A SEARCH FOR FIRM CHARACTERISTICS THAT EXPLAIN OPTION-GRANTING BEHAVIOUR IN SOUTH AFRICA

A DISSERTATION PRESENTED TO
THE DEPARTMENT OF ACCOUNTING
UNIVERSITY OF CAPE TOWN

IN FULFILMENT
OF THE REQUIREMENTS FOR THE
MASTERS OF COMMERCE
DEGREE

By

TARYN MILLER

JUNE 2003

ACKNOWLEDGEMENTS

Many thanks go to:

Associate Professor Mark Graham for supervising this report, and for his advise, constant availability, encouragement and sense of humour.

Craig West for giving up much of his time to provide excellent guidance that enabled me to complete this dissertation timeously.

The Department of Accounting at the University of Cape Town for their assistance and support, in particular Mike Wormald, Geoff Everingham, Alex Watson, Tessa Minter, Shannon Baker, Keith Huxham, Collin Smith and Ilse Lubbe.

Neal Smith from Alliance Capital for his help with obtaining the data.

Cadiz Holdings Ltd, for their assistance with the Black-Scholes Model.

My academic article colleagues for their support and fun.

My husband Jonathan Miller and my family.

The Holy Spirit for His peace and guidance.

I certify that, except as noted above, this dissertation is my own work (except where acknowledgments otherwise indicate) and has not been submitted, in whole or on part, as a submission for another degree at this or any other university.

T K MILLER

June 2003

ABSTRACT

Share options have become a popular, frequently rewarding and incentive-providing form of remuneration for executive directors and other employees. Previous international research has shown that the firm's decision to grant share options may be influenced by its financial reporting situation; its tax position; the existence of conflicting interests between management and other stakeholders; as well as the firm's size and liquidity situation.

The reasons why the conflict of interest has been found to be significantly associated with the granting of share options is because share options can align the interests of management with those of the shareholders and in so doing reduce the extent of agency costs. The lack of an accounting requirement to recognise share options as an expense has also been found to influence the firm's decision to grant share options depending on its financial reporting position. The firm's tax position has also been associated with the decision to grant options based on the fact that firms cannot obtain a tax deduction for the value of share options granted. Finally, large firms with liquidity constraints have been found to be more likely to grant share options, due to the lack of available cash reserves for the payment of salaries.

There has been no research as to whether the above explanatory variables influence the granting of share options by South African firms. The objective of this study is to investigate whether the variables that were identified internationally as being associated with share option grants apply to grants made to South African executive directors.

This study examines whether the extent of share options granted is associated with various financial reporting and tax indicators, proxies for agency costs, the firm's size and its liquidity. Data from 61 firms over 2000 and 2001 was obtained. A total of 33 firms that granted share options were examined together with 28 firms that did not. The value of share options was measured using the dividend-adjusted Black Scholes model, and the dependent variable was calculated to be the value of share options granted during the year divided by the sum of the value of share options granted and the annual cash salary paid to the executives. This variable was regressed against thirteen independent variables identified in previous research.

The results of this research indicate strongly that the larger the firm and the greater the extent of future growth opportunities (represented by the ratio of research and development to total assets), the more likely it is that firms will grant options, both of which are consistent with existing theory. Option granting behaviour was also found to differ across industries and there was some evidence that the more difficult it is to monitor executive's performance (represented by the ratio of the variance in return on equity to the variance in share price), the more likely it is that the firm will grant options.

Variables that were statistically significant but in the opposite direction to what was expected were growth in assets and the market-to-book ratio, both of which were negatively correlated with option granting behaviour. This inconsistency may however be due to the fact that the data from the sample may not be a true reflection of the population.

Financial reporting incentives, tax disincentives, liquidity, and two proxies for agency costs (the variance of market-adjusted returns and the ratio of the variance of market-adjusted returns to total returns) were not found to be significantly associated with option granting. This suggests that the lack of a requirement to recognise share options as an expense; no deductions of share options for tax purposes; the fact that executive's choose to invest in projects that yield highly variable returns; and that firms that have a large amount of noise in their share price relative to the market, do not influence the decision to grant share options in South Africa.

It therefore appears that the key drivers for granting share options to South African executive directors are firm size, unclear signals between earnings performance and the quality of manager's decisions and the desire to reduce agency costs by encouraging managers to focus on long-term investment opportunities.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER 1

INTRODUCTION

1.1 Background

The use of share options as a form of remuneration for executive directors and employees has become a popular means of compensation in South Africa and throughout the world. Share options give the holder of the option the right to acquire shares at a future date at a specified price. They therefore provide an incentive for management to increase the value of the firm so that they can exercise their options at a price that is lower than the prevailing share price. Share options have frequently been the source of media attention as a result of the various efficiencies and inefficiencies of share option schemes in practice. There has also been much debate within the standard setting bodies worldwide concerning whether share options should be expensed in the income statement for accounting purposes or merely disclosed as a note in the financial statements, as is the current accounting treatment.

Various studies have been conducted overseas to determine the factors that influence the decision of whether or not to grant share options. Empirical evidence (see for example Lewellen, Loderer and Martin (1987); Gaver and Gaver (1993); Smith and Watts (1992); Lambert and Larcker (1987); Sloan (1991); and Klassen and Mawani (2000)) has suggested that firms grant share options to align management and shareholder goals, thereby reducing agency costs. Proxies for agency costs have included the variance of shareholder returns; long-term investment and growth opportunities; the executive's age; the firm's debt-equity ratio and beta; the unexplained variance in the firm's share price that is attributable to market forces and the noise in earnings relative to share price. These proxies for agency costs have all been found to be significantly associated with share option granting. Furthermore, research has shown that option granting behaviour differs between firms in different industries (see Smith and Watts (1992) and Ely (1991)).

Since the value of share options granted need not be expensed by the firm for accounting purposes, the financial reporting position performance of the firm was also found to influence the option granting decision in studies conducted by Matsunaga

(1995) and Klassen and Mawani (2000). The firm's tax position may also influence the decision of whether or not to grant options as there is no tax deduction for share options granted by companies in South Africa, as was the case in the study conducted by Klassen and Mawani (2000).

Finally, research conducted by Klassen and Mawani (2000); Gaver and Gaver (1993); Smith and Watts (1992) and Matsunaga (1995) suggests that the firm's size may also influence the firm's option granting behaviour, as may its liquidity (see Yermack (1995)).

No known research has been conducted in South Africa to determine whether the factors identified in the abovementioned international studies influence option granting by South African firms.

1.2 Statement of the Problem and Research Objective

The lack of information regarding the variables driving the granting of share options in South Africa formed the basis of this study. Those variables identified in international studies explaining the reasons for share option grants have not been tested in South Africa. Stakeholders of South African firms are therefore unable to anticipate whether firms are more or less likely to grant share options based on its current circumstances.

