

**EFFECT OF RETURN ON INVESTMENT ON
PORTFOLIO DIVERSIFICATION AMONG
COMMERCIAL SUGARCANE INVESTORS IN KENYA**

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**Effect of Return on Investment on Portfolio Diversification among
Commercial Sugarcane Investors in Kenya**

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other University

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DEDICATION

This study is dedicated to my dad Mr. Alex Mamwa and my siblings for their support during my studies without which this project study would not have been possible

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ACRONYMS AND ABBREVIATIONS

CAPM	Capital Asset Pricing Model
GDP	Gross Domestic Product
IFAD	International Fund for Agricultural Development
KESGA	Kenya Sugar Cane Growers Association
KESREF	Kenya Sugar Research Foundation
KSB	Kenya Sugar Board
MPT	Modern Portfolio Theory
ROA	Return On Asset
ROCA	Return On Current Asset
ROCE	Return On Capital Employed
ROE	Return On Equity
ROFA	Return on Fixed Assest
ROI	Return On Investment
UNECA	United Nations Economic Commission for Africa

DEFINITION OF TERMS

Commercial Sugarcane Farmer:- Commercial sugarcane farming is a type of farming in which sugarcane are grown for commercial use only. It is a modernized method of farming that is undertaken on a large scale. (Kabajeh, 2012)

Contract Farming: Contract farming (CF) is defined as forward agreements specifying the obligations of farmers and buyers as partners in business. Legally, farming contracts entail the sellers' (farmers') obligation to supply the volumes and qualities as specified, and the buyers' (processors'/ traders') obligation to off-take the goods and realise payments as agreed (Kremer, Lorenzo, & Sendhil, 2012).

Financial Perfomance: Financial performance is explained by the level of concentration of capital in farming and in the resource base namely debt capital, farm asset and farm equity(Alvin, 2005).

Market Performance Measurement: Al Matari (2014) describes market performance measures as the techniques and process of measuring the efficiency and effectiveness of a firm perfomance and resource utilization.

Non-Farm assets: all activities outside the agricultural sector (Barretta, Reardonb, & Webb, 2001).

Portfolio Diversification: Investing in different asset classes and in securities of many issuers in an attempt to reduce overall investment risk and to avoid damaging a portfolio's performance by the poor performance of a single security, industry or country (Rodrik, 2004). In finance and investment planning, portfolio diversification is the risk management strategy of combining a variety of assets to reduce the overall risk of an investment portfolio (Abor, 2005).

Return on Assets: Return on assets (ROA) is a financial ratio that shows the percentage of profit a company earns in relation to its overall resources. It is commonly defined as net income divided by total assets (Maverick, 2015).

Return on Capital Employed: Return on capital employed (ROCE) is a financial ratio that measures a company's profitability and the efficiency with which its capital is employed. ROCE is calculated as: $ROCE = \text{Earnings Before Interest and Tax (EBIT)} / \text{Capital Employed}$ (Alvin, 2005).

Return on Equity: According to Kabajeh (2012), Return on equity (ROE) is the amount of net income returned as a percentage of shareholders equity. It measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested.

Return on Investment: A performance measure used to evaluate the efficiency of an investment or to compare the efficiency of a number of different investments (Campbell, 2006).

Commercial Sugarcane Farmer: A performance measure used to evaluate the efficiency of an investment or to compare the efficiency of a number of different investments (Campbell, 2006).

ABSTRACT

The main purpose of this study was to establish the effect of return on investment on portfolio diversification among commercial sugarcane investors in Kenya. The study had four specific objectives: evaluate the effect of return on capital employed on portfolio diversification among sugarcane investors in Kenya; assess the return on equity on portfolio diversification among sugarcane investors in Kenya; examine the influence of return on assets on portfolio diversification among sugarcane investors in Kenya and to evaluate the influence of market performance measures on portfolio diversification among sugarcane investors in Kenya. Descriptive correlation was then used to describe and establish the relationships among the study variables. The target population for this study comprised of all sugarcane investors around Kakamega and Bungoma Counties. Both primary and secondary data was used in this study and the positivistic approach to research guided data analysis was also used. Primary data was collected through the use self-administered questionnaire. Secondary data on the other hand, was used to obtain information from already existing literature. The study used multi stage sampling in selecting the investors to be interviewed. After the data has been collected. The data was analyzed by simple descriptive analysis using statistical package for social scientists (SPSS) to generate cumulative frequencies and percentages. The study collected data from a sample of 312 out of 399 respondents. The study revealed a positive and statistically significant correlation between Return on Investment and portfolio diversification. Several measures were used to establish this relationship. These include ROCE, ROE, ROA; Fixed and Current and market performance measures. All the measures indicated a positive relationship with portfolio diversification independently. In general the study revealed a positive and statistically significant relationship between Return on investment and portfolio diversification. The study was limited in coverage to only two counties and therefore recommends that a similar study be carried in other counties to enhance the generalisability of the findings.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

This section provides the basis of making an argument for an extant problem with respect to how return on investment affects portfolio diversification among sugar cane investors in general and those in Kenya in particular.

1.1.1 Return on Investment

According to Jensen (2013), return on investment (ROI) or rate of return, measures the percentage return on a particular investment. ROI measures the profitability of an output for a given amount of time. It is the performance measure used to evaluate the efficiency of investment. It compares the magnitude and timing of gains from investment directly to the magnitude and timing of investment costs. ROI is an important financial metric for asset purchase decisions; approval and funding decisions for projects and programs of different types; traditional investment decisions (Campbell, 2006).

Return on investment (ROI) is “the ratio of money gained or lost on an investment relative to the cost of the investment.” It allows one to analyze and compare investments in order to identify the best alternative for their situation (Justin, 2014). Towards ensuring a healthy farm ROI, it’s important to be mindful of all the different costs associated with owning and operating a farm. These include, input costs, yields, and market prices. For many farmers and landowners, closely weighing the options regarding seeds, chemicals, fertilizer, and equipment is necessary when determining the return on investment. It is often necessary to consider the actual ROI when making farming decisions, because while a certain decision may seem too pricey initially, the actual ROI makes it a worthy investment (Jennifer, 2014).

Profitability ratios are an indicator for the firm's overall efficiency (Jennifer, 2014). They are used as a measure for earnings generated by the enterprise during a defined period based on its level of sales, assets, capital employed, net worth and earnings

per share (Jennifer, 2014). Profitability ratios measures earning capacity of the firm, and they are considered as an indicator for its growth, success and control. Creditors for example, are also interested in profitability ratios since they indicate the company's capability to meet interest obligations. Gallinger (1977) developed a model that comprised indicators of return on investments such as the return on sales, the financial leverage, the interest expenses, and the return on equity. This allows analyzing a company's asset management and the opportunity to redeploy the assets in the future (Kabajeh, 2012).

Al-Matari (2014) identified a number of profitability or performance measures that are used to judge performance. The metrics identified included return on assets, return on equity, and profit margin among others. These measure can be broadly classified as consisting of the accounting based measures such as the return on assets and return on equity and market measures of performance such as the price earning ratio Al-Matari (2014). The accounting based measures have however been criticized as backward looking and partially estimates future events such as in terms of depreciation and somehow limited by accounting standards. They are short-term measures with the possibility that the current to some extent indicates the future performance potential particularly if the analysis uses some longitudinal approach. The market-based measures are long-term measures of firm performance and to a large extent measures the future performance based on the current value (Al-Matari, 2014).

Among the accounting measures that are commonly used by managers in gauging firm performance for purposes of decision-making, it was noted that return on assets was the most frequently used followed by return on equity and thirdly the profit margin while all the other accounting measures were rated as minimally used (Beaver & Morse, 1978). The market based measures identified included Tobin-Q as the most commonly used followed by Market-to-Book Value (MTBV) Abnormal Returns and Annual stock return (RET) and the price earning ratio while all the other were minimally used. Chong (2008), using a qualitative approach (in depth interviews of the owner managers) showed that modern SMEs actually adopt a hybrid approach that is financial (accounting) and non-financial (market based)

measures to judge performance. He further noted that the owner managers indicated that for the financial measures, they mainly use the return on investment measures and for the non-financial, they use customer satisfaction measures in the short term and growth in revenues and market share in the long term.

From the studies by Al-Matari (2014) and Chong (2008), the most important financial (accounting) measures commonly used include return on assets, return on equity and the profit margin. While on the non-financial (market based) although the price-earning ratio is not the most commonly used but has a relation with the financial measure in that it can be easily derived from the financial statements. For the most important and frequently used non-financial (market based) measures; they are mainly applicable in a competitive market structures unfortunately, sugarcane investors face a monopsony or oligopsony types of market thereby rendering these market based measures inapplicable in their context. Chong (2008) further shows that the SMEs owner managers indicated that growth of revenues are important for future decision about investments decision either to facilitate expansion or diversification. Therefore, return on capital employed can act as the proxy measure of revenues at hand for future investment decisions.

Returns on capital employed (ROCE) is a long-term profitability ratio because it shows how effectively assets are performing while taking into consideration long-term financing (Maverick, 2015). It is also the accounting rate of return and calculated as the ratio of the accounting profit generated by an investment to the required capital outlay, expressed as a percentage (Lumpy & Chris, 2003). The ROCE is based on two important calculations; operating profit and capital employed. Operating profit also referred to as earnings before interest and tax (EBIT), represents the earning power of the company or business with regard to revenues generated from ongoing operations while capital employed, also known as funds employed, is the total amount of funds or capital used for the acquisition of profits. Capital employed is the total amount of share capital and debt that a company has and uses (Scarlet, 2006) it refers to the amount of assets that contribute to a company's ability to generate revenue, it represents the financial resources necessary for the company to continue functioning and engage in its primary task of revenue

generation (Eilon, 1988). A high ROCE indicates more efficient use of funds or capital and vice versa. This efficiency has a direct effect on portfolio diversification as it is the revenues accrued that actualizes investments

Return on equity (ROE) tells what percentage of profit the company makes for every monetary unit of equity invested in the company. It provides a good indication of whether the company is even capable of generating a return that is worth whatever risk the investment may entail (Berman, Knight, & Case, 2013). This makes ROE such an important indicator for any investor in that the essence of investment is not only recouping the investment outlay but equally to make a profit despite the risk faced. It is therefore an holistic measurement of firms performance taking into consideration the capital outlay and risks involved. According to Black, Wright and Davies (2001), shareholder value is created when the equity returns of a company exceed the cost of that equity. These benefits can then be used to intensify investments.

Return on assets (ROA) is of the most important profitability ratios and indicates management performance regarding firm's resources and assets calculated by dividing net profit by total assets. According to Royanto (2014), Return on Assets (ROA) is used to measure the effectiveness of the company in generating profits by exploiting its assets (Prastowo, 2014). Return on assets (ROA) is an indicator of how profitable a company is relative to its total assets. Profitability is the key to creation of wealth or reserve resources that can in turn be used to diversify investments (Al-Matari, 2014). Return on assets gives an indication of the capital intensity of the company, which will depend on the industry. Capital-intensive industries (such as railroads and thermal power plant) will yield a low return on assets, since they must possess such valuable assets to do business. Shoestring operations (such as software companies and personal services firms) will have a high ROA: their required assets are minimal. The implication of this is that the shoestring operations, which can also include sugarcane investments, do face higher risks particularly with regard to intense competition and thereby would be more inclined to diversify their portfolios. Therefore, ROA is also an indicator of measuring managerial efficiency (Rusudi & Tennant, 2003).

Anderson and Brooks (2005) define price earnings ratio as market price per share divided by annual earnings per share. Graham and Dodd (1940) introduced price to earnings ratio and its reciprocal, earnings to price, as a benchmark for equity valuation. The application of P/E ratio is based on the idea that earnings are related to value. The fact that each share is worth a number of times its current earnings became commonly accepted as market makers and financial investors based their buy/sell decisions on a specific P/E level (Drenman, 1977). The buy and sell decision therefore implies the decisions to either diversify or not are critically based on the expected future earnings of the investment. This is in line with Anderson and Brooks (2005) who, posit that P/E ratio reflects the price that the market is willing to pay for a shilling of earnings of the share or investment. Investors especially those who believe in value investing use price earnings (P/E) ratio as a tool to measure how cheap or expensive a stock or a potential investment is.

1.1.2 Portfolio Diversification

Diversification is a cornerstone of the portfolio theory pioneered by Markowitz (1952) and Valery (2002). The canonical model of portfolio choice by Markowitz indicate that household will hold a positive share in risky assets and that this risky component will consist of a well-diversified portfolio in order to optimize its risk return characteristics. An investigation on financial portfolio decisions reveal a participation decision in terms of the binary decision either to hold or not to hold some financial assets (extensive margin) as well as the allocation decisions that concerns what share of the financial portfolio to hold in those assets (intensive margin).

The main purpose of portfolio diversification is portfolio risk management and optimization. A risk management plan should include diversification rules, which are strictly followed. Optimization occurs because risk is minimized; allowing the portfolio manager to seek out higher returns (Rodrik, 2004). A risk management plan should lower the volatility (risk) of a portfolio because not all asset categories, industries, or stocks move together. Thus holding a variety of non-correlated assets can nearly eliminate unsystematic risk. In other words, by owning a large number of

investments in different industries and companies, industry and company specific risk is minimized. This decreases the volatility of the portfolio because different assets should be rising and falling at different times; smoothing out the returns of the portfolio as a whole. In addition, diversification of non-correlated assets can reduce losses in bear markets; preserving capital for investment in bull markets (Robert, 2004).

Portfolio diversification involves divergence of investments. The aim is to maximize and sustain overall profit in the context of investments risks. The implication of this is that investments and profit (performance of investment) have a relationship. Critical to understand is which influences the other. From the Keynesian perspective, the relationship between profit and investment is a simultaneous equation problem. Profit influence investment as well as investments influences profit. However, which direction in the simultaneous relation between profit and investment is stronger or significant is what will provide insights into relation between them (Andrew, 2009).

1.1.3 Return on Investment and Portfolio Diversification

According to Dlamini (2010), high financial performance has changed the farmers' enterprises. In most cases, the scale of change was relatively modest reflecting the general stability of these farms. The urges to spread risk, earn more from investments and ensure food security were the drivers behind the change. Return on Investments is a question that occupies every farmer and landowner's thoughts on a regular basis: What is the return on investment of my farm operation? Am I making the right decisions when it comes to my input costs? Am I marketing my crops effectively? These are important questions, and rightly so—any successful business owner knows that the key to making money and staying in business for the long term involves a high degree of attention to this key aspect.

In the agricultural sector livelihood diversification is the process by which families establish a diverse portfolio of activities or assets and social support capabilities or securities both as a survival mechanism and to improve their standards of living, which depend on the returns of their diverse portfolios (Ellis, 2008). According to the IFAD Rural Enterprise Policy (2004), poverty in the rural areas has contributed by

degradation of agro-ecological environmental, lack of productive assets such as land, capital and skills as well as by the lack of linkages of the rural sector to the other sectors of the economy such as urban markets. Ellis and Freeman (2004) attributed low incomes or returns from agricultural activities and therefore high incidences of poverty to low land and livestock holding, heavy reliance on food crop agriculture and low commercialization of the rural economy. Given that the main economic activity in rural areas is farming, poor farmers seek ways of supplementing or smoothing their mainstream income (farm income) or assets which is usually subject to risks which arise from the vagaries of weather and fluctuations in market prices (Ellis, 2008). The most common option for poor farmers seeking to stabilize or supplement their income is to sell their labor to better-off farmers or engage in other non-farm activities or investments (Tripathi, 2015).

From the in depth interviews by Chong (2008), in addition to general financial arguments, revenues play a crucial role in ensuring current and future investments decisions of firms. Revenues of a firm point to internal financing either through profits retained after taking care of costs or the revenues of a firm borrowed by remaining indebted to the suppliers. In this case then financial performance or profits influences investments hereby implying that profits influences portfolio diversification; but it is also logical that the type of investments influences profits.

Stubelji (2014) observed that profit expectations play a crucial role in firm investment decisions and that these expectations strongly are affected by current investment that is there is an argument of two-way causality. This therefore makes it difficult to conclude with certainty direction of causal link between investments and profits. However, at firm level there is research support for the causal effect relationship in the direction of the profit to investments that is if the profit motive or expectations is true then profit drives investments. Stubelji (2014) argues that only if the firm has other motive then investment determines profit. According to the evidence adduced, this is mainly true at the national level.

Support of the direction of influence from profit to investment was stronger at the industry and sector levels (Stubelj, 2010). The explanation was that firms depend

mainly on internal financial sources just as Chong (2008) had noted. From financial theory imperfect financial markets, limits company acquisition of external funding sources that can influence company's investments policies and limit their investments. In such cases then information of past profit is a good predictor of investment. Therefore, it can be concluded that, higher profits, higher range of investment with expected higher returns and proper pricing mechanisms support the profit motive of enterprises thereby implying that at the enterprise level the direction of influence is from profit to investments, which in turn leads to portfolio diversification (Stubelji 2014). In this case then the sugarcane investors face the direction of influence from profit to investments implying the direction of profit (an indicator of returns on investment) to portfolio diversification.

1.1.4 Commercial Sugarcane Farming in Kenya

Sugar cane was first introduced in Kenya in 1902 with the first sugar factory being set up at Miwani near Kisumu in 1922. Later in 1927, another sugar factory was set up at Ramisi in the coast province, the area where the current Kwale International Sugar is located. After independence, the Government of Kenya moved to expand sugar through investments in sugar cane growing schemes and establishment of more new sugar factories. These include Muhoroni Sugar Factory (MSF) in 1966, Chemelil Sugar Factory (CSF) in 1968, Mumias Sugar Company (MSC) in 1973, Nzoia Sugar Company (NSC) in 1978 and South Nyanza Sugar Company (SONY)-Awendo in 1979 (Departmental Committee On Agriculture, 2015).

The total area under cane in the country presently is 203,730 Ha, comprising 189,390 Ha belonging to out-growers and 14,340 Ha Nucleus Estates (land owned/leased by mills to grow cane). There are 300,000 cane farmers, 4,500 of which are large scale. The quality of cane as measured by pol % cane averages 12 compared 13.5% in the region. Pol % of cane dropped from a weighted average of 11.16 in 2012 to 11.08 in 2013, due to cane harvested below 13 months. However, there was an improvement in fibre percentage cane, from 17.18 to 17.01 during the period (Departmental Committee on Agriculture, 2015).

The average yield per Ha in Kenya is 60.5MT compared to the global average of 63MT. Columbia produces 115 MT per Ha. Total cane supplied for processing by mills in 2013 was 6,764,200 MT compared to 5,842,830 MT in 2012, representing a 15.77% increase. Today, Kenya has eleven (11) operational sugar mills in the country, 1 to be commissioned in Kwale (Kwale International Sugar Company) while 2 mills (Muhoroni and Miwani) are under receivership. The 11 sugar factories have an annual production capacity of about 600,000MT of sugar against the annual domestic requirements of 800,000MT, running a deficit of 200,000MT. The estimated 200,000 metric tons shortfall is offset by sugar imports, which has created a lot of instability in the local domestic market. Kenya has only managed to achieve significant production of the commodity in 1980 and 1981 to meet domestic demand (Departmental Committee on Agriculture, 2015).

Portfolio is a bundle or a combination of individual assets or securities. These securities or assets are generally looked at investments that are held in order to yield returns. It is a generally accepted principle that a portfolio is designed to suit the investor's risk tolerance, period and investment objectives (Pandey, 2010). The portfolio theory provides insights to understanding and analyzing investors portfolios. The theory is based on the assumption that investors are risk averse. This implies that investors hold well-diversified portfolios instead of investing their entire wealth in a single or a few assets (Pandey, 2010).

According to Tripathi (2015), agricultural credit provided directly to farmers, called direct finance to farmer for agriculture, is either short-term or long-term. While short-term credit enables cultivators to procure inputs such as fertilizer and seeds needed for agricultural operations, long-term credit is meant for investment in fixed assets such as irrigation pumps, tractors, agricultural machinery and so on, thus accentuating capital formation. The available evidence indicates a strong association between long-term (direct) agricultural credit and private sector gross capital formation in agriculture the correlation coefficient between them comes out to be 0.84 between the period 2000-01 and 2013-14 (Dave, 2014). Therefore, private capital formation in agriculture is predominantly dependent on long-term credit. There are obvious reasons behind this. Private investment in agriculture depends,

among other things, mainly on investable resources and expected rate of return on investment, which, in turn, is determined by the prices of agricultural inputs and output. It is in the context of availability of investable resources that the credit from financial institution becomes critically important (Tripathi, 2015).

Notwithstanding the impressive gains made by the rural credit delivery system in terms of resource mobilization, geographical coverage and functional reach during 2000s, inadequacy of farm credit remains one of the major bottlenecks hindering the growth in investment in agriculture. Despite having manifold increase in the volume of direct finance to agriculture in the 2000s—17.8% per annum as compared to 8.5% per annum in the 1990s—there has been a fall in the share of long-term credit in total direct finance to agriculture. The share declined from 66.5% in 1991-92 to 37.9% in 2011-12; therefore, only an increasingly smaller portion of credit supplied to agriculture transformed into capital formation in the 2000s (Shahriar, 2007). This implies that for the agricultural sector the sugarcane investors would then be more dependent on internal financial sources when making decisions on portfolio diversification.

According to Waswa, Gweyi and Mcharo (2012), sugarcane farming supports over 200,000 small – scale farmers in Kenya. In addition, an estimated six million Kenyans derive their livelihood directly or indirectly from the sugar industry. Domestic production of sugar saves the country about Kshs 45 billion in foreign exchange. Most farming is in western Kenya. In Kenya cane growing on a commercial scale began in Miwani and Kibos areas of Kisumu District and Ramisi and Shimoni areas of Kwale. After independence, the Government began large scale sugar projects in Nyanza and Western Provinces in an attempt to meet the growing local sugar demands which were being supplemented by imports from Uganda

Statistics show that Kenya's consumption of sugar outstrips production. Kenya currently produces about 70% of her domestic sugar requirement. Sugar production has increased from 384,171 tonnes in 1995 to 448,489 in 2013. Consumption also increased from 560,000 tonnes in 1995 to 691,563 tonnes in 2013. The deficit in sugar production is met through imports. There exists potential for Kenya to become

and retain self-sufficiency in sugar production and produce surplus amounts for export. The envisaged expansion and setting up of new factories in the country will help reduce this deficit (Board, KSB Report, 2012:2013).

1.2 Statement of the Problem

A comparative performance of the sugar industry by the Kenya sugar Board (2015) shows that the sugar industry recorded an 8.3% decrease in sugar production during the period January-March 2013 compared to the same quarter the previous year. Total sugarcane sales for the quarter were 135,610 tonnes against 143,077 tonnes in the same period 2012, a decrease of 5.2%. The quarter ended with closing stock of 14,658 tonnes against 21,726 tonnes in the same period the previous year. Total area under cane as at the end of March 2013 was 180,912 hectares compared to 206,809 hectares in the same period the previous year, a decrease of 14%. This indicates a decline in the production of sugar despite the increase in consumption of the same an indication of sugarcane investors diversifying into other portfolios.

Rural households in developing countries are likely to face a substantial risk of income variability (Jensen's, 2013). This implies that the investments in the rural sector equally face substantial risks. Therefore, the variability and level of income influence the portfolio diversification of rural households (Barretta, Reardonb, & Webb, 2001). This points to the perspective then that the sugarcane investors would always seek to generate portfolio of different degrees of risk, expected returns, liquidity and seasonality to smoothen and maximize returns (Andrew, 2009).The implication of this is that whatever portfolios the sugarcane investors would be diversifying into the profit motive will be the primary expectations in their minds.

Since the sugarcane investors have at their utmost minds, the profit motive the implication then is that the profits or the revenues accrued in their sugarcane investments influences their choices of portfolios and this in turn their portfolio diversification. This is in line with the findings among others of Stubelji (2010) and Chong (2008) who indicated that at sectorial or industry levels the direction of influence is from profit to investments thereby contributing to portfolio diversification. They further argue that the direction of influence is because of the

limitation of relying on internal financing in addition to the profit motive. For the sugarcane investors, noting that there has been a decline in sugarcane output and even acreage under cultivation implies then portfolio diversification has or is taking place. (Dlamini et al., 2010; Andrew 2009; Kenya sugar Board 2013). The question then is whether this is driven by the profit motive and if this is the case then to what extent are the different conceptions or quantitative measurements of investments returns influence portfolio diversification decision.

1.3 Research Objectives

This section provides the general and specific objectives.

