misleading when trying to determine which products or customers, etc., are profitable. ABC permits more accurate and reliable measure of profit margins, and this, in turn, leads to more effective decision-making. In the ABC model of costs, work activities or processes consume the organization's resources (cost inputs), and the products and services consume the work activities. ABC identifies the activities that are responsible for costs (the cost drivers). These activity costs are passed on to products or services only if the product or service uses the activity. Each cost is determined by the quantity of its cost driver and all of the costs are eventually re-aggregated into the final cost objects.

Using this approach, companies get insight into profitable and profitless activities based on a customer or a product viewpoint (Kaplan & Norton, 2001:55). ABC, then, is a way of measuring which of the firm's activities generate revenues in excess of costs and as a result, provide keen insight into what is really providing value for customers (Meyer, 2002:45).

3.4 Non-financial performance measures

The pressure of reporting corporate performance based on non-financial as well as financial measures has intensified over the last few years. For example, the conference board of the Canadian Institute of Chartered

Accountants (CICA) reported that traditional accounting-based perfomance measures are excessively historical; they lack predictive power. The conference board also concludes that these measures give inadequate consideration to such resources as intellectual capital (Waterhouse, 1999:8). Accordingly, the Board suggests that strategically oriented performance measurement systems should measure non-financial as well as financial outcomes. Likewise, a report by the American Institute of Certified Public Accountants (AICPA) recommends that companies should disclose leading, non-financial measures on key business processes such as product quality, cycle time, innovation, and employee satisfaction (AICPA Report, 1994:143).

Recently a number of companies have begun to create new performance measurement systems that supplement and extend the more traditional financial measures of company performance. In response to changing markets, and concerns about a "short-term orientation," these firms have begun to use, so called, non-financial measures. Several non-financial measures have been developed to capture the richness of the organizational effectiveness, for example the literature of total quality (TQM) and service quality (SERVQUAL) measures are discussed in sections 3.4.2 and 3.4.3 respectively.

3.4.1 The need for non-financial measures

Financial performance measurement alone is not enough for the new reality of organizations (e.g. accelerated changes in technology, needs for innovation and flexibility, shortened product life cycles). The crucial importance of non-financial indicators, which are based on organizational strategy, include key measures of success (Olve, *et al*. 2001:13).

Adams & Neely (2002:29) stated, “while accounting clearly has a role, these financial measures are not sufficient on their own to steer a company through difficult times”. In this regard consideration must be given, to other important non-financial measures such as investors, customers, employees and

suppliers, all of which are integrated into the balanced approaches, or variants of it.

According to recent authors (such as Lingle & Schiemann, 1996:56-61; Kaplan & Norton, 1996:23; Olve, *et al.* 2001:12-13), firms have tried to overcome perceived limitations in accounting profit-based performance measures by using non-financial measures for decision-making and performance evaluation (Ittner & Larcker, 1998: 205).

Furthermore, "there was a very long drive throughout the 1980s on financial results, and an increasing focus on organizational results by financial analysts. So if senior managers wanted to communicate to shareholders how their strategies would eventually lead to financial benefits, then they had to find a new way of communicating the relationship between present investment in things like employee skills, information technology, and future performance" (Clarke as cited in Creelman, 1998:12).

3.4.2 Total quality measures (TQM)

Traditionally the responsibility for ensuring quality has resided with the provider and was generally tracked and ensured through the use of inspection. Quality control and zero defects were the watchwords. In order to shield the customer from receiving poor quality products, aggressive efforts were focused on inspection and testing at the end of the production line. Increased competition and greater demands by the end users of products and services have resulted in a rethinking of how quality is measured and delivered to the customer (Bitner & Hubbert, 1994:77).

TQM has been defined in a wide variety of ways. Juran (1988:28) was among the first to define TQM. His definition still stands as one of the simplest and yet most accurate definition of the field. He defined TQM as "fitness of use", i.e. designing products and services capable of meeting customer needs, having a predictable degree of uniformity and dependability at low cost and with a quality standard suitable to the market. Moreover, Reeves & Bednar

(1994:419) defined quality as the extent to which a product or service meets a customer's expectations.

Quality is defined as how well a product does what it is supposed to do - how closely and reliably it satisfies the specifications to which it is built. Managers in successful organizations are quality conscious and understand the link between high-quality goods and/or services, and competitive advantage (Hellriegel, *et al.* 2001:67).

Hellriegel, *et al.* (2001:68) also says that the quality viewpoint emphasizes achieving customer satisfaction through the provision of high quality goods and services. Thus, the focus of the quality viewpoint is the customer, who ultimately defines quality in the marketplace.

Providing high-quality products is not an end in itself. Successfully offering high-quality goods and services to the customer typically results in important benefits to the organization, namely a positive company image, lower costs and higher market share, and decreased product liability.

Over the past few decades, many firms have adopted various quality programs, such as total quality management (TQM), Six Sigma, certified quality standard (ISO9000), European Foundation Quality Management (EFQM) and the Baldridge National Quality Program to improve the quality of the manufacturing and service offerings and to help organizations to gain competitive advantages (Zairi, 1996:49-50). Each award is based on a perceived model of TQM and a central tenant of all of these programs is business performance measurement. For example, the Baldrige National Quality Program measures businesses in categories such as leadership, human resource focus, strategic planning, process management, customer and market focus, information and analysis, and business results (Artley, 2001: 30-34).

The Malcolm Baldridge National Quality Award (MBNQA) and European Quality Award (EQA) focus on customer satisfaction more than any other criteria. Furthermore, they place emphasis on the following (Zairi, 1996: 49):

- Customers dictate the place of competition demanding higher standards of quality, delivery, reliability and lower prices.
- Markets are becoming more and more saturated; opportunities for growth are not as abundant as in the past, and maintaining market share will become a testing experience for all.
- Emphasis is on innovation rather than productivity. Customers are more willing to pay for things they have asked for and need, rather than what is stocked up on shelves and made available to them in the market place.

TQM has been widely implemented throughout the world. Many firms have arrived at the conclusion that effective TQM implementation can improve their competitive abilities and provide strategic advantages in the marketplace (Anderson & Sedatole, 1998). Several studies have shown that the adoption of TQM practices enable firms to compete globally (e.g., Allen & Kilimann 2001:110). Total quality has developed to what it is today along with other business management philosophies. It is a diversified way to see the growth of the whole business. TQM posits certain numerical and non-numerical goals for a company. Reaching these goals is typically not easy. It requires support from management, long-term strategic decision-making and motivated personnel (Garvin, 1988:319).

In general, product or service quality measures are essential to find out information that is really important to customers about each product or service. This information can help to drive the new product design process, which fits the customers' requirement (Brown, 1996:84). Moreover, measuring product and service quality is identifying information on what customers want as well as what dimensions of products or services need to be measured and controlled. However, since quality alone as a single non-financial measure

could not satisfy the need to measure the overall performance of organizations, the call of an integrated measurement system still remains.

3.4.3 Service quality measures (SERVQUAL)

Over recent years, there have been a variety of studies on different aspects of service quality measurement. Traditionally, the SERVQUAL measurement has been defined as the difference between customers' expectations and their perceptions of the service they actually receive (Parasuraman, Zeithaml, & Berry, 1988:12). Many researchers accept this approach of service quality. For example, Bitner & Hubbert (1994:77) define quality as "the consumers' overall impression of the relative inferiority/superiority of the organization and its services". Parasuraman, *et al*. (1985:41) viewed quality as "the degree and direction of discrepancy between customers' service perception and expectations". According to this approach, services are different from goods because they are intangible, heterogeneous and are simultaneously produced and consumed.

The SERVQUAL instrument is designed to be broadly applicable to service industries, and has been used by researchers (e.g. Parasuraman, *et al*. 1988:35-43; Augustyn & Ho, 1998:71) in replication studies in service industries, such as banking, credit card processing, repair and maintenance, and long distance telephone service.

Based on this traditional definition of service quality, Parasuraman, *et al.* (1985:12-40) developed the "Gap Model" of perceived service quality. This model has five gaps: (1) between management perceptions of consumers' expectations and expected service, (2) between management perceptions of consumers' expectations and the translation of perceptions into service quality specification, (3) between translation of perceptions of service quality specification and service delivery, (4) between service delivery and external communications to consumers, and (5) the gap between the customers' expected level of service and the actual service performance.

As mentioned above, this disconfirmation paradigm conceptualizes the perception of service quality as a difference between the expected level of service and the actual service performance. They revealed the following ten second-order dimensions that are used by consumers in assessing service quality in a broad variety of service sectors: (a) tangibles, (b) reliability, (c) responsiveness, (d) competence, (e) courtesy, (f) credibility, (g) security, (h) access, (i) communication, and (j) understanding (Parasuraman, *et al*. 1985: 41-50).

Using these ten dimensions, Parasuraman, *et al*. (1988:38) made the first effort to operationalize the concept of service quality. They developed an instrument to assess service quality that empirically relied on the difference in scores between expectations and perceived performance. The instrument consists of twenty-two items divided along the ten second-order dimensions previously listed, with a seven-point answer scale accompanying each statement to test the strength of relations. These twenty-two items were used to represent five dimensions: reliability, responsiveness, tangibles, assurance, and empathy.

Reliability refers to the ability to perform the promised service dependently and accurately. Responsiveness reflects the willingness to help a customer and provide prompt service. Tangibles refer to the appearance of the physical facilities, equipment, personnel and communication material. Empathy refers to caring, individualized attention the firm provides its customer (Chang, *et al.* 2002:5).

However, several researchers challenged the usefulness of the SERVQUAL scale as a measure of service quality by pointing out its shortcomings (Oliver, 1994:16). SERVQUAL's shortcomings result from the weakness of the traditional definition that it applies. It is noted that there are several problems in the traditional (disconfirmatory) definition of service quality. First, customers' needs are not always easy to identify. If their need is not correctly identified, conformance to a specification is not proper. Chang, *et al*. (2002:5) pointed out that customers bring a complex and multidimensional set of expectations to the service encounter. Customers come with expectations for

more than a smile and handshake. The traditional definitions failed to provide a way to measure customers' expectation, which determines the level of service quality. Customers' expectations may fluctuate greatly over time (Reeves & Bednar, 1994:419-445). Therefore, empirically it is not valid to use the difference in scores between expectation and perceived service quality to measure service quality.

In short, SERVQUAL, which applies the traditional model, was the first effort to operationalize service quality. Although it made a great contribution to the field of service quality, it is insufficient because of its inherent weaknesses. In recent years organisations have sought to develop more comprehensive performance measurement systems (PMS) to provide managers and employees with information about multiple dimensions of the firm's operations (Ittner, *et al*. 2003). The move towards more comprehensive PMS has been popularized in techniques such as the balanced scorecard (Kaplan & Norton, 1996).

3.5 Summary

It has been clear from the literature that business performance measurement is an integral component to how businesses know things and how it helps them to act in a manner that enables to survive and thrive. Today's business enterprises adopt performance measurement systems for a variety of reasons, chiefly to determine how well their products and services are responsive to the needs of the customers and to know how well organizations are capable to improve effectiveness.

Furthermore, performance measurement helps to provide the data necessary for showing how activities support broader goals, and provide the data necessary for supporting requests for additional resources or for supporting initiatives. But it is the effective use of this data by decision makers at all levels of the organizations that will aggressively improve products and services.

The performance measurement systems have shown significant development, from financial to integrated financial and non-financial measures for the past two decades. Several non–financial (qualitative) performance measurement approaches, or frameworks, for building and managing performance measurement systems have evolved today.

Nevertheless, non-financial measures are also problematic. The relation between improvement in non-financial measures and profits is unclear. Financial (quantitative) measure is feasible and realistic; its use should be encouraged. When developing measures, it is important to include a mix of quantitative and qualitative measures. Quantitative measures provide more objectivity than qualitative measures. These financial data have the advantage of being precise and objective. They may help to justify critical management decisions on resource allocation or systems improvement. Companies should first identify any available quantitative data and consider how it can support the objectives and measures integrated.

Qualitative measures involve matters of perception, and therefore of subjectivity. For example, while a company will usually need surveys to gauge some elements of customer satisfaction such as timeliness of service, process-oriented measures such as acquisition lead time or contract delivery time may be used as supplemental quantitative indicators - they help explain the underlying reasons for survey performance results.

The problem is not only on non-financial measures, but also a problem of most financial measures as they focus on the past. Significant arguments against such measures are that measuring the long-term period's performance is critical for any organization. Past and present metrics are the easiest to come up with, because future measures help predict success over a longer-term than next month or next quarter. Further, financial measures alone do not provide adequate information for productivity measurement and improvement programs. They are inappropriate in modern manufacturing settings as well.

Many proposed a variety of integrated measures; the problem is which measure from the many available an organization should use. But as it is clear from the literature selecting the right measure for success is the vital issue in today's competitive environment, priority is given to the vital few performance measures.

With this in mind, many began to realize that integrated financial and non-financial measures such as the BSC were considered as effective performance measurement tools for strategic decision making. In this regard the BSC performance measurement frame works will be discussed in the next chapter.

