

The effect of employee share ownership on company performance in South African mining

Shameegh Khan

A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Business Administration

Johannesburg, 2014

ABSTRACT

This study investigates the effects of Employee Share Ownership Plans (ESOP's) on company profitability in the South African mining industry for companies listed on the Johannesburg Stock Exchange (JSE).

The South African mining industry has been in the global spotlight since the Marikana miners' strike of 2012 and the subsequent killing of 34 people on 16 August 2012. ESOP's can be used to stabilize the sector by alleviating some of the tension that is present between workers, shareholders, management and government.

This research uses the same measurement as Spiess and Affleck-Graves (1995), who measure share price performance as a cumulative average of returns (CAAR) over a five year period. Regression analysis is used to test for correlations and descriptive statistics is used to explain findings (Spiess & Affleck-Graves, 1995).

The difference between companies that do not have ESOP's in place is negative for (CAAR) compared to those who have an ESOP in place. This is consistent with the theory and findings of studies such as Robinson and Zhang (2005). It has been applied to the South African context within the JSE listed mining sector.

The theory that ESOP's will improve profitability of a company listed on the JSE within South African mining has been found to be statistically significant. ESOP's can help improve cumulative profits and help transform the industry through share ownership of workers which will help decrease the gap between CEO's remunerations and the lowest paid workers.

DECLARATION

I, Shameegh Khan, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Shameegh Khan

Signed at

On the day of 2014

DEDICATION

786 – All praise should go to the Creator of all systems. This research is dedicated to Hazrat Shah Saeed Ahmed Raipuri (RA) who emphasised to me the implementation of a well-balanced economic system that uplifts and benefits all of human kind regardless of status, race, colour, creed, religion or any other defining factor; based on the philosophy of Shah Waliullah.

ACKNOWLEDGEMENTS

My sincere gratitude goes to my wife, Saima, without whom my life would not be complete, a pillar of strength, motivation and unwavering support and to my kids, who provided lots of inspiration.

My parents, siblings, family, friends, all my teachers in my entire life, everyone who has ever taught me anything and especially to my supervisor, Mike Mundy, I acknowledge that I would not be here without you, thanks.

TABLE OF CONTENTS

ABSTRACT	II
DECLARATION.....	III
DEDICATION	IV
LIST OF TABLES.....	VIII
LIST OF FIGURES	IX
1. CHAPTER 1: INTRODUCTION	10
1.1 PURPOSE OF THE STUDY	10
1.2 CONTEXT OF THE STUDY	10
1.3 PROBLEM STATEMENT	13
1.3.1 MAIN PROBLEM	13
1.3.2 SUB-PROBLEMS	13
1.4 SIGNIFICANCE OF THE STUDY	14
1.5 DELIMITATIONS OF THE STUDY.....	15
1.6 DEFINITION OF TERMS	15
1.7 ASSUMPTIONS	16
CHAPTER 2: LITERATURE REVIEW	17
2.1. INTRODUCTION	17
2.2. EMPLOYEE SHARE OWNERSHIP PLANS (ESOP's).....	21
2.3. SHARE OWNERSHIP VERSUS COMPANY PERFORMANCE	25
2.4. CONCLUSION OF LITERATURE REVIEW	27
2.5. FORMULATION OF HYPOTHESIS	27
2.5.1 NULL HYPOTHESIS (H_0)	28
2.5.2 ALTERNATIVE HYPOTHESIS (H_1)	29
2. CHAPTER 3: RESEARCH METHODOLOGY	30
3.1 RESEARCH METHODOLOGY /PARADIGM	30
3.2 RESEARCH DESIGN	31
3.3 POPULATION AND SAMPLE.....	32
3.3.1 POPULATION	32
3.3.2 SAMPLE AND SAMPLING METHOD	33
3.4 PROCEDURE FOR DATA COLLECTION.....	34

3.5	DATA ANALYSIS AND INTERPRETATION	34
1.7.1	VARIABLE DESCRIPTIONS	34
3.6	LIMITATIONS OF THE STUDY.....	36
3.7	VALIDITY AND RELIABILITY	36
3.7.1	EXTERNAL VALIDITY	36
3.7.2	INTERNAL VALIDITY	36
3.7.3	RELIABILITY	36

3. CHAPTER 4: PRESENTATION AND DISCUSSION OF THE RESULTS.....37

4.1	INTRODUCTION	37
3.2	RESULTS OF ESOP UPON THE MEAN %CHANGE IN CAAR	37
4.3	RESULTS OF ESOP UPON THE MEAN %CHANGE IN ROA.....	39
4.4	RESULTS OF ESOP UPON THE MEAN %CHANGE IN NET PROFIT.....	40
4.5	RESULTS OF ESOP UPON THE MEAN %CHANGE IN TOTAL ASSETS	41
4.6	RESULTS OF ESOP UPON THE MEAN %CHANGE IN DEBT	43
4.7	RESULTS OF ESOP UPON THE MEAN %CHANGE IN EQUITY	44
4.8	TEST OF CORRELATION BETWEEN VARIABLES	45
4.9	BIVARIATE PLOTS PRESENTING A LINEAR RELATIONSHIP BETWEEN VARIABLES & REGRESSION ANALYSIS.....	53
4.10	PARTITIONING.....	71
4.11	SUMMARY OF RESULTS.....	75

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS..76

5.1	INTRODUCTION	76
5.2	CONCLUSIONS OF THE STUDY	76
5.3	RECOMMENDATIONS	79
5.4	SUGGESTIONS FOR FURTHER RESEARCH	80

REFERENCES82

APPENDIX A – ALL DATA87

APPENDIX B –STATISTICS99

LIST OF TABLES

Table 1: Population of ESOP Research.....	33
Table 2 - Results ESOP vs % Change CAAR.....	38
Table 3 - ESOP vs % Change ROA.....	40
Table 4 - ESOP vs % Change Net Profit.....	41
Table 5 - ESOP vs % change in Total Assets	42
Table 6 - ESOP upon the mean %change in Debt.....	43
Table 7 - ESOP vs %change in Equity.....	44
Table 8 - The coefficients between pairs of continuous variables	45
Table 9 Correlation for Hypothesis 1.....	47
Table 10 Correlation for Hypothesis 2.....	48
Table 11 Correlation for Hypothesis 3.....	49
Table 12 Correlation for Hypothesis 4.....	50
Table 13 Correlation for Hypothesis 5.....	52
Table 14 Leaf Label	72

LIST OF FIGURES

Figure 1 ESOP vs % Change CAAR.....	37
Figure 2 ROA vs % Change ESOP	39
Figure 3 - ESOP vs % Change in Net Profit.....	41
Figure 4 - ESOP vs % change in Total Assets	42
Figure 5 - ESOP upon the mean %change in Debt.....	43
Figure 6 - ESOP vs %change in Equity.....	44
Figure 7 - Partition Platform – Decision Tree	71
Figure 8 - Receiver Operating Characteristic	73

1. CHAPTER 1: INTRODUCTION

1.1 Purpose of the study

The purpose of this study was to investigate the effects of Employee Share Ownership Plans (ESOP's) on company profitability in the South African mining industry for companies listed on the Johannesburg Stock Exchange (JSE). Essentially, ESOP's provide employees with a stake in the company. ESOP's are relevant to the current debate as many sectors of society are calling for the transformation of the South African mining industry (Kahn, 2013). This research sought to contribute to the existing literature by assessing whether ESOPs achieve any effect on the profitability or the operational success of companies. The investigation attempted to find a correlation between ESOP's and profitability or operational success such as Return on Assets. This was assessed through an empirical study of JSE listed mining companies by comparing variables consisting of profitability ratios and others such as return on assets for productivity of those companies who have ESOP's and those who do not.

1.2 Context of the study

The South African mining industry has been in the global spotlight since the Marikana miners' strike of 2012 and the subsequent killing of 44 people on 16 August 2012 (Nkosi, 2012). The incident has exacerbated the call by some sections of society for the nationalisation of mines while others are calling for economic freedom by transferring ownership of the mines to communities (Kahn, 2013).

One of the solutions to the current problems in the mining sector which has been pushed by ex-Anglo America CEO, Clem Sunter, is for greater use of ESOP's in order to redress the inequalities and reduce the income gap in South Africa (Visser, 2004). This call for ESOP's to redress the problems in society has been intensified because of studies such as Robinson and Zhang (2005) who have shown that not only do ESOP's add value to the bottom line but also that there is a case for improvement at other levels of business such as staff retention through the use of ESOP's.

Countries such as the UK are well known for legislation which is based on a belief that ESOPs have a motivating and productivity-enhancing role in the economy (Robinson & Zhang, 2005). It is for this reason that the South African mining industry has been called to book by various sectors of society who have asked why the industry is not transformed and have raised concerns about this non-transformation, especially of share ownership (Kahn, 2013). The wealth of the country remains in 'the hands of a few' is the cry by some sections of society.

On an international level, capitalism has been criticised and condemned over the past few years, especially since the Global Financial Crisis which started in 2007. Shahrokhi (2011) showed that the U.S. housing bubble caused values of securities tied to U.S. real estate pricing to plummet, damaging financial institutions worldwide. Economies worldwide slowed as credit tightened and international trade declined. Governments and central banks responded with unprecedented fiscal stimulus, monetary policy expansion and institutional bailouts (Shahrokhi, 2011).

The Levin–Coburn Report found “that the crisis was not a natural disaster, but the result of high risk... and the failure of regulators, the credit rating agencies, and the market itself to rein in the excesses of Wall Street”(Levin & Coburn, 2011, pp. 2-9). Therefore, mining companies in South Africa are threatened both within the local and the international context. ESOP’s may be a form of alleviating some of the risks associated with the threats of state capitalism as well as other forms of nationalisation.

It is within this context that an assessment of ESOP’s in the mining sector of South Africa was done so that it might shed some light on whether actual benefits of ESOP’s can be made.

The research focused on a narrow sector that is currently under the spotlight. According to Mitchell (2013) ESOP’s may shed light on the current debate of what type of solutions should be considered in order to redress the wealth imbalances in society.

The mining sector plays an important role within the context of the South African economy by providing finances to the government and jobs to ordinary citizens. According to Kelly et al. (2005), South Africa has significant mineral reserves which remain to be exploited.

ESOP’s can therefore be used to stabilize the sector by alleviating some of the tension that is present between workers, shareholders, management and government. The wealth of the sector can also be used to uplift workers through the use of ESOP’s. This may be seen as a form of redistribution of wealth without shareholder interests being completely forfeited as would be the case if the mines would be nationalized.

1.3 Problem statement

1.3.1 *Main problem*

This research investigated the impact of ESOP's as part of an employee benefits scheme and as a mechanism to create shareholder wealth. The question was whether, indeed, ESOP's have an impact on company profitability.

The research aimed to provide insight into the effectiveness of ESOPs as a mechanism to create profitability within the South African mining industry for companies listed on the Johannesburg Stock Exchange (JSE). It sought to provide evidence of how company profitability may be affected by employee share ownership.

1.3.2 *Sub-problems*

The sub-problem investigated the effectiveness of ESOPs as a productivity performance enhancer. The impact of company performance and ESOP concentration was investigated in terms of whether companies who have an ESOP in place outperformed those companies who have no ESOP. The performance was measured using profit per employee and return on assets among other variables.

1.4 Significance of the study

The study aimed to provide guidance to the South African mining industry through identifying whether ESOP's would actually assist the mining industry in improving profitability or performance and whether an ESOP should seriously be considered with regard to employee benefits as an incentive mechanism that would assist organisations achieve better results or improve performance.

The speed of transformation in the mining industry has been debated with ever increasing tension over the fact that the mining industry has not met the requirements of the Mining Charter. The mining charter has set a target of twenty six percent ownership to designated groups and this target has not been met by a long shot (G. Mitchell, 2013). ESOP's such as Anglo American's (Kumba Iron Ore Limited - Envision) share ownership scheme which has had major success also places pressure on other mining companies to follow suit (Rees, 2011).

While there has been much debate about ESOP's, this study aimed to address the gap of empirical evidence which either proved or disproved the assumption that ESOP's would make a positive impact for both companies and employees within the conditions of the South African mining sector.

Robinson and Zhang (2005) have shown, through an empirical study, that ESOP's have an influence on the profitability of companies; therefore employers, government, unions and employees may be interested in establishing the literary claims within the context of the JSE listed, South African mining industry.

1.5 Delimitations of the study

The scope of the research was focused on the mining industry within South Africa and was limited to companies which are listed on the JSE. Published and audited financial data were used for the study. These companies are required to apply various accounting and corporate governance principals as listed entities on the JSE. Although the requirements for JSE listing are stringent, listing itself does not automatically imply that companies follow all legal, accounting or governance requirements. This does help to provide better data compared to companies who do not comply with any type of governance. It is therefore not the claim of this research that all the JSE companies comply with exactly the same standards and governance but rather that the general practices should be of good quality based on the audit requirements and restrictions that JSE listing comes with.

1.6 Definition of terms

The following terms were widely used throughout the research report:

ESOPs- Employee Share Ownership Plans

JSE - Johannesburg Stock Exchange

CAAR – Cumulative Annual Average Returns

ROA – Return on Assets – Net Profit after tax/Total Assets

ESOP % - Concentration of Employee Share Ownership of Total Shares allocated for the company

P-L / Employee – Profit or loss per employee

D/E – Total Debt over Total Equity

HEPS – Headline Earnings per Share

% Increase – Percentage increase in the specific variable

Mean change - used to describe the average change over an entire data set of a specific variable

ID – Independent Variable

DV – Dependant Variable

1.7 Assumptions

It is assumed that the JSE is an efficient market which reflects the true intrinsic value of the companies. An Efficient Market Hypothesis (EMH) was formulated by Eugene F Fama, Fisher, Jensen, and Roll (1969) while Bodie, Kane, and Marcus (2005) suggest either a weak, semi-strong or strong form of EMH. It is assumed that the JSE is a semi-strong form of efficiency as the possibility of insider information access cannot be precluded from the JSE.

CHAPTER 2: LITERATURE REVIEW

2.1. Introduction

The literature review collates information on existing research as well as defines an ESOP. It also discusses relevant literature related to the relationship between share ownership and company performance. It looks at the ESOP's historical background, how it works in relation to international standards and what has been discussed within the South African context.

The main area of focus of this study is the direct relationship between ESOP's and company profitability. This relationship has been empirically proven by both Robinson and Zhang (2005) as well as Freeman and Knoll (2008). The main problem which this research attempts to answer is the question of an ESOP's relationship with company profitability. While this relationship has been proven by research such as (Freeman & Knoll, 2008; Robinson & Zhang, 2005) the question remains to be answered in South Africa.

The research has its roots in the problem of how to deliver appropriate incentives to employees while at the same time increasing wealth to shareholders. The literature review thus considers the classic work of agency theory according to M. C. Jensen and Meckling (1976). This work was followed up by Haugen and Senbet (1981), and later by Agrawal and Mandelker (1987). Agency theory expands on the idea of the performance relationship between compensation and company profits (Agrawal & Mandelker, 1987; Haugen & Senbet, 1981; M. C. Jensen & Meckling, 1976).

While these studies are focussed on share ownership of executives, a similar case can be made for general employees. Thus, share ownership of either executives or employees should provide both an incentive for shareholders as well as staff to improve productivity and performance of the organisations. The general productivity improvement should be of interest to various productivity institutes and governments in general, as is the case with the United Kingdom's tax incentives for the use ESOP's (Robinson & Zhang, 2005). The potential improvement of productivity and profit that ESOP's might provide is arguably an incentive for entire countries and regions.

The agency problem which refers to the tendency of employees not to act in the best interest of shareholders is discussed by Eugene F. Fama and Jensen (1983). One of the methods which can be used to solve this agency problem is ESOP's (Frohlich, Godard, Oppenheimer, & Starke, 1998).

The question asked by Eugene F Fama et al. (1969) and M. C. Jensen and Meckling (1976), which relates to agency theory, is exactly how effective share options are for creating wealth and improving productivity.

Other scholars have looked at this question from different angles, such as corporate governance (Abdullah, 2006; Klapper & Love, 2004; Okeahalam, 2004; Weir & Laing, 2001). These studies are mainly focussed on share options in relation to the question of corporate governance and whether the incentives had the effect of executives abusing their power to achieve profits at the expense of good corporate governance.

Abdullah (2006) found that share options are not associated with ROA, but did find a negative influence on corporate governance, while growth was positively influenced for companies in Malaysia. While corporate governance may be an important aspect of business today, the question of profitability remains a key focal point of survival for any organisation, especially in the turbulent times we have seen since the major collapse of 2008 (Shahrokhi, 2011). The question of survival in the South African mining context is of paramount importance in the current era.

Estrin, Grout, Wadhwani, Nickell, and King (1987) have argued vehemently against profit sharing with workers, claiming that in the long run wages will actually be reduced. Ultimately, though, Estrin et al. (1987) concede that profit sharing has helped increase worker productivity.

Freeman and Knoll (2008) had the benefit of over ten years of empirical data in the United States of America (USA) where ESOP's have been used for many decades. They drew from extensive empirical literature on ESOP's to evaluate their consequences. The Freeman and Knoll (2008) studies show that an ESOP is more than likely to lead to, on average, an increase in productivity and profitability that will benefit both employees and employers. It is specifically these claims that this study evaluates on a smaller scale within a very specific context in the JSE listed South African mining industry.

The study done by Freeman and Knoll (2008) has provided some of the most compelling evidence that ESOP's made a significant impact in the USA. Their calculations indicated that ESOP's resulted in equity contributions of more than \$14 billion annually, plus \$3 billion attributable to increased job stability, as well as non-quantified benefits of greater work

satisfaction and reduced stress (Freeman & Knoll, 2008). Moreover, the \$14 billion was channeled into forced savings. Evidence suggests that this forced savings shows up almost entirely in increased savings where it generates an additional \$34 billion a year (Freeman & Knoll, 2008). Nonetheless, that is wealth that U.S. workers would not otherwise have without ESOPs.

Many studies have shown the benefits of ESOP's (Estrin et al., 1987; Freeman & Knoll, 2008; Legros & Newman, 2008; Robinson & Zhang, 2005; Sesil, Kroumova, Blasi, & Kruse, 2002; Visser, 2004), while others have found little or no value in ESOP's (Choi Sang, Gondyah, & Musibau, 2013).

The research related to ESOP's has many branches and cannot be decisively dealt with in the context of this study. Ultimately the focal point of the literature review has established that many researchers found benefits from the use of ESOP's with regards to the profitability of the firms who use ESOP's as a form of incentivising management and staff.

Profitability as an issue may have been proven in the U.S.A. and other developed countries, but developing nations, such as South Africa, cannot be compared directly to these countries. South Africa has a unique economy, set of circumstances and socio-political environment. The method of focussing on a very narrow and specific target thus allows the theory to be tested specifically in the JSE listed, South Africa mining industry. This narrow focus provides a concentrated, detailed observation, beneficial to this industry.

2.2. Employee Share Ownership Plans (ESOP's)

Rosen, Klein, and Young (1986) broadly define employee share ownership as ***possession of shares by a significant number of employees, including but not restricted to management and workers, regardless of hierarchical level or compensation type.*** This definition is supported by Pierce, Rubinfeld, and Morgan (1991, p. 305), but they add that:

“Where the formal ownership system is operationalized such that it leads to psychological ownership, a bonding or integration of the employee-owner with the organization occurs”.