The objective of this study is to determine which of the identified variables influence share option granting, in particular those granted to South African executive directors. Specifically, this study seeks to determine whether firms are more likely to grant share options to executive directors (a) in order to reduce agency costs, and/or (b) to capitalise on minimal financial reporting requirements, and/or (c) to take advantage of their taxable income position.

With regard to (a) above, there has been some evidence in South Africa that firms use share options to reduce agency costs (see Hall (1998)). This study will hopefully provide further insight regarding this theory, and concurrently reveal which agency cost proxies are significantly associated with option granting. With regard to (b) and (c) above, this study seeks to ascertain whether a firm's financial performance or tax position are indeed determinants of share option grants. These results may provide an understanding as to

the timing of remuneration committees' decisions to grant share options. They may also have implications for the IASB, users and preparers of financial statements with respect to the impact that the lack of a requirement to expense share options has had on share option granting behaviour. Depending on the outcome of this study, the South African Legislature may consider the introduction of a tax deduction for share options.

Furthermore the results of this study may provide some explanation for the failure of some share option schemes in South Africa. Finally, this study may enable stakeholders to anticipate share option grants if the results reveal those factors that are significantly associated with option granting.

1.3 Report Structure

The report is contained in the next four chapters. In Chapter 2 a discussion of share options and their prevalence within practice is made, followed by an outline of the agency, accounting and taxation issues relating to share options and finally the results of the previous research are addressed.

Chapter 3 details the variables selected for this study and how they were calculated, and reviews the methodology used in this study based on two different techniques. Chapter 4 reports the results of this study, compares these to the international research results and discusses possible reasons for any inconsistencies between the results. Finally in Chapter 5, conclusions are drawn and areas for possible future research are suggested.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The use of share options, as a form of compensation has become a common feature in South African executive directors' and employees' remuneration packages. Data gathered for this study revealed that 93% of the one hundred largest[1] South African companies make use of share option schemes to remunerate directors and/or employees. In the United States, 97% of the companies in the Standard & Poor's (S&P) 500 index granted options to their executive directors in 1998. The value of these options comprised 40% of total remuneration for the S&P 500 Chief Executive Officers (*Stock Options (or expropriating the shareholders)* 2001).

The inherent conflict of interest between management and shareholders is commonly known as the agency problem. Jensen and Meckling (1976) originally identified agency theory, referring to the costs of agency. Agency costs refer to the costs of the conflict of interest between management and shareholders, and can include lost opportunities for shareholders due to management acting in their own self-interest, corporate expenditure on luxurious and unnecessary goods that benefit management but cost the shareholders, or expenses that arise from the need to monitor management's actions such as external audit fees. Agency costs are reduced when management's goals are closely aligned with those of the shareholders. The way in which management is compensated can play a major role in aligning these goals. Studies conducted by Haugen and Senbet (1981), Hemmer (1993) and Hall and Liebman (1998) have all concluded that share options as a constituent of executive compensation aids the alignment of shareholder and management goals.

A further reason for the granting of share options by firms may be that current accounting standards do not require firms to recognise share options as a cost to the firm in the income statement, or elsewhere. This treatment has recently been the source of much debate in the international accounting arena. In terms of the current treatment for share options in South Africa, the only accounting entry passed will be when the share options are exercised: cash is debited and equity credited with the consideration received

[1] The size of the company was calculated by the market value of the company as of 31 October 2001.

on issue. However, this accounting treatment may soon change as a result of an exposure draft, ED 160 *Share-based Payment* (SAICA 2002), which was recently released by the South African Institute of Chartered Accountants (SAICA) based on the International Accounting Standards Board (IASB) equivalent: ED 2. ED 2/ED 160 proposes the recognition of share options as an expense at the fair value of the options granted. Whether or not this recognition method is appropriate is outside the scope of this dissertation, however, whether the lack of such a reporting requirement influences the decision to grant share options will be considered.

A disadvantage of granting share options in South Africa is that firms cannot get a tax deduction for the cost of the option. Options are not considered to be an expense by the South African Revenue Service, and, apart from any specific provision to the contrary, deductions are only permitted for expenses actually incurred in the production of income, not of a capital nature (Huxham 2002).

Thus, internationally, share options are seen to align management and shareholders' interests by reducing agency costs. In addition, they offer financial reporting benefits as no expense is recognised, but they are a disincentive in tax regimes where a deduction cannot be claimed for tax purposes. It is not clear whether these three factors are in fact the reason why South African firms grant share options.

This chapter will continue with a discussion of the history of share options, the relationship between share options and agency theory, as well as the financial reporting, taxation, and agency issues surrounding share options. It will conclude with a review of the previous research that has been conducted in this area, focusing on the variables that have been found to influence share option granting.

2.2 Background: Share Options

2.2.1 Forms of Share-Based Payment

Share-based payment plans are often intricate and structured in ways that incorporate different forms of payment such as a combination of share options and share purchase plans. Typical share option plans include either 'plain vanilla' plans which simply give a director or employee the right to purchase a number of shares at a fixed price within a defined time span. Other share option plans are known as performance vesting share options that only vest[2] when certain performance criteria (such as the attainment of a specified return on equity) are achieved. If these performance criteria are attained prior to the beginning of the vesting period and the firm has a performance-accelerated vesting plan, then early vesting of the share options occurs (IASB 2000).

Apart from share option plans, a number of other share-based payment plans are used by firms. Share appreciation rights (SARs) are awards granted to employees and directors equal to the excess of the market value at a specified future date over a stated price, payable in cash or shares or a combination of both. Share purchase plans allow the employee to purchase a specific number of shares usually at fair market value at a specified future date. Phantom share plans are deferred bonus plans whereby the employee receives phantom shares, the value of which fluctuates with the firm's actual share price (or another indicator), which are paid out in the form of a cash bonus at a specific future date (IASB 2000).

Apart from share options, all other forms of share-based compensation have been excluded from the scope of this study and will hence not form part of this literature review.

2.2.2 Share Option Schemes in Practice

Share option schemes involve the offer of nonmarketable share options to directors and/or employees either on a general or selective basis. The number of shares that a director or employee is entitled to is at the discretion of the firm. The shares are usually available during a specified period decided by the firm. The employee is locked into buying the shares only once he has decided to exercise the option, so there is no risk to

the employee from any fluctuation in the market value. Under traditional share option schemes, the employer firm will form an *inter vivos* trust ("share trust") for the benefit of its employees. The share trust either purchases shares on the open market or subscribes for shares in the firm (*The Professional – Share schemes can sting* 2000). These shares are available for purchase if the option holder decides to exercise his option.