CHAPTER FOUR

The fundamentals of Balanced Scorecard (BSC) performance measurement

4.1 Introduction

In recent years organisations have sought to develop more comprehensive performance measurement systems (PMS) to provide managers and employees with information about multiple dimensions of the firm's. Given the recent development in performance measurement, more executives around the world have begun to question whether they measure the financial as well as the non-financial outcome. In this regard, the integrated performance measurement approach, such as the Balanced Scorecard, has become very topical than ever (Ittner, Larcker & Randall, 2003:715-741).

The increasing interest has been driven by the increased rate of change in business environment in both the private and public sectors. Researchers and practitioners around the globe are contributing to this evolving body of research. Several researchers (Kaplan & Norton, 1996; Neely, *et al*. 1995; Olive, *et al*. 2001; Kennerly & Neely, 2000; Ittner *et al*. 2003) have discussed the need to develop integrated performance measurement system so that managers might obtain information from all parts of their organization.

The performance measurement frameworks discussed in the previous chapters display a number of key characteristics that help an organization to identify an appropriate set of measures to assess their performance. This chapter reviews the need for balanced performance measurement, the development of balanced scorecard performance measurement frameworks, which provide a balanced picture of the business and the balanced scorecard

perspectives along with the common pitfalls of organizations in implementing BSC.

4.2 The need for balanced performance measures

The revolution in performance measurement prompted organisations to implement non-financial measures that appropriately reflect their objectives as well as financial measures that indicate the bottom line results. It was the enormous growth in interest in performance measurement in the 1980's and 90's that brought widespread acceptance of the need for organisations to take an integrated approach to measurement (Neely, *et al*. 2000:292). These interests in measurement frameworks help organisations to implement a balanced set of measures.

Summarizing the work of recent authors (Altrey, 2001:11; Brown, 1996:11; Olve, *et al*. 2001:12; Kaplan & Norton, 1996:22, 38-40), on performance measurement, the following relevant guidelines and characteristics of balanced performance measurement systems can be given:

- It must reflect relevant non-financial information, based on key success factors of each business.
- It should be implemented as means of articulating strategy and monitoring business results.
- It should be based on organizational objectives, critical success factors, and customer needs, and should monitor both financial and non-financial aspects.
- It must change dynamically with the strategy.
- It must meet the needs of specific situations in manufacturing operations and should be long-term oriented as well as simple to understand and implement.
- It must make a link to reward systems.
- The financial and non-financial measures must be aligned and fit within a strategic framework.

Examining the most recent literature, one can find words like balanced, integrated, linked, multi-faceted or multi-dimensional starting to be used to describe performance measurement systems. Moreover, the widespread acceptance of the need for organisations to take an integrated approach lead to the development of “balanced” or “ multi-dimensional” performance measurement frameworks (Bourne *et. Al*. 2000:754-755). However, the balanced performance measurement system is not without difficulties. Gomes, *et al*. (2004:489) clearly identifies the problems as summarized:

- There are many non-financial measures that can be used by organizations. The problem is which measure from the many available an organization should use. Perhaps it all depends on the characteristics of the organization and the nature of its industry.
- There are problems with output measurability and timeliness of information.
- Little or no consideration is given for the existing measurement systems that companies may have in place.

Since, the 1990’s many variations of the concept of performance measurements have surfaced, due mainly to the fact that no two organizations are alike and their need for balanced measures and their identified business perspectives vary. Regardless, the key components of all of these frameworks are a balanced set of measures and a set of strategically focused business perspectives (Artley, 2001:19).

Several authors stressed the crucial importance of non-financial indicators, which are based on organizational strategy, which include key measures of success and which are perceived as immune from the various shortcomings of financial measures. Nonetheless, non-financial measures are also problematic. The relation between improvement in non-financial measures and profits is unclear.

Gradually, performance measurement frameworks began to reconcile the use of financial and non-financial measures. Examples include the balanced scorecard, which will be discussed in the next section.

4.3 The development of BSC performance measurement

The idea of the BSC was introduced first by Kaplan & Norton in the 1992 issue of the Harvard Business review. Recognizing some of the weaknesses and vagueness of previous management approaches, the balanced scorecard approach provides a clear prescription as to what companies should measure in order to 'balance' the financial and non-financial perspectives (Olve, *et al.* 2001:5-6). The BSC is a formal management technique built on the premise that the main prerequisite to effective management is measurement (Zairi, 1996:31). The set of measures should reflect financial and non-financial measures; internal and external measures; and efficiency and effectiveness measures.

In observing and working with many companies, Kaplan &Norton (1992: 71-79) have found that senior executives do not rely on one set of measures to the exclusion of the other. They realize that no single measure can provide a clear performance target or focus attention on the critical areas of the business.

Resent years have witnessed rising interest towards integrated performance measurement systems to provide managers and employees with adequate information about the firm's operation. According to (Jalbert & Landry 2003:2) the balanced scorecard system is based on the concept that financial variables alone may not be a sufficient measure of corporate performance (Olve, 1998:12). To address this problem, the balanced scorecard provides an integrated framework to help managers implement strategies, measure performance, and compensate employees by developing goals and measures along different perspectives and linking them together with the vision, mission, and strategy of the firm. According to a recent balanced scorecard report, various surveys estimate that 40-50 percent of large organizations have

begun implementing this concept (BSC Report, 1999 as cited in Sim & Koh, 2001:18-27).

4.4 The BSC – measures that drive performance

There are arguments on the numerous measures that created for the scorecard, as they may unnecessarily complicate the decision-making and performance evaluation process, managers may need to know when to emphasize particular metrics (Reisinger, *et al*. 2003:430). However, according to Kaplan & Norton (1996:162) the balance scorecard explicitly identifies the critical few drivers of success. It reflects the company's strategy by understanding the financial and shareholder requirements, the customers' needs, internal processes and enablers such as company culture, information and infrastructure.

Artley (2001:19) suggested that this framework is intended for top managers in an organization to be able to obtain a quick and comprehensive assessment of the organization in a single report. Use of the balanced scorecard requires executives to limit the number of measures to a vital few and allows them to track whether improvement in one area is being achieved at the expense of another area.

Brown (1996:12) remarked that designing few and improved measurement systems may save much time. Similarly, Kaplan & Norton (1996:163) state "corporations should have hundreds, perhaps thousands, of measures that they can monitor to ensure that they are functioning as expected, and to signal when corrective action must be taken. But these are not the drivers of competitive success. Such measure captures the necessary 'hygiene factors' that enable the company to operate. These measures should be monitored diagnostically, with deviation from expectation".

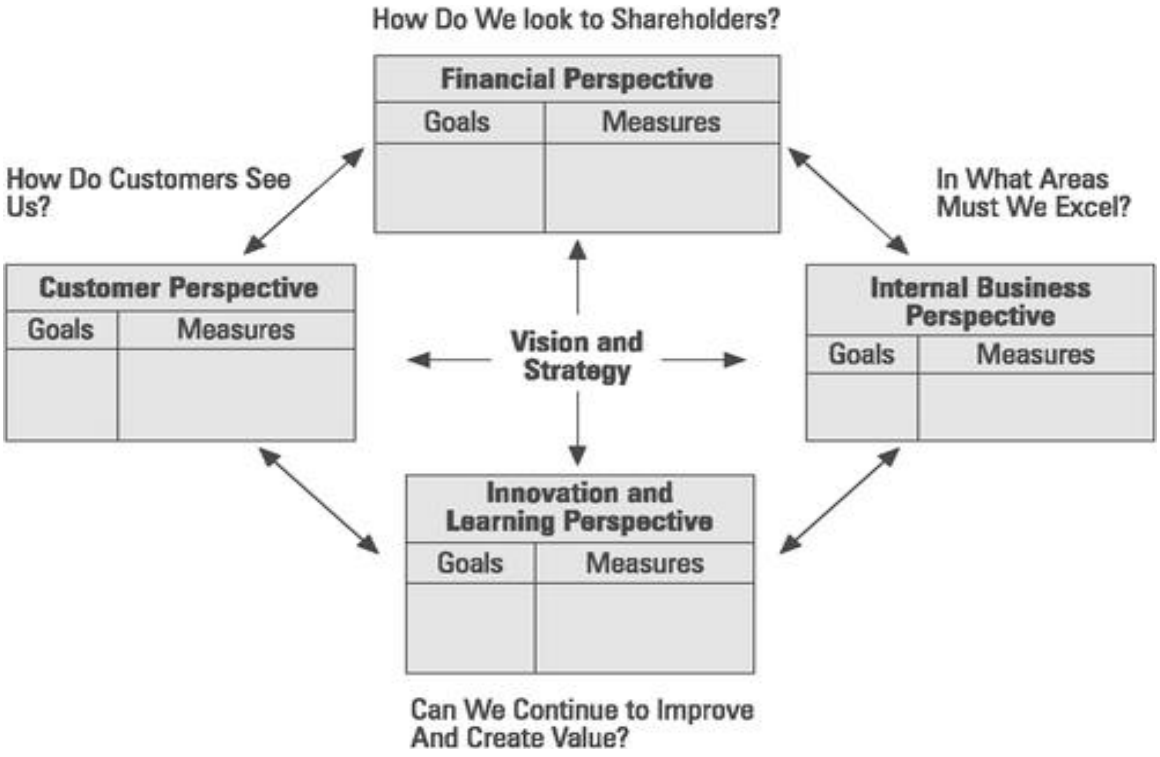

Figure 4.1 The balanced scorecard (Kaplan & Norton, 1996:9)

Figure 4.1 shows how the BSC translates a business unit mission and strategy into objectives and measures. According to the authors of BSC the measures present a balance between external measures for shareholders and customers, and internal measures of critical business processes, innovation, learning and growth. Using the measurements focus, the scorecard accomplishes critical management processes such as:

- clarifying and translating vision and strategy
- communicating and linking strategic objectives and measures
- planning, setting target and designing strategic initiatives
- enhancing strategic feedback and learning.

The balanced scorecard (Kaplan & Norton, 1996:9) allows managers to look at the business from four perspectives (see Figure 4.1 the balanced scorecard links performance measures). It provides answers to four basic questions:

- How do we look to shareholders? (Financial perspective)
- How do customers see us? (Customer perspective)
- What must we excel at? (Internal perspective)
- Can we continue to improve and create value? (Innovation and learning perspective).

These perspectives enable companies to track financial results and simultaneously monitor progress in building the capabilities that are necessary for acquiring the "intellectual capital" or "intangible assets" needed for future business growth and for providing keener competition (Kaplan & Norton, 2001: 23).

4.4.1 The financial perspective

The balanced scorecard does not disregard the traditional need for financial data but rather encourages organizations to identify their specific financial objectives and link the corporate strategy to these objectives (Kaplan & Norton 1996:30). The financial objectives serve as the focus for the objectives and measures of the other three perspectives. This perspective can employ any number of financial measurements, but care should be taken to ensure that the measures incorporate elements of both risk and return (Jalbert & Landry, 2003:2).

Every measure should be part of a cause-and-effect relationship that culminates in improving long-term sustainable financial performance (see Figure 3.1). The scorecard is an illustration of the strategy, starting with the long-term financial objectives and then linking them to the customer focused initiatives, internal operational processes and investments in employees and systems that combine to produce the desired economic performance (Kaplan & Norton, 1996:47).

Clearly it is important to get the 'right' measures. Accordingly recent literatures such as Brown (1996:52-55), Kaplan & Norton (1996: 50) and Stewart (1999:4) suggest that leading organizations are now finding new financial measures, rather than simply considering the obvious financial measures of revenue, profit, share value or dividend cover, consideration is being given to a recently developed measure namely economic value added (EVA). The authors of scorecard consider EVA as more accurate way of measuring a company's profitability, because it includes the cost of capital in the equation. Moreover, Stewart (1999:1) considers MVA as an indicator of a company's ability to create wealth for its shareholders, and ABC as an accurate method for tracking all costs associated with producing goods and services.

Furthermore, according to Kaplan & Norton (2001:51-59) the following three general objectives or themes that typically reflected in the financial perspective of a balanced scorecard are identified and summarized as follows:

Revenue growth refers to expanding product and service offerings, reaching new customers and markets, changing the product and service mix toward higher value added offerings, and pricing products and services.

The cost reduction and **productivity objective** refers to efforts to lower the direct costs of products and services, reduce indirect cost, and share common resources with other business units.

Regarding **asset utilization** managers attempt to reduce the working capital levels required to support a given volume and mix of business. They also strive to obtain greater utilization of their fixed asset base, by directing new business to resources currently not used to capacity, using scarce resources more efficiently, and disposing of assets that provide inadequate returns on their market value.

4.4.2 The customer satisfaction perspective

Recent management philosophy (Kaplan & Norton, 1996:63; Olve, *et al.* 2001:61) has shown an increasing realization of the importance of customer focus and customer satisfaction in any business. The customer perspective involves corporations seeking to understand what their target customers want (Jalbert & Landry, 2003:2). According to Chaudron (2003:2) these are leading indicators. If customers are not satisfied, they will eventually find other suppliers that will meet their needs. Customer satisfaction results in retained and repeat business as well as new business from customer referrals. Poor performance from this perspective is thus a leading indicator of future decline, even though the current financial picture may look good. In developing metrics for satisfaction, customers should be analyzed in terms of kinds of customers and the kinds of processes for which companies are providing a product or service to those customer groups.