The definitions by both Pierce et al. (1991) and Rosen et al. (1986) encompass a holistic view of employee share ownership. The combination of this broad definition of an ESOP as an incentive to the employee by holding shares in the firm is what the researcher adopted as a working definition.

The method of obtaining ownership by employees can be through direct purchase, a bonus, stock options or a profit sharing plan but the most common form in the current business environment is the ESOP or ‘stock ownership plans,’ as it is known in some countries (Ding & Sun, 2001).

Setting up an ESOP is done by the use of a collective investment vehicle, better known as a trust fund, to buy shares for employees. The allocations are worked out

according to formulas which allocate stock based on a combination of the number of years of service and actual compensation of the employee. The shares are purchased by the firm (Hallock, Salazar, & Venneman, 2003).

Employees gradually gain access to their funds through both dividends and after a number of years they receive the actual shares which they can cash out or retain (Klein & Hall, 1988). All rules are set out by the vesting requirements of the fund.

Historically, various forms of ownership have been punted. On the one end of the scale of ownership is Adam Smith in his *magnum opus* which argued for the division of labour, productivity of labour and the often quoted 'invisible hand' that distributes wealth accordingly while ownership should remain in the hands of the investor (Smith, 1863).

On the other end of the scale are Karl Marx and Friedrich Engels (1867) with 'Das Kapital' that transformed Russia through the implementation of their ideas. Marx and Engels (1961) suggested the complete ownership of the means of production by the workers through what they called the 'dictatorship of the proletariat'. Classically, the middle road of shared ownership as a philosophy comes from the eighteenth century Indian economist, Shah Waliullah, who suggested human economic needs should be fulfilled through collective ownership by both owners and workers (Hermansen, 1996).

In my opinion the two extremes of either a completely Capitalist or completely Marxist approach may not be the best solution for the South African model. A middle of the road solution to ownership such as Waliullah suggested may be the correct balance for the South African context. In that case competition would not be limited and workers will own a share in the companies they work for. The question of physiological

ownership cannot be addressed within this context though I do believe that once worker receive dividends on shares paid out they will be more inclined to doubt this type of compromise.

A problem with ESOP's for workers is that they are traditionally inclined towards salary and have been conditioned through many years of unionism to believe in earning as much as possible. This can be seen through the recent strikes in the mining sector and the call for a minimum wage. Workers may prefer increased wages compared to share ownership. This may not however be mutually exclusive. A living wage and share ownership need not be juxtaposed.

Alternatives to an ESOP may be Nationalization of the mines as would be the case under a Marxist approach or the state could buy shares in companies; profit sharing may be another method but this has not been as widespread as ESOP's as stated by Weitzman and Kruse (1990).

Black Economic Empowerment (BEE) deals may be considered as an alternative to ESOP's but these deals have mainly enriched a few individuals. Freund (2007) suggests that BEE only created an elite of a small number of people while this does not necessarily benefit the majority of people in the country or the workers of these companies in particular. Ponte and Van Sittert (2007) on the other hand goes as far as proclaiming that despite its redistributive intentions, BEE has not been productive or profitable. One of the issues that came up during my research, which may require further investigation, is that companies who engaged in BEE deals did not do as well as companies who went for the ESOP option.

More currently practical forms of share ownership have been practiced in its modern form in the USA from as early as the 1920's. By 1927 almost four hundred American firms had some form of employee ownership (Stern & Comstock, 1978). By the 1990's around eleven thousand firms in the USA had an ESOP in place which benefited almost eight million employees (Blasi & Kruse, 1991).

ESOP's now have a significant presence in the UK, parts of the European Union, Japan and former Eastern bloc countries (Jones & Kato, 1995; Karsai & Wright, 1994; Millward, Stevens, Smart, & Hawes, 1992; Uvalic, 1991).

South Africa had little experience with ESOP's until the mid-1980's, when a small number of firms started implementing them following disinvestment from international companies and the government of the time's privatisation programme (Mazibuko & Boshoff, 2000).

Thus far, a democratic South African government has not been able to radically transform the economy or implement significant ownership for employees (Horwitz & Currie, 2007). Recently, Hamann (2003) has found that South African mining houses, in particular, find themselves in a very difficult position as far as corporate social responsibilities are concerned, especially related to share ownership and Black Economic Empowerment (BEE) issues.

ESOP's can broadly be divided into two types; non-leveraged and leveraged. The latter requires borrowing to fund the acquirement of stock while the former is sponsored by the employer (Hallock et al., 2003). Hallock et al. (2003) further elaborate on the leveraged option by explaining that debt financing is often used through the credit of the employer to purchase stock for employees, while at the same time creating

cash for the company and shareholders. Distributions by the company to the ESOP annually may even help repay the firm's loans (Hallock et al., 2003).

Landau and Ramsay (2007) find many reasons why firms implement ESOP's, including macroeconomic projects, enterprise wide reasons or part of broader social responsibility. In the UK, many companies use tax incentives as the main reason to implement ESOP's (Robinson & Zhang, 2005). The USA, on the other hand, mostly perceive an ESOP as an incentive to employees and a productivity enhancement tool for employers (Bryson, Freeman, Lucifora, Pellizzari, & Perotin, 2012).

2.3. Share ownership versus company

Performance

The framework of agency theory is often associated with ESOP's. The theory asserts that transforming employees into owners reduces the agency costs to the company as employees become more aligned to stakeholders, but this might create problems for corporate governance as the line of separation between ownership and control becomes blurred (R. Mitchell, O'Donnell, & Ramsay, 2005).

While M. C. Jensen and Meckling (1976) looked at how behaviour of managers is significantly influenced by equity ownership through agency costs, it was Agrawal and Mandelker (1987) who found that ownership of shares actually reduced agency costs.

Conclusive proof that share ownership influenced company performance was found through the study conducted by M. Jensen and Murphy (1999). Further support that the agency

cost was reduced through share ownership was provided by DeFusco, Johnson, and Zorn (1990).

Duffhues and Kabir (2008) have produced positive results from the relationship between company performance and share ownership in the Netherlands, this has been replicated in Singapore by S.-S. Chen, Ho, Lee, and Yeo (2000), in Italy by Brunello, Graziano, and Parigi (2001) and in China by J. Chen (2001). The USA study by Freeman and Knoll (2008) found significant benefits to both workers and employers.

Breton-Miller, Miller, and Steier (2004) have found that concentrated ownership by few individuals and shareholders tend to produce favouritism and nepotism. An argument is therefore made for the implementation of ESOP's which should improve operational efficiencies and ultimately better company performance (Breton-Miller et al., 2004).

Short and Keasey (1999) contended that the effects of share ownership on firm performance are dependent on the level of ownership. The study showed a positive correlation between ownership and performance at various percentages. The percentages of companies studied in this research were very low at 1.4% to 3% of total shares. It is therefore difficult to do any study related to the percentages of share ownership with the current situation in the South African mining industry as these percentages are extremely low and very narrow.

2.4. Conclusion of Literature Review

There is strong evidence in the literature review that there is a need to evaluate the effect of ESOP's on company performance in the South African context as it affects not only company profitability, performance and shareholder value creation, but also employee retention and may improve industrial relations. The literature assessed indicates that many studies have found a positive correlation between company profitability and the use of ESOP's. The scope of this study does not cover other areas of ESOP's such as corporate governance. The areas of study related to ESOP's are enormous. The study can therefore not do justice to all the available literature related to this subject; Google Scholar indicates over twenty six thousand articles about ESOP's.

2.5. Formulation of Hypothesis

This research subscribed to the concept that increased employee share ownership will, on average, yield improved company performance and/or better productivity by employees who are incentivised with ESOP's. Eight of the thirty companies investigated have ESOP's in place while the other twenty two do not.

Those companies who have ESOP's in place may suppress 'self-enrichment' by employees which will result in reduced agency costs so that employees prioritise shareholder value (Hansen & Hill, 1991).

The research investigated the effect of %ESOP upon various financial indicators of companies involved.

When processing financial data over a period of time, consideration must be given to the effect of time upon these

indicators. To minimise (or eliminate) the effect of time, the annual percentage (%) change in the indicators has been calculated by determining the % difference with respect to the previous year.

In this research the %ESOP over several years has remained constant, whether the organizations involved applied ESOP or not. Consequently, there is no annual %change in ESOP. The %ESOP change could therefore not be used as a predictor of the %change in the indicators.

Instead the occurrence of an ESOP in organizations was used. That is to say, a single nominal variable was allocated to an organization to indicate whether ESOP was implemented or not.

The existence/lack of an ESOP is thus the predictor in establishing whether an ESOP influenced financial indicators.

The mean %change in financial indicators over the years 2008 to 2012 was thus the dependent variable.

Shareholder wealth is defined as the cumulative average annual returns (CAAR) of the same share price. Share options concentration levels is the ratio of the value of the number of share options outstanding to the value of issued share capital (Agrawal & Mandelker, 1987). On this basis, the following hypothesis was tested in this research:

2.5.1 Null Hypothesis (H_0)

Firms with an ESOP in place will perform on average the same as firms without any ESOP within the mining industry for JSE listed companies.

2.5.2 Alternative Hypothesis (H_1)

Firms with an ESOP in place will have a positive impact on profit or performance compared to firms without an ESOP for firms listed on the JSE within the mining industry.

Therefore for profitability:

H_0 : ESOP's will have no impact on CAAR.

H_1 : Companies with an ESOP's will have a higher cumulative average annual share price returns.

H_0 : ESOP's will have no impact on HEPS

H_1 : Companies with an ESOP will have a higher HEPS

Furthermore we will also test for productivity:

H_0 : ESOP's will have no impact on ROA

H_1 : Companies with an ESOP will have a higher level of ROA

H_0 : ESOP's will have no impact on Debt to Equity Ratio (Gearing)

H_1 : Companies with an ESOP will have a better level of Debt to Equity Ratio (Gearing)

H_0 : ESOP's will have no impact on Profit / Loss per employee

H_1 : Companies with an ESOP will have a higher level of Profit per employee or a lower level of loss per employee

2. CHAPTER 3: RESEARCH METHODOLOGY

This chapter provides a discussion of the research methodology that was used to investigate the impact of ESOP's on company performance for JSE listed companies within the mining sector of South Africa.

3.1 Research methodology /paradigm

The research methodology for this study falls within quantitative research as defined by Neville (2005) and Leedy and Ormrod (2001) with the approach being positivistic (Leedy & Ormrod, 2001; Neville, 2005). This approach is appropriate, according to Neville (2005), as it allows for testing links and relationships as well as allowing for systematic statistical process.

From the literature it became evident that this method was used by several authors including, but not limited to: Agrawal and Mandelker (1987); DeFusco, Zorn, and Johnson (1991); Core and Guay (1999); Garvey and Milbourn (2000); Brunello et al. (2001); Chhaochharia and Grinstein (2007); Duffhues and Kabir (2008).

3.2 Research Design

Correlation and regression analysis was used in conjunction with hypothesis testing. The results were first adjusted to allow for the time factor of the data (i.e. each data point was taken from audited annual financial results which had to be adjusted into a percentage for the regression tests to be acceptable). Agrawal and Mandelker (1987) used hypothesis testing which provides the ability to test for statistical significance. In order to obtain acceptable test results for hypothesis testing, different measures were used. Regression models provide a statistical framework in which assumptions will be satisfied, inferences will be made and validity can be increased (Aiken & West, 1991).

According to Aiken and West (1991), the statistical method also provides several tests to confirm statistical significance and confidence levels. Zellner (1962) and Albright (2006) assert that this type of research design will provide sufficient results to compile summary statistics that will allow industry analysis which will facilitate a process of making inferences.

This research used the same measurement as Spiess and Affleck-Graves (1995), who measure share price performance as a cumulative average of returns over a five year period. Regression analysis was used to test for correlations and descriptive statistics were used to explain findings (Spiess & Affleck-Graves, 1995).

The method used to explore the problem was a test for correlation between variables and the share option ratio. Relationships were tested through regression analysis in order to test the hypothesis as follows:

Cumulative annual average returns (CAAR) will be calculated as: $(\text{Share price 2012} / \text{Share price 2008})$.

Return on Assets (ROA) will be calculated as: $\text{Net Profit after tax} / \text{Total Assets}$

Profit or loss per employee is calculated as: $\text{Number of employees} / \text{Total Profit or Loss}$

Debt to equity is calculated as: $\text{Total Debt} / \text{Total Equity}$

Headline Earnings per Share (HEPS) is calculated as: $\text{Headline earnings} / \text{weighted average number of shares in issue}$.

3.3 Population and sample

3.3.1 Population

The total population included thirty mining companies currently listed on the main board of the JSE. Only companies that have adopted the International Financial reporting Standards with detailed compensation data for at least five years were part of the population.

3.3.2 Sample and sampling method

A substantial number of JSE listed mining companies were included in the analysis: See Table 1, below

Table 1: Population of ESOP Research

Number	Name	Full Name	Code	Sector
1	KUMBAIO	KUMBA IRON ORE LTD	KIO	1757
2	HULAMIN	HULAMIN LIMITED	HLM	1757
3	EHSV	EVRAZ HIGHVELD STEEL & VAN	EHS	1757
4	RBPLAT	ROYAL BAFOKENG PLATINUM LTD	RBP	1779
5	EASTPLATS	EASTERN PLATINUM LIMITED	EPS	1779
6	ATLATSA	ATLATSA RESOURCES CORP	ATL	1779
7	IMPLATS	IMPALA PLATINUM HOLDINGS LIMITED	IMP	1779
8	JUBILEE	JUBILEE PLATINUM PLC	JBL	1779
9	LONMIN	LONMIN PLC	LON	1779
10	NORTHAM	NORTHAM PLATINUM LIMITED	NHM	1779
11	ANGLOPLAT	ANGLO AMERICAN PLATINUM CORPORATION LIMITED	AMS	1779
12	ANGGOLD	ANGLOGOLD ASHANTI LIMITED	ANG	1777
13	GFIELDS	GOLD FIELDS LIMITED	GFI	1777
14	FIUUNIT	FIRST URANIUM CORP	FUU	1755
15	PALAMIN	PALABORA MINING COMPANY LIMITED	PAM	1755
16	INSIMBI	INSIMBI REF&ALLOY SUP LD	ISB	1755
17	METMAR	METMAR LTD	MML	1755
18	ASSORE	ASSORE LTD	ASR	1775
19	BAUBA	BAUBA PLATINUM LTD	BAU	1775
20	GOLIATH	GOLIATH GOLD MINING LTD	GGM	1775
21	COAL	COAL OF AFRICA LTD	CZA	1775
22	MERAPE	MERAPE RESOURCES LTD	MRF	1775
23	SENTULA	SENTULA MINING LTD	SNU	1775
24	MIRANDA	MIRANDA MINERAL HLDGS LD	MMH	1775
25	PETMIN	PETMIN LTD	PET	1775
26	WESCOAL	WESCOAL HOLDINGS LTD	WSL	1771
27	SACMH	SOUTH AFRICAN COAL MIN	SAH	1771
28	DELRAND	DELRAND RESOURCES LTD	DRN	1773
29	ROCKWELL	ROCKWELL DIAMONDS INCOR	RDI	1773
30	DIAMONDCP	DIAMONDCORP PLC	DMC	1773

3.4 Procedure for data collection

A quantitative statistical method was used as the instrument of the research. The sources of data used for the research were from the JSE and McGregor BFA. The JSE was used primarily for historical All Share Index (ALSI) returns, alphas, betas, dividend yields, historical share prices and market capitalisation.

3.5 Data analysis and interpretation

The hypothesis formulated in Chapter 2 was tested using the methodology described in 3.1 above and statistical analysis tools which allows hypothesis testing, clarifying of relationships between variables, identifying trends and accurate predictions. The research used the linear model which offers a variety of regression and advanced statistical procedures which is designed to fit the characteristics of data describing complex relationships (IBM, 2013).

1.7.1 Variable Descriptions

a. *ESOP ratio*

The ESOP ratio variable is the percentage of shares owned by the ESOP fund of the total number of shares issued. The ESOP ratio was employed to distinguish the ESOP share concentration levels for different companies that use ESOP's. For example, Kumba Iron Ore Limited (Envision) share ownership scheme has a concentration level of 3% of the total shares issued (Rees, 2011).

b. *% Change in Cumulative Annual Average*

Returns (CAAR)

The cumulative average annual returns over five years from historical share price data was constructed using this variable.

c. *% Change of increase in Assets*

The percentage increase in assets was also calculated over five years of historical data (Spiess & Affleck-Graves, 1995).

d. *% Change of increase in Equity*

The percentage increase in equity was also calculated over five years of historical data (Spiess & Affleck-Graves, 1995).

e. *Profit or Loss per employee*

The profit or loss per employee was also calculated over five years of historical data.

f. *Headline Earnings per Share*

The headline earnings per share was also calculated over five years of historical data.

3.6 Limitations of the study

Albright (2006) points out that correlation analysis only applies to linear relationships and the study therefore guarded against making swift conclusions about such results.

3.7 Validity and reliability

Leedy and Ormrod (2001) have shown that it is of upmost importance to have a valid study as it shows whether the study has measured what it is supposed to measure.

3.7.1 External validity

The study can be applied to various realms of management behaviour and other forms of incentives, as was the case for Heaton (2002) and Bolton, Scheinkman, and Xiong (2006).

3.7.2 Internal validity

As this is not an experimental design, internal validity was not of major concern, as suggested by Leedy and Ormrod (2001).

3.7.3 Reliability

Research design and methods which have been confirmed through different statistical procedures in studies by Agrawal and Mandelker (1987), DeFusco et al. (1990) and Core and Guay (1999) were used. These methods have already been tested for the reliability of their conclusions.

3. CHAPTER 4: PRESENTATION AND DISCUSSION OF THE RESULTS

4.1 Introduction

This chapter presents the actual results of the %ESOP changes for companies who either have ESOP's or do not have an ESOP in place, compared to the various financial indicators. Each section is discussed, based on the findings and relevance of the data.

3.2 Results of ESOP upon the mean %change in CAAR

Figure 1 is a diagrammatical representation of the statistical results for ESOP's compared to CAAR:

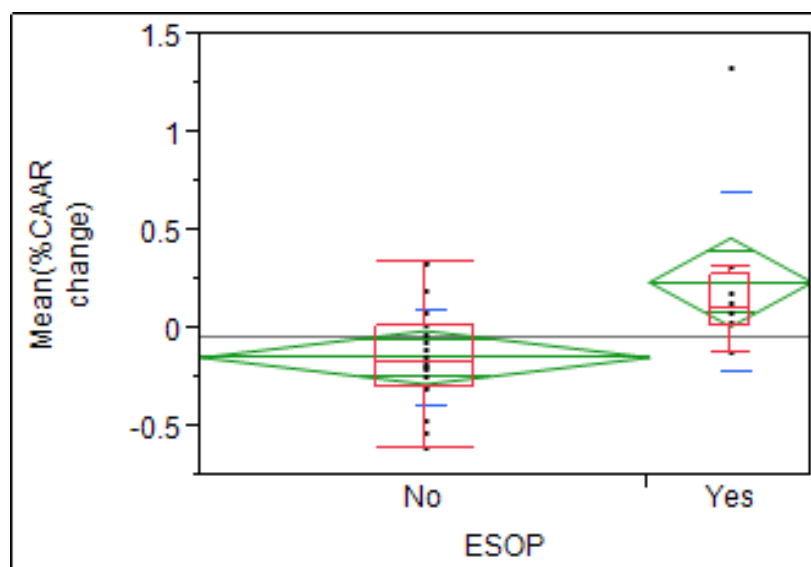


Figure 1 ESOP vs % Change CAAR

Companies with ESOP's will, according to the statistical analysis diagram, produce more positive Cumulative Average Annual Returns (CAAR) than companies who do not have an ESOP in place. The main problem of this research is answered by this statistical diagram. The null hypothesis has thus been disproved.

