A CRITICAL REVIEW OF ECONOMIC VALUE ADDED (EVA) AS A MEASURE TO EVALUATE THE FINANCIAL PERFORMANCE OF MILK PRODUCERS

by

KHUMBUZILE CECILIA MAMPANE

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To my parents

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DECLARATION

I declare that the thesis hereby submitted in partial fulfilment for the requirements of the degree Master of Science (Agricultural Economics) at the University of Pretoria has not been submitted by me for any other degree at any other institution.

Name and Surname: Khumbuzile Cecilia Mampane

Signature: _____

Date: _____

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KHUMBUZILE CECILIA MAMPANE

Supervisor : Doctor Mariëtte Geyser
Co-supervisor : Professor John Hall
Department : Agricultural Economics, Extension and Rural Development
University : University of Pretoria
Degree : M.Sc. (Agric)

ABSTRACT

Farm profitability and the measurement of such profitability are usually calculated by traditional profitability measures such as return on equity (ROE), return on assets (ROA), net farm income (NFI) and the operating profit margin (OPM). The emergence of economic value added (EVA) during the 1990's has changed the field of performance measurement. The question arises whether the new value measurement can give a better answer about value creation than traditional measures in specific areas such as farm profitability.

This study examines the applicability of EVA as a measurement tool to measure the profitability and value creation by a sample South African milk producers. Milk production is one of the most important agricultural products in the economy. Fresh milk is ranked ninth among the top 20 gross production value contributors in agriculture in South Africa.

The study reviewed EVA and few traditional measures (ROA, ROE, NFI and OPM). The literature review formed the basis for the application. The main objective of this

study was to calculate and evaluate EVA as a financial performance measure that can be used by milk producers. Further objectives were to evaluate the financial performance of six milk producers, to determine whether these milk producers created value, and to compare EVA with traditional measures to see whether EVA is a better measure of wealth creation than other profitability measures.

Based on the calculations using the traditional measures, it can be conclude that only four farms were profitable and that the other two were unprofitable. Although three farms of the four profitable ones had low returns, the results suggested that they were still profitable and that value has been created. Based on the EVA calculation, only one farm created value while the rest destroyed it. A comparison achieved using these measures shows that EVA gives the clearest results, while the traditional measures were misleading in three of the farms.

A comparison of EVA and the four traditional measures showed that EVA was the best measure and gave more reliable results than the traditional measures in some cases. From the results it could be concluded that the EVA and the traditional measures can fruitfully be used together. EVA should take the commanding role, while the traditional measures can provide additional information.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

Recent developments in finance have included the emergence of several new measurement tools to assess value creation. The question arises whether traditional performance measurement tools used to assess value creation are still applicable to farm enterprises or whether economic-based measures would provide clear results.

There are 16 accounting-based ratios that are often used to assess farm performance. These ratios can be grouped into five categories, namely liquidity, solvency, profitability, repayment capacity and financial efficiency. In assessing farm profitability, four traditional measures are often used, namely return on assets (ROA), return on equity (ROE), the net farm income (NFI) ratio and operating profit margin (OPM). Shiely (1996) argues that measures such as ROE and ROA may bear little resemblance to the economic return earned by an enterprise, because accounting-based measures do not account for the risk incurred by an enterprise's management in the search for growth and profitability. When traditional measures of farm performance are compared with Economic Value Added (EVA), EVA may be said to be the best tool, because EVA as a measure contains information that neither ROE nor ROA can provide.

ROA is probably the single best overall measure of operating performance. ROA is a good and illustrative tool to measure a farm's performance, because it provides additional information about the financial state, although decisions should not be done based on ROA only. Maximising the rate of return is not that important when the goal is to maximise the returns to shareholders.

ROE is easy to compute and widely understood. It is a useful and important tool, but it must be interpreted in the light of its limitations and should never be used mechanically to suggest that a higher ROE is always better than a lower one.
The NFI is a meaningful absolute profitability measure of the business from year to year, but it is not very useful in comparing the profitability of one farm to another (Ibendahl & Fleming 2003).

The OPM ratio measures the profitability of the enterprise as a proportion of the volume of production. This ratio demonstrates how an enterprise can increase its profitability. An enterprise can, for example, increase its profitability by increasing the OPM ratio while maintaining the same size of operation and the same interest obligations (Kay & Edwards, 1994).

The problem with traditional measures is that more information is needed to calculate them than EVA (Kay & Edwards. 1994). Another problem is that they are distorted by accounting anomalies and that distortion leads to poor performance results. It is also difficult to know whether the results obtained shows profitability or not, since the benchmark figures vary considerable between industries, even between different farm enterprises.

In the late 1980s, Joel Stern and G. Bennett Stewart III of the New York consulting firm Stern, Stewart & Co. began to develop and promote (EVA) in the business community as a method that can be connected with a firm's share price. EVA was then adapted to determine management performance. Stern Stewart & Co. has worked with more than 300 corporations worldwide to help them to become EVA benefiting companies (Stern & Stewart III, 2004).

EVA is a financial tool that emphasises the importance of maximising incremental earnings beyond capital costs. It is a performance measure which highlights the value added beyond the cost of capital of the enterprise's periodic income. EVA is thus a performance measure which provides a decision criterion with regard to what creates value beyond and above the cost of capital.

EVA is computed by taking the spread between the return on capital and the cost of capital, and multiplying this difference by the capital outstanding at the beginning of the year (or the average over the year if that was used in computing the return on capital). EVA is the residual income that remains after operating profits cover a full and fair return on capital (Stewart, 1991). An enterprise's EVA is positive when the after-tax operating profits exceed the rand costs of capital and it is negative when the after-tax operating profits are less than the rand costs of capital.

Milk production is one of the most important agricultural industries in South Africa. Milk production is ranked ninth among the top 20 gross production value contributors to agriculture in South Africa. Milk as a percentage of animal production contributes 35% of the gross value of agricultural production (ABSTRACT, 2004). Milk producers are struggling to survive due to small profit margins, fixed selling prices and increasing input prices. Milk producers organisation (MPO) therefore cooperated with University of Pretoria in identifying respondents.

Applying EVA and/or traditional measures would motivate milk producers to focus on elements that will improve their shareholder (owner) value. EVA is a measure that can be used to set goals, evaluate performance, determine bonuses, communicate with investors and be used for capital budgeting and valuation of all sorts. Using both traditional performance measures and EVA, managers can make necessary changes as they strive to eliminate the inefficiencies in their processes and systems.

1.2 CLARIFICATION OF CONCEPTS

Several research studies have focused on EVA in South Africa (You Lee, 1995; Lloyd, 1996; Pearson, 1998; Jansen, 1998; Bottger, 1999; Wood, 2000), but no research was done to develop EVA as a measurement tool for milk producers in South Africa prior to the current study.

Traditional measures were used to evaluate the performance of the enterprises. Johnson and Soenen (2003) used ROA as an asset utilization ratio that indicates how effectively an enterprise uses its assets. The effectiveness with which fixed

assets, working capital and other assets are employed is obviously a driver of growth. Not surprisingly, the greater the ROA, the higher the growth potential of the enterprise. ROE describes the returns per rand of equity and provides a basis for comparison with the rates of return on non-farm investments (Penson, Klinefelter & Lins, 1982).

There are limitations on using ROE and ROA as profitability measures, because unrealized capital gains are excluded from the calculations. ROE and ROA calculations give a percentage as the answer and therefore neither of them indicates whether the farmer has created wealth during the course of the year (Ibendahl & Fleming, 2003).

Operating profit margin (OPM) as a measure is helpful, but it only explains half of the ROA. In other words, the asset turnover times the operating profit margin equals the ROA.

Net Farm Income (NFI) is the total gross margin less overhead costs. NFI does not imply profit, as it is generally understood, because management remuneration, interest on capital and rental are excluded. The reason is that the NFI is solely used for comparison between farm businesses (Van Zyl *et al.*, 1999). The limitation of NFI is that it does not fully account for the resources used to generate rand, as it gives the rand amount (Ibendahl & Fleming, 2003). The limitations of traditional measures are that they are misleading where one wishes to measure wealth creation and they also lack theoretical appeal.

Bottger (1999) has found that basic corporate finance and microeconomic theory indicate that the primary financial directive of any firm ought to be to maximize the wealth of the shareholders (in this case, the milk producers). EVA is a tool that determines whether a farmer has created wealth or not. Ibendahl and Fleming (2003) argue that EVA is the best, because it fully accounts for the resources used on a farm. It also includes both realized and unrealized capital gains in the calculation.

EVA provides a tool to diagnose performance. It shows investors and corporate managers where value has been created in the business and where value has been

destroyed. It measures the company's success in creating shareholder value (Young, 1997). EVA provides a system of management, which, if implemented, reshapes a manager's work. It also reshapes the whole organisational structure and role of management within the structure. It consists of those financial policies, procedures, methods and measures that guide a company's operations and strategy, and therefore EVA can be said to be a financial management system (Mouritsen, 1998). EVA is a system that transforms corporate activity, including a manager's job.

EVA provides a language that can be used to measure and communicate an enterprise's performance internally and externally and this helps to convince capital providers that funds will be productively and profitably used in their companies (Young, 1997).

Bottger (1999) argues that EVA as a financial management system is the key to creating wealth, based on the results of a practical and theoretical investigation. Rogerson (1997) uses a principal-agent model to show that basing a manager's pay on a measure such as EVA eliminates the moral hazard problem that exists when traditional evaluation rules are used.

One criticism of EVA is that it does not account for real options embedded in the investment decision. EVA neglects the growth opportunities of an enterprise by concentrating on the assets that are in place and is therefore a short-term performance measure (Johnson & Soenen, 2003). Brewer *et al.* (1999) have also found that EVA is a short-term concept because ideas that have a long-term payoff may be rejected. Their future contribution of such ideas may not be fully reflected in the numbers used to calculate EVA. On the other hand, Fatemi *et al.* (2003) believe that compensation contracts based on EVA are generally set up in a manner that encourages the long-term interests of shareholders, even when doing so may mean lower short-term profits.

Size difference has been another problem when using EVA. Larger farms could create more wealth than smaller farms, although they may not be using their assets as efficiently (Brewer *et al.* 1999). Ibendahl and Fleming (2003) have found that by grouping farms into type and size categories, this limitation is minimised. On the

other hand, Brewer, Chandra and Hock (1999) argue that EVA is a guide and it does not indicate where problems may lie.

Comparing traditional measures of farm performance and EVA, Fatemi, Desai and Katz (2003) have found that EVA and Market Value Added (MVA) are better predictors of cross-sectional variation in top manager pay than traditional performance measures such as ROA, although they found the relationship between EVA and compensation to be weaker. MVA is the difference between the market value of the firm and the total invested in it (Young, 1997).

EVA provides additional information that neither ROA nor ROE can provide. Results of EVA are easier to interpret than ROA and ROE, because EVA reflects a rand amount. You Lee (1995) has conducted a study on the use of EVA as a performance measurement tool. The main finding was that within the context of the Johannesburg Securities Exchange (JSE), EVA was the best performance measurement tool, marginally better than ROA and ROE.

Ibendahl and Fleming (2003) have conducted a study on using EVA to examine farm business. Turvey *et al.* (2000) did a study on the relationship between EVA and the stock market performance of agribusiness firms. Both these studies found EVA to be superior to ROA and ROE. EVA is said to be better than traditional measures because it focuses on economic activity, rather than an accounting. Profit plays an important role in the valuation of performance, because the manager's goal is value creation rather than a mere manipulation of short-sighted accounting figures (Acheampong & Wetzstein, 2001).

Value added measures such as EVA provide useful information for managers in that, with this information, managers have a guide to help them in decisions that lead to value creation. Traditional measures have been used in the past and EVA outperforms them because of their limitations.

1.3 GENERAL PROBLEM

This study focuses on evaluating the financial performance of milk producers. Research on agricultural co-operatives has been done where the focus was on adaptations of EVA. The study has created such interest that the Milk Producers' Organisations (MPO) cooperated with University of Pretoria in identifying respondents who will give information needed to evaluate milk producer's financial performance using EVA.

1.4 SPECIFIC PROBLEM

The study aimed to determine whether milk producers add value to their net worth (equity). A positive EVA would indicate that value is being added, while a negative value would indicate that value is being destroyed. The study also compared traditional performance measures with EVA to determine whether a superior measure exists.

1.5 OBJECTIVES OF THE STUDY

1.5.1 General objective

The main objective of this study was to examine selected financial performance measures that are used by milk producers: four traditional accounting measures (ROA, ROE, NFI and OPM) and EVA as economic measure.

1.5.2 Specific objectives

The specific objectives of the study, selected to underpin the main objective, were:

- to establish how the selected measures work on the bases of a literature review;
- to evaluate the financial performance of a sample of milk producers;
- to determine whether these milk producers create value; and
- to compare the results of these milk producers obtained using EVA with the results obtained using the traditional measures to determine whether EVA is a better measure of wealth creation than these other measures.

1.6 HYPOTHESES

The following hypothesis were tested:

1.6.1 Milk producers in the selected study group are performing well financially.

1.6.2 EVA is a better wealth indicator than traditional measures.

1.7 RESEARCH METHOD

The financial performance of milk producers was determined by calculating EVA and traditional profitability measures such as ROE, ROA, NFI and OPM, and the results were compared.

1.8 LIMITATIONS OF THE RESEARCH

The limitations of this study are the:

- Only limited financial information could be obtained from the farmers in this study.
- Statistical information was only available up to 2003, therefore the study was unable to compare its results with others.
- An assumption had to be made on the tax rate, since the study had no access to audited statements.
- The study group was relatively small; six milk producers from Humansdorp in South Africa.

1.9 OUTLINE OF CHAPTERS

The outline of the rest of the study is as follows:

1.9.1 Chapter Two defines the traditional measures ROA, ROE, NFI and OPM and EVA in more details and compares them

1.9.2 Chapter Three provides an overview of agriculture in South Africa and the milk industry.

1.9.3 The research methods, empirical analysis, and interpretation of results are set out in Chapter Four.

1.9.4 This study is summarised and concluded in Chapter Five

CHAPTER TWO

FINANCIAL PERFORMANCE MEASURES

2.1 INTRODUCTION

In order to know in which businesses one wants to be involved, one requires management expertise in three fundamental areas: finance, production and marketing. Finance is mentioned first, as it is a function of production and marketing. Because farming is a capital-intensive business, arranging sufficient funding for an entire year is absolutely essential in order to be certain that the enterprise can complete an operating cycle.

Farm financial managers use traditional accounting-based financial performance measures to assess the profitability, liquidity, solvency and financial efficiency of their businesses. These performance measures assist managers in making effective planning, implementation and control decisions.

There is some debate as to whether to use traditional or value-added measures to determine the profitability of a farm. Most commonly used traditional measures are based on accounting data and are subjective in terms of the accounting procedure used. The inefficiency of traditional financial ratios as a way of determining performance has led corporations in South Africa and in all other parts of the world to search for better ways to measure the creation of value.

Companies need a new approach to performance measurement. As they strive toward world-class performance in the face of rapid change, the traditional methods have become a hindrance because of their distortions. Many companies are looking for measures that depart from traditional ones in order to take decisions that lead them to value creation (Maskell, 1994). Measures of business performance as indicators of an enterprise's value are very important to the business enterprise.

Various studies, such as those by Stewart (1991), Ehrbar (1998), MäKeläinen (1998) and De Villiers (1997), have investigated the advantages of using value-added measures rather than traditional measures. Value-added measures look at value creation by the business. The use of these measures has been prompted by the fact that they require less information than traditional approaches. It has been claimed that value is estimated better using these new measures. One of the most recently developed concepts for evaluating an enterprise's performance is EVA, which measures the rand surplus value created by an enterprise such as a farm in its existing environment.

This chapter looks at the different types of financial performance measures available. The benefits and limitations of each financial performance measure are discussed. Traditional performance measures and EVA are then compared.

2.2 TRADITIONAL PERFORMANCE MEASURES

Measuring performance is particularly important for the control function (Boehlje, 1993). Performance measures can be used to provide warning signs or indicators that corrective actions are needed to improve an enterprise's financial positions and profitability. The information provided by performance measures also allows managers to make strategic plans and track their progress relative to the enterprise's goals.

Performance measures can be obtained from the balance sheet, income statement or the cash flow statement. The income statement and balance sheet are the most important tools used to summarise the financial position of a business. The balance sheet summarises the financial situation of a business at a given point in time. It summarises the number of assets, liabilities, and the net worth held by a business or individual at a given point in time. The income statement summarises revenue and expense transactions over a specific period (Purdy & Langemeier, 1995). These fundamental financial statements can provide a rich and extensive set of indicators for evaluating profitability, liquidity and solvency by organising the data that is needed. They are also part of information system that is used to report on historical

performance, to forecast future performance, and to provide data for managerial decision-making (Barry *et al*., 2000).

Profitability measures explain how efficient a business or enterprise is in using its resources to generate profit (Kay & Edwards, 1994). There are many tools available to measure and monitor the financial performance of a farm business. These tools provide methods to estimate the financial performance measures and diagnostic indicators of financial performance. The performance measures can include absolute measures and/or ratios. Absolute measures refer to the monetary or physical levels of measured items. Absolute measures have limited generality and are primarily useful in evaluating and monitoring individual businesses over time. Inter-farm comparisons of absolute measures are usually inappropriate, due to the size differences between farms.

Ratios are mathematically expressed as fractions, decimals or percentages. Barry, *et al.* (2000) suggests that ratios typically have greater generality in various types of comparison than do absolute measures. The proper application of financial ratios achieves two elementary business objectives that are crucial strategically. First, management is able to identify and quantify critically important financial interrelationships involving assets, liabilities, sales and expenses. Second, corresponding financial performance measurements can be forecast, monitored and tracked, thus substituting control for crisis management (Ferguson, 1990).

The popularity of EVA as a measure does not appear to be waning. The number of companies that are adopting EVA is still increasing rapidly (Wallace, 1997). One reason for why EVA has become so popular is that it was marketed with the concept of Market Value Added (MVA) and it offers a sound theoretical link to market valuations.

Traditional measures are said to be unreliable because they are based on accounting data and are subjective to the accounting procedures that have been used. By contrast, EVA has gained a considerable amount of attention because it is easy to use and because less information is needed than when using traditional measures. Traditional measures and EVA are discussed in detail in the next sections.

2.2.1 Net farm income (NFI)

NFI is calculated by subtracting cash operating expenses and depreciation from the accrued gross farm income (Purdy & Langemeier, 1995). It provides key information about the results of the operating activities of an enterprise over a given period. NFI is one of the most crucial measures found on an income statement. If the difference between revenue and expenses is positive, there is a profit or positive NFI. If the difference is negative, there is a loss or negative NFI. On most farm operations, the operator and other family members provide labour resources, but are not compensated by a set wage. The NFI measurement represents the return provided to the operator and family members for labour, management and owner's equity (Purdy & Langemeier, 1995).

NFI is a meaningful absolute profitability measure of the business from year to year. It is not very useful, however, for comparing the profitability of one farm to another or to established standards, because each farm represents a unique set and volume of resources. Under these types of circumstance, ratio measures of profitability provide better general performance indicators than absolute measures do. It is a limitation of NFI that it does not fully account for the resources used to generate rands, as it gives a rand amount as the answer (Ibendahl & Fleming, 2003).