1.3.1 General objective

To evaluate the effect of return on investment on portfolio diversification among sugarcane investors in Kenya

1.3.2 Specific objectives

The specific objectives of this study are:

- i. To evaluate the effect of the return on capital employed on portfolio diversification among sugarcane investors in Kenya
- ii. To assess the effect of return on equity on portfolio diversification among sugarcane investors in Kenya
- iii. To examine the effect of return on assets on portfolio diversification among sugarcane investors in Kenya
- iv. To evaluate the effect of market return on portfolio diversification among sugarcane investors in in Kenya

1.4 Hypothesis

The study tested the following null hypotheses:-

H₀₁: Return on capital employed has no significant effect on portfolio diversification among sugarcane investors in Kenya

H₀₂: Return on equity has no significant effect on portfolio diversification among sugarcane investors in Kenya.

H₀: Return on assets has no significant effect on portfolio diversification among sugarcane investors in Kenya.

H₀₄: Market return has no significant effect on portfolio diversification among sugarcane investors in Kenya

1.5 Justification of the Study

Return on investment has important implications in investment decision making. It is widely used and accepted since it is used to assess overall business performance. As a relative measure, it enables comparisons to be made with divisions or companies of different sizes. Ultimately, it affects the level of farm output achieved and in the end economic conditions in Kenya where agriculture contributes up to 24% of the GDP. Information on the influence of sugarcane ROI on portfolio diversification represents important contribution to the existing knowledge.

It brings out the relationship of ROI on portfolio diversification. This is important because it can help the farmers better understand the aspects of their investments and what decisions they need to make in order to get optimized returns.

Since ROI, techniques are valuable when analyzing potential results and making decisions in turn with conserving capital and minimizing risks, the relationship status act as a basis for their decision-making. The findings of the study are also likely to aid the government in coming up with strategies for enhancing cash crop productivity within diversified portfolios.

1.6 Scope

The study focused on evaluating the effect of sugarcane return on investment on portfolio diversification. Portfolio diversification decision can be influenced by other factors but the study focused on return on investment; ROCE, ROE, ROA and market performance measures

Geographically the study was confined to Bungoma and Kakamega Counties. This is because a big population of the sugarcane growers comes from this region and thus data collected and analyzed was a representative of diversified portfolios in sugar growing areas.

Conceptually, the study focused on four performance measures of return on investment. These include return on equity, return on capital employed, and return on assets and market returns. These were considered adequate in line with Stubelji (2010).

1.7. Limitations of the Study

The study focused only in Bungoma and Kakamega Counties given their importance in sugarcane farming. Accordingly, the study was limited in scope to these counties and it is not clear if these findings can be generalizable to other parts of Kenya and the world. The findings are considered valid however since Kakamega and Bungoma provide the majority of sugar farmers in Kenya.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter gives a detailed literature review of the relationship between return on investment and portfolio diversification among sugarcane investors. It describes the various theories and diagrammatically shows the conceptual framework. It clearly analyzes the existing literature on the above subject and concludes by identifying the research gaps.

2.2 Theoretical Framework

A theoretical framework refers to how the researcher not only questions, but also ponders and develops thoughts or theories, which are grouped together into themes that frame the subject. According to Mugenda (2003), theoretical framework is an explanation of a phenomenon that systematically explain the relationship among a given phenomenon for purposes of explaining, predicting and controlling such a phenomenon.

2.2.1 Markowitz Portfolio Theory

Markowitz (1952), introduced the analysis of the portfolios of investments in his article “Portfolio Selection” published in the Journal of Finance in 1952. The new approach presented in this article included portfolio formation by considering the expected rate of return and risk of individual stocks and, crucially, their interrelationship as measured by correlation (Megginson, 2006).

The diversification plays a very important role in the modern portfolio theory since the decision is equivalent to selecting an optimal portfolio from a set of possible portfolios. The method that should be used in selecting the most desirable portfolio involves the use of indifference curves. Indifference curves represent an investor’s preferences for risk and return. Following Markowitz approach, the measure for

investment return is expected rate of return and a measure of risk is standard deviation(Frantz & Payne, 2013).

The exemplified map of indifference curves for the individual risk-averse investor is presented in Fig.2.1. Each indifference curve here (I_1, I_2, I_3) represents the most desirable investment or investment portfolio for an individual investor. That means, that any of investments (or portfolios) plotted on the indifference curves (A,B,C or D) are equally desirable to the investor because all portfolios that lie on a given indifference curve are equally desirable to the investor and indifference curves cannot intersect. An investor has an infinitive number of indifference curves representing his or her preferences for expected returns and risk (standard deviations) for each potential portfolio.

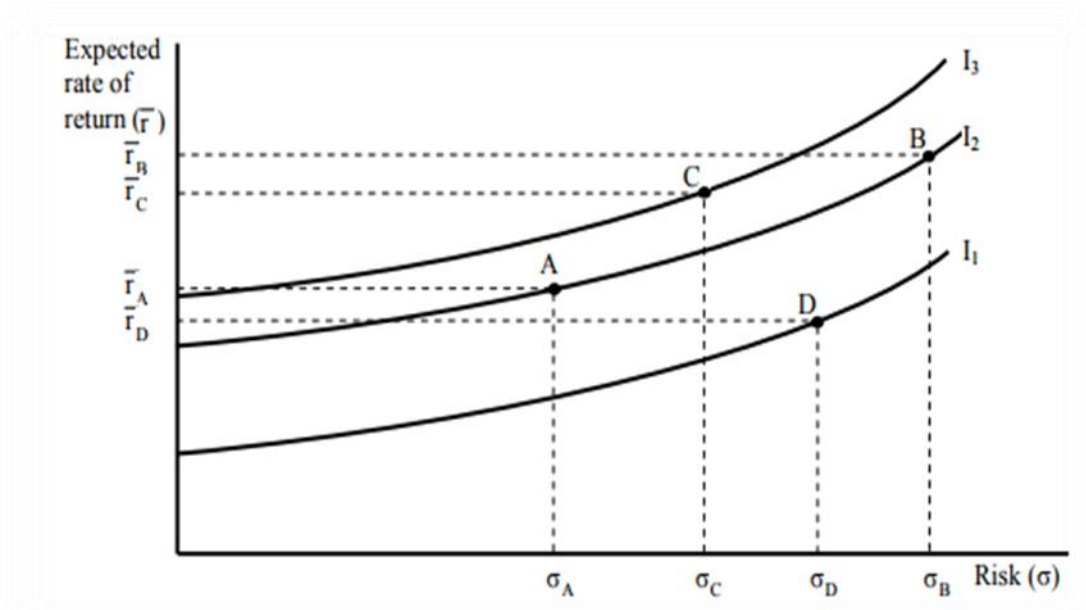


Figure 2.1: Map of Indifference Curves for A Risk-Averse investor (Hight, 2010)

Two important fundamental assumptions while examining indifference curves and applying them to Markowitz (1952) portfolio theory is that : The investors are assumed to prefer higher levels of return to lower levels of return, assumption of non-satiation and investors are risk averse. It means that the investor when given the

choice, will choose the investment or investment portfolio with the smaller risk assumption of risk aversion (Hight, 2010).

Following Markowitz (1952), efficient set portfolios approach an investor should evaluate alternative portfolios inside feasibility set on the basis of their expected returns and standard deviations using indifference curves. The expected rate of return of the portfolio can be calculated in some alternative ways. The Markowitz focus was on the end-of-period wealth (terminal value) and using these expected end-of-period values for each security in the portfolio the expected end-of-period return for the whole portfolio can be calculated. But the portfolio really is the set of the securities thus the expected rate of return of a portfolio should depend on the expected rates of return of each security included in the portfolio. The investor who simply wants the highest possible expected rate of return must keep only one security in his portfolio which has a highest expected rate of return. However the majority of investors don't do so and keep several different securities in their portfolios because they try to diversify their portfolios aiming to reduce the investment portfolio risk (Witt & Dobbins, 2009).

Portfolio theory suggests that it is possible to construct an "efficient frontier" of optimal portfolios, offering the maximum possible expected return for a given level of risk (Witt & Dobbins, 2009). It suggests that it is not enough to look at the expected risk and return of one particular stock. By investing in more than one stock, an investor can reap the benefits of diversification, particularly a reduction in the riskiness of the portfolio. The theory quantifies the benefits of diversification, also known as not putting all of your eggs in one basket. Consider that, for most investors, the risk they take when they buy a stock is that the return will be lower than expected. In other words, it is the deviation from the average return. Each stock has its own standard deviation from the mean, which MPT calls "risk" (Cochrane, 2007). The risk in a portfolio of diverse individual stocks will be less than the risk inherent in holding any one of the individual stocks (provided the risks of the various stocks are not directly related). Consider a portfolio that holds two risky stocks: one that pays off when it rains and another that pays off when it does not rain.

A portfolio that contains both assets will always pay off, regardless of whether it rains or shines. Adding one risky asset to another can reduce the overall risk of an all-weather portfolio. In other words, Markowitz showed that investment is not just about picking stocks, but about choosing the right combination of stocks among which to distribute one's nest egg. On the more technical side, there are five statistical risk measurements used in portfolio theory; alpha, beta, standard deviation, R-squared and the Sharpe ratio. All of these indicators are intended to help investors determine a potential investment's risk-reward profile (Cochrane, 2007).

Rather than look at diversification at the individual security level, Markowitz (1952) approached it from a different perspective. He understood that diversification needed to be viewed at the portfolio level. If investors were attempting to diversify the first security they owned with a second, then the third security purchased needed to consider not only the first, but also the second. As additional securities were added, so did the complexity of the decisions investors had to make. It was clear that diversification was not just a single security problem, but also a complex problem that needed to consider all of the other securities that make up an investor's portfolio. Markowitz's 1952 *Journal of Finance* article titled "Portfolio Selection" provided investors with the answer as to how they should approach diversification. The theory began with the recognition that investors facing uncertain outcomes have always had to make investment decisions based on their beliefs about the future of the investments they selected (West, 2014).

Two important fundamental assumptions examining Markowitz (1952) portfolio theory: Assumption of non-satiation. The investors are assumed to prefer higher levels of return to lower levels of return: because the higher levels of return allow the investor to spend more on consumption at the end of the investment period. Thus, given two portfolios with the same standard deviation, the investor will choose the portfolio with the higher expected return. This is called an assumption of non-satiation. Assumption of risk aversion states that investors are risk averse. It means that the investor when given the choice, will choose the investment or investment portfolio with the smaller risk. This means that the investor needs to evaluate all these portfolios on return and risk basis. According to Markowitz portfolio theory an

investor will choose his/ her optimal portfolio from the set of the portfolios that: (1) offer maximum expected return for varying level of risk, and (2) offer minimum risk for varying levels of expected return. Efficient set of portfolios involves the portfolios that the investor will find optimal ones. These portfolios are called an efficient frontier which can be described by the curve in the risk-return space with the highest expected rates of return for each level of risk (Veneeya, 2013).

The process of selecting a portfolio may be divided into two stages. The first stage starts with observation and experience and ends with beliefs about the future performances of available securities. The second stage starts with the relevant beliefs about future performances and ends with the choice of portfolio.

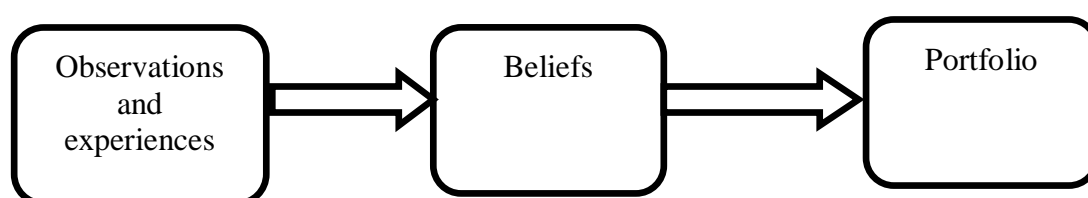


Figure 2.2: The Fundamentals of the Portfolio Selection Process pg 58
(Cochrane, 2007)

It is both evident and intentional from the very introduction of the concept of asset allocation that the beliefs we hold are at the core of the portfolio selection process. In this sense, it is important to understand that the process represents not only a diversification of assets or asset classes, but also a diversification of the beliefs regarding the expected returns and risks of those investments or asset classes (Cochrane, 2007).

The two key considerations of an investor in making investment decision is the rate of return and the risk involved in achieving this. In an attempt to optimize returns the investors diversify their portfolios which in the long-run lowers the investment related risks. As stated in the MPT theory, by investing in more than one stock an investor can reap the benefits of diversification particularly a reduction in the riskiness of the portfolio. This therefore implies that investors will always look for a

way of optimizing investments by diversifying which in the long-run reduces the risk levels of their investments.

2.2.2 Capital Asset Pricing Theory

Capital asset pricing theory states that portfolio returns are a function of the risk free rate of return and market risk premium (Sharpe, 1964). It gives rise to the capital asset pricing model (CAPM) which was developed by Sharpe (1964). CAPM simplified Markowitz's Modern Portfolio theory, made it more practical. Markowitz showed that for a given level of expected return and for a given feasible set of securities, finding the optimal portfolio with the lowest total risk, measured as variance or standard deviation of portfolio returns, requires knowledge of the covariance or correlation between all possible security combinations (Sharpe, 1964).

Measuring risk in Capital asset Pricing Model (CAPM) is based on the identification of two key components of total risk: systematic risk and unsystematic risk. Systematic risk is that associated with the market. Unsystematic risk is unique to an individual asset and can be diversified away by holding many different assets in the portfolio. In CAPM investors are compensated for taking only systematic risk (Andre, 2004)

The essence of the CAPM: CAPM predicts what an expected rate of return for the investor should be, given other statistics about the expected rate of return in the market, risk free rate of return and market risk (systematic risk). Each security has its individual systematic - undiversified risk, measured using coefficient Beta. Coefficient Beta (β) indicates how the price of security/ return on security depends upon the market forces. The Beta of the portfolio is simply a weighted average of the Betas of its component securities, where the proportions invested in the securities are the respective weights (Sharpe, 1964)

In managing unsystematic risks the investor can diversify their portfolios. CAPM model calculates the total return comprising risk free return and risk premium which is dependent on the degree of risk taken. The relationship between risk and returns should be linear and correlated. The general idea behind CAPM is that investors need

to be compensated in two ways; time value of money and risk. Although investors may expect a particular return when they make a certain investment they may be disappointed or pleasantly surprised, because fluctuations in price levels result in fluctuations in returns. An underpinning of CAMP is the observation that risks investments can be combined so that the combination the (portfolio) is less risky than any of its components.

2.2.3 Behavioral Finance Theory

Traditional finance uses models, in which the economic agents are assumed rational, which means they are efficient and unbiased processors of relevant information and that their decisions are consistent with utility maximization (Barberies & Thaler, 2003). Behavioral finance is based on the alternative notion that investors, or at least a significant minority of them, are subject to behavioral biases that mean their financial decisions can be less than fully rational. Evidence of these biases has typically come from cognitive psychology literature and has then been applied in a financial context. These include: Overconfidence and over optimism investors overestimate their ability and the accuracy of the information they have; Representativeness investors assess situations based on superficial characteristics rather than underlying probabilities; Conservatism forecasters cling to prior beliefs in the face of new information; Availability bias investors overstate the probabilities of recently observed or experienced events because the memory is fresh; Frame dependence and anchoring the form of presentation of information can affect the decision made; Mental accounting individuals allocate wealth to separate mental compartments and ignore fungibility and correlation effects; Regret aversion— individuals make decisions in a way that allows them to avoid feeling emotional pain in the event of an adverse outcome. Behavioral finance also challenges the use of conventional utility functions based on the idea of risk aversion (Jaya, Sujata, & Jhumur, 2015).

Another divergence from the traditional rational behavior of investors lies in the question of whether or not relative income is of importance for people. Behavioural finance theory says that relative income does matter and people derive happiness

from earning more than other people. Additionally, behavioural finance theory suggests that people are influenced by their peers, by their past, and by the general decision circumstances. Looking at the upcoming importance of sustainability of investments, Behavioural finance theory support the view that many people act out of self-interest, however they see behaviour also influenced by altruism and ethics. Moreover, behavioural finance theory doubt that markets are efficient. This is one of the most important assumptions of behavioural finance theories as it calls into question one of the underlying fundamentals of modern economics theory, namely the efficient market hypothesis (Pruden, 2012).

The use of behavioral finance theories in finance industry in particular is justified from the perspective that investing always involves uncertainty and behavioural finance is essentially the science of how people make economic decisions under uncertainty. This makes behavioural finance an inevitable part of the finance industry, which is especially true for traders. This can be demonstrated by the prospects theory which first and foremost concludes that the same amount of losses is perceived to elicit stronger and more negative emotions than the same amount of gains eliciting positive emotions on individual investors. In other words: If someone loses \$100, it will have a stronger negative impact on their mental state than a \$100 gain would have on positive feelings. Additionally, prospect theory suggests that once someone has won (earned) a lot of money, the incremental satisfaction of winning (earning) decreases. So, the more someone earns, the less satisfaction they can get from any additional money earned. This also holds for the opposite, i.e. if an investor has already taken a big loss, additional losses are perceived as less influential on the investors mental state. Being aware of this can prevent traders from making wrong decisions that are based on previously experienced gains or losses instead of solely concentrating on rational factors to come to a trading decision. Therefore behavioral finance offers an alternative foundation block for each of the foundation blocks of standard finance implying that people are normal and that markets are not efficient (Thaler, 2013).

2.2.4 Theory of the Firm

The theory of the firm is the microeconomic concept founded in neoclassical economics that states that firms (including businesses and corporations) exist and make decisions to maximize profits. Firms interact with the market to determine pricing and demand and then allocate resources according to models that look to maximize net profits (Braendle, 2014).

In the theory of the firm, the behavior of a particular business entity is said to be driven by profit maximization. This theory governs decision making in a variety of areas including resource allocation, production technique, pricing adjustments and quantity produced. The theory of the firm goes along with the theory of the consumer, which states that consumers seek to maximize their overall utility. In this case, utility refers to the perceived value a consumer places on a good or service, sometimes referred to as the level of happiness the customer experiences from the good or service (Braendle, 2014).

The theory is always being analyzed and adapted to suit changing economies and markets. Early economic analysis focused on broad industries, but as the 19th century progressed, more economists began to look at the firm level to answer basic questions about why companies produce what they do, and what motivates their choices when allocating capital and labor. Theory of the firm takes into account such facts as low equity ownership by many decision makers into account; some theorize that chief executive officers (CEOs) of publicly held companies are interested in profit maximization as well as in goals based on sales maximization, public relations and market share. Contemporary theory of the firm sometimes distinguish between long-run motivations, such as sustainability, and short-run motivations, such as profit maximization. This implies that particularly in the short run firms will always be seeking to maximize their returns on investments the most common indicator being the profit level (Margaret, 2013).

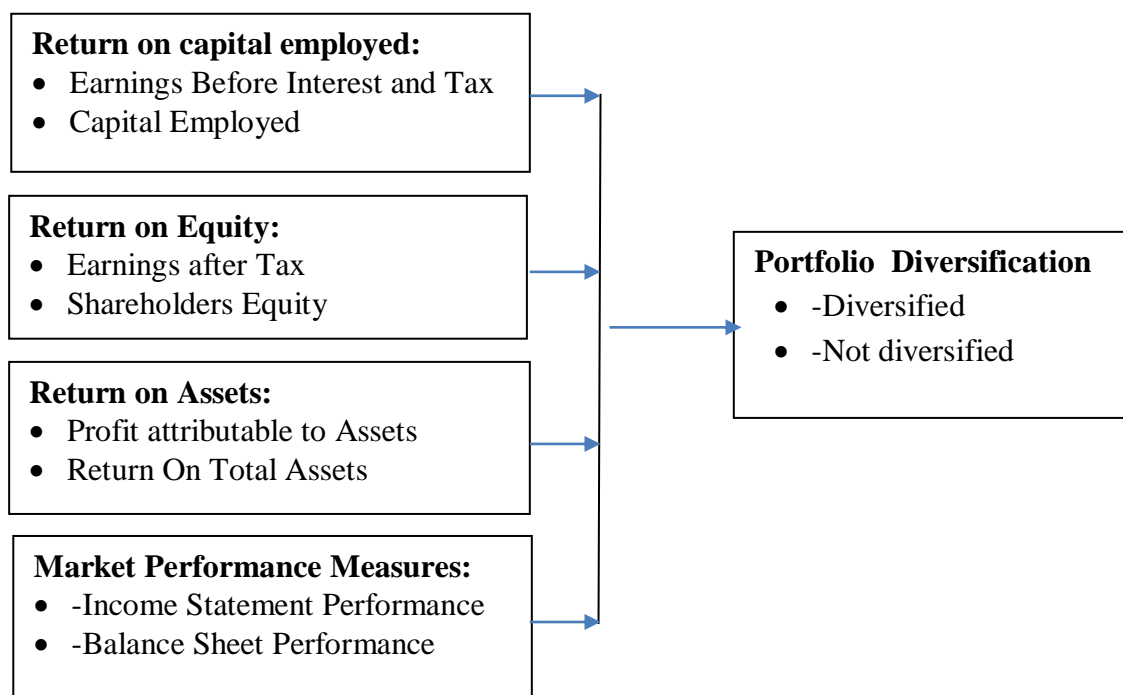
The theory of the firm can benefit investors who would think more systematically about firm emergence, how firms adopt and respond to economic change and how established firms can be more entrepreneurial and innovative. In search for optimised

portfolios investors would think of better ways to manage their business and look out to other opportunities that will minimize their risks and maximise their returns.

2.3 Conceptual framework

Figure 2.2 outlines how the study variables interact. The study suggested that portfolio diversification decision is a function of return on investment. Return on investment on capital employed, equity, asset and market value measures were the independent variables of the study while portfolio diversification was the dependent variable.

The conceptual framework in figure 2.2. shows that portfolio diversification is directly affected by return on investment but this effect is moderated by market characteristics. The following section presents the argument behind the conceptual framework and the already formulated hypotheses.



Independent variable

Dependent variable

Figure 2.3: Conceptual framework

2.3.1 Return on Capital Employed

The primary goal for any firm is to maximize its profits and thereby increasing shareholders' wealth therefore, the factors that affect profitability have continuously been of concern over the years to investors. Working capital management and liquidity are some of these factors that have a direct effect on profitability. Efficiency of working capital management and liquidity level of the firm ensures maximization of the firm's profits and thereby stakeholder's wealth, since these two measures are considered to be the cause of the profitability of the firm (Awad & Jayyar, 2013).

Arnold (2008), points that holding cash (being liquid) provides some advantages, such as: provides the payment for daily expenses, such as salaries, materials and taxes. Secondly due to the fact that future cash flows are uncertain, holding cash gives a safety margin for eventual downturns and finally the ownership of cash guarantees the undertaken of highly profitable investments that demands immediate payment. Thus it is an important task for the financial manager to achieve the appropriate balance between the adequate liquidity and a reasonable return for the company.

According to Chandra (2015), normally a high liquidity is considered to be a sign of financial strength, however according to some authors as Assaf (2003), a high liquidity can be as undesirable as a low. This would be a consequence of the fact that current assets are usually the less profitable than the fixed assets. It means that the money invested in current assets generates less return than fixed assets, representing thus an opportunity cost. Besides that, the amounts employed in current assets generate additional costs for maintenance, reducing thus the profitability of the company.

Gitman (2003), notes that net working capital is the amount by which a firm's current assets exceed its current liabilities. If the company fails to keep a satisfactory level of working capital, it will probably become insolvent. The current assets of enterprises must be at a level that can cover the liabilities at reasonable margin of safety. According to Assaf (2003), the greater the amount of funds invested in current assets, the lower the profitability, and by the same time the less risky is the working capital

strategy. In this situation, the returns are lower in the case of a greater financial slack, in comparison to a less liquid working capital structure. Conversely, a smaller amount of net working capital, while sacrificing the safety margin of the company, by raising its insolvency's risk, positively contributes to the achievement of larger return rates, since it restricts the volume of funds tied up in assets of lower profitability. This risk-return ratio behaves in a way that no change in liquidity occurs without the consequence of an opposite move in profitability. This way each company should choose an amount of net working capital that better fits its risk accessibility and profit margins. Braga and Marques (2004), confirmed this inverse relationship between liquidity and profitability for a sample of food companies. Blatt (2001) also called a negative relationship between liquidity and profitability, measured by Dynamic Model and profitability.

One thing to note is that the appropriate return allows the self-financing of business operations through the retained portion of net profit. Thus, good profitability increases the liquidity and marketability promotes proper growth and future profitability. Thus the optimal level for liquidity would be obtained by a trade-offs between the low return of current assets and the benefit of minimizing the need for external finance (Chang-Soo, Mauer, & Sherman, 1998).

ROCE has its effect on liquidity as well on profitability of the firm (Eljelly, 2004) elucidated that efficient liquidity management involves planning and controlling current assets and current liabilities in such a manner that eliminates the risk of inability to meet due short-term obligations and avoids excessive investment in these assets.