Table 2 - Results ESOP vs % Change CAAR

ESOP	N	CAAR mean %Change	Std Dev	ANOVA $F_{1,29}$	p- value	Welch $F_{1,29}$	p- value	χ^2 -value DF=1	p-value
No	22	-0.142	0.2457	8.8801	0.0059	5.1266	0.0514	7.6562	0.0057
Yes	8	0.241	0.4556						

Table 2 shows the standard deviation test for structure and ANOVA test for significance.

Levene's test for homogeneity of variance has p-value=0.2637. Equal variances are therefore accepted. This inferential statistic is used to assess the equality of variances for a variable calculated for the group with an ESOP and those without. Thus it is concluded that there is a difference between the variances in the population.

Since the p-values of the ANOVA test and the Wilcoxon

Signed Rank test are < 0.05 ; the null hypothesis is rejected.

The mean %change in CAAR for organizations that implement ESOP is significantly higher (0.241) than organizations that do not implement ESOP.

4.3 Results of ESOP upon the mean %change in ROA

Figure 2 displays a diagrammatical representation of the statistical results for ESOP's compared to ROA:

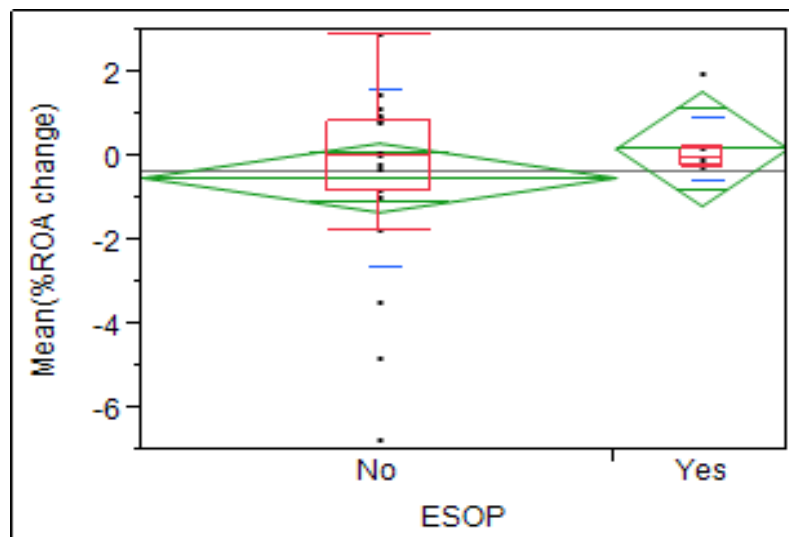


Figure 2 ROA vs % Change ESOP

The difference between companies that have an ESOP and those that do not when compared to ROA is not statistically significant based on the findings of figure 2.

Table 3 - ESOP vs % Change ROA

ESOP	N	ROA mean %Change	Std Dev	ANOVA F _{1,29}	p- value	Welch F _{1,29}	p- value	χ^2 value DF=1	p- value
No	22	-0.493	2.1324	0.7885	0.3821	1.7395	0.1979	0.2199	0.6391
Yes	8	0.196	0.7331						

Table 3 shows the standard deviation test for structure and ANOVA test for significance.

Levene's tests of homogeneity of variances=0.0929. There is no difference in the variances between the 2 groups.

There is no significant difference in the mean %changes in ROA between the groups of organizations that implement ESOP and those who do not implement ESOP.

4.4 Results of ESOP upon the mean %change in Net Profit

The following figure displays a diagrammatical representation of the statistical results for ESOP's compared to Net Profit:

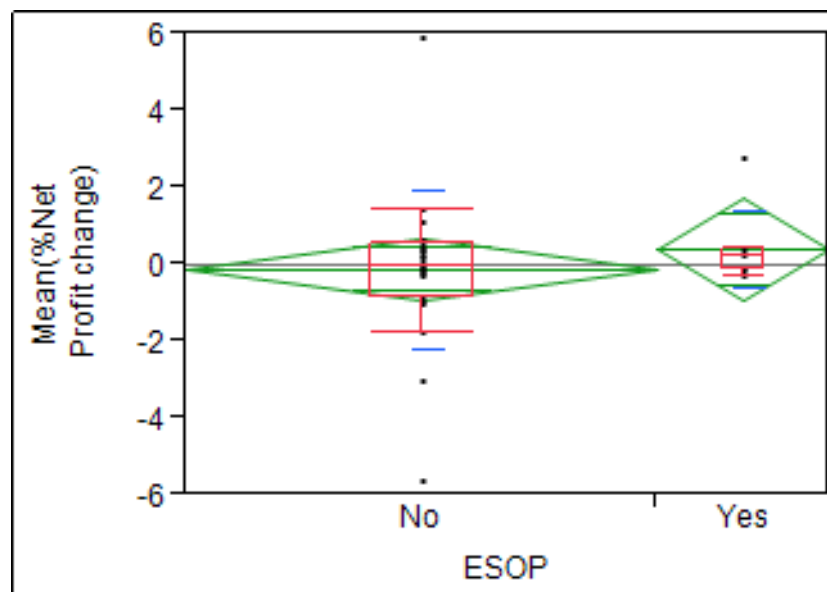


Figure 3 - ESOP vs % Change in Net Profit

The difference between companies that have an ESOP and those that do not when compared to % change in net profit is not statistically significant based on the findings of figure 3.

ESOP	N	Net profit mean %change	Std Dev	ANOVA F _{1,29}	p-value	Welch F _{1,29}	p-value	χ^2 value DF=1	p-value
No	22	-0.123	2.0517	0.4782	0.4949	0.8911	0.3540	0.4949	0.4818
Yes	8	0.402	0.9768						

Table 4 - ESOP vs % Change Net Profit

Table 4 shows the standard deviation test for structure and ANOVA test for significance.

Levene's tests of homogeneity of variances=0.2669. There is no difference in the variances between the 2 groups.

There is no significant difference in the mean %changes in Net Profit between the groups of organizations that implement ESOP and those who do not implement ESOP.

4.5 Results of ESOP upon the mean %change in Total Assets

Figure 4 displays a diagrammatical representation of the statistical results for ESOP's compared to Total Assets:

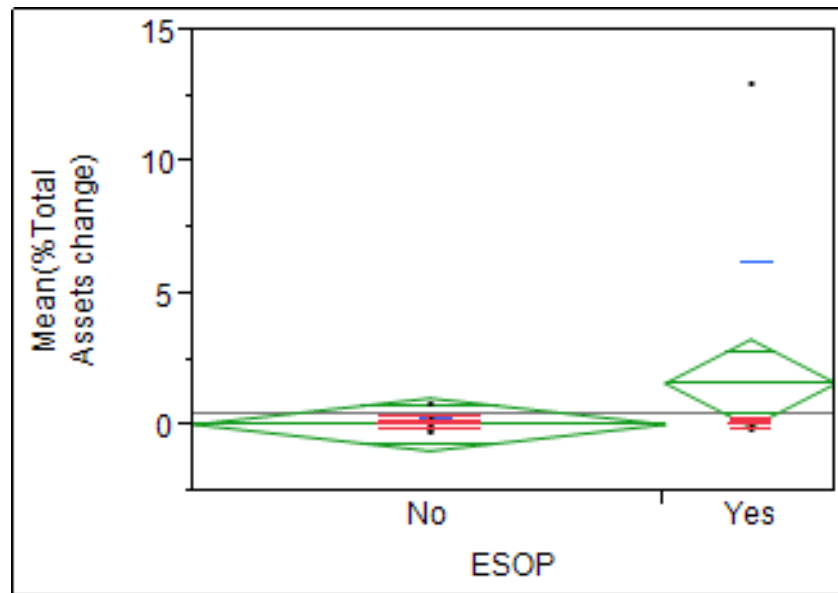


Figure 4 - ESOP vs % change in Total Assets

ESOP	N	Tot Assets mean %change	Std Dev	ANOVA $F_{1,29}$	p-value	Welch $F_{1,29}$	p-value	χ^2 value DF=1	p-value
No	22	0.082	0.1999	2.7290	0.1097	0.9350	0.3657	0.0022	0.9626
Yes	8	1.647	4.5750						

Table 5 - ESOP vs % change in Total Assets

Table 5 shows the standard deviation test for structure and ANOVA test for significance.

Levene's tests of homogeneity of variances=0.0007. There is a difference in the variances between the 2 groups.

There is no significant difference in the mean %changes in Total Assets between the groups of organizations that implement ESOP and those who do not implement ESOP.

4.6 Results of ESOP upon the mean %change in Debt

Figure 5 displays a diagrammatical representation of the statistical results for ESOP's compared to Total Debt:

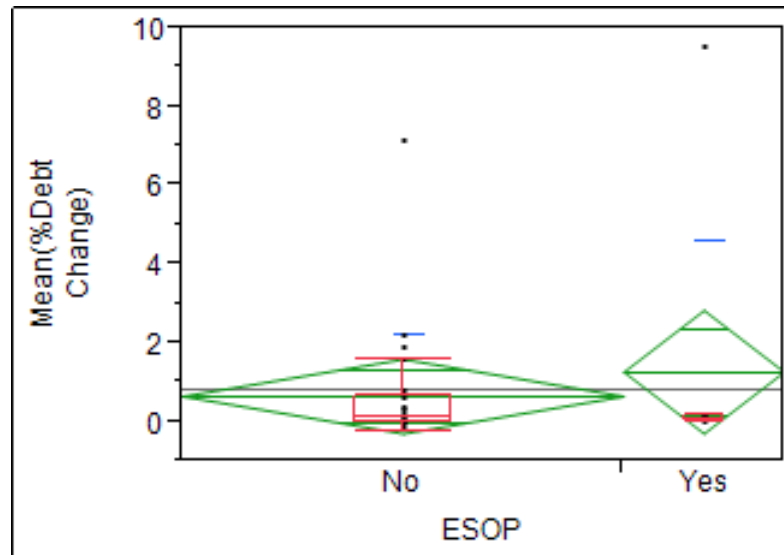


Figure 5 - ESOP upon the mean %change in Debt

ESOP	N	Debt mean %change	Std Dev	ANOVA $F_{1,29}$	p-value	Welch $F_{1,29}$	p-value	χ^2 value DF=1	p-value
No	22	0.658	1.5923	0.4833	0.4927	0.2565	0.6259	0.4311	0.5115
Yes	8	1.278	3.3290						

Table 6 - ESOP upon the mean %change in Debt

Table 6 shows the standard deviation test for structure and ANOVA test for significance.

Levene's tests of homogeneity of variances=0.1129. There is no difference in the variances between the 2 groups.

There is no significant difference in the mean %changes in Debt between the groups of organizations that implement ESOP and those who do not implement ESOP.

4.7 Results of ESOP upon the mean %change in Equity

Figure 6 displays a diagrammatical representation of the statistical results for ESOP's compared to Total Debt:

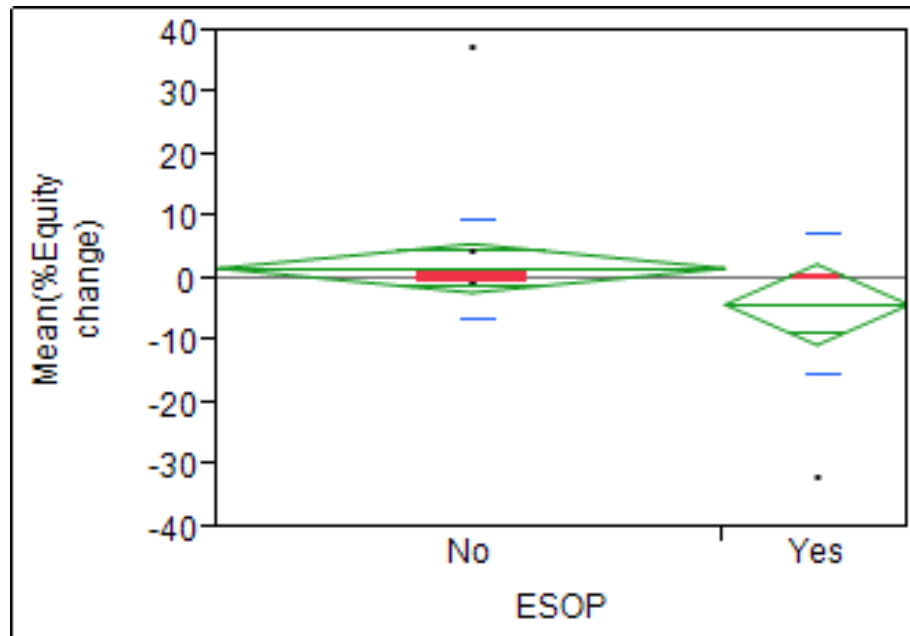


Figure 6 - ESOP vs %change in Equity

ESOP	N	Debt mean %change	Std Dev	ANOVA $F_{1,29}$	p-value	Welch $F_{1,29}$	p-value	χ^2 -value DF=1	p-value
No	22	1.976	7.992	2.5056	0.2115	1.7916	0.2115	0.2199	0.6391
Yes	8	-3.885	11.410						

Table 7 - ESOP vs %change in Equity

Table 7 shows the standard deviation test for structure and ANOVA test for significance.

Levene's tests of homogeneity of variances=0.2553. There is no difference in the variances between the 2 groups.

There is no significant difference in the mean %changes in Equity between the groups of organizations that implement ESOP and those who do not implement ESOP.

4.8 Test of correlation between variables

The Pearson correlation coefficient is a measure of the strength of the linear relationship between 2 continuous variables. The coefficient value varies from -1 to +1, where -1 and +1 are perfect negative and perfect positive linear relationships. A value of 0 indicates a total lack of any linear relationship. The following provides a rough guideline in interpreting the correlation coefficient:

±1.0	Perfect correlation
±0.8	Strong correlation
±0.5	Medium correlation
±0.2	Weak correlation and
±0.0	No correlation

The following table presents bivariate correlation values between the mean values for the period 2008 to 2012

Indicator	ESOP %	CAAR	Share Price @ FYE	Net Prof	Tot Ass	ROA	HEPS	DEBT	Equity
ESOP %	1	0.4115	0.4108	0.5126	0.5466	0.3226	0.1224	0.5107	0.6405
CAAR	0.4115	1	0.1120	0.1492	0.1130	0.2455	0.0960	0.1105	0.1833
Share Price @ F YE	0.4108	0.1120	1	0.5325	0.6188	0.3938	0.1114	0.6573	0.6402
Net Prof	0.5126	0.1492	0.5325	1	0.7640	0.2810	0.0983	0.4387	0.8046
Tot Ass	0.5466	0.1130	0.6188	0.7640	1	0.2666	0.1018	0.8976	0.9744
ROA	0.3226	0.2455	0.3938	0.2810	0.2666	1	-0.0519	0.2550	0.3263
HEPS	0.1224	0.0960	0.1114	0.0983	0.1018	-0.0519	1	0.0880	0.1135
DEBT	0.5107	0.1105	0.6573	0.4387	0.8976	0.2550	0.0880	1	0.8638
Equity	0.6405	0.1833	0.6402	0.8046	0.9744	0.3263	0.1135	0.8638	1

Table 8 - The coefficients between pairs of continuous

variables

It may be noted that the %ESOP is positively correlated with CAAR (0.4115), Share Price for YE (0.4105), Net Profit (0.5126), Total Assets (0.5466), ROA (0.3266), HEPS (0.1224), Debt (0.5107), Equity (0.6405).

The bivariate correlations between the %ESOP and the variables above vary from weak to medium.

A positive correlation implies that an increase in one variable (in this case the %ESOP) is associated with an increase in the accompanying variable. The following section will elaborate on this further.

Therefor for Profitability

g. *Hypothesis 1*

H0: ESOP's will have no impact on CAAR.

H1: Companies with a higher level of ESOP's ratio will have a higher level of cumulative average annual share price returns.

To test the hypothesis, correlation analysis was conducted. The analysis was conducted at 5% significance level for each of the years under study.

Rejection criterion: The null hypothesis is rejected if the p-value is less than 0.05 (the significance level). This is a one-tailed test since the test is to confirm if a company has a high level of the ESOP's ratio then they will have a higher level of cumulative average annual share price returns. The results are shown below.

Table 9 Correlation for Hypothesis 1

Correlations					
		CAAR 09	CAAR 10	CAAR 11	CAAR 12
ESOP	Pearson Correlation	.511	.340	.378	.392
	Sig. (1-tailed)	.002	.033	.020	.016
	N	30	30	30	30

The results show that there is a positive correlation between the ESOP's ratio and the level of cumulative average annual share price returns. This is because the p-values for all the years were less than 0.05. Thus, the null hypothesis is rejected and it is concluded that companies with a higher level of ESOP's ratio will have a higher level of cumulative average annual share price returns.

h. ***Hypothesis 2***

H₀: ESOP's will have no impact on HEPS

H₁: Companies with a higher level of ESOP's ratio will have a higher level of HEPS

To test the hypothesis, correlation analysis was also conducted. The analysis was conducted at 5% significance level for each of the years under study.

Rejection criterion: The null hypothesis is rejected if the p-value is less than 0.05 (the significance level). This is a one-tailed test since the test is to confirm that if a company has a higher level of ESOP's ratio, they will have a higher level of HEPS. The results are shown below.

Table 10 Correlation for Hypothesis 2

Correlations						
		HEPS 08	HEPS 09	HEPS 10	HEPS 11	HEPS 12
ESOP	Pearson Correlation	.159	.105	.108	.135	.326
	Sig. (1-tailed)	.200	.290	.284	.239	.039
	N	30	30	30	30	30

Although the correlation coefficients were all positive for the years 2008 up to 2012, the only significant correlation was recorded for year 2012. Thus, since 2012 is the latest year, the null hypothesis is rejected and it is concluded that companies with a higher level of ESOP's ratio will have a higher level of HEPS compared to companies with low or no ESOP.

Productivity Results:

i. Hypothesis 3

H_0 : ESOP's will have no impact on ROA

H_1 : Companies with a higher level of ESOP's ratio will have a higher level of ROA

To test the hypothesis, correlation analysis was also conducted. The analysis was conducted at a 5% significance level for each of the years under study.

Rejection criterion: The null hypothesis is rejected if the p-value is less than 0.05 (the significance level). This is a one-tailed test since the test is to confirm that if a company has a higher level of ESOP's ratio, they will have a higher level of ROA. The results are shown below.