2.2.2 Return on assets (ROA)

ROA is the ratio of the net income to the total assets. It is basically a measure of how well a farm is using its assets to produce more income. This ratio is useful for comparing firms of the same industry. ROA varies widely across different industries. Capital-intensive industries (such as farming enterprises) will yield a low ROA, since they have to own such expensive assets to do business. Industries that require minimal assets will have a high ROA. Everything a manager does (both right and wrong) in operating the business is reflected in the ROA.

The popularity of ROA is in part due to its ability to compare enterprises of different sizes, to compare the returns of enterprises from different sectors of the economy,

and to compare a business's performance with the performance of financial instruments. Hopkins and Morehart (2000) have decomposed ROA into two other common ratio measures: a profitability measure called the operating profit margin (OPM) and an efficiency measure called the asset turnover (AT), to illustrate differences between the profitability of enterprises of different sizes and between enterprises in the farm and non-farm sectors.

A higher ROA is preferred to a lower return. The return on assets can be readily compared to the return on off-farm investments such as stocks and bonds (Kay & Edwards, 1994). A consistently low return on assets should raise a red flag for management: in such a case, management should shift its investment to other enterprises or activities.

2.2.3 Return on equity (ROE)

ROE is the profitability measure that represents the rate of return on the equity capital that owners have invested in the business. It is a useful measure of the performance of farm owners' invested or equity capital. ROE is calculated by dividing the net profit after tax by the average total farm equity (net worth). A higher return on equity is preferred to a lower return. The biggest advantage of ROE is that it is one of the traditional measures and is easy to compute and widely understood.

ROA differs from ROE because ROA measures profit as a percentage of the total assets, while ROE measures profit as a percentage of shareholders' equity only. ROE is related to and heavily influenced by ROA (Miller, Boehje & Dobbins, 2001). Increasing OPM and/or AT should have a favourable impact on ROE. ROE should exceed ROA for farms that borrow money. If the ROE does not exceed the ROA, it means that the borrowed capital is not earning enough to pay its cost. Alternatively, the ROE may be above the ROA, which may indicate the potential for the enterprise to benefit from additional investment in the farm.

The ROE provides useful information about the performance of debt in the capital structure (Miller, Boehje & Dobbins, 2001). Debt is an important component of the

capital structure of many farm businesses. Debt provides the resources needed to take advantage of profit opportunities. When it is used productively, debt can leverage equity capital in a way that is very beneficial financially. But financial leverage is impartial and unforgiving. Debt can also work to the detriment of a farm business when it is used unproductively, just as it works to benefit a farm that is managed wisely.

Managers have three levers for controlling ROE. They are:

- the earnings generated out of each rand of sales, called the profit margin;
- the sales generated from each rand of asset employed, called the asset turnover; and
- the amount of debt used to finance the assets, called the financial leverage (Higgins, 1983).

Higgins (1983) has found ROE to be a useful and important indicator, but it must be interpreted in the light of its limitations and should never be used mechanically. It is foolish to suggest that a higher ROE is always better than a lower one. There are, however, also disadvantages to the use of ROE. The disadvantages are the following:

- ROE creates a timing problem: many businesses need to sacrifice present earnings in anticipation of enhanced future earnings. If one calculates the company's ROE just after the introduction of a new product, it will appear depressed. However instead of suggesting poor performance, the low ROE is just the result of the company's new product introduction. Thus, the ROE fails to capture the full impact of longer-term decisions because it includes earnings for only one year.

- ROE creates a risk problem: the problem with ROE in this regard is that it says nothing about the risk the company has taken to generate its ROE. When a company runs a high business risk and uses extreme financial leverage that makes it a very uncertain enterprise. Because the ROE looks only at return, while ignoring risk, it can be an inaccurate yardstick of financial performance.

- ROE creates a value problem: the market value of equity is significant to farmers because it measures the current, realisable worth of shares, whereas book value is only historical. Higgins (1983) concludes that, because of possible divergence between the market value of equity and its book value, a high ROE may not be synonymous with a high return on investment for farmers.

- ROE is based on accounting earnings. Reported accounting earnings are distorted. Among other things, they can be distorted by the choice of "last-in, first-out" (LIFO) or "first-in, first-out" (FIFO) for inventory and purchase or pooling for acquisitions, the expensing of research and development, the use of successful efforts instead of full cost to account for risky investment and accrual bookkeeping entries that bury in the cash flow a company recurringly generates from its operations reserves (Stewart, 1991).

- ROE reacts to changes in the mix of debt and equity that an enterprise employs and in the rate of interest it pays on its debt. That makes it difficult to tell whether ROE has risen or fallen for operating or financial reasons. With ROE as its goal, management may be tempted to accept truly sub-standard projects that happen to be financed with debt and pass by very good ones if they must be financed by equity (Stewart, 1991).

2.2.4 Operating profit margin (OPM)

OPM is another commonly used profitability measure used to evaluate farm profitability. It is calculated by adding NFI and interest paid, then subtracting labour and management costs divided by the gross enterprise (farm) income. The OPM ratio measures the profitability of the farm as a proportion of the volume of production. Interest is added back to the NFI to eliminate the effect of financing on the profit margin. This allows the OPM to focus strictly on the profit made from producing agricultural commodities, for example, without taking into account financing considerations, which can vary substantially between farms. Kay and Edwards (1994) have found that this adjustment permits a valid comparison of this

ratio between different farms. This ratio demonstrates how a farm can increase its profitability. A farm can increase its profitability by increasing the OPM ratio while maintaining the same size of operation and the same interest obligations. Furthermore, a farm can increase its profits by raising its volume of production while maintaining the same profit margin ratio and interest obligations.

The ROA is itself the product of a measure of financial efficiency and a measure of profitability. The ROA may be calculated by multiplying the OPM with the asset turnover ratio (ATR). The interrelatedness of these three performance measures emphasises the fact that there are two primary ways to enhance the efficient use of farm resources to produce profit (Miller, Boehlje & Dobbins, 2001). One way is to increase the profit per unit of output. The OPM is the measure of profit per unit of product produced or the output. A farm operation that has a high OPM percentage is a low cost producer. Thus, the general manager may respond to a poor or small OPM by instituting cost controls in order to increase profits per unit (Miller, Boehlje & Dobbins, 2001).

Another way to enhance performance is to increase the revenues generated per rand of farm assets, as indicated by the ATR. So, for example, higher value crops might be added to a crop mix to effect an increase in the asset turnover. The ATR is calculated by dividing the gross farm revenue by the average value of the total farm assets. For a given set of farm resources or size of farm, the OPM and ATR are two key determinants of the profit that a farmer must try to influence in order to improve the financial performance of the farm. An increase in either or both will increases the ROA and is generally indicative of improved financial performance (Miller, Boehlje & Dobbins, 2001).

The ROA, ROE, NFI and OPM as traditional measures have been discussed together with their advantages and disadvantages. Although traditional measures have been trusted for a long time, they have not fully satisfied farmers, especially with regard to planning, implementing and taking control decisions. The disadvantages of using traditional measures are discussed below. This will show clearly what problems are posed by traditional measures and what makes them less than trustworthy.

2.3 DISADVANTAGES OF USING TRADITIONAL MEASURES

In most farm operations, the farm manager and other family members provide labour resources, but are not compensated by a set wage. The problem in agricultural accounting with regard to a typical proprietary farm arises because the NFI measurement often represents returns provided by the farm manager and family members for unpaid labour and management as well as the ROE. The opportunity costs of unpaid labour and management are subtracted from the NFI to calculate the ROE. Precise estimates of these alternative earnings are difficult to obtain.

Another problem in using and interpreting accounting statements involves the inclusion and evaluation of personal assets. Many agricultural operations are sole proprietors or family-owned businesses. Separate financial statements are not typically prepared for personal and business purposes. That results in difficulties in distinguishing between farm and personal assets.

Traditional measures of performance, directly derived from accounting profits, may not reflect the economic reality. These traditional measures can easily be manipulated using accounting procedures, and thus they may not necessarily give an accurate yardstick by which performance can be evaluated (Acheampong & Wetzstein, 2001).

ROE and ROA calculations give a percentage as the answer and for that reason neither of them indicates whether the farmer has created wealth during the course of the year (Ibendahl & Fleming, 2003). Ehrbar (1998) argues that measures such as ROA and ROE are as bad as earnings. Both the earnings and the farmer's equity or assets are distorted by accounting anomalies; there is no reason to expect that a ratio of the two will convey any meaning at all. ROE suffers from the added shortcoming that it is easily manipulated. Although an asset might be fully depreciated and thus not reflected in the balance sheet, it can still be used in the production process, resulting in a distorted ROA.

Enterprises must have an attractive rate of return in order to be competent with their capital. Earning high returns is not enough, because it may send wrong signals to managers. That can lead to a misallocation of capital because, during the process of maximising the returns, attractive investment opportunities may be passed up. That is why Stewart (1991) maintains that ROA and ROE may be a perfectly good way to evaluate whether an individual project should be accepted or rejected, but that as a performance measure for an entire enterprise or business unit, it is flawed. Ehrbar (1998) argues, however, that both ROA and ROE are considerable improvements over operating profits because they encourage a focus on the efficient management of assets. On the other hand, any rate of return measure presents a number of practical and conceptual disadvantages, especially when it is used as the basis for incentives. Moreover, rates of return that are calculated using conventional accounting statements share the same anomalies and distortions as accounting earnings.

If an enterprise is trying to maximise its ROA or its return on net assets (RONA) and its rate of return is already much higher than its cost of capital, it may reject any investment with an expected rate of return that is lower than the current RONA, even if it is higher than the cost of capital. In other words, it will pass up many opportunities to create shareholders' wealth. Alternatively, if the current rate of return is less than the cost of capital, the farm can improve its rate of return by undertaking any new investment with a return greater than the current rate, even if it is lower than the cost of capital. These two scenarios accurately describe what usually happens when companies compensate managers on the basis of ROA and RONA (Ehrbar, 1998).

ROE suffers from the same shortcomings as ROA. Compensation for risk is not included and hence there is no comparison between ROE and ROA. The level of ROE does not tell the owners whether the company is creating shareholders' wealth or destroying it. With ROE, this shortcoming is, however, much more severe than with ROA, because simply increasing leverage can increase ROE. Because decreasing solvency does not always make the shareholders' position better, due to the increased financial risk, ROE should also be taken as an informative measure but it should not guide operations (MäKeläinen, 1998).

It has been shown in this section that calculating traditional measures requires information from the balance sheet and the income and cash flow statements. Separate financial statements are not typically prepared for personal and business purposes. That can become a problem when one is using and interpreting accounting statements. Traditional measures are therefore distorted by accounting anomalies. It makes it difficult to trust that these measures will convey any meaning at all. Many opportunities to create shareholders' wealth are passed up. That is why traditional measures should be taken as informative measures, but not as a guide for the enterprise. To deal with some of these problems, EVA as a value-based measure was developed, and is fully discussed in the next section.

2.4 ECONOMIC VALUE ADDED (EVA)

2.4.1 EVA defined

EVA is a financial tool that emphasises the importance of maximising incremental earnings above capital costs. It is a performance measure which highlights the value added beyond the cost of capital of the enterprise's periodic income (Ehrbar, 1998). EVA is a measure of corporate performance that differs from most others because it includes a charge against profit for the costs of all the capital an enterprise (such as a farm) employs. EVA is much more than just a measure of performance. It is a framework for complete financial management. It underpins an incentive compensation system that can guide every decision a farmer makes, that can transform a corporate culture, that can improve the working lives of everyone in an organisation by making them more successful, and that can help them produce greater wealth.

Stewart (1991) defines EVA as a value-based performance measure, an investment decision tool and also a performance measure reflecting the absolute amount of the enterprise value created. EVA is an estimate of true economic profit, or the amount by which earnings in any given period exceed or fall short of the cost of capital used to produce that profit. EVA is calculated by taking the difference between the rate of

return on capital (r) and the cost of capital $(c*)$ and then multiplying that by the economic book value of the capital committed to the business.

$$EVA = (r - c^*) \times Capital$$

Where:

$$r = \frac{NOPAT}{Capital}$$

Therefore:

$$EVA = \left(\frac{NOPAT}{Capital\ \ invested} - Cost\ \ of\ \ Capital \right) x\ Capital\ \ invested$$

EVA is not a new concept. It has been around for years. Young (1997) has also found that the basic idea behind EVA is not new. Alfred Marshall, the noted Cambridge economist, developed the related concept of economic income more than 100 years ago (Young 1997). The underlying concept is that a company earns genuine profits only when revenues are sufficient to cover the enterprise's operating costs and its cost of capital. An accounting performance measure called residual income is defined as the operating profit subtracted with capital charge. EVA is thus one variation of residual income with adjustments to how one calculates income and capital.

In the 1970s, residual income did not enjoy wide publicity and it did not become the prime performance measure in many companies. One reason for this oversight might be that EVA was marketed with the concept of MVA and it offers a theoretically sound link to market valuation. MVA is the difference between the total value of the farm and the total capital (including equity and debt) contributed to an enterprise such as a farm. The relation between EVA and MVA is that MVA is the present value of the farm's expected future EVAs. The difference between the two is that EVA reveals more than MVA because it measures performance annually, while MVA is a

static measure that reports on the sum total of the farm's value creation from its beginning to the date where the MVA is calculated. An important advantage about EVA over MVA is that EVA can be used to measure performance at any level of a business enterprise, not just at the group level (Young, 1997).

Damodaran (1998) conducted a study on value creation and enhancement. He concluded that EVA is a sound measure. It is not how much income an enterprise makes that marks its success, but how much it makes in excess of its rand financing costs. Stewart (1991) recommends that managers should aim to maximise EVA instead of maximising profit.

EVA is a strategy formulation and a financial performance management tool that can help any enterprise to achieve a return greater than the enterprise's cost of capital. Farmers can adopt this concept to track their financial position and guide management decisions regarding resource allocation, capital budgeting and acquisition analysis. On the other hand, EVA is both a measure of value and a measure of performance. It is a measure that can link forward-looking valuations and capital budgeting procedures with the manner in which performance can subsequently be evaluated. EVA is the bedrock upon which a new and completely integrated financial management system can be constructed.

Ehrbar (1998) defines EVA as follows:

- EVA is a corporate performance measure that is tied most directly, both theoretically and empirically, to the creation of an enterprise's wealth.
- EVA is the only performance measure that helps the enterprise to make the right decisions and give answers to most business questions (when a farmer has a higher EVA, then he/she knows that the farm is performing well – that is what makes EVA the best measure of continuous improvement; by contrast, actions that increase profit margins, earnings per share, and even the rate of return sometimes destroy the farmer's wealth because they do not give enough information, especially for decision-making. They also send wrong

signals to managers about the enterprise and, in that way; good investment opportunities can be passed up).

- EVA is the framework underlying a comprehensive new system of corporate financial management that guides every decision, from annual operating budget to capital budgeting, strategic planning, and acquisition and divestitures.
- EVA is a simple but effective method for teaching business literacy to even the least sophisticated workers.
- EVA truly aligns the interests of managers with those of shareholders and causes managers to think and act like owners.
- EVA is a framework that companies can use to communicate their goals to investors. Conversely, it also helps investors to identify companies with superior performance prospects.
- Most important, EVA is an internal system of corporate governance that motivates all managers and employees to work co-operatively and enthusiastically to achieve the very best performance possible.

EVA is innovative in three important ways. Firstly, EVA is not bound by General Accepted Accounting principles (GAAP); its users are willing to make whatever adjustments are needed to produce more economically sound numbers. Secondly, EVA proponents have been pushing enterprises to use EVA in successively lower levels of the organisation. Finally, EVA offers a common performance language, which most other measures fail to do (Young, 1997).

EVA has been defined in several ways, as discussed above. The importance of EVA is discussed in the next section.

2.4.2 Importance of EVA

EVA is important because, when it is accompanied by cash accounting, it properly measures all three ways in which a company can create wealth: by raising the efficiency of the current operations, by achieving profitable growth and by paring

down uneconomic activities, so that the immediate exit proceeds more than make up for the subsequent cash flow forgone (Stewart, 1991).

Traditional performance measures are unable to describe an enterprise's true business results. Sometimes they lead to wrong business decisions because they provide less information than is needed to make decisions and send wrong signals to the managers about the performance of an enterprise. The EVA concept is easy to understand and easy to use. The following example is used to illustrate why traditional measures are unable to describe true business results. In this example, the ROA is 30%. The example shows how ROA and EVA can change after an investment producing a return of 20%.

Situation before investment:

Given:

Operating profit	30,000	
Capital employed	100,000	
Cost of Capital	10%	(0.1*100 000=10 000)

$$ROA = \frac{net\ profits\ after\ taxes}{total\ assets}$$

$$ROA = \frac{30\,000}{100\,000} = 0.3 \qquad 30\%$$

$$EVA = \left(\frac{NOPAT}{Capital\ \ invested} - Cost\ \ of\ \ Capital \right) x\ Capital\ \ invested$$

$$EVA = 30\,000 - 10\,000 = 20\,000$$

Investment opportunity

Given:

Operating profit	4 000	
Required capital employed	20 000	(offers a return of 20%)

Situation if the investment is made

Given:

Operating profit	30 000 + 4 000 = 34 000
Capital employed	100 000 + 20 000 = 120 000
Cost of Capital	10% (0.1*120 000 = 12 000)

$$ROA = \frac{34\,000}{120\,000} = 0.28$$ 28%

$$EVA = \left(\frac{NOPAT}{Capital\ invested} - Cost\ of\ Capital \right) x\ Capital\ invested$$

EVA = 34 000 -12 000 = 22 000

The above examples and calculations indicate that if an investment adds more to returns than to cost, it will lead to an increase in total returns but may result in lower ROA if the return on the additional investment is lower than the before investment ROA. ROA does not take into account the increase or decrease in the invested capital in account. The EVA calculation is simple, since only the main data contained in the income statement and the balance sheet are needed.

When the EVA concept is integrated in a company's decision-making process, this improves its business performance, because managers have a deeper knowledge of the capital and capital costs are therefore able to make better decisions. Moreover, using EVA eliminates the distortions that plague conventional accounting. Standardised accounting, for example, penalises managers for increased spending on innovations and brand building. During the innovation of a new product, the performance of an enterprise will appear depressed and that suggests poor performance to the managers. It makes it hard for them to jettison poorly performing assets and restructure. It causes aggressive financing to make poor investments look like winners, and distort true performance in many other ways as well. EVA removes the most destructive of these distortions so that managers can make better assessments of the impact of their actions on true economic profits (Ehrbar, 1998).

EVA is an important tool because it provides more information on which to base a decision than traditional measures do and avoids sending wrong signals to managers. Now that EVA and its importance have been discussed, the benefit of EVA can be examined in the next section.

2.4.3 The advantages of EVA

EVA is the single most reliable measure of a company's past performance. It accounts properly for all the ways in which corporate value may be added or lost (MäKeläinen & Roztocki, 1998). EVA is the tool that tells investors and managers where value has been created in a business and where value has been destroyed.

It is the only method that can clearly connect prospective capital budgeting and strategic investment decisions with the way in which actual operating performance could subsequently be evaluated (Stewart, 1991). It provides better bridges to link operations and strategy with financial results. EVA and net present value (NPV) are similar concepts because both measures tell us about the impact to shareholders wealth. (Ibendahl & Fleming, 2003). When the NPV of an enterprise is negative, it is unwise for managers to invest in that enterprise because it will not benefit them. When the NPV is positive, it shows that the enterprise will benefit from that investment. This also applies to EVA because positive EVA indicates that value is created while a negative EVA indicates that value is destroyed. MäKeläinen (1998) suggest that EVA and NPV should be in the commanding side in corporate control while traditional measures take the role of giving additional information. Thus EVA can have a constructive influence on investment decision-making.