Deloof (2003) discussed that most firms had a large amount of cash invested in working capital. It can therefore be expected that the way in which working capital is managed will have a significant impact on profitability of those firms. Using correlation and regression tests he found a significant negative relationship between gross operating income and the number of days accounts receivable, inventories and accounts payable of Belgian firms. On basis of these results he suggested that managers could create value for their shareholders by reducing the number of days'

accounts receivable and inventories to a reasonable minimum. The negative relationship between accounts payable and profitability is consistent with the view that less profitable firms wait longer to pay their bills.

Shin and Soenen (1998), highlighted that efficient Working Capital Management (WCM) was very important for creating value for the shareholders. The way working capital was managed had a significant impact on both profitability and liquidity. The relationship between the length of Net Trading Cycle, corporate profitability and risk adjusted stock return was examined using correlation and regression analysis, by industry and capital intensity. They found a strong negative relationship between lengths of the firm's nettrading Cycle and its profitability. In addition, shorter net trade cycles were associated with higher risk adjusted stock returns.

According to Maverick (2015), ROCE can be used in many ways by organization and management teams as a performance measure and as a tool when preparing budgets and valuations. One of these ways is that management team may set ROCE goals for either the entire organization or its sub-units and decision making in respect of investing in new projects to ensure that the business is performing at a level that is greater than weighted average cost of capital. ROCE is also able to be used to set up a performance remuneration plan for management of employees.

Firms that have low independence on physical assets as well as higher profitability might be outperforming companies with the opposite characteristic in the market. Despite the lack of empirical research, conventional wisdom would suggest that they should conceptually; investors should prefer profitable companies to less profitable companies and low capital intensive to high capital-intensive firms. Using a large sample of global stocks over the period from 1988 to 2010, the effect of using capital intensity and return of capital employed (ROCE) as filters for portfolio inclusive was investigated. The empirical findings of this study reveal that there was no discernible pattern of outperformance by low capital-intensive quintiles using annual rebalancing. However, the lowest capital-intensive firms had the highest average returns using five-year holding periods. Combining both capital intensive and ROCE,

a portfolio focused on low capital intensity and high profitability produced a compound annual growth rate that is 9.18 (Steyn, 2012).

Over five year holding periods there is a distinct outperformance by low capital-intensive firms with high operational profitability. These results indicate that allocation of investment capital to capital-intensive companies with low operational profitability seems likely to impair long-term returns and there may be value in a focus on low capital intensity firms that are able to generate high returns on capital employed (Droms, 2008).

2.3.2 Return On Equity

The ultimate purpose for any profit-seeking organisation is to create wealth for its owners (Black, Wright & Davies, 2001). It is the goal of a street vendor, as well as for a large listed company. The only difference is that the street vendor operates for the benefit of one person whereas a listed company operates for the benefit of a large number of shareholders. According to Black, Wright and Davies (2001) shareholder value is created when the equity returns of a company exceed the cost of that equity. It can also be described as the present value of all future cash flows, less the cost of debt. Therefore it is crucial to evaluate the ratio, which is very important for company shareholders the (ROE) return on equity (Price, 2012).

ROE tells what percentage of profit the company makes for every monetary unit of equity invested in the company. ROE doesnot specify how much cash will be returned to the shareholders, since that depends on the company's decision about dividend payments and on how much the stock price appreciates. However, it's a good indication of whether the company is even capable of generating a return that is worth whatever risk the investment may entail (Berman, Knight, & Case, 2013).

Helfert (2014), divided the factors of influencing ROE into three categories of activities: operational activity, investment activity and financing activity. The operational activity influences ROE through the operating profit margin. The investment activity influences the return on equity by the return on invested capital. And the financing activity influences the return on equity through the financial

leverage effect. Such a decomposition of ROE can be used to analyze the impact of decisions taken by the company management on the shareholders' remuneration. However, it can be used to track the interdependencies between different factors of influence, respectively to follow the effects of a decision on different sides of the business activity but also to track the combined effect of several policies adopted on the three activities, and finally, on the return on equity (Siminica & Marcu, 2011).

Acheampong (2013), analysed the effects of both country and company factors on the return on equity in the beverage and tobacco, and food and consumer-products industries. Panel data covered 129 companies from 1989 to 1995 in 12 industrialized countries. It was concluded that country and company factors are important in explaining variation in return on equity within countries but not generally across countries or time.

Siminica, Circiumaru and Marcu (2012), studied a sample of 73 Romanian companies and analysed if the return on sales (ROS), the asset turnover and the financial leverage impact return on equity (ROE) by employing regression analysis. A correlation between ROS and ROE was found, however it was not observed that ROS impacts ROE. Empirical results by Kim and Kim (2010) found that there is a significant mutual Granger causality between equity returns and equity fund flows. By introducing the dividend yield effect, significant Granger causality is also found among the three variables.

Return on equity (ROE) ROE, along with return on assets (ROA), is one of the alltime favourites and perhaps most widely used overall measure of corporate financial performance (Rappaport, 1998). This was confirmed by Monteiro (2006) who stated that ROE is perhaps the most important ratio an investor should consider. The fact that ROE represents the end result of structured financial ratio analysis, also called Du Pont analysis (Stowe, Robinson, Pinto, & McLeavy, 2002); (Correia, Flynn, Uliana, & Wormald, 2003); (Firer, Ross, Westerfield, & Jordan, 2008) contributes towards its popularity among analysts, financial managers and shareholders alike. ROE can be analysed further and broken down into other well-known financial accounting ratios. These ratios cover the categories of profitability,

asset management and financial structure. Instead of regarding ROE as the point of departure, one could also view it as the final result of structured financial ratio analysis (Firer, Ross, Westerfield, & Jordan, 2008).

Pursuing a higher ROE may lead to wealth destruction, which is not in line with the economic principles of shareholder value creation (Warusawitharana, 2013). Rappaport (1986), has pointed out that the second component of ROE, namely asset turnover, is affected by inflation in such a way that it may increase even when assets are not utilised better. He reasons that sales immediately reflect the impact of inflation, whereas the book value of assets, which is a mixture of new and older assets, does not adapt as quickly to the effects of inflation. Rappaport's (1986) studies in the 1970's revealed that although the earnings of Standard and Poor's 400 companies decreased dramatically during the 1970's, their ROEs actually increased through increased levels of asset turnover and gearing. The markets, however, were not misled by this apparent 'better performance'. Consequently the market returns during this period were generally 'dismal', according to Rappaport. Around 1989 when Reimann (1989) published his work, ROE was used extensively for measuring whether value was being created for shareholders. The reason behind the adoption of ROE as a measure was that it gave more reliable results than earnings per share (EPS) (Reimann, 1989). As it is important to consider how investors value the shares of a company Reimann (1989) considered a number of strategy consulting firms and found that they focus their measurements on the spread between ROE and the cost of equity. If the spread is positive, it indicates that a company has advantageous growth opportunities.

Reimann (1988) also identified changes to accounting conventions (policies) as being a problem when using ROE as a performance measure. It was also recognised that financial measures such as ROE may be too short-term and that longer-term measures, perhaps more qualitative, must be adopted as well. Reimann (1988) found that ROE still left 66 percent of the variation in share prices unexplained, indicating a large degree of unreliability. Another problem with the use of ROE, as identified by Finegan (1991) is that it does not consider the timing of cash flows. For that reason the free cash flow model is often cited as a better means to determine whether

shareholder value is being created. Finegan (1991) also stated that investors 'go far beyond earnings in evaluating performance'. Therefore the managers of a company cannot rely on earnings figures alone to measure performance, unless they want to wait for investors' reactions to see how they are performing. Copeland, Koller and Murrin (2012) argue that ROE is a short-term performance measure and that too much focus on it can lead a company to overlook long-term growth opportunities that might increase shareholder value.

2.3.3 Return On Assets

A profitability based performance management framework will translate organisational strategy into appropriate functional level goals, which can be tracked and monitored at the right levels and frequency, to deliver predictable improvement in metrics like return on assets (ROA) and thereby valuation. While ROA and market capitalisation appear to be in tandem, what drives ROA appears to be a mixed bag, busting a few myths and highlighting the benefits of managed growth with a keen eye on profitability (Authur, 2015).

Return on Assets (ROA), measures the overall effectiveness of management in generating returns to ordinary shareholders with its available assets. When return on assets (ROA) is positive it indicates a proper use of the total assets to provide profit to the company. Conversely, a negative return on assets indicates that the use of total assets was improper thus the company suffered a loss. So that if a company has a high ROA are positive then the company has a great opportunity to enhance the growth of their own capital. But conversely, if the total assets used by the company are not making a profit it will inhibit the growth of their own capital. (Syawal, Triharjono & Siti, 2013).

According to Harahap (2006), profitability is the company's ability to generate earnings for a certain period. For firms with similar business risk profiles, pretax ROA is a useful statistic for comparing the profitability because it avoids distortions that are introduced by differences in financial leverage and complications in the tax laws. ROA displays wide variation both across businesses within a quarter and among businesses over time.

To the extent that ROAs are generated by exogenous economic conditions, business returns are attributable to the good luck of “being in the right place at the right time,” and not to exceptional managerial skill. In addition to time variation in the economic environment, differences in firms ROA may also be attributed to differences in operational and business management choices. A firm’s supervisory rating may also be correlated with its ROA. Over the longer term, ROA in the supervisory context is likely endogenous, meaning that the ratings take into account a firm’s ROA along with other operating statistics and many other factors. In the short run, however, a firm’s poor existing supervisory rating may be indicative of a limited ability to generate ROA, because these firms must take steps which can often be costly to improve the firm’s condition, and may face operating restrictions or other requirements to implement remedial safety and soundness measures (Roman & Danuletiu, 2013).

According Prastowo (2014), Return on Assets (ROA) is used to measure the effectiveness of the company in generating profits by exploiting its assets. This measure may give an indication of good or bad neighbor management in implementing cost control or management of his property. Return on Assets (ROA) is therefore a financial measure used to measure the degree to which the assets have been used to generate profits. The greater Return on Assets (ROA) shows that the better the company's performance, because of the greater rate of return on investment (Riyanto, 2001).

In accordance with the concept of signaling theory, ROA can be used as signal information regarding future cash flows. Therefore, the ROA will be significant positive effect on stock returns or firm value. Research conducted by Ulupui (2007) found results that ROA significant positive effect on stock returns one period ahead. Therefore, ROA is one of the factors that affect firm value. Makaryawati (2002), Carlson and Bathala (1997) also found that ROA has a positive effect on firm value.

2.3.4 Market Performance Measures

The price earning (P/E)measure plays a pivotal role in both academic research and investment practices and it has been found to reflect the market’s expectation of

future growth and is associated with firm risk (Wu, 2013; Thomas & Zhang, 2006; Zarowin, 1990). This measure is related with the value/glamour anomaly and has been used by money managers to form investment strategies. The P/E measure is used to estimate the cost of equity capital (Easton, 2004) and is also heavily used by financial analysts to justify their stock recommendations. Bradshaw (2002) finds that 76% of the sell-side analysts cited the P/E ratio as a justification for their stock recommendations. This frequency is two times of the next mostly widely used variable - 'Growth' - which is cited in 37% of analysts' reports. Despite the crucial role of the P/E, research has not fully explored its relation with profitability (Ohlson & Gao, 2006).

The term earnings per share (EPS) represents the portion of a company's earnings, net of taxes and preferred stock dividends, that is allocated to each share of common stock. The figure can be calculated simply by dividing net income earned in a given reporting period (usually quarterly or annually) by the total number of shares outstanding during the same term. Because the number of shares outstanding can fluctuate, a weighted average is typically used (Besley & Brigham, 2006).

Valuation models, such as the Gordon Growth model and the Ohlson and Juettner-Nauroth (OJ) model, suggest that the P/E is a function of expected earnings growth and expected rate of return. Specifically, the theories predict that P/E is positively correlated with expected growth and negatively correlated with expected rate of return. Some studies find that that P/E is better explained by forecasted growth than realized growth (Beaver & Morse, 1978; Zarowin, 1990; Thomas & Zhang, 2006). Thomas and Zhang (2006) show that replacing the trailing P/E with the forward P/E yields results that are more consistent with the theoretical predictions.

Prior literature has examined how the P/E can be used to explain stock prices and to predict future earnings (Wu, 2013). It is a well-known phenomenon that the P/E is related with the value/glamour anomaly. Prior studies show that an investment strategy which longs low P/E stocks and shorts high P/E stocks yields significantly positive returns. Compared to the trailing P/E the forward P/E divide stock price by forecasted earnings and thus is less affected by nonrecurring earnings. Prior literature

demonstrates that forward-looking earnings are more value relevant than historical earnings(Beaver & Morse, 1978) conclude that ‘they (the forward earnings) should be used as long as earnings forecasts are available.’ Consistent with this argument, there exists evidence that the forward P/E explains stock prices better than other historically based financial measures. Such results are robust for the U.S. and European markets and IPO settings Wu (2013) also find that the forward P/E ratio predicts future earnings growth better than the trailing P/E ratio.

Although studies on stock price movements were typically confined to developed countries like USA and UK such as by Durre and Giot (2007) used a cointegration framework to test the presence of a long-term contemporary relationship between earnings, yield on long-term government bond and stock prices by using the data of thirteen countries from the year 1973 to 2004 and found that long-term movements in the share market are mainly driven by the earnings, while changes in the yields on long-term government bond have a short-term impact on stock prices movements and do not appear to have a significant long-term impact on long run market price of stocks. Malakar and Gupta (2008) did a study by using the data of eight major companies of cement industry in India for the period 1968 to 1988 and discovered that earning per share has significant impact on market price of share (MPS).

Bhatt and Sumangala (2012) studied the impact of earning per share on market value of an equity share of 50 most valuable companies as per the ranking of Business today survey of 2010 and found that EPS impact significantly and explains on an average about 45 per cent variation in the market value of an equity share. On other side, Fisher and Statman (2010) found that returns on portfolios of low price earnings ratio stocks are higher on average than returns on higher price earnings ratio stocks, even after adjusting for risk. They investigated the relation between price earnings ratio and future returns in stock market and found that P/E ratio are not good indicators of future stock returns over the short period of time (one to two years), but P/E ratio has better forecasting power when used to estimate stock returns over the longer period of time, while in more extensive way Rapach and Wohar (2013) by using a data sample from 1872 to 1997, reported the presence of little evidence of correlation between P/E ratio and future stock price changes in the short term, but

high correlation has found over longer time perspective. While a company's share price reflects the value that investors are currently placing on that investment, a stock's P/E ratio indicates how much value an investor supposed to pay for every rupee of earning. The market price of a given share is required to calculate its P/E ratio, but in many ways, the P/E ratio of a company offers better insight into the growth potential of share in the terms of market price. Generally, a high P/E ratio can indicate that the share is being overvalued and if investor invests in an overvalued share, you are at the risk of losing money, but if company's share has a low P/E ratio, it may indicate that the share is undervalued and Investors can often buy undervalued share at a discount and then profit when the price of that stock increases.

Malhotra and Tandon (2013) examined empirically the impact of earning per share and price earnings ratio on market price of share of 95 select companies listed on NSE-100 and found that earning per share and price earnings ratio impact significantly on market price of shares and EPS has found to be the major determinant of share price movements, followed by price earnings ratio. On the basis of review of literature, research hypothesis that there is significant impact of earning per share and price earnings ratio on market price of share has been developed.

Investors are majorly concerned about stock price movements because this directly affects their wealth in the form of capital gain. They constantly and keenly review the stock market and the company performance. Different approaches have been developed to invest money in securities of value and growth companies. Among these approaches is the Dividend payout ratio, Market to Book value ratio and Price Earnings ratio. Analysts and investors over the years have used the Price Earnings ratio for stock selection. Economists, researchers and investors have continued to examine anomalies on the stock exchange for decades hence they believe that it is possible to earn abnormal returns from the market. With an investment strategy based merely on purchasing stocks based on their price per earnings ratio it has been established to be possible to beat the market. This is called the price earnings effect. The question whether PE ratio has positive or negative effects on stock return has been controversial and discussed in the literature of corporate finance and financial management research (Breen, 2014).

There are several measures to determine the valuation of a security. Most often, the measures are determined by comparing the security's price to different fundamentals such as earnings and dividends. One of the most applied stock valuation measures is the Price Earnings Ratio, which compare the price of the security to the company's earnings. The price/earnings ratio (P/E ratio) provides a comparison of the current market price of a stock and that stock's earnings per share. It is determined by dividing the current share price by the reported attributable earnings over the prior twelve months. This is the historical or reported P/E ratio (White, 2014).

Prospective or Forward P/E ratio is the current share price divided by the anticipated earnings over the next twelve months. The earnings per share are the company's entire net profit, or earnings, divided by the number of shares in issue. The P/E ratio is simple to calculate and probably the most consistent red flag to excessive optimism and over-investment. It also serves, regularly, as a marker of business problems and opportunities. One simple way to understand P/E is that it gives the number of years the company will need to generate enough value to cover the cost the stock at the current market price (assuming no growth in earnings). The P/E ratio also reflects the market's expectation regarding the future performance of the stock. Higher price-earnings ratio indicates higher expectations for the company. Using the P/E ratio, we can compare the relative earning power of the companies regardless of their size or stock price. A stock with a P/E higher than its peers may be overpriced. A company with a high P/E is one where the market anticipates rapid growth and is willing to pay a price for the shares beyond what is justified by historical earnings. A company with a low P/E is one which is out of favour, or which is at the bottom of an industry cycle, and in which the market sees little excitement. Existing literature has examined the determinants of P/E ratio by using different proxies for risk, growth, discount rate and dividend payout mostly in developed countries (Shamsuddin & Hiller, 2013).

Overall P/E ratios vary across sectors because of diverse growth prospects, typically sectors having companies with mature, stable and moderate growth potential have low P/E ratios compared to the sectors having relatively young and fast growing companies (Anderson & Brooks, 2011). However, the P/E ratio as it is commonly

used is the result of network of influences, similar to the way in which a company's share price is influenced not only by idiosyncratic factors particular to that company, but also by movement in prices on markets as a whole, and the sector in which the company operates. Four main influences on a company's P/E ratio have been identified: The year - the average market P/E varies year by year, as the overall level of investor confidence changes; The sector in which the company operates; The size of the company - there is a close positive relationship between a company's market capitalization and the P/E accorded; Idiosyncratic effects. Companies examined in the same year, operating in the same sector and of similar size nevertheless have different P/E's. Idiosyncratic effects, that do not affect any other company account for this (Kumar & Warne, 2012).

The word profitability is composed of two words, namely, profit and ability. The term profit has been explained above and the term ability indicates the power of a business entity to earn profits. The ability of a concern also denotes its earning power or operating performance. The profitability may be defined as the ability of a given investment to earn a return from its use. Profitability is a relative concept whereas profit is an absolute connotation. Despite being closely related to and mutually interdependent, profit and profitability are two different concepts. In other words, in spite of their generic nature, each one of them has a distinct role in business. As an absolute term, profit has no relevance to compare the efficiency of a business organization. A very high profit does not always indicate sound organizational efficiency and low profitability is not always a sign of organizational sickness. Therefore, it can be said that profit is not the prime variable on the basis of which the operational efficiency and financial efficiency of an organization can be compared. To measure the productivity of capital employed and to measure operational efficiency, profitability analysis is considered as one of the best techniques (Tulsian, 2013)

In agribusiness, a competitive firm/farm is one that has the ability to produce and sell quality products in a given market at a profit, over the life of the firm. Kennedy, Harrison and Piedra (2008) define competitiveness as the ability of a business to profitably create and deliver value at prices equal to or lower than those offered by

other sellers in a given market. It is the ability to sell products that meet demand requirements in terms of price, quality and quantity and at the same time ensure profits over time that enable the firm to thrive. Longwe-Ngwira, Simtowe and Scambi (2012) defines it as a sustained ability to profitably gain and maintain market share. Numerous studies have been undertaken to determine profitability of different agricultural enterprises, including livestock in both emerging and developing countries .

Productivity and efficiency are also often cited as indicators or measures of competitiveness or profitability and this is reflected in empirical approaches to the measurement of efficiency: essentially measuring the potential input reduction or potential output increase relative to a benchmark, or frontier (Alvarez & Arias, 2014). The frontier can be technically identified by non-parametric and parametric methods .The non-parametric approach uses mathematical programming techniques, of which the most widely used is data envelopment analysis (DEA) (Mester, 2013). This has the desirable empirical attributes of imposing neither functional form specification, nor assumptions about the nature of an error term. However, its limitations include non-inclusion of prices so as to account only for technical inefficiency in the form of using too many inputs or producing too few outputs(Mester, 2013) and its implicit assumption of the absence of random errors. The DEA technique uses two-stage estimation procedure where the production (or profit) function is estimated to derive the efficiency scores in the first stage. In the second stage the derived efficiency scores are used as explanatory variables in a profit function to be estimated econometrically. Further, DEA ignores a management-related issue in that the firm's input choices are potentially affected by that firm's knowledge of its level of technical efficiency (Chirwa, 2015).

Chamdimba (2007), defines gross margin as the difference between the value of an enterprise's gross output and variable cost of production. Gross margins are used to evaluate economic viability of an enterprise. They are used in agriculture for farm planning and comparing different farms with similar characteristics or different enterprises on the same farm.

Somda, Kamuanga and Tollens (2005) analyzed the economic viability of milk production in smallholder farming systems in Gambia. In a study involving 90 smallholder dairy farms, the gross margin analysis was used to assess the profitability and viability of smallholder dairy production. The results showed that smallholder dairy farming in Gambia was indeed viable. The study also established that profitability varies across groups based on the scale i.e. medium-resource group and resource poor farmers. Viability was higher in resource medium group than in resource poor group. This implies that smallholder dairy farmers have different resource endowments which affect profitability. Overall a dairy technology that requires more resources is likely to be less preferred by resource-poor farmers.

Bayemi, Webb, Ntam and Chinda (2009) used partial budgeting to analyze the impact of management interventions such as artificial insemination, feed supplementation, and farmer training in milk processing and veterinary services on smallholder dairy farms of western highlands of Cameroon. The study, which involved 24 peri-urban farmers, found that the interventions decreased feed, transport and veterinary costs. An overall return of 200% was realized from the management interventions. Furthermore, the study concluded that milk collection system, price of fresh milk, genotype of cattle and management were the most important factors influencing profitability and economic viability of smallholder dairying

Mwale (2009) assessed economic feasibility of smallholder dairy farmers using Malawi Zebu and its crosses for dairy in Mzuzu Milk Shed Area. The results suggested interlinkages between genotype and management level under the prevailing smallholder conditions in Malawi. In addition, when no labor costs were included, gross margin analysis showed that the Malawi Zebu was the most efficient genotype in a low-input low-output system. This therefore implies that the genotype of the dairy cow, management practice and labour costs (family and hired labour) have a significant influence on smallholder dairy returns. She also applied the gross margin analysis to estimate returns from smallholder dairy among borrowers and non borrowers of in kind credit in central and northern milk shed areas of Malawi. The results revealed that smallholder dairyfarming was profitable for both borrowers and non borrowers with borrowers reporting higher gross margins than non borrowers.

2.3.5 Portfolio Diversification

There are different approaches for diversification analysis i.e. asset based approach, activity based approach and income based approach (Barrett & Reardon, 2001). Assets are factors that directly or indirectly generate cash or in-kind returns. In portfolio theory, on which the diversification literature is based, assets are emphasized as objects of agent's choice for the sake of income maximization, risk minimization (such as reducing income variability) or both. However, this approach has two disadvantages in that productive assets cannot always be allocated to a particular activity and secondly calculating the true value of some assets is difficult due to insufficient development of asset markets in developing countries. The second approach to study diversification is the activity approach which can be used but it also has some drawbacks(Barretta, Reardonb, & Webb, 2001). The draw backs are similar to those of assets approach in that activities cannot be aggregated in single money-metric aggregate and hence cannot be used to examine diversification patterns.

Given the shortcomings of the asset and activity based approaches, income has often been used in empirical work on diversification. Using income may offer several advantages: first, since the two main motives of diversification are maximization of income and stabilization of income, or both, discussing diversification in terms of income diversification appears to be a natural candidate (Ellis 2000, Barrett et al., 2001). Secondly, income is the end outcome of income-generating activities, to which both productive and non-productive assets are allocated. Due to these reasons it seems that, defining diversification in terms of income may be the most suitable approach.

In agriculture based rural settings diversification concerns the switch from subsistence food production to the commercial agriculture. Delgado and Siamwalla (1997) for example argue that 'farm diversification' as an objective in African smallholder agriculture should refer primarily to the part of farm household output undertaken specifically for cash generation. A less ambiguous term for this type of diversification is agricultural commercialization. Income diversification in this

context then describes expansion in the importance of non-crop or off-farm income. Non-farm income includes both off-farm wage labor and non-farm self-employment. Diversification into non-farm activities usually implies more diversity in income sources but this is not always the case. For example, if a household increases the share of income from non-farm sources from 30 percent to 75 percent, this represents diversification into non-farm activities but not income diversification in terms of the number and balance of income sources. In agricultural context then income diversification can be defined as the process of switching from low value crop production to higher-value crops, livestock, and non-farm activities (Readon, 2006).