The JSE Securities Exchange has experienced a downward trend in share prices over the last two years and many employees have thus been holding out-of-the-money[3] share options. Thus firms have often had to either issue new shares at a lower price or cancel the existing incentive scheme (Wood 2002). Consequently, this has had a negative affect on employees' morale and many have opted to seek employment at competitor firms. There have also been reports of directors exercising their options ahead of profit warnings to the detriment of both staff and shareholders (Kruger 2002). Furthermore, a number of major US companies in the Information Technology (IT) sector have been involved in litigation for firing employees with share options so as to prevent them from exercising those options (Van Niekerk 2000). These reports suggest that share option plans have not always successfully aligned management and shareholder goals.

Further evidence of a counterproductive share option scheme is that of Dimension Data (Didata), whereby executive directors were able to benefit by cashing in their options before the value of the company declined. During 2000, 39 million share options were granted to employees and directors, but after the IT crash in 2001 and Didata's unattained performance targets, the directors halved their annual salaries, received no bonuses, and saw all the share options granted in 2000 lapse. However, by the time the announcement regarding the lapsing of share options was made the executive directors had already exercised many of their options and had greatly benefited. The Executive Chairman Jeremy Ord made a gain of $12 million on his options and the other executive directors made gains of more than $7 million each (Bidoli 2002).

Option re-pricing has become a frequent occurrence in South Africa, particularly with small to medium sized investment banks and is a further area where management's goals do not appear to be in line with those of the shareholders. This method of re-pricing out-of-the-money options to make them valuable again has been quoted to be "cynical at

[2] Vesting occurs when the grantee of the option becomes unconditionally entitled to the option.
[3] An out-of-the-money share option is one where the strike price is greater than the prevailing share price.

best, corrupt at worst" (Cohen 2001b). One of the most extraordinary re-pricing incidents seen in South Africa was when Metcash Ltd adjusted a R5,49 strike price to a mere R1,30 in April 2001 (Henderson 2001). It is argued that from a moral perspective, executive directors should endure volatility in share prices along with shareholders, and that re-pricing is only appropriate when there is a fundamental structural change (Cohen 2001b).

The purpose of compensating executive directors and employees with share options is to attempt congruence of shareholder and management goals. The negative affects of poorly structured, ineffective share option schemes with terms that subsequently change to the benefit of management but not shareholders, has not helped in achieving this congruency.

2.2.3 Recent Trends

As a result of the problems discussed above, firms have begun to structure their schemes in such a way that aligns them to their core business strategies, the retention of staff and with a focus on long-term performance (Wood 2002). This has resulted in increasingly complex share option schemes.

An example of the increasing complexity is the scheme used by South African Breweries (SAB). The company operates two executive schemes: an Inland Revenue[4] Approved Share Option Scheme up to an approved limit and an unapproved scheme for options in excess of the Inland Revenue limit. Options under both schemes are granted at market value and the vesting of options is dependent on the company's performance relative to an economic indicator. SAB recently changed the terms of the scheme with respect to the economic indicator, such that any previously granted options vest when the growth in Earnings per Share (EPS) is equal to or greater than the change in the UK Retail Price Index (RPI) plus 3% compounded over a three year period until ten years after grant. This performance requirement is subject to testing at three, four and five year intervals. Regarding future option grants, half of any additional amount granted will vest when EPS growth is greater than or equal to RPI plus 4% and the other half at RPI plus 5%, subject to testing at years four and five. Any unvested options at the end of year five will lapse (SAB 2001).

Noticeable trends in recent South African schemes have been the regular offers of options on an annual or biannual basis as opposed to substantial and irregular allocations. In addition, the time before the options vest has declined to between two and five years from the previous five and seven year vesting periods. Within this time period, options that are designed to reward performance tend to vest earlier than those that focus on the retention of staff. Finally, the schemes seem to be geared to a smaller group of participants. This group is now typically restricted to top management and directors (Wood 2002).

An alternative theory is that share option schemes tend to be overused and should be de-emphasized in favour of bonus plans that are structured to make executive directors and employees think and act like owners. G.B Stewart III suggests that the participants of share option schemes should be restricted to executive directors and top management as they are generally financially literate, unlike many other employees that incorrectly believe accounting measures of earnings or cash flows drive their company's share price. Stewart believes that using these measures as financial targets sets improper goals for firms (Stewart 2002).

In addition Stewart argues that at some point investors will fully anticipate the firm's future growth prospects, resulting in a steady share price that will diminish the attractiveness of share options. He therefore suggests a bonus scheme, that is a set percentage of the increase in economic profit or Economic Value Added (EVA)[5] after subtracting the cost of capital and adjusting for material accounting distortions. Furthermore, there should be no cap on the allowed magnitude of the bonus, so that the unlimited increase in the bonus can promote entrepreneurship whilst the unlimited decrease in the bonus value can discourage excessive risk taking. Finally, a portion of large bonuses should be carried forward and paid over time subject to forfeiture if future performance targets are not attained. This provides a means of sustaining performance; discourages short-term gaming; lengthens decision horizons and holds managers accountable for delivering expected returns year on year (Stewart 2002).

[4] Inland Revenue is the authorised tax-collecting body in the United Kingdom

[5] EVA was developed in the early 1980's by Stern Stewart & Co and is a measure of economic profit. EVA is calculated as the net profit after tax less a charge for the capital invested in the business. The charge for the capital invested in the business is the weighted average cost of capital multiplied by the net investment of debt and equity holders.

Thus, although there is no consensus as to the most appropriate compensation structure for the various categories of employees, it is clear that share options are considered to be an effective incentive strategy for executive directors and top management.

2.3 Reasons for Granting Share Options

Previous literature suggests that the agency problem, financial reporting incentives and tax disincentives have influenced the decision by firms whether to grant options to executive directors and employees. This section contains a detailed discussion of these three areas.

2.3.1 The Agency Problem

Jensen and Meckling (1976) first presented a formal treatment of the agency problem. They addressed agency problems in the context of a firm that is viewed as a hub of many contracts with its stakeholders. Incentive conflicts arise in these contractual relationships as the parties pursue their own self-interest. Jensen and Meckling demonstrated that an owner-manager who retains complete control of the firm and finances through the issuance of shares or debt to outsiders produces costs for the firm. These costs arise when management's desire to benefit from his position causes him to exhaust the firm's resources in excess of what is optimal, and when management invests in high-risk projects and in so doing transfers wealth from debt-providers to shareholders.

Hall (1998) examined the existence of the agency problem in South Africa by sending questionnaires to the firms listed on the JSE Securities Exchange. The questions posed aimed to determine the goals that management of companies pursue. Hall found that a significant number of companies pursue goals which cannot be reconciled with an increase in shareholder wealth, and concluded that an agency problem does exist in South Africa. Furthermore, he found that the occurrence of share option and bonus schemes is very high and stated that it appeared to be one of the most popular methods of circumventing the agency problem.