EVA is a performance measure that provides a decision criterion in that it reflects a value beyond the cost of capital (MäKeläinen & Roztocki, 1998). One of the benefits of EVA is its simplicity and the ease with which it can be adjusted for risk. Risk can be adjusted by adjusting the risk premiums for the given companies and by adjusting the required rate of return for the farms concerned. EVA provides a system of management, which, if implemented, crafts the manager's work anew. It consists of all the financial policies, procedures, methods and measures that guide a company's

operations and strategy and therefore EVA is actually a financial management system (Mouritsen, 1998).

Managers need a language of value creation that will help them to convince capital providers that funds will be productively and profitably used in their enterprises. EVA provides a language that can be used to measure and communicate an enterprise's performance internally and externally, because it is expressed in rand terms. A rand term is more easily understood than percentages, because it is easy to see the performance difference between a small and a big company (Young, 1997).

One of the advantages of EVA is its conversion of accounting information to an economic reality that can be readily understood by non-financial managers. This advantage arises because EVA is expressed in rand terms rather than as a percentage. EVA is a useful tool in the allocation of a small company's scarce capital resources. It allows for a greater willingness to rationalize and redirect resources. It also has a positive impact on the management of assets (MäKeläinen & Roztocki, 1998).

EVA tends to identify unused assets. It can also, from the portfolio of assets, identify those assets that provide the lowest economic return (Turvey *et al*., 2000). By assessing a charge for using capital, EVA makes managers care about managing assets as well as income, and helps them to assess the tradeoffs between the two properly (Stern Stewart & Co., 1996). One of the benefits of EVA is that it inspires managers and employees to act and think like shareholders.

EVA has been beneficial to companies that have used it. Researchers have proven its usefulness and importance. However, no matter how good a performance measure is, it also has limitations. EVA's limitations are discussed in the next section.

2.4.4 Limitations of EVA

EVA is a short-term performance measure because growth opportunities of an enterprise are neglected by concentrating on the assets that are already in place (Johnson & Soenen, 2003).

Another limitation of EVA is that it is based on accounting profits. Accounting profits are a poor proxy for economic profit. The discrepancy between accounting earnings and economic earnings is exacerbated by inflation (De Villiers, 1997). According to Stewart (1991), the two most important ways to decrease accounting distortions are introducing a modified depreciation schedule or imposing a level of capital charge throughout the life of an asset. Either of these prevents the EVA from increasing simply because an asset is growing older (Kroll, 1997).

Acheampong and Wetzstein (2001) have found that it is often very difficult to calculate a value-based measure, because various adjustments must be made to the accounting figures. EVA is a short-term concept. It therefore uses only the current year's financial data. However, the objective of an enterprise is to maximise shareholders' wealth, which is a long-term strategy. Ideas that have a long-term payoff may be rejected because their future contribution may not be fully reflected in the numbers used to calculate EVA (Ibendahl & Fleming, 2003).

Like other financial performance measures, such as ROA, EVA on its own is inadequate as a means to assess an enterprise's progress toward achieving its strategic goals and to measure divisional performance. Other more forward-looking measures, often non-financial in nature, should be included in regular performance reports to provide early warning signs of problems (Wood, 2000).

2.4.5 What can be done to increase EVA?

The limitations of EVA have been discussed above. Ways that will help to increase EVA are needed. Ehrbar (1998) has identified four ways to increase EVA:

- Cut costs and reduce taxes to increase profitability on existing capital.
- Make investments that earn more than the weighted average cost of capital (WACC).
- Pull out of investments that earn less than the WACC.
- Structure the company's finances to minimise the WACC.

Stewart (1991) has identified the following ways in which value is created (EVA captures them all):

- More operating profits are generated without tying up any more funds in the business and that improves the rate of return earned on the existing base of capital.
- Additional capital is invested in projects that return more than the cost of obtaining the new capital.
- Capital is liquidated from, or further investment is curtailed in, substandard operations where inadequate returns are earned.

Managers can be successful in operating their enterprises if they adopt these ways to improve EVA as a performance measure and as a value creation language. There is one important question that arises after discussing EVA and traditional measures. That question is why EVA as a tool is so successful.

2.4.6 Success of companies using EVA

EVA is viewed as presenting a pragmatic approach to management. Various companies have used EVA for numerous reasons with a great amount of success. These companies have successfully used EVA to measure the economic

performance of business units and management's performance. Each of these companies had a different reason for using EVA. The Ball Corporation rejected the acquisition of an Eastman Kodak unit because the unit failed the EVA test. The Perfect Data Corporation and Incstar both discontinued unprofitable product lines based on EVA. IBM applied EVA for strategic direction to evaluate its strategic plans for key Latin American markets. Hamischfeger uses EVA to make decisions with respect to production sourcing and receivables, as well as inventory management. Deere and company use EVA to focus management on the value drivers of its business and the true costs of its asset base. By understanding the direct and opportunity costs associated with capital employed, managers (as the following examples illustrate) are better positioned to make shareholder-maximising decisions.

2.4.6.1 Coca-Cola

Roberto Goizuetta, the CEO of Coca-Cola, explains: "…we raise capital to make concentrate, and sell it at an operating profit. Then we pay the cost of capital. Shareholders pocket the difference" (Tully, 1993). Goizuetta left a motley group of businesses that made pasta, tea, plastic cutlery, decentralization equipment, and wine, but kept the soft drink business that earns far in excess of the cost of capital. He also focuses on raising returns far faster than the cost of capital. Coca-Cola had practically no debt in the 1980's. Goizuetta decided to make extensive use of borrowings, which is far cheaper than equity capital, to lower the average cost of capital from 16% to 12%. One can determine the cost of debt by using the following formula:

$$K_d = I(1-T)$$

Where:

k_d = *the after tax cost*

I = the interest rate

T = tax

The tax benefit on interest is taken into consideration, whereas no tax benefit is available when the cost of equity is determined. By using more debt, the proportion of debt: equity is larger, resulting in an exponential decrease of WACC.

$$WACC = Cost\ of\ Equity \times \frac{Equity}{Total\ Assets} + Cost\ of\ debt \times \frac{Debt}{Total\ Assets}$$

Goizuetta also enhanced operational efficiency by coaxing the business into doing more with the capital it had and Coca-Cola now produces more with 40 plants than with 52 plants in 1982. As a result of these actions, Coca-Cola's share price has increased from $3 to $43 over the 12-year period since Goizuetta took over (Tully, 1993).

2.4.6.2 CSX

CSX, a shipping/transportation company, increased its freight by 25% while reducing the number of its shipping containers by 4 000 and the number of locomotives it uses by 50. They did this by noting that a given train that required four locomotives and travelling 28 miles per hour would arrive at its destination four to five hours before it could be unloaded. Using three locomotives travelling at 25 miles per hour would increase travel time by three hours (but that time would have been idle anyway). This thinking reduced the capital employed by $70 million (Martin, 1996).

2.4.6.3 Quaker Oats

Quaker Oats used to provide significant premiums or price discounts to channel partners and retailers to encourage them to load up on Quaker Oats' products. Encouraging retail purchases, especially at the end of each quarter when earnings reports had to be supplied, meant that huge amounts of inventories had to be held, and huge warehouses were required for storage. After the so-called "trade loading", many warehouses were nowhere near capacity, yet significant overhead costs were incurred by idle warehouses, and significant working capital was employed during the routine build-up of the quarterly inventories. In response to EVA, Quaker Oats ended the trade-loading policy, reduced inventories by $6 million while increasing sales, and

closed five out of 15 warehouses, which resulted in a saving of an additional $6 million (Tully, 1993).

2.4.6.4 SPX

SPX Corporation has five business segments. The technical products and systems segment focuses on solving customer's problems with complete technology-based systems. Secondly, industrial products and services provide productivity solutions for industry. Thirdly, the flow of technology segment has businesses that design, manufacture and market solutions and products that are used to process or transport fluids, as well as transfer heat and provide air treatment. Fourthly, the cooling technologies and services segment provides a diverse offering of cooling products and systems, thermal components and engineered services for the power generation, refrigeration and industrial market. Lastly the service solutions segment includes operations that design, manufacture and market a wide range of speciality tools, service equipment, technical and training information. EVA has helped SPX to improve both its operating performance and its use of capital. During 1996, SPX associates were included in the EVA compensation plan. This action resulted in a 15% reduction in inventories, a reduction of $33 million in working capital and a net debt reduction of 86 million. EVA has been a catalyst in producing a quick financial turnaround and a remarkable culture transformation. According to the SPX Corporation, EVA is one of the financial measures that links all the shareholders in a company and it encourages associates to think and act like owners. It has become a common language, a mind-set, and the way the company does business (SPX Corporation, 1997).

2.4.6.5 Eli-Lilly

"EVA forces you to align your thinking with shareholder value and causes you to focus on capital expenditures," says Randall Tobias, CEO of this pharmaceutical company. The pharmaceutical industry is a very capital-intensive business, which is why capital expenditure is so critical to this industry. Companies are required to command a return on a new drug or laboratory in which they have invested, well in excess of the cost of the capital financing the asset. Eli Lilly adopted EVA in June

1994 and the company has exceeded its 1994/1995 target. This means that all stakeholders had a positive balance. Shares are performing well too. The share price has also gone up to 105% over the same period (Martin, 1996).

2.4.6.6 New Clicks

The company is an investment holding company. New Clicks Holdings Ltd's trading subsidiaries are engaged in the discount retailing of toiletries, cosmetics, gifts, recorded music and other merchandise on a cash basis, in South Africa and in Australia. Some of the company's subsidiaries operate as franchisors. In addition, the company is the sole shareholder in property-owning subsidiaries. EVA was first implemented at the management level in New Clicks during 1995. It was then implemented for all 5000 staff members with the difference that bonuses are paid out immediately. Mr Peter Green, the financial director of New Clicks, has stated that there has been a vast improvement at most Clicks, Diskom and Musica stores (Hogg, 1997).

2.4.6.7 Briggs and Stratton

Briggs and Stratton once took great pride in its ability to manufacture small engines, but this pride did not compensate the company for a 7.7% return on capital when the cost of that capital was 12%. Briggs and Stratton allowed the managers to outsource the manufacturing of some parts where the costs of in-house resources were just too high to justify the capital expenditure (Tully 1993).

EVA aligns management and shareholders' interests by giving managers the motivation to choose strategies and to make operating decisions that maximise shareholder wealth. It also provides sufficient leverage, as measured by the variability of potential rewards, to motivate managers to work long hours, take risks, and make unpleasant decisions such as laying off staff or closing a plant.

EVA limits the risk that valued managers will accept a better offer, especially during industry downturns and recessions. It also keeps shareholders' costs at reasonable level. EVA has been proven to work virtually everywhere, because it is the right

approach for all companies in all times and in all environments, according to Ehrbar (1998).

Many companies have used EVA and they have had good results, as their performance has increased. However, some research about the use of EVA has suggested that some false claims are made about EVA. In the next section, these claims are discussed in detail.

2.4.7 False claims about EVA

EVA is a performance measure that improves a company's performance. It shows that the success of a company is determined by how much it makes in excess of its rand financing costs. Making EVA an absolute measure enables managers to choose viable projects that will not destroy value. Maximising value is equivalent to the traditional objective of maximising farm value. Damodaran (1998) is prepared to support EVA, but only if the proponents of EVA stopped at this point. He indicates that there are some who, in the process of selling the measure, go beyond these claims. The false claims about EVA are listed as follows:

- *"EVA is a new and evolutionary way of thinking about financial decisions."* EVA is merely a net present value presented differently. There is little in the measure that can claim to be original, other than its name.
- *"EVA is not an accounting measure."* In truth, EVA is very dependent upon accounting measures such as operating income and capital invested, although adjustments are made to both. De Villiers (1997) also points out that EVA is based on accounting profits.
- *"An investment with a positive EVA is a good investment."* Damodaran (2003) agrees that this statement is clearly true, if EVA is computed based on the capital invested in an asset rather than its current market value.
- *"Enterprises make better investment decisions when they use EVA to analyse projects."* This statement might be true if the only alternatives to using EVA were accounting return measures and simple cash flow approaches (such as payback). If the alternative is NPV, using EVA does not result in better

investment decisions. Since NPV is the more general approach, it is EVA that is likely to lead to errors on project choices.

- *"Valuing an enterprise using its EVA provides a more precise estimate of value than traditional valuation models."* Discounted cash flow valuation and EVA should yield the same enterprise values, as long as the assumptions made are consistent across the approaches.
- *"An enterprise with a positive EVA, on average, allocating capital well since it is earning surplus value."* The value of the enterprise's assets is the present value of the EVA generated by them. Thus an enterprise could be generating a positive EVA in a current year from assets, but the expected EVA in future years may be negative, making these assets poor investments.
- *If an enterprise increases its EVA this year relative to last year, it has become more valuable."* An enterprise that increases its EVA relative to the previous year's EVA or even relative to expectations might have done so by trading off against future growth or increasing its risk. If it has done so, the enterprise value can decrease even as the EVA increases.
- *"EVA is a risk-adjusted measure."* It is argued that EVA is a risk-adjusted measure because it is defined as an excess of earnings over the cost of capital. Thus, it is argued that an enterprise that increases its EVA, even with higher risk, should be more valuable. The problem with this argument is that while the EVA may be risk-adjusted, it still has to be discounted back to the present to arrive at the value of the enterprise.
- *In a rational market, an enterprise that increases its EVA will also increase its market value."* The reported increase in EVA has to be greater than expected for the enterprise to increase its market value.
- *"Increases in EVA are more highly correlated with the increase in market value than other variables such as earnings per share or operating income."* The results with regard to this statement are, in fact, mixed. The studies that claim to show the correlation between increases in EVA and increases in stock prices find very low correlations, and there are studies such as those of Bernstein & Pigler (1997) and Bacidore *et al*. (1997) that indicate almost no correlation.

EVA has been discussed and it has been found to be a very important financial performance measurement tool. It is not a new discovery, but it became very popular in the 1980's. The benefits and the importance of EVA and traditional measures have been discussed. Limitations have also been touched on, together with false claims about EVA. Ways of increasing EVA and the reasons why EVA is so successful have been dealt with. Next, the traditional measures and EVA are compared to see which is best.

2.5 COMPARING TRADITIONAL MEASURES AND EVA

Peterson and Peterson (1996) have compared the traditional and value-added measures. Their findings suggest that although traditional measures have little theoretical appeal, they should not be eliminated as a means of evaluating performance. This is because the traditional measures are not empirically less related to stock returns than return on capital. They state that the focus on economic rather than accounting profit plays an important role in the evaluation of performance because managers' goal then tends to be value creation rather than the mere manipulation of short-sighted accounting figures. On the other hand, the results of research by Biddle, Bowen and Wallace (1997) suggest that EVA components contribute only marginally to the information already available to market participants in NFI.

Comparing traditional measures of farm performance and EVA, Fatemi *et al*. (2003) have found that EVA and MVA are better predictors of cross-sectional variation in top manager pay than traditional performance measures such as ROA, although they found the relationship between EVA and compensation to be weaker.

Acheampong and Wetzstein (2001) argue that the value-based measures are not significantly different from traditional measures of performance and must not replace them. Value added measures could be used along with traditional measures when necessary.

Ibendahl and Fleming (2003) argue that EVA is superior to ROA and ROE. That makes EVA the right measure to use for setting goals, evaluating performance, determining bonuses, communicating with investors and capital budgeting and valuation of all sorts. Biddle *et al.* (1999) conducted a study to find out whether EVA dominates other earnings like NFI and operating cash flow (OCF). They found that EVA does not dominate traditional accounting earnings in association with the stock returns and enterprise values. On the contrary, the evidence suggests that, on average, NFI appears to outperform EVA. This implies that earnings generally beat EVA in value relevance to market participants.

EVA is based on common accounting-based items such as interest-bearing debt, equity capital and net operating profit. It differs from traditional measures mainly by including the cost of equity (MäKeläinen, 1998). Mathematically, EVA gives the same results in valuation as the Discounted Cash Flow (DCF) and Net Present Value (NPV) (Ibendahl & Fleming 2003). The DFC and NPV have been acknowledged as the best analysing tools from a shareholder's perspective. These measures include the opportunity cost of equity and they take into account the time value of money. They also do not suffer from any kind of accounting distortion. On the other hand, DFC and NPV do not suit performance evaluation because they are based exclusively on cash flows. MäKeläinen (1998) regards EVA as the measure that is best suited to performance measurement, even though EVA and the traditional measures DCF and NPV are equivalent. MäKeläinen (1998) concluded that this equivalence between EVA and traditional measures such as DFC and NPV has nothing to do with performance measurement.

Zimmerman (1997) concludes that the best performance measure is the one that, without imposing excessive costs, gives managers the strongest incentives to take actions that increase enterprise value.

EVA and traditional measures have been compared in the past. Research has been done on EVA and traditional measures. In most of the studies it has been concluded that EVA is the best performance measure and is better than traditional measures.

2.6 CONCLUSION

In this chapter, performance measures have been discussed. Financial performance measures are very important in assessing farms' financial performance, and such assessment is very important for the control function. Farm financial managers use financial performance measures to assess the profitability of their businesses. Profitability measures explain how efficient the business or enterprise is in using its resources to produce profit. They allow the enterprise to assess changes in profits relative to the condition of other financial measures.

The information needed to calculate these measures is found on the balance sheet and the income statement. Traditional measures, together with their benefits and limitations, have been discussed. It has been shown that they are unreliable because they are based on accounting data and are subjective in respect of the accounting procedures that are used. ROA, ROE, OPM and NFI are the traditional performance measures discussed in this study. EVA as a performance measure has also been discussed and compared to traditional measures.

ROA is probably the single best overall measure of operating performance. There is no reason to abandon ROA, because it is a very good and illustrative measure. ROA can always be used along with EVA to measure company performance. ROA provides additional information, although decisions could not be made based on ROA only. Maximising the rate of return does not matter when the goal is to maximise the returns to shareholders. EVA should be in the commanding role in corporate control and the ROA should have the role of giving additional information.

The biggest advantage of using ROE is that it is one of the traditional measures which is easy to compute and widely understood. ROE is a useful and important tool, but it must be interpreted in the light of its limitations and should never be used mechanically to suggest that a higher ROE is always better than a lower one.

NFI is a meaningful absolute profitability measure of the business from year to year. It is not very useful, however, for comparing the profitability of one farm to another.

For these reasons it is better to use ratio measures to get better general performance indicators. The OPM ratio measures the profitability of the enterprise as a proportion of the volume of production. This ratio demonstrates how an enterprise can increase its profitability. An enterprise can increase its profitability by increasing the OPM ratio while maintaining the same size of operation and the same interest obligations.

The disadvantages of using traditional measures instead of EVA have been touched upon as well. More information is needed to calculate traditional measures than to calculate EVA. Another problem is that the traditional measures are distorted by accounting anomalies and that leads to poor performance results. Traditional measures should be taken as informative measures but not as a guide for the enterprise. EVA happens to be a solution to the anomalies encountered with traditional measures.

One of the main advantages of EVA is the ease with which employees at all levels can grasp it and put it to use. It is easy to understand and it provides a common language that can be translated into actions. However, EVA is not a panacea and should never be viewed as a substitute for good management practice. EVA and other financial metrics are only guides and do not say where a problem may lie. EVA has its benefits and limitations. More than 300 companies have used it and they have reported it to be the best tool to create wealth.