Table 11 Correlation for Hypothesis 3

Correlations						
		ROA 08	ROA 09	ROA 10	ROA 11	ROA 12
ESOP	Pearson Correlation	.103	.300	.425	.318	.376
	Sig. (1-tailed)	.294	.054	.010	.043	.020
	N	30	30	30	30	30

The results show that there is a positive correlation between ESOP's ratio and ROA. This is because the p-values for all the years except 2008 and 2009 were less than 0.05. Thus, the null hypothesis is rejected and it is concluded that companies with a higher level of ESOP's ratio will have a higher level of ROA.

i. ***Hypothesis 4***

H_0 : ESOP's will have no impact on Debt/Equity (Gearing)

H_1 : Companies with a higher level of ESOP's ratio will have a higher level of Debt to Equity Ratio (Gearing)

To test the hypothesis, correlation analysis was also conducted. The analysis was conducted at a 5% significance level for each of the years under study.

Rejection criterion: The null hypothesis is rejected if the p-value is less than 0.05 (the significance level). This is a one-tailed test since the test is to confirm that if a company has a higher level of ESOP's ratio, they will have a higher level of Debt to Equity Ratio (Gearing). The results are shown below.

Table 12 Correlation for Hypothesis 4

Correlations						
		D/E 08	D/E 09	D/E 10	D/E 11	D/E 12
ESOP	Pearson Correlation	-.229	.432	.001	-.214	-.278

	Sig. (1-tailed)	.112	.009	.499	.128	.068
--	-----------------	------	------	------	------	------

The results for the most recent years 2011 and 2012 show a negative correlation between the gearing ratio and the ESOP level. The correlation is however not statistically significant at 5% significance level since the p-values were greater than 0.05, that is 0.128 and 0.068 respectively. Thus the null hypothesis is accepted and it is concluded that ESOP's will have no impact on Debt to Equity Ratio (Gearing)

j. ***Hypothesis 5***

H_0 : ESOP's will have no impact on Profit / Loss per employee

H_1 : Companies with a higher level of ESOP's ratio will have a higher level of Profit / Loss per employee

To test the hypothesis, correlation analysis was also conducted. The analysis was conducted at a 5% significance level for each of the years under study.

Rejection criterion: The null hypothesis is rejected if the p-value is less than 0.05 (the significance level). This is a one-tailed test since the test is to confirm that if a company has a higher level of ESOP's ratio, they will have a higher level of Profit / Loss per employee. The results are shown below.

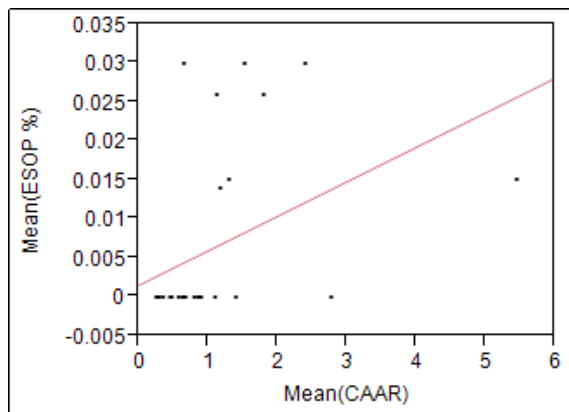
Table 13 Correlation for Hypothesis 5

Correlations						
		Profit / Loss per Employee				
		2008	2009	2010	2011	2012
ESOP	Pearson Correlation	.167	.234	.312	.573	.417
	Sig. (1-tailed)	.261	.183	.111	.008	.048
	N	17	17	17	17	17

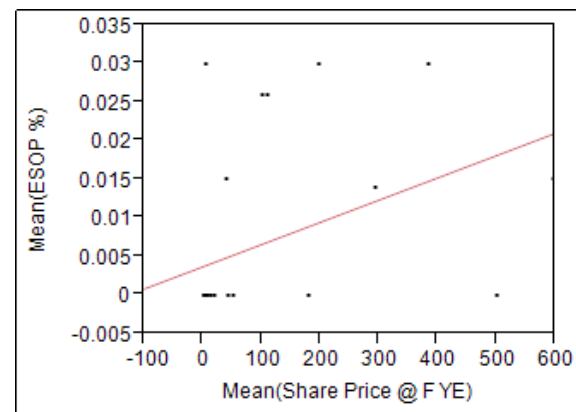
The results for the most recent years 2011 and 2012 shows a positive correlation between Profit / Loss per employee and the ESOP level. The correlation is statistically significant at a 5% significance level since the p-values were less than 0.05, which is 0.008 and 0.048 respectively. Thus the null hypothesis is rejected and it is concluded that companies with a higher level of ESOP's ratio will have a higher level of profit per employee.

4.9 Bivariate plots presenting a linear relationship between variables & regression analysis

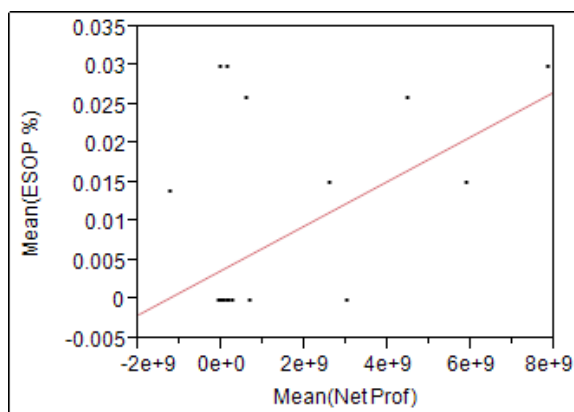
Mean % ESOP vs Mean CAAR



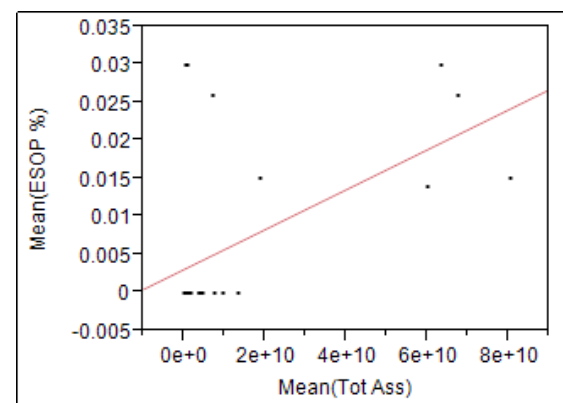
Mean % ESOP vs Mean Share price for YE



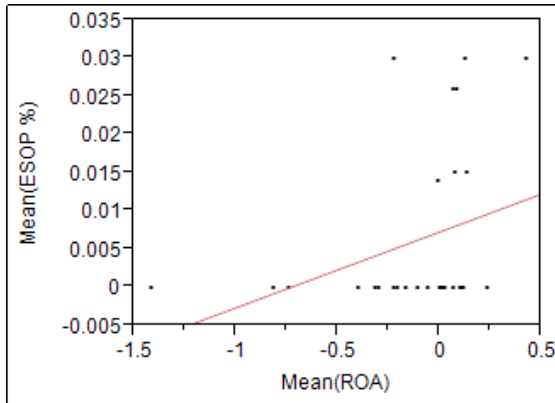
Mean % ESOP vs Mean Net Profit



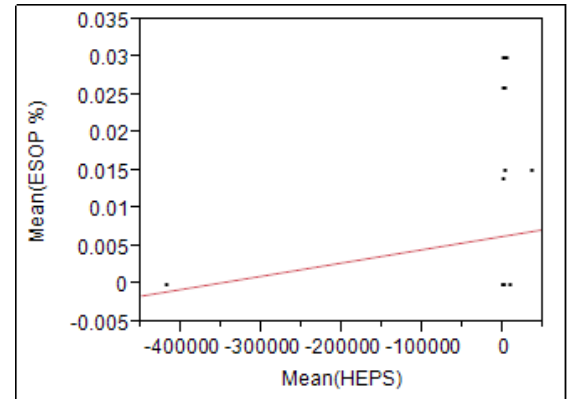
Mean % ESOP vs Tot Assets



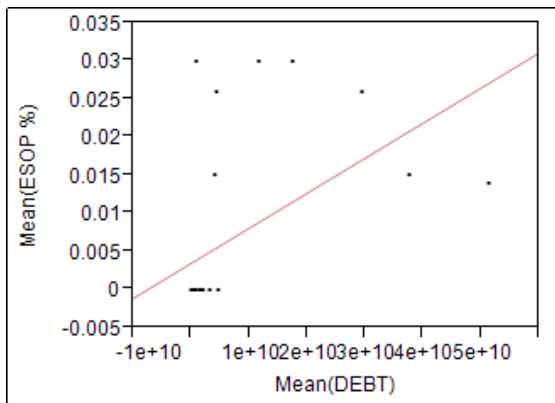
Mean % ESOP vs Mean ROA



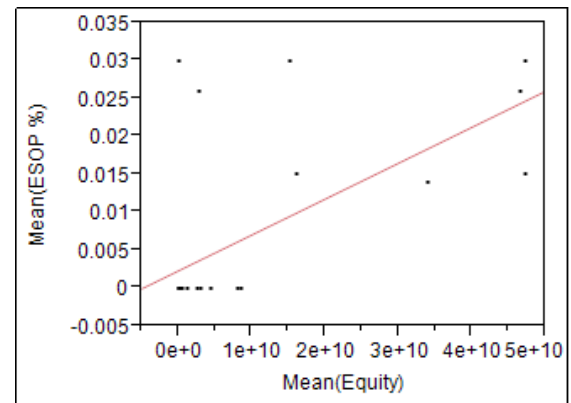
Mean % ESOP vs HEPS



Mean % ESOP vs Mean Debt



Mean % ESOP vs Mean Equity



k. **Regression Analysis for 2012**

To establish whether there was a causal relationship between ESOP and CAAR, regression analysis was conducted with CAAR being the dependent and ESOP as the independent variable. The results are shown below:

CAAR 2012

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.392 ^a	.153	.123	1.5523080

a. Predictors: (Constant), ESOP

The model summary table shows an R-square of 0.153 which means that the regression ESOP explains 15.3% variability in CAAR for 2012. The Analysis of variance (ANOVA) table is shown below;

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.224	1	12.224	5.073	.032 ^b
	Residual	67.470	28	2.410		
	Total	79.694	29			
a. Dependent Variable: CAAR_12						
b. Predictors: (Constant), ESOP						

ANOVA tests the hypothesis that there is a linear relationship between ESOP and CAAR. The p-value of the F-tests was

0.032 which is less than 0.05 (significance level). This means that the null hypothesis is rejected, and it can be concluded that there is a linear relationship between ESOP and CAAR (2012). The actual relationship is indicated in the coefficients table below;

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.629	.326		1.929	.064
	ESOP	58.722	26.072	.392	2.252	.032
a. Dependent Variable: CAAR_12						

The results shows that for 2012, CAR is given by the model; $CAAR(2012) = 0.629 + 58.722 (ESOP)$. As was shown on the ANOVA table, the p-value for the coefficient of ESOP was 0.032, which is less than 0.05 (the significance level). This implies that ESOP is significant in determining CAAR. Since the coefficient is positive, it means that companies with a higher level of ESOP ratio's will have a higher level of cumulative average annual share price returns.

CAAR 2011

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.378 ^a	.143	.113	1.2465134
a. Predictors: (Constant), ESOP				

The model summary table shows an R-square of 0.143 which means that for 2011 ESOP explained 14.3% variability in CAAR. The Analysis of variance (ANOVA) table is shown below;

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.270	1	7.270	4.679	.039 ^b
	Residual	43.506	28	1.554		
	Total	50.776	29			
a. Dependent Variable: CAAR_11						
b. Predictors: (Constant), ESOP						

ANOVA tests the hypothesis that there is a linear relationship between ESOP and CAAR. The p-value of the F-tests was 0.039 which is less than 0.05 (significance level). This means that the null hypothesis is rejected, and it can be concluded that there was a linear relationship between ESOP and CAAR (2011). The actual relationship is indicated in the coefficients table below;

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.823	.262		3.140	.004
	ESOP	45.286	20.936	.378	2.163	.039
a. Dependent Variable: CAAR_11						

The results show that for 2011, CAR is given by the model;

$$\text{CAAR (2011)} = 0.823 + 45.286 (\text{ESOP}).$$

As was shown on the ANOVA table, the p-value for the coefficient of ESOP was 0.0039, which is less than 0.05 (the significance level). This implies that ESOP is significant in determining CAAR. Since the coefficient is positive, it means that companies with a higher level of ESOP ratio's will have a higher level of cumulative average annual share price returns.

CAAR 2010

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.340 ^a	.116	.084	1.8191299
a. Predictors: (Constant), ESOP				

The model summary table shows an R-square of 0.116 which means that the regression ESOP explains 11.6% variability in CAAR for 2010. The Analysis of variance (ANOVA) table is shown below;

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.131	1	12.131	3.666	.066 ^b
	Residual	92.659	28	3.309		
	Total	104.790	29			
a. Dependent Variable: CAAR_10						
b. Predictors: (Constant), ESOP						

The p-value of the F-tests was 0.066 which is greater than 0.05 (significance level). This means that the null hypothesis is accepted, and it can be concluded that there was no linear relationship between ESOP and CAAR (2010). The actual relationship is indicated in the coefficients table below;

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.953	.382		2.492	.019
	ESOP	58.500	30.554	.340	1.915	.066
a. Dependent Variable: CAAR_10						

The results show that for 2010, CAR is given by the model;

$$\text{CAAR (2010)} = 0.953 + 58.500 (\text{ESOP}).$$

As was shown on the ANOVA table, the p-value for the coefficient of ESOP was 0.066, which is greater than 0.05 (the significance level). This implies that ESOP is not significant in determining CAAR.

CAAR 2009

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.511 ^a	.261	.235	.5449846
a. Predictors: (Constant), ESOP				

The model summary table shows an R-square of 0.261 which means that the regression ESOP explained 26.2% variability in CAAR for 2009. The Analysis of variance (ANOVA) table is shown below;

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.937	1	2.937	9.890	.004 ^b
	Residual	8.316	28	.297		
	Total	11.254	29			
a. Dependent Variable: CAAR_09						
b. Predictors: (Constant), ESOP						

The p-value of the F-tests was 0.004 which is less than 0.05 (significance level). This means that the null hypothesis is rejected, and it can be concluded that there was a linear relationship between ESOP and CAAR (2009). The actual relationship is indicated in the coefficients table below;

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.678	.115		5.917	.000
	ESOP	28.787	9.154	.511	3.145	.004
a. Dependent Variable: CAAR_09						

The results show that for 2012, CAR is given by the model;

$$\text{CAAR (2009)} = 0.6789 + 28.787 (\text{ESOP}).$$

As was shown on the ANOVA table, the p-value for the coefficient of ESOP was 0.004, which is less than 0.05 (the significance level). This implies that ESOP is significant in determining CAAR. Since the coefficient is positive, it means that companies with a higher level of ESOP ratio's will have a higher level of cumulative average annual share price returns.

ROA 2012

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.376 ^a	.142	.111	.267855
a. Predictors: (Constant), ESOP				

The model summary table shows an R-square of 0.142 which means that the regression ESOP explains 14.2% variability in ROA for 2012. The Analysis of variance (ANOVA) table is shown below;

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.331	1	.331	4.618	.040 ^b
	Residual	2.009	28	.072		
	Total	2.340	29			
a. Dependent Variable: ROA_12						
b. Predictors: (Constant), ESOP						

ANOVA tests the hypothesis that there is a linear relationship between ESOP and ROA. The p-value of the F-tests was 0.040 which is less than 0.05 (significance level). This means that the null hypothesis is rejected, and it can be concluded that there is a linear relationship between ESOP and ROA in 2012. The actual relationship is indicated in the coefficients table below;

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.176	.056		-3.132	.004
	ESOP	9.668	4.499	.376	2.149	.040
a. Dependent Variable: ROA_12						

The results show that for 2012, ROA is given by the model;

$$\text{ROA (2012)} = -0.176 + 9.668 (\text{ESOP}).$$

As was shown on the ANOVA table, the p-value for the coefficient of ESOP was 0.040, which is less than 0.05 (the significance level). This implies that ESOP significant in determining ROA. Since the coefficient is positive, it means that companies with a higher level of ESOP ratio's will have a higher level of ROA.

Profit/ loss per Employee 2012

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.417 ^a	.174	.119	125610.5421349
a. Predictors: (Constant), ESOP				

The model summary table shows an R-square of 0.174 which means that the regression ESOP explains 17.4% variability in Profit / Loss per employee for 2012. The Analysis of variance (ANOVA) table is shown below;

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	49900557426.927	1	49900557426.927	3.163	.096 ^b
	Residual	236670124431.486	15	15778008295.432		
	Total	286570681858.414	16			
a. Dependent Variable: P_L_per_Emp_12						
b. Predictors: (Constant), ESOP						

ANOVA tests the hypothesis that there is a linear relationship between ESOP and profit/ loss per employee. The p-value of the F-tests was 0.096, which is greater than 0.05 (significance level). This means that the null hypothesis is accepted, and it can be concluded that there is no linear relationship between ESOP and profit/ loss per employee in 2012.

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-71007.744	38594.779		-1.840	.086
	ESOP	4592002.787	2582114.726	.417	1.778	.096
a. Dependent Variable: P_L_per_Emp_12						

The results show that for 2012, profit/ loss per employee is given by the model;

Profit/ loss per employee (2012) = -71007.744 + 4592002.787 (ESOP).

As was shown on the ANOVA table, the p-value for the coefficient of ESOP was 0.096, which is greater than 0.05 (the significance level). This implies that ESOP is not significant in determining profit/ loss per employee.

HEPS 2012

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.326 ^a	.107	.075	937.507
a. Predictors: (Constant), ESOP				

The model summary table shows an R-square of 0.107 which means that the regression ESOP explains 10.7% variability in HEPS for 2012. The Analysis of variance (ANOVA) table is shown below;

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2935141.505	1	2935141.505	3.339	.078 ^b
	Residual	24609750.362	28	878919.656		
	Total	27544891.867	29			
a. Dependent Variable: HEPS_12						
b. Predictors: (Constant), ESOP						

ANOVA tests the hypothesis that there is a linear relationship between ESOP and HEPS. The p-value of the F-tests was 0.078 which is greater than 0.05 (significance level). This means that the null hypothesis is accepted, and it can be concluded that there is no linear relationship between ESOP and HEPS for 2012.

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	73.860	197.049		.375	.711
	ESOP	28775.220	15746.307	.326	1.827	.078
a. Dependent Variable: HEPS_12						

The results show that for 2012, HEPS is given by the model;

$$\text{HEPS (2012)} = 73.860 + 28775.220 (\text{ESOP}).$$

As was shown on the ANOVA table, the p-value for the coefficient of ESOP was 0.078, which is greater than 0.05 (the significance level). This implies that ESOP is not significant in HEPS.

Debt Equity Ratio 2012

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.278 ^a	.077	.044	10.8378011
a. Predictors: (Constant), ESOP				

The model summary table shows an R-square of 0.077 which means that the regression ESOP explains 7.7% variability in Debt Equity ratio for 2012. The Analysis of variance (ANOVA) table is shown below;

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	275.419	1	275.419	2.345	.137 ^b
	Residual	3288.822	28	117.458		
	Total	3564.241	29			
a. Dependent Variable: D_E_12						
b. Predictors: (Constant), ESOP						

ANOVA tests the hypothesis that there is a linear relationship between ESOP and Debt Equity ratio. The p-value of the F-tests was 0.137 which is greater than 0.05 (significance level). This means that the null hypothesis is accepted, and it can be concluded that there is no linear relationship between ESOP and Debt Equity ratio for 2012.