Kaplan & Norton (1996:67) remark that, before establishing customer measures, organizations must identify the market segments they are serving or wish to serve. Organizations may select market segments that are most profitable, or that are under-served. For each segment it is possible to customize the following set of widely used measures: market share, customer retention, customer acquisition, customer satisfaction, and customer profitability. These measures can be summarized as follows (Kaplan & Norton, 1996:67-71):

Market Share reflects the proportion of business in a given market (in terms of numbers of customers, dollars spent, or unit volume sold) that a business unit sells. Companies could measure market share by percentage of market segment captured by organizations or by percentage of each customer's total requirement served by companies.

Customer Retention tracks, in absolute or relative terms, the rate at which a business unit retains or maintains ongoing relationships with its customers.

Companies can readily measure customer loyalty by the percentage of growth of business with existing customers.

Customer acquisition measures in absolute or relative terms, the rate at which a business unit attracts or wins new customers or businesses. Companies could measure number of actual new customers divided by number new customers, ratio of sales to inquiries, average cost to acquire a new customer, average order size, or average revenue per customer interaction.

Customer satisfaction assesses the satisfaction level of customers along specific performance criteria within the value proposition. Three techniques can be employed: mail survey, telephone interviews and personal interviews to identify number of complaints, number of unsolicited thank you letters, and number of individuals indicating that they are extremely satisfied with their experience with organizations on a satisfaction survey.

Customer profitability measures the net profit of a customer, or a segment, after allowing for the unique expenses required to support that customer. Two techniques can be employed: Total profit per customer and total cost per customer or per transaction.

4.4.2.1 Performance drivers for customer satisfaction

Many factors may influence customer-focused performance in practice, and all have a significant impact on business performance, especially on profitability. However, according to Kaplan & Norton (1996: 85-90), all these factors tend to fall into four categories: time, quality, performance and service, and cost (including price, effort, energy and other related cost such as ordering, scheduling and delivering). These factors can be well explained (Zairi, 1996:49) that customers dictate the place of competition, demanding higher standards of quality, delivery time, reliability of service and lower prices. Moreover, Hellriegel, *et al.* (2001:68) elaborate further, that the quality viewpoint emphasizes achieving customer satisfaction through the provision

of high quality goods and services. Thus, the focus of the quality viewpoint is the customer, who ultimately defines quality in the marketplace.

Brown (1996:43) suggested that the key to a good customer satisfaction measurement system is to have a good mix of data on customer opinions and their actual buying behaviour. The soft or opinion data should help to identify problems early so they can be corrected, and the hard data on buying behaviour is to know what customers say about the products and service actually relate to their buying behaviour. Brown (1996:43-84) identifies a number of companies that have a difficult time linking customer satisfaction levels with market share and repeat business.

Customer satisfaction is perceived to be a key indicator of a firm's market share and profitability, and it is revealed that, a satisfied customer is expected to repeat the purchase of the goods or services, increasing a firm's market share and profits, which imply its significance to successful competition in customer-centred era (Kaplan & Norton, 1996:70). In general, high customer satisfaction should indicate increased loyalty of current customers, and enhanced reputation for the firm, which can aid in introducing new products by providing instant awareness and lowering the buyers' risk.

Product / service quality measures

The balanced scorecard methodology builds on some key concepts of previous management ideas such as total quality management (TQM), including customer defined quality, continuous improvement, employee empowerment, and -- primarily – measurement-based management and feedback.

Measuring product and service quality is identifying information on what customers want and expect as well as what dimensions of products or services need to be measured and controlled. Customers' need are not easy to identify, because what customers want and expect changes quite often, it is important then to conduct customer requirement research on a regular and frequent basis (Chang, *et al*. 2002:5). Brown (1996:89) suggests that every

organization needs set standards for product /service quality levels based on customer requirements and quality levels of world-class organizations' product/services.

Measuring supplier performance

The supplier is a crucial part of the partnership of producing goods and services (Kennerley & Neely, 2000:292). Furthermore, Brown (1996:111) suggests that loyal and good suppliers are as important as loyal and satisfied customers. Supplier management goes beyond ensuring cost-effectiveness, capacity control, quality, and responsiveness to create a competitive advantage for the organization through a superior relationship management. It has application and benefits not only in production, but also in marketing, sales, and support operations.

According to Brown (1996:121) the three common measures for suppliers' performance are:

- ***Quality of goods and services purchased***: In this category excellent companies used to collect data on key product/service variables for the goods and services it buys from suppliers.
- ***Price (Value)*****:** Suppliers are rated on their pricing and how it compares to their chief competitors.
- ***Products returned (shipment rejected):*** Suppliers are assessed using key process metrics along with the traditional quality and price metrics.

4.4.3 Internal business process perspective

The internal business perspective involves identifying those internal business activities that are critical to the company's success. This perspective relates to the production of the company's goods or services and involves developing efficient work processes that minimize costs and maximize quality (Jalbert & Landry, 2003:2).

The objectives and measures for this perspective thus enable a focus on maintaining and improving performance of those processes that deliver the objectives established as key to satisfying customers, which in turn satisfy shareholders.

Internal business process measures address things such as productivity, accuracy, cycle time, core competencies and effective use of people and information resources. According to (Kaplan & Norton, 1996:96; Brown, 1996:109), there are many internal processes in the typical organization that deserve attention and measurement. Organizations need measures of performance all the way from the identification of a customer need to the satisfaction of that customer need. This internal business perspective model encompasses three principal business processes, namely:

Innovation; this process help the business unit researchers to identify the emerging or latent needs of customers, and then create the product or services that will meet these needs.

Operational; this process is where existing products and services are produced and delivered to customers. This process has historically been the focus of most organizations' performance measurement systems.

Post sale service; this is a major step where training service is rendered to customers. For example, companies that sells sophisticate equipment or products may offer training programs for customers' employees to help them use the equipment or system more effectively and efficiently. All these activities expected to add value to target customers.

4.4.4 The innovation and learning perspective

The innovation and learning perspective recognizes that customers' needs, perceptions, and expectations constantly change. As a result, corporations have to evolve and continuously improve. In order to adapt to change, organizations must create an environment conducive to innovation and

learning. This perspective encourages investment for future growth in the area of human resources (Jalbert & Landry, 2003:2).

Furthermore, the organisation has to identify the infrastructure that must be built in order to create long-term growth and improvement. The objective is to build up mechanisms to fill up the existing gaps in knowledge and processes and to be continually innovative. Kaplan & Norton (1996:127) emphasize that 'learning' is more than 'training'; it also includes things like mentors and tutors within the organization, as well as that ease of communication among workers that allows them to readily get help on a problem when it is needed.

The three common categories for learning and growth measures are: employee satisfaction, employee retention, and employee productivity. Here are a few examples of measures for the learning and growth perspective (Kaplan & Norton, 1996:45).

***Measuring employee satisfaction*:** The employee satisfaction objective recognizes that employee moral and satisfaction are now considered highly important by most organizations. Satisfied employees are preconditions for increasing productivity, responsiveness, and quality and customer service. According to the authors of BSC excellent companies, measure employee satisfaction with employee surveys on which specified percentage of randomly chosen employees is surveyed.

***Measuring employee retention**:* This objective recognizes to retain those employees in whom the organization has a long-term interest. Long-term loyal employees carry the values of the organization, knowledge of the organization process, and sensitivity to the needs of customers. Employee retention is generally measured by percentage of key staff turnover.

Measuring employee productivity: The objective of measuring employee productivity is an outcome of aggregate impact from enhancing employee skills, employee moral, innovation, improving internal processes and

satisfying customers. The simplest measurement of productivity measures is revenue per employee.

4.5 Common pitfalls of organizations in implementing BSC

It can be clear from the literature of BSC that there can be many organisational benefits in using a BSC for integrating strategy with performance measurement and providing a comprehensive set of achievable measures. However, despite its well-publicized successes, the majority of organizations that adopt a scorecard fail to reap the rewards they expect. In researching these disappointments, some common themes are discussed as follows (Bloomfield, 2002):

Measures that do not focus on strategy: A common problem is that an organization will adopt some new non-financial measures, but fail to align the measures adequately with strategy.

Failure to communicate and educate: A scorecard is only effective if it is clearly understood throughout an organization. Frequently, scorecards will be developed at the executive level, but not communicated or cascaded down through an organization. Without effective communication throughout the organization, a balanced scorecard will not encourage performance improvement.

No accountability: Accountability and high visibility are needed to help drive change. This means that each measure, objective, data source, and initiative must have an owner. Without this level of detailed implementation, a perfectly constructed scorecard will not achieve success, because nobody will be held accountable for performance.

Employees not empowered: While accountability may provide strong motivation for improving performance, employees must also have the authority, responsibility and tools necessary to impact relevant measures. Otherwise they will resist involvement and ownership. Resources must be

made available, and initiatives funded, to achieve success. Employees are likely to need new information tools to help them understand the drivers of measures for which they are responsible so they can take action. These tools can include systems for analysis and early warning indicators, exception reports and collaboration.

Too many initiatives: Large, decentralized organizations usually find that crossover and duplication among initiatives can be identified. Cross-matching scorecard objectives with current and planned initiatives can be an important way to focus and align a company. This method will identify cases where objectives are supported inappropriately. Rather than relying on budgeting for strategic funding, this process eliminates waste, speeds scorecard implementation, and helps an organization prioritize their initiatives to better support their strategy.

4.6 Summary

In this chapter the literature on the balanced scorecard performance measurement has been explored. An attempt was made to discuss on the need to develop an integrated performance measurement system so that managers might obtain information from all parts of their organization. The balanced scorecard performance measurement frameworks developed by the mentioned authors is a multi-faceted framework, which provide a balanced picture of the business.

As it has been already discussed, the BSC system is based on the concept that financial measures alone may not be sufficient to measure corporate performance. It is believed that the BSC may provide an integrated framework to help managers to obtain information from all parts of their organization for better strategic decisions.

Since the goal of making measurements is to permit managers to see their company more clearly -- from many perspectives -- and hence to make wiser

long-term decisions. The BSC allows managers to look at the business from four perspectives to best represent the factors that lead to improved financial, customer, operational, and employee performance. A comprehensive set of measures or indicators tied to company performance requirements represents a clear basis for aligning all activities with the company's goals.

Over the last few years, several companies have been involved in addressing the challenge of both measuring the performance of their manufacturing systems and using performance results to improve their processes and practices to better meet the expectations of their customers for higher quality, lower cost, and improved service. It was the enormous growth and interest in performance measurement that brought wide spread acceptance of the need for organization to implement the BSC system. Despite some disappointments with organizations to be successful, various surveys estimate that organizations have begun implementing this concept.

Having argued the literature of BSC performance measurement, it becomes pertinent to turn to the Eritrean manufacturing enterprises practices and investigate by means of survey.

CHAPTER FIVE

Overview of the study site and methodology

5.1 Introduction

In previous chapters the literature review was presented to put the study in proper perspective as well as to increase understanding of performance measurement practices. In order to formulate a conceptual framework of integrated performance measurement for strategic decision-making and performance reporting, a literature study of recent developments in performance measurement practices forms the basis of this study.

The literature identified many things that an effective performance measurement system should be. Moreover, lessons can be learned from an experience of developing countries. Drawing on the literature review and in line with the research objectives, this chapter focuses on the overview of research area, and methods used as a guideline for the empirical study. In this sense, it links the theory with the empirical work that will be reported in chapter six.

5.2 Overview of Eritrean manufacturing

Background

Eritrea has a long history of industry and manufacturing in the last one hundred and thirty five years, starting from the acquisition of the Red Sea Coast of Assab by the Rubitino Company (1869) to the present. During 1869, manufacturing enterprises began with large scale farming and processing of agricultural products. Eritrea has undergone major socio- economic and

politico-cultural transformations (Haile, 1992:28). Historically it has been a trading nation, given its strategic location and easy access to the markets of the Middle East, Africa and Europe.

Modern industrial enterprises in Eritrea began with the advent of Italian colonialism. By the early 1930s, there were over 50 industries including five flourmills, two pasta factories, three bakeries, a canned meat factory, two tanneries, a vegetable fibre plant, a button factory, a cement factory, two salt works, a soap factory, an edible oil factory and a liquor factory (World Bank, 1994). Development of industries suffered during the early years of Second World War. After the defeat of Italy in Africa, British and U.S. war needs created conditions that encouraged the revitalization of Eritrean factories and the establishment of new ones.

From 1943 onwards, the number of firms increased. By the end of 1945, there were more than 300 small, medium and large factories. The major firms set up by the assistance of the British military administration were: Meloti, Breweri, Merengi Glass Factory, Mademi Match Factory, Spinalli Boot Factory, Mother of Pearl Trocas Shell Industry, De Rossi Dommut Factory and Massawa Salt company (Haile, 1992:38). However, the revival was short lived, due to the competition from the export industries of other countries and the lack of reinvestment in Eritrean industries to bolster its competitiveness. The problem was compounded when the British military administration dismantled and sold infrastructure installations in 1945.