The advantages of using EVA to measure business health more than compensate for the known disadvantages of this measure. The problem with EVA is that it causes difficulties in comparing companies or business units of different sizes. Grouping farms into categories according to type and size can minimise this limitation. People have also made some false claims about EVA, which need to be debunked. These claims have been discussed and it is clear that some people have not yet understood EVA.

EVA and traditional measures have been compared. It is clear from this comparison that EVA is better in many respects than the traditional measures. EVA is a measure that can be used to set goals, evaluate performance, determine bonuses, communicate with investors and be used for capital budgeting and valuation of all

sorts. Value-based measures are not significantly different from traditional measures of performance and must not replace them. Traditional measures should not be eliminated as a means of evaluating performance even though they have no theoretical appeal. They should be used in conjunction with EVA.

In the next chapter, the importance of agriculture in the South African economy is discussed, followed by a discussion of the gross value of production in the milk industry. The chapter also highlights the Milk Producers' Organization (MPO).

CHAPTER 3

AGRICULTURE IN SOUTH AFRICA AND THE MILK INDUSTRY: AN OVERVIEW

3.1 INTRODUCTION

The literature on traditional measures and EVA has been discussed in the previous chapter. The agricultural sector has been chosen as the focus for this study because no previous study had as yet been undertaken in this field in South Africa. Furthermore, because of the role that agriculture in general and the milk industry in particular plays in the South African economy. Agriculture is a generator of wealth. It also supplies basic human needs and employment, especially in the rural areas. It is an important earner of foreign exchange and contributes to the GDP. This chapter highlights the importance of agriculture in the South African economy. The gross value of agricultural production and the South African milk industry are dealt with.

3.2 THE IMPORTANCE OF AGRICULTURE IN THE SOUTH AFRICAN ECONOMY

Agriculture is a generator of wealth and constitutes one of the key industries in the country's economy. The situation regarding agriculture not only concerns farmers, urban areas and secondary manufacturing: because of the input agriculture requires, its outputs and its function as an employer, it has a profound impact on the entire economy. Agriculture provides for basic human needs and it is a prerequisite for an acceptable economic, political and social order, as well as for the general stability of society.

Agriculture's direct, private contributions to farm households are tangible, easy to understand and simple to quantify. Rural households produce and consume food,

sell commodities to earn profits and find farm jobs for wages. Many of agriculture's direct contributions to non-farm households, to urban centres and even to the National Treasury are also easy to recognize and measure. Like other economic sectors, agriculture produces export earnings and tax revenues for public spending needs. As farm incomes increase, households save more and spend more, stimulating growth and investment in other sectors. The agriculture sector also contributes less tangible, non-market-mediated services and benefits. Table 3.1 shows the direct and indirect contribution to the private and public sector by the agricultural sector.

Table 3.1: Agriculture's contribution to the private and public sectors

	DIRECT	INDIRECT
PRIVATE	Food production Income generator Employment and wages	Household food security Safety net Health and prosperity Agri-tourism Cultural identity
PUBLIC	Tax revenue Surplus labour Export/foreign exchange Food Products for emerging agro-industries	Soil conservation, watershed services Biodiversity benefits Carbon sequestration National cultural heritage Rural-urban balance Rural viability

Source: Kirsten (2004)

Agriculture is an important sector in the South African economy, despite its relatively small share of the Gross Domestic Product (GDP). The agricultural sector encompasses not only the primary agricultural activities but also includes the input and financial sectors, as well as agro-processing firms. Together, the agro-food complex contributes between 14% and 20% of the GDP and remains an important provider of employment, especially in the rural areas, and an important earner of foreign exchange (Fenyes & Meyer, 2003). Many of the poorest communities in the rural areas rely on agricultural activities as one of their many strategies to earn a

livelihood. The agro-food sector also provides food and fibre, two of the most basic needs of all human beings (NDA, 2003). The relative contribution of agriculture to the GDP, its share of the labour force and its contribution as an earner of foreign exchange highlight the importance of the sector.

3.2.1 The contribution of agriculture to the GDP

Although the contribution of agriculture to the GDP of the country has declined over the years, this does not mean that agriculture is no longer important in South Africa. The direct and indirect contribution of agriculture to the economy, like that of other sectors, must not be underestimated. Figure 3.1 shows the population growth and agricultural production.

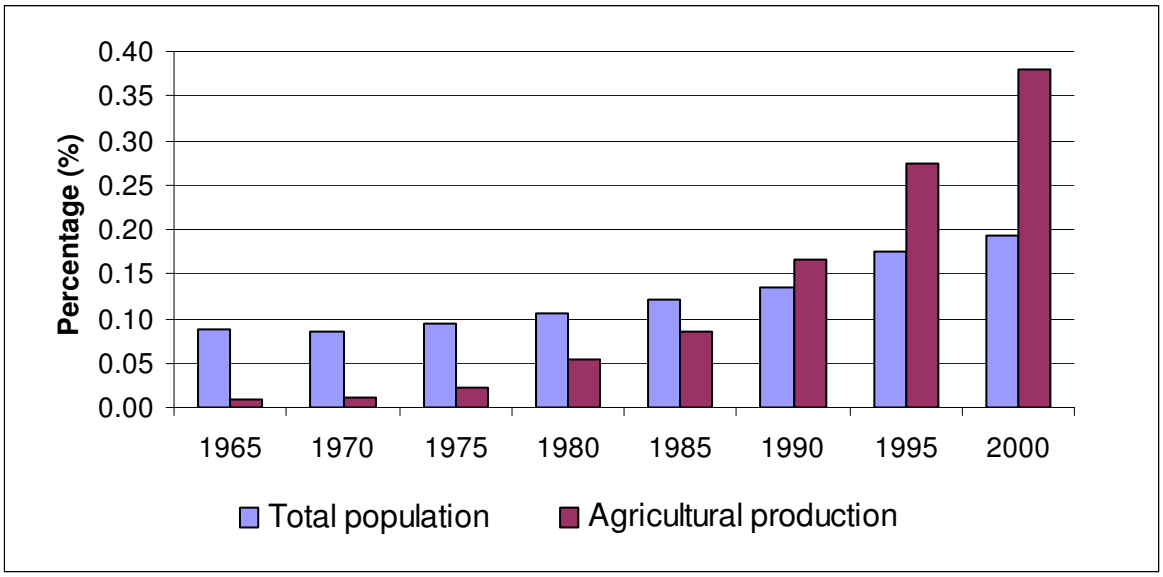

Figure 3.1: Percentage growth (year-on-year) in population and agricultural production, 1965 - 2000 (*ABSTRACT*, 2004)

In agriculture, the following factors demand attention:

- The most important role played by agriculture is providing our population with food at affordable prices. Over the past 55 years the population has grown faster than food production by at least one per cent and, as a result, the *per*

capita food output in Africa has been falling steadily over the past few decades. Between 1978 and 1987, for instance, it fell by 0.7% annually, and from 1987 to 1994 it fell by 0.6%. It started to rise in 1994 (NDA, 2003). This can result in the rise of agricultural produce prices, owing to the underlying supply and demand factors. The reason for these is that agricultural production is, by volume, still higher than domestic demand. The surplus is exported, and South Africa is still one of the seven countries in the world that are net exporters of agricultural produce.

- South Africa sells its agricultural produce internationally, despite the fact that agricultural subsidies are substantially higher in many countries than in South Africa. This has resulted in the limitation of an increase in domestic prices in agriculture in order to remain internationally competitive.

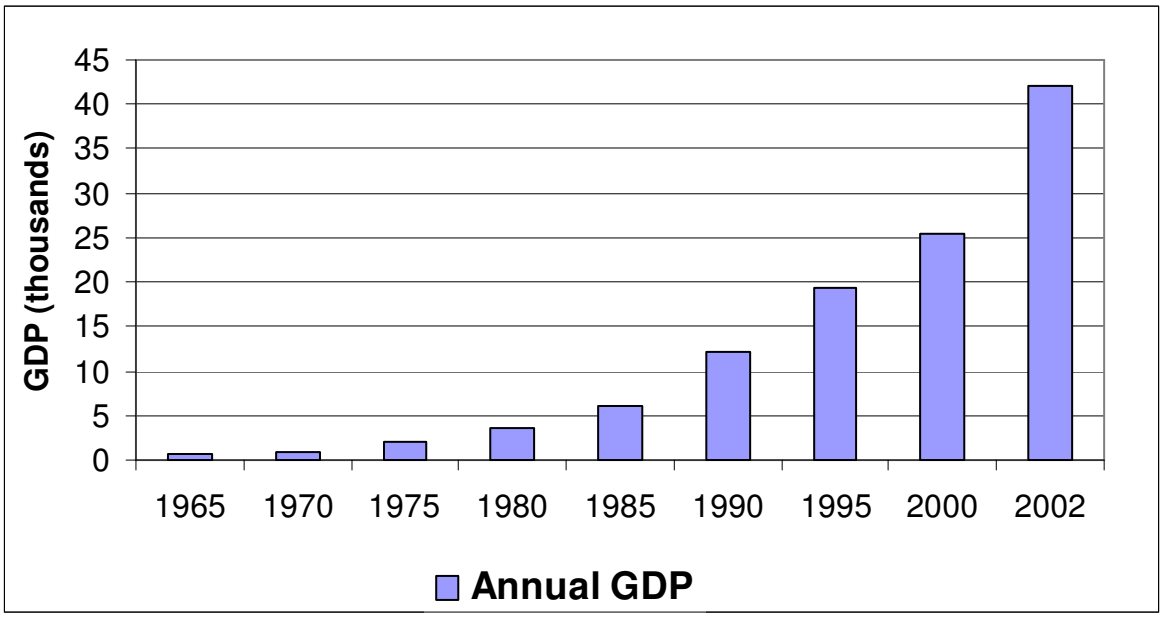

Figure 3.2: Agriculture's contribution to the GDP, 1980 - 2002

(*ABSTRACT*, 2004)

Figure 3.2 shows that agriculture's contribution to the South African GDP increased from R190 million in 1946 to R42 098 million in 2002 (*ABSTRACT*, 2004). The value added by the agricultural sector grew by 3.8% during this period. The growth in the GDP has been accompanied by a high degree of diversification of the economy.

Figure 3.3 shows that the lower growth rate of the agricultural sector relative to that of the overall economy has resulted in a steady decline in its share in the GDP.

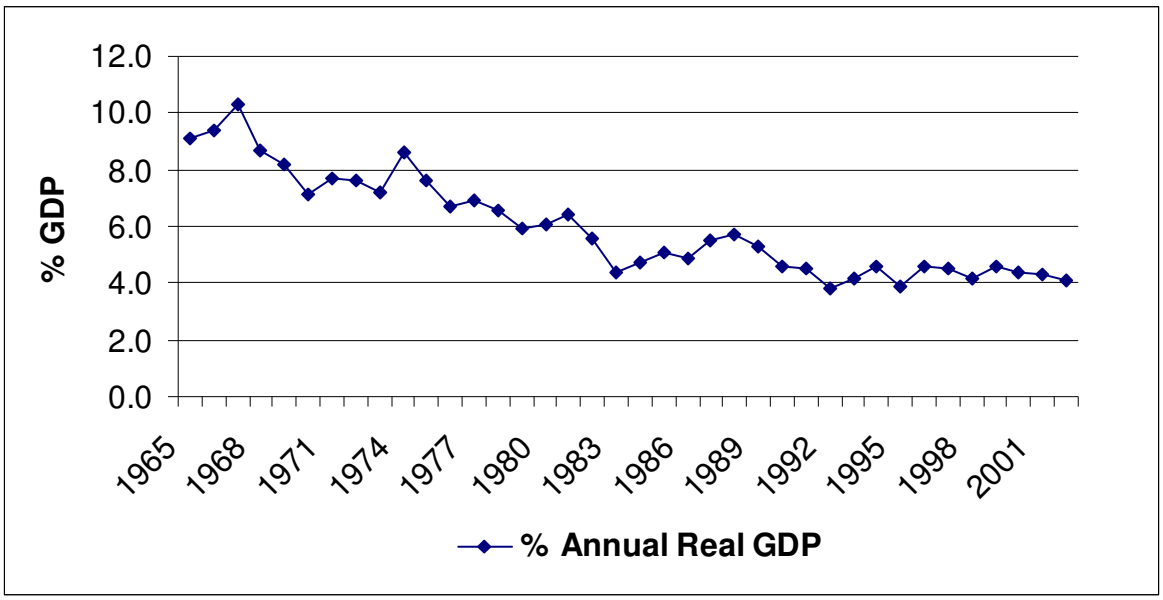

Figure 3.3: Agriculture's percentage contribution to GDP, 1965 - 2003 *(ABSTRACT, 2004)*

The average annual real GDP was 9.0% during the 1960s, 7.2% during the 1970s, 5.4% during the 1980s and only 4.3% during the period from 1990 to 2002 (Fenyes & Meyer, 2003). The low contribution of agriculture to the GDP does not mean that agriculture is not important. The true values lie in its backward and forward linkages. The impact of agriculture's performance on the economic growth rate can be linked to the negative influence in years when agricultural production is adversely affected by natural factors such as droughts, while favourable periods have a positive impact on the economic growth rate.

3.2.2 Contribution to employment

Primary agriculture offers the largest employment opportunities in the country. It is an important source of employment. The majority of Africans are rural, and for these people, their incomes and livelihoods are directly and indirectly linked to agriculture. Commercial farmers employ more than 1 million workers — in the emerging

agricultural sector, one million small-scale farmers and employers earn a living from agriculture (NDA, 2003). Within the broad sector of agriculture, hunting, forestry and fishing, the agriculture and hunting sub-sectors together account for 92% of all employment opportunities (*ABSTRACT*, 2004).

Employment in this sector has gradually declined since the 1980's. This might be the result of the deregulation of agricultural product markets, a slashing of subsidies and the elimination of import tariffs. Mandatory minimum wages may also have contributed to the decrease in the number of farm workers (Department of Labour, 2003). Some employers retrench those workers they can no longer afford — that affects more than half of all farm and domestic workers. Vink and Kirsten (1999) argue that the only way in which agriculture can become a creator of employment opportunities is through a wider and deeper export drive, supported by policies that encourage the employment of a larger workforce.

3.2.3 Agriculture as an earner of foreign exchange

Agriculture is a net earner of foreign exchange. Export earnings in this sector have increased at a more rapid rate than import expenditure. Agriculture has made an enormous contribution to foreign exchange earnings in the last few years, despite poor production conditions in agriculture and persistent recessionary conditions in the economy as a whole in the early 1990s. That has helped the country to meet its foreign debt obligations. The value of agricultural exports has shown the biggest increase in comparison with other sectors in the economy since 1993. This was the result of a high demand for South Africa's deciduous fruit, citrus, wool, mohair, groundnuts, cut flowers and bulbs (Fenyes & Meyer, 2003).

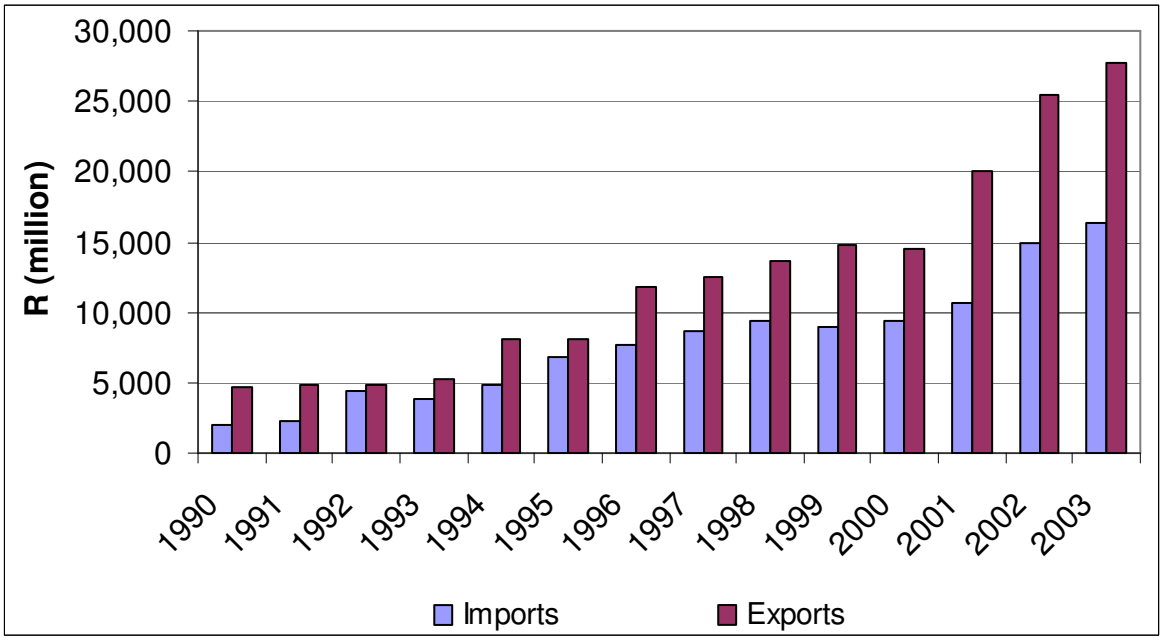

Figure 3.4: Annual agricultural imports and exports, 1990 – 2003

(*ABSTRACT*, 2004)

Figure 3.4 shows that the estimated value of imports for the year 2003 came to approximately R16 297 million, compared to R14 939 million for the whole year in 2002. The estimated value of exports increased from R25 460 million for 2002 to about R27 774 million for 2003. According to the 2003 export values, wine, citrus, grapes and apples, pears and quinces were the most important export products. Rice, wheat, palm oil, undenatured ethyl alcohol and oil cake were the most important import products (NDA, 2003).

3.2.4 Agricultural and food policies

The most significant achievement in terms of policy change was the deregulation of the **marketing** sector to bring it into line with the social and economic democratisation of the country and with the international trend towards deregulation. The marketing of most agricultural products in South Africa was regulated by statute, largely under the 22 marketing schemes introduced from 1931 and especially from the time of the 1937 Marketing Act (Fenyes & Meyer, 2003). That continued until early 1998. The Marketing of Agricultural Products Act, Act 47 of 1996, changed the

way in which agricultural marketing policy was managed (Fenyes & Meyer, 2003). It also opened up the sector to world market influences in a manner that could hardly have been anticipated a decade earlier. During the transformation process, greater emphasis was placed on developing small-scale agriculture. Significant progress has been made in land reform, access to credit and market opportunities.

There are other important policies in and outside agriculture such as policies with regard to land reform, labour market reform, trade policies, institutional restructuring in the public sector and infrastructure programmes in the rural areas. The general purpose of these reforms was to correct the injustices of past policy, principally through land reform, to get the agricultural sector onto a less capital-intensive growth path, and to enhance the international competitiveness of the sector.

The consequences of these changes in policies can be measured in terms of the main trends in output, input use, productivity, profitability and foreign trade in the agricultural sector. The Total Factor Productivity ratio is used to measure the effects of deregulation. Efficiency is measured by the ratio of the total value of outputs to the value of inputs used in agriculture. To gain profit, one must use less input and achieve more output.

3.2.5 The asset base in agriculture

Figure 3.5 shows the value of capital assets. From 1982 to 2002, the value of capital assets declined by 63%. The value of capital assets in agriculture on 31 December 2003 was estimated at R110 302 million.