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.428	2.278		1.066	.296
	ESOP	-278.741	182.031	-.278	-1.531	.137
a. Dependent Variable: D_E_12						

The results show that for 2012, debt equity ratio is given by the model;

Debt equity ratio (2012) = 2.428 – 278.741 (ESOP).

As was shown on the ANOVA table, the p-value for the coefficient of ESOP was 0.137, which is greater than 0.05 (the significance level). This implies that ESOP is not significant in determining debt equity ratio.

4.10 Partitioning

A partition platform recursively partitions data according to a relationship between X (independent) and Y (dependent) variables. It finds a set of cuts or groupings of X values which best predict the Y values. It does this by exhaustively searching all possible cuts or groupings. This results in the optimal split in a large number of possible splits.

A limitation of the partition performed here, is the small number of observations available. The occurrence of data over time demanded the calculation of the mean %change of the financial indicators of the businesses involved. In the partitioning or splits below, there are 30 observations (businesses) of which 8 have implemented ESOP (Yes) and 22 have not implemented ESOP (No).

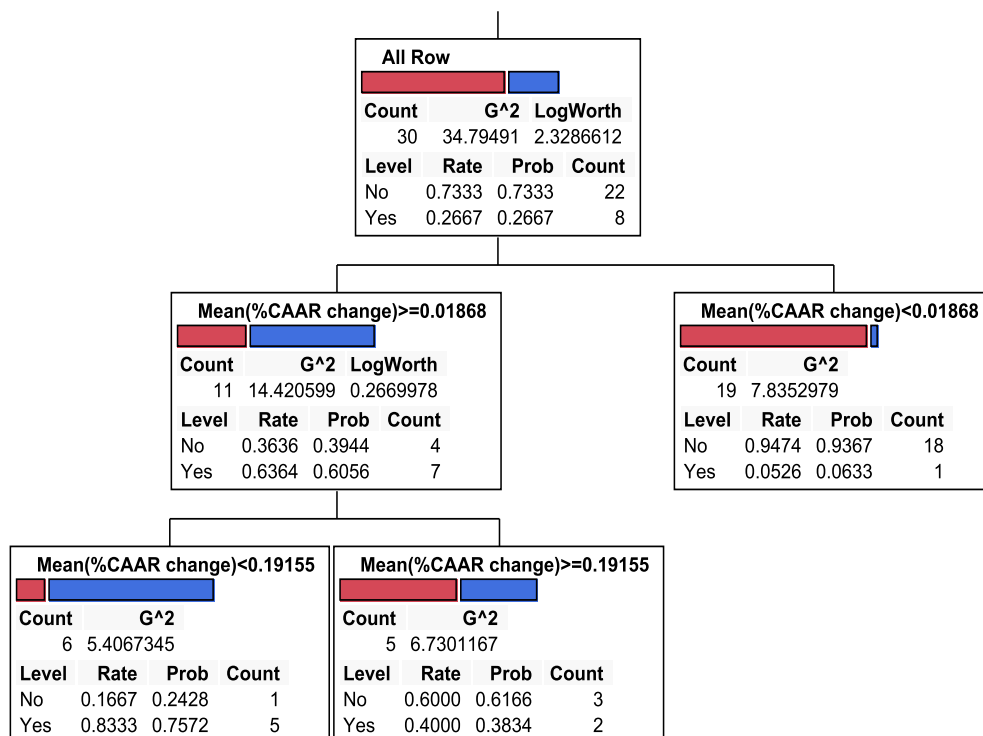


Figure 7 - Partition Platform – Decision Tree

From the decision tree above it is seen that %CAAR change is the main predictor for the implementation of ESOP.

Of the 8 organizations implementing ESOP, 7 (87.5%) have a mean %change in CAAR > 0.0189 and only 4 out of 22 (18.2%) non-participating ESOP businesses have a mean %change in CAAR > 0.0189.

Of the above 7 ESOP businesses, 2 (25% of the original 8) have mean %change in CAAR > 0.1915.

The following leaf report displays the count and probability distribution:

Leaf Label	No	Yes
Mean(%CAAR change)>=0.018681&Mean(%CAAR change)<0.191552	0.24277	0.7572
Mean(%CAAR change)>=0.018681&Mean(%CAAR change)>=0.191552	0.61657	0.3834
Mean(%CAAR change)<0.018681	0.93666	0.0633
Mean(%CAAR change)>=0.018681&Mean(%CAAR change)<0.191552	1	5
Mean(%CAAR change)>=0.018681&Mean(%CAAR change)>=0.191552	3	2
Mean(%CAAR change)<0.018681	18	1

Table 14 Leaf Label

The following ROC and Lift curves display the sorting efficiency of the model.

If the model perfectly rank-orders the response values, then the sorted data has all the targeted values first, followed by all the other values. The curve moves all the way to the top before it moves at all to the right. Therefore a good decision.

Receiver Operating Characteristic

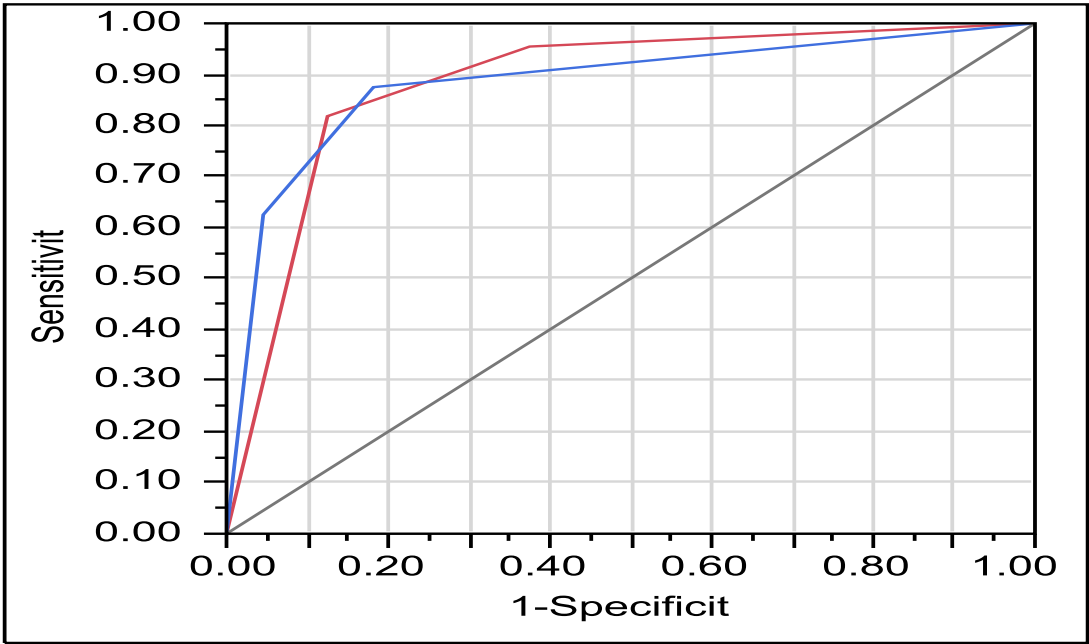


Figure 8 - Receiver Operating Characteristic

ESOP	Area
No	0.8835
Yes	0.8835

Measure	Training Definition
Entropy RSquare	0.4188 $1 - \text{Loglike}(\text{model}) / \text{Loglike}(0)$
Generalized RSquare	0.5605 $(1 - (L(0)/L(\text{model}))^{(2/n)}) / (1 - L(0)^{(2/n)})$
Mean -Log p	0.3370 $\sum -\text{Log}(\rho_{ij})/n$
RMSE	0.3172 $\sqrt{\sum (y_{ij} - \rho_{ij})^2/n}$
Mean Abs Dev	0.2144 $\sum y_{ij} - \rho_{ij} /n$
Misclassification Rate	0.1333 $\sum (\rho_{ij} \neq p_{\text{Max}})/n$
N	30 N

The Generalized R Square is a generalization of the R Square measure that simplifies to the regular R Square measure for continuous normal responses. It can be deduced that 56% of the variation in the data is explained by the partition model.

The misclassification rate is the rate for which the response category with the highest fitted probability is not the observed category. The rate for this partitioning is of 13%.

The confusion matrix is a two-way classification of actual and predicted responses.

Confusion Matrix

Actual or Predicted

Training No Yes

No	21	1
Yes	3	5

4.11 Summary of results

In summary thus a business with an ESOP in place has a higher mean %change in CAAR for the years 2008 – 2012 compared to businesses that do not have an ESOP.

A scatterplot of these variables will often create a cone-like shape, as the scatter (or variability) of the dependent variable (DV) widens or narrows as the value of the independent variable (IV) increases. The inverse of heteroscedasticity is homoscedasticity, which indicates that a DV's variability is equal across the values of an IV.

In conclusion thus, it appears as though CAAR is most prominently influenced by the implementation of an ESOP.

This was seen in the comparison of businesses that implement/do not implement an ESOP.

From a partitioning of financial indicators between an ESOP and a non-ESOP, CAAR is the most prominent indicator to predict the existence of an ESOP

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter concludes and summarises the analysis process of this research. Findings are explained and future research is suggested.

5.2 Conclusions of the study

The impact of employee share ownership plans on company performance was investigated using various financial indicators. An employee share ownership plan ratio was constructed and used to test between various productivity and profitability variables.

The ESOP variable was produced based on the concentration of shares of the ESOP to the total number of shares allocated. The percentage of ESOP shares was found to be between 1.4% and 3% of total shares for the companies researched. Based on the fact that the number of companies who had an ESOP in place was eight out of a total of thirty (low number) and the ESOP concentration had a very narrow gap of 1.6%, it was deduced that the statistical tests would only measure between companies who had an ESOP in place and those who did not have an ESOP in place. Therefore, concentration levels would not be used; a simple yes or no answer would be required to test for an ESOP.

The data used for all variables was from secondary sources of published annual financial results. The JSE bulletin, McGregor BFS and company websites were used to retrieve the data required. Each set of financial results was used over the period of 2008 to 2012. For this reason, a standard statistical analysis method could not be used as the research had to take into account the time difference of the data. Therefore a percentage increase of the results was used.

The variables of CAAR and HEPS were used to test for profitability based on the impact that an ESOP would have on the variables. CAAR was constructed as a compounded annual average over a period of five years. HEPS was constructed as a percentage increase in headline earnings per share over the five years.

Return on Assets, Debt to Equity and Profit / Loss per employee was used to test for productivity levels based on the impact that an ESOP may have on the variables. These variables were used in many studies to test for performance of companies (Spiess & Affleck-Graves, 1995).

The method employed for all the variables was to use the first year (2008) as a base of all companies and then look at the percentage increase over the next four years from 2009 to 2012.

Various statistical methods were used to compare the ID's with the DV (ESOP). CARR was found to be the most significant. Standard deviation, ANOVA and other tests were conducted. Levene's test for homogeneity of variance produced a significant result of 0.264 which allowed inferential statistics to be used and for equal variances to be accepted.

A Pearson correlation test was conducted to measure the strength of the linear relationship between CAAR and the ESOP variable per company over the period concerned. The Pearson correlation for all years found a positive result for all years together of 0.412. Individually, the results for 2009 to 2012 all showed positive correlations. The p-values for all the years, both individually and collectively, were less than 0.05 which proves that a linear relationship does exist.

A partition platform was then tested to best predict the linear relationship of the various variables. A decision tree was used to clearly establish that CAAR was indeed a determinant when an ESOP was present. This too, together with an efficiency model and a confusion matrix provided conclusive evidence of statistical significance of the relationship between CAAR and an ESOP.

The difference between companies that do not have ESOP's in place can be clearly seen as more negative for CAAR compared to companies who have an ESOP in place. This is consistent with the theory and findings of studies such as Robinson and Zhang (2005) and can be applied to the South African context within the JSE listed mining sector.

The theory that an ESOP will ensure improved profitability of a company listed on the JSE within the South African mining sector has been found to be statistically significant.

Headline earnings per share (HEPS) had a positive correlation coefficient for all years, but this was only found to be significant for the year 2012. The relationship of an ESOP with this particular indicator may take more time to bear fruit

but since the criterion for the tests were over five years, a significant statistical relationship cannot be assumed.

The findings of ROA to ESOP yielded mixed results. A positive linear relationship for 2008 and 2009 was found but there is no significant difference in the mean %changes in ROA between the groups of organizations that implement ESOP and those who do not implement ESOP for the other years. The South African experience based on the data and within the defined sector therefore did not prove to be of statistical significance for this variable. The Malaysian experience is similar to this finding (Abdullah, 2006).

For the gearing ratio of Debt to Equity, no significant level was found for any of the years. It was therefore concluded that an ESOP did not play any role when it came to the gearing of companies. This too is consistent with the findings of Abdullah (2006) in Malaysia.

The most recent years of 2011 and 2012 show a positive significant relationship between the Profit / Loss per employee and an ESOP. This too may be the similar to HEPS. Even though the result of an ESOP may take some time to be effective; this may be due to the phenomenon which Pierce et al. (1991) discuss as the psychological ownership which is created over time for employee ownership, the results will have to be rejected as not significant based on the criterion that was employed for this study.

5.3 Recommendations

Based on the finding that there is a statistical significance between profitability and the implementation of Employee Share ownership schemes, the researcher recommends that mining companies listed on the JSE should seriously consider

using this method to improve profitability. There may be other benefits besides profitability associated with implementing an ESOP, based on the literature review, which include staff retention and enhanced industrial relations.

For companies who already have an ESOP in place, a further recommendation would be to increase the percentage of the ESOP over time should the company continue to be profitable as the actual percentages of ESOP concentration remained low over the period of study and no companies actually experimented with increasing these levels.

The funding for implementation of an ESOP need not come from company funds; funding can be sourced from various sectors, including investment banks such as the Industrial Development Bank, National Empowerment Fund or various other sources. Therefore the implementation of an ESOP can be funded from outside sources and may prove to be profitable.

5.4 Suggestions for further research

The evidence suggests a linear relationship between profitability and the implementation of employee share ownership schemes. The only conclusive evidence produced by this research is that cumulative average annual returns has a positive linear relationship with ESOP's in the JSE listed mining companies of South Africa. This theory can be tested in individual organisations or more broadly across other industries and in other countries that employ ESOP's.

Much research of ESOP's has been conducted in developed countries and some developing economies but there is very little research of the broader subject within African economies

and South Africa.

This study is limited to a small sector; this is not conducive to more detailed results, such as those of Robinson and Zhang (2005), as well as Freeman and Knoll (2008). The South African experience needs to be captured in a very detailed way such as the above mention authors have done with their studies.

Future research can perhaps ignore the initial period of implementation of an ESOP and perhaps focus on the period after the 'physiological ownership' has been achieved (Pierce et al., 1991).

The South Africa mining industry has been under the spotlight over the last couple of years for negative reasons such as Marikana (Nkosi, 2012). Future research of ESOP's can help turn this negative light into a positive one by exploring the possibilities of Employee Share Ownership and its implementation.

REFERENCES

- Abdullah, S. N. (2006). Directors' remuneration, firm's performance and corporate governance in Malaysia among distressed companies. *Corporate Governance*, 6(2), 162-174.
- Agrawal, A., & Mandelker, G. N. (1987). Managerial Incentives and Corporate Investment and Financing Decisions. *Journal of Finance*, 42(4), 823-837. doi: <http://www.blackwellpublishing.com/journal.asp?ref=0022-1082>
- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*: Sage.
- Albright, J. J. (2006). Confirmatory factor analysis using AMOS, LISREL, and MPLUS. *The Trustees of Indiana University*.
- Blasi, J., & Kruse, D. (1991). *The new owners: Employee ownership in public companies*: New York: HarperCollins.
- Bodie, Z., Kane, A., & Marcus, A. (2005). *Investments*, McGraw-Hill. *Franklin Allen, Stewart C. Myers, and Richard A. Brealey (2006) Principles of Corporate Finance, McGrawHill*, 180-222.
- Bolton, P., Scheinkman, J., & Xiong, W. (2006). Executive compensation and short-termist behaviour in speculative markets. *The Review of Economic Studies*, 73(3), 577-610.
- Breton-Miller, I. L., Miller, D., & Steier, L. P. (2004). Toward an integrative model of effective FOB succession. *Entrepreneurship Theory and Practice*, 28(4), 305-328.
- Brunello, G., Graziano, C., & Parigi, B. (2001). Executive compensation and firm performance in Italy. *International Journal of Industrial Organization*, 19(1), 133-161.
- Bryson, A., Freeman, R., Lucifora, C., Pellizzari, M., & Perotin, V. (2012). *Paying For Performance: Incentive Pay Schemes and Employees' Financial Participation*: Centre for Economic Performance, LSE.
- Chen, J. (2001). Ownership structure as corporate governance mechanism: Evidence from Chinese listed companies. *Economics of Planning*, 34(1-2), 53-72.
- Chen, S.-S., Ho, K. W., Lee, C.-f., & Yeo, G. H. (2000). Investment opportunities, free cash flow and market reaction to international joint ventures. *Journal of Banking & Finance*, 24(11), 1747-1765.
- Chhaochharia, V., & Grinstein, Y. (2007). Corporate governance and firm value: The impact of the 2002 governance rules. *The Journal of Finance*, 62(4), 1789-1825.

- Choi Sang, L., Gondyah, M. R. a. I., & Musibau, A. A. (2013). Can Employee Share Option Scheme Improve Firm's Performance? A Malaysian case study. *Information Management & Business Review*, 5(3), 119-128.
- Core, J., & Guay, W. (1999). The use of equity grants to manage optimal equity incentive levels. *Journal of accounting and economics*, 28(2), 151-184.
- DeFusco, R. A., Johnson, R. R., & Zorn, T. S. (1990). The effect of executive stock option plans on stockholders and bondholders. *The Journal of Finance*, 45(2), 617-627.
- DeFusco, R. A., Zorn, T. S., & Johnson, R. R. (1991). The association between executive stock option plan changes and managerial decision making. *Financial Management*, 36-43.
- Ding, D. K., & Sun, Q. (2001). Causes and effects of employee stock option plans: evidence from Singapore. *Pacific-Basin Finance Journal*, 9(5), 563-599.
- Duffhues, P., & Kabir, R. (2008). Is the pay–performance relationship always positive?: Evidence from the Netherlands. *Journal of multinational financial management*, 18(1), 45-60.
- Estrin, S., Grout, P., Wadhvani, S., Nickell, S. J., & King, M. (1987). Profit-Sharing and Employee Share Ownership. *Economic Policy*, 2(4), 13-62. doi: 10.2307/1344552
- Fama, E. F., Fisher, L., Jensen, M. C., & Roll, R. (1969). Economics Department of the University of Pennsylvania Institute of Social and Economic Research--Osaka University. *International Economic Review*, 10(1), 1-21.
- Fama, E. F., & Jensen, M. C. (1983). SEPARATION OF OWNERSHIP AND CONTROL. *Journal of Law & Economics*, 26(2), 301-326.
- Freeman, S. F., & Knoll, M. (2008). S Corp ESOP Legislation Benefits and Costs: Public Policy and Tax Analysis. *Organizational Dynamics Working Papers*, 4.
- Freund, B. (2007). South Africa: The end of apartheid & the emergence of the 'BEE Elite'. *Review of African Political Economy*, 34(114), 661-678.
- Frohlich, N., Godard, J., Oppenheimer, J. A., & Starke, F. A. (1998). Employee versus Conventionally-Owned and Controlled Firms: An Experimental Analysis. *Managerial and Decision Economics*, 19(4/5), 311-326. doi: 10.2307/3108241
- Garvey, G. T., & Milbourn, T. T. (2000). EVA versus earnings: does it matter which is more highly correlated with stock returns? *Journal of Accounting Research*, 209-245.
- Hallock, D. E., Salazar, R. J., & Venneman, S. (2003). A research model to

investigate the organizational impact of an ESOP. *International journal of sociology and social policy*, 23(12), 47-64.