Therefore income diversification refers to an increase in the number of sources of income or the balance among the different sources. Thus, a household with two sources of income would be more diversified than a household with just one source, and a household with two income source each contributing half of the total, would be more diversified than a household with two sources, one that accounts for 90 percent of the total (Joshi, 2003; Ersado, 2003). Based on this argument then diversification would broadly be referring to holding a varied number of portfolios that together contributes to increase in sources of income as well as manages investment risks such as reducing the risks of variability incomes. Studies related to this conceptualization of diversification have been carried out in a number of stock exchanges in the World.

Tang (2004) examined whether naive (equal weight) diversification is efficient. He analytically showed that for an infinite population of stocks, a portfolio size of 20 is required to eliminate 95 % of the diversifiable risk on average. However, an addition of 80 stocks (i.e. a size of 100) is required to eliminate an extra 4 % (i.e. 99 % total) of diversifiable risk. This result depends neither on the investment horizons, sampling periods nor the markets involved. But the number of stocks required in portfolio in order to eliminate the same percentage of diversifiable risk differs according to the size of population. For example, in order to eliminate 98 % of diversifiable risk, 50 stocks are required in 10000 stocks population and 22 – in 40 stocks population (Tang, 2004).

Aleknevičienė (2012) empirical research was carried out to measure the diversification effect of differently weighted portfolios. It was done on the Lithuanian Stock Exchange market and based on daily stock market prices during 2009-2010. The authors formed both naïve portfolios and differently – weighted stocks portfolios by capitalization using three stocks’ selection criterion. The research results showed that forming naïve portfolios, the diversification effect is slightly larger than forming differently – weighted portfolios by capitalization (Aleknevičienė, 2012).

Zulkifli (2010) investigated the optimum number of stock that can help the investor to maximize the benefit of diversification in their investment. Using a simplified approach by Elton and Gruber (1977) a series of portfolio variance was derived to identify the ultimate diversification. 80 samples of stock were randomly chosen from Bursa Malaysia for a period of 1999-2002. The finding was that 13 stocks are enough to make a well diversified portfolio.

2.4 Critique of the existing literature relevant to the study

According to Dlamini (2010), Smallholder sugarcane growing is central to rural development and poverty alleviation. The main objective of his study was to investigate the profitability of smallholder sugarcane farmers’ associations under KDDP and to explain the determinants of sugarcane profitability. The study used data from 2004/05 to 2010/11 production seasons for 15 smallholder sugarcane farmers’ associations under KDDP. A structured questionnaire was used to solicit production and financial data. Secondary data were obtained from accounting records of the farmers. The associations were purposively selected because of their experience in sugarcane production.

Descriptive statistics such as mean, standard deviation, minimum and maximum values were used in data analysis. The cost and returns analysis was used to assess the profitability, whilst multiple linear regression analysis was used in identifying the determinants of profitability. The associations were found to be profitable with a mean profit per hectare of E5080.00. The further results indicated that variables such as farm size, farming experience, sucrose price, labour cost per hectare and fertilizer

cost per hectare significantly ($p < 0.01$) influence the profitability of smallholder sugarcane farmers' associations in the study area. The adjusted R^2 was 0.623, suggesting that about 62.3% in the variation in profit per hectare is explained by the explanatory variables. It was, therefore recommended that good crop husbandry practices like timely weeding, fertilization, and irrigation should be adopted to produce a good crop which will enhance profitability.

However, he noted that there is need for the promotion of collective action as an institutional means to improve bargaining power of farmers, especially when procuring inputs. Collective action will enable smallholder sugarcane farmers to buy in bulk and be entitled to discounts and that can enhance sustainability of profitability of the farmers. Masuku (2011) proposed and analysed a model of relationships between smallholder sugarcane growers and millers in the Swaziland sugar industry. In particular, he identified the behavioural factors that contribute to the level of satisfaction that sugarcane growers perceive in their relationship with the millers. Using recursive models and multiple regression analysis, the results indicate that higher levels of trust lead to higher levels of cooperation that, in turn, lead to higher levels of commitment by the smallholder growers to the business relationship. Cooperation is also an antecedent of the benefits and of the satisfaction that these growers gained from the relationship. These results agree with a priori theory that trust, cooperation, strategic benefits, commitment and absence of opportunistic behaviour are essential elements for a successful relational exchange.

The findings imply that both cane growers and millers need to focus on initiating, signalling and disclosing their behaviours in an effort to improve their relationship with each other. A relationship founded on trust and mutual respect is more likely to succeed than a relationship of convenience supported by legal contingencies. Therefore, relationships characterised by trust and physical and psychological commitment as well as cooperation between exchange parties is more important for mutual benefit and good quality relationship Waswa, Gweyi and Mcharo (2012), in their research on Contract sugarcane farmers and farmers income, used a social survey design of research. They collected primary data using questionnaires from 37, 40 and 40 household heads representing sugarcane farmers from Lurambi, Koyonzo

and Chemelil respectively. Data on farmer incomes were obtained from individual farmer payment statements. Descriptive statistics focusing on frequency distributions and step-wise backward regression were used to derive income models as platforms for future decision-making in sugarcane agri-business.

The data from Lurambi, Koyonzo and Chemelil showed that on average farmers retained only 32, 31 and 34% respectively of the gross income from contract sugarcane farming. Although net income was influenced differently by conventional input costs, yield appears to be a key determinant of gross income across the sites. Net income was significantly depressed by company-driven deductions for which farmers had no control. Such skewed sharing of income, where the sugar companies retain at least 60% of the gross income raises sustainability concerns that need to be addressed through a participatory approach involving all key stakeholders. They recommended that, to profit from contract sugarcane farming, farmers need to at least double their current mean yields per unit area, assuming that available land devoted to sugarcane excluding land for subsistence farming is at least 5 acres. Where this option is not possible, farmers should be encouraged to diversify their livelihoods to other cash crops through sustainable intensive systems. A more proactive extension service involving the farmers, companies and ministry of agriculture will be required.

According to Owuor (2009), the determinants of agricultural productivity in Kenya are multifaceted and vary from region to region. However, in general poor households perceive the market to be too risky for the purchase of their food needs. This implies that these households cannot rely on the market to obtain their food needs. The policy implication is that there is need to reduce costs in the food system so that households may be enabled to shift into higher-valued crops and increase their agricultural income without putting their families in jeopardy of acquiring food. More reliable food markets for rural consumers are a precondition to exploit opportunities for commercialization.

The evidence shows there is positive correlation between off-farm income and crop value per unit of land in Western transitional zone, Western highlands, and high

potential maize zone and in Central highlands. The evidence indicates that off-farm income plays an important role in allowing farmers to shift to higher-valued crops hence increase their agricultural productivity per unit of land. Policies that are geared towards the growth of off-farm income would enhance further commercialization and increase agricultural productivity. Horticultural production is highest in Central province. This is related to proper distribution of water supply. There is need to develop basic water infrastructure to further commercialization in domestic horticulture.

There is need to enforce policies with regard to duty on imported textile and sugar to achieve further commercialization among cotton and sugarcane growing households. Obange (2011), investigates market (supply and demand) factors causing high pricing, which influences performance of the locally manufactured sugar from the six (n=6) manufacturing firms in Kenya. The study was based on Industry competitiveness model (Siggel, 1995; Markusen, 1992; Kasekende, 1994). Empirical results reveal that consumption of sugar in Kenya varies from an average rate of about 2.2% whereas sales of sugar registered an average of 2.1%. From this analysis, the study unveils a market deficit of locally produced sugar that falls below market demand. Correlation analysis between sales and consumption of local sugar for the same period (1996-2006) shows a negligible 0.155 but with significance of 0.67. The study concludes that price related factors significantly contribute to poor performance of local sugar manufacturing firms under the prevailing imperfect market conditions in Kenya. The study recommends that diversifications are crucial for sugar subsector if the sugar firms have to maximize revenues and become more competitive both at local and regional markets.

The importance of having a portfolio perspective versus focusing on individual holdings cannot be overstated. Since diversification can help reduce risk without inevitably reducing the portfolio's expected return, an investor's assets should be assessed by their contribution to the risk and return of the investor's portfolio.

2.5 Research Gaps

Studies of rate of returns to agricultural research investment in SSA have found generally positive returns. (Oehmke & Crawford, 1996; Masters & Rukuni, 1998). However the absolute level of investment in agricultural research in SSA has been too low to significantly raise agricultural productivity and reduce poverty. The impact of new technologies has thus been less apparent and agricultural productivity has at best stagnated (Nkamleu, 2004).

The “underinvestment hypothesis” is a straightforward application of marginalist economic theory: if by policy decision or a budget constraint the social value of the last unit of product consumed (or input employed) is greater than the social cost, then there is underconsumption or underuse of the factor because it would pay to borrow until the social gain and social cost are equal. If projects are ranked in descending order by their expected rates of return (call it the marginal efficiency of investment) and the return of the last project undertaken is higher than the social (opportunity cost of capital), this is *prima facie* evidence of underinvestment (Robert, 2004).

Hundreds of individual studies of the rate of return to research consistently show that the rate of return to public investment in agricultural research (40-50 percent) is higher than either the social rate of return on capital or other opportunities for public investment. In general the return to public investment is higher than the private rate of return even after allowing for the marginal excess tax burden of the tax collection system and the returns accrued to farmers. This because it is impossible to appropriate many of the benefits associated to the research done by private firms (Widmer et al., 1988; Evenson & Westphal, 1995). There is no tendency for the rate of return to decline over time. Furthermore, it appeared that the rates of return may be higher when the research is conducted in more-developed countries (Alston et al., 2000).

Across the empirical literature, one can find diverse approaches, mostly depending on the data hand (Stephan, 2010). According to Carl, Mark and Kent (2003) no studies have been found that have looked at the relationship between returns on investments and portfolio diversification for different classes of farms in a dynamic

setting. Previous studies recommend that, to profit from contract sugarcane farming, farmers need to at least double their current mean yields per unit area, assuming that available land devoted to sugarcane excluding land for subsistence farming is at least 5 acres. Where this option is not possible, farmers should be encouraged to diversify their livelihoods to other cash crops through sustainable intensive systems. Thus, a need for a more pro-active research on the relationship between return on investments and financial portfolio diversification is required.

2.6 Summary

Chapter two has looked at the relevant literature on Return on Investment and Portfolio diversification. The chapter has analyzed the major components of the Return on Investment that is Return on Capital Employed, Return on Assets, Return on Equity and Market Characteristics. The components of portfolio diversification have also been analyzed. The chapter has further presented a critical analysis of the various theories that explain the relationship between return on Investment and portfolio diversification. The chapter has also analyzed the existing literature relevant to the study and reserch gaps have been idetified.

There is need to enforce policies with regard to duty on imported sugar to achieve further commercialization among sugarcane growing households. There is need to carry out a research on how to commercialize sugar cane growing in order to optimize returns. The study recommends that diversifications are crucial for sugar subsector if the sugar firms have to maximize revenues and become more competitive both at local and regional markets. However, how the return on investment influences the portfolio diversification is not known.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter outlines how the proposed study was carried out. It covers the design used to do the research in terms of research procedures, the target population and sample size, data collection methods used and how data was analyzed.

3.2 Research Design

A research design refers to the overall strategy that you choose to integrate the different components of the study in a coherent and logical way, thereby, ensuring you will effectively address the research problem; it constitutes the blueprint for the collection, measurement, and analysis of data (Sakaran, 2003). This study was a survey research design. The survey design allows for the the description and evaluation of the relationship between the study variables associated with the research problem. The survey research design is a very valuable tool for assessing opinions and trends. A cursory examination of these figures usually shows that the results of these surveys are often manipulated or carefully sifted to try reflect and distort the results to match the whims of the owners (O'Connor, 2011).

The research approach was quantitative. A quantitative approach utilize statistical techniques to verify relations and directions of influence. It refers to the systematic empirical investigation of social phenomena via statistical, mathematical, or computational techniques. Researches in the area of finance and specifically in the study problem chosen commonly use the quantitative approach. For study of relationships, confirmations of the existence and strength of these relationships the variables handled quantitatively.

A quantitative research method involves a numeric or statistical approach to research design. Leedy and Ormrod (2001) alleged that quantitative research is specific in its surveying and experimentation, as it builds upon existing theories. The methodology of a quantitative research maintains the assumption of an empiricist paradigm

(Creswell, 2003). The research itself is independent of the researcher. As a result, data is used to objectively measure reality. Quantitative research creates meaning through objectivity uncovered in the collected data and can be used in response to relational questions of variables within the research.

3.3 Population

The target population for this study comprised of all sugarcane production investors in the counties in the West of Kenya. These investors have a long experience in sugarcane production, which spans over four decades. They not only possess the experience in this area of business or income generating activity but also have in their custody the financial statements over the years of the performance of their sugarcane investments among other investments. They are considered adequate since not only do they have experience in sugarcane investment but they equally are in possession of the financial statements, which contains the key information necessary for this study. In addition, they are aware of the portfolios they have diversified in to. As much as the financial statements could have been obtained from the respective millers this had two problems. The first is that such information is private and the consent of each of the investors would have to be granted before they could be availed. Secondly, on whether they have diversified their portfolios or not, this information is not included in the financial statements. It is because of this that the study settled on targeting the actual investors. The total number of sugarcane investors in region constituted 177,000 approximately (RoK, 2015).

3.4 Sampling Techniques and Sample Size

The researcher used multi stage sampling techniques to get the sample size. The first stage sampling included selection of the two counties using purposive sampling technique. The reason is that Kakamega county has the highest installed capacity when it comes to sugarcane production and processing and controls 59 percent of Kenya sugar output under the influence of Mumias and West Kenya sugar companies. It would therefore be logical to presume that Kakamega can influence sugarcane production in Bungoma county which is the only neighbouring county to Kakamega with sugarcane investors. Bungoma sugarcane production and processing

is under the influence of Nzoia sugar company which controls about 12 percent of Kenya sugarcane production and processing. Together therefore Kakamega and Bungoma counties control 71 percent of sugarcane production and processing (EPZA, 2005). The other counties with sugarcane investors namely Kisumu, Migori and Homabay control around 29 percent.

Stage two involved the identification of the sugarcane production investors in Kakamega and Bungoma counties. This utilized stratified sampling technique as per the county and this is summarized in Table 3.1 below. The sample size was drawn from target population using the population Yamane (1967:886) provides a simplified formula as elaborated below

Table 3.1: Population

Counties	Total county Population	Target population number of sugarcane farmers/investors
Bungoma	1,650,750	67,000
Kakamega	1,929,426	110,000
TOTAL	3, 035,714	177,000

Source: KNBS (2014) RoK 2015

Using a 95% confidence level and $P = .05$ where n is the sample size, N is the population size, and e is the level of precision, Yamane (1967:886) formula can be summarized as follow:

$$n = \frac{N}{1 + N(e)^2}$$

Application of the formula to the target population

Sample size= 177,000

$$1 + \frac{177,000}{399} (0.05)^2$$

$$= 399$$

With a target population of 177,000 sugarcane farmers in both Bungoma and Kakamega counties region, the sample size is thus: 399-sugarcane production farmers/investor. The sample size for each county was finally derived using proportions. The identification of the investors was done through the picking of the investors at random in their homesteads (farms) from selected reference points.

Table 3.2: Sample size

NAME OF COUNTIES	NUMBER OF SUGARCANE FARMERS	PROPORTION	SAMPLE SIZE
Bungoma	67,000	67,000/177,000*100=38%	38%*399=152
Kakamega	110,000	110,000/177,000*100=62%	62%*399=247
TOTAL	177,000	100%	399

The targeted number of financial statements collected was 399 same as the number of respondents to be included. Therefore, in the process of collecting information on portfolio diversification the financial statements information were also included. The number of financial statements collected was considered adequate given that for a highly randomized quantitative data just like financial statements are a minimum of thirty (30) observations is recommended (Mugenda, 2003). However, in this research the number of financial statements used was in tandem with the number of sugarcane investors finally sampled.

3.5 Data Collection Instruments

According to Mugenda (2003) data collection instruments are the tools to assist the researcher in the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes. For this study, the researcher used the financial statements to gather the required data. This was assisted by a short questionnaire that only gathered the other information not contained in the financial statements. These included the kind of risks they face while investing and whether they have diversified their portfolios.

The secondary data collection guide collected the quantitative data. The quantitative data constituted the financial information contained in the financial statement(s) of the sugarcane investors. This information is usually prepared as a final statements of the dues owed to the sugarcane investor after supplying the millers. Just like any financial statement it contains income costs and other financial information relevant to judging the performance of the sugarcane investment. Specifics of the financial information that was collected with respect to the study included (but not limited to) total income, total expense, value of sugarcane and price per tonne (see Appendix I).

3.6 Pilot Study

For purposes of ensuring that the study collects the relevant data a pilot study was carried out with a sample of thirty sugarcane investors. The number of investors was adequate when one takes in to account that the bulk of the questionnaire was collecting financial information already contained in the financial statements the investors were in possession of. For the data from the financial statements, the only main test was to see if all; the necessary adequate required data were contained in the statements issued over the years.

Reliability on the other hand refers to the measure of the degree to which a research instrument yields consistent results across time and across the various items of the instrument (Sekaran, 2003). Reliability is the extent to which an instrument is predictable, stable, accurate and dependable to yield the same results every time it is

administered. Validity then is the extent to which the data and or the research instruments would reflect the characteristics of the population. In this study however the material being collected was data from the financial statements that was standard ratio. It therefore decided that to check for the credibility of the data Shapiro-Wild test of normality was applied. This test allows the extent to which the data reflects the normal distribution of the population and if that is so then the data is considered valid and reliable to make conclusion about the population under study.

3.7 Data Analysis and Presentation

After the data was collected, the researcher edited them to ensure their completeness and consistency, Coding and classification then followed to ensure sufficient analysis. The data was then entered and analyzed by simple descriptive analysis using statistical package for social scientists (SPSS) computer software to generate cumulative frequencies and percentages. The software package was chosen because it is the most used package for analyzing survey data and has the advantage of being user friendly (Mugenda, 2003). It is also easily used to analyze multi-response questions, cross section and time series analysis and cross tabulation; (relate two sets of variables) and it can also be used alongside Microsoft Excel and Word packages.

Both descriptive and inferential statistics was used in the analysis then presented using frequency and contingency tables. Descriptive statistics was used to deduce any patterns, averages and dispersions in the variables. They include measure of locations (mean) and measure of dispersions (standard error mean). These measures were used to describe the characteristics of the collected data. Inferential statistics were used to determine the relationship between the study variables and these inferential statistics included correlation Spearman's Rho and logistic regression analysis.

Table 3.3: Study Hypotheses and Measurements

Hypothesis statement	Hypothesis test	Decision rule and anticipated model
H₀₁ Return on Capital Employed does not have significant effect on portfolio diversification among sugar cane investors.	P-value and t-test Logit regression H ₀ : $\beta_1 = 0$ H _A : $\beta_1 \neq 0$	Reject H ₀₁ if P- value ≤ 0.05 otherwise fail to reject H ₀₁ if P- value is > 0.05
H₀₂ Return on Equity does not have significant effect on portfolio diversification among sugarcane investors.	P-value and t-test Logistic regression H ₀ : $\beta_2 = 0$ H _A : $\beta_2 \neq 0$	Reject H ₀₂ if P- value ≤ 0.05 otherwise fail to reject H ₀₂ if P – value is > 0.05
H₀₃ Return on Assets does not have significant effect on portfolio diversification among sugarcane investors in Kenya.	P-value and t-test Logit regression H ₀ : $\beta_3 = 0$ H _A : $\beta_3 \neq 0$	Reject H ₀₃ if p- value ≤ 0.05 otherwise fail to reject H ₀₃ if P-value is > 0.05
H₀₄ Market performance does not have significant effect on portfolio diversification among sugarcane investors in Kenya	P-value and t-test Logit regression H ₀ : $\beta_4 = 0$ H _A : $\beta_4 \neq 0$	Reject H ₀₄ if p- value ≤ 0.05 otherwise fail to reject H ₀₄ if P-value is > 0.05

The relationship between return on investment and portfolio diversification was expected to follow the Logistic regression model

$$P_i = E\left(Y = \frac{1}{X_i}\right) = \frac{1}{1 + e^{-(\beta_1 + \beta_2 X_i)}}$$

Where:

P_i = Probability of portfolio diversification

Y = Dependent variable (portfolio diversification).

X_i = Return on Capital employed

β_1 etc = the beta coefficients of the respective independent variables and the constant

Therefore the probability of not diversifying one's portfolio becomes $1 - P_i$ since for diversifying is P_i

$$\text{taking } Z_i = \beta_1 + \beta_2 X_i \text{ then } P_i = \frac{1}{1 + e^{-Z_i}} \text{ and } 1 - P_i = \frac{1}{1 + e^{Z_i}}$$

therefore the odds ratio in favour of diversification of portfolio is given by the probability of diversifying divided by the probability of not diversifying.

$$\text{That is } \frac{P_i}{1 - P_i} \text{ which implies that } \frac{P_i}{1 - P_i} = \frac{1 + e^{Z_i}}{1 + e^{-Z_i}} = e^{Z_i}$$

When the odds ratio is subjected to natural logarithm then what is obtained is the logit regression model

$$L_i = \ln\left(\frac{P_i}{1 - P_i}\right) = Z_i = \beta_1 + \beta_2 X_i$$

L referred to as the logit; which is the log of the odds ratio and is not only linear with regard to X but also linear in the parameters. The slope that is β_2 etc measure the changes in L for a unit change in X_i . That is it tells us the log odds in favour of

diversifying portfolio as the X_i changes by a unit. The constant β_1 is the log odds in favour of diversifying if X_i is zero. However the interpretation of β_1 may not have any physical meaning.

Table 3.4: Study Objectives and Measurements

Objective	Indicators
Return on Capital Employed (ROCE)	Return on Capital employed = $\frac{\text{EBIT}}{\text{Capital Employed}}$
Return on Equity (ROE)	Return on Equity = $\frac{\text{Net Income}}{\text{Total equity}}$
Return on Assets (ROA)	Return on Fixed Assets = $\frac{\text{Net Income}}{\text{Total Fixed Assets}}$ Return on Current Assets = $\frac{\text{Net Income}}{\text{Total CA}}$
Market Performance Measures	Profit margin = $\frac{\text{Net Income}}{\text{Sales}}$ Price-Earnings Ratio = $\frac{\text{Price per Tonne}}{\text{Earning per Tonne}}$

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

The chapter presents the research response level, data coding and cleaning as well as the assessment of data normality, linearity and independence and a descriptive analysis of all the study variables. Also presented in this chapter are the hypotheses tests and the logit regression models of the study variables.

4.2 Background Information

4.2.1 Response level, Data coding and Cleaning

Although the study had intended to collect data from a sample of 399 Households, the researcher managed to successfully contact 321 respondents, they however gave 148 more financial statements of the different years to be reviewed. This represents a response rate of 80 percent of the target population that the researcher considered. The data was then coded and cleaned through extensive checks for consistency. Data was analyzed using a set of descriptive and inferential statistics in statistical package for social sciences (SPSS) version 12.0 software.

4.3 Diversification Risk and Characteristics

Table 4.1: Portfolio risks

Which among the business risks below would you consider critical for you in deciding to diversify your investments away from sugar cane.	Critical	Not critical
	%	%
Interest rate increase risk on Loan attached to the sugar cane	55	45
Credit loss risk on commitment attached to the sugar cane	55	45
Asset loss risks on commitment attached to the sugarcane	57.5	42.5
Market oversupply risk attached to the sugarcane	60	40
Price ability to meet costs risk attached to sugarcane	70	30
Increased production costs risk attached to sugarcane	85	15
Adverse weather risks attached to sugarcane production	75	25
Reduction in production levels due to security related risks (e.g. arson).	55	45

From Table 4.1 above the most highly regarded risks by 70 percent and above of the respondents are those related to price and cost risks. This has been acknowledged by a number of authors in the area of sugarcane and related investments. They are some of the challenges that have been noted to afflict this sector as well as contributing to diversification in this sector. It can also be noted that adverse weather conditions are critical risks that the sugarcane investors have to endure given that sugarcane production is rain fed and therefore highly dependent on weather conditions.

According to Simkins, Cater and Rogers (2012) commodity price risk can affect the returns on stocks and that commodity hedging can reduce this exposure. In particular, strong evidence is found that commodity risk management adds value for firms hedging input price risk. The risks of equity are shared among more investors with different portfolio exposures and hence a different “appetite” for bearing certain

risks, equity market risk premiums should fall for all companies in countries with access to global markets. Although the largest reductions in cost of capital resulting from globalization will be experienced by companies in liberalizing economies that are gaining access to the global markets for the first time, risk premiums can also be expected to fall for firms in long-integrated markets as well (Rene M Stulz, 1999).