During the 1950s to the mid 1960s, light industries flourished and reached 122 in number. They employed 13,351 workers and had a total investment of about 139 million Ethiopian dollars (Haile, 1992:43). In the mid 1960s to the mid 1970s the number of firms increased to 165, because of the availability of infrastructure such as ports and transport facilities, raw materials and mineral deposits as well as easy access to foreign markets. However, during the first half of 1970s the Ethiopian imperial government restricted the growth of industries. According to Makki (1996:492) the Ethiopian imperial state undermined Eritrea's economy by closing down industries, cancelling projects

concerning the generation of hydroelectric power, cotton plantations, and a textile factory in the Western lowland.

In 1975, the socialist government of Ethiopia nationalized more than 40 factories in Eritrea. Although the nationalized enterprises were mismanaged and neglected, Eritrea retained almost 30 percent of Ethiopia's industrial production and continued to be one of the most industrialized areas in East Africa (World Bank, 1994). However, by 1991, Eritrea was a devastated land. According to the Africa Research Bulletin (1996), Eritrean industry, which made the Italian colony one of the most developed countries in Africa, is now obsolete and functions at only two thirds of its capacity. Thirty years of war left the country with a per capita income that is one of the lowest in the world.

In January 1997 the Ministry of Trade and Industry of Eritrea conducted an extensive study on privatization. The statistical base survey for manufacturing establishments helped to get access to financial facilities and international markets. During 1998 this survey enabled the Ministry of Trade and Industry to produce detailed industrial statistics, providing users with statistical data and analysis on the structure and performance of the manufacturing sector for the year 1999 – 2001 (Ministry of Trade and Industry Report, 2003:16).

The ownership of the manufacturing establishments is classified in public and private companies. The government of Eritrea drafted its policy to create an enabling environment where the private sector would play a leading role in the economy and has privatized almost all public-manufacturing enterprises (Economic Policy of the Government State of Eritrea, 1998).

According to the Ministry of Trade and Industry report (2003:17) at the end of 1998 the government offered all the public enterprises for sale. At the end of 2001 only 9 enterprises remained under public ownership.

5.3 Sample selection

Focusing on Eritrea as a case study, the big industries in Eritrea that were nationalized in 1975 (see section 5.2) was taken as a total population for the study. These enterprises have a long history of industrial development in Eritrea. Recently these enterprises are privatised, only 9 enterprises remained under public ownership. In order to understand the general and specific trends on the public and private manufacturing enterprises, twenty public and recently privatised manufacturing enterprises were selected randomly. These include 50% of all the main sub-sectors of the industrial sector, these are: (1) Food, Beverages and Tobacco (2) Textiles, Footwear, and Leather (3) Paper product, Printing, and Publishing (4) Chemical and associated products (5) Metal, Wood and Plastics (6) Non-metallic minerals and others. The basic criterion on which the sample was chosen was random sampling method as shown below in table 5.1. The names of the sample enterprises are listed in appendix B.

Table 5.1 Number of manufacturing industries selected

Industry name	Total population	Sample selected	Percentage of sample
Food, beverage and tobacco	10	5	50%
Textile, clothing, footwear and leather	10	5	50%
Paper product, printing and publishing	4	2	50%
Chemical and associated products	6	3	50%
Non-metallic mineral products	2	1	50%
Metal, machinery, wood and plastic products	8	4	50%
Others		-	-
Total	**40**	**20**	**50%**

5.4 Data collection

A survey was carried out to gather quantitative and qualitative data pertaining to performance measurement practices using a structured questionnaire. A combination of open ended and closed ended questions were designed. Face-to-face interviews were carried out, with the owners/managers, administrative managers, finance heads, operational managers, marketing managers, and personnel of each enterprise. Interviews were selected as the best means of administering the questionnaire, as it gives a researcher the opportunity to give brief clarification about the questionnaire.

The interviews lasted between sixty and ninety minutes. All interviewees were asked to complete questionnaires related to their position. For example, if the respondent is a finance manager he/she is asked to answer the questions related to financial performance measurement practices. Ninety-two respondents were interviewed in twenty selected enterprises. Ninety percent of the respondents were qualified as university graduates, while ten percent were diploma and technical school graduates. The average work experience of the respondents is ten years.

The sample enterprises responded the questionnaire entirely. In this regard, the feedback can be considered as successful. The reason for this success rate is the personal collection of questionnaires supported by face to face interviews and continuous follow-up to collect the outstanding.

5.5 Survey instrument

Success in collecting data is more a function of correctly designing and administering a survey instrument. Thus a questionnaire was constructed based on an extensive review of the literature in the areas of business performance measurement. The questionnaire was prepared in a way that

would allow the researcher to elicit the information relevant to the study. The questionnaire for this study consists of four major sections.

The analytical questionnaire (appendix A) was structured as follows:

The first section (questions 1-6) required to establish information about company details.

The second section (questions 7-13) was designed to solicit respondents to indicate management approaches to measurement. These questions are used to assess the existing performance techniques they used and how the enterprises are performing.

The third section (questions 14- 35) sought to establis h information on the specific types of performance measures used in the enterprise such as:

- Financial measures that focus on financial indicators that accurately measure financial performance.
- Customer measures that focus on the most important requirements of customers' retention and customer satisfaction measures.
- Internal process/operational measures that accurately measure process cost, quality and time performance.
- Employee measures that can be used to monitor and improve employee commitment.

Section four (questions 36 to 38) asked respondents to indicate information on the overall performance measures that can be used as a balanced set of measures that accurately measure performance for reporting and analyzing data.

All the questions in the sections were answered by means of five point scale (Likert-type Scale), where 1 indicates 'strongly disagree' and 5 represents 'strongly agree'; yes/no questions; writing short notes and selecting the appropriate answer from the given choices.

5.6 Methods of data analysis

The unit of analysis refers to the object, phenomenon, entity, process or event the researcher will be investigating (Mouton, 2001:51). In this regard, the objective of the study is to investigate the existing performance measurement practices in selected Eritrean manufacturing companies and identifying to what extent the enterprises use the integrated performance measures, their extent of utilization and perceived relevance related to their actual financial results. To attain this objective the study used quantitative as well as qualitative data. Accordingly, the first step of this study is to assess the profile of financial performance using some selected financial ratios such as sales growth, liquidity and profitability ratios and compare with the international trends.

Second, the balanced scorecard performance measurement perspectives (financials, customer, internal process/operational measures, and employee measures) used to identify the degree of adoption of financial measures as well as the non-financial measures. The objective of this analysis was to obtain a profile of the respondents in terms of their use of the integrated measures in the performance evaluation of the manufacturing enterprises.

The third step is to analyze the relationship between actual financial performances of the manufacturing enterprises and the degree of adoption of non-financial measures. The descriptive methods of data analysis, which include tabulation, cross tabulation, computations of frequencies, and computations of percentages were used to investigate the existing practices of performance measurement. In addition, statistical software such as; Pair wise correlation and multiple regression modeling were employed to determine the correlation between the existing practices of performance measurement in relation to their financial performance and the effect of one dependent variable with one or more independent variables.

The four perspective balanced scorecard performance measurements: financials, customer, internal process/operational, and employee measures was employed to quantify the existing performance measurement practices.

For each perspective the study used not less than four measures. The five point Likert scale ranging from “strongly disagree” (1) to “strongly agree” (5) is used to quantify the extent to which they used the measurement variables. Five and four are taken to quantify the agreed responses, one and two are disagreed and three is an average response. The rate of adoption of measures (customer satisfaction/retention, internal process/operational and employee training/satisfaction) is taken as independent variables.

Two variables (average sales growth and return on assets) are taken as dependent variables. Sales growth is taken as average growth of four consecutive years (1999 – 2002) while return on asset is taken only of one year (2002). This is because of perceived problems of respondents. In addition, although return on equity is an important profitability measure, we couldn’t get accurate data of all the respondent enterprises.

Finally the responses of the management on the existing performance measurement and their comments on the use of balanced measures for the strategic decision-making will be analyzed and discussed.

5.7 Validity and reliability of the approach used

Validity – According to Leedy & Ormrod (2001:106) researchers employ certain strategies to support the validity of their findings. One of these strategies is feedback validation. There must be a complete analysis and feedback loop that ensure performance measurement is analysed, and translated into action (Parker, 2000:63-66).

In this study, feedback from managers regarding the use and value of balanced performance measurement in manufacturing enterprises and value of the approach in a real-world context, could contribute towards verifying the validity of the study. In addition the findings of the quantitative data, which supported by the statistical analysis can be used to describe the expected relationship precisely by means of an equation that has predictive value.

Moreover, in dealing with the validity, the formal normal goodness of fit test of the model used is given in the normal assumptions section (see Appendix C).

Reliability -The benefit of measurement is often dependent on the reliability and comparison of measures over time. It is therefore important to identify measures, which can be made reliably and consistently over the desired time period (Parker, 2000:63).

As it has already been stated, the BSC performance measurement approach is utilized in the present study as it is receiving increasing research attention. Researchers and practitioners around the globe are contributing to this evolving body of research (see, for example, Balanced Scorecard report (1999), Creelman (1998), Sim *et al*. (1999:1-21), Ittner *et al*. (2003). Furthermore, prior research relating to BSC performance measurement system has used the correlation & regression analysis to investigate whether there are any linkages between business success and the use of strategically linked performance measures, which include both financial and non-financial performance measures (for example, Kim & Koh, 2001:18-26).

Consistent with the present studies, this study deals with the BSC performance measurement variables and the statistical method of analysis - correlation and regression. These techniques are used to investigate relationships between two variables (dependent and independent) to investigate whether a change in one of these variables associated with a change in the other. In this regard, overall the results from the measurement model indicate that each variable exhibits satisfactory reliability and validity.

Having discussed the methods of collection and analyzing the data in this chapter, the analysis and interpretation will be presented in chapter six.

CHAPTER SIX

Results and discussions

6.1 Introduction

In this chapter the data is analysed and interpreted to examine whether Eritrean industry practices are keeping track with the international trends regarding performance measures identified in the literature study, and if not, to identify possible reasons for the disparity.

Quantitative as well as qualitative survey data were used to provide an in-depth analysis amongst the sample enterprises with respect to the issues examined in this study. The content of this chapter has been restricted to the presentation, analysis and interpretation of collected data. The first part of this chapter presents the general profile of the respondent enterprises, the second part is the profile of financial performance of the sampled enterprises, and the third is the descriptive, correlation and regression analysis comparing the financial performance of the respondents with the extent to which they also use non-financial measures. The final part presents the management approaches to strategic performance measurement. The conclusions and implications will be discussed in chapter seven.

6.2 Profile of sampled enterprises

This section provides the profile of the respondent enterprises (name, number of employees, and average turnover). There are twenty enterprises in the research sample. The Table 6.1 below lists the names and number of these enterprises and the industry to which they belong.

Table 6.1 List of respondents' enterprises and their relevant industries, 2004

Enterprise name	Number	Industry name
Red Sea Flour Mills	1	Food, beverage and tobacco
Red Sea Bottlers Sh.Co.	2	"
Asmara Brewery	3	"
Asmara Wine & Liquor Factory	4	"
Rothman Sh.Co. (Eritrea)	5	"
Asmara Textile	6	Textile, clothing, footwear and leather
Mereb Textile	7	"
Eritrean Textile	8	"
Dahlak Shoe Factory	9	"
Red Sea Tannery	10	"
Sabur Printing Press	11	Paper product, printing and publishing
Asmara Match	12	"
Asmara Soap	13	Chemical and associated products
Red Sea Soap	14	"
Poly Plastic Factory	15	"
Eritrean Cement Factory	16	Non-metallic mineral products
Eritrea Steel Sheet Factory	17	Metal, machinery, wood and plastic products
Eribus Assembling	18	"
Wina Household	19	"
Himbol Household	20	"

Source: Questionnaire

Table 6.2 provides information on the job positions of the respondents who completed the questionnaire. As can be seen from the table below, the respondents belong to senior management staffs who are closely involved in strategic planning and decision making. From the sample enterprises ninety two respondents were interviewed. On an average four to five respondents were interviewed in each enterprise. Each respondent is responsible to the questions related to the department in which he/she is working. For example financial manager is responsible to the financial measurement related questions; the owner/managers are responsible to the general questions of strategic performance measurement questions; operational managers to the

operational/internal process questions; sales/marketing managers to customer related questions, and the human resource managers to the employee related questions.

Table 6.2 Positions of the interviewed respondents, 2004

Position	Number
Owners/managers	12
Financial managers/ Chief accountants	20
Operational managers	20
Sales/Marketing managers	20
Administrative heads of each enterprise	20
Total respondents	92

Source Questionnaire

Table 6.3 below presents the number of employees of the respondent enterprises grouped into four categories. Most of the respondents have between 201 and 1000 employees, illustrating that the typical big Eritrean enterprise is not big in international terms.

Table 6.3 Number of employees of respondent enterprises, 2004

Category	Number of enterprises	Percentages
0-200	2	10
201-500	11	55
501-1000	5	25
1001 and above	2	10
Total sample	**20**	**100**

Source : Questionnaire

Table 6.4 presents the profile of the annual average turnover of the respondent enterprises. The average turnover of the respondent enterprise is evenly distributed with 65% having an annual turnover of less than *ERN*100 million (R33 million).