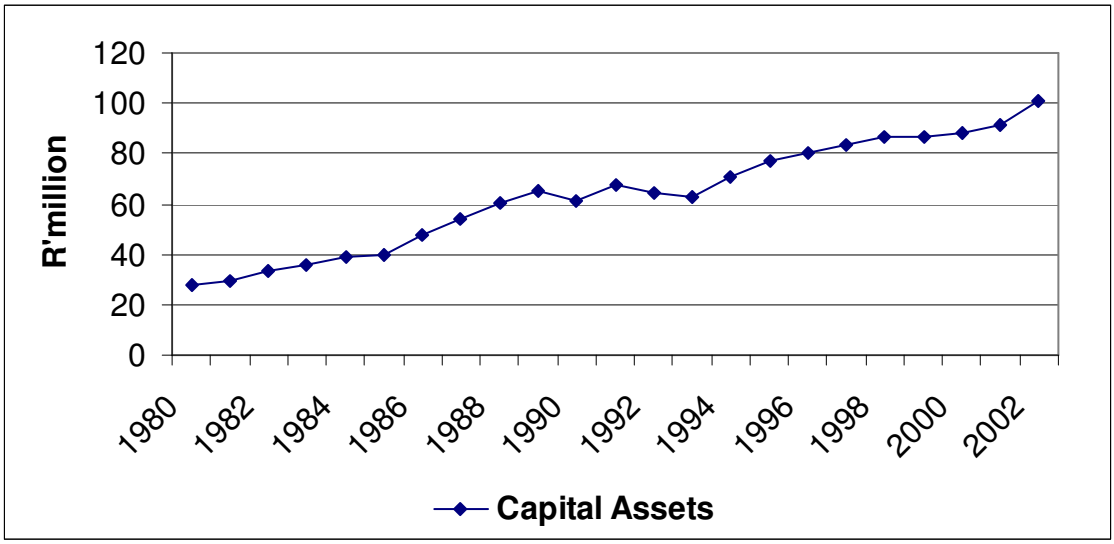

Figure 3.5: Value of capital assets, 1980 - 2002

(*ABSTRACT*, 2004)

Land and fixed improvements constituted no less than R61 780 million, machinery and implements R 19 172 million, and livestock R 29 350 million of the total value of capital assets. The gross investment in respect of fixed improvements for the year that ended on 31 December 2003 increased from the previous year by 9.8% to R2 766 million. In the case of machinery, implements and vehicles, investment decreased by 3.5% and amounted to a total of R3 887 million. The livestock inventory is estimated to have decreased by R 198 million during 2002 (NDA, 2003).

3.2.6 Agricultural debt

Figure 3.6 depicts the shifts in agricultural debt since 1970. Farm debt is increasing because of new technologies and agricultural practices. Inputs are expensive and there has been a high growth in wages that in turn resulted in an increased total wage bill.

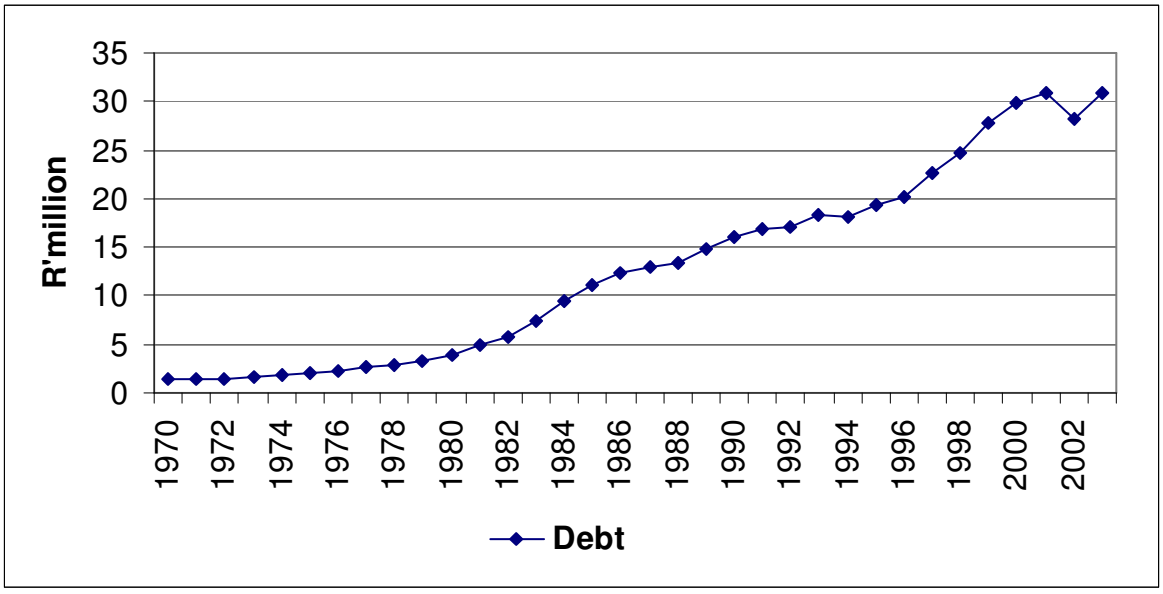

Figure 3.6: Total farming debt, 1970 - 2003

(*ABSTRACT*, 2004)

Figure 3.6 shows that the total farming debt at the end of December 2003 was estimated at R30 879 million, which is an increase of 9.4%.

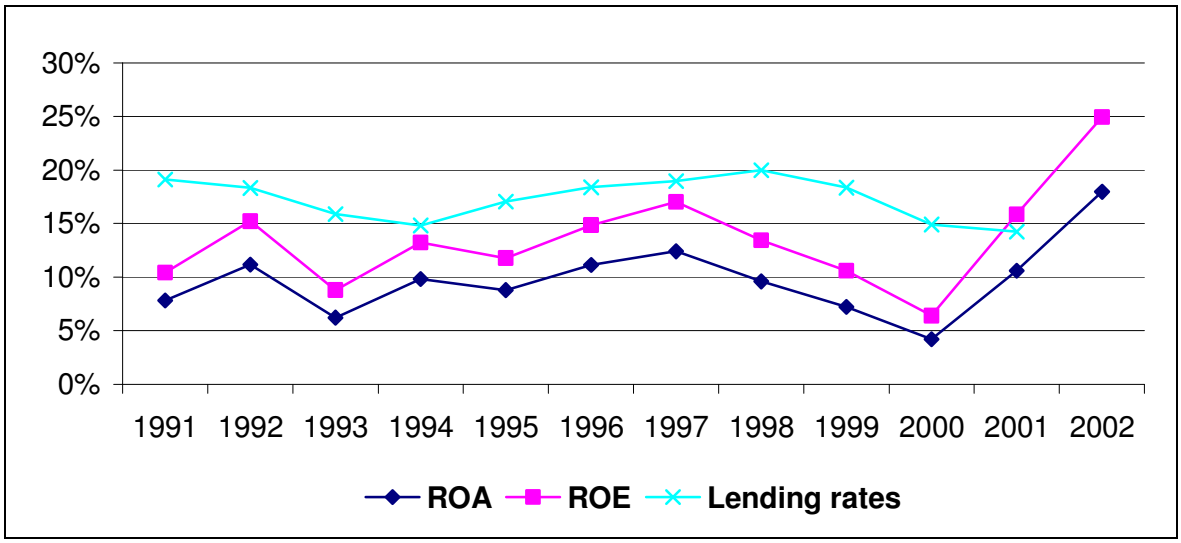

Figure 3.7: ROA, ROE and interest rates, 1991 - 2002

(*ABSTRACT*, 2004)

The debt: capital ratio improved significantly between 1999 and 2002. This was the result of a 19% decline in real farming debt since 2000 and a slight decrease of 2% in

real capital assets. Figure 3.8 shows the changes in the ROA, the ROE and interest rates. The ROA and ROE are lower than the lending rate from 1991 to 2000. This means that farmers were unable to create wealth. The ROE rose in 2001 and 2002, which means that borrowed funds had been used successfully. It is important that the ROE is above the lending rate for farmers to increase their wealth.

Agriculture plays an important role in our economy. It may seem as if it contributes little, but the truth is that agriculture is underestimated. It is the provider of employment and millions of people rely on agriculture to earn a livelihood. Agriculture as an earner of foreign exchange has made a difference in this sector. The deregulation of some policies has resulted in justice, growth and competitiveness in agricultural sector. Agricultural debt is increasing and there is a lot to be done in order to decrease it. The gross value of production is discussed below in order to show which products contribute most in this sector.

3.3 GROSS VALUE OF PRODUCTION

In the years between the two world wars the volume of agricultural production in South Africa doubled, but the gross value of agriculture increased by only 45%. During these years agricultural progress was seriously hampered by poor marketing conditions, low prices and drought.

The total value of agricultural production in 2003/04 was R70 485 million. Field crops contributed R18 906.5 million, horticulture R20 581.6 million, and livestock products R30 942.9 million. In the last 25 years or so there has been a marked change in the market segmentation in agriculture. There has been a shift away from field crops (from 48% in 1978/79 to 26.9% in 2003/04), and a shift towards horticulture culture (from 16% in 1978/79 to 29.2% in 2003/04). Livestock production has increased (from 36% in 1978/79 to 43.9% in 2003/04).

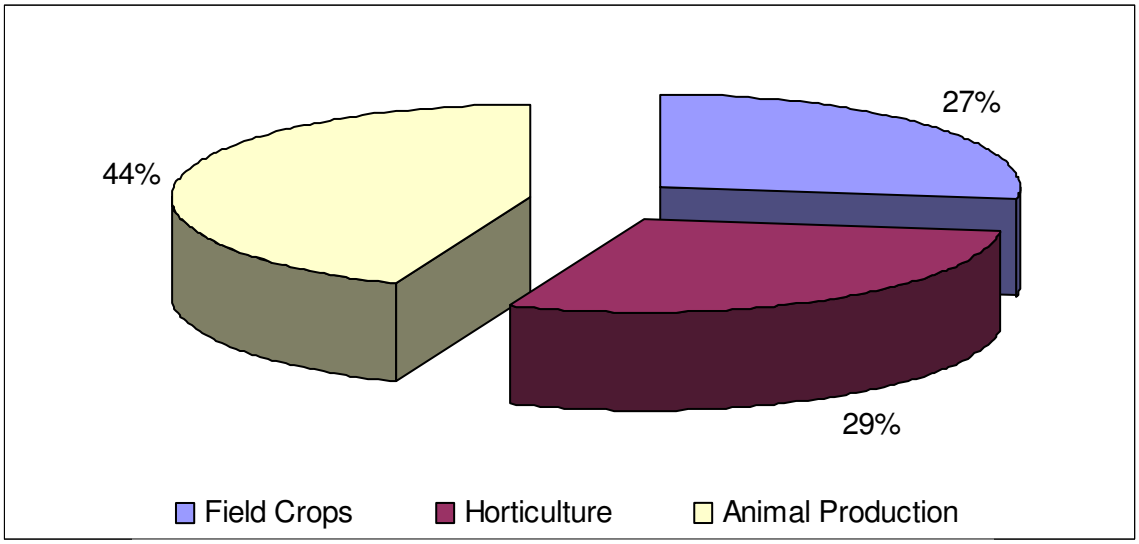

Figure 3.8: Gross value of agricultural production per sector, 2003 - 2004 (*ABSTRACT*, 2004)

Figure 3.8 shows that the gross value of animal products, field crops and horticultural products contributed 44%, 27%, and 29% respectively to the gross value of agricultural production in the 2003/04 period.

According to ABSTRACT (2004) there are some 100.6 million hectares of agricultural land in South Africa (excluding former homelands), of which approximately only 16.7 million hectares (13.7%) has a high enough rainfall for the land to be considered arable for farming. The remainder is used extensively for grazing (83.9 million ha or 68.6%), forestry (1.4 million ha or 1.2%) and nature conservation (11.8 million ha or 9.6%). About 1.35 million ha (7.8%) of the arable land is irrigated, yet is responsible for at least a third of total agricultural production. The sectors mentioned above fall within this resource endowment.

One of the agricultural products in South Africa is milk. Milk is the only animal production product that is dealt with in detail in this study. The reason why the milk industry has been chosen is low milk prices, high feed prices and small profit margins. Another reason is the need to find out whether milk producers add or destroy value.

3.4 THE MILK INDUSTRY

Milk production is an important agricultural industry in South Africa. It is the fifth largest agricultural industry among the top 20 gross production value contributors to agriculture in South Africa. (Table 3.2 shows that the biggest industry is maize and that it has been doing well for the past decade or more. Deciduous and other fruits were in third position during 2001/2002, then fourth in 2002/2003.) Cattle and calves slaughtered took the third place in 2002/2003 and the rest of the industries stayed in the same position for both seasons.

Table 3.2: Top 20 agricultural industries based on gross value

Number	Products	Rank	2001/2002 R'M	Rank	2002/2003 R'M
1	Maize	1	13,865,533	1	9,828,375
2	Fowls slaughtered	2	7,945,419	2	8,618,569
3	Cattle and calves slaughtered	4	4,584,945	3	5,753,002
4	Deciduous and other fruit	3	4,609,160	4	4,753,838
5	Milk	5	3,898,562	5	4,241,528
6	Wheat	6	3,559,642	6	3,953,173
7	Sugar cane	7	3,389,912	7	3,888,038
8	Vegetables	8	3,027,541	8	3,818,730
9	Citrus fruit	9	2,801,662	9	2,885,838
10	Eggs	10	2,761,797	10	2,642,200
11	Potatoes	11	2,528,471	11	2,528,471
12	Viticulture	12	2,330,201	12	2,330,201
13	Hay	13	1,804,760	13	1,804,760
14	Sheep and goats	14	1,614,525	14	1,614,525
15	Pigs	15	1,247,997	15	1,394,242
16	Other livestock products	16	1,205,983	16	1,247,997
17	Wool	17	1,197,689	17	1,205,983
18	Sunflower seed	18	1,136,585	18	1,197,689
19	Subtropical fruit	19	971,554	19	1,136,586
20	Tobacco	20	716,674	20	971,554

Source: *ABSTRACT* (2004)

3.4.1 Milk production and consumption

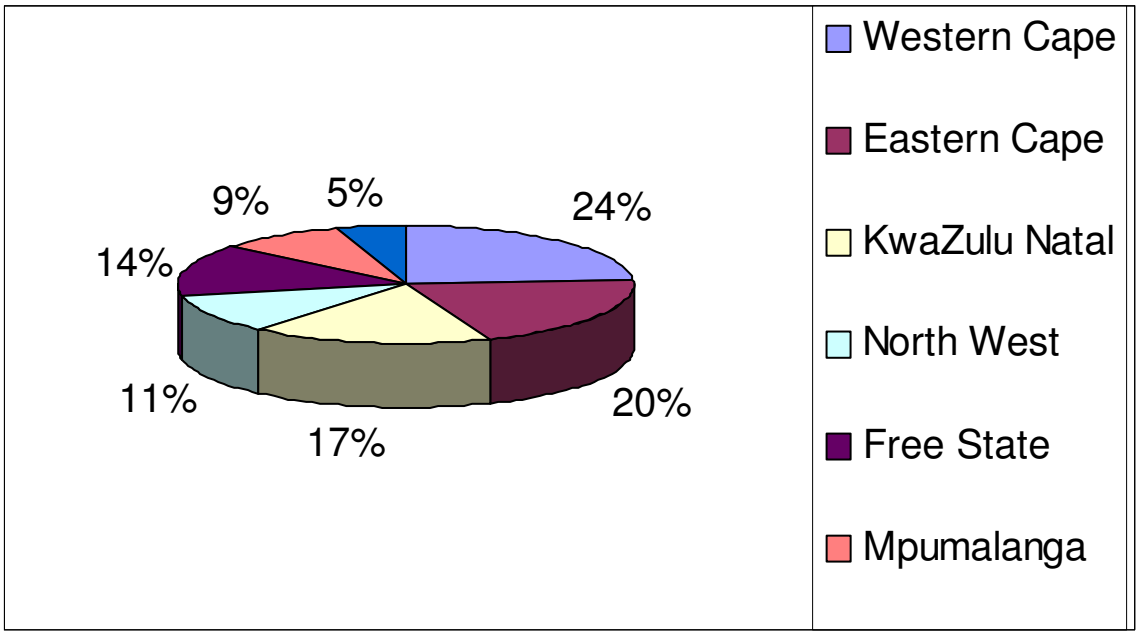

Figure 3.9: Milk production by region (NDA, 2003)

Milk is produced in nearly all regions in South Africa. In 2002, the Western Cape contributed 24% to total production, the Eastern Cape 20%, KwaZulu-Natal 17%, the North West 11%, the Free State 14%, Mpumalanga 9% and the four remaining provinces 5% (NDA, 2003).

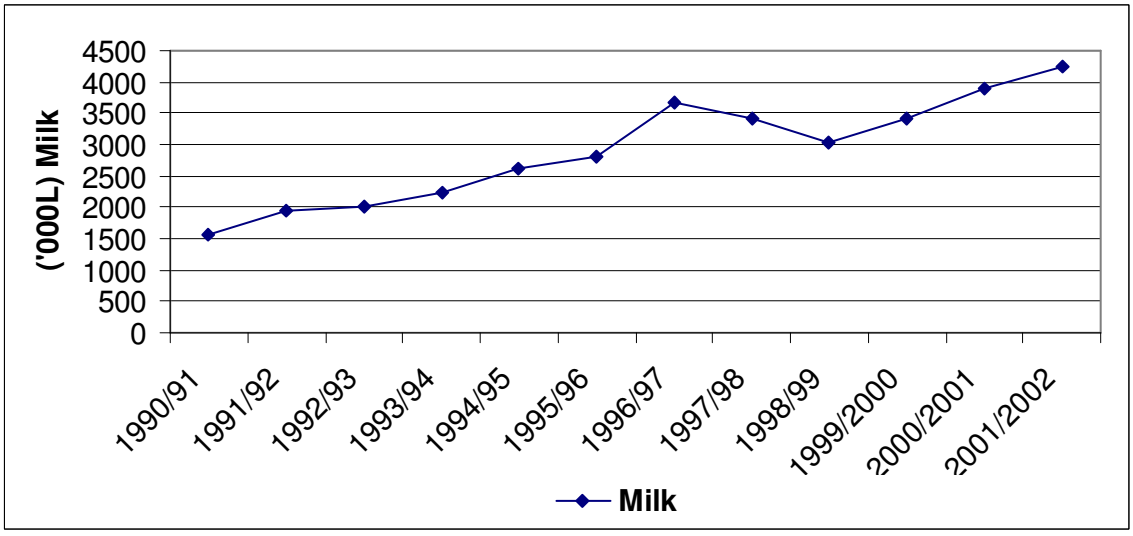

Figure 3.10: Gross value of milk, 1990 - 2003

(*ABSTRACT*, 2004)

Figure 3.10 set out the long-term trend in milk production. Milk production shows an increasing long-term trend at the beginning. In 1999 the increase in milk production slowed down. It accelerated again in 2003/4. The gross value of milk produced during the 2002/3-production season, including milk that was produced for own consumption on farms, is estimated at R3 862 million. Milk as a percentage of animal production contributes 41% of the gross value of agricultural production (*ABSTRACT*, 2003).