Table 4.2: Return on Investment Measures

Return on Investment measures	Shapiro-Wilk		
	Statistic	observations	Sig.
Return on Capital Employed	.769	321	.000
Net Income/Total Equity	.962	321	.345
Return On Fixed Asset=Net Income/Total Fixed Assets	.939	321	.084
Return on Current Assets=Net Income/Total Current Assets	.943	321	.108
Profit Margin=Net Income/Sales	.937	321	.076
Earning Price Ratio=Earnings per Tonne/Price per Tonne	.945	321	.125

The normal distribution test was carried out using the Shapiro-Wilk test. This test has both the statistic and the graphical analysis (Hair et al., 2010). This test is useful for small and medium sample sizes which are less than or equal to two thousand observations. It is used to measure the degree of departure from the normally distributed population. The null hypothesis in this test is that the data is normally distributed or does not differ from the normal distribution observed in the population. It therefore can be argued to test the extent to which the data can be a representative of the population characteristics that are under study. As per the table 4.2 above all the returns on investment measures were not significant except for the return on capital employed. This implies that from the Shapiro-Wilk test the null hypothesis is upheld implying that the sample data is normally distributed thereby it can be confidently concluded that they have similar characteristics as the population except for the return on capital employed.

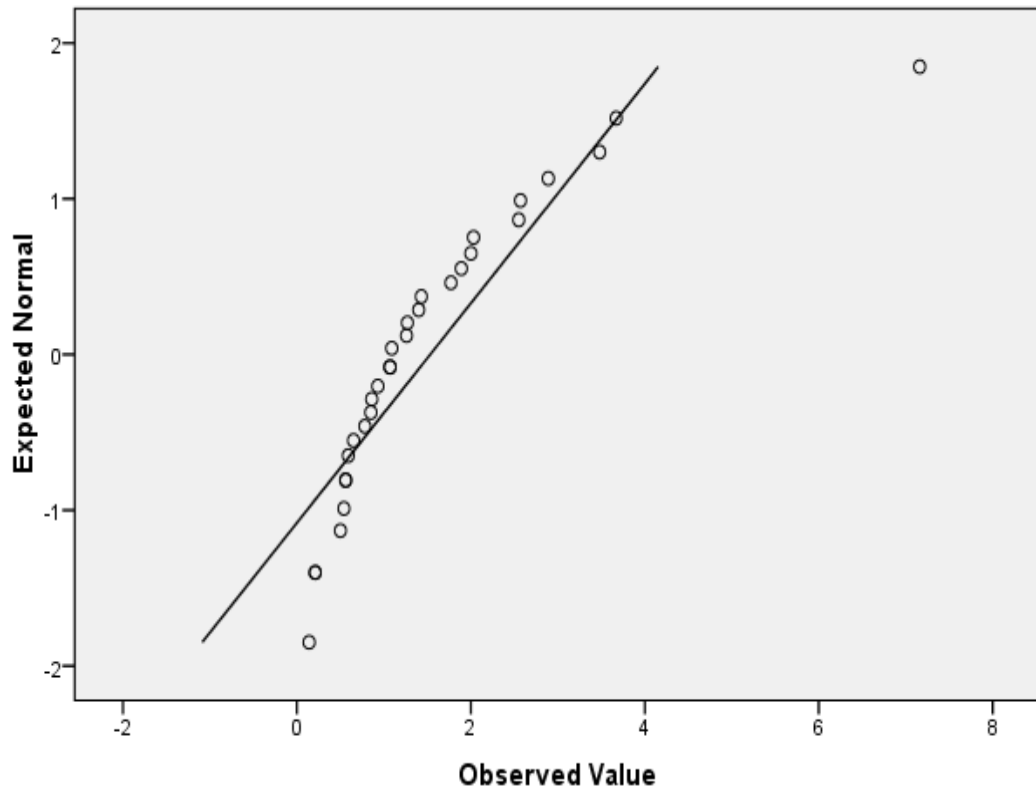


Figure 4.1: Normal Q-Q Plot of ROCE

For the return on capital employed (ROCE) the null hypothesis was rejected as per the Shapiro-Wilk test. In the event of this it is recommended that the graphical analysis through the analysis of normality plots (Hair et al 2010). Such a plot is the Normal Q-Q plot as depicted in Figure 4.1 above. The visual analysis used is that as long as the distribution is close to the diagonal straight line then it can be assumed to be close to a normal distribution and therefore may not have violated the normal distribution of the population. From the graphical analysis of Figure 4.1 the ROCE data follows closely the diagonal line implying that it is safe to assume the data is normally distributed and similar to the population distribution.

Table 4.3: Portfolio Diversification

Portfolio diversification	YES	NO
	%	%
I invest in other businesses/activities apart from growing sugar cane	35	65
I run other trading activities (Kiosk/shop) apart from growing sugar cane	23	77
For commercial purposes I only grow sugarcane	48	52
Sugarcane is my only commercial activity in my farm	50	50
Sugarcane is the only cash crop I depend on for commercial purposes	48	52
Currently I invest in other trading/activities apart from growing sugar cane	18	82
In the future I will invest in trading/activities apart from growing sugar cane	40	60
Apart from sugarcane I engage in trading activities to improve my cash flow	23	77
Trading is the other commercial activity I engage in	25	75
My trading activities have greatly contributed to my cash flow	28	72

Table 4.4: Summary of diversification characteristics

Year financial statement prepared		Sugarcane investments in hectares	
Years	%	Hectares	%
1999 and below	10	0.5 and below	45
2000 to 2009	40	0.5 > to 1.0	20
2010 and above	50	1.0 > to 1.5	25
		Above 1.5	10
Frequency on whether investor has diversified portfolio		Type of sugarcane investment relationship with miller	
Portfolio	%	Type	%
Diversified	22.5	Contract	78
Not diversified	77.5	Private	22

From Table 4.4 above of the financial statements were as far as from the year 2000 onwards with very few about 10 percent covering before this time. This is understandable in that recent records are much easily available than older records especially given that these documents were sourced from the sugarcane investors themselves. In terms of scale of investment the majority (65 percent) of the investors operated farms of one hectare or less. This is an indication that the majority of the investors are smallholders which was the design of sugarcane investments in these regions. Further as expected for the relationship with the millers since it was a smallholders concept vertical integration by the millers was practised through ensuring formal contract between the sugarcane production investors and millers securing the supply of sugarcane to the millers. In the process this assured the millers the supply of raw material. As the challenges of payment of suppliers of raw material intensified and more millers got into the market some of the investors opted for private production which simply means non contractual production of sugarcane. This is a clear indication that sugarcane investors were diversifying their portfolio as one needs other sources of income to sustain such operations. This is because in contractual relationship inputs would be provided for on credit payable upon harvest and therefore other sources of income were not a pressing issues. Therefore from Table 4.4 the sugarcane farmers have diversified their portfolio with about 22.5 percent indicating having fully diversified to other portfolios making sugarcane production as only one of the many but not the critical source of funds.

4.4 Return On Capital Employed

4.4.1 Trend analysis for Returns On Capital Employed

The trend analysis is a visual representation of the behaviour of the values of return on capital employed (ROCE) as it varies with regard to time, price changes and differences in land sizes under sugarcane investments. Therefore for all the three elements that have an impact on return on capital employed the trends are as summarised in the figures below.

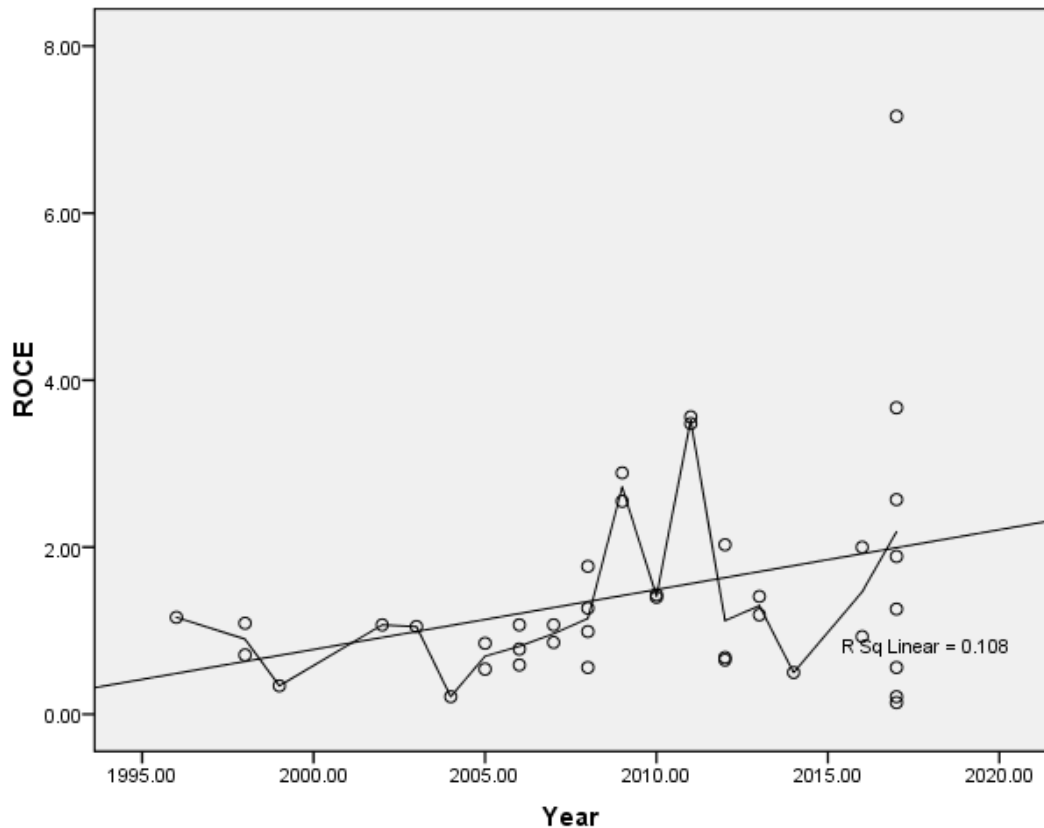


Figure 4.2: ROCE trend over the years

The trend results reveal that over the years the returns on capital employed (ROCE) experienced a continual increase as depicted by the Figure 4.2 above. On the basis of the theory of investment the overall returns levels have been above zero and somehow it has had a gradual but steady growth in returns over the years. This implies that the sugarcane portfolio is still a rational investment option. This explains why despite the many challenges facing this industry there is still continued investments. According to Kim, Mauer, and Sherman, (1998) the appropriate return allows the self-financing of business operations through the retained portion of net profit. Thus, good profitability increases the liquidity and marketability promotes proper growth and future profitability.

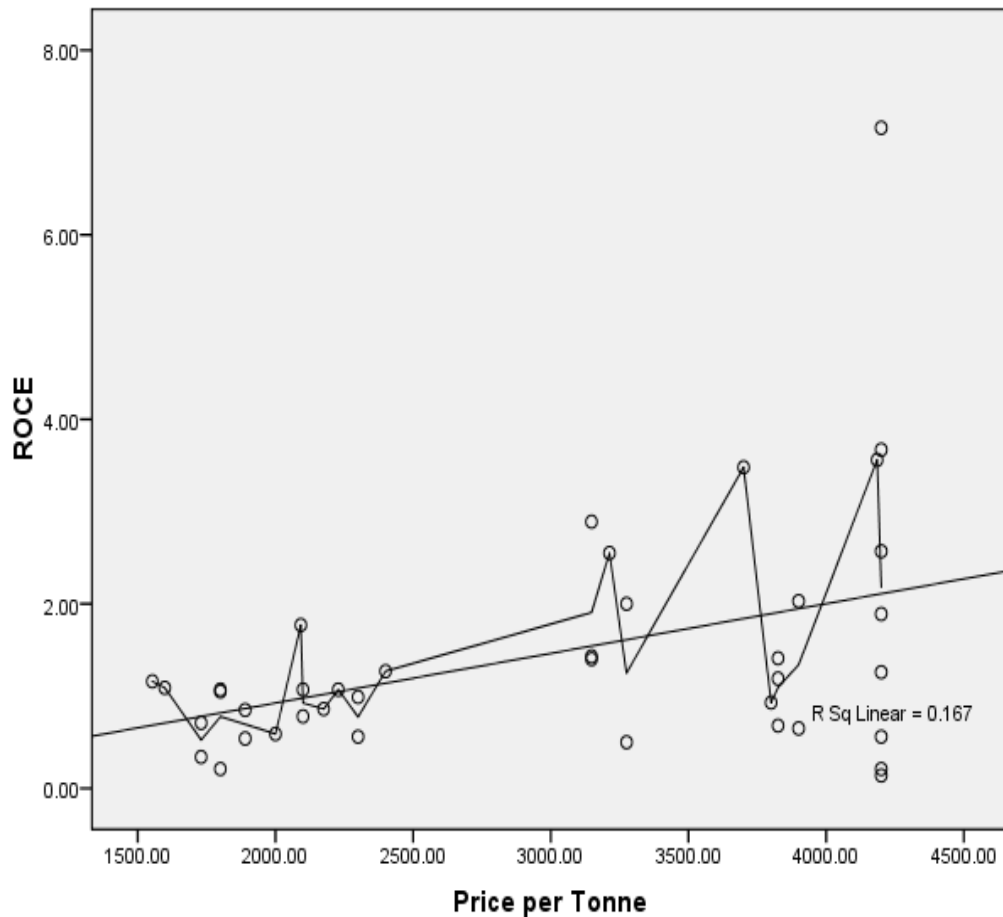


Figure 4.3: ROCE against the Price Per Tonne

With the increase in price per tonne for the sugarcane there is an increase in ROCE implying that the sugarcane investors have maintained positive and better returns as the price levels increases. The price increases could have been brought about by a number of factors both financial – such as inflation pressures that affects costs of inputs, higher costs of living and non financial – such as increased demand due to population growth, diversified use of the sugar etc. This is in line with the general economic and business principles that higher prices generally contribute the sustained profitability of any portfolio.

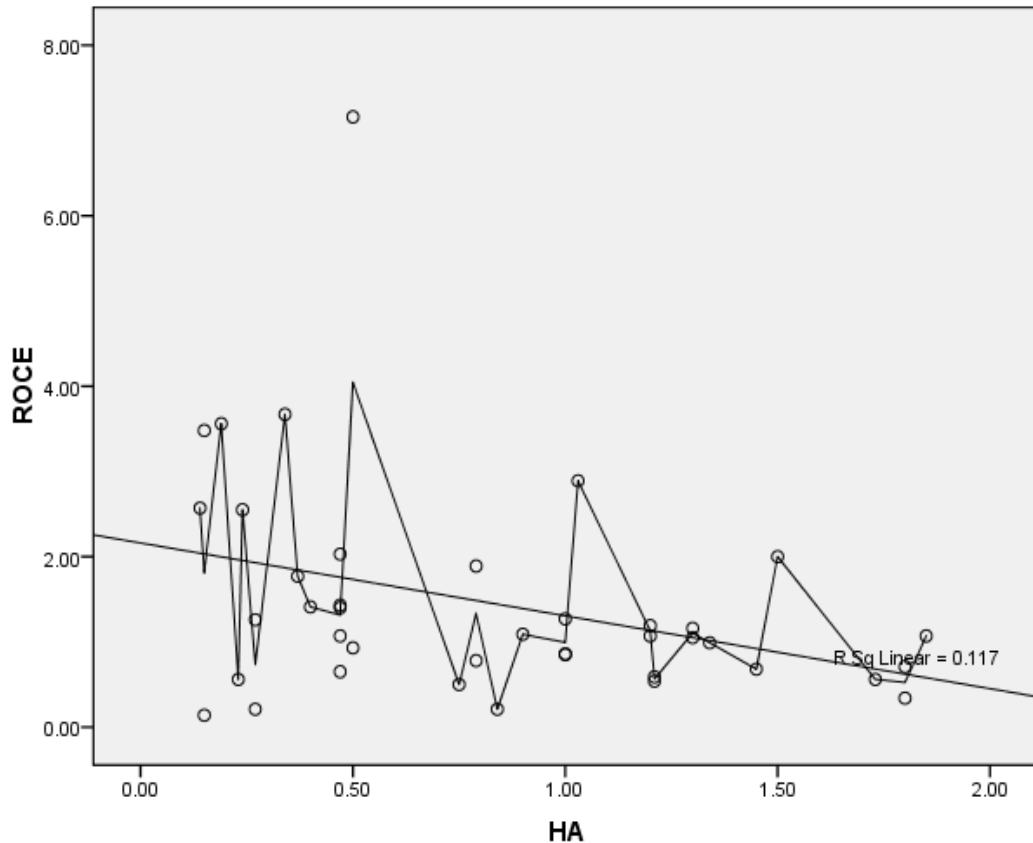


Figure 4.4: ROCE against the Land Size

The key asset to ensuring increased output which in turn translates to higher turnover and therefore increasing the possibilities greater profits for sugarcane investors is the land size under sugarcane. Generally when it comes to investments the more the productive assets and its accompanied inputs the higher the returns on investments mainly due to economies of scale. On the relation between the return on capital employed and the size of land under sugarcane it can be noted in Figure 4.4 above there is an inverse relation between land size and returns on capital employed. These findings suggest that gains from improving technical efficiency exist in all farm categories but the expectation is that they would be much higher on large than on small farms. However the inverse relationship between farm size and productivity has generated controversy since its discovery by Sen (1962) in the pre green revolution era. Prior to Sen' study, the inverse relationship between farm size and

output was first discovered in Russian agriculture by Chayanov (1926). This relationship has continued to dominate research findings with results indicating positive relationships are comparatively sparse empirically. The findings are also in line with Joshua (2005) and Droms (2008) who found out that low capital intensive firms have higher operational profitability in comparison to higher capital intensive firms if one looks at land size as the as an indicator of level of capitalization.

Table 4.5: Descriptives for ROCE

Return on Capital				
Employed (ROCE)	Std.			
	Mean	Deviation	Minimum	Maximum
ROCE	1.4535	1.30111	.14	7.16

From Table 4.5 ROCE had a mean of 1.5 when rounded off to one decimal point. With a mean return of 1.5 times above, capital employed does imply that sugarcane investments are liquid since ROCE is associated with the measurement of firms' liquidity. The association is such that the higher the ROCE the greater a firm's liquidity and therefore its financial strength. This is in line with Chandra (2015) who argues that high liquidity is a sign of financial strength. Arnold (2008) who indicated that being liquid ensures cash guarantees to undertake highly profitable investments that demands immediate payment further supports this. However sugarcane returns are based on 24 months cycle implying that despite an impressive 50 percent returns on capital employed if it is compared with the generally employed period for calculating returns that is 12 months then the returns on capital employed will be lower that is 25 percent using a simple averaging. This suggests that for every unit of capital employed that return is only 25 cents holding constants all other risks related to sugarcane investments.

Table 4.5 indicates that overall the mean returns of the ROCE are positive and above zero. This is true for both the sugarcane investors who have diversified and those who have not. To understand whether there are differences in the ROCE mean

returns of these two groups and which of the groups has a higher mean returns analysis of variance (ANOVA) was carried out. The analysis was guided by the null hypothesis that there is no difference in the ROCE mean returns for the two groups. The results are summarized in the table 4.6.

Table 4.6: ANOVA for ROCE

ROCE = EBIT/CAPITAL EMPLOYED				
Portfolio diversification	Mean	Std. Deviation	F	Sig
Not diversified	1.0926	.72004	14.186	.001
Diversified	2.6967	2.01623		

As per Table 4.6, the mean returns for ROCE total were 2.6967 for the diversified and 1.0926 for the not diversified sugarcane investors. The ANOVA was significant and therefore the null hypothesis was rejected and the alternative hypothesis accepted that there is a difference between the ROCE total mean returns for the two groups. For the diversified the higher returns does imply they may be experiencing higher profitability levels in comparison to the not diversified group. Awad and Jayyar (2013) confirms this by noting that efficiency of working capital management and liquidity levels of the firms ensures maximization of the firm's profits as the two measures are considered to be the cause of firm profitability. For the diversified the higher returns does imply they may be experiencing higher efficiency in working capital management. Gitman (2003) notes that for a firm to avoid insolvency working capital management must ensure that the current assets are at the levels that cover liabilities at a reasonable safety. Eljelly (2004) further elucidates that this involves planning and controlling current assets and liabilities to reduce the risks of inability to meet short-term obligations that can have major effects on profitability of a firm.

4.4.2 Correlation between ROCE and Portfolio diversification

The strength of the relationship between ROCE measures which were the independent variables of the study and portfolio diversification was assessed using correlation coefficient. As shown in the table 4.5 below there was a strong positive significant correlation between ROCE measures and portfolio diversification (see also Appendix II tables).

Table 4.7: Correlations for Portfolio Diversification and ROCE

		ROCE	PORTFOLIO DIVERSIFICATION
ROCE	Correlation Coefficient	1.000	.412**
	Sig. (2-tailed)	.	0.008
	N	321	321
	Correlation Coefficient	0.412**	1.000
PORTFOLIO DIVERSIFICATION	Sig. (2-tailed)	0.008	.
	N	321	321
	**.		
	*.		

In the sugarcane supply industry there is only one buyer and if more buyers they average between two to three. This implies the market structure is a kind of monopsony. The implication of this is that the sellers are price takers; dictated by the buyers. From the Table 4.7 above the correlation between portfolio diversification and the return on capital employed is moderate. With a correlation of 0.412, it implies a moderate positive relation such that as the ROCE increases the probability of the sugarcane investor diversifying improves. This can be interpreted from the liquidity perspective in that selling implies availability of cash and therefore the investor has the necessary resources to either reinvest the cash or seek for other investment opportunities thereby diversifying (Arnold, 2008).

4.4.3 Logit Analysis of ROCE

Since the dependent variable was dichotomous logit regression was used to test the null hypothesis that ROCE does not significantly influence sugarcane investors' decisions to diversify or not. This is because the dependent variable portfolio diversification is dichotomous and probability based. In such case, the general ordinary least square (OLS) regression models are inadequate and it has been proven would lead to biased estimates of the parameters (Gujarati et al 2009). The logit regression for the ROCE was guided by the hypothesis that:

H₀₁ Return on Capital Employed has no influence on portfolio diversification of sugarcane investors

Table 4.8: Logit regression of ROCE on Portfolio Diversification

Return on Capital Employed	B	S.E.	Sig.
ROCE	1.370	.565	.015
Constant	-3.039	1.027	.003

In the Table 4.8 above only the ROCE is statistically significant and positively related to portfolio diversification. This therefore allows the rejection of the null hypothesis and accept the alternative that ROCE selling has a significant influence on portfolio diversification. This seems to support that the perspective that being liquid is one of the important preconditions to investing and therefore diversity (as elucidated by Chandra (2015) and Arnold (2008) and that ensuring efficient liquidity levels would lead to profitability and subsequently reinvestment or diversification (Awad & Jayyar, 2013). This is also in line with the theoretical literature that higher returns would motivate one to spread ones risk since the investor is rational and will always seek to maximize profit.

4.5 Return On Equity

4.5.1 Trend analysis for Return on Equity

Return on equity (ROE) was assessed using one key measure; Net Income/ Total equity. It is a measure of performance over time. A trend analysis is carried out with regard to its behaviour over time as well as with respect to other factors. The trend analysis is summarized in the figures below.