Table 6.4 Average turnover of respondent enterprises, 2004

Category (in million of *ERN**)	Number of enterprises	%
Less than 10	3	15%
11 – 50	6	30%
51 – 100	4	20%
101 – 150	2	10%
151 – 200	3	15%
201 – 250	2	10%
Total sample	**20**	**100%**

Source: Questionnaire

ERN = Eritrean *Nakfa* (*ERN* 3.32 = R1)[3]

6.3 Overview of financial performance

As was argued in chapter 3 that ratio analysis is an effective tool for assessing a company's financial conditions, but its limitations must be recognized. No single ratio or group of ratios is adequate for assessing all aspects of a company's financial conditions. Just looking at the historical trend of a specific company's ratios could also be limiting. This is why, with the globalization of markets and greater foreign competition, it becomes all the more important to compare a company's financial indicators against international industry norms or benchmarks. In this section the average financial ratios of the sampled enterprises were benchmarked against global averages. For ratios where there are large deviations between the average enterprise in Eritrea and the benchmarks, tables are provided. The results are presented in Tables 6.5 and 6.6 and 6.7 below.

[3] * 1 *USD = 19.00 ERN = 5.72 Rand: Therefore 1Rand = 3.32 ERN*
http://www.shabait.com/articles-new/publish/article_2816.html accessed Dec.2004.

Table 6.5 Overview of industrial averages vs. global norms[4], 2004

Types of ratio	Food, beverage & tobacco	Textile, clothing, footwear & leather	Paper product, printing & publishing	Chemical & associated products	Non-metallic mineral products	Metal, machinery, wood & plastic products	Overall averages	Global norm	Gap
Average years	4	4	4	4	4	4	4		
Number of enterprises	5	5	2	3	1	4	20		
Sustainability									
Sales growth (%)	13.72	4.00	4.00	9.67	-.15	0.65	5.71		
Cash flow % Sales	7.77	5.00	17.00	16.33	-3.00	11.27	9.55	18.38	-8.83
Liquidity									
Current ratio	2.07	1.67	1.74	1.85	1.29	1.75	1.81	2.60	-0.79
Profitability									
Operating profit margin (%)	17.00	-4.50	17.00	11.67	-15.50	15.81	9.84	12.09	-2.25
Return on asset (ROA) %	4.29	3.27	3.88	4.71	-1.80	3.37	3.57	5.45	-1.88

Source: Author's computation based on the survey (see tables 1-6 in Appendix B).

Note: 1.The above ratios are the commonly used financial performance measurements in the respondent manufacturing enterprises. It is believed that these ratios provides valuable information of enterprises about their future growth, their ability to repay their current obligations and to what extent the sample enterprises are profitable and how well they are utilizing their assets to generate profits (for the detail discussion and motivation see sections. 6.3.1 – 6.3.3). Note: 2.The international industry norms or benchmarks (* Source: Philip M. Parker, 2003 as cited in http/www.ICONGROUPONLINE.COM) was taken to investigate how well the enterprises perform against the international trends. These may provide managers in determining how well their enterprises perform compared with similar units in the industry and globally. This gives the use of performance measures in a broader perspective and to select among measures of "best practices".

[4] Parker 2003 cited in icon group ltd. Available at http/www.ICONGROUPONLINE.COM accessed October 10, 2004

6.3.1 Sustainability ratios

In this section average sales growth percentage and cash flow percentage to sales are taken as sustainability measures to estimate the enterprises' ability to grow in the future.

6.3.1.1 Sales growth

Sales growth is taken as a sustainability measure used to compare a company's financial condition against international industry norms. It is believed that this measure provides valuable information to estimate the ability of enterprises to sustain and grow in the long-run. The overall sales growth presented in Table 6.6 (5.71%) is an outcome of the mixed results of negative and positive growth of the individual respondent enterprises. The result indicates that 5 (25%) of the respondent enterprises grow negatively. This negative growth may indicate the inability to grow and to pay their obligations when needed.

Table 6.6 The highest/lowest average sales growth, 2004

Sales growth	Number of enterprises	Percentage (%)	Average sales growth (%)
21 and above	2	10%	23.00
16 – 20	1	5%	17.00
11 – 15	2	10%	12.00
6 – 10	7	35%	8.08
1 – 5	3	15%	3.03
-5 - 0	3	15%	-3.47
-10 - -6	-	-	-
-15 - -11	2	10%	-14.00
Overall average	**20**	**100**	**5.71**

Source: Authors computation based on data obtained from survey (see Appendix B).

6.3.1.2 Cash flow

The overall average percentage of cash flow to sales of the sample enterprises presented in Table 6.5 shows a serious deviation (-8.83%) from the global norm (18.38%). Since cash flow is the essence of any business and one of the best indicators of financial sustainability, this gap indicates that a number of respondents lack the ability to generate cash flows which could lead to an inability to meet their future obligations.

6.3.2 Liquidity ratios

Liquidity ratios are taken as a measure to what extent the enterprises are solvent and able to repay their current obligations.

The current ratio of the twenty enterprises classified under the six industries ranged from a low of 1.29 of the Non-metallic industry to the high 2.07 of the Food, beverage, and tobacco industry (see Table 6.5). The overall average current ratio based on the averages of all the industries is 1.81 while the global current ratio norm is 2.60. These enterprises have, therefore, been operating below the global norm. The overall gap of -0.79 illustrates the short-term potential liquidity problems of the respondents.

6.3.3 Profitability ratios

Profitability ratios are taken to investigate to what extent the sample enterprises are profitable and how well they are utilizing their assets to generate profits. Profit margin and return on asset are taken as profitability measures to compare with global norms. Although return on equity is an important profitability measure of a business enterprise unit, in this study it wasn't possible to capture accurate data due to perceived difficulties of the respondent enterprises.

6.3.3.1 Operating profit margin (PM)

The profit margin measures the operating income before interest and tax and capital charges to the total sales (EBIT/Sales). It ranged from the lowest -15.50% in Non-metallic enterprises to the highest of 17.00% in Food, Beverage & Tobacco industry as well as in Printing & Paper products. The overall average profit margin is 9.84% which is far below the global norm 12.09% (see Table 6.5). The gap of the industry average versus the global norm (- 2.25%) indicates the need for further investigation on the main causes of the low operating profit.

6.3.3.2 Return on asset (ROA)

As a measure of income from operations to the average total assets (investment), the ratio of the sampled enterprises has ranged from lowest -1.80% (Non-metallic products) to the highest 6.04% (Metallic and machinery). Table 6.7 depicts the overall return on asset (3.57%) as compared with the international norm. The result presents 80% of the respondent enterprises show below the global norm (5.45%). Since return on asset measures how well the business is utilizing its assets to generate profits, further investigation is needed to the reasons why such deviation exists.

Table 6.7 The highest/lowest average return on asset, 2004

Return on asset	Number of enterprises	Percentage (%)	Average ROA (%)
6 – 10	4	20%	5.61
1 – 5	14	70%	3.66
-5 - 0	2	10%	-1.18
Overall average	**20**	**100**	**3.57**
Global			**5.45**
Gap			**-1.88**

Source: Authors computation based on data obtained from survey

Note: For the detailed information see Table 6.5 and Appendix B.

6.3.4 Financial performance

According to the overall financial profiles of the sampled enterprises, it is apparent that almost all the financial ratios presented (Table 6.5) show below the international trend. The goal of this report may assist managers in gauging the competitive financial performance of enterprises operating in Eritrea at the global level. Though this report heavily relies on historical performance, because of today's globalization of markets, greater foreign competition, it is important to compare the enterprises financial performance against other locations on a worldwide basis. This may give the use of performance measures a broader perspective and can provide a measure of "best practice".

6.4 The use of financial and non-financial measures

In the previous section the study tried to assess the financial profiles using some selected financial ratios against the global norms. This may provide as means of determining how well a business unit or organization is performing compared with similar units in the industry or globally. However, in the literature study (in chapter 3) it was argued that financial performance measurement alone as a single measure could not satisfy the need for the new reality of organizations (e.g. accelerated changes in technology, needs for innovation and flexibility, shortened product life cycles etc.).

Nevertheless, non-financial measures are also problematic as they could lack objectivity. For this reason, a number of research findings in the literature (see chapter 3) proved that the need of an integrated performance measurement is to enable managers to measure equally to arrive at strategic goals and objectives. In this regard respondents were asked to identify the degree of adoption of financial measures as well as the non-financial measures using 1 to 5 Likert-type scales. The objective of this analysis was to obtain a profile of the respondents in terms of their use of the integrated measures in the performance evaluation of the manufacturing enterprises.

6.4.1 Evaluating the financial measures

Literature (chapter 3) suggested that financial (quantitative) measures are feasible and realistic; there use should be encouraged. Identifying your critical numbers is essential. It clarifies where you should focus your efforts, what business processes need to be improved and identifies the weakness of your organization. When developing measures, it is important to include a mix of quantitative and qualitative measures. Quantitative measures provide more objectivity than qualitative measures. They may help to justify critical management decisions on resource allocation or systems improvement. Companies should first identify any available quantitative data and consider how it can support the objectives and measures integrated.

In this regard, the financial measures, which are commonly used by the respondent enterprises such as: sales growth, cash flow, profitability, and liquidity measures; are taken to investigate to what extent these financial ratios used to measure the selected enterprises' financial performance.

Empirical finding (Table 6.8) reveals that 74% of the sampled enterprises agreed on the use of the financial measures (only 4 and 5 on the Likert scale were regarded as positive response). The respondents strongly agreed that financial measures are important and are actually using these financial measures. Sales growth, cash flow, liquidity, profit margin are in order of importance, all are very popular measures used by the respondents enterprises, but against all expectations, return on asset seems to be a less popular financial measure.

Table 6.8 The degree of response to the use of financial measures, 2004

Types of measures	Number of responses (N=20)				
	1 (SD)	**2**	**3**	**4**	**5 (*SA*)**
Sales Growth (SG)	0	0	0	2	18
Cash flow (CF)	0	0	4	7	9
Liquidity(LQ)	0	1	4	9	6
Profit margin (PM)	0	2	1	13	4
ROA	0	9	5	4	2
Total responses	**-**	**12**	**14**	**35**	**39**
% responses		**12.00%**	**14.00%**	**35.00%**	**39.00%**

Source: Authors computation based on the data obtained from the survey

Note: 5(SA) = Strongly Agree, 4(A) = Agree, 3(SA)=Somewhat Agree, 2(D) =Disagree, SD) = strongly disagree

6.4.2 Non-financial measures

Recent literature (see chapter 3) related to manufacturing performance measurement points to the increasing relevance of non-financial measures. The literature argued that financial performance measurement alone is not enough for the new reality of organizations (e.g. accelerated changes in technology, needs for innovation and flexibility, shortened product life cycles etc.). In this regard consideration has been given to other important non-financial measures such as customers, employees and operational measures, all of which are integrated into the balanced approaches, or variants of it.

With regard to non-financial performance measurements, the research findings exhibited a noticeably different pattern compared to the financial dimensions.

6.4.2.1 Customers satisfaction and retention measures

Recent research argued that customers are far more demanding and informed today than in the past (see chapter 4). People now have access to information much more easily and search for companies who will do more than just meet their needs; customers do research the product quality, price and delivery time. They chose companies who will delight them. Delighted

customers lead to loyal customers. Nevertheless, this understanding is not reflected in most of the sampled enterprises. Empirical results (Table 6.9) shows that only 16.25% of the sampled enterprises agreed that, the overall customer satisfaction and retention measures are used to evaluate enterprises performance. This is far below the satisfactory level. From this result one can understand that most of the respondent enterprises may lead to lack of customer related information. This may cause a problem to the respondent enterprises in improving and redesigning their products. In addition, the low results in customer satisfaction measures could lead to a decline in market share and loyalty.

Table 6.9 The degree of response to the use of customer measures, 2004

Types of measures	Number of responses (N=20)				
	1(SD)	2	3	4	5(SA)
Customer survey (CS)	3	11	5	1	-
Customer complaint (CC)	1	10	9	0	-
Percent of returned order (PR)	0	7	10	3	-
Market share (MSH)	0	5	6	9	-
Total responses	**4**	**33**	**30**	**13**	**-**
% responses	***5.00%***	***41.25%***	***37.50%***	***16.25%***	**-**

Source: Author's computation based on the data obtained from the survey
Note: 5(SA) =strongly Agree, 4(A) = Agree, 3(SA) =somewhat Agree, 2(D) =Disagree, SD) = strongly disagree

6.4.2.2 Internal process / operational measures

Literature in chapter 4 argued that achieving good performance levels on process or operational measures lead to high quality products and services, which, in turn, lead to satisfied or delighted customers, which lead to repeat business and promote long-term success. Hence, the types of process measures that are taken to evaluate the existing operational/ process of the sampled enterprises are: customer perceived product quality control, manufacturing cycle time, and order to deliver time.

The study recommends, if manufacturing enterprises fail to produce customer perceived product quality to deliver in the right time in both the short and long run, sales revenue may decline and the business may wither. Furthermore,

time is critical process measure for any task because it equates to cost and satisfying customers' needs. Customers need things quickly at a minimum payment. Focusing on cycle time allows enterprises to keep its cost down while satisfying even delighting customers. Nevertheless, empirical findings as depicted in table 6.10 shows only 37.50% of the respondents agree on operational measures. This may lead to loss of existing customers and decline of sales revenue or market share.