Hamann, R. (2003). Mining Companies' Role in Sustainable Development: The 'Why' and 'How' of Corporate Social Responsibility from a Business Perspective. *Development Southern Africa*, 20(2), 237-254. doi: <http://www.tandf.co.uk/journals/titles/0376835x.asp>

Hansen, G. S., & Hill, C. W. (1991). Are institutional investors myopic? A time-series study of four technology-driven industries. *Strategic Management Journal*, 12(1), 1-16.

Haugen, R. A., & Senbet, L. W. (1981). Resolving the agency problems of external capital through options. *The Journal of Finance*, 36(3), 629-647.

Heaton, J. B. (2002). Managerial optimism and corporate finance. *Financial Management*, 33-45.

Hermansen, M. K. (1996). The conclusive argument from God. *ISLAMIC PHILOSOPHY THEOLOGY AND SCIENCE*, 25.

Horwitz, R. B., & Currie, W. (2007). Another instance where privatization trumped liberalization: The politics of telecommunications reform in South Africa—A ten-year retrospective. *Telecommunications Policy*, 31(8), 445-462.

IBM. (2013). SPSS Statistics Standard

Jensen, M., & Murphy, K. (1999). CEO incentives: it's not how much you pay, but how.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of financial economics*, 3(4), 305-360.

Jones, D. C., & Kato, T. (1995). The productivity effects of employee stock-ownership plans and bonuses: evidence from Japanese panel data. *The American Economic Review*, 391-414.

Kahn, M. (2013). Natural resources, nationalism, and nationalization. *Journal of the Southern African Institute of Mining and Metallurgy*, 113, 03-09.

Karsai, J., & Wright, M. (1994). Accountability, governance and finance in Hungarian buy-outs*. *Europe-Asia Studies*, 46(6), 997-1016.

Kelly, T. D., Matos, G. R., Buckingham, D., DiFrancesco, C., Porter, K., Berry, C., . . . Sznopce, J. (2005). *Historical statistics for mineral and material commodities in the United States*: US Geological Survey Reston, VA.

Klapper, L. F., & Love, I. (2004). Corporate governance, investor protection, and performance in emerging markets. *Journal of corporate finance*, 10(5), 703-728.

- Klein, K. J., & Hall, R. J. (1988). Correlates of employee satisfaction with stock ownership: who likes an ESOP most? *Journal of Applied Psychology*, 73(4), 630.
- Landau, I., & Ramsay, I. (2007). *Employee Share Ownership Plans in Australia: The Corporate Law Framework*: Centre for Corporate law and Securities Regulation, the Centre for Employment Relations Law and The Tax Group, The University of Melbourne.
- Leedy, P. D., & Ormrod, J. E. (2001). *Practical research*: Pearson education international.
- Legros, P., & Newman, A. F. (2008). Competing for Ownership. *Journal of the European Economic Association*, 6(6), 1279-1308. doi: 10.2307/40282705
- Levin, C., & Coburn, T. A. (2011). *Wall Street and the financial crisis: anatomy of a financial collapse*: Cosimo Reports.
- Marx, K., & Engels, F. (1961). *Das Kapital: A critique of political economy*: Gateway Editions.
- Mazibuko, N. E., & Boshoff, C. (2000). *Employee perceptions of share ownership schemes: An empirical study*. Vista University.
- Millward, N., Stevens, M., Smart, D., & Hawes, W. (1992). Workplace Industrial Relations in. *Transition*.
- Mitchell, G. (2013). Making sense of transformation claims in the South African mining industry. *Journal of the Southern African Institute of Mining and Metallurgy*, 113, 39-43.
- Mitchell, R., O'Donnell, A., & Ramsay, I. (2005). Shareholder value and employee interests: intersections between corporate governance, corporate law and labor law. *Wis. Int'l LJ*, 23, 417.
- Neville, C. (2005). Introduction to Research and Research Methods. *Bradford: Bradford*.
- Nkosi, M. (2012). South African mine owner Amplats fires 12,000 workers. *BBC News*. Retrieved from Africa News website: <http://www.bbc.co.uk/news/world-africa-19848915>
- Okeahalam, C. C. (2004). Corporate governance and disclosure in Africa: issues and challenges. *Journal of Financial Regulation and Compliance*, 12(4), 359-370.
- Pierce, J. L., Rubenfeld, S. A., & Morgan, S. (1991). Employee ownership: A conceptual model of process and effects. *Academy of Management review*, 16(1), 121-144.
- Ponte, S., & Van Sittert, L. (2007). The chimera of redistribution in post-

apartheid South Africa: 'Black Economic Empowerment' (BEE) in industrial fisheries. *African Affairs*, 106(424), 437-462.

Rees, M. (2011). Kumba R500 000 worker payout approved.

Robinson, A. M., & Zhang, H. (2005). Employee Share Ownership: Safeguarding Investments in Human Capital. *British Journal of Industrial Relations*, 43(3), 469-488. doi: 10.1111/j.1467-8543.2005.00365.x

Rosen, C. M., Klein, K. J., & Young, K. M. (1986). *Employee ownership in America: The equity solution*: Lexington Books/DC Heath and Com.

Sesil, J. C., Kroumova, M. K., Blasi, J. R., & Kruse, D. L. (2002). Broad-based Employee Stock Options in US 'New Economy' Firms. *British Journal of Industrial Relations*, 40(2), 273-294. doi: 10.1111/1467-8543.00232

Shahrokhi, M. (2011). The Global Financial Crises of 2007–2010 and the future of capitalism. *Global Finance Journal*, 22(3), 193-210.

Short, H., & Keasey, K. (1999). Managerial Ownership and the Performance of Firms: Evidence from the UK. *Journal of corporate finance*, 5(1), 79-101.

Smith, A. (1863). *An Inquiry into the Nature and Causes of the Wealth of Nations*: A. and C. Black.

Spiess, D. K., & Affleck-Graves, J. (1995). Underperformance in long-run stock returns following seasoned equity offerings. *Journal of financial economics*, 38(3), 243-267.

Stern, R., & Comstock, P. (1978). ESOPs: Benefits for whom. *Key Issues Series*, 23.

Uvalic, M. (1991). *The PEPPER Report: Promotion of employee participation in profits and enterprise results in the Member States of the European Community*: Office for Official Publications of the European Communities.

Visser, W. (2004). Sustainable business futures: setting the global agenda for corporate responsibility and 'ubuntu' capitalism. *B. Bowes, S. Pennington and G. Lundy, South Africa, 2014*, 349-351.

Weir, C., & Laing, D. (2001). Governance structures, director independence and corporate performance in the UK. *European Business Review*, 13(2), 86-95.

Weitzman, M., & Kruse, D. (1990). Profit sharing and productivity. 1990, 95-142.

Zellner, A. (1962). An efficient method of estimating seemingly unrelated regressions and tests for aggregation bias. *Journal of the American statistical Association*, 57(298), 348-368.

APPENDIX A – ALL DATA

Name	Number	Code	Sector	ESOP %
KUMBAIO	1	KIO	1757	0.03
HULAMIN	2	HLM	1757	0
EHSV	3	EHS	1757	0
RBPLAT	4	RBP	1779	0.015
EASTPLATS	5	EPS	1779	0
ATLATA	6	ATL	1779	0.03
IMPLATS	7	IMP	1779	0.03
JUBILEE	8	JBL	1779	0
LONMIN	9	LON	1779	0
NORTHAM	10	NHM	1779	0
ANGLOPLAT	11	AMS	1779	0.015
ANGGOLD	12	ANG	1777	0.014
GFIELDS	13	GFI	1777	0.026
FIUUNIT	14	FUU	1755	0
PALAMIN	15	PAM	1755	0.026
INSIMBI	16	ISB	1755	0
METMAR	17	MML	1755	0
ASSORE	18	ASR	1775	0
BAUBA	19	BAU	1775	0
GOLIATH	20	GGM	1775	0
COAL	21	CZA	1775	0
MERAPE	22	MRF	1775	0
SENTULA	23	SNU	1775	0
MIRANDA	24	MMH	1775	0
PETMIN	25	PET	1775	0
WESCOAL	26	WSL	1771	0
SACMH	27	SAH	1771	0
DELRAND	28	DRN	1773	0
ROCKWELL	29	RDI	1773	0
DIAMONDCP	30	DMC	1773	0

Name	Number	CAAR 08	CAAR 09	CAAR 10	CAAR 11	CAAR 12
KUMBAIO	1	1.00	1.72	2.63	3.13	3.56
HULAMIN	2	1.00	0.92	0.62	0.56	0.23
EHSV	3	1.00	1.04	1.44	0.61	0.23
RBPLAT	4	1.00	1.41	10.05	5.97	8.83
EASTPLATS	5	1.00	2.47	4.38	4.40	1.68
ATLATSA	6	1.00	1.84	2.65	1.10	1.05
IMPLATS	7	1.00	0.59	0.62	0.59	0.46
JUBILEE	8	1.00	0.57	0.35	0.28	0.15
LONMIN	9	1.00	0.70	0.63	0.47	0.27
NORTHAM	10	1.00	0.48	0.69	0.64	0.38
ANGLOPLAT	11	1.00	1.71	1.50	1.17	1.15
ANGGOLD	12	1.00	1.15	1.30	1.37	1.04
GFIELDS	13	1.00	1.04	1.24	1.29	1.06
FIUUNIT	14	1.00	0.00	0.14	0.08	0.00
PALAMIN	15	1.00	1.80	1.98	2.36	1.89
INSIMBI	16	1.00	1.00	0.77	0.80	0.98
METMAR	17	1.00	0.77	0.83	1.00	0.59
ASSORE	18	1.00	0.60	0.82	0.27	0.36
BAUBA	19	1.00	0.60	0.67	0.35	0.28
GOLIATH	20	1.00	0.60	0.76	1.56	1.62
COAL	21	1.00	0.37	0.40	0.28	0.16
MERAPE	22	1.00	1.68	2.05	1.21	1.04
SENTULA	23	1.00	0.12	0.13	0.13	0.10
MIRANDA	24	1.00	0.59	0.43	0.23	0.13
PETMIN	25	1.00	0.42	0.59	0.61	0.59
WESCOAL	26	1.00	0.66	1.14	0.97	0.77
SACMH	27	1.00	0.00	0.00	0.22	0.13
DELRAND	28	1.00	0.40	0.36	1.35	0.88
ROCKWELL	29	1.00	0.08	0.12	0.10	0.00
DIAMONDCP	30	1.00	0.36	0.18	0.00	0.18

Name	Share Price @ F YE 21008	Share Price @ F YE 21009	Share Price @ F YE 21010	Share Price @ F YE 21011	Share Price @ F YE 21012
KUMBAIO	160.00	275.00	421.00	501.00	569.00
HULAMIN	13.94	12.81	8.64	7.85	3.21
EHSV	58.61	60.73	84.24	35.72	13.44
RBPLAT	6.51	9.20	65.40	54.90	57.50
EASTPLAT S	2.68	6.63	11.75	11.80	4.50
ATLATSA	3.42	6.29	9.07	3.76	3.60
IMPLATS	306.01	179.10	188.55	181.12	139.26
JUBILEE	9.79	5.58	3.47	2.76	1.44
LONMIN	292.26	203.29	185.29	138.61	80.09
NORTHAM	68.10	32.64	46.69	43.82	25.85
ANGLOPL AT	456.30	782.11	684.70	534.95	526.00
ANGGOLD	252.00	290.50	327.00	344.00	262.00
GFIELDS	97.00	101.00	120.60	125.00	103.00
FIUUNIT	76.03	0.00	10.31	6.32	0.00
PALAMIN	55.61	100.29	109.89	131.25	105.00
INSIMBI	0.64	0.64	0.49	0.51	0.63
METMAR	4.26	3.30	3.55	4.24	2.51
ASSORE	822.57	493.17	676.89	220.00	294.65
BAUBA	5.00	3.00	3.34	1.74	1.40
GOLIATH	2.50	1.50	1.90	3.90	4.06
COAL	30.78	11.54	12.27	8.67	5.03
MERAFA	0.77	1.29	1.58	0.93	0.80
SENTULA	21.26	2.53	2.81	2.84	2.22
MIRANDA	1.38	0.81	0.60	0.32	0.18
PETMIN	4.70	1.96	2.75	2.86	2.79
WESCOAL	0.95	0.63	1.08	0.92	0.73
SACMH	1.14	0.00	0.00	0.25	0.15
DELRAND	1.59	0.63	0.58	2.15	1.40
ROCKWEL L	4.20	0.33	0.49	0.40	0.00
DIAMOND CP	4.44	1.60	0.80	0.00	0.80

Name	Net Prof 08	Net Prof 09	Net Prof 10	Net Prof 11	Net Prof 12
KUMBAIO	72080000	69750000	143230000	170420000	112477200
HULAMIN	268172000	89633000	73248000	79676000	132548000
EHSV	2539000000	163000000	-549000000	45000000	-943000000
RBPLAT	4437266000	4836887000	3166300000	273400000	170300000
EASTPLATS	4160000	5650000	13352000	-86988000	-113942000
ATLATSA	-13486000	-35532000	-51721000	-81929000	-32787000
IMPLATS	17596000000	6020000000	4715000000	6638000000	4177000000
JUBILEE	-3332000	-3961000	-2228000	-6821000	-6783000
LONMIN	348000000	-269000000	112000000	273000000	-410000000
NORTHAM	1492811000	630482000	641026000	349209000	310512000
ANGLOPLAT	14243000000	2993000000	9973000000	3586000000	1468000000
ANGGOLD	16105000000	2762000000	637000000	11282000000	708000000
GFIELDS	4457500000	1535600000	3555100000	7026700000	5658100000
FIUUNIT	-22347000	-16342000	-92178000	-69873000	-165099000
PALAMIN	719539000	283837000	589000000	1464000000	-97000000
INSIMBI	26559000	53746000	10642000	11993000	15634000
METMAR	67407000	174445000	161886000	46746000	80205000
ASSORE	3069522000	3241452000	1479524000	3219754000	4033013000
BAUBA	-8021000	-8224000	-25772000	-67140000	-4770000
GOLIATH	-6035000	-7369000	-337000	-6145000	-85863000
COAL	-10890000	-14520000	-101441000	-219003000	-138908000
MERAPE	1027691000	-152325000	278704000	116750000	48873000
SENTULA	113567000	278531000	239138000	35127000	-516703000
MIRANDA	-9119000	-10868000	-16704000	-54063000	-27174000
PETMIN	380353000	118364000	107717000	100982000	112682000
WESCOAL	11830000	18491000	6672000	-43618000	20602000
SACMH	-98710000	-31056000	-10031000	-98536000	-48800000
DELRAND	-103002000	-8951000	-1566000	-123000	-239000
ROCKWELL	-9403000	-12976000	-7037000	-5127000	0
DIAMONDCP	-4285000	-4207000	-3315000	-3823000	-3016000

Name	Tot Ass 08	Tot Ass 09	Tot Ass 10	Tot Ass 11	Tot Ass 12
KUMBAIO	167030000	178070000	278750000	344130000	365360000
HULAMIN	7640997000	6884328000	7324426000	7471596000	7481294000
EHSV	5337000000	4897000000	4063000000	4458000000	3667000000
RBPLAT	1849723700	2488552200	1541350000	1721750000	1794700000
	0	0	0	0	0
EASTPLATS	872227000	706850000	1126975000	282370000	151227000
ATLATSA	15174000	1001833000	1075640000	880120000	814065000
	6109100000	5666200000	6155300000	6658600000	7160900000
IMPLATS	0	0	0	0	0
JUBILEE	25149000	8193000	22150000	21837000	14632000
LONMIN	3073000000	3136000000	3733000000	3756000000	4121000000
			1008930700	1192957100	1224385200
NORTHAM	4119526000	9348350000	0	0	0
	6866800000	7582100000	8380100000	8728000000	8594700000
ANGLOPLAT	0	0	0	0	0
	7479900000	7145400000	6135200000	8517200000	
ANGGOLD	0	0	0	0	7963000000
	5845660000	6079570000	6735540000	7982310000	7067680000
GFIELDS	0	0	0	0	0
FIUUNIT	387742000	566472000	684643000	805866000	660310000
PALAMIN	6580599000	7003043000	7571000000	7195000000	7119000000
INSIMBI	201842000	239364000	211823000	251651000	271000000
METMAR	544755000	846529000	1023153000	1278392000	1671880000
	1005833000	1115832100	1234725200	1502938700	1743480500
ASSORE	0	0	0	0	0
BAUBA	22741000	49849000	36307000	28898000	29159000
GOLIATH	39876000	27167000	26776000	34763000	168551000
COAL	498349000	533961000	775232000	570879000	535080000
MERAPE	3754350000	3403899000	3817608000	3922138000	4292112000
SENTULA	3988879000	4514982000	4622522000	3980336000	3415706000
MIRANDA	27798000	28144000	44295000	28117000	25477000
PETMIN	1327001000	1466405000	1591930000	1788877000	2036242000
WESCOAL	119534000	182103000	183135000	208270000	213038000
SACMH	203596000	134618000	183255000	180558000	180937000
DELRAND	19112000	6778000	5228000	5274000	5660000
ROCKWELL	133693000	106363000	105243000	110184000	0
DIAMONDCP					
	9985000	7195000	11307000	7867000	13588000

Name	Number	ROA 08	ROA 09	ROA 10	ROA 11	ROA 12
KUMBAIO	1	0.432	0.392	0.514	0.495	0.308
HULAMIN	2	0.035	0.013	0.010	0.011	0.018
EHSV	3	0.476	0.033	0.135	0.010	0.257
RBPLAT	4	0.240	0.194	0.205	0.016	0.009
EASTPLATS	5	0.005	0.008	0.012	0.308	0.753
ATLATSA	6	0.889	0.035	0.048	0.093	0.040
IMPLATS	7	0.288	0.106	0.077	0.100	0.058
JUBILEE	8	0.132	0.483	0.101	0.312	0.464
LONMIN	9	0.113	0.086	0.030	0.073	0.099
NORTHAM	10	0.362	0.067	0.064	0.029	0.025
ANGLOPLAT	11	0.207	0.039	0.119	0.041	0.017
ANGGOLD	12	0.215	0.039	0.010	0.132	0.089
GFIELDS	13	0.076	0.025	0.053	0.088	0.080
FIUUNIT	14	0.058	0.029	0.135	0.087	0.250
PALAMIN	15	0.109	0.041	0.078	0.203	0.014
INSIMBI	16	0.132	0.225	0.050	0.048	0.058
METMAR	17	0.124	0.206	0.158	0.037	0.048
ASSORE	18	0.305	0.290	0.120	0.214	0.231
BAUBA	19	0.353	0.165	0.710	2.323	0.164
GOLIATH	20	0.151	0.271	0.013	0.177	0.509
COAL	21	0.022	0.027	0.131	0.384	0.260
MERAFAE	22	0.274	0.045	0.073	0.030	0.011
SENTULA	23	0.028	0.062	0.052	0.009	0.151
MIRANDA	24	0.328	0.386	0.377	1.923	1.067
PETMIN	25	0.287	0.081	0.068	0.056	0.055
WESCOAL	26	0.099	0.102	0.036	0.209	0.097