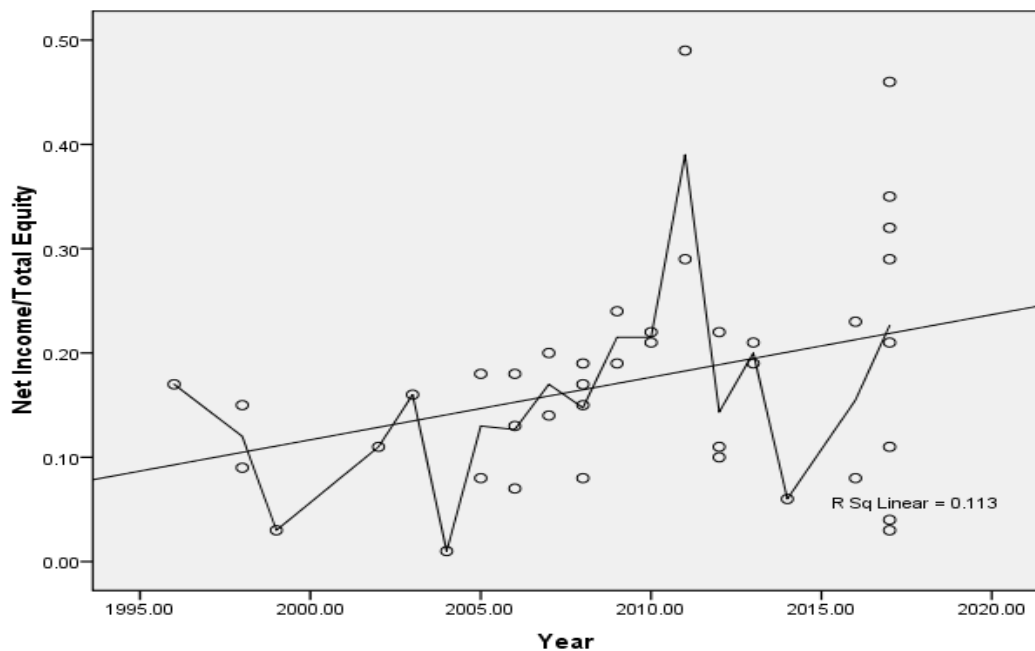


Figure 4.5: ROE against the year

Performance ratios like ROE, concentrate on past performance to get a gauge on future expectations. In the figure 4.5 it can be visualized that the past performance has been rather dismal and the average variation have barely oscillated around plus or minus 0.10 which implies minimal changes in ROE. This can bring in to doubt whether sugarcane investments are capable of generating returns worth future investment risks in sugarcane (Berman, Knight, & Case, 2013). Since the past

determines future expectation it can be deduced from the figure above that the sugarcane investors would then be more inclined towards diversifying their portfolios as the band of variation is so minimal that expectations of higher profit margin are in doubt.

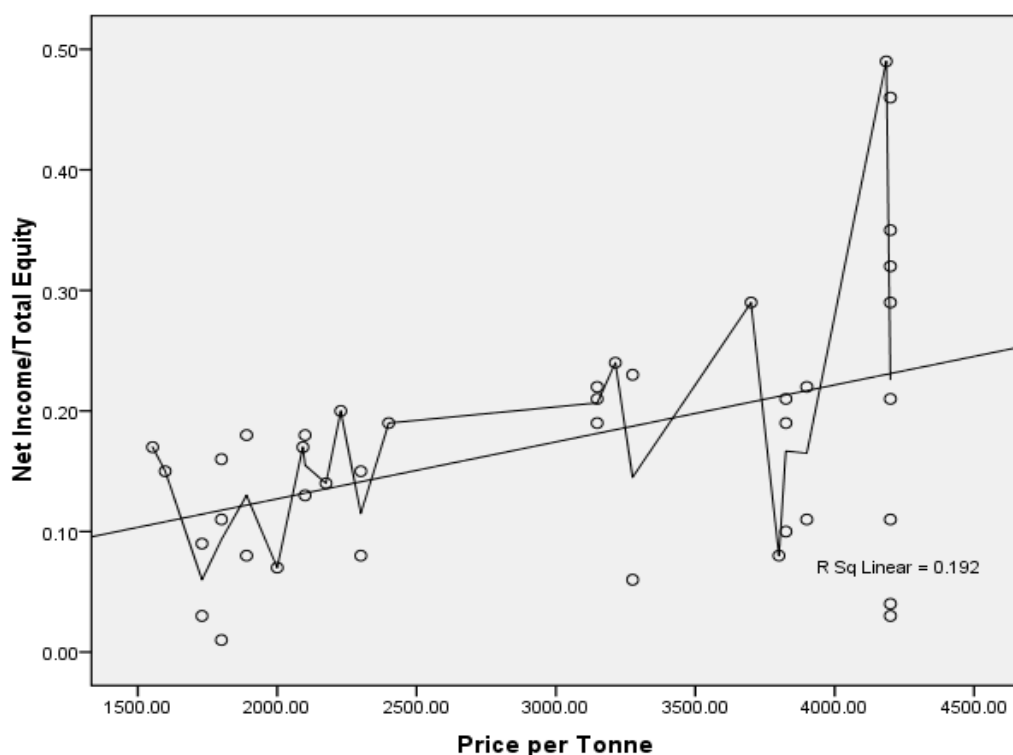


Figure 4.6: ROE against Price Per Tonne

From figure 4.6 above the ROE is positively related to pricing. This is expected as price increase is a motivator for suppliers of goods and services to increase their output thereby their operational activities. The reasons for this is that the investors will be in a position to cater for inflation and other costs with regard to production and management of the investment. This is noted by Helfert (2014) that the factors that influence ROE includes operational activity among others such that operational activity influences ROE through the operating profit margin. Critical to improving

the profit margin are the price levels and this according to Figure 4.6 improves the ROE. The price level determines the unit income or revenue that is accrued by the investor thereby contributing to earnings which if greater than the costs contributes to better profit margins. The better profit levels implies the shareholders wealth is created and this in turn can act as catalyst for portfolio diversification (Price, 2012).

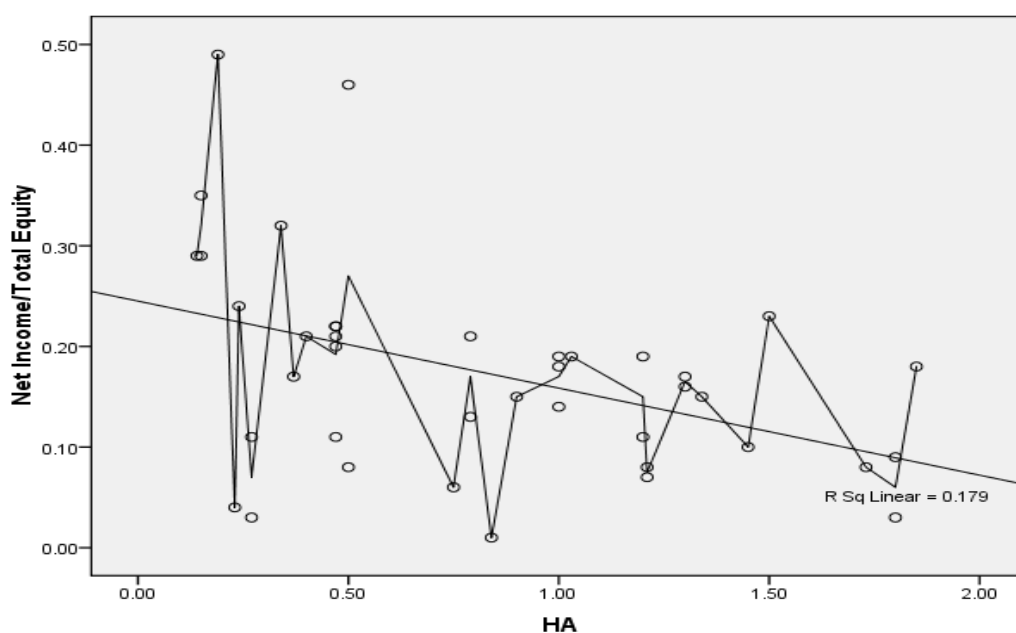


Figure 4.7: ROE against the Size of Land

From figure 4.7 as the land size increase the ROE decreases. This is contrary to the expectations that higher land mass given that it is the key input to sugarcane production would imply higher ROE. The most likely interpretation of this finding would be that there are better wealth creation opportunities in the smaller piece of land in comparison to the large pieces in the sugarcane subsector (Joshua 2005; Droms 2008). The possible explanation is manpower challenges as most of the production process weeding, planting etc are all labour intensive. In many cases the dependency was on household labour who may be basically seasonal given the contemporary lifestyle of seeking for education and looking for white or blue collar

work as opposed to agriculture work would be more effective in a smaller land size than a bigger one.

Table 4.9: Descriptives and ANOVA for ROE

Return on Equity = Net Income/Total Equity.				
Portfolio diversification	Mean	Std. Deviation	F	Sig.
Not diversified	.1455	.08970	12.239	.001
Diversified	.2700	.10863		
Overall	.1735	.10669		

The average return on equity (ROE) was 0.1735 implying that the venture is still profitable (see Table 4.9). The low mean score is simply because the capital infusion that is land is expensive (in the equation for calculating ROE the market value of the land was used). Taking into consideration that the sugarcane investors own the land either through inheritance mainly or through purchase of the land; the ROE mean scores implies profit margins that the investors would still consider reasonable and therefore would be motivated to use the profits from the land to engage in other investments. Assuming for example that land is inherited and that land is the only equity then ROE for those who inherited land would be huge probably higher than the mean of ten (10) or figures similar to those of return on capital employed. Higher ROEs implies that the shareholders wealth is being created since equity returns exceeds the costs of that equity and that the ratio tells us what percentage of profit the firm makes for every unit of equity invested in the firm (Black, Wright & Davies, 2001).

As per Table 4.9 the ANOVA tested the null hypothesis that ROE has no significant effect on sugarcane investors portfolio diversification. The F-test score were significant and therefore the null hypothesis was rejected and the alternative accepted. This implies that the ROE mean return score of 0.2700 for the portfolio diversified group is significantly different from the 0.1455 for the not diversified. The higher ROE for the diversified group can imply that better financial performance and therefore higher profitability for them in comparison to the not diversified

(Rappaport 1998; Monteiro 2006; Acheampong 2013). Since ROE can be decomposed into the operational, investment and financing activities then the diversified group can then be argued to be performing better in these activities combined (Helfert, 2014). This is a possible explanation for higher ROE for the diversified.

4.5.2 Correlation between ROE and Portfolio diversification

As per the Table 4.10 below (see also Appendix II tables) the correlation between ROE and Portfolio Diversification moderate is at (0.498). This combined with the overall ROE being at 0.1735 which can be considered quite low seems to imply that some wealth is being created in these investment. Warusawitharana (2013) supports this by arguing that pursuing higher ROE may lead to wealth destruction. This is because inflation such that new and older assets does not adapt quickly to the effects of inflation (Rappaport, 1998), as well as observed in the figure 4.10 above where the larger the land size (the asset) the lower the ROE.

Table 4.10: Correlation between ROE and Portfolio Diversification

		Portfolio diversification	Net Income/Total Equity
Portfolio diversification	Correlation Coefficient	1.000	.498**
	Sig. (2-tailed)	.	.001
	N	321	321
Net Income/Total Equity	Correlation Coefficient	.498**	1.000
	Sig. (2-tailed)	.001	.
	N	321	321

** . Correlation is significant at the 0.01 level (2-tailed).

4.5.4 Logit Analysis of ROE

The extend to which ROE influence portfolio diversification among the sugarcane investors was undertaken using the logit regression analysis. The logit was guided by the null hypothesis that:

H₀₂ Return on Equity does not have a significant influence on portfolio diversification among sugarcane investors

Table 4.11: Logit regression of ROE on Portfolio Diversification

Return on Investment Measures	B	S.E.	Sig.
ROE	12.426	4.981	.013
Constant	-3.697	1.127	.001

From the Table 4.11 above it can be deduced that ROE significantly influence the probability of portfolio diversification among sugarcane investors (see also Appendix III tables). The influence is positive implying the higher the ROE the higher the possibility of a sugarcane investor diversifying his/her portfolio. This can be supported by Warusawitharana (2013) who argues that pursuing higher ROE would lead to wealth destruction and therefore for rational investors portfolio diversification seems the only logical way out.

4.6 Return On Assets

4.6.1 Trend analysis for Return On Assets

The figures below analyzes the trends of Return on Asset (ROA). ROA was measured using two ratio the return on fixed assets and the return on current assets. The fixed assets was basically land holdings which is the main asset in sugarcane investments. The current assets was the value of sugarcane.

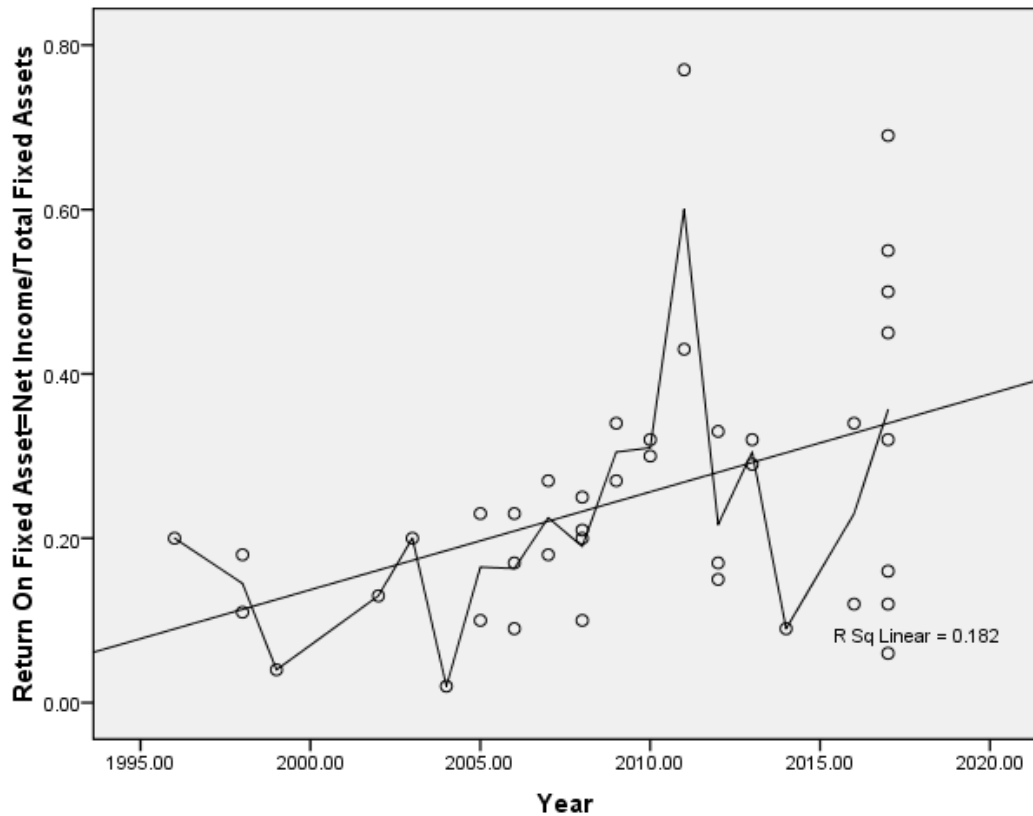


Figure 4.8: ROA Fixed against the year

The return on fixed assets ROFA has been on the increase over the years. This is as expected as with time as the firm gains experience it is bound to become more efficient to translate returns from its fixed assets. Since ROFA measures the overall effectiveness of management experience over time, thus implying over time the continued mastery of skills and knowledge necessary to perform (Syawal, Triharjono & Siti, 2013). However the range of variation of the returns across sugarcane investors was plus or minus 0.20 a fairly narrow range. The implications of this is that there has been limited opportunities to improving returns on fixed assets as far as sugarcane investment is concerned.

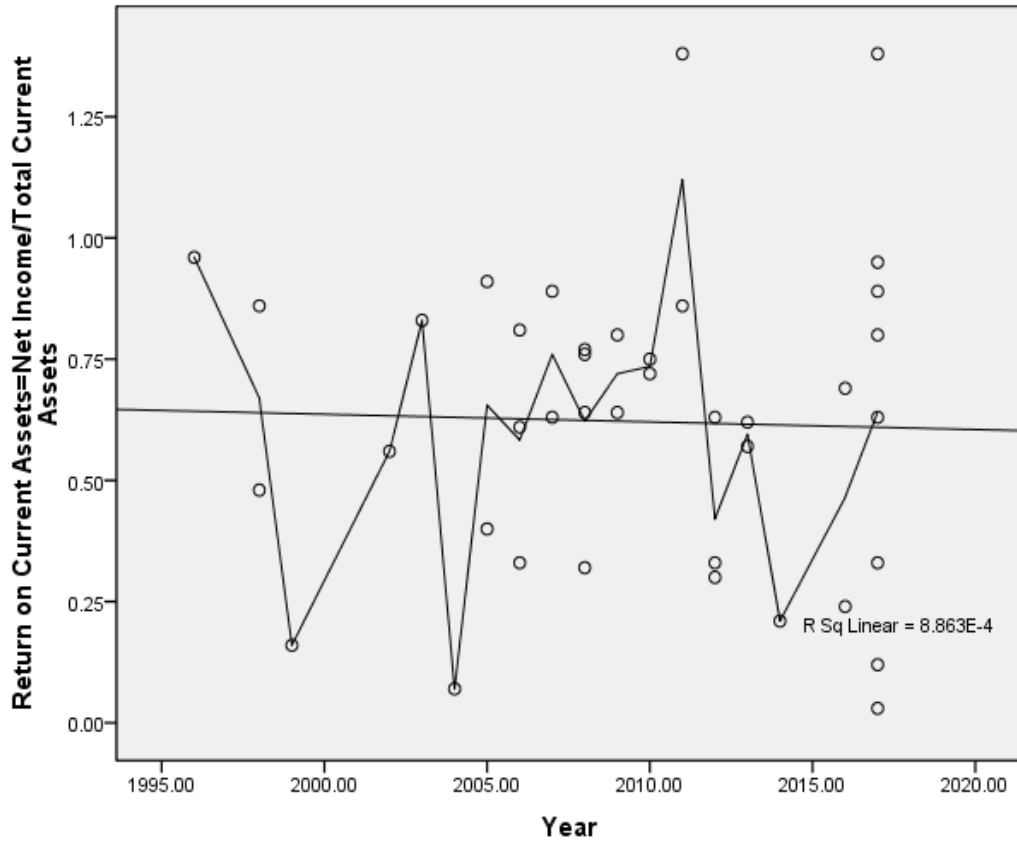


Figure 4.9: ROA current against the year

The returns on current assets (ROCA) over the years have remained constant. Current assets are those in the normal course of operations are expected to be converted in to cash or consumed in the production process. However the results are contrary to expectation. The possible explanation is given by Roman and Danuletiu (2013) who argue that firms may have poor supervisory rating an indication of limited ability to generate ROA. They clarify this by arguing that costs may in the end hinder the implementation of remedial safety and soundness measures necessary to improving the ROA. Since the returns on current assets have not changed over the years the implication is that there is some motivation for any sugarcane investor with this information to diversify his/her portfolio.

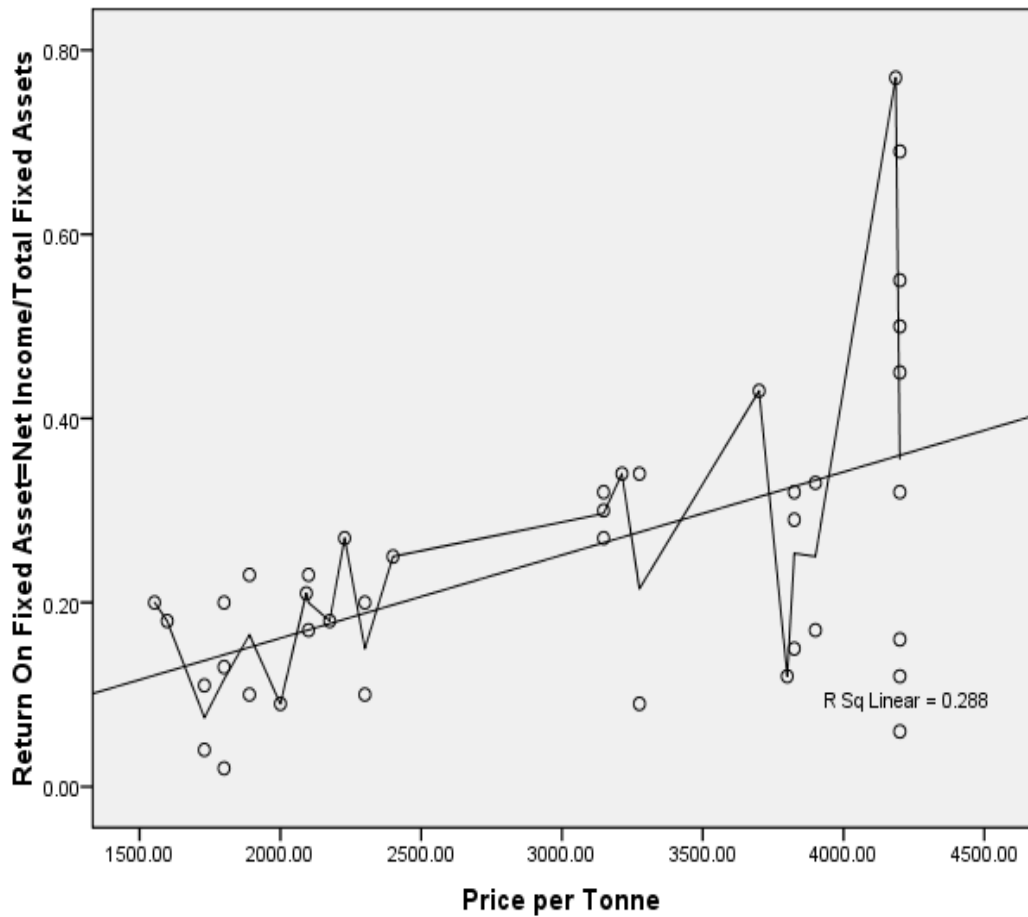


Figure 4.10: ROA Fixed against Price Per Tonne

The increase in price per tonne leads to an increase in return on Fixed Asset. ROA is impacted by both profitability and efficiency. Profitability is related to the continued increase in price which ensures that revenues increase. Although price increases is not a sure sign of efficiency since it is an externally induced phenomenon but its increasing returns is a possible indicator of existence of efficiency. This is in line with Riyanto (2001) who argues that higher ROA implies better performance because of greater returns on investment.

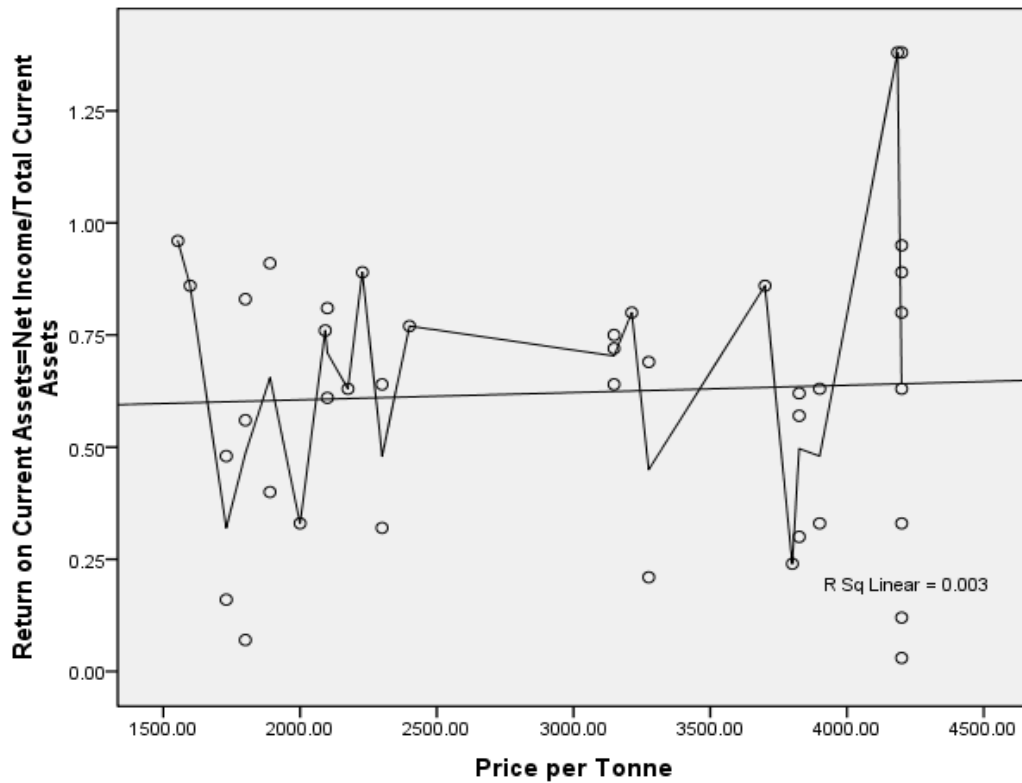


Figure 4.11: ROA Current against Price Per Tonne

From the Figure 4.11 above as prices of sugarcane increase the ROCA remained constant. This is in line with Rasiyah (2010) whose study showed that profitability ratios are not affected by changes in price levels. It is generally expected that as the price levels of an investment rises ROCA would improve. This is violated and the possible explanation according to Roman and Danuletiu (2013) may be supervisory weaknesses. This can be pin pointing at the possibility that efficiency improvement probably have not been experienced in this industry. Other explanation can be that the prices increases were only adequate enough to cover inflationary pressures facing this industry. It can also be looked at from the perspective of the market structure which is monopsony. In this market structure there are many suppliers implying that on the supply side there is high competition and therefore the firms can only make normal profits.