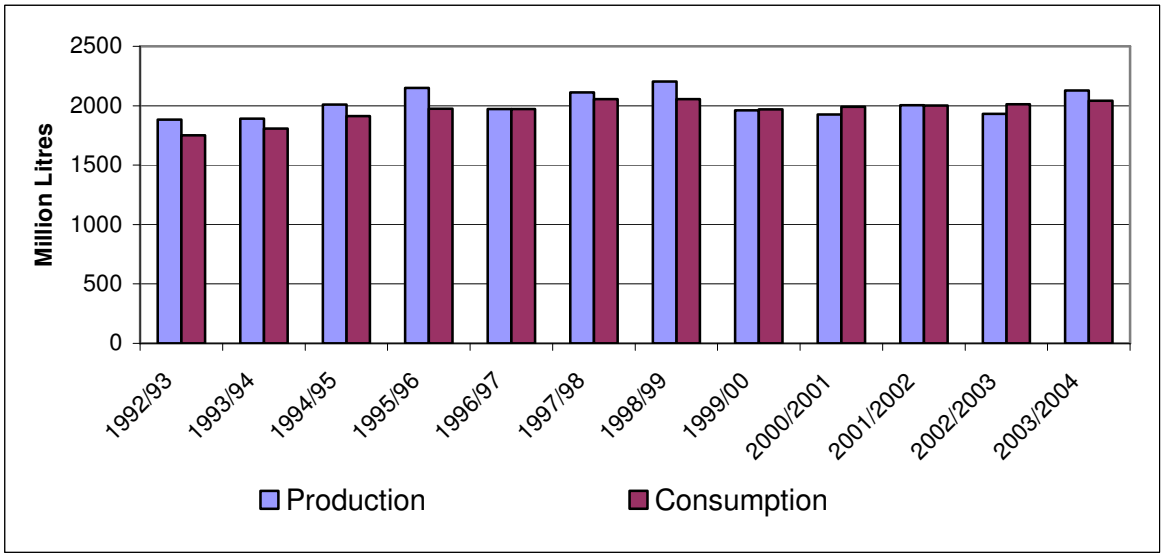

Figure 3.11: Production and consumption of locally produced milk, 1992/93 - 2003/04 (Coetzee, 2004)

Milk production and consumption is shown in Figure 3.11. Total milk production for 2001/2 was 1 973 million litres, which exceeds the production of 2000/1. Production for 2002/3 amounted to 1 931 million litres. It was estimated that production for 2003/4 would be 2 128 million litres. Milk consumption was 1 931 million litres during 2002/3 and that was more than the production by (–3.6%). During 2003/4, consumption is expected to increase by 1. 34%.

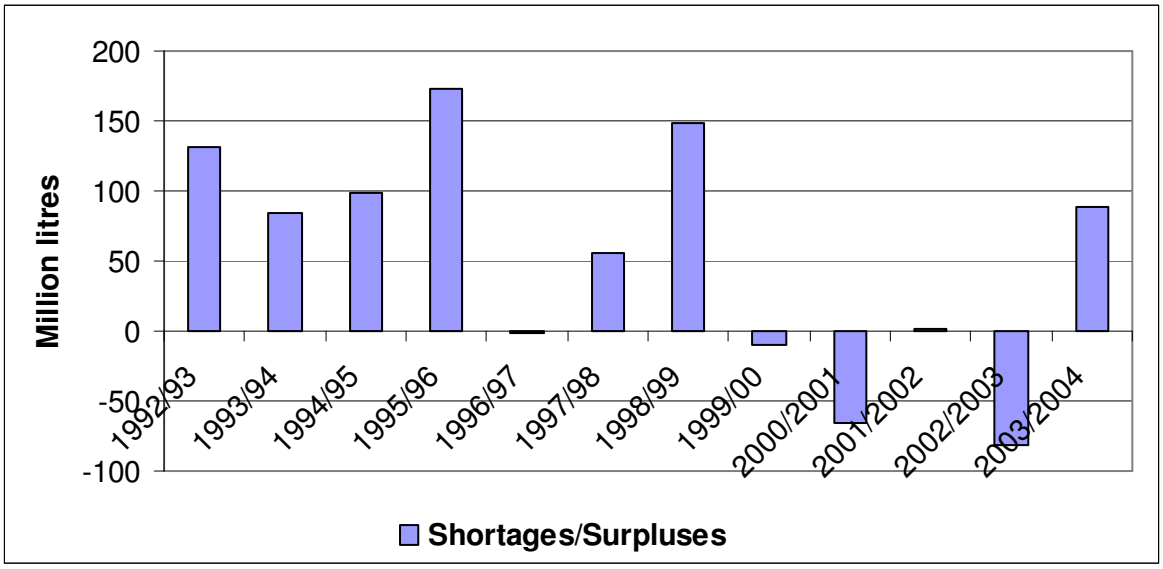

Figure 3.12: Annual difference between milk production and consumption, 1992/93 - 2003/4 (Coetzee, 2004)

The annual difference between milk production and consumption from 1992/3 and 2003/4 is shown in Figure 3.12. This figure shows clearly that South Africa is traditionally a producer of surpluses. Annual shortages are an infrequent occurrence, with the exception of the preceding four production seasons. In 1996/7 there was a shortage of 1 686 thousand litres, followed by a 9 750 thousand litre shortage in 1999/2000, then a 9 750 thousand litre shortage in 2000/1. The worst shortage was in 2002/3, when there was a shortage of 82 113 thousand of litres. It is estimated that the 2003/4 season will end with a 47 million litre surplus.

After the milk shortage in 1996/7, the processors offered dairy farmers high prices, which resulted in a large milk surplus in 1998. The expansion of dairy herds or an increase in milk production (as during 1998/9) resulted in a decline in raw milk demand and a slower increase in producer prices (Vink & Kirsten, 2002).

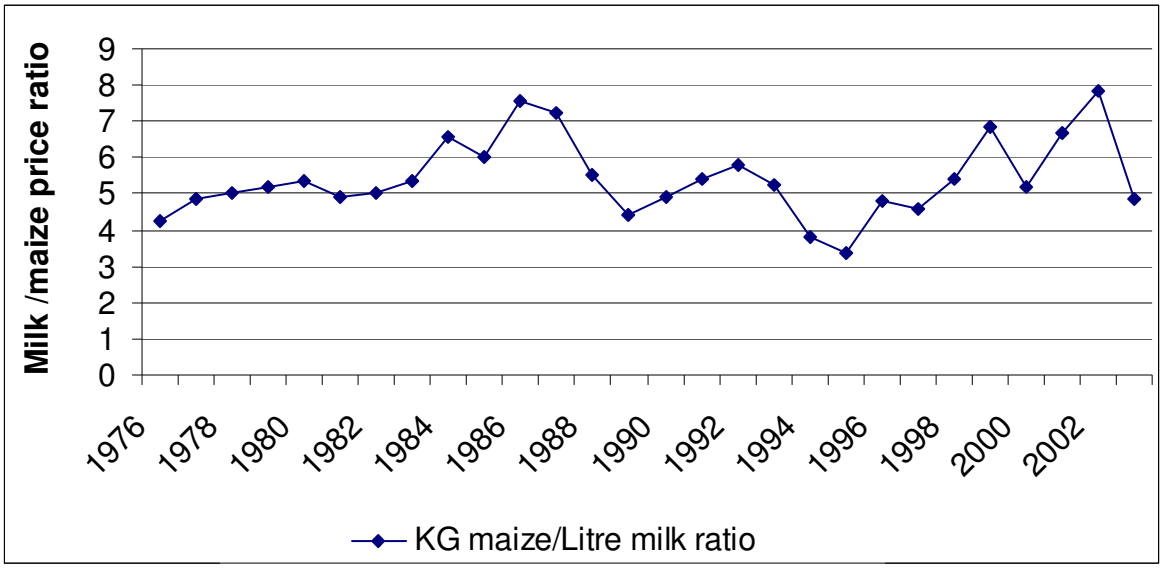

Figure 3.13: Milk/Maize price ratio, 1976 - 2003 (Coetzee, 2004)

The adverse production conditions during in 1997 and 1999 to 2002 resulted in a sharp decline in milk production. Prices increased and interest rates decreased. The increases in producer prices were offset by the higher maize price, resulting from a lower than expected maize crop. The effect of the higher maize price had a greater effect than expected and the production of milk declined by more than 2.6%. Imports of dairy products went down drastically, especially as the rand was trading at R6.00 to the US$. The rand declined steadily and dairy products remained under pressure in 1997. The prices increased slightly in 1999 and 2000; the dairy product stocks were at very high levels and there were no significant imports in this sector during 1999. The increase in producer prices did not result in a large increase in production because of a deteriorating milk/maize price ratio, as can be seen in Figure 3.13.

3.4.2 Milk producer prices

Monthly producer prices were under upward pressure from low production levels, higher import prices and low stock levels. Shortages, especially in the fresh milk sector, could lead to sharp price increases in the following months.

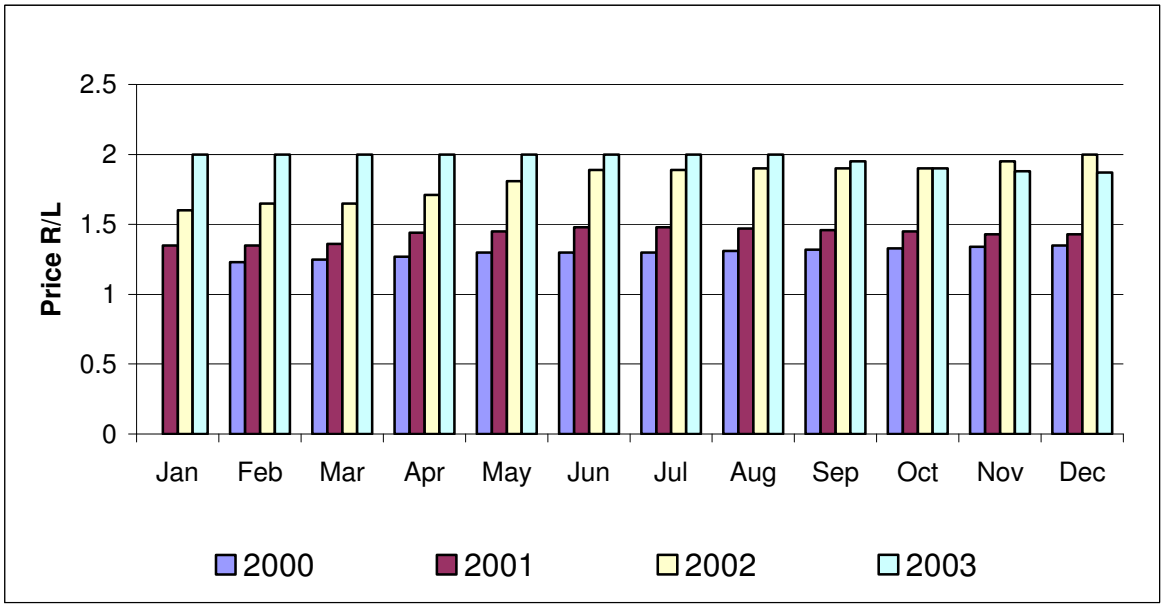

Figure 3.14: Monthly producer prices of milk in real terms, 2000 - 2003
(Coetzee, 2004)

Figure 3.14 shows that the long-term trend in producer prices kept pace with the increases in consumer prices and will probably continue to do so in the foreseeable future. The gap between the highest and the lowest price in the market will probably decrease. Prices remained stable at R2/litre from December 2002 until August 2003, then declined by 10 cents/litre during September 2003. In October, November and December, prices declined.

The milk industry is discussed above with reference to milk production and consumption together with the annual differences between the two. Milk prices are explained and graphs are used to show the trends.

3.5 CONCLUSION

Agriculture is an important sector in the South African economy. It contributes a lot to the country's GDP, provides employment and is an earner of foreign exchange. Policies have been deregulated for the agricultural sector to be more competent and to improve. That has helped considerably in dealing with some injustices in the sector. Reasons for the focus on the milk industry in this study have been discussed. The study area, data and data gathering are also highlighted in the next chapter. The types and interpretation of traditional performance measures and EVA formulas are explained.

CHAPTER 4

RESEARCH METHODOLOGY AND EMPIRICAL ANALYSIS

4.1 INTRODUCTION

In the previous chapter, the importance of agriculture in our economy and the milk industry were addressed. On the basis of this background, this chapter focuses on the research methodology that was used to conduct an empirical analysis of financial statements among the milk producers. First, data collection is discussed, followed by a research method then calculation of performance measures. Lastly, the results of the study and an interpretation of the results are set out.

4.2 DATA COLLECTION

4.2.1 Selecting the sample

The MPO cooperated with University of Pretoria in selecting the respondents, which were used in evaluating the financial performance of milk producers. A study group of nine *bona fide* dairy farmers in the Humansdorp area was used in the study. The study group was randomly selected by the MPO. The names of the farmers were not provided in order to protect their identity.

4.2.2 Collecting the data

In order to calculate the EVA for the nine farms, production volumes were obtained from the nine farmers of the study group. Wolmarans Kruger (the auditing firm for the study group) was telephonically contacted in order to obtain financial information.

4.2.3 The data collected

Some difficulties were experienced in obtaining valid information. Trial balances for six of the nine farmers in the original sample were obtained after long collaboration between the University of Pretoria and Wolmarans Kruger. Income statements and balance sheets for February 2004 were then constructed using these trial balances. See appendix A for trial balances.

The financial information on the six milk producers consisted of the following:

- average milk sales: 2 678 539 litres for year 2003/2004;
- average income from milk sales: R5 474 319 for year 2003/2004;
- average herd size: 390 dairy cows; and
- average expenses: R1 473 945 for year 2003/2004.

The formulas for the traditional measures and EVA are discussed in the following section. These formulas were employed in the empirical analysis.

4.3 RESEARCH METHOD

Performance measurement does not only provide a mechanism for assessing progress towards functional and farm objectives. The ultimate goal of performance measurement is to integrate organizations across various managerial levels and functions. Mitchell & Co (1996) states “measuring something is the best way to make it improve”. Performance measurement is a helpful tool that increases understanding of how the enterprise operates and why it fails to produce the required results.

Performance measurement helps managers to make the necessary changes as they strive to eliminate inefficiencies in their processes and systems in an effort to operate better, faster, cheaper and deliver improved results.

In this study, the financial performance of six milk producers was determined by calculating Economic Value Added (EVA) and traditional profitability measures such as return on equity (ROE), return on assets (ROA), net farm income (NFI) and the operating profit margin (OPM). The basic formulas have been slightly adapted in order to suit the farm situation.

4.3.1 Financial statements

The profitability measures that were calculated in this study were computed from the information used to construct income statements and balance sheets.

Performance measures have norms that can be used when one wishes to evaluate the performance of a farm. These norms provide important indications of the farm's financial state and one can then tell whether the farm is profitable or not.

The calculation of EVA and traditional performance measures is illustrated below by means of an example. Farmer BBQV006 was selected randomly for the demonstration on how the profitability measures are calculated. Table 4.1 and 4.2 present the constructed balance sheet and the income statement for Farmer BBQV006.

Table 4.1: Balance sheet for Farmer BBQV006 for the year ended February 2004

	2003 (R)	2004 (R)
ASSETS		
Non-current assets	4,236,860.53	6,267,642.94
Assets at cost	4,448,659.00	6,512,383.77
Provision for depreciation	219,127.45	262,471.44
Fixed asset value	4,229,531.55	6,249,912.33
Investments	7,328.98	17,730.61
Current assets	3,758,630.02	3,754,305.74
Inventory	2,003,000.00	3,284,000.00
Cash	-	-
Debtors	1,755,630.02	470,305.74
Total assets	**7,995,490.55**	**10,021,948.68**
EQUITY AND LIABILITIES		
Equity	4,707,436.41	5,120,054.22
Capital	3,385,252.25	3,983,050.66
Accumulated income	1,322,184.16	1,137,003.56
Non - current liabilities	1,679,965.68	2,975,805.31
Loans and hire purchases	1,679,965.68	2,975,805.31
Current liabilities	1,608,088.46	1,926,089.15
Creditors	932,622.16	1,342,797.74
Bank overdraft	675,466.30	583,291.41
Total equity and liabilities	**7,995,490.55**	**10,021,948.68**

Table 4.2: Income Statement for Farmer BBQV006 for the year ended February 2004.

Revenue		1,613,544.16
Cost of sales		942,033.32
	Opening Stock	2,003,000.00
	Purchases	338,966.68
	Closing Stock	3,284,000.00
Gross Profit		2,555,577.48
Other Income		17,709.21
Operating expenses		1,589,252.48
Profit from operations		984,034.21
Finance Costs		34,431.25
Investment Income		-
Profit before tax		949,602.96
Tax expense - PAYE		975.86
Tax expense - SARS		332,361.04
Net profit after tax		616,266.06

4.4 CALCULATION OF PERFORMANCE MEASURES

4.4.1 ROA

ROA measures the overall effectiveness of management in generating profits with the available assets (Gitman, 1998). The higher the net income for a given amount of assets, the better the return on those assets. The ROA for Farmer BBQV006 for 2004 was calculated as follows:

$$ROA = \frac{Net\ Profit\ after\ tax}{Total\ Assets} * 100$$

$$= \frac{616{,}266.06}{10{,}021{,}948.68} * 100$$

$$= 6.15\%$$

4.4.2 ROE

ROE measures the return earned on the shareholders' or owners' investments. ROE provides useful information about the effectiveness of debt in the capital structure (Miller *et al.*, 2001). A higher ROE is preferred to a lower return, but the ROE must be interpreted in light of its limitations and one should never mechanically suggest that a higher ROE is always better than the lower one. The ROE for Farmer BBQV006 for 2004 was calculated as follows:

$$ROE = \frac{Net\ Profit\ After\ Tax}{Equity} * 100$$
$$= \frac{616{,}266.06}{5{,}120{,}054.22} * 100$$
$$= 12.04\%$$

4.4.3 Net Farm Income (NFI)

NFI is a meaningful absolute profitability measure of the business from year to year. It provides key information about the results of the operating activities of a farm over a period of time. The NFI ratio measures the percentage of gross farm income represented by NFI or profit. The sum of the operating expense ratio and the NFI ratio equals 100 per cent. Thus the NFI ratio represents the percentage of the gross farm income left after subtracting operating expenses from the gross farm income. The NFI ratio for Farmer BBQV006 for the year ending 2004 was calculated as follows:

$$NFIR = \frac{Net\ Profit\ After\ Tax}{Gross\ Profit} * 100$$
$$= \frac{616{,}266{,}06}{2{,}555{,}577.48} * 100$$
$$= 24.11\%$$

4.4.4 Operating Profit Margin (OPM)

OPM ratio measures the profitability of the farm as a proportion of the volume of production. The OPM ratio demonstrates how a farm can increase its profitability. A farm can increase its profitability by increasing the OPM ratio while maintaining the same size of operation and the same interest obligations. A higher profit margin is preferred to a lower profit margin. The OPM for Farmer BBQV006 for the year ending 2004 was calculated as follows:

$$OPM = \frac{Profit\ Before\ Tax + Finance Cost}{Gross\ Profit} * 100$$
$$= \frac{949{,}602.96 + 34{,}431.25}{2{,}555{,}577.48} * 100$$
$$= 38.51\%$$

4.4.5 Economic Value Added (EVA)

EVA has various components that need to be calculated before one can calculate EVA itself. The EVA components are discussed in the following section.