		-	-	-	-	-
SACMH	27	0.485	0.231	0.055	0.546	0.270
		-	-	-	-	-
DELRAND	28	5.389	1.321	0.300	0.023	0.042
		-	-	-	-	-
ROCKWELL	29	0.070	0.122	0.067	0.047	0.000
		-	-	-	-	-
DIAMONDCP	30	0.429	0.585	0.293	0.486	0.222

Number of
employees
per year

Name

KUMBAIO	1		5171	5248	5845	5750
HULAMIN	2		2555	2482	2516	2188
EHSV	3		2626	2321	2506	2565
RBPLAT	4		7671	7671	7671	7942
EASTPLATS	5	-	-	-	-	-
ATLATSA	6	-	-	-	-	-
IMPLATS	7		32035	33229	38317	32909
JUBILEE	8		9	1	1	61
LONMIN	9		25362	22000	22781	25097
NORTHAM	10		9000	8462	9042	9983
ANGLOPLAT	11		50152	55829	48509	58541
ANGGOLD	12		62895	63364	62046	61242
GFIELDS	13		51192	49715	44672	48524
FIUUNIT	14	-	-	-	-	-
PALAMIN	15		2198	2021	2250	2321
INSIMBI	16	-	-	-	-	-
METMAR	17	-	-	-	-	-
ASSORE	18	-	-	-	-	-
BAUBA	19	-	-	-	-	-
GOLIATH	20	-	-	-	-	-
COAL	21		128	112	427	456
MERAPE	22		5897	6326	6337	6444
SENTULA	23		3757	3757	4367	3585
MIRANDA	24	-	-	-	-	-
PETMIN	25		1102	652	663	1048
WESCOAL	26	-	-	-	-	-

SACMH	27	-	-	-	-	-
DELRAND	28	-	-	-	-	-
ROCKWELL	29	-	-	-	-	-
DIAMONDCP	30		99	59	23	29

Name	P-L per Emp 08	P-L per Emp 09	P-L per Emp 10	P-L per Emp 11	P-L per Emp 12
KUMBAIO	13939	13291	24505	29638	18212
HULAMIN	104960	36113	29113	36415	63511
EHSV	966870	70228	-219074	17544	-420419
RBPLAT	578447	630542	412762	34425	22725
EASTPLATS					
ATLATSA					
IMPLATS	549274	181167	123052	201708	126338
JUBILEE	-370222	-3961000	-2228000	-111820	-94208
LONMIN	13721	-12227	4916	10878	-14524
NORTHAM	165868	74507	70894	34980	26601
ANGLOPLAT					
	283997	53610	205591	61256	-26038
ANGGOLD	-256062	-43589	10267	184220	10756
GFIELDS	87074	30888	79582	144809	116614
FIUUNIT					
PALAMIN	327361	140444	261778	630763	-42544
INSIMBI					
METMAR					
ASSORE					
BAUBA					
GOLIATH					
COAL	-85078	-129643	-237567	-480270	-188990
MERAPE	174274	-24079	43980	18118	7274
SENTULA	30228	74137	54760	9798	-155587
MIRANDA					
PETMIN	345148	181540	162469	96357	117499
WESCOAL					
SACMH					
DELRAND					
ROCKWELL					

DIAMONDC
P

-43283

-71305

-144130

-131828

-58000

Name	HEPS 08	HEPS 09	HEPS 10	HEPS 11	HEPS 12
KUMBAIO	2302	2182	4467	5313	3797
HULAMIN	124	42	27	25	57
EHSV	2650.1	168.1	-386.3	-15.1	-1022
RBPLAT	179766	-1072	192	167	104
EASTPLATS	0	1	2	0	-12
ATLATSA	-7	-12	-12	-19	40
IMPLATS	2065	1001	786	1105	685
JUBILEE	-3.5	-0.1	-1.4	-2.7	-2.4
LONMIN	413.9	-139	62	135.8	7.4
NORTHAM	627.2	172.2	177.8	89.5	80.9
ANGLOPLAT	5609	298	1935	1365	-562
ANGGOLD	-1379	-1880	259	2773	296
GFIELDS	459	431	438	970	816
FIUUNIT	-18	-12	-56	-38	-69
PALAMIN	1493	598	1128	3036	-201
INSIMBI	8.6	20.9	4.1	3.9	6.1
METMAR	37.2	100.6	16.9	23.1	34.1
ASSORE	11362	13772	6243	2690	3519
BAUBA	-0.9	-0.7	-38.8	-41.7	-7
GOLIATH	-1.8	-2.2	-1.2	-16	-23
COAL	-4.1	-2.8	-22.2	-0.4	-0.2
MERAPE	42	-6	11	6	5
SENTULA	-8.2	109.1	0.6	16.1	21.7
MIRANDA	-4.5	-4.5	-6.7	-11.3	-8.71
PETMIN	15.3	22.3	19.1	17.5	19.1
		-	-	-	
WESCOAL	0	570000	964000	144000	0
SACMH	-13.40	-18.60	-0.50	-20.70	-11.51
DEL RAND	-420	-27	-2	0	0
ROCKWELL	-5	-5	-3	-1	0
DIAMONDCP	-11.6	-6.2	-2.3	-2.4	-1.22

Name	DEBT 08	DEBT 09	DEBT 10	DEBT 11	DEBT 12
KUMBAIO	8197000000	8851000000	9499000000	13821000000	17227000000
HULAMIN	3910366000	3169923000	2748238000	2849470000	2704549000
EHSV	2495000000	1823000000	1553000000	1838000000	1929000000
RBPLAT	2302929000	4357336000	4099500000	4355400000	4620800000
EASTPLATS	163691000	77338000	857960000	270090000	404590000
ATLATSA	16503000	804707000	970740000	921094000	608808000
IMPLATS	16806000000	14877000000	16838000000	17994000000	20152000000
JUBILEE	378000	549000	19706000	26205000	23431000
LONMIN	1541000000	1411000000	1742000000	1521000000	1878000000
NORTHAM	1215655000	1016164000	1256153000	1814219000	1830605000
ANGLOPLAT	39172000000	43188000000	28783000000	30537000000	45481000000
ANGGOLD	52456000000	50246000000	35606000000	45320000000	72260000000
GFIELDS	20354300000	22585200000	25191800000	36220500000	41880000000
FIUUNIT	201778000	342879000	458017000	572093000	777390000
PALAMIN	3912678000	5328334000	5361000000	3543000000	2988000000
INSIMBI	227714000	187370000	178825000	210340000	222743000
METMAR	355065000	550903000	600853000	731734000	1181872000
ASSORE	5780051000	4441000000	4380521000	4152143000	4538147000
BAUBA	21996000	25734000	34816000	36064000	1331000
GOLIATH	2942000	2945000	2991000	4109000	18952000
COAL	7061000	14028000	152353000	160888000	176570000
MERAPE	1275012000	1070363000	1242603000	1263470000	1582483000
SENTULA	2393945000	2686410000	2136677000	1479186000	1424860000
MIRANDA	7422000	14119000	30581000	49695000	58355000
PETMIN	334177000	354229000	354916000	473604000	631054000
WESCOAL	97926000	95809000	81527000	132293000	124516000
SACMH	375310000	380316000	447001000	528304000	520150000
DELRAND	16547000	1462000	1363000	706000	932000
ROCKWELL	34644000	34060000	27400000	26978000	0
DIAMONDCP	4167000	3881000	2855000	513000	5122000

Name	Equity 08	Equity 09	Equity 10	Equity 11	Equity 12
KUMBAIO	8506000000	8956000000	18376000000	20592000000	19309000000
HULAMIN	3760146000	3744279000	4609534000	4669625000	4776749000
EHSV	2842000000	3074000000	2510000000	2620000000	1738000000
RBPLAT	10036445000	25659566000	14351200000	15137200000	15480600000
EASTPLATS	708536000	629512000	104117900	378902000	282376000
ATLATSA	-1329000	209508000	121366000	-28085000	-18792000
IMPLATS	45303000000	42803000000	45733000000	49610000000	52475000000
JUBILEE	31245000	37080000	83150000	83854000	73118000
LONMIN	2594000000	2802000000	3082000000	3341000000	2745000000
NORTHAM	2903871000	8332186000	8833154000	10115352000	10413247000
ANGLOPLAT	29496000000	36900000000	60840000000	59120000000	50100000000
ANGGOLD	23759000000	22527000000	27034000000	41488000000	54690000000
GFIELDS	42561200000	42669400000	46622500000	48061500000	53457400000
FIUUNIT	185964000	223593000	226626000	233773000	-117080000
PALAMIN	2672026000	1679580000	2218000000	3659000000	4143000000
INSIMBI	4066000	91932000	72936000	79749000	87863000
METMAR	195882000	361430000	487172000	608572000	645098000
ASSORE	4281387000	6720248000	7969478000	10879811000	12923360000
BAUBA	745000	24115000	1491000	284000	45134000
GOLIATH	36934000	25722000	26785000	30654000	149599000
COAL	494458000	523640000	626419000	430791000	377267000
MERAPE	2479338000	2333536000	2575005000	2658668000	2709629000
SENTULA	1979633000	2264021000	2914614000	2932835000	2430775000
MIRANDA	337817000	348778000	353326000	12469000	-8277000
PETMIN	1007858000	1119101000	1241421000	1317162000	1405188000
WESCOAL	58333000	154420000	166655000	136632000	157061000
SACMH	198656000	173701000	157920000	59384000	10585000
DELRAND	2565000	5316000	3865000	4568000	4728000
ROCKWELL	99049000	72303000	77843000	83206000	0
DIAMONDCP	12735000	10443000	18006000	16602000	13073000

Name	D/E 08	D/E 09	D/E 10	D/E 11	D/E 12
KUMBAIO	0.96	0.99	0.52	0.67	0.89
HULAMIN	1.04	0.85	0.60	0.61	0.57
EHSV	0.88	0.59	0.62	0.70	1.11
RBPLAT	0.23	0.17	0.29	0.29	0.30
EASTPLATS	0.23	0.12	8.24	0.71	1.43
ATLATSA	-12.42	3.84	8.00	-32.80	-32.40
IMPLATS	0.37	0.35	0.37	0.36	0.38
JUBILEE	0.01	0.01	0.24	0.31	0.32
LONMIN	0.59	0.50	0.57	0.46	0.68
NORTHAM	0.42	0.12	0.14	0.18	0.18
ANGLOPLAT	1.33	1.17	0.47	0.52	0.91
ANGGOLD	2.21	2.23	1.32	1.09	1.32
GFIELDS	0.48	0.53	0.54	0.75	0.78
FIUUNIT	1.09	1.53	2.02	2.45	-6.64
PALAMIN	1.46	3.17	2.42	0.97	0.72
INSIMBI	56.00	2.04	2.45	2.64	2.54
METMAR	1.81	1.52	1.23	1.20	1.83
ASSORE	1.35	0.66	0.55	0.38	0.35
BAUBA	29.52	1.07	23.35	126.99	0.03
GOLIATH	0.08	0.11	0.11	0.13	0.13
COAL	0.01	0.03	0.24	0.37	0.47
MERAPE	0.51	0.46	0.48	0.48	0.58
SENTULA	1.21	1.19	0.73	0.50	0.59
MIRANDA	0.02	0.04	0.09	3.99	-7.05
PETMIN	0.33	0.32	0.29	0.36	0.45
WESCOAL	1.68	0.62	0.49	0.97	0.79
SACMH	1.89	2.19	2.83	8.90	49.14
DELRAND	6.45	0.28	0.35	0.15	0.20
ROCKWELL	0.35	0.47	0.35	0.32	0.00
DIAMONDCP	0.33	0.37	0.16	0.03	0.39

APPENDIX B –STATISTICS

Profitability

Correlations					
		CAAR 09	CAAR 10	CAAR 11	CAAR 12
ESOP	Pearson Correlation	.511	.340	.378	.392
	Sig. (1-tailed)	.002	.033	.020	.016
	N	30	30	30	30

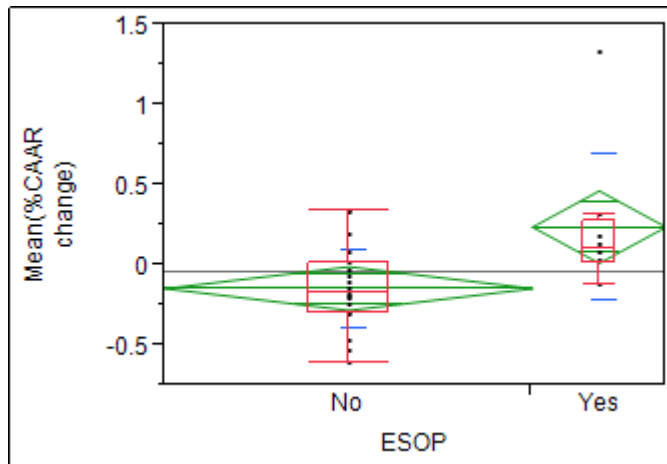
Correlations						
		HEPS 08	HEPS 09	HEPS 10	HEPS 11	HEPS 12
ESOP	Pearson Correlation	.159	.105	.108	.135	.326
	Sig. (1-tailed)	.200	.290	.284	.239	.039
	N	30	30	30	30	30

Productivity:

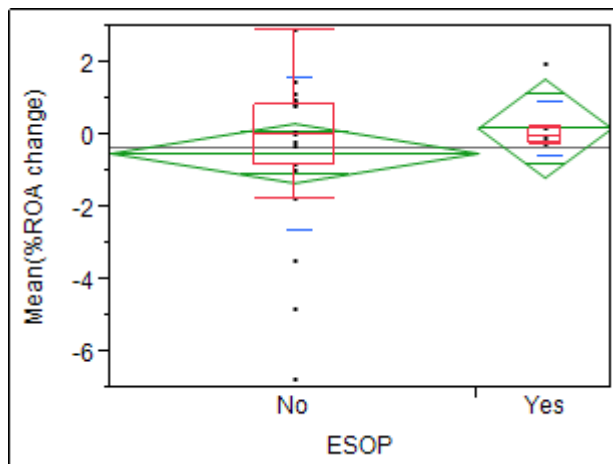
Correlations						
		ROA 08	ROA 09	ROA 10	ROA 11	ROA 12
ESOP	Pearson Correlation	.103	.300	.425	.318	.376
	Sig. (1-tailed)	.294	.054	.010	.043	.020
	N	30	30	30	30	30

Correlations						
		D/E 08	D/E 09	D/E 10	D/E 11	D/E 12
ESOP	Pearson Correlation	-.229	.432	.001	-.214	-.278
	Sig. (1-tailed)	.112	.009	.499	.128	.068
	N	30	30	30	30	30

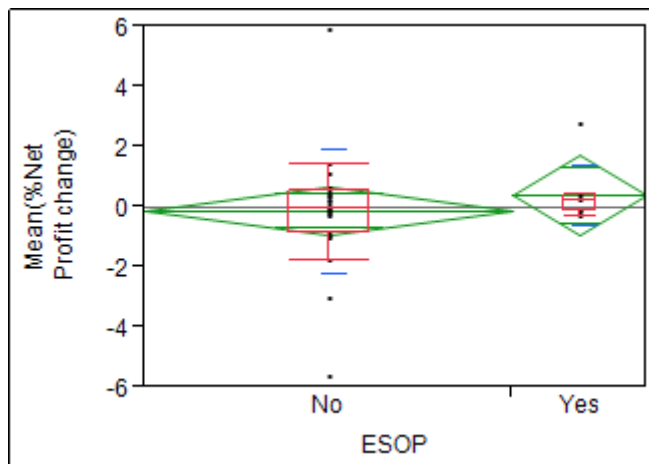
Correlations						
		Profit / Loss per Employee				
		2008	2009	2010	2011	2012
ESOP	Pearson Correlation	.167	.234	.312	.573	.417
	Sig. (1-tailed)	.261	.183	.111	.008	.048
	N	17	17	17	17	17



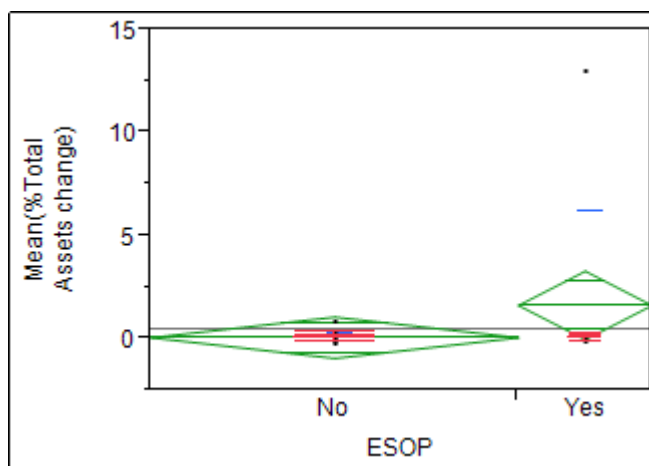
ESOP	N	CAAR mean %Change	Std Dev	ANOVA $F_{1,29}$	p-value	Welch $F_{1,29}$	p-value	χ^2 value DF=1	p-value
No	22	-0.142	0.2457	8.8801	0.0059	5.1266	0.0514	7.6562	0.0057
Yes	8	0.241	0.4556						



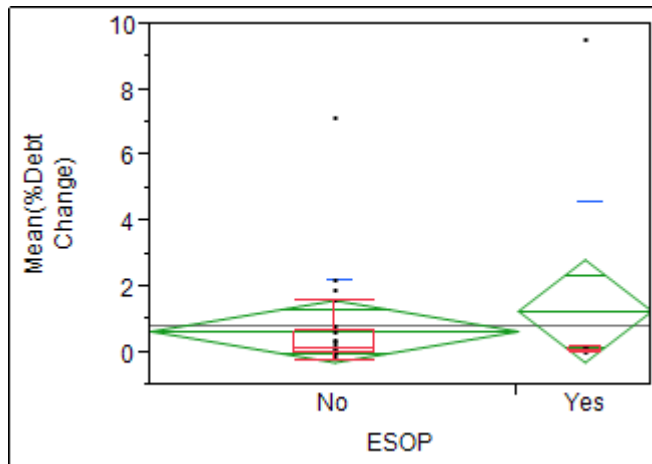
ESOP	N	ROA mean %Change	Std Dev	ANOVA $F_{1,29}$	p-value	Welch $F_{1,29}$	p-value	χ^2 value DF=1	p-value
No	22	-0.493	2.1324	0.7885	0.3821	1.7395	0.1979	0.2199	0.6391
Yes	8	0.196	0.7331						