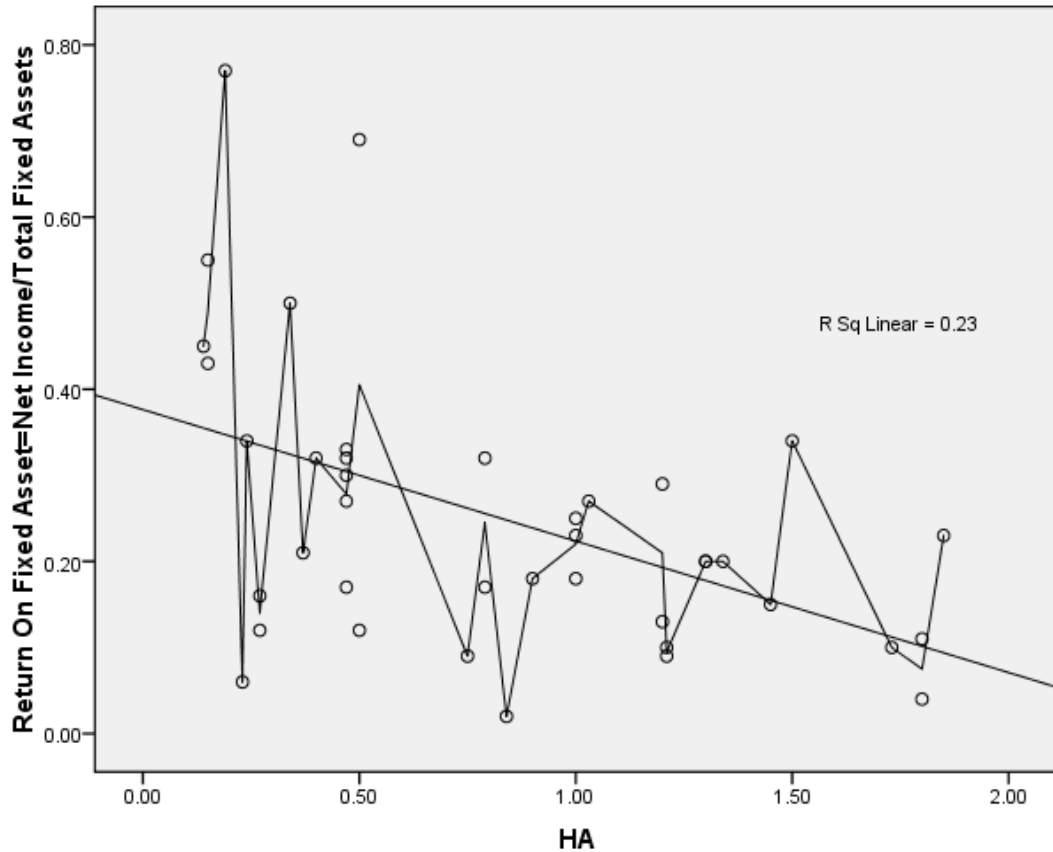


Figure 4.12: ROA Fixed against size of Land

Both the ROFA and ROCA showed a decline as the land size increased. This implies that the smaller the land size the better the returns on assets. The results can be understood from efficiency perspective as the sugar production primarily depend on the family labour to a larger extent in comparison to engaging casual labourers. This makes monitoring and implementation of best practices difficult confirming the observations of Roman and Danuletiu (2013). Therefore it may be better for the sugarcane investor to either create some professionalism in the industry which is an uphill task. The second rational option is to diversity ones portfolio to improve overall ROA.

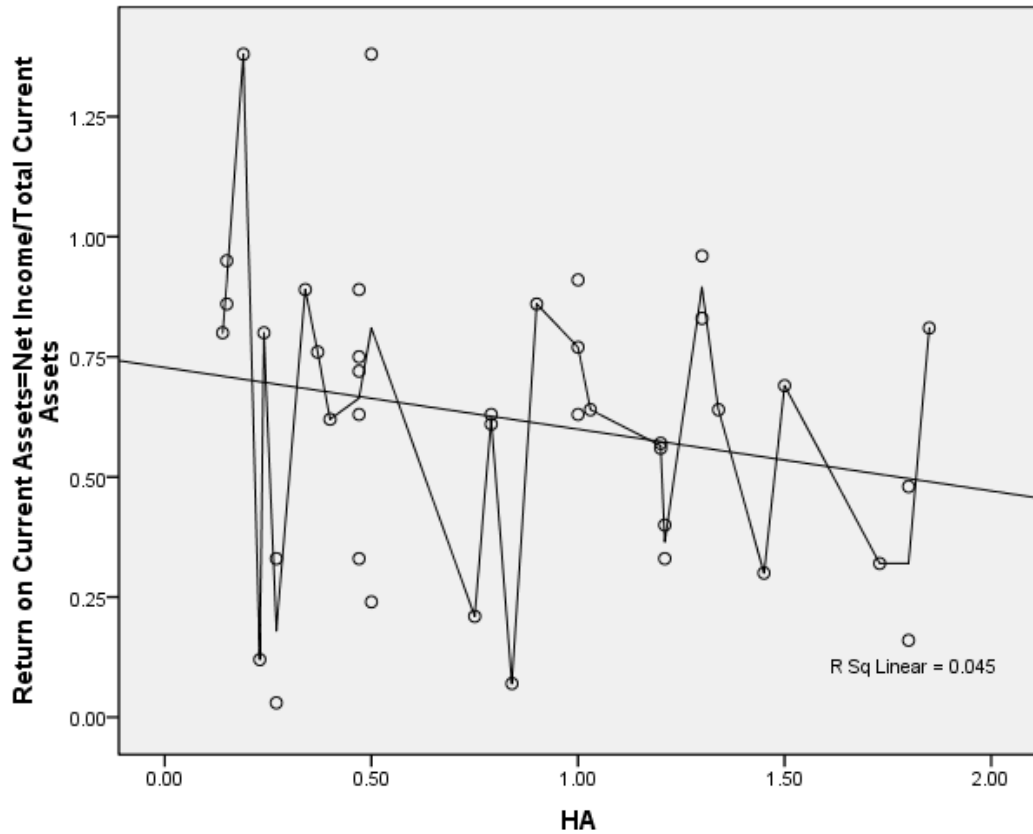


Figure 4.13: ROA Current against the size of Land

As per Table 4.12 Return on Current Assets had a higher mean return of 0.62 while the return on Fixed Assets had a mean return of 0.25. The differences between the mean return scores is due to the fact that the value of fixed asset that is land is high in comparison to the current assets the value of sugarcane under the land.

Table 4.12: Descriptives for ROA fixed and ROA current

Return on Assets (ROA)	Std.			
	Mean	Deviation	Minimum	Maximum .
ROA Fixed	.2500	.16632	.02	.77
ROA Current	.6215	.31575	.03	1.38

The return on current assets which is basically the market value of the output is low at 0.62 for the average maturity period of 24 months for cane. This would translate to ROA current of 0.31 for a 12 month period the standard financial year for firms. This implies that the earnings from output for sugarcane investors is low but at least not zero implying at least the sugarcane investments are generating profits by exploiting the fixed and the current assets (Prastowo, 2014). This therefore can act as an incentive for sugarcane investors to diversify.

Table 4.13: ANOVA for ROA fixed

Return On Fixed Asset=Net Income/Total Fixed Assets.				
Portfolio diversification	Std.		F	Sig.
	Mean	Deviation		
Not diversified	.2055	.13713	12.876	.001
Diversified	.4033	.17378		

As per Table 4.13 the ANOVA tested the null hypothesis that ROA fixed has no influence on sugarcane investors portfolio diversification. The F-test score were significant and therefore the null hypothesis was rejected and the alternative accepted. This implies that the ROA fixed mean return score of 0.4033 for the portfolio diversified group is significantly different from the 0.2055 for the not diversified. The higher ROA fixed for the diversified group can imply that as per Prastowo (2014) they are more effective in generating profits by exploiting the fixed assets than the not diversified group. Therefore as supported by Riyanto (2001) the

diversified group experience better investment performance than the not diversified group.

Table 4.14: ANOVA for ROA Current

Return on Current Assets=Net Income/Total Current Assets				
Portfolio diversification	Mean	Std. Deviation	F	Sig.
Not diversified	.5642	.30228	5.004	.031
Diversified	.8189	.29468		

With the ROA current as summarized in Table 4.14 the F-test was significant implying that the null hypothesis that return on current assets has no influence on portfolio diversification is rejected and the alternative hypothesis accepted. Therefore the diversified sugarcane investors who have better mean return of 0.8189, their ROA current has a higher contribution to ensuring sugarcane investment value as supported by Ulupui (2007) and Makaryawati (2002). With better investment value or worth then portfolio diversification becomes the only other plausible action to maximizing returns.

4.6.2 Correlation Analysis between ROA and Portfolio Diversification

On the relation between ROA fixed, ROA current and portfolio diversification the correlation coefficient were positive which implies the higher the ROA the higher the chances that the portfolio diversification will be realized. This is confirmed by the observation that a firm with a higher current ratio will often be able to attain financing at a better rate thus reducing interest expense and generating higher ROA (Campbell, 2006). That is return on Assets (ROA), measures the overall effectiveness of management in generating returns from its available assets. If a firm has a high positive ROA then the firm has a great opportunity to enhance the growth of its own capital. Conversely, if the total assets used by the firm are not making a profit it will inhibit the growth of their own capital (Syawal, Triharjono & Siti,

2013). Which can imply then that the investor need to think seriously about diversifying.

Return on fixed assets had a higher correlation coefficient at 0.51 compared to 0.37 of the return on Current Asset (see also Appendix II tables). This can be understood from trend analysis where ROA current remained constant (with minimal variability if any) over the years and even as the prices rose, which was unlike in the case of ROA which was fixed as noted above. However, the correlation coefficients are moderate implying the relation with portfolio diversification may be weak in this industry implying limited cash flows since ROA is a predictor of future cash flow as supported by the concept of signaling theory (Ulupui, 2007).

Table 4.15: Correlations between Portfolio Diversification and ROA Fixed and ROA Current

		PD	ROFA	ROCA
Portforlio Diversification	Correlation	1.000	.509**	.368*
	Coefficient			
	Sig. (2-tailed)	.	.001	.019
	N	321	321	321
ROFA=Net Income/Total Fixed Assets	Correlation	.509**	1.000	.790**
	Coefficient			
	Sig. (2-tailed)	.001	.	.000
	N	321	321	321
ROCA=Net Income/Total Current Assets	Correlation	.368*	.790**	1.000
	Coefficient			
	Sig. (2-tailed)	.019	.000	.
	N	321	321	321

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

ROFA: Return on fixed assets

ROFA: Return on current assets

PD: Portfolio diversification

4.6.3 Logit Analysis of Return On Assets

In order to be able to assess the relationship between Return on Assets and Portfolio diversification commercial sugarcane farmers in Bungoma and Kakamega Counties, the study had set the following null hypothesis:

H₀₃ Return on Assets does not influence portfolio diversification among sugarcane investors.

Table 4.16: Logit regression of ROA on Portfolio Diversification

Return on Investment Measures	β	S.E.	Sig.
ROA Fixed	10.720	5.393	.047
ROA Current	-2.134	2.987	.475
Constant	-2.882	1.157	.013

In the logit regression only the ROA fixed significantly influences the probability of portfolio diversification among sugarcane investors (see also Appendix III tables). The implication of this is that as ROA fixed rises the chances for the sugarcane investor to diversify increases. This can be attributed to the fact that higher ROA implies greater opportunities to enhancing the capital base of the firm thereby improve on profit which in turn can translate to greater wealth necessary for portfolio diversification (Prastowo, 2014, Makaryawati, 2002). The ROA current was not significant and this can be understood from the lack of opportunities to value addition for the product in addition weak supervisory arrangements to improving productivity (Roman & Danuletiu, 2013). This implies there are fewer opportunities to extract higher profits from the product when one takes in to account that there is only one buyer and the product itself has no value to the sugarcane investor if it is not bought by the single buyer.

4.7 Market Performance Measures

4.7.1 Trend Analysis for Market Performance Measures

The measures of market performance analyzed using two ratios: price earning ratio (PE) and profit margin ratio (PM). The behaviour of the two ratio with regard to time among other variables are summarized in the figures below.

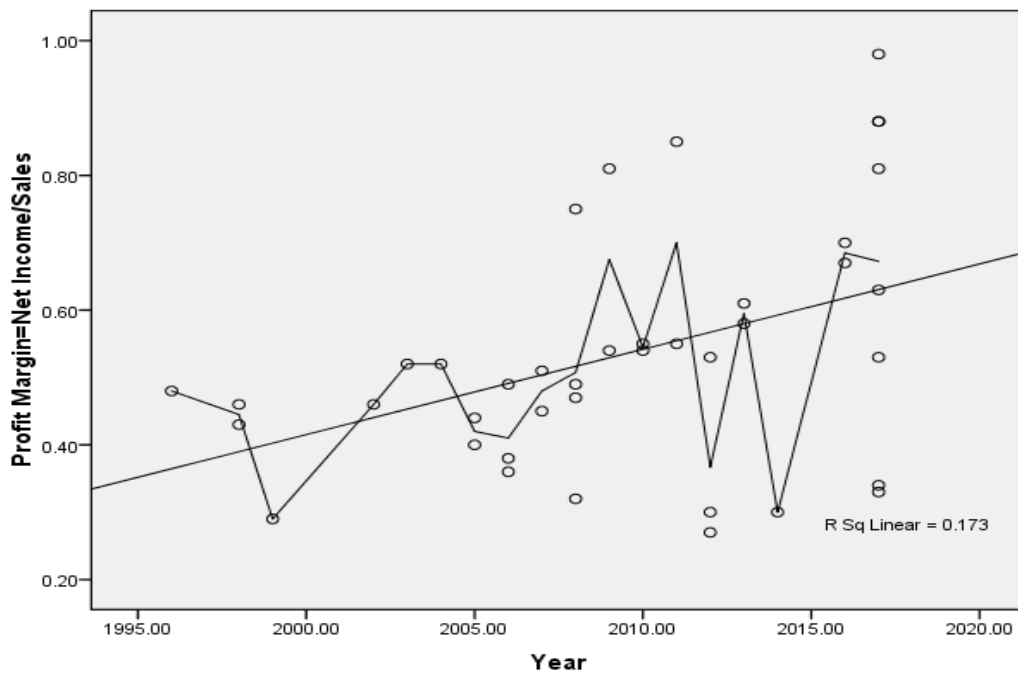


Figure 4.14: Profit Margin against the year

Both market performance measures that is price earning ratio and profit margin ratio have been on the increase over the the years as depicted in Figure 4.14 above (see Appendix IV for price earning ratio figure). PE particularly is regarded as an indicator of future growth expectation for any investment (Wu, 2013), (Thomas & Zhang, 2006). Figure 4.14 seem then to confirm that profit in the past have been growing implying that for the sugarcane investor the ability to raise capital for re-investment or for diversification has been assured over the years.

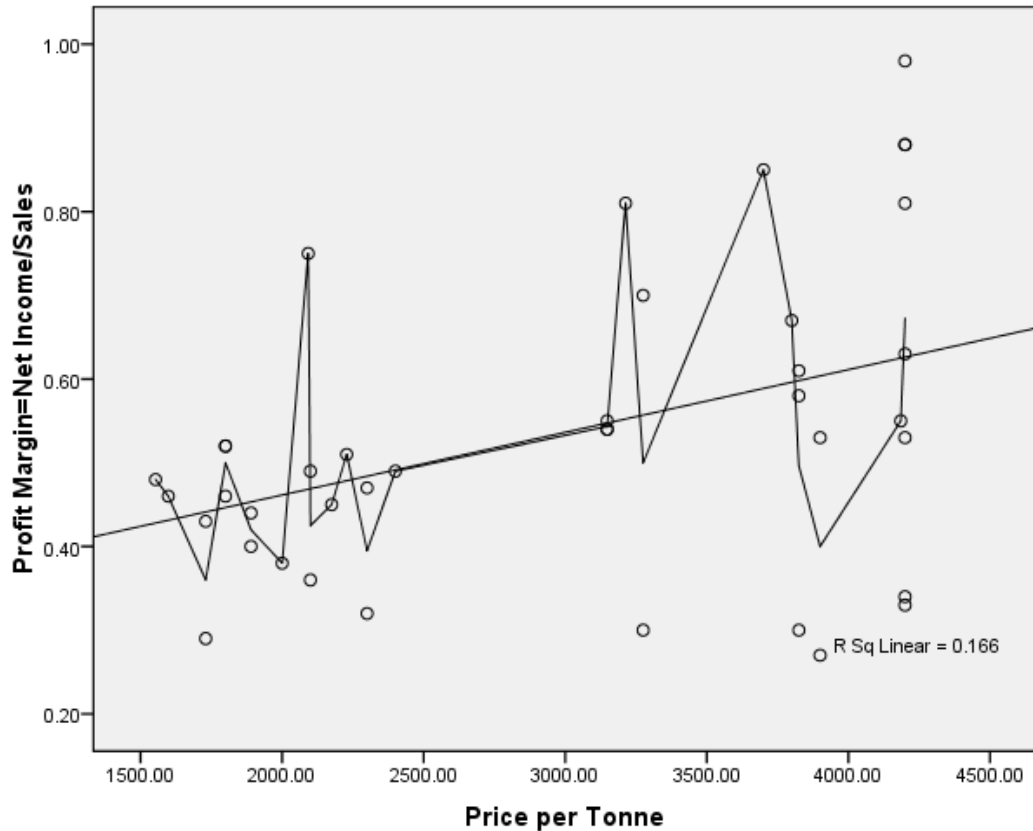


Figure 4.15: Profit Margin against Price per Tonne

An increase in price per tonne lead to an increase in the market performance measures. According to Authur (2015), all business owners grapple with pricing. It is an important question since the success of a business relies on the ability to make a profit. For both market performance measures, they positively relate to changes in the prices within the range of plus or minus 0.20, which is quite moderate (see Appendix IV for price earning ratio figure). Usually a low to moderate PE indicates a market where there is little excitement about its future earnings (Shamsuddin & Hiller, 2013). This may be the case with the sugar industry in Kenya which is exuberated by the fact that it is a monospony market (a single buyer), which suggests limited opportunities to improving the price levels for greater profit. Implying the players in this industry may need to diversify their portfolios.

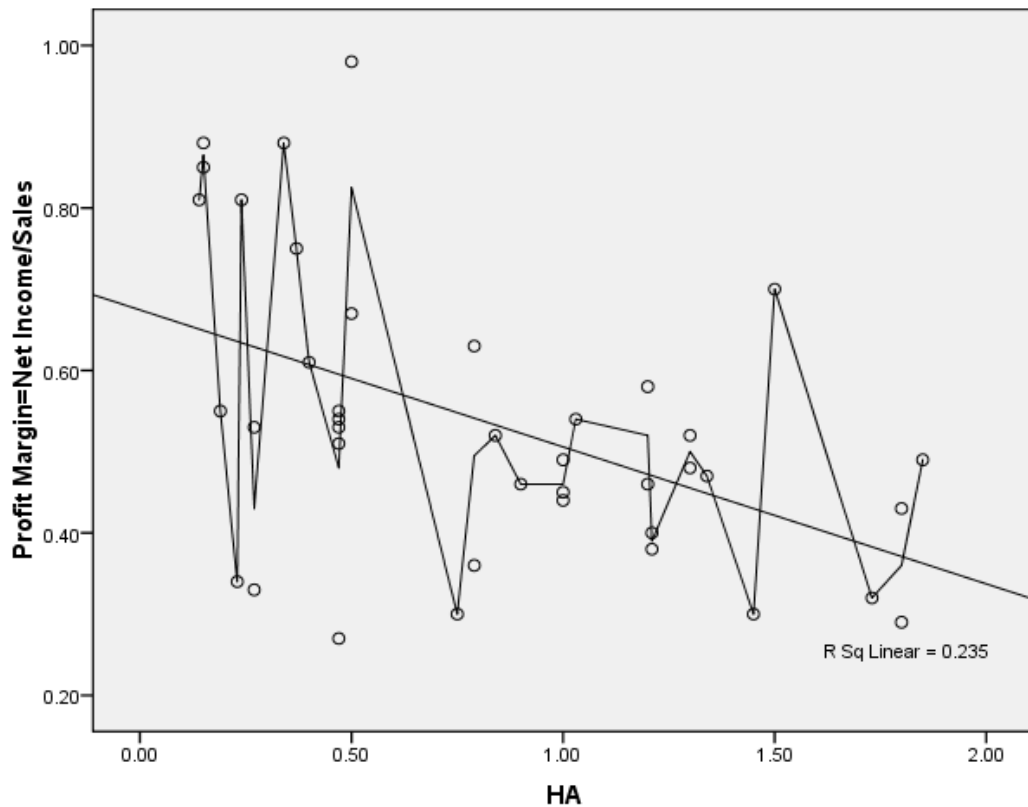


Figure 4.16: Profit Margin against size of Land

As summarized in Figure 4.16 above as the land size under sugarcane increases the market performance measures are on the decline (see Appendix IV for price earning ratio figure). Therefore, there do not appear to be any advantages to larger farm sizes over small to medium sized farms, from a standpoint of lower cost of production and higher return per hectare. This is in line with Iqbal, Sheikh, and Maqbool (2012), who found empirical evidence regarding small farmers' relative superiority with regard to per unit land productivity over large farmers in India largely based on aggregated data. Further Kent (2014) observed that well-managed farms of all sizes that control production costs and machinery expenses could be profitable. Profitability is not only confined to economies of scale as is generally expected but also on how efficient the sugarcane investor is. When it comes to diversification then

the implication of this is that all the sugarcane investors have the potential to undertake portfolio diversification.

Both the market performance measures had identical mean return scores of 0.53 approximately. The observation can be understood from the perspective that market performance measures indicates the amount an investor is to pay for each shilling of earnings got (Rapach & Wohar, 2013). Since the sugarcane market is monospony prices are then determined by the millers, which in turn would also imply earnings would generally not vary so much and therefore whatever market performance measures used their values would be similar.

Table 4.17: Descriptives for Profit Margin and Price Earning ratios

Market Performance Measures	Mean	Std. Deviation	Minimum	Maximum
	Profit Margin Ratio	.5350	.18160	.27
Price Earning Ratio	.5315	.18523	.27	.98

For the profit margin as depicted in Table 4.18, the mean return score for the diversified group of 0.8144 is greater than 0.4539 for the not diversified group. Similar observations are noted for the price earnings ratio. The observation is that mean returns for both market performance measures for the not diversified and the diversified groups are similar approximating 0.45 and 0.81 respectively.

Table 4.18: ANOVA for Profit Margin and Price Earning ratios

Profit Margin=Net Income/Sales.				
Portfolio diversification	Mean	Std. Deviation	F	Sig
Not diversified	.4539	.10065	90.838	.000
Diversified	.8144	.09710		
Earning Price Ratio=Earnings per Tonne/Price per Tonne				
Portfolio diversification	Mean	Std. Deviation	F	Sig
Not diversified	.4490	.10419	88.774	.000
Diversified	.8156	.09710		

The differences in their mean scores is confirmed by each respective F-test indicating that there are significant differences between the two groups mean returns. On this basis then the null hypotheses that there are no differences in mean returns is rejected and the alternatives accepted. The diversified group has higher mean returns for the market performance measures implying possibilities of them earning above the normal profits for the industry as supported by Breen (2014).

4.7.2 Correlation between Market Performance Measures and Portfolio Diversification

The correlation between the profit margin measures and portfolio deversification of 0.72 is a relatively strong (see also Appendix II tables). This is expected as diversification is a factor of profitability in that the retained earnings can be used to undertake other investments opportunities. Therefore the higher the retained earnings the greater the chances that an investor will diversify his/her portfolio. This means that with an increase in the profit margin and higher price earning ratio there is a likelihood of an increase in portfolio diversification.

Table 4.19: Correlations between Portfolio Diversification and Profit Margin and Price Earning ratios

		Portfolio Diversification	Profit Margin	Earning Price Ratio
Portfolio Diversification	Correlation Coefficient	1.000	.724**	.724**
	Sig. (2-tailed)	.	.000	.000
	N	321	321	321
Profit Margin=Net Income/Sales	Correlation Coefficient	.724**	1.000	.933**
	Sig. (2-tailed)	.000	.	.000
	N	321	321	321
Earning Price Ratio=Earnings per Tonne/Price per Tonne	Correlation Coefficient	.724**	.933**	1.000
	Sig. (2-tailed)	.000	.000	.
	N	321	321	321

** . Correlation is significant at the 0.01 level (2-tailed).

4.7.3 Logit Analysis of Market Performance Measure

To assess the extent to which the market performance measures influence portfolio diversification logit regression analysis was employed. The analysis was guided by the null hypothesis that:

H₀₄ Market Performance Measures do not influence portfolio diversification among sugarcane investors in Kenya

The results are summarized in Table 4.20 below (see also Appendix III tables).