4.4.5.1 Net operating profit after tax (NOPAT)

EVA is the measure of operating profit adjusted for the cost of capital employed. In order to get the true profits, earnings and invested capital need to be adjusted. They are adjusted as capital charge subtracted from net operating profit after tax (NOPAT)(Miller *et al.*, 2001). NOPAT is an important component when calculating EVA. The NOPAT for Farmer BBQV006 for the year ending 2004 was calculated as follows:

$$NOPAT = Net\ income(loss) + (Interest\ paid * (1 - T))$$
$$= 616{,}266.06 + (34{,}431.25 * (1 - 0.35))$$
$$= R638{,}646$$

Where:

T = Tax rate (which was assumed to be 35%)

4.4.5.2 Capital invested

The total economic capital employed must be known in order to calculate EVA. Total capital employed consists of adjusted common equity, as well as total debt. In turn, adjusted common equity consists of the sum of the total equity capital and deferred taxes from the previous year. In this study, the deferred tax was not included, because it was not available on the financial statements. Total debt consists of the sum of the total interest-bearing external long-term liabilities and the total interest-bearing current liabilities. The previous year's amounts must be used, because capital at the beginning of the financial year will be used in the generation (and therefore calculation) of EVA for the current year.

$$Capital = Adjusted\ common\ \ equity + Total\ debt$$
$$= 4{,}707{,}436 + 2{,}355{,}432$$
$$= R7{,}062{,}868$$

4.4.5.3 Cost of capital

The cost of capital is the minimum acceptable return on investment. It is a differentiator between good and bad performance by the farm, in line with the argument of Stewart (1991). The cost of capital consists of the cost of equity and the cost of debt. First, the cost of equity is discussed and calculated, followed by the cost of debt.

- *Cost of equity capital*

  No information regarding the cost of equity capital could be obtained from the study group. The study therefore merely analysed the generally accepted

financial methods available to determine the cost of equity capital briefly. The four methods are:

- Personal return on equity

  With this method, the farmer decides what return on equity capital he or she would like to achieve on his or her investments. The amount is completely subjective and is determined by personal experience and expectations. The farmers in this study were reluctant to give such information, and due to the subjective nature of this method, it was decided not to use it.

- Constant Growth Valuation (Gordon) Model

  The Gordon model assumes that the value of a share of stock is equal to the present value of all future dividends (assumed to grow at the constant rate) over an infinite time horizon (Gitman, 1998). The formula for the Gordon model is:

  $$K_s = \frac{D_1}{P_0} + g$$

  Where:

  K_s = required return on common stock;

  D_1 = per-share dividend expected at the end of year 1;

  P_0 = value of common stock; and

  g = constant rate of growth in dividends.

  This formula indicates that if the dividends expected at the end of the year 1 are divided by the current share price and then the expected growth rate is added, the cost of ordinary share equity can be found (Gitman, 1998). This model could not be used because all the farmers used in this study were sole proprietors. There is no share capital, which means there are no share prices.

- Capital asset pricing model (CAPM)

The cost of equity is the opportunity cost that investors require to compensate them for the variability of bottom-line profits (Stewart, 1991). While this opportunity cost does not appear in any financial statements, Stern Stewart approximates it, based on the Capital Asset Pricing Model (CAPM), by adding an individual company's adjusted risk premium of 6% in the United States to the return on long-term government bonds. Ross *et al.* (2001) determined the average risk premium in South Africa for the period from 1925 to 1999 to be 9.8% ($K_m - R_{f.}$). The average return on the R150 government bond was used as the risk-free rate (R_f).

In order to use the CAPM, the beta needed to be determined. Beta measures the risk in models of risk in finance. They measure the risk added to a diversified portfolio, rather than total market risk. The cost of equity capital was then calculated, using the CAPM. The risk free rate is 8.66% (South African Reserve Bank, 2004).

$$k_j = R_f + \left[b_j * \left(k_m - R_f\right)\right]$$

where

$k_j = required\ \ return\ on\ assets\ j$

$R_f = risk - free\ rate\ of\ return$

$b_j = beta\ coeffiecient$

$k_m = market\ return$

Shadbolt (2001) measured the risk beta for farmland and found 0.7 percent to be a favourable beta. Nartea and Basata (1998) and Brown (1999) also found a similar beta value for farmland in the USA. This beta value is also a reflection of land as a good long-term investment. Since no study has so far been undertaken in South Africa to determine the beta of farm activities, in this study it was assumed that the same risk beta of 0.7 would also be

applicable in South Africa. The cost of equity capital based on CAPM are found to be:

$$Rj = Rf + \beta(Rm - Rf)$$

Where:

Rj = Cost of equity capital;
Rf = Risk – free rate;
β = Beta; and
Rm = Average market return.

$$Rj = Rf + \beta(Rm - Rf)$$
$$= 8.66 + 0.7 * 9.8$$
$$= 15.52\%$$

- Bond-Yield-plus-Risk-Premium Approach

In this model, a judgmental risk premium of 3 to 6 percentage points is added to the interest rate on a farm's own long-term debt. A risky, high-interest-rate farm will also have a risky, high-cost-equity, which means that the procedures of basing the cost of equity on a readily observable debt cost is used. This method is not likely to produce a precise cost of equity. The reason is that the empirical work in recent years suggests that the risk premium over a farm's own bond yield has generally ranged from 4 to 7 percentage points (Brigham, Gapenski & Daves, 1999). Agriculture normally has low returns on assets. Since it is imperative for farmers to achieve a greater return on assets than lending rates, a risk premium can be justified. The question was how many percentage points must be added?

In order to answer this question, a sensitivity analysis was done in determining EVA at different percentage point levels. Table 4.3 sets out the various results.

A further limitation in the study was that no audited financial statements were available. Trial balances for the farmers were provided which were used to construct financial statements. This resulted in an unknown tax rate per farmer. A sensitivity analysis was also conducted on tax rates. EVA's were calculated at different tax rates and cost of capital rates.

Table 4.3: Sensitivity analysis for tax rates and equity premiums

	Tax Rates (%)				
	40	38	35	32	30
Equity Premiums (%)	**EVA (R)**				
Debt + 6	(427,485)	(414,746)	(394,137)	(372,129)	(360,790)
Debt + 5	(380,411)	(367,072)	(347,063)	(327,055)	(313,716)
Debt + 4	(333,336)	(319,997)	(299,989)	(279,980)	(266,641)
Deb t+ 3	(286,262)	(272,923)	(252,914)	(232,906)	(219,567)
Debt + 2	(239,188)	(225,849)	(205,840)	(185,831)	(172,492)
Debt + 1	(192,113)	(178,774)	(158,766)	(138,757)	(125,418)
CAPM (R)	(310,741)	(297,402)	(227,393)	(257,384)	(244,045)

The tax rate does not seem to make a significant difference (small percentage changes). In this case, the average tax rate (35%) was used. It was more difficult to choose which equity premiums to use, because there was a major difference between them.

As a result, the percentage change between the tax rate and equity premiums was calculated in order to see how significant the difference between them is. Table 4.4 depicts the percentage change in the tax rates and equity premiums.

Table 4.4: Percentage change in tax rates and equity premiums

	Tax rates (%)				
	40	38	35	32	30
Equity premium (%)	**Percentage change**				
Debt + 5	-11.01	-11.49	-11.94	-12.11	-13.05
Debt + 4	-12.37	-12.82	-13.56	-14.39	-15.01
Debt + 3	-14.12	-14.71	-15.69	-16.81	-17.65
Debt + 2	-16.44	-17.25	-18.61	-20.21	-21.44
Debt + 1	-19.68	-20.84	-22.87	-25.33	-27.29

An equity premium of 3% was chosen for this study because it falls within the area of the mean of the percentage changes, as deducible from Table 4.4 and gives similar results than CAPM.

- **Cost of debt capital**

  The cost of debt is the rate that a farm would have to pay in the current market to obtain new long-term debt capital. The farmers in the study were reluctant to supply specific information regarding their financing activities and the interest rates they have paid on borrowings. Therefore, in order to calculate the cost of debt capital, in this study the average interest rate quoted by the Land Bank and the other commercial banks in South Africa was used. Available statistics regarding the average lending rate were calculated from 1998 to 2001. Table 4.5 (below) shows the average lending rate extended by the Land Bank and the commercial banks for the period from 1998 to 2001.

Table 4.5: Average lending rates for the period from 1998 to 2001

Year	Land Bank (%)	Commercial banks (%)	Average (%)
1998	17.05	21.64	19.35
1999	19.13	18.23	18.68
2000	15.48	14.5	14.99
2001	14.99	13.83	14.41

Source: *ABSTRACT* (2004)

Land Bank and commercial banks were called to find out the lending rates for 2004. The Land Bank offered 10.75% as the lending rate for February 2004 and the commercial banks' average rate were 13.25%. The average between the banks (12%) was used in this study.

Table 4.6: Average lending rates for 2004

Year	Land bank (%)	Commercial banks (%)	Average (%)
2004	10.75	13.25	12

In this study, it is assumed that the same interest rate applies to all the farmers. Based on this assumption, the cost of debt for the milk producers was calculated as follows:

$$id = interest\ rate(1 - T)$$
$$= 12\%(1 - 0.35)$$
$$= 7.80\%$$

where:

$id = after\ tax\ cost\ of\ debt.$

- ***Weighted Average Cost of Capital (WACC)***

The weighted average cost of capital (WACC) was used in determining the cost of capital. It is a weighted average of the costs of debt and equity capital, where the weights are the market values of debt and equity. WACC can be calculated after the cost of capital (consisting of cost of equity capital and the cost of debt capital) have been determined.

$$WACC = Rj * (E/A) + id * (D/A)$$

Where

$E = Adjusted\ common\ equity$

$A = Total\ assets$

$D = total\ debt$

$$WACC = \left(15\% * \frac{4,707,436}{7,062,868}\right) + \left(\langle 7.80\% \rangle * \frac{2,355,432}{7.062,868}\right)$$

$$= 12.60\%$$

4.4.6 EVA

EVA is calculated by taking the spread between the rate of return on capital (r) and the cost of capital $(c*)$ and then multiplying that by the economic book value of the capital committed to the business.

$$EVA = (r - c*) \times Capital$$

Where:

$$r = \frac{NOPAT}{Capital}$$

Therefore:

$$EVA = \left(\frac{NOPAT}{Capital\ invested} - Cost\ of\ Capital \right) x\ Capital\ invested$$

$$= \left[\left(\frac{638{,}646}{7{,}062{,}868} * \frac{100}{1} \right) - 12.60\% \right] * 7{,}062{,}868$$

$$= R(251{,}193)$$

Information was extracted from the financial statements and the traditional measures and EVA was calculated. From the traditional measures that were calculated for Farmer BBQV006, one can see that this farm is performing well. The ratios were above the traditional norms used to tell whether a farm is profitable or not.

EVA was also calculated for this farm. First, the different components had to be calculated before EVA itself could be calculated. NOPAT and capital were calculated and the results were R638 646 and R7 062 868 respectively. Then the cost of capital was examined. First, the cost of equity was determined, choosing between four generally accepted financial methods, namely personal returns on equity, the Gordon Model, the Bond-Yield-plus-Premium approach and the CAPM. In this study, a Bond-Yield-plus-Premium approach was used because there is a close correlation with the CAPM.

A sensitivity analysis was conducted in order to decide which percentages to use for the tax rate and equity premiums. An average 35% tax rate and an equity premium of 3 were chosen after the sensitivity analysis. Then the cost of equity was calculated and found to be 15.52%. The cost of debt was found to be 7.8% (the average lending rate, as discussed above, between the Land Bank and commercial banks, was 12%). Lastly the WACC was calculated, with a result of 12.60%.

Once the EVA components of EVA had been calculated, it was possible to calculate EVA itself, using the equation above. The EVA was found to be R (251,193). This value for EVA means that the farm destroyed value.

The same calculations were done for the remaining five farmers. In the next section, the results of the calculations of the traditional measures and EVA are presented.

4.5 RESULTS AND INTERPRETATION

The results of the calculations of EVA and four traditional measures for all six farmers are presented in Table 4.7 below.

Table 4.7: EVA and traditional measures for six milk producers in Humansdorp

	BBQV001	BBQV004	BBQV005	BBQV006	BBQV008	BBQV009
ROA (%)	0.31	16.07	(17.82)	6.15	8.68	(46.59)
ROE (%)	0.46	20.11	(36.60)	12.04	14.33	21.24
NFIR (%)	0.28	19.39	68.09	24.11	40.11	(65.94)
OPM (%)	0.44	29.72	(132.29)	38.51	61.67	(56.93)
NOPAT (R)	18,717	1,227,581	(935,823)	638,646	776,023	(285,042)
Equity	3,430,377	4,425,475	1,950,549	4,707,436	4,770,735	(306,636)
Debt	473,593	367,740	1,708,748	2,355,432	2,583,719	3,480,774
WACC (%)	14.13	14.45	11.64	12.60	12.47	7.10
Spread (%)	(14.12)	(14.19)	(11.89)	(12.51)	(12.37)	(7.19)
EVA (R)	(532,780)	535,076	(1,361,687)	(251,193)	(141,117)	(510,547)

Now that the performance measures have been calculated, the results can be interpreted. The results are discussed in the next sections. First, the traditional measures' results are discussed for each farm, followed by the results for EVA and its components.

4.5.1 Traditional measures

Figure 4.1 represents the traditional accounting-based measures. These ratios are analysed using benchmarks (which differ between industries). For the positive and negative ratios one can analyse the financial state of the farms and see whether they are profitable or not. What is important is to find out how significant the information given by these traditional measures is in measuring the real financial state of the farms.

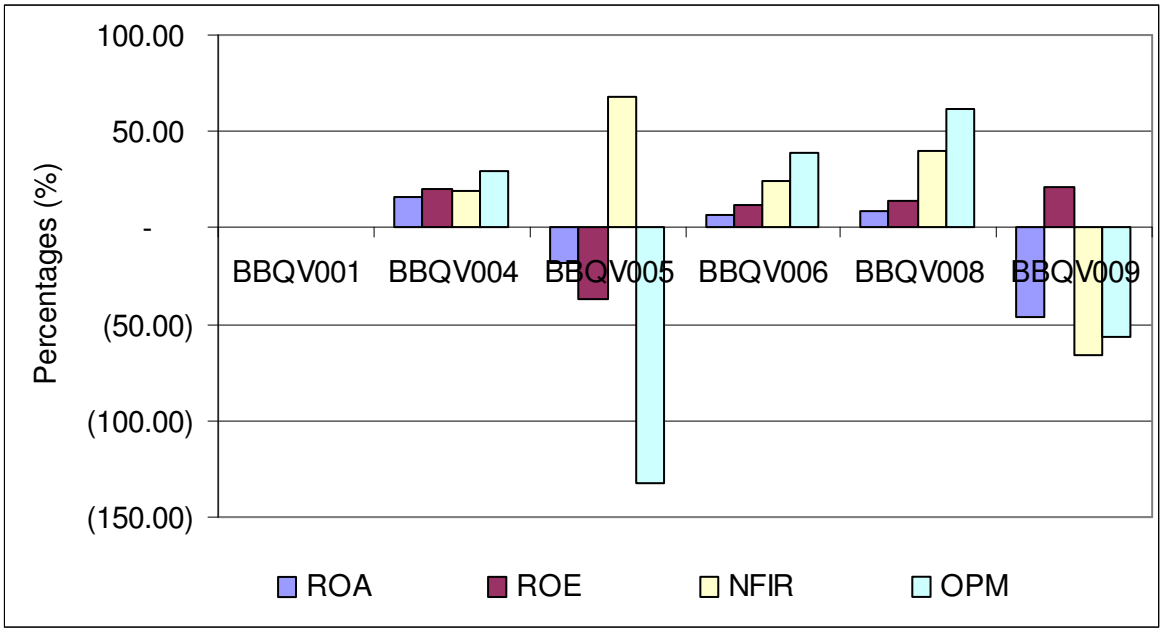

Figure 4.1: Traditional measures (accounting-based measures)

From the graph above, one can see that all the traditional ratios for Farmers BBQV001, BBQV004, BBQV006 and BBQV008 are positive. BBQV005 had a negative ROA, ROE and OPM. BBQV009 had a negative ROA, OPM and NFI ratio. The ratios are analysed below.

4.5.1.1 ROA and ROE

A positive ROA suggests that a farm has generated positive returns from its assets. Although asset values are expected always to be positive, a negative ROA is still a meaningful measure of profitability. There are reasons for negative values, for instance, large farm losses. ROE provides useful information about the performance of debt in the capital structure. The norm for ROE requires it to be more than the ROA for a farm to be profitable. One must bear in mind that a high ROE does not mean that the farm is profitable – one has to look at the limitations of the measure. ROE's exceeded the ROA for all these milk farms. Figure 4.2 depicts the results for ROA and ROE.

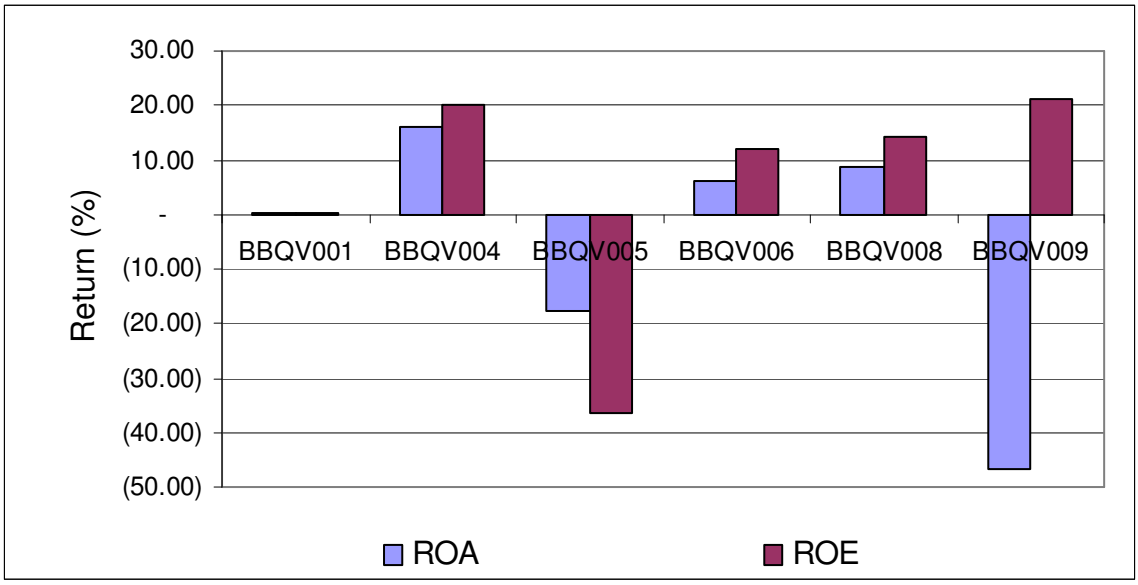

Figure 4.2: ROA and ROE

- BBQV001

The ROE was very low, due to a very low ROA. The reason is that this farm has invested about R2.3 million for a return of R14 000. This investment is unfruitful, as a better return can be obtained from a risk-free bond (8.66% instead of the 0.6% that is currently being generated). The net operating expense is far too high and, as a result, it affects the net profit margin. Moreover, the farmer is renting a property for about R226 666 per annum. A saving on rentals can increase the ROA.

The total asset turnover is good, but the current ratio is far too low, which suggests that the farm might experience liquidity problems. The debt to equity ratio is good, which means that the farmer is making use of his debt capital. In this case the farm is unprofitable, even though the ratios are positive. The farmer should consider dispensing with non-productive assets and acquire more productive assets by increasing debt. He should also eliminate unnecessary expenses, because the farm's expenditure is almost as high as the sales income.