Table 6.10 The degree of response to the use of operational measures, 2004

Types of measures	Number of responses (N=20)				
	(SD)1	2	3	4	(SA) 5
Customer perceived product quality control(CPPQ)	0	14	6	0	0
Manufacturing cycle time(MCT)	1	5	5	8	1
Cost of product(CP)	0	2	9	9	0
Process efficiency(PE)	0	0	8	10	2
Total responses	**1**	**21**	**28**	**27**	**3**
% response	**1.25%**	**26.25%**	**35.00%**	**33.75%**	**3.75%**

Source: Author's computation based on the data obtained from survey
Note: 5(SA) = Strongly Agree, 4(A) = Agree, 3(SA) =Somewhat Agree, 2(D) =Disagree, 1(SD) = strongly disagree

6.4.2.3 Assessing employee satisfaction and retention measures

In the literature study (chapter four) it was argued that the challenge of recruiting, training, and retaining quality employees are more important in business than ever before. It is believed that enterprises today must plan for change, assure high quality training, and provide personal growth opportunities to employees. Manufacturing enterprises are expected to understand their company culture and employee needs more effectively. Furthermore, the study recommends that delighted employees are much more productive. It means that people choose to work for the employer and really dedicate themselves to the employer's success.

However, the results of employee related measures (see Table 6.11) revealed that only 20% of the sampled enterprises agreed that employee training and

satisfaction measures are used as a performance measure of their manufacturing enterprise. This low rating, perhaps lead to low quality of product and increase cycle time which in turn may increase the cost of production. In addition the low rating in employee satisfaction and retention measures may cause losing the most valuable assets, their employees. As the result the total outcome of these overall results may lead to lower financial performance.

Table 6.11 The degree of response to the use of employee related measures, 2004

Types of measures	Number of responses (N=20)				
	(SD)1	2	3	4	(SA) 5
Salary satisfaction (SS)	1	11	8	0	0
Training (TR)	2	12	5	1	0
Job security (JS)	0	3	10	7	0
Employee benefit (EB)	0	7	5	4	4
Total responses	**3**	**33**	**28**	**12**	**4**
% response	***3.75%***	***41.25%***	***35.00%***	***15.00%***	***5.00%***

Source: Author's computation based on the data obtained from the survey
Note: 5(SA) =Strongly Agree, 4(A) = Agree, 3(SA) =Somewhat Agree, 2(D) =Disagree, SD) = strongly disagree

6.5 The relationship between the financial performance and the non-financial measures

In previous sections the study tried to assess the existing financial profile of the sampled enterprises using some selected financial ratios such as sales growth and return on asset. Results of the financial ratios show that most of the enterprises performance is below the international trends. In addition the study investigated the degree of adoption of financial measures and non-financial measures such as customer satisfaction and retention; quality and cycle time operational measures; and employee training and retention measures. The objective of this analysis was to obtain a profile of the respondents in terms of their use. The results of the descriptive analysis show

that financial measures are relatively more important than the non-financial measures in the respondent enterprises.

In this section correlation and regression analysis techniques were used to test hypothesized relationships between the two variables (the financial performance and the extent to which the non-financial measures are used in the sampled enterprises).

Consistent with the latest developments in the performance measurement literature such as those advocated by proponents of the BSC (Kaplan & Norton, 1996: 31) suggested every measure should be part of a cause-and-effect relationship that culminates in improving long-term sustainable financial performance. Furthermore, they indicated that there is a cause and effect relationship between non-financial measures and financial performance. Finally they concluded that companies who understand this link will implement the best long-term approach to improving their financial performance.

Accordingly, the measurement system was expected to make the relationship among measures and the performance of the selected enterprises. It is expected that companies that continuously improve their skilled work force (employee training and satisfaction) should achieve better performance in their internal business process perspective which will, in turn, lead to better performance in their customer perspective. All such efforts should lead to improve financial performance. Keeping in mind that these expected relationships, the focus of this study is on business unit performance (i.e. performance of the manufacturing division). Therefore correlation and regression of the sampled enterprises is provided in the following tables to examine the relationships of financial performance and non-financial measures.

6.5.1 Results of correlation analysis

Kaplan & Norton (1996b) suggested the use of correlation analysis to test the expected relationships in the balanced scorecard performance measurement

variables. Accordingly, correlation analysis was used to test how the performance measurement perspectives (customer satisfaction, internal process/operational, and employee training/satisfaction measures) are correlated with the actual financial results (average sales growth and return on asset).

Findings from Pearson pair-wise correlations matrix presented in Table 6.12 show strong correlations between the measurement variables of the financial performance and the extent of the use of the non-financial measures in the sampled enterprises.

This means that a higher score on the performance measurement is related to a better performance. All aspects are strongly correlated to the financial performance (sales growth and return on assets). The correlation coefficient varies from the lowest (0.83) to the highest (0.97). The variables are positively correlated and are significant. The result implies financial performance increases with increase of the use of the non-financial measures.

The results of the relationship are consistent with the assumption. Results from statistical analysis supported the expectations. This is consistent with similar studies by Sim & Koh (2001) also found relationships between the innovative techniques and employee training with financial performance.

Therefore, from the results of the correlation analysis one can conclude that it pays for companies not only to measure their financial performance, but to do this in an equal balance among all measures.

Table 6.12 The relationships between the scores of performance measures and the enterprises financial performance.

	CM	***OM***	***EM***	***SG***	***ROA***
CM	1				
OM	0.91	1			
EM	0.89	0.96	1		
SG	0.90*	0.97*	0.97*	1	
ROA	0.91*	0.90*	0.83*	0.88*	1

Note: Correlation is significant at **P<0.001*.
Source: Authors computation based on the data obtained from the survey.
Note: For the detailed computation of the statistical analysis see Appendix C.

6.5.2 Regression analysis

The results of correlation analysis in the correlation section tested the statistical significance of the association and their directional relationships between the scores of the non financial measures and the financial performance. In addition to the correlation analysis the study further examined the effect of the independent variables on the dependent variables. Therefore, additional analysis that allows us to make better inferences was conducted. Results of the regression analysis show the effect of sales growth and return on asset (dependent variables) with customer, operational and employee measures (independent variables).

Regression equation

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3$$

Where:
Y = dependent
a = intercept
$b_1 \ldots b_3$ *= coefficients*
$x_1 \ldots x_3$ *= independent Variables*

Variables

The variables in the model are:

Dependent Variables:

Y_1 = Sales growth (*SG*)

Y_2 = Return on asset (*ROA*)

Independent Variables:

X1 = Customers satisfaction and retention measures (*CM*)

X2 = Internal process/operational (*OM*)

X3 = employee training, satisfaction and innovation (*EM*)

6.5.2.1 Results and discussion

In this section, the relationships between the financial performance and the balanced performance measurement variables are examined. The findings from the multiple regression model confirms that the results of the cross-tabulations for the type and directions of the relationship of most of the independent variables with dependent variables.

The regression results (see Table 6.13, Panel A) indicated that the overall performance measurement perspectives (independent variables) explained about 95% of the variation of sales growth (r^2 = 0.95). The sales growth variation shows the combined effect of measurement variables on the financial performance (sales growth) is statistically significant (p<0.05). Therefore customer satisfaction, operational and employee measures were found to be the determinants factors of sales growth. The directional signs on the coefficients for these statistically significant explanatory factors are positive, which implies, increase in sales growth is the effect of increase in the overall performance measurement variables. The results were also consistent with the expectation that the non-financial measures have significant effect on financial performance (sales growth).

Similarly, the regression results (see table 6.13 Panel A) indicated that the overall measurements (independent variables) explained about 86% of the

variation of return on asset (r^2 = 0.86). The return on asset variation with an ANOVA of F- ratio (38.39) shows the overall effect of measurement variables on return on asset is statistically significant. The coefficient representing customer satisfaction, operational measures and employee training and satisfaction measures are found to be strong determinant factors of return on assets (p<0.10 and p<0.05). The directional signs on the coefficients for these statistically significant explanatory factors are positive. This shows their strong relationships and is also consistent with the assumptions.

The result implies, in today's sophisticated technological and competitive business environment, competent people are the main determinant factors. It is not enough to have short-term financial results and happy customer in terms of quality, efficiency and delivery time without the prerequisite of growth and learning perspective. Results are also consistent with theories in the performance literature (Kaplan & Norton 1996:31).

Furthermore, the adoption of product quality and reduced cycle time measures, increase in customer satisfaction and loyalty, which in turn contributes towards attaining, increased market share. This result corresponds to the expectation that enterprises operating performance measurements link to improve financial performance

Table 6.13 Results of the regression analysis between financial and non-financial measures

Variable	Coefficients	T-test	Significance
Panel A Sales Growth			
Customer	1.56	1.97	0.06*
Operational	45.66	2.83	0.01**
Employee	32.03	2.45	0.03**
Constant	-41.69	-6.05	0.00
R^2	0.96	2.12	
Adjusted R^2	0.95		
F-ratio		143.73	0.00**
Panel B ROA			
Customer	8.96	2.55	0.02**
Operational	18.41	2.98	0.01**
Employee	10.74	2.15	0.05**
Constant	-6.89	-5.88	0.00
R^2	0.89	2.13	
Adjusted R^2	0.86		
F-ratio		38.39	0.00**

Notes: Level of significance at ** $P<0.05$, * $P<0.10$.
Source: Author's computation based on survey data.
Note: For the detailed computation of the statistical analysis see Appendix C.

6.6 Managers/owners perception to the use of performance measurement

This section presents the results of the assessment of respondents' viewpoints to the use of financial and non-financial measures for strategic decision making. An attempt was also made to see the consistency between the findings of the quantitative data in the foregoing part and the managers' perceptions regarding the use of performance measurement in manufacturing enterprises and how to link measures to strategy for success.

The literature in chapter 4 argued that the balance scorecard explicitly identifies the critical few drivers of success. It reflects the company's strategy by understanding the financial and shareholder requirements, the customers' needs, internal processes and enablers such as company culture, information and infrastructure. This framework is intended for top managers in an organization to be able to obtain a quick and comprehensive assessment of

the organization in a single report and requires executives to limit the number of measures to a vital few and allows them to track whether improvement in one area is being achieved at the expense of another area. Furthermore, they argued that selecting the right measure for success is the vital issue in today's competitive environment.

To assess the existing measurements used, respondents were asked to indicate the number of performance measures in each department. This might be a factor which weakens the link between the performance measurement system and organizational goals by inhibiting a coordinated approach to the achievement of strategic objectives. To address this question results are presented in Table 6.14. 85% of the respondents in the finance department and 75% in the manufacturing department show many, while respondents 80% of the respondents in the marketing, and 25% in quality department presents none. The results indicated that they use many measurements in some of the departments for decision making and this is not easy to reach the goals as well as not consistent with the literature in chapter two and chapter three.

Table 6.14 Number of performance measurements in each department, 2004

	% responses			
Number of measures used	**None**	**Few**	**Several**	**Many**
Finance	0	5	10	85
Personnel	0	92	8	0
Manufacturing	0	10	15	75
Marketing	80	20	0	0
Quality	5	30	65	0

Source: Author's computation based on the data obtained from the survey.

Literature (chapter 2) suggested that resources in any organization are limited and scarce; performance measurement provides management with the opportunity to control and measure effectively, to make the right allocation of resources and to set the right priorities for improvement. Respondents gave their viewpoint on performance measures to the enterprises' strategic decision

making. Results (see Table 6.15) show that 95% of the respondents indicate that the value of performance measurement is as a key to managerial control and effective. It seems that they are well aware of the value of performance measurements.

Table 6.15 Responses on the value of performance measurement, 2004

Degree of assessment of value	% response	Number of respondents
A key managerial control	60	12
Effective	35	7
Limited value	5	1
Waste of time	0	0
Total	**100**	**20**

Source: Author's computation based on the data obtained from the survey

The second question asked whether performance measures were modified when there were changes in the enterprises' strategic objectives. The results are summarized in Table 6.16. Majority of respondents indicate that performance measures are rarely modified when there is a change in strategy. The result is inconsistent to the literature (chapter 2). Since one of the reasons for measuring performance is to support and enhance improvement. If measurement is not part of continuous improvement, then the critical linkage between performance and evaluation is broken.

Table 6.16 Responsiveness of performance measures to strategy

Frequency of improvement with changes	%response	Number of respondents
Always modified	0	0
Often	20	4
Usually	30	6
Rarely	45	9
Never	0	0
Total	**100**	**20**

Source: Author's computation based on the data obtained from the survey

Literature in chapter 3 argued, while financial measures have a role to indicate the financial condition of a business enterprise, these measures alone are not sufficient on their own to steer a company through difficult times, consideration must be given to other important non-financial measures.

In this regard the use of non-financial measures for strategic decision making in the manufacturing enterprises was tested in the empirical study, only 20% of the respondents indicate that their departments use the non-financial measures as well as financial measures for decision making. The empirical study also revealed that 87% of the respondents are of the opinion that the non-financial measures should be included as a measurement for strategic decision-making.

70% of the respondents indicated that it will be possible to apply the balanced scorecard performance measurement in manufacturing enterprise. The other 30% retained their opinion and did not indicate they were negative about the application. From this result it is possible, therefore to implement the balanced performance measures in manufacturing enterprises for decision-making.