Table 4.20: Logit regression of Market Performance measures on Portfolio Diversification

Return on Investment Measures	B	S.E.	Sig.
Profit Margin	832.919	7.687E5	.999
Price Earning	-96.197	7.657E5	1.000
Constant	-478.784	3.637E4	.989

From the Table 4.20 above the profit margin measures were not statistically significant and therefore the null hypothesis is accepted. This can be understood from the perspective of the market structure that the sugarcane investors are trading in. It is a monopsony implying that they they are dictated to on the price levels of their products. This means they have no opportunity to decide on price levels and therefore finally what will be their earning in the end. With this the sugarcane investors would shy away from using the market price to base on their decision to diversify their portfolios.

4.8 Relation between Return on Investment and portfolio diversification

The study sought to understand the relation between measures of returns on investment and portfolio diversification. Several measures were extracted from the financial statements of the sugarcane investors. These measures were individually analyzed in the previous sections and it was noted using logit regression that they do influence portfolio diversification except for market performance measures. This section therefore discusses the overall analysis of the measures of return on investments that is the returns on capital employed, returns on assets, return on equity and market performance measures influence on portfolio diversification using the logit regression.

Logit regression was chosen given that the dependent variable portfolio diversification is dichotomous and probabilistic in its structure. This is the recommended model of analysis when the dependent variable is probabilistic. Further it needs to be noted that in logit the independent variables jointly interact to influence the dependent variable (Gujarati et al., 2009). This is unlike in OLS regression model where each variable singly without the aid of the other independent variables influence the dependent variable. In this regard therefore results of the logit regression that included all the ROI measures are summarized in the tables below.

In the overall logit regression that included all the ROI variables against portfolio diversification all were all not significant (see appendix III tables). Subsequent analysis noted that the return on equity and return on assets measures – namely ROA Fixed and ROA Current – significantly influenced portfolio diversification. However for the return on capital employed and the market performance measures - namely profit margin and price earnings ratio – did not significantly influence portfolio diversification. These observations can be best understood from the tool logit regression used in this study (Gujarati et al., 2009). It is based on whether the independent variables interact with each other and how this interaction affects the dependent variable. The results of the overall logit regression is presented in the Table 4.21 below (see also Appendix III tables).

Table 4.21: Logit regression of return on investment - ROE and ROA - on Portfolio Diversification

Return on Investment Measures	B	S.E.	Sig.
ROE	520.482	227.095	.022
ROA Fixed	-245.589	109.657	.025
ROA Current	-45.108	20.053	.024
Constant	-3.939	1.846	.033

The influence of return on investment measures namely return on equity and returns on assets – fixed and current - on portfolio diversification was analyzed using logit

regression model. All the returns were significant and negatively influenced portfolio diversification except for return on equity which was positive. This confirms the observation by Al-Matari (2014) and Chong (2008) who in their study noted that for firms decisions ROE and ROA are the most highly utilized measures of firms performance. Performance where for most firms if not all implies the profit motive has been or will be realized acts as basis for decisions such as whether to diversify or not among others.

Return on assets fixed and current have a negative beta values and significant. This implies that the higher the returns on assets the lower the chances that the sugarcane investor will diversify and vice versa. This can be understood that in all cases the main asset for a sugarcane investor is land. Land is a flexible asset when it comes to the possible uses of land. Therefore the only motivation for the sugarcane investor to continue investing in sugarcane is if and only if the returns are high otherwise the sugarcane investor will diversify his/her portfolios away from sugarcane. This is affirmed by Tripathi (2015) indicating that to avoid risks related to farm investments which includes lower returns the sugarcane investors would engage in other non-farm activities or investments.

The positive beta values for return on equity implies that the higher the returns on equity the greater the chance that the sugarcane investor will diversify his/her portfolio. Return on equity is a measure of the overall performance of the sugarcane investment and therefore higher levels of returns on equity is a good and holistic measure of the realized profits of the firm; allowing one then to confidently engage in diversifying. This does imply then that the firm is experiencing some reasonable amount of liquidity which it can spare for alternative investments that may be available. On this basis therefore its significance influence on portfolio diversification is in line with Chong (2008) who asserted that revenues (liquidity) are crucial to ensuring current and future investment decisions of firms to diversify or not.

Table 4.22: Summary of Research Hypotheses

Null Hypothesis	Comments
H₀₁ Return on Capital Employed does not significantly affect portfolio diversification among sugarcane investors	Accepted
H₀₂ Return on Equity does not significantly affect portfolio diversification among sugarcane investors	Rejected
H₀₃ Return on Assets does not significantly affect portfolio diversification among sugarcane investors	Rejected
H₀₄ Market Performance does not significantly affect portfolio diversification among sugarcane investors	Accepted

As noted by Al-Matari (2014) and Chong (2008) ROE is one of the most important measures of firm performance. It is, therefore expected to be an important input in most if not all firms' decision including whether to diversity or not. As expected then ROE significantly influenced portfolio diversification. This can be understood from the assertion by Helfert (2014) who noted that ROE is a holistic measure of firm performance covering operations, investments and financing activities. Portfolio diversification decisions do cover these aspects and as confirmed by the results ROE is an influential input.

For the ROA measures mean returns in the overall logit regression were all significant. However it was noted that ROA fixed and ROA current had negative values implying inverse relationship with portfolio diversification. The implication is that the higher mean returns for ROA fixed and ROA current the less the probability of portfolio diversification. The plausible explanation of this would be these measures are partial measures of returns on investments. Since ROA can be used to signal future cash flows as per the signalling theory, ROA fixed and ROA current separately only take in to account a part of total assets used in the investment and therefore the resultant calculations would exaggerate the firms value (Ulupui, 2007; Riyanto 2001). This therefore can lead to a misconception that the investment is

performing well in case of higher mean returns and vice versa thereby creating the inverse relation with portfolio diversification.

The ROCE measure in the simple logit regression between which the and portfolio diversification was significant. It therefore positively influenced portfolio diversification. The implication of this was that the higher the ROCE mean returns the higher the probability of portfolio diversification. This was in line with the observations of Eljelly (2004), and Chandra (2015) who noted that higher ROCE can be sign of higher liquidity and financial strength which are the critical elements for portfolio diversification. However when it came to the overall logit regression that is combining ROCE with all the other independent variables it was not significant. This contradicted the earlier observations but somehow confirmed the findings of Al-Matari (2014) and Chong (2008), who noted that ROCE is not one of the most commonly used measures of firm performance. Its used to make decisions on portfolio diversification and is therefore in doubt from the results.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents summary discussions of the study results, conclusions and the recommendations made from the findings of the study. The chapter also provides suggestions for further research.

5.2 Summary

The study was guided by the overall objective to analyze the relationship between return on investment and portfolio diversification among sugarcane investors in Kenya. This was based on the perspective that profit is the basis that determines portfolio diversification. The measures of profitability therefore constituted return on capital employed, return on equity, return on assets and market performance measures. The profitability measures then influence the portfolio diversification of investors or firms. The research problem centered on the observation that sugarcane investors in Kenya have been documented to be diversifying their portfolio. The problematic question therefore was whether this observation may be due to the performance of their main investment. This necessitated the need to understand the relationship between return on investment measures and portfolio diversification among sugarcane investors.

The second chapter reviewed the theoretical and empirical literature with regard to the return on investment and portfolio diversification. Several theories were reviewed including: Markowitz portfolio theory and capital asset pricing model that explain portfolio selection and its processes, theory of behavioural finance which behavioural biases towards choice of portfolio and the theory of the firm which explains the profit motive of an investor. In the conceptual framework, the measures of return on investment depicted their respective sub concepts and the portfolio diversification conceptualized as either diversified or not. The review of variables that is the

empirical literature analyzed the relationship between measures of return on investment and portfolio diversification.

In the research methodology chapter the survey was the adopted research design. This was due to the observation that a number of researchers in similar studies used the survey research design. The research approach was quantitative justified by the study objective that sought to prove whether a relationship exists between return on investments and portfolio diversification. The target population for the study was sugarcane investors in the two selected counties of Kakamega and Bungoma counties. This was justified in that these two counties control above seventy percent of sugar production in Kenya. The data collected were both primary and secondary. Secondary data were derived from the financial statements which included among others the incomes of the investments. Primary data mainly constituted the whether diversified as well as other data such as risks faced in sugarcane investments. Data were analyzed using both descriptive and inferential statistical techniques.

The trend analysis of the return on capital employed found out that over time ROCE mean returns had been on the rise. The same trend was observed as sugarcane prices increased. However, with land size the relation was inverse; the larger the land under sugarcane the lower the mean returns for ROCE. While for mean returns for ROCE rising with time and as prices of sugarcane rise was expected the relation with land size was not as expected. This was however explained by the observations of Sen (1962) in the pre green revolution era and Chayanov (1926) with regard to Russian agriculture confirming the inverse relation.

ANOVA results indicated that the ROCE mean returns for the diversified and the not diversified group was significantly different. The diversified group had higher mean return scores for ROCE. The implication is that the diversified group was experiencing higher profitability and liquidity levels a clear pre-requisite to diversifying. This is in line with Chandra (2015) who argues that high liquidity is a sign of financial strength for which the diversified group seem to be enjoying. The correlation results also indicated that the relation between the ROCE and portfolio diversification is positive and significant.

For return on equity, the trend analysis had similar results as the return on capital employed. In the ANOVA analysis, the mean returns of the diversified and the not diversified were significantly different. The diversified group had higher ROE mean returns implying higher returns and therefore higher profits for them in comparison to the not diversified group. Since ROE is, a measure of past performance implies that diversified group performance profits did have an impact on portfolio diversification (Price, 2012). This was confirmed by the results indicating that the correlation between ROE and portfolio diversification was significant and positive.

ROA trend analysis produced different results when compared to those of ROCE and ROE. The findings were such that the ROA fixed mean returns increased over time and as the prices of sugarcane rose. For the ROA current, its mean returns remained constant over time and as the prices of sugarcane rose. These findings indicates that although there is efficiency in the management of the fixed assets the value of the current assets have remained constant over time and the price increases over time only covered the inflation costs experienced by the sugarcane investors. Roman and Danuletiu (2013) argued that firms with poor supervisory management have limited ability to generate ROA a plausible explanation for the constant ROA current remaining constant.

The ANOVA results for the ROA fixed and current showed that mean returns for the diversified group and the not diversified was significantly different. The mean returns for the diversified group was higher than the ones for the not diversified. This implied that the diversified group are more effective in managing the assets in generating returns and therefore have higher profitable potential than the not diversified. This superiority in generation of profit implies they have better chances of mobilizing funds to diversify their portfolio. This was affirmed by the findings that correlations between mean returns for ROA fixed, ROA current and portfolio diversification were respectively significant and positive.

Logit regression further clarified the relationship between ROA and portfolio diversification. The findings indicated that ROA fixed significantly influences portfolio diversification while ROA current was not significant. For ROA current it

was as expected since in the trend analysis it did not vary over time or even with changes in the price levels of sugarcane. ROA fixed where the fixed asset was land is an indication that the management of the land is effective enough to ensure returns for the investor.

The market performance measures namely profit margin and price earning ratio showed similar trends such as those of ROE and ROCE; in that over time and as prices rose the mean returns increased. For the relation with land the mean returns and land size had an inverse relationship. For the ANOVA just like the other measures of return on investment the mean return differences between the diversified groups and the not diversified was significant. The diversified group had higher mean return implying a higher profits and therefore better odds to diversify. Correlation analysis affirmed this where for both profit margin and price earning ratio mean returns the correlation with portfolio diversification were strongly positive and significant. These results were however not confirmed by the logit regression where the null hypothesis was accepted. In the logit both the profit margin and price earning ratio mean returns were not significant and therefore have no influence on portfolio diversification.

The overall logit regression indicated that ROE and ROA were the only ones that significantly influenced portfolio diversification. As noted ROE is considered a holistic measure of firm performance and therefore as expected positively influenced portfolio diversification. This is in line with Berman, Knight and Case (2013) and Price (2012) who noted that higher ROE could indicate wealth creation for shareholders. Since possession of wealth is an important pre-requisite for investments, the results therefore logically point to the perspective that wealth in turn promotes portfolio diversification.

ROA measure were noted to significantly influence portfolio diversification as per the overall logit regression. The direction of influence was negative implying the higher the ROA measures the less the probability of portfolio diversification. This explanation was possible due to the partial nature of the ROA fixed and ROA current which would exaggerate the firms value in either direction thereby creating the inverse

relationship with portfolio diversification. This therefore would lead to a misconception that the investment is performing while it is not as confirmed by Joshua (2005) and Droms (2008) who found out that low capital intensive firms have higher operational profitability in comparison to higher capital intensive firms while the opposite is what is expected.

5.3 Conclusion

Generally for all the measures of return on investment trend analysis revealed that the ROIs are inversely related to the land size. Such that the smaller the land size the higher the mean returns and vice versa. This could be related to change in socio-demographics among others. It is therefore concluded that small holdings have better opportunities to improving their returns.

The ANOVA results for all the ROIs were significant implying the mean returns for the diversified and the not diversified were different. Since the mean returns for the diversified group was higher it implied they have higher opportunities to improving their returns. They are therefore more efficient in their handling of their investments possibly as they can compare and interrogate different investment returns. It can therefore be concluded that portfolio diversification has the potential to improving efficiency in order to reap the maximum possible benefits from the investments.

The correlations between the ROI measures and portfolio diversification were all significant and positive. Significance implies relationships were confirmed while the positive correlation values indicated that as the ROI mean returns rose so were the odds to diversity. It can therefore be concluded that the ROI mean returns are above zero and therefore sugarcane is still a worthwhile investment that can create the necessary capital for diversification.

ROE in the overall logit regression was significant and positively influenced portfolio diversification. This implied the higher the ROE the higher the odds that one would will undertake portfolio diversification. This reaffirms the reliability and importance of ROE as a measure of performance for any investment.

The ROA measures namely ROA fixed and ROA current inversely influenced portfolio diversification. The implication was that investors with low capitalization had higher probability of portfolio diversification in comparison to those with high capitalization in this sector. It can therefore be concluded that creating the necessary profit for portfolio diversification is within reach of many in this sector.

5.4 Recommendations

On the trend analysis the conclusion was that small holdings have higher returns on investments than larger holdings implying that they have room to improving their returns and therefore portfolio diversification. Since many small holdings have myraid of problems at hand including payment of their supplies it is therefore recommended that to further boost their potential to improve returns concerned institutions in this sector such as the sugar board should design policies and interventions favouring the small holders.

The ANOVA results led to the conclusion that a portfolio diversified investors experienced higher returns on investments. This is because portfolio diversification has potential to improving efficiency of investment thereby leading to higher profits. It is therefore recommended that sugarcane investors those who have not diversified ought to be encouraged to do so.

The correlations results led to the conclusion that sugarcane investment is still a worthwhile investments as a possible starting point to amassing the necessary capital for portfolio diversification. This is because the ROI measures were all positively correlated to portfolio diversification. The recommendation arising from this is that the concerned players in this sector particularly the government and millers should urgently work towards ameliorating the issues and problems afflicting this sector.

The ROE was found to be positively influencing portfolio diversification leading to the conclusion that it reaffirmed its reliability and importance as a measure of performance for any investment. This is because it has the characteritics of being a more comprehensive measure of performance. It is therefore recommended that

before investors decide to diversify they need to evaluate all their portfolio using the ROE.

The ROA measures namely ROA fixed and ROA current negatively influenced portfolio diversification leading to the conclusion that investment performance here looked as creating profits from assets was within reach of many in the sector. This is because high returns were associated with low capitalization. It is therefore recommended that investors in this sector should at most strive to use their own resources first in whatever portfolio diversification they undertake within this sector.

5.5 Recommendations for further studies

On the basis of the results the market performance measures namely profit margin and price earning ratio were found as not significantly influencing portfolio diversification. This is despite them having strong high correlation coefficient between them and portfolio diversification. Their relations over times as well as the prices rose was positive just like all the other measures of return on investment. There is therefore for further research to confirm or reject these findings as the expectation was that they would have positively influenced portfolio diversification.

Similar research needs to be carried out in other sectors that face similar or different market conditions as the sugarcane investors. This is because there are some results in this study such as low capitalization and portfolio diversification, the insignificance of market performance measures in portfolio diversification among others which so far can be explained as possibly unique to the market conditions that the sugarcane investors were facing. Whether these are unique to the sectors that face market conditions similar to those of the sugarcane investors or not is the puzzle that needs to be understood.

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APPENDICES

Appendix I: Research Questionnaire

My name is Jennifer Chepkorir . I am a PhD candidate in the Department of Business,School of Human Resource Development at Jomo Kenyatta University of Agriculture and Technology. I am conducting a study on relationship between return on investments and portfolio diversification among sugarcane growing farmers in Kakamega County. I consider you as the most informed person in the area of my study and therefore selected you as one of my study respondents. Please take a few minutes and answer the questions in the questionnaire. I assure you that the answers will be kept completely confidential and will be used for academic purpose only. Your participation in facilitating this study is highly appreciated.

Part I: Respondent's Information

1. Name of the farmer optional].....

2. What is the size of your land in hectares that has sugarcane?

Less than 5

Between 5-10

More than 10

3. Do you consider yourself as having diversified your investments in addition to the sugarcane investment? (Kindly tick the appropriate box)

Diversified

Not Diversified

4. PORTFOLIO DIVERSIFICATION

Portfolio diversification	YES	NO
I invest in other businesses/activities apart from growing sugar cane		
I run other trading activities (Kiosk/shop) apart from growing sugar cane		
For commercial purposes I only grow sugarcane		
Sugarcane is my only commercial activity in my farm		
Sugarcane is the only cash crop I depend on for commercial purposes		
Currently I invest in other trading/activities apart from growing sugar cane		
In the future I will invest in trading/activities apart from growing sugar cane		
Apart from sugarcane I engage in trading activities to improve my cash flow		
Trading is the other commercial activity I engage in		
My trading activities have greatly contributed to my cash flow		

5. PORTFOLIO RISKS

Which among the business risks below would you consider critical for you in deciding to diversify your investments away from sugar cane.	Critical	Not Critical
Interest rate increase risk on Loan attached to the sugar cane		
Credit loss risk on commitment attached to the sugar cane		
Asset loss risks on commitment attached to the sugarcane		
Market oversupply risk attached to the sugarcane		
Price ability to meet costs risk attached to sugarcane		
Increased production costs risk attached to sugarcane		
Adverse weather risks attached to sugarcane production		
Reduction in production levels due to security related risks (e.g. arson).		

RETURN ON INVESTMENT SECONDARY DATA COLLECTION GUIDE

FOR THE TABLE BELOW KINDLY FILL IN THE AMOUNT COLUMN AS PER YOUR FINANCIAL STATEMENT(S). ALTERNATIVELY, YOU CAN REQUEST HELP IN FILLING FROM THE RESEARCH ASSISTANTS. FOR ASSISTANCE IN FILLING

1. Year the financial statement was prepared?.....

(a) RETURN ON CAPITAL EMPLOYED

Return on Capital Employed	Amount
Income	
Employed capital	

(b) RETURN ON EQUITY

Return on Equity	Amount
Net Income	
Equity	

(c) RETURN ON ASSETS

Return on Assets	Amount
Net Income	
Fixed Asset-Value of land	
Current Asset-Value of sugarcane	

(d) MARKET CHARACTERISTICS

Return on Assets	Amount
Contract farming content: (Pricing)	
Net Income	
Sales	
Freelance farming: (Pricing)	
Net Income	
Sales	

THANK YOU FOR YOUR PARTICIPATION IN THIS STUDY

Appendix II: Correlations results

ROCE Correlations

			ROCE	PORTFORLIO DIVERFICATION
Spearman's rho	ROCE	Correlation	1.000	.412**
		Coefficient		
		Sig. (2-tailed)	.	.008
		N	321	321
	PORTFOLIO DIVERSIFICATION	Correlation	.412**	1.000
		Coefficient		
		Sig. (2-tailed)	.008	.
		N	321	321

** . Correlation is significant at the 0.01 level (2 tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

ROE Correlations

			Portfolio	Net
			diversification	Income/Total
				Equity
Spearman's rho	Portfolio diversification	Correlation Coefficient	1.000	.498**
		Sig. (2-tailed)	.	.001
		N	321	321
	Net Income/Total Equity	Correlation Coefficient	.498**	1.000
		Sig. (2-tailed)	.001	.
		N	321	321

** . Correlation is significant at the 0.01 level (2-tailed).

ROA Correlations

			Portfolio diversification	Return Fixed Asset=Net Income/Total Fixed Assets	Return On Current Assets=Net Income/Total Current Assets
Spearman's rho	Portfolio Diversification	Correlation Coefficient	1.000	.509**	.368*
		Sig. (2-tailed)	.	.001	.019
		N	321	321	321
	Return On Asset=Net Income/Total Assets	Fixed Correlation Coefficient	.509**	1.000	.790**
		Fixed Sig. (2-tailed)	.001	.	.000
		N	321	321	321
	Return on Assets=Net Income/Total Assets	Current Correlation Coefficient	.368*	.790**	1.000
		Current Sig. (2-tailed)	.019	.000	.
		N	321	321	321

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Market Characteristics Correlations

			Portfolio Diversificatio	Profit Margin=Net Income/Sales	Earning Price Ratio=Earnings per Tonne/Price per Tonne
Spearman's rho	Portfolio Diversification	Correlation Coefficient	1.000	.724**	.724**
		Sig. (2-tailed)	.	.000	.000
		N	321	321	321
	Profit Margin=Net Income/Sales	Correlation Coefficient	.724**	1.000	.933**
		Sig. (2-tailed)	.000	.	.000
		N	321	321	321
	Earning Price Ratio=Earnings per Tonne/Price per Tonne	Correlation Coefficient	.724**	.933**	1.000
		Sig. (2-tailed)	.000	.000	.
		N	321	321	321

** . Correlation is significant at the 0.01 level (2-tailed).

Appendix III: Logit Regressions

Logit regression table for ROE and ROCE on Portfolio Diversification

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	11.358	2	.003
	Block	11.358	2	.003
	Model	11.358	2	.003

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	31.295 ^a	.247	.377

a. Estimation terminated at iteration number 6 because parameter estimates changed by less than .001.

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	ROCE	.733	.612	1.436	1	.231	2.082
	ROE	6.474	7.196	.809	1	.368	648.056
	Constant	-3.706	1.188	9.731	1	.002	.025

a. Variable(s) entered on step 1: ROCE, ROE.

Logit regression table for ROE and ROA on Portfolio Diversification

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	19.505	3	.000
	Block	19.505	3	.000
	Model	19.505	3	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	23.321 ^a	.386	.589

a. Estimation terminated at iteration number 8 because parameter estimates changed by less than .001.

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1^a	ROE	520.482	227.095	5.253	1	.022	1.102E226
	ROA Fixed	-245.589	109.657	5.016	1	.025	.000
	ROA Current	-45.108	20.053	5.060	1	.024	.000
	Constant	-3.939	1.846	4.554	1	.033	.019

a. Variable(s) entered on step 1: **ROE, ROA Fixed, ROA Current.**

ROCE Omnibus Tests of Model Coefficients

	Chi-square	df	Sig.
Step 1 Step	10.503	1	.001
Block	10.503	1	.001
Model	10.503	1	.001

ROCE Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	26.149 ^a	.295	.419

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

ROCE Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a ROCE	1.370	.565	5.871	1	.015	3.936
Constant	-3.039	1.027	8.751	1	.003	.048

a. Variable(s) entered on step 1: ROCE.

ROE Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	9.604	1	.002
	Block	9.604	1	.002
	Model	9.604	1	.002

ROE Model Summary

Step	-2 Log likelihood	Cox & Snell R	
		Square	Nagelkerke R Square
1	33.049 ^a	.213	.326

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

ROE Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a ROE	12.426	4.981	6.224	1	.013	2.493E5
Constant	-3.697	1.127	10.767	1	.001	.025

a. Variable(s) entered on step 1: ROE.

ROA Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	10.150	2	.006
	Block	10.150	2	.006
	Model	10.150	2	.006

ROA Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	32.503 ^a	.224	.342

- a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

ROA Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)	
Step 1 ^a	ROA Fixed	10.720	5.393	3.952	1	.047	4.527E4
	ROA Current	-2.134	2.987	.511	1	.475	.118
	Constant	-2.882	1.157	6.206	1	.013	.056

- a. Variable(s) entered on step 1: ROA Fixed, ROA Current.

Market Measures Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	42.653	2	.000
	Block	42.653	2	.000
	Model	42.653	2	.000

Market Measures Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	.000 ^a	.656	1.000

a. Estimation terminated at iteration number 20 because maximum iterations has been reached. Final solution cannot be found.

Market Measures Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)	
Step 1 ^a	Profit Margin	832.919	7.687E5	.000	1	.999	.
	Price Earning	-96.197	7.657E5	.000	1	1.000	.000
	Constant	-478.784	3.637E4	.000	1	.989	.000

a. Variable(s) entered on step 1: Profit Margin, Price Earning.

Appendix IV: Trend Analysis