- BBQV004

The ROE is very good. It is greater than the ROA, which is to be expected. ROA is also good because the net profit margin is also high. The performance of this farm seems to be the best in the graph. It may be reasonable to use its returns as a benchmark for the highest possible return in this industry. The current ratio and the debt to equity ratios are also good, which means that the farm is profitable.

- BBQV005

The ROE is very low and negative, due to a low ROA. The net profit margin is far too low and the farm is making a loss. Operating expenses are high and the sales are too low. The total asset turnover is too low which means that the farmer is not utilizing his assets very well. An average of 366 cows produce about R1 million sales for BBQV005, while the 459 cows of BBQV004 produce about R6 million. This suggests that there may be a problem with the farmer's production methods. The current ratio is too low, indicating that the farm is experiencing liquidity problems. The farmer is relying on his retained income and equity capital to finance his farm, which is the reason why the debt ratio is so poor. In this case the farmer should increase milk production, as sales cannot be increased because the milk price is fixed. To balance this effort, unnecessary expenses should be eliminated until this farm is profitable.

- BBQV006

The ROE is good and greater than the ROA. Asset turnover is far too low, resulting in a low ROA. Sales dropped by R1 million from 2003 and this has affected all the profitability measures, which makes the analysis of this farm complicated. The farmer has a high number of fixed assets which the farmer is not utilizing to their optimal potential. The farmer should rectify the problems that occurred in 2004. Production should be increased in order to increase the

asset turnover for the ROA to be high. The farmer is not making sufficiently extensive use of debt capital and that has also resulted in the poor debt ratio.

- BBQV008

The net profit margin is very good, even though the ROA is very low. The asset turnover is far too low, as a result of the farmer's not making extensive use of his land, and that in turn affects the ROA. The ROE is good and greater than the ROA. The current ratio is very good and there is no sign of liquidity problems. The debt ratio is also good, indicating that the farmer is making use of his debt capital. Although the sales are very low at R 1 935 799 (compared to BBQV004 at more than R6 million), but generally the farm is performing very well.

- BBQV009

The ROE is very good, but the ROA and the net profit margin are low and negative, which means that the farm is making a loss. According to the financial statements, the losses are standing over from the past, as they amount to R2 885 228. The total asset turnover is good and the farmer is utilizing his land very well, but the operating expenses are high and exceed the sales. The farmer should examine and improve his milk production methods. The current ratio is low, indicating a liquidity problem. This farm is only financed by debt, thus it may be difficult for it to obtain financing.

4.5.1.2 Net Farm Income (NFI)

Figure 4.3 shows the NFI ratio of the six farms. This ratio measures the percentage of the gross farm income represented by the net farm income or profit.

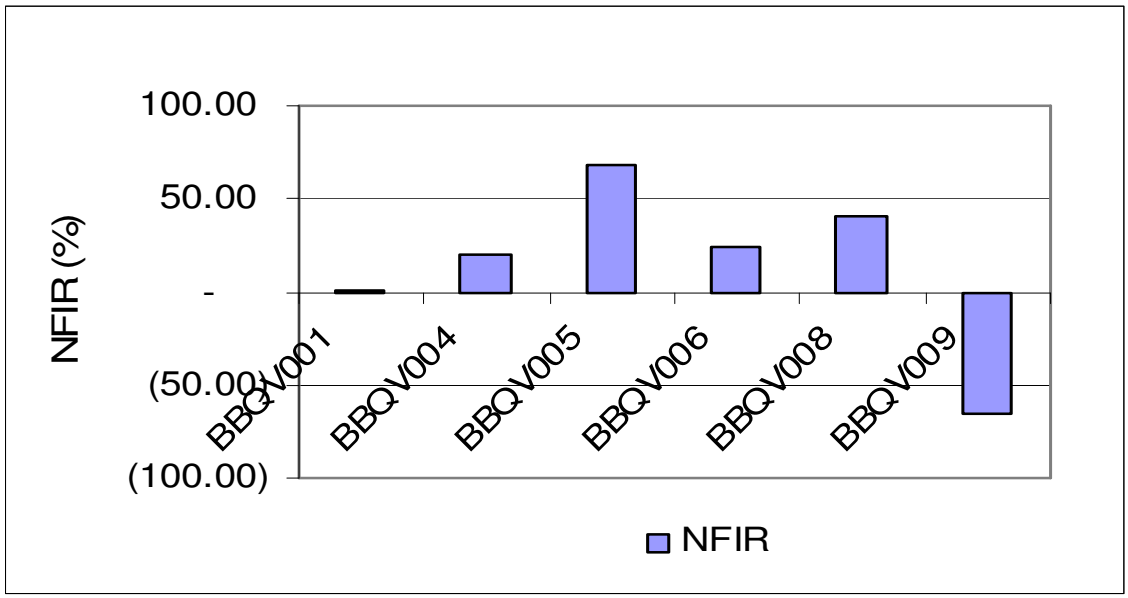

Figure 4.3: NFI ratio

From the graph it can be seen that, on average, 0.28%, 19.39%, 68.09%, 24.11% and 40.11% of the gross income represents profit for the Farmers BBQV001, BBQV004, BBQV005, BBQV006 and BBQV008 respectively. The other 99.72%, 80.61%, 31.91%, 75.89% and 59.89% of the respective gross farm incomes are used to cover operating, interest and depreciation expenses. In this situation, the NFI ratio for BBQV009 is not meaningful, because it is negative and the farm is making a loss.

BBQV001 has a low NFI ratio because of an investment. In other words, the farm makes an insignificant profit, as the return on that investment is 0.6%. BBQV004 is getting 19% as its profit, which is reasonable, and this means that the farmer is able to pay his debts. This is confirmed by the financial statements, because BBQV004's debts are lower than that of the other five farms. BBQV005 and BBQV006 earn 68.89% and 24.11% respectively as their profit, which looks good. BBQV008 makes a profit of 40.11%, which is also very good. BBQV009 makes no profit, because it does not use debt capital extensively. The NFI ratio for four of the farmers is good, but BBQV001 and BBQV009 have NFI ratio problems.

4.5.1.3 Operating profit Margin (OPM)

Figure 4.4 sets out the OPM ratios, which demonstrate how much profit each farm has generated.

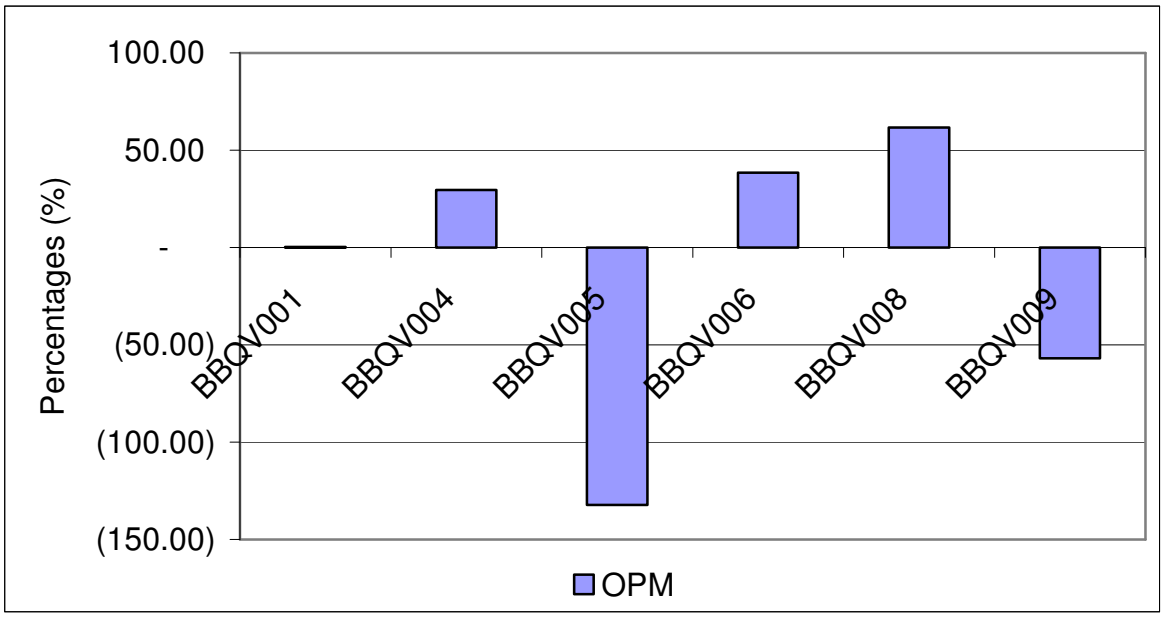

Figure 4.4: OPM

From the graph above one, can see that for every rand of gross farm income, about 0.44cents, 29.72cents, 38.51cents and 61.67cents remain as profits after all expenses have been covered, except interest rates, for BBQV001, BBQV004, BBQV006 and BBQV008 respectively. BBQV001's profit is very low, as a results of the investment made in this farm. The other three farms, which are BBQV004, BBQV006 and BBQV008, are really making a profit, as a higher OPM is preferable to a lower one. The OPM for BBQV001 and BBQV009 are not meaningful.

4.5.2 EVA and NOPAT

Figure 4.5 sets out the EVA and NOPAT values for all six farms.

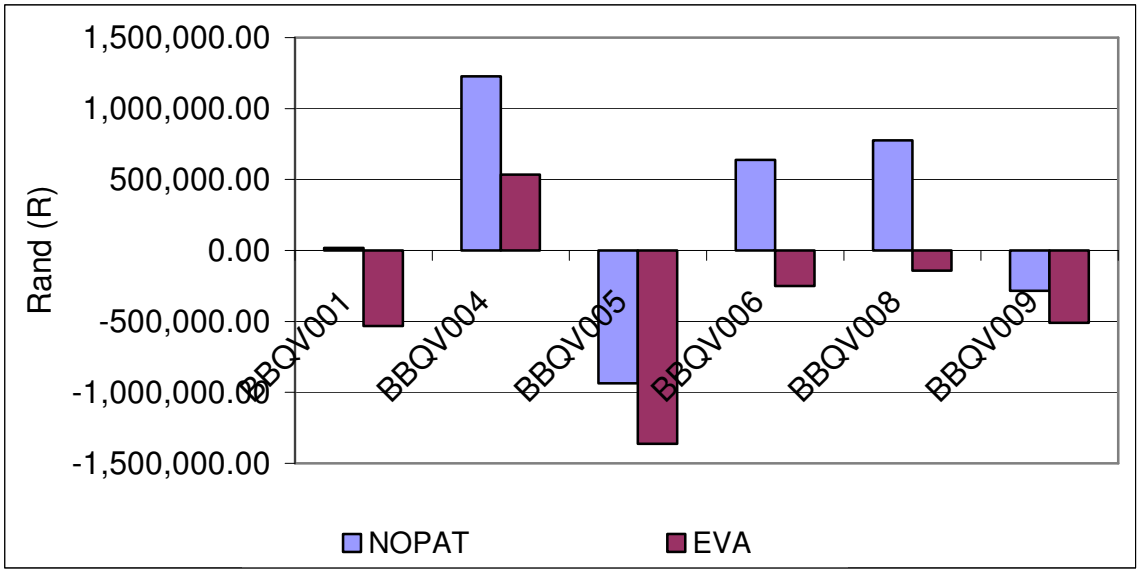

Figure 4.5: EVA and NOPAT

A positive value for EVA indicates that the farm has created value, while a negative EVA value indicates that the farm has destroyed value. Whether a farm creates or destroys value depends on the size of NOPAT. The higher the NOPAT, the more value is created and *vice versa*. From the graph above, one can see that only one farm has created value. BBQV004 has an EVA of as high as R535 076 because it has the highest NOPAT (R1 227 580), while BBQV001 has the lowest NOPAT of R18 717, which resulted in a negative value for EVA (R532 780). BBQV005 and BBQV009 have a negative NOPAT and that is why BBQV005 has the highest value of negative EVA. BBQV008 has the lowest negative EVA (R141 117) compared to all other value destroyers.

The rate of return is very low for BBQV005, BBQV006, BBQV008 and BBQV009 because of the high values of debt used. BBQV009 has the highest debt among the six farmers, which is R3 480 774, while BBQV001 and BBQV004 have the lowest debt of R473 593 and R367 740 respectively. BBQV001 and BBQV004 have the highest WACC of 14.13% and 14.45% respectively and the lowest is 7.10% for

BBQV009. Bearing in mind the formula for EVA ((r-WACC)*capital), the spread (r-WACC) remains negative for all the farms. BBQV001 and BBQV004 have the lowest spread of 14.12% and 14.19% respectively. BBQV009 had the highest spread of 7.19%.

High debt used by the farmers resulted in low rates of return. All the WACC values were negative and higher than the rate of return. That has resulted in a negative spread for all the farms, thus the EVA remains negative for all farms except BBQV004.

4.6 COMPARING EVA AND TRADITIONAL MEASURES

The results attained using EVA as opposed to the traditional measures can be compared to see which financial measure gives the best information about the financial performance of the milk producers. Two questions need to be answered while comparing these measures. Firstly, does each measure show profitability or unprofitable results? Secondly, do the traditional measures and EVA give the same results? Table 4.8 presents the comparison of these measures.

Table 4.8: EVA and the traditional measures' results

	BBQV001	BBQV004	BBQV005	BBQV006	BBQV008	BBQV009
ROA	POSITIVE	POSITIVE	NEGATIVE	POSITIVE	POSITIVE	NEGATIVE
ROE	POSITIVE	POSITIVE	NEGATIVE	POSITIVE	POSITIVE	POSITIVE
NFIR	POSITIVE	POSITIVE	POSITIVE	POSITIVE	POSITIVE	NEGATIVE
OPM	POSITIVE	POSITIVE	NEGATIVE	POSITIVE	POSITIVE	NEGATIVE
EVA	NEGATIVE	POSITIVE	NEGATIVE	NEGATIVE	NEGATIVE	NEGATIVE

Looking at the traditional measures, one can see that BBQV001, BBQV004, BBQV006 and BBQV008 are profitable because of their positive ratios, while they indicate that BBQV005 and BBQV009 are not profitable. When one uses EVA, only BBQV004 is shown to create value while the rest are shown to destroy it.

Table 4.9: EVA vs. traditional measures

	BBQV001	BBQV004	BBQV005	BBQV006	BBQV008	BBQV009
Results	Same	Same	Same	Contradict	Contradict	Same

The two measures (accounting-based and economic-based) were compared to see whether they lead to same conclusion. One should bear in mind that BBQV001 showed very small positive results and can therefore be seen as giving the same answer as EVA. According to Table 4.9, above, for only four farms did the traditional measures and EVA lead to same conclusion about the financial state of the farm, while the results on the other two farms were contradicting.

Traditional measures are presented in percentage form, while EVA is shown in real terms. This might be the reason why these results are contradictory. On the other, hand the traditional measures suggest positive returns even when the returns are low and that might lead to misleading results. In this case, it would be better if both measures are used together to assess the financial profitability of the farms in order to avoid misleading results.

4.7 CONCLUSION

Trial balances of farmers were obtained from six Humansdorp milk farmers and from these balance sheets and income statements were constructed. Financial performance measure formulas were discussed and slightly adapted in order to suit the farm situation. Four traditional profitability measures were calculated (ROA, ROE, OPM and the NFI ratio) using one sample case as a detailed demonstration, and the results for al the farmers were tabulated and presented graphically. EVA's components, like return on the cost of capital and capital invested in those farms, were determined before calculating EVA itself.

The results were then interpreted. The traditional measures indicated that only four farms are profitable, and that the other two were not profitable. EVA indicated that only one farm out of the six created value and the rest destroyed value. EVA and traditional profitability measures' results were then compared to see how similar the

results are. The results of these two sets of measures were the same for four farms, while for the remaining two farms the results were contradictory results. These measures presented different results when used on their own. It is therefore important to combine both types of measure in order to take a right decision. In the next chapter, this study is summarized and concluded.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

The aim of this study was to critically evaluate EVA as a measure to evaluate financial performance for milk producers. The main objective of this study was to calculate and evaluate selected financial performance measures that are or can be used by milk producers. Further objectives were to evaluate the financial performance of milk producers, to determine whether milk producers create value and to compare EVA with traditional measures to see whether EVA is a better measure of wealth creation than these other measures.

5.2 APPROACH FOLLOWED

EVA and four traditional measures, ROA, ROE, NFI and OPM, were discussed and compared in this study as performance measures. These measures were used to evaluate the financial profitability performance of six sample milk producers.

Profitability measures help farmers to see how efficient they are in using their resources to create a profit. Firstly, the formulas were explained and slightly adjusted in order to suit the farm situation. Balance sheets and income statements were constructed from the trial balances. The information needed to calculate EVA and the traditional measures were extracted from those financial statements and these measures were calculated.

5.3 RESEARCH RESULTS

In this study, the traditional measures were calculated first, followed by EVA. From the results using the traditional measures, one can see that only four farms out of the six created value because of the positive returns, which were above the norms. One of the four profitable farms (BBQV004) had high and positive ratios, which indicated that the farm was performing well. Three of the four had low but positive returns, which are misleading to the farmer. It was also clear from the results that one out of the four profitable farms (BBQV001) had positive but very low returns which were below the norm. Two of the unprofitable farms had negative returns.

According to the EVA calculations, only one farm (BBQV004) had a positive EVA, which indicates that value is created, while the rest had negative EVA indicating that these farms destroyed value. These measures were then compared and the results for EVA and the traditional measures were found to be contradictory for two farms. However, they gave same results for the remaining four farms. Traditional measures suggested that there was a positive return for these four farms while EVA suggested that value was destroyed for three of the four farms. This indicates that the traditional measures are not good, because they indicate value creation while value is actually being destroyed. Using traditional measures on their own will give misleading results, because decisions can be taken on the basis of misrepresentative financial information that is not indicative of the actual financial situation of the farm.

Traditional measures should not be eliminated as a means of evaluating performance, even though they may appear to have no theoretical appeal. They should be used in conjunction with EVA. EVA should be in the commanding role in corporate control, and the traditional measures should have the role of giving additional information. This means that traditional measures should be taken as informative measures but not as a guide for the enterprise. EVA happens to be a solution to the anomalies encountered with traditional measures.

Thus, the first hypothesis, namely that the selected milk producers are performing well, had to be rejected for the sample, with the exception of one farm. The second

hypothesis, namely that EVA is a better wealth indicator than traditional measures could be cautiously accepted, but the study still recommends that EVA be used in combination with other measures to obtain a more comprehensive picture of the situation of a dairy farm.

5.3 FURTHER RESEARCH

The following areas for further research are suggested:

- One of the most important research opportunities is to determine why farms EVA numbers are so low.
- Actual management practices should be identified rather than only the financial performance of the farm.
- EVA and traditional measures can be used to predict farm insolvency.
- The EVA of three or more years can be recalculated for all these farms or a much larger sample and the results can be compared to retest the first hypothesis for more milk producers.

5.4 CONCLUSION

The main aim of the study was to evaluate the financial performance of a sample of milk producers by using both EVA and traditional performance measures. Four ratios (ROA, ROE, NFI and OPM) were used as the traditional measures which were calculated, along with EVA, and the results were interpreted. From the results it was clear that in the sample, most of the milk producers were not creating value.

A comparison of EVA and the four traditional measures showed that EVA was the best measure and gave more reliable results than the traditional measures in some cases. From the results it could be concluded that the EVA and the traditional measures can fruitfully be used together. EVA should take the commanding role, while the traditional measures can provide additional information.

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APPENDIX

Trial balances from Wolmarans Kruger in Humansdorp.