6.7 Summary

A survey was done on Eritrean manufacturing enterprises investigating how well enterprises measure their performance and acting on the results. The findings are based on the experiences of twenty Eritrean manufacturing enterprises. A survey instrument was used and majority of the respondents in this study were top-level executives or directors of manufacturing enterprises.

The financial profile of the selected enterprises presented to compare some of the commonly used average financial ratios against the international industry norms or benchmarked. Almost all the ratios show large deviations from the global norm. This could be an indicator of the poor financial performance of the selected enterprises as compared with the international trends.

The degree of adoption of financial and non-financial measures assessed using the descriptive analysis. The objective of this analysis was to obtain a profile of the respondents in terms of their use of both financial and non-financial measures in the performance evaluation of the manufacturing enterprises. The overall, empirical findings, based on descriptive analysis indicate that the majority of the respondent enterprises almost exclusively relying on financial measures.

Correlation and multiple regression analysis presented to examine the relationships between the financial performance of the selected enterprises and the adoption of the financial and non-financial measures. The result indicated that there is a clear and strong relation between the financial performance and the attention given to performance measurement (customers, operational and employees).

The result of correlation analysis shows that sales growth and return assets are significantly positively correlated with customers, operational and employee related measures. In addition, empirical findings on regression analysis suggest that the independent variables (the non-financial measures) are significant explanatory factors of financial performance.

Finally the management response on the existing performance measurement in the selected enterprises is examined to see the consistency between the findings of the quantitative data in the foregoing part and the managers' perceptions regarding the use of balanced measures. The results show that majority of the respondent enterprises measure their performance financially, but also indicate their opinion that it will be possible to apply the balanced scorecard performance measurement in the manufacturing enterprises for strategic decision making.

Having discussed all the results of the study in this chapter, it is pertinent to give conclusion and recommendations for betterment in the subsequent chapter.

CHAPTER SEVEN

Summary, conclusions and recommendations

7.1 Brief summary of the research

Performance measurement points to the increasing relevance of financial and non-financial measures in the evaluation of manufacturing organizational performance. Over the last few years, the performance measurement systems have shown significant changes. Several companies have been involved in addressing the challenge of both measuring the performance of their manufacturing systems and using performance results to improve their processes and practices to better meet the expectations of their customers for higher quality, lower production cost, and improved service.

One of the hallmarks of leading-edge manufacturing enterprises, be they public or private, has been the successful application of integrated performance measurement to gain insight into, and make judgments about their organization and the effectiveness and efficiency of its programs, processes, and people. In other words, they use financial and non-financial performance measurement for managing their companies. Effective communication with employees, process owners, customers, and shareholders is vital to the successful development and deployment of performance measurement and management systems.

The study aims to assess to what extent Eritrean companies use these integrated performance measures; their extent of utilization and perceived relevance related to their actual financial results. Specifically, this study has aimed to identify financial and non-financial indicators such as customers' satisfaction, process/operational and employee performance as seen by the

selected enterprises. In this case a survey was carried out to gather quantitative and qualitative data, pertaining to performance measurement practices, using a structured questionnaire of twenty private and public enterprises. Interviews were carried out, which were administered in depth with the respondent enterprises, as it gives a researcher an opportunity to give brief clarification about the questionnaire.

Qualitative and quantitative techniques were employed for analysing the data (see chapter 6). The specific methods of data analysis include descriptive statistics such as tabulation, cross tabulation, computations of frequencies, and computations of percentages as well as correlation and regression models. The four perspective balanced scorecard performance measurements: financials, customer, internal process/operational measures, and employee measures were employed to quantify the existing performance measurement practices. The value of financial as well as non-financial measures in relation to the performance evaluation process in the context of manufacturing enterprises were also investigated.

7.2 Conclusions and Recommendations

In this section conclusions of the research as well as recommendations for the betterment of performance measurement practices in Eritrean manufacturing enterprises are addressed. The empirical and literature studies revolved around exploring the extent to which performance measurement is being used in practice in the selected enterprises. The most important conclusions and recommendations are shown in the subsequent sections.

7.2.1 Conclusions based on the empirical study

7.2.1.1 Financial performance profile

The financial profile of the selected enterprises was presented to compare average financial ratios against the international industry norms or benchmarks. Some of the selected financial ratios such as sales growth and profitability measures were taken to assess the financial condition of the selected enterprises.

The result regarding the financial performance reveals a large deviation from the international trend. These findings may be utilized by decision makers for further investigation into the reasons for such deviations. In addition, the investigation may provide managers valuable information in determining how well their enterprises perform compared with similar units in the industry and globally. This gives the use of performance measures in a broader perspective and to select among measures of "best practices".

7.2.1.2 Financial and non-financial measures

Descriptive analysis was employed to examine the extent to which sample enterprises' used integrated measures. The specific objective, to obtain a profile of the respondents in terms of their use of both financial and non-financial measures in the performance evaluation of the manufacturing enterprises, was achieved and summarized below.

Regarding the financial measures the study investigated to what extent the respondents use the financial measures. The overall empirical findings, based on descriptive analysis, show that majority (74%) of the respondent enterprises strongly agree on financial measures. From the result of the

study, it can be concluded that financial measures are considered as having great importance in the respondent enterprises.

Regarding the non-financial measures the study investigates to what extent the respondent enterprises use the customers, employees and operational measures, as an integrated approach of measurement. Empirical results show that the measurements are poorly integrated and rely too heavily on financial measures.

The result revealed that only 16.25% of the respondents agreed that customer satisfaction and retention measures are used in their enterprises. It seems that little attention is given to this measure. From this result the study concluded that the respondent enterprises may not get enough information from their customers to determine how their customers see them, how they perceive their products and services, and what the requirements of their customers are. This may cause a problem to the respondent enterprises in improving and redesigning their products. In addition, the low results in customer satisfaction measures could lead to a decline in market share and loyalty.

Regarding the operational measures the result shows only 37.50% of the respondent enterprises agreed on the use of operational measures. This perspective allows the managers to know how well their businesses are being managed, and whether its products and services conform to customer requirements. These metrics have to be carefully designed by those who know these processes most intimately. This investigation may provide managers where to give special attention. Unless the measures are firmly connected to results from a defined process, it is difficult to know what corrective actions to take as well as being able to predict with confidence what effects those changes will have. In order to be able to identify effective corrective actions to improve products and services, results of all key

processes must be measured. In this way, specific processes that need to change can be identified when progress is not satisfactory.

The study also attempted to investigate the use of employee training and satisfaction measures among the respondent enterprises. Results of the study reveal that only 20% of the respondents agreed on employee satisfaction and training perspective. The low rating of this perspective may cause losing the most competent employees. As the result the total outcome of these overall results may lead to produce low quality products and increased cycle time, which in turn may decrease their financial performance.

7.2.1.3 The relationships between financial and non-financial measures

According to correlation and regression analysis of the sample enterprises, the specific objective about the relationships between the financial performance and the factors influencing it and their relative importance are investigated, and summarized below:

The result of correlation analysis shows that there is a clear and strong relationship between the financial performance and the attention given to performance measurement (customers, operational and employees). The correlation coefficient varies from the lowest (0.83) to the highest (0.97). The variables are positively correlated and are significant. The result implies financial performance (sales growth and return on asset) increases with increase of the use of the non-financial measures (i.e. financial performance is significantly and positively correlated with the degree of adoption of customer, operational and employee measures).

In addition, the regression results indicated that the overall performance measurement perspectives explained about 95% of the variation of sales

growth. The coefficient of determination (r^2=95%) shows that the combined effect of measurement variables on the financial performance (sales growth) is statistically significant.

Regarding the return on assets, the results indicated that the overall measurements (independent variables) explained about 86% of the variation of return on assets. The result of the coefficient of determination (r^2 = 0.86) implies that the independent variables (customer satisfaction, operational measures and employee training and satisfaction measures) are found to be strongly determinant factors of return on assets.

More importantly, empirical findings suggest that despite the poor adoption of integrated performance measurement in the selected enterprises, this study provide further evidence of manufacturing plants that strongly agree on the use of financial and non-financial measures performed better than those that do not. In addition, the formula found from result of the regression analysis may help managers to predict the enterprises' future performance and long-term strategic decision-making. In general the study has collected essential numerical evidence for the future possible development of manufacturing enterprises in Eritrea. Knowledge and understanding of the critical factors underpinning enterprises' performance can lead to further improvements. In turn this will help for the overall development in national economy.

7.2.1.4 Managers' perception on the use of BSC performance measures

Finally, the specific objective to evaluate managers' perception and their opinion regarding the use of balanced measures as an appropriate measurement model were attained. The result show that majority of the respondent enterprises measure their performance financially, but respondent also indicated that it will be possible to apply the balanced

scorecard performance measurement in the manufacturing enterprises for strategic decision making.

Furthermore, the study suggested selecting the right measure for success is the vital issue in today's competitive environment. If companies don't know what to measure, they measure too much or too few and no individual can monitor and control many variables on a regular basis. Results of the study show that majority of the enterprises use many financial measurement variables for decision-making. From the result it can be concluded that this is not easy to reach the goals. They may loose their momentum. This investigation may help managers to designing few and improved measurement systems to save their time and arrive at specific goals and objectives for success.

Consistent with the current body of literature, this study has also demonstrated that non-financial measures are useful indicators of financial performance for manufacturing companies. Most important, it is hoped that the study encourages more managers to apply the integrated performance measurement system. Last but not least, the model presented in this study should be considered as a template and not a ''cure-all'' solution.

7.2.2 Recommendations

- It is clear from the results and discussions that Eritrean manufacturing enterprises performance measures have been financial - measuring such ratios as rate of return, cash flow, sales growth rate and profit margins. Despite the fact that the non-financial measures are as important as the financial measures, little attention has been paid to the non-financial dimensions. In order to improve the existing measurement practices, the following are possible areas of

intervention, which might mitigate the problem of evaluating manufacturing performances.

- The traditional need for financial measures should be encouraged. Timely and accurate data will always be a priority. However, the point is that the current emphasis on financial measures leads to the 'unbalanced" situation with regard to other perspectives and focus on past results. There is perhaps the need to balance them to make sure that one dimension or set of dimensions not stressed by the other.

- To be internationally competitive these practices should not only identify financial, they must measure performance in ways that both promote positive future results and reflect past performance. Management of manufacturing organizations should find the right mix of measurement tools that will address the current dilemmas of finding appropriate performance measurement variables.

- In today's turbulent environment, customers are playing an important role in competition. Business priority should be given to what customers really value. If the customer is not satisfied, there is no tomorrow.

- The operation process should identify the cost, quality and time that enable to deliver superior product and service to its targeted current customers. Today's manufacturing organizations are in a state of constant change. To continue to be at the leading edge, the respondent enterprises must continually analyze and systematically improve their business processes measures. Therefore, attention must be given for continuous process improvement to meet customers' requirement and increase their market share.

- Training and development of the employees is required to ensure competent people in the long run. It is important to communicate with every one in the organization; empowerment and delegation are largely about giving each employee a sense of responsibility for manufacturing a product or for performing a service to satisfy customers.

- Therefore, from the results of the study, policy recommendations were outlined. Manufacturing businesses have to invest in re-training employees to get motivated and competent people to produce customer perceived product quality as well as continuous improvement of operational processes, which may help the enterprises to compete with today's dynamic business environment.

- Although the study carried out from the survey data of manufacturing enterprises' in Eritrea, the results may help all the managers of African countries to find the best mix of measurement which can allow them to see how their business is running chiefly to determine how well their products and services are responsive to the needs of the customers, and to know how well organizations are capable to improve effectiveness.

7.3 Limitations of the study

This study did not pay attention to all dimensions of performance measurement approaches. It is possible that there are other aspects of importance to performance driven measurements, which have not been included in the analysis. Despite the limitations, this research gives an interesting picture of the relation between financial performance and the non-financial performance measurements. These limitations call for further researches to be done on this area of study to obtain relatively full conclusive results.

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APENDIX A

QUESTIONNAIRE

Performance measurement practices in Eritrean manufacturing enterprises

Dear Sir/ Madam

Completion of research questionnaire

I am at present conducting research into the Eritrean manufacturing enterprises, at the University of Free State, department of business management towards an MCOM degree. The topic is "performance measurement practices in Eritrean manufacturing enterprises". The object of the questionnaire is to obtain the views of the manufacturing enterprises and analyze how they measure their performance using the integrated financial and non- financial performance measures.

I should appreciate if you would complete the attached questionnaire or direct it to the person in charge with this responsibility. Due to limited resources a fairly small sample was selected to receive this questionnaire, thus your response is very crucial to the success of the survey. All information will be treated in the highest confidence and the respondent's name (optional information) will not be revealed.

Thank you for your time and consideration

Section I

Company details

1. What is your current position? (Indicate by means of a circle).

1.1 Owners/manager

1.2 Finance head

1.3 Operational manager

1.4 Marketing manager

1.5 Administrative head

1.6 If others, please specify _____

2. What is the nature of your business? Please circle the appropriate number.

2.1 Food, beverage and tobacco
2.2 Textile, clothing, footwear and leather
2.3 Paper product, printing, and publishing
2.4 Chemical and associated products
2.5 Non-metallic mineral products
2.6 Metal, machinery, wood and plastic products
2.7 If others, please specify

_____

3. What is your highest qualification?

_____

4. How long have you been with this company?

_____ Years.

5. What is the average annual turn over for the past three years, in million ERN? (Please circle the appropriate number)

Less than 10	1
11 – 50	2
51 – 100	3
101 – 150	4
151 – 200	5
201 –250	6

Section II

Performance measurement related

Performance measurement in this questionnaire does not refer to the performance of individuals. It refers to the process of collecting and analyzing data for the purpose of strategic decision making.