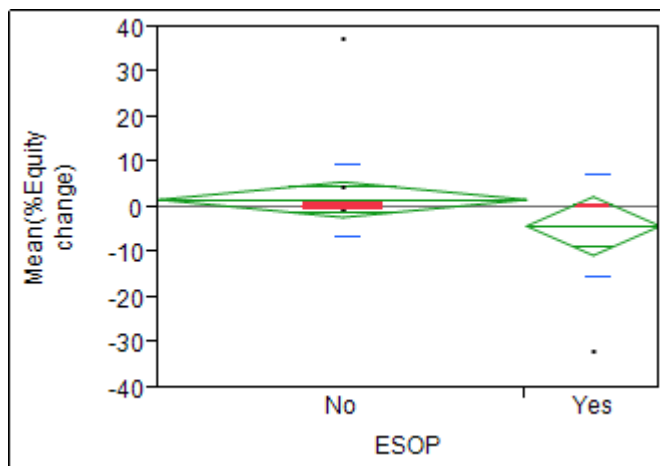
ESOP	N	Net profit mean %change	Std Dev	ANOVA $F_{1,29}$	p-value	Welch $F_{1,29}$	p-value	χ^2 -value DF=1	p-value
No	22	-0.123	2.0517	0.4782	0.4949	0.8911	0.3540	0.4949	0.4818
Yes	8	0.402	0.9768						



ESOP	N	Tot Assets mean %change	Std Dev	ANOVA $F_{1,29}$	p-value	Welch $F_{1,29}$	p-value	χ^2 -value DF=1	p-value
No	22	0.082	0.1999	2.7290	0.1097	0.9350	0.3657	0.0022	0.9626
Yes	8	1.647	4.5750						



ESOP	N	Debt mean %change	Std Dev	ANOVA $F_{1,29}$	p-value	Welch $F_{1,29}$	p-value	χ^2 -value DF=1	p-value
No	22	0.658	1.5923	0.4833	0.4927	0.2565	0.6259	0.4311	0.5115
Yes	8	1.278	3.3290						



ESOP	N	Debt mean %change	Std Dev	ANOVA $F_{1,29}$	p-value	Welch $F_{1,29}$	p-value	χ^2 -value DF=1	p-value
No	22	1.976	7.992	2.5056	0.2115	1.7916	0.2115	0.2199	0.6391
Yes	8	-3.885	11.410						

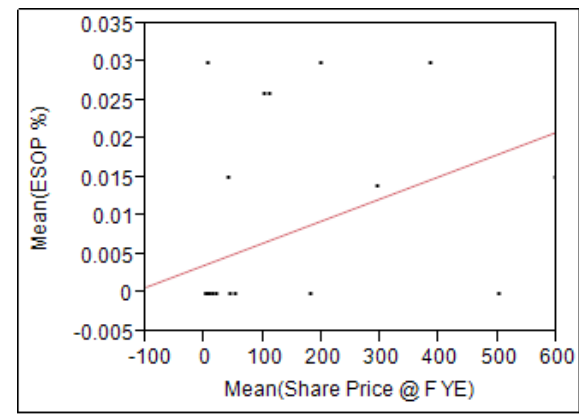
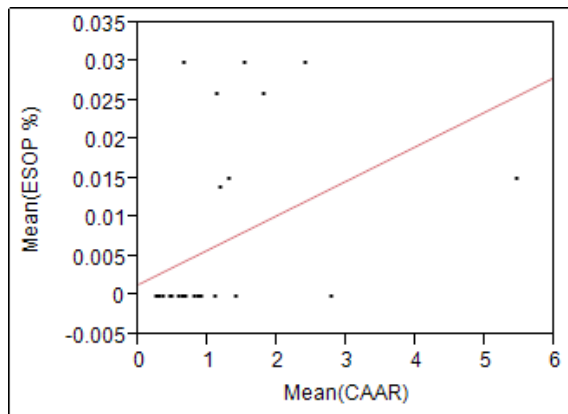
Indicator	ESOP %	CAAR	Share Price @ FYE	Net Prof	Tot Ass	ROA	HEPS	DEBT	Equity
ESOP %	1	0.4115	0.4108	0.5126	0.5466	0.3226	0.1224	0.5107	0.6405
CAAR	0.4115	1	0.1120	0.1492	0.1130	0.2455	0.0960	0.1105	0.1833

Share Price @ F YE	0.4108	0.1120	1	0.5325	0.6188	0.3938	0.1114	0.6573	0.6402
Net Prof	0.5126	0.1492	0.5325	1	0.7640	0.2810	0.0983	0.4387	0.8046
Tot Ass	0.5466	0.1130	0.6188	0.7640	1	0.2666	0.1018	0.8976	0.9744
ROA	0.3226	0.2455	0.3938	0.2810	0.2666	1	-0.0519	0.2550	0.3263
HEPS	0.1224	0.0960	0.1114	0.0983	0.1018	-0.0519	1	0.0880	0.1135
DEBT	0.5107	0.1105	0.6573	0.4387	0.8976	0.2550	0.0880	1	0.8638
Equity	0.6405	0.1833	0.6402	0.8046	0.9744	0.3263	0.1135	0.8638	1

Mean % ESOP vs Mean CAAR

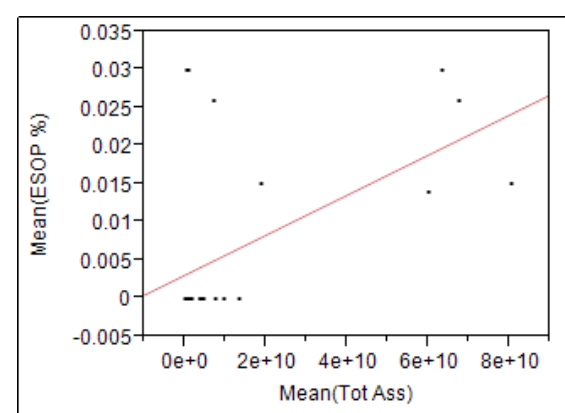
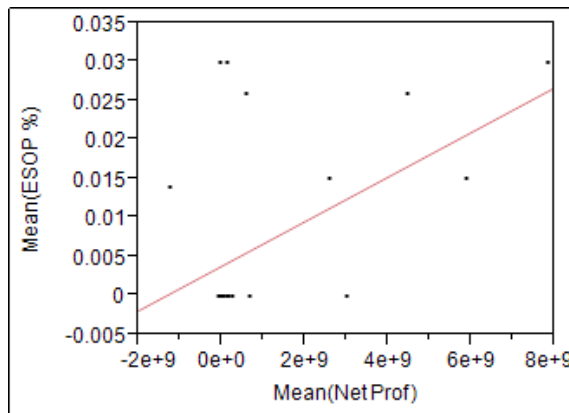
Mean %

ESOP vs Mean Share price for YE

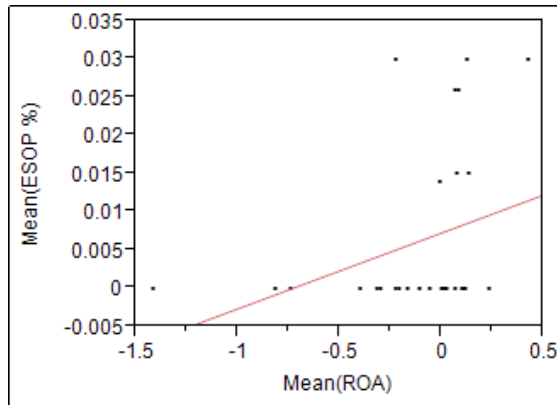


Mean % ESOP vs Mean Net Profit
Tot Assets

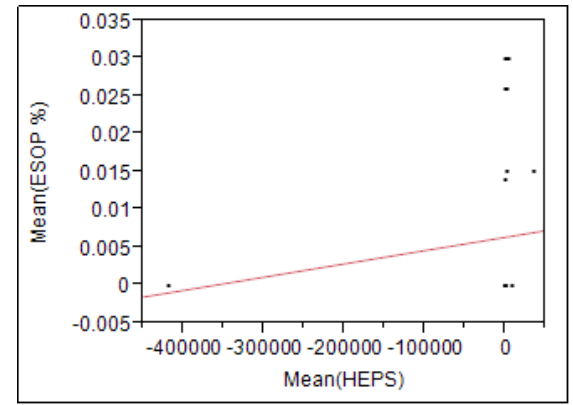
Mean % ESOP vs Mean



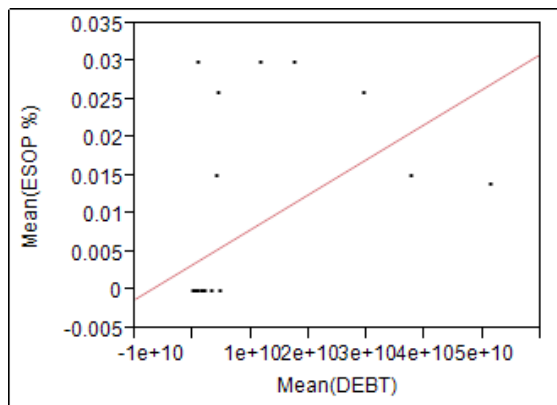
Mean % ESOP vs Mean ROA
Mean HEPS



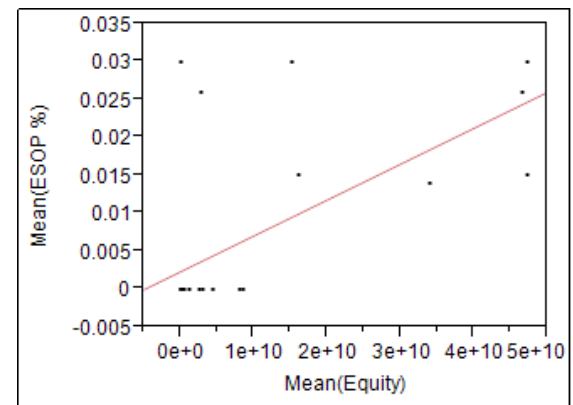
Mean % ESOP vs



Mean % ESOP vs Mean Debt
Mean Equity



Mean % ESOP vs



CAAR 2012

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.392 ^a	.153	.123	1.5523080

a. Predictors: (Constant), ESOP

ANOVA^a

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.224	1	12.224	5.073	.032 ^b
	Residual	67.470	28	2.410		
	Total	79.694	29			

a. Dependent Variable: CAAR_12

b. Predictors: (Constant), ESOP

Coefficients^a

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.629	.326		1.929	.064
	ESOP	58.722	26.072	.392	2.252	.032

a. Dependent Variable: CAAR_12

CAAR 2011

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.378 ^a	.143	.113	1.2465134

a. Predictors: (Constant), ESOP

ANOVA^a

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.270	1	7.270	4.679	.039 ^b
	Residual	43.506	28	1.554		
	Total	50.776	29			

a. Dependent Variable: CAAR_11

b. Predictors: (Constant), ESOP

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.823	.262		3.140	.004
	ESOP	45.286	20.936	.378	2.163	.039
a. Dependent Variable: CAAR_11						

CAAR 2010

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.340 ^a	.116	.084	1.8191299
a. Predictors: (Constant), ESOP				

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.131	1	12.131	3.666	.066 ^b
	Residual	92.659	28	3.309		
	Total	104.790	29			
a. Dependent Variable: CAAR_10						
b. Predictors: (Constant), ESOP						

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.953	.382		2.492	.019
	ESOP	58.500	30.554	.340	1.915	.066
a. Dependent Variable: CAAR_10						

CAAR 2009

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.511 ^a	.261	.235	.5449846
a. Predictors: (Constant), ESOP				

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.937	1	2.937	9.890	.004 ^b
	Residual	8.316	28	.297		
	Total	11.254	29			
a. Dependent Variable: CAAR_09						
b. Predictors: (Constant), ESOP						

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.678	.115		5.917	.000
	ESOP	28.787	9.154	.511	3.145	.004
a. Dependent Variable: CAAR_09						

ROA 2012

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.376 ^a	.142	.111	.267855		
a. Predictors: (Constant), ESOP						
ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.331	1	.331	4.618	.040 ^b
	Residual	2.009	28	.072		
	Total	2.340	29			
a. Dependent Variable: ROA 12						

b. Predictors: (Constant), ESOP

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.176	.056		-3.132	.004
	ESOP	9.668	4.499	.376	2.149	.040
a. Dependent Variable: ROA_12						

Profit/ loss per Employee 2012

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.417 ^a	.174	.119	125610.5421349
a. Predictors: (Constant), ESOP				

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	49900557426.927	1	49900557426.927	3.163	.096 ^b
	Residual	236670124431.486	15	15778008295.432		
	Total	286570681858.414	16			
a. Dependent Variable: P_L_per_Emp_12						
b. Predictors: (Constant), ESOP						

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-71007.744	38594.779		-1.840	.086
	ESOP	4592002.787	2582114.726	.417	1.778	.096
a. Dependent Variable: P_L_per_Emp_12						

HEPS 2012

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.326 ^a	.107	.075	937.507
a. Predictors: (Constant), ESOP				

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2935141.505	1	2935141.505	3.339	.078 ^b
	Residual	24609750.362	28	878919.656		
	Total	27544891.867	29			
a. Dependent Variable: HEPS_12						
b. Predictors: (Constant), ESOP						

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	73.860	197.049		.375	.711
	ESOP	28775.220	15746.307	.326	1.827	.078
a. Dependent Variable: HEPS_12						

Debt Equity Ratio 2012

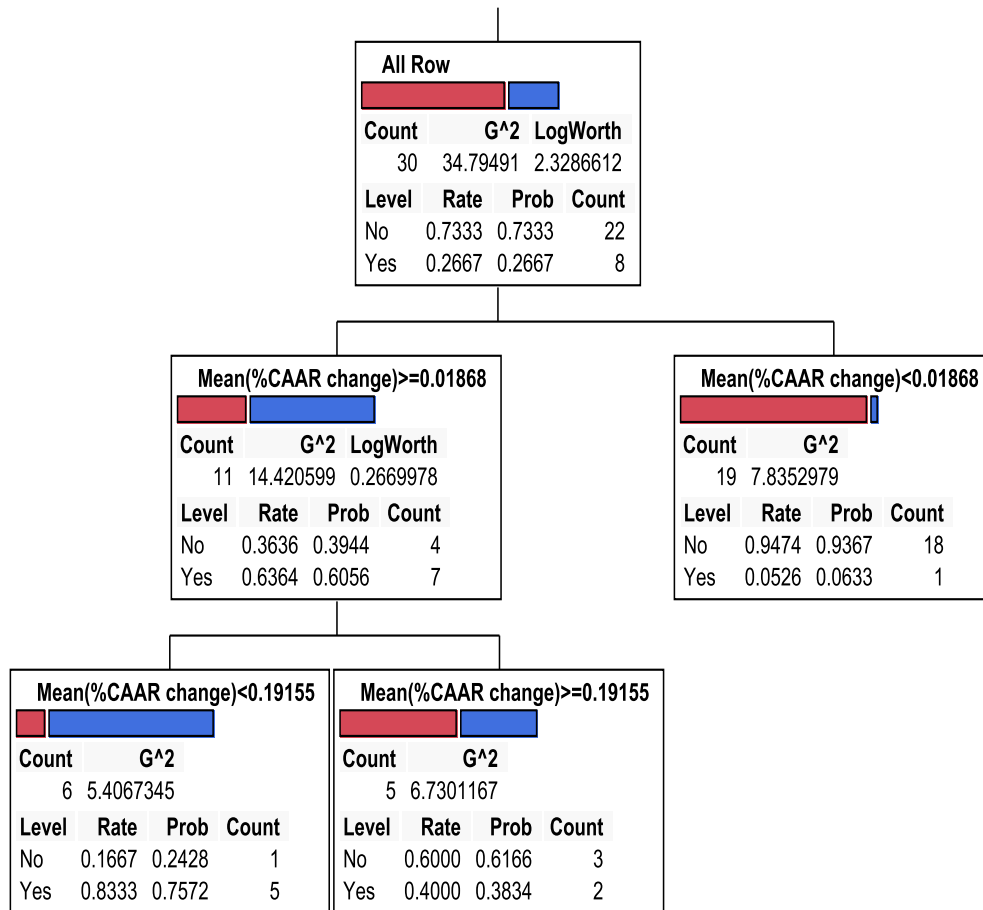
Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.278 ^a	.077	.044	10.8378011
a. Predictors: (Constant), ESOP				

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	275.419	1	275.419	2.345	.137 ^b
	Residual	3288.822	28	117.458		

	Total	3564.241	29			
a. Dependent Variable: D_E_12						
b. Predictors: (Constant), ESOP						

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.428	2.278		1.066	.296
	ESOP	-278.741	182.031	-.278	-1.531	.137
a. Dependent Variable: D_E_12						

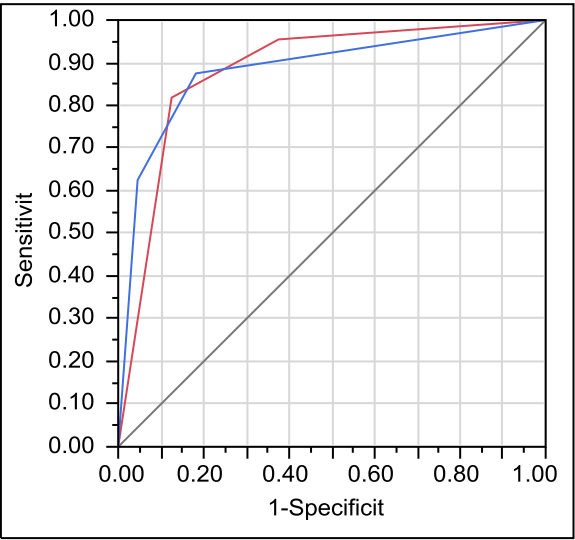
In the partitioning or splits below, there are 30 observations (businesses) of which 8 have implemented ESOP (Yes) and 22 have not implemented ESOP (No).



The following leaf report displays the count and probability distribution:

Leaf Label	No	Yes
Mean(%CAAR change)>=0.018681&Mean(%CAAR change)<0.191552	0.24277	0.7572
Mean(%CAAR change)>=0.018681&Mean(%CAAR change)>=0.191552	0.61657	0.3834
Mean(%CAAR change)<0.018681	0.93666	0.0633
Mean(%CAAR change)>=0.018681&Mean(%CAAR change)<0.191552	1	5
Mean(%CAAR change)>=0.018681&Mean(%CAAR change)>=0.191552	3	2
Mean(%CAAR change)<0.018681	18	1

Receiver Operating Characteristic



ESOP		Area
No		0.8835
Yes		0.8835

Measure	Training Definition
Entropy RSquare	0.4188 $1 - \text{Loglike}(\text{model}) / \text{Loglike}(0)$
Generalized RSquare	0.5605 $(1 - (L(0)/L(\text{model}))^{2/n}) / (1 - L(0)^{2/n})$
Mean -Log p	0.3370 $\sum -\text{Log}(p[i]) / n$
RMSE	0.3172 $\sqrt{\sum (y[i] - p[i])^2 / n}$
Mean Abs Dev	0.2144 $\sum y[i] - p[i] / n$
Misclassification Rate	0.1333 $\sum (p[i] \neq p_{\text{Max}}) / n$
N	30 n

Confusion Matrix

Actual

Predicted

Trainin	No	Yes
g		
No	21	1
Yes	3	5