Haugen and Senbet (1981) and Hemmer (1993) found that executive compensation that comprises share options provides a vital role in resolving agency problems. Haugen and

Senbet demonstrated that if the owner-manager takes positions in call and put options[6] to purchase and/ or sell the firm respectively at a specific price, the options substantially alleviate the agency problem that exists between managers and external capital contributors. Their use of call options is equivalent to the use of executive share options in executive compensation, and the put options represent convertible debentures retained by external financiers.

Haugen and Senbet solved for the exercise prices for call and put options whilst controlling for agency costs, such as the fact that the manager cannot consume resources in excess of what is optimal, and that the total wealth of the manager including receipts from outsiders must total to firm value. Furthermore, they ensured that no incentive exists for the manager to avoid value-creating projects in preference for high variance investment opportunities, nor in preference for low but suboptimal investments. By assuming the options were European with a single period to expiration, Haugen and Senbet were able to solve for the exercise price of both call and put options whilst maintaining zero agency costs. Firms therefore use share options to align executive directors' interests with shareholders, and convertible debentures to align executive directors' interests with debt providers (Haugen & Senbet 1981).

Hall and Liebman (1998) also found that share options diminish agency costs when they used the Black-Scholes method of option valuation to assess the correlation between CEO compensation and market valuations for 478 large United States firms during the 1980's and 1990's. They found that shares and options as a form of compensation provided a much stronger link to shareholder value than traditional salaries and annual bonuses did. The results showed that 98% of the link between total pay and performance is attributable to changes in the value of share and share option holdings, and that only 2% comes from salary and bonus changes. This provides further evidence that share options align management and shareholders' incentives.

2.3.2 Financial Reporting Issues

2.3.2.1 Background: Accounting for Share Options

Although the use of share-based compensation has increased, there is currently neither a South African nor an International Accounting Standard that deals with the accounting

[6] A put option is the option, but not the obligation to sell an underlying asset.

for these payments. Consequently, companies are not recognising any charge to the income statement to reflect this payment. The well-known American investor Warren Buffet aptly summed up the situation in 1998 when he wrote: "Accounting principles offer management a choice: pay employees in one form and count the cost, or pay them in another form and ignore the cost. Small wonder the use of options has mushroomed" (Cohen 2001b).

The impact of the lack of an accounting statement was clearly shown in research conducted by Smithers & Co in 2001 in the United Kingdom. They found that out of the top one hundred US companies, eleven would have had no positive net earnings if the cost of employee share options were accounted for as an expense. Another thirteen companies including Coca-Cola, Gillette and Walt Disney would have halved their profits had they recognised a share option expense (Hasenfuss 2001), although Coca-Cola have since deducted share options as an expense beginning in the fourth quarter of their 2002 financial year (Hill & Durr 2001).

The United States (US) was the first country to attempt to implement an accounting statement for share-based payment. In 1993 The Financial Accounting Standards Board (FASB) was placed under pressure by a US Senate subcommittee to propose an accounting rule to reflect the value of share options to directors and employees and the cost to the firm. They proposed the recognition of share-based compensation as an expense in the income statement to the firm on granting date. This proposal was heavily criticised and the US Senate publicly opposed the FASB's proposal "on practical and technical grounds" (*International Employee Stock Option Coalition* 2001). The FASB succumbed and in 1995 produced a Financial Accounting Standard No. 123 (FAS 123) that gave companies the choice of reporting share options as an expense in the income statement or, as has been the choice of almost all US companies, as a footnote in the annual report. The FASB did however maintain that share options issued as compensation do have a value and that disclosure is not a sufficient mechanism to reflect this value (Newbury 2001).

The International Accounting Standard Board (IASB) were the next to identify the need for guidance on accounting for these payments, and in July 2000, the G4+1 issued a Discussion Paper on accounting for share-based payment. The Discussion Paper proposed that such payments should be recognised in the financial statements, with a corresponding charge to the income statement when the goods or services are consumed.

In addition, the transaction should be measured at the fair value of the shares or options issued, which an option-pricing model would establish, and that the vesting date is the appropriate measurement date. When the other party is required to perform between the date of being granted the share-based payment and vesting date, an estimate of the transaction amount should be accrued over the performance period (IASB 2000).

Due to the increased interest in accounting for share options, the FASB's 1993 proposal has recently been under scrutiny. However, the basis for their conclusions in their proposal does not appear to be consistent with their conceptual framework. The framework states that equity transactions (which includes share-based transactions) are always non-reciprocal[7] transactions as opposed to reciprocal transactions. By proposing that the cost of share options be expensed in the income statement, the FASB's proposal applied an accounting treatment for share options that was in fact for reciprocal transactions. Newbury (2001) believes that share options are indeed reciprocal in nature as resources flow both to and from the firm when the director or employee provides a service and the firm remunerates him for it. It has been suggested that this inconsistency between their proposal and their conceptual framework will cause confusion and is potentially detrimental to future projects both within the United States and in other jurisdictions that draw from the FASB's conceptual framework. The FASB have begun to address this issue in their new project to reconsider the distinction between liabilities and equity (Newbury 2001).

The IASB also recognised the need to classify share-based compensation transactions, and did so by addressing the distinction between liabilities and equity in their discussion paper on share-based payment. They confirmed that a share option is an equity instrument and stated that the issue of share options does not compel the firm to transfer cash or other assets to another party, and it therefore cannot meet the definition of a liability as embodied in the IASB conceptual framework (IASB 2000). The Discussion Paper therefore does not appear to contradict the IASB conceptual framework, unlike the situation in the US.

A further issue that threatened the validity of the IASB conceptual framework was whether the recognition of an expense from share-based payment is consistent with the

[7] Non-reciprocal transactions occur when resources flow in one direction only, such as contributions from owners. Most transactions take the form of reciprocal transactions, which occur when resources flow both to and from the firm.

definition of an expense. In April 2002, the IASB confirmed that their conclusions were indeed consistent with the conceptual framework, and accompanied this statement with comprehensive reasons. The definition of an expense as per the conceptual framework includes the statement that an expense is a decrease in economic benefits during the accounting period in the form of outflows or depletions of assets, or incurrence of liabilities. The IASB concluded that an 'asset' is not limited to resources that can be recognised on the balance sheet as such, and that personal services are momentary assets to the company. The consumption of these services gives rise to an expense, and there is therefore a depletion of assets and an expense as defined (IASB 2002a).

The IASB's Discussion Paper has generated a large amount of interest. Over 280 comments including submissions from the major accounting firms on the IASB's Discussion Paper were received. Arthur Anderson[8], PricewaterhouseCoopers (PWC), Deloitte & Touche and KPMG all agreed that there should be recognition of these payments in the financial statements, but recommended that the fair value of the goods or services received and not the fair value of the shares or options granted is the appropriate measurement. The appropriate date was also believed to be the granting date and not the vesting date, and that the proposal to accrue for the payment over the performance period was appropriate. However PWC, Deloitte & Touche and KPMG all recommended the use of an extensive disclosure model rather than financial statement recognition until such time as the complexities of this topic are resolved. The complexities were believed to be determining the fair value of the goods or service received, deciding on the date that the transaction should be measured, and the uncertainty regarding the definitions of liabilities and equity. PWC also stated that the current format of financial statements does not provide a suitable environment for the expensing of share options, and that a more fundamental project on reporting financial performance, defining what performance is and how performance should be measured should take first priority (G4+1 Letters 2001).

Comments submitted by organisations such as the International Employee Stock Option Coalition opposing the proposals outlined in the Discussions Paper, have also strongly urged the IASB towards a disclosure-based standard. Their letter to Sir David Tweedie, chairman of the IASB, declared that "if adopted, the approach set forth in the G4+1 Discussion Paper would create a distinct disparity between the time-tested US standard FAS123 and the IASB's proposed standard, and would preclude the consensus that we

understood the IASB was designed to create" (*International Employee Stock Option Coalition* 2001).

These comments contributed towards the IASB's tentative conclusions issued in May 2002. The IASB stated that no exemption from the proposed future standard on employee share purchase plans would be permitted. The Board suggested that the share option transaction should be measured at the fair value of goods or services received, or the fair value of the equity instruments issued (or to be issued), whichever is more readily determinable, and that a rebuttable presumption exists for transactions with employees, stating that the fair value of the equity instrument issued (or to be issued) is more readily determinable. Furthermore, the fair value should also be estimated at grant date (IASB 2002b). The date of measurement has therefore changed from the original proposal of vesting date, and the basis of measurement been clarified. The proposal to recognise share options as an expense, has therefore generally been opposed by preparers of financial statements but unanimously agreed with by users of financial statements (IASB 2002a).

In accordance with this proposal an exposure draft ED 2: Share-based payments, has been issued by the IASB and an identical South African exposure draft (ED 160: Share-based Payment) was issued thereafter. ED 2/ED 160 proposes that a share option expense and simultaneous increase in equity be recognised at the fair value of the options granted because it is presumed to be more readily determinable than the fair value of employee services received. ED 2/ED 160 also proposes that fair value should be measured at grant date, as was proposed by the IASB in their tentative conclusions issued in May 2002. Comments on the exposure draft were to be submitted by the 21 February 2003. At the time of writing, the outcome of this feedback has not been made public.

2.3.2.2 The Situation in South Africa Prior to ED 160

In South Africa, AC116: Employee Benefits does not specify recognition or measurement requirements for equity compensation benefits. It does however list a number of disclosure requirements that include; the nature and terms of equity compensation plans, the accounting policy employed, any amounts recognised in the financial statements, the number, terms and fair value of equity financial instruments at the beginning and end of the period.

[8] Arthur Anderson changed its name to Anderson in 2000, and ceased to exist in 2002.

Furthermore, the number of equity instruments distributed, exercised and lapsed during the period should be disclosed, as well as details of options that vested and the fair value of any consideration received from equity compensation plans during the period (SAICA 2001).

The JSE Securities Exchange (JSE) also prescribes in its listing requirements the minimum content to appear in the annual financial statements of listed companies. With regard to share incentive schemes; a summary of the details and terms of options, the number of securities that may be utilised for the purposes of the scheme at the beginning of the accounting period, the movement during the period and the balance at the end of the period must be disclosed. Furthermore, an analysis in aggregate of directors' emoluments including any share options, their strike price and period, the period when and at what price options have been exercised and any other relevant information is required. The analysis must show these disclosures separately for executive and non-executive directors (PricewaterhouseCoopers 2000).

These disclosure requirements are repeated in the Code of Corporate Practices and Conduct within the King Report on Corporate Governance 1994 with which listed companies, banks, financial and insurance entities, as well as public sector enterprises are required to comply (Institute of Directors in Southern Africa 1994).

The Second King Report on Corporate Governance (King II) was published in March 2002, and requires increased detail with regard to remuneration. It stated that performance-related elements should constitute a substantial portion of the total remuneration package of executives and that full disclosure of director remuneration on an individual basis, including details of restraint payments, all share schemes and other incentive schemes, should be provided (Institute of Directors in Southern Africa 2002).

King II differs to the original King Report in that it permits the granting of share options to non-executive directors, subject to prior shareholder approval and the requirements of the Companies Act, and suggests an appropriate vesting period for these options. However, it does state that the international view is that non-executive directors should preferably receive shares rather than share options to avoid the dilution of independence. King II also provides guidance on the re-pricing of share options, requiring details and shareholder approval for each director who stands to benefit from the re-pricing. Share

options that are issued at a discount also require specific shareholder approval (Institute of Directors in Southern Africa 2002).

Thus significantly more disclosure in the Annual Report and additional corporate governance with respect to remuneration procedures can be anticipated in the interim before ED 2/ED 160 becomes applicable. This will enable shareholders to more thoroughly assess and monitor whether the interests of the directors are in line with their own.

2.3.3 Taxation Issues

2.3.3.1 Taxation from the Firm's Perspective

Share options are not considered to be expenditure for tax purposes, thus no deduction is permitted for the firm when share options are granted. The South African Revenue Service (SARS) views share options, not as a cost to the firm, but merely a dilution of the other shareholders' holdings, and therefore the costs do not fall under the general deduction section 11(a) (Huxham 2002). When the IASB releases a standard on accounting for share-based payment that states this form of payment to be an expense (as previously discussed), SARS may change their stance and the Legislature may amend the Income Tax Act 58 of 1962 to include some form of tax deduction for the firm.

2.3.3.2 Taxation from the Employee's Perspective

From the employee's perspective, s8A of the South African Income Tax Act includes in taxable income any gain made by the exercise, cession, or release of a share option. This section applies to directors, former directors and employees. The amount included in taxable income is equal to the difference between the amount paid for the shares and the market value at that date, less any amount paid for the options. If the taxpayer has a restriction placed on his right to dispose of the shares for a specified period, then the s8A gain is deferred until the period has passed. S8A(6) also contains an anti-avoidance provision that prevents the original holder of the share option from avoiding tax if the gain is made by any other person (Huxham & Haupt 2002).

Capital Gains Tax (CGT) was introduced in South Africa with effect from 1 October 2001, and has implications for share options. Many of the complex issues surrounding CGT including some relating to share options are as of yet unresolved, and will hopefully be clarified in due course. Paragraph 58 of the 8th Schedule of the Income Tax Act

disregards any capital gain or loss made on the exercise of an option, the reason being that the amount paid for the option will be allowed as part of the base cost of the share acquired in terms of the option. The base cost of the share forms part of the capital gain calculation when the shares are sold (Huxham & Haupt 2002). If the option was acquired before 1 October 2001, the valuation of the option at this date will be treated as part of the base cost of the share. If the option was acquired after this date, the expenditure incurred in acquiring the option is part of the taxpayer's base cost. Furthermore, paragraph 18(1) states that if the person entitled to exercise the option does not do so, any capital loss he may sustain is disregarded (Meyerowitz 2001). However paragraph 18(2) states that paragraph 18(1) does not apply when the option is to acquire a financial instrument, which a share is. Thus it appears that holders of share options may carry forward any capital loss incurred on the non-exercise of the options.

2.4 Previous Studies

A number of previous studies have been conducted on share options. These studies have identified three main possibilities as to why companies grant share options. The first possibility (reason) is that companies grant share options to reduce the costs of agency between management and shareholders. These studies used proxies for agency costs to determine the relationship between the use of share options and the costs of agency. The second reason is the finding that the use of share options can have favourable accounting implications due to the fact that no expense need be recognised. A number of variables were identified to represent the companies accounting performance in these studies. The third reason for the granting of share options has been related to the companies tax position, and proxies for this were also identified in previous research.
This section continues with a detailed discussion of these three reasons and the variables that were previously identified as proxies for these reasons.

2.4.1 Proxies for Agency Costs

As discussed above, the use of share option schemes has been found to reduce the problem of agency, by aligning shareholder and management goals. Extensive research has been done to identify variables that can be used as proxies for agency costs, that are significantly associated with share option grants. The variables identified are discussed below.

2.4.1.1 The Variance of Share Returns

Lewellen, Loderer and Martin (1987) conducted research on the proportion of share-related and cash-based components of executive remuneration. They hypothesised that a major motivation for the different components of executive remuneration is to reduce the conflicts of interest between owners and managers due to differences in time-horizons and risk exposure. They argued that because the shareholders' time horizon is in principle unlimited since all future residual cash flows that the firm is expected to generate will be impounded into the share price, managers need to be given an explicit claim on those future cash flows. This is necessary to encourage management to give proper attention to decisions that will favourably affect them and to align their time horizon with that of the shareholders. However, a concern was raised that although a share of the firm's future cash flows would reduce the limited time-horizon problem of managers, it would simultaneously increase their risk exposure as a result of a greater proportion of their wealth being connected to the future financial well-being of the firm. It was argued that managers may therefore start to make decisions that reduce firm risk and in so doing diminish shareholder wealth. Thus the point was made that the solution to either the difference in time-horizons or risk exposure may intensify the problem of the other.

With this concern in mind, Lewellen *et al* (1987) examined the manner in which the circumstances of the individual firms determine the composition of their senior executive compensation packages. One of the hypotheses that they tested was whether the proportion of total pay that consists of share-based payment was associated with the variance of firm's share return. They argued that share-based compensation could assist in aligning managerial and shareholder interests, by increasing the cost to managers of investments that decrease share prices, and raising the payoff to them from variance-increasing investments if the firm is levered. Hence, the variance of share returns was included.

The results showed a significant positive relationship between the proportion of total pay consisting of share-based payment and the variance of the firm's share returns. Lewellen *et al*'s (1987) original concern that managers may in fact avoid variance-increasing investments due the consequential increase of their personal risk exposure therefore did not appear to influence the proportion of share-based compensation granted to them.

These results were consistent with Smith and Watts' (1992) and Gaver and Gaver's (1993) later findings.

2.4.1.2 Long-term Investment Opportunities and Growth

When determining the different components of management compensation, the extent of the firm's long-term investment opportunities may influence this decision. Lewellen *et al* (1987) also tested whether the proportion of share-based compensation was associated with the proportion of firm's investment opportunities that are long-term in nature. Two variables were included as proxies for these investment opportunities: the book value of the long-term assets divided by the book value of total assets which measured the importance of current projects with a long useful life; and secondly the market value of equity divided by the book value of equity to assess the relative importance of options on future profitable investment opportunities. The second variable was necessary because the firm's market-to-book ratio reflects the rate at which earnings and cash flows would be expected to grow over time, given the volume of investment opportunities.

The results showed a significant positive relationship between the proportion of total pay consisting of share-based payment and the proportion of a firm's investment opportunities that are long-term in nature.

In a similar study, Gaver and Gaver (1993) found that growth firms (defined in that study by the ratio of research and development (R&D) expenditure to the book value of assets) are more likely to use share option plans as opposed to non-growth firms. The logic for this variable's inclusion is that the higher the expenditure on R&D, the greater the investment made by the firm in creating new products and potential barriers to entry, and the greater the pursuit of long term earnings which would align shareholders and managements goals. A disadvantage to using this variable was stated to be that it represents only one example of many available types of discretionary expenditures that support growth, and is thus not suitable in all industries. However, Baber, Janakiraman and Kang (1996); Bushman, Indjejikian and Smith (1996); Douglas, Scott, Boyle and Zhang (1997) and Klassen and Mawani (2000) also identified this variable as a proxy for the firm's investment opportunities.

Other variables that were included by Gaver and Gaver (1993) were the earnings yield of the firm and the frequency that the firm was included in growth-oriented mutual funds.

By including a variable for the frequency that a firm is included in growth-mutual funds, Gaver and Gaver stated that a bias towards larger firms is introduced. This is because the transaction costs associated with the investment for extremely small firms (including filing requirements if the fund obtains a material interest in the firm) exceed the expected benefits.

These findings of Lewellen *et al* (1987) and Gaver and Gaver (1993) showed that firm's with long-term investment and growth opportunities are more likely to grant share options and were consistent with those of Lambert and Larcker (1987), Smith and Watts (1992), and Klassen and Mawani (2000). However, they were inconsistent with Yermack (1995) and Bizjak , Brickley and Coles (1993) whose findings showed a significant negative association between option granting and growth opportunities. Yermack justified his finding by relating the result to the method that he used to measure the dependent variable which differed to all the other studies, namely, the sensitivity of CEO wealth to changes on the firm value. Bizjak *et al* (1993) could not provide an intuitive economic interpretation of his result. Further inconsistent findings were identified by Matsunaga (1995), who did not find a significant relationship between the extent of research and development expenditure and option granting, although he did find the market-to-book ratio to be significantly associated with option granting. Matsunaga did not provide any reasons for his contradictory results.

2.4.1.3 The Executive's Age

Lewellen *et al*'s (1987) study also tested the association between the age of the executive and the composition of compensation. Their reasons for including the age variable were that they hypothesised that the younger the executive, the longer his prospective employment period with the firm, and the less likely it should be that his investment decisions on behalf of the firm would be in his own self-interest. That is, younger executives will be more prepared to spend on research and development because they will potentially still be at the firm in the long-term to enjoy the benefits of that expenditure. Thus conflicts of interest are not expected to be as apparent between young executives and the firm as between older executives and the firm. Younger executives were also considered to be less wealthy than older executives and less willing to accept additional risk exposure from long-term forms of compensation. Lewellen *et al* (1987) therefore expected a positive correlation between the proportion of share-based compensation and age, to reduce the differences in time-horizons, and indeed found a significant positive relationship between the executive's age and the proportion of share-

based compensation. However, Yermack (1995) and Eaton and Rosen (1983) did not find executives age to be significantly correlated with option granting. There are therefore conflicting findings as to whether the executive's age is significantly associated with option granting.

2.4.1.4 The Debt-Equity Ratio

The association between the debt-equity ratio and the composition of executive compensation has also been examined. The logic behind the use of a debt-equity ratio is that when this ratio is large, shareholders may prefer executives to be compensated by non-cash means, so as to preserve the cash to meet debt commitments. Lewellen *et al* (1987) found this variable to be significantly positively related to the proportion of pay that consists of share-based payment. This result was supported by Klassen and Mawani (2000).

However, Yermack (1995) argued that if managers have strong incentives to maximise the value of equity, debt holders would demand a higher risk premium for supplying capital because they will fear that management will pursue overly risky investment projects that transfer wealth from debt holders to equity holders. He therefore anticipated a negative relationship between financial leverage and share option granting, although his results did not confirm this. Matsunaga (1995) also did not find a significant relationship between these variables.

2.4.1.5 The Firm's Beta

The beta of the firm (which is a measure of the firm's systematic risk relative to the market) was also included by Lewellen *et al* (1987) in their research to explain the reasons for the different proportions of share-based compensation to cash compensation. They stated that share-based payments link executive compensation to general movements in share prices, which executives cannot control. The more sensitive the firm's share price is to market-wide movements the weaker the association between the benefits of including share options as managerial compensation and the performance of the firm that management is incentivised to improve upon.

A significant negative relationship was found in his study between the proportion of total pay that consisted of share-based payment and the beta of firm.

2.4.1.6 The Use of Earnings Performance Measures

Sloan (1991) hypothesised that compensation contracts that are based on earnings performance measures *in addition* to share price performance help shield executive compensation from market-wide fluctuations in equity values. Fama (1976) showed that approximately one third of the variation in share price related to market-wide fluctuations in share price, which supported the theory that market-wide movements are a major source of noise in firms' share prices.

Sloan expected earnings to be more sensitive to firm-specific value changes (which are typically as a result of changes in cash flows) than to market-wide value changes because accounting principles do not incorporate the market-wide fluctuations in discount rates on the value of future cash flows, which is a major source of market-wide changes in value. The amount of noise in share returns was calculated as an increasing function of the proportion of the variation in share returns that is related to market-wide movements in share returns.

Sloan expected that firms with a high amount of noise in share returns relative to market returns are more likely to use earnings performance measures in compensation contracts. Lambert and Larcker (1987) (see 2.4.1.7 below) showed that these performance measures are more likely to be used when the noise in earnings is high relative to the noise in share price which was found to be significantly positively associated with the proportion of executive share-based compensation. Based on Lambert and Larcker's (1987) results, Sloan predicted and found that the noise in share price attributable to the market was positively associated with the use of share-based forms of executive compensation. This variable has therefore been found to influence the decision to grant share options.

2.4.1.7 Monitoring Difficulty

Lambert and Larcker (1987) examined the usage of accounting returns versus market returns as performance measures in determining CEO's compensation. They defined market returns as the sum of the firm's capital gains and dividends divided by the share price at the beginning of the year, and accounting returns were measured by the firm's return on equity. Lambert and Larcker found that the degree to which compensation is related to market returns versus accounting returns is positively related to the inverse of the degree of noise in these two performance measures. Stated differently, the relative weight placed on a performance measure in a compensation contract is an increasing function of its signal-to-noise ratio with respect to the executive's actions.

This occurs when remuneration committees have difficulty obtaining clear signals of the quality of manager's decisions. In these situations, the committees cannot make reliable decisions about revising executive's cash salaries and bonuses and thus share-based compensation offers an alternative to salary revisions based on direct monitoring. Therefore when the noise in earnings is high relative to the noise in share price, the quality of manger's decisions are not apparent, more emphasis is placed on share-based compensation as opposed to cash-based compensation. This theory was supported by the results of Eaton and Rosen (1993) and Lewellen *et al* (1987). It was however not supported by Mehran (1995), Yermack (1995) and Matsunaga (1995), although this was possibly due to the dissimilar measurement basis used to calculate this variable. For example, Matsunaga (1995) incorporated both the risk premium demanded by the executive and the cost of monitoring management when calculating this variable.

2.4.1.8 Industry

Smith and Watts (1992) and Ely (1991) suggested that the structure of compensation packages differ across industries. Ely (1991) assumed that firms in the same industry face similar production environments, and hypothesised that if executive compensation is related to firm performance then differences in the production environment should cause inter-firm differences in the relation between executive compensation and performance. Indeed significant inter-industry differences were found between executive compensation and performance. By analysing the results per industry, any differences between industries can be disregarded. Matsunaga (1995), Yermack (1995) and Klassen and Mawani (2000) used industry dummy variables to capture differences in agency costs across the sample of firms. Both the studies conducted by Yermack and Klassen and Mawani revealed that the industry classification influenced the firm's decision to grant options or not.

2.4.1.9 Fraction of Equity Owned by Executives

Yermack (1995) also examined whether the decision to grant share options is significantly associated with the fraction of the firm's equity currently owned by the executive. He included this variable due to the theory that low levels of executive share ownership are a major source of agency problems, which has consequently led to the argument that executive compensation contracts should take into account the executive's personal share ownership. Yermack predicted that executive's that do not hold a large proportion of the firm's shares would be more motivated by share options. However, he did not find

a significant relationship between the two variables, and neither did Matsunaga (1995). Mehran (1995) on the other hand found a significant negative relationship between the proportion of the firm's share capital owned by the executive and share options granted to such executive. A reason suggested by Mehran for his finding was that remuneration committees consider the executive's total incentives rather than only equity-based incentives when they design executive pay packages. This was the only significant result with regard to this variable.

2.4.1.10 Share Return

Jensen and Murphy (1990) hypothesised that public and private political forces impose constraints that reduce the association between executive pay and performance levels. Indeed they found a rather small relationship between executive wealth and shareholder wealth. They did however find that the largest (although still small) performance incentive came from ownership of the firm's shares, and thus a significant positive relationship was found to exist between the firm's share returns and the use of share options as a form of compensation.

2.4.2 Proxies for Financial Reporting Implications

Three major studies have been conducted in the United States and Canada on the relationship between financial reporting incentives and option granting behaviour. The following variables were identified as proxies for the firm's financial reporting situation.

2.4.2.1 Interest Cover

In the United States, Yermack (1995) tested many hypotheses relating to share options, one of which was whether the mix of compensation between share options and cash salary for Chief Executive Officer's (CEO's) can be explained by the firm's financial reporting management. Yermack's rationale for the study was that prior research had generally focused on a smaller number of hypotheses and had treated share options as a smaller part of a broader research area. At the time of his study, few conclusions regarding whether firms grant share options in accordance with their financial reporting situation had been made.

Yermack contributed a new measure for the mix of compensation between share options and cash salary that approximated the change in executives' wealth in relation to the firm value when share options are granted. He used data from 792 US firms

between 1984 and 1991, and his proxy for financial reporting management (interest cover) was based on work done by Matsunaga, Shevlin and Shores (1992). His logic for using this variable was that firms with low interest cover might have low profitability and a high risk of violating debt covenants. The results however showed that the proxy for financial reporting management was not found to influence the mix of compensation. No reasons for this finding were provided.

2.4.2.2 Deviation from Target Net Income and the use of Income-Increasing Accounting Methods

A further study was done in 1995 in the United States when Matsunaga examined the financial reporting effects of granting share options in the US, as the literature had been sparse in this regard. Matsunaga regressed the value of employee share options[9] on test variables that reflect the firm's financial reporting benefits. He also tested whether the value of share options was associated with the firm's employment of income-increasing accounting strategies, based on work done by Press and Weintrop (1990) and Zmijewski and Hagerman (1981). The income increasing (decreasing) choices were shown to be (a) FIFO (LIFO), (b) straight-line (accelerated) depreciation, (c) an amortisation period of past service costs greater than or equal to 30 years (less than 30 years), and (d) accounting for the investment tax credit using the flow-through (deferral) method[10].

With regard to the financial reporting effects of granting share options, Matsunaga assumed that implicit or explicit costs arise (financial reporting costs) from reporting net income below a target level. These costs could either be as a result of violating debt covenants based on the attainment of accounting performance measures, or implicit costs as a result of shareholder dissatisfaction. This target was assumed to follow a random walk with a drift if the estimated drift was positive and a random walk without a drift if the estimated drift was negative. The drift was estimated as the average change in income before extraordinary items over a five-year period. Matsunaga hypothesised that firms below their target level of income will substitute options for other forms of compensation to boost their reported income as no expense need be recognised. He therefore anticipated a negative correlation between the value of share options granted and the deviation from target income. When firms exceed their target level of income, Matsunaga hypothesised that the value of share options granted could be either negatively or positively correlated with the deviation from target income: it would be

[9] Calculated using the dividend-adjusted Black Scholes Model.

negative if directors adjust their use of share options to smooth reported income, and positive if the use of options reflects a reward for performance.

Data from 123 firms from 1979 to 1989 was examined. The results were that the value of options granted was significantly negatively related to the extent the firm is below its target level of income. Firms reporting poor earnings and therefore facing greater financial reporting costs were more likely to issue share options to executives. No association between options granted and earnings above the firms target level was found. The proportion of income-increasing accounting methods used by the firm was also found to be significantly positively correlated with the value of options granted.

2.4.2.3 Deviation from Target Return on Equity

In Canada, Klaasen and Mawani (2000) explored the effects of financial reporting incentives on options granted to Canadian Chief Executive Officers. Option granting behaviour was measured as the ratio of the Black-Scholes value of share options granted to the sum of this value and cash compensation. The option ratio was regressed on a number of financial reporting and tax variables while controlling for agency costs, liquidity, profitability and size which he reduced to two factors. Data from 184 firms granting options and 143 firms not granting options from 1993-1995 was examined.

Contrary to the findings of Yermack (1995) and consistent with Matsunaga (1995), the results suggest that the lack of the need to recognise a share option expense influences the decision to grant share options, particularly when firms are below their target earnings. The calculation of the deviation from target earnings was similar to that used by Matsunaga, except that it was a deviation of return on equity rather than a deviation of earnings, and the drift was calculated using a geometrically declining weighted average of the change in return on equity over the previous five years.

There is therefore some evidence that firms that have earnings below their target profit level or implement income-increasing accounting policies are more likely to issue share options so as to avoid recognising an expense and further reducing profit.

[10] This accounting technique is not applicable in South Africa.

2.4.3 Proxies for Tax Status

The studies conducted in Canada and the United States also examined the tax effects of share option grants. However from these studies emerged conflicting results. One reason for this is that the US studies examined grants consisting mainly of nonqualified options (NQO's)[11] that are deductible for the firm at the date of exercise. In Canada however, no deduction is permitted for share options granted, as is the case in South Africa. Thus South African and Canadian firms both experience tax disincentives in that no deduction is obtained when granting share options, whereas US firms obtain tax benefits by claiming a deduction for the share options granted. Conflicting results are therefore to be expected.

2.4.3.1 Assessed Losses Carried Forward

With regard to the mix of compensation, Yermack (1995) also tested the hypothesis that a greater fraction of CEO compensation should be in the form of share options when firms have assessed losses carried forward. The reason for this is that firms that have tax losses carried forward are more likely to obtain the least benefit from tax deductions for cash compensation, and may therefore be more willing to grant options instead of cash. The result however was that tax position was not found to influence the mix of compensation, possibly due to the fact that both cash and NQO's are deductible in the US.

2.4.3.2 The Firm's Estimated Future Marginal Tax Rate

Matsunaga's (1995) study differed to Yermack in that he included both nonqualified stock options granted in his sample, together with incentive share options granted (ISO's). ISO's were created in 1981 and differ to NQO's in that the firm cannot obtain a tax deduction. Matsunaga measured tax status as a linear function of the firm's estimated future marginal tax rate. This variable was based on a study by Shevlin (1990) who used a simulation to estimate the present value of the change in taxes payable for an additional dollar of income earned in the current year. He did not however find an association between options granted and the size of the tax disincentive relating to ISO's. No reasons were given as to why the association between the firm's estimated future marginal tax rate and value of share options granted was not statistically significant.

[11] Firms that issue non-qualified options will obtain a deduction at exercise date equal to the difference between the market value at exercise date less the exercise price, and will be taxed at the marginal tax rate for the firm.

Thus neither Yermack nor Matsunaga found option granting behaviour to be influenced by tax position.

2.4.3.3 Assessed Losses Carried Forward and the Sign of Taxable Income

Klassen and Mawani (2000) did find the tax position of the firm to be significantly associated with option granting behavior, contrary to the findings of both Yermack (1995) and Matsunaga (1995). Firms were considered to have a high marginal tax rate if they had positive taxable income and no assessed losses carried forward. If they had positive taxable income and assessed losses carried forward or negative taxable income but no assessed losses carried forward, they were considered to have moderate marginal tax rates. If they had both negative taxable income and assessed losses carried forward, they were considered firms with low marginal tax rates. The reason for these results conflicting with those of Yermack was that Canadian firms are never permitted to deduct the cost of share options whereas US firms can deduct the cost of their NQO's. It remains unclear why Matsunaga did not obtain statistically significant