6. From the following functional departments please estimate the number of performance measures used, by ticking the appropriate box.

Department		**N/A**	**None**	**Few**	**Several**	**Many**
6.1	Finance	( )	( )	( )	( )	( )
6.2	Personnel	( )	( )	( )	( )	( )
6.3	Manufacturing	( )	( )	( )	( )	( )
6.4	Marketing	( )	( )	( )	( )	( )
6.5	Quality	( )	( )	( )	( )	( )
6.6	Others (specify)	( )	( )	( )	( )	( )

_____

Questions number 7 to 10 please circle the appropriate response.

7. Over the last five years, how would you describe your organization's approach to the use of performance measurement?

   1. Falling interest 2.Unchanged 3.Increasing interest 4.Heavy emphasis

8. What is your assessment of value of performance measurement to the organization?

   1. Waste of time 2. Limited value 3.Effective 4. A key managerial control

9. Are performance measures modified when there are changes in the organization's strategic objective?

   1. Never 2. Rarely 3. Usually 4. Often 5. Always

10. Does your organization use performance measurement to identify areas that require strategic focus?

    1. Never 2. Rarely 3. Sometimes 4.Frequently 5. As a mater of policy.

11. What performance measures do you use for strategic decision making? Please specify if any.

    _____
    _____
    _____
    _____
    _____

12. How often do you prepare your formal performance measurement reports? Please circle the most appropriate response.

    12.1 Every month
    12.2 Quarterly
    12.3 Twice a year
    12.4 Annually
    12.5 If other please specify

13. Based on the performance measurement report please indicate the following financial information For the last four years.

	1999	2000	2001	2002
Sales increase /decrease				
Cash flow				
Operating profit / profit margin				
Liquidity ratio				
ROA/ROI				
ROE				

Section III Specific type of measures

This section refers to the specific type of measures. Read each statement and check the appropriate box, depending on the extent to which you agree. Scale: 5=Strongly Agree; 4= Agree; 3= Somewhat Agree 2= Disagree 1= Strongly Disagree

Financial related measures

Rate the following financial measures relative to their effective use/ importance in your enterprise.

		Disagree				**Agree**
14	Sales growth rate	1	2	3	4	5
15	Net working capital/cash flow	1	2	3	4	5
16	Liquidity	1	2	3	4	5
17	Profit margin	1	2	3	4	5
18	ROI (Return on investment)	1	2	3	4	5
19	ROE (Return on equity)	1	2	3	4	5
20	ROA (Return on Assets)	1	2	3	4	5
	If other specify and rate.	1	2	3	4	5
_____		1	2	3	4	3

_____

Customer- related measures

Questions number 19 – 29 please indicates the appropriate response.

		Disagree				Agree
21	We keep accurate data on customer satisfaction, repeat/ loss of big customers complaints, perception and so on.	1	2	3	4	5
22	We keep accurate data for returned order.	1	2	3	4	5
23	We collect information on what customers want and expect in terms of product/service quality, price (customer survey).	1	2	3	4	5
24	We collect market share relative to competitors.	1	2	3	4	5
25	If other specify _____	1	2	3	4	5

Internal process/ operational measures

The organization has developed the following key operational measures:

		Disagree				Agree
26	Cycle time need to produce a product	1	2	3	4	5
27	Customers perceived service, quality and price	1	2	3	4	5
28	Process/ product cost.	1	2	3	4	5
29	Process efficiency (PE)	1	2	3	4	5
30	If other specify _____	1	2	3	4	5

Employee related measures

If the following employee related measures are used in your enterprise, please rate the degree of effective use of the measures:

		Disagree				Agree
31	Salary satisfaction.	1	2	3	4	5
32	Continuous on job training given	1	2	3	4	5
33	Job security	1	2	3	4	5
34	Employees benefit, rewards, incentives	1	2	3	4	5
35	If other please specify and rate _____	1	2	3	4	5
		1	2	3	4	5

Section IV

The balanced scorecard performance measures

36. Financial and non-financial performance measurement is effective for decision making. Are you of the opinion that non-financial measures should include in your measurement?

1. Yes 2.No

37. According to the balanced scorecard approach performance measurement should include financial and non-financial measures and should be linked to the strategies of an organization.

37.1 Does your enterprise make use of the balanced scorecard as an approach to measure performance?

1. Yes 2. No

37.2 If No is the answer of number 37.1. Do you think that the balanced scorecard approach can be applied in the manufacturing sector?

1. Yes 2. No

38. Give your comments regarding the performance measurement practices in your enterprise.

_____

_____

_____

_____

_____

_____

_____

Thank you.

APPENDIX B

Table 1 Overview of financial performance of food, beverage and tobacco industry

Types of ratio	Red sea Mills	Red sea Bottlers sh.comp.	Asmara Brewery	Asmara Wine & Liquor factory	Rothman of Pall-mall (Eritrea) sh.co.	Industry averages
Average years	4	4	4	4	4	4
Number of enterprises	1	1	1	1	1	5
Sustainability						
Sales growth (%)	-3.40	21.00	9.00	17.00	25.00	13.72
Cash flow % Sales	8.00	-0.94	30.79	-2.00	3.00	7.77
Liquidity						
Current ratio	1.79	2.03	1.89	2.35	2.30	2.07
Profitability						
Operating profit margin (%)	17.00	18.00	9.00	12.00	29.00	17.00
Return on asset.(ROA) %	1.25	5.68	4.82	3.65	6.04	4.29

Source: Authors computation based on data obtained from survey

Table 2 Overview of financial performance of textile, clothing, footwear and leather

Types of measures	Asmara Textile	Mereb Textile	Eritrean Textile	Dahlak Shoe factory	Red sea Tannery	Industry averages
Average years	4	4	4	4	4	4
Number of enterprises	1	1	1	1	1	5
Sustainability						
Sales growth (%)	-5.00	12.00	10.00	-2.00	6.00	4.00
Cash flow % Sales	-3.00	13.00	12.00	-2.00	7.13	5.00
Liquidity						
Current ratio	1.80	2.00	1.87	1.02	1.88	1.67
Profitability						
Operating profit margin (%)	-22.00	7.00	5.00	-8.00	13.00	-4.50
Return on asset (ROA) %	1.85	5.48	4.55	2.45	2.02	3.27

Source: Author's computation based on data obtained from survey

Table 3 Overview of financial performance of paper product, printing and publishing

Types of ratio	Sabur printing press	Asmara match & pulb. factory	Industry Average
Average years	4	4	4
Number of enterprises	1	1	2
Sustainability			
Sales growth %	6.00	2.00	4.00
Percentage change of cash flow (%)	18.00	16.00	17.00
Liquidity			
Current ratio	1.59	1.88	1.74
Profitability			
Operating profit margin (%)	25.00	9.00	17.00
Return on asset (ROA) %	3.87	3.89	3.88

Source: Authors computation based on data obtained from survey

Table 4 Overview of financial performance of chemical and associated products

Types of ratios	Red sea Soap factory	Asmara Soap factory	Eritrea poly plastic factory	Industry average
Average years	4	4	4	4
Number of enterprises	1	1	1	3
Sustainability				
Sales growth %	9.00	12.00	8.00	9.67
Cash flow % Sales	7.00	17.00	25.00	16.33
Liquidity				
Current ratio	2.06	2.28	1.21	1.85
Profitability				
Operating profit margin (%)	22.00	5.00	8.00	11.67
Return on asst (ROA) %	4.92	4.72	4.50	4.71

Source: Authors computation based on data obtained from survey

Table 5. Overview of financial performance of non-metallic mineral products

Types of ratios	Eritrea cement factory	Industry average
Average years	4	4
Number of enterprises	1	1
Sustainability		
Sales growth %	-.15	-15
Percentage change of cash flow (%)	-3.00	-3.00
Liquidity		
Current ratio	1.29	1.29
Profitability		
Operating profit margin (%)	-15.50	-15.50
Return on asset (ROA) %	-1.80	-1.80
Return on equity(ROE)%	5.00	5.00

Source Authors computation based on data obtained from survey

Table 6 Overview financial performance of metal, machinery, wood and plastic products

Types of ratio	Eritrea Steel Sheet Factory	Eribus Assembling	Wina household	Himbol household	Industry average
Average years	4	4	4	4	4
Number of enterprises	1	1	1	1	4
Sustainability					
Sales growth %	8.53	2.08	-13.00	5.00	0.65
Cash flow % Sales	53.00	12.00	-27.00	7.08	11.27
Liquidity					
Current ratio	2.01	1.65	1.02	2.30	1.75
Profitability					
Operating profit margin (%)	23.25	7.00	12.00	21.00	15.81
Return on asset (ROA) %	5.25	4.50	-0.56	4.28	3.37

Source: Authors computation based on data obtained from survey

APPENDIX C

Multiple Regression Report

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Dependent **ROA**

Descriptive Statistics Section

Variable	Count	Mean	Standard Deviation	Minim.	Maximu
ROA	20	3.568	2.0903	-1.8	6.04

Regression Equation Section

Independent Variable	Regression Coefficient	Standard Error	T-Value (Ho: B=0)	Prob Level	Decision (5%)	Power
Intercept	-6.8920	1.1710	-5.8853	0.0000	Reject Ho	0.9998
CM	8.9613	3.5146	2.5497	0.0214	Reject Ho	0.6681
OM	18.4069	6.1773	2.9798	0.0088	Reject Ho	0.7988
EM	10.73647	5.0042	2.1455	0.0476	Reject Ho	0.5224
R-Squared	0.8780					
T-Critical	2.1199					

Analysis of Variance Section

Source	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1	254.6125	254.6125			
Model	3	72.8891	24.2964	38.3887	0.0001	0.9981
Error	16	10.1265	0.6329			
Total(Adjusted)	19	83.0155	4.3692			

Root Mean Square Error	0.7956	R-Squared	0.8780

Mean of Dependent	3.5680	Adj R-Squared	0.8551
Coefficient of Variation	0.2229	Press Value	15.7433
Sum |Press Residuals|	14.4479	Press R-Squared	0.8104

Normality Tests Section

Assumption	Value	Probability	Decision (5%)
Skewness	0.2733	0.784629	Accepted
Kurtosis	-0.3203	0.748778	Accepted
Omnibus	0.1772	0.915189	Accepted

Multiple Regression Report

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Dependent **SG**

Descriptive Statistics Section

Variable	Count	Mean	Standard Deviation	Minimu.	Maximum
SG	20	5.7105	10.0772	-15	25

Regression Equation Section

Independent Variable	Regression Coefficient	Standard Error	T-Value (Ho: B=0)	Prob Level	Decision (5%)	Power
Intercept	-41.6942	3.0575	-13.6365	0.0001	Reject Ho	1.0001
CM	1.5615	9.1765	1.9702	0.0570	Accept Ho	0.8671
OM	45.6579	16.1286	2.8309	0.0120	Reject Ho	0.7574
EM	32.0335	13.0658	2.4517	0.0261	Reject Ho	0.6342
R-Squared	0.9642					
T-Critical	2.1199					

Analysis of Variance Section

Source	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1	652.1962	652.1962			
Model	3	1860.418	620.1393	143.7315	<0.0001	1.0000
Error	16	69.03311	4.314569			
Total(Adjusted)	19	1929.451	101.5501			

Root Mean Square Error	2.077154	R-Squared	0.9642
Mean of Dependent	5.7105	Adj R-Squared	0.9575
Coefficient of Variation	0.3637429	Press Value	109.8438
Sum |Press Residuals|	39.53445	Press R-Squared	0.9431

Normality Tests Section

Assumption	Value	Probability	Decision(5%)
Skewness	0.0367	0.970755	Accepted
Kurtosis	-0.6433	0.520052	Accepted
Omnibus	0.4151	0.812559	Accepted

Correlation Report
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Pearson Correlations Section (Pair-Wise Deletion)

	CM	OM	EM	SG
CM	1.0000	0.9115	0.8899	0.8975
	0.0000	0.0000	0.0000	0.0000
OM	0.9115	1.0000	0.9619	0.9749
	0.0000	0.0000	0.0000	0.0000
EM	0.8899	0.9619	1.0000	0.9699
	0.0000	0.0000	0.0000	0.0000
SG	0.8975	0.9745	0.9698	1.0000
	0.0000	0.0000	0.0000	0.0000

Cronbachs Alpha = 0.0903 Standardized Cronbachs Alpha = 0.9827

	CM	OM	EM	ROA
CM	1.0000	0.9115	0.8899	0.9079
	0.0000	0.0000	0.0000	0.0000
OM	0.9115	1.0000	0.9619	0.9051
	0.0000	0.0000	0.0000	0.0000
EM	0.8899	0.9619	1.0000	0.8339
	0.0000	0.0000	0.0000	0.0000
ROA	0.9079	0.9051	0.8339	1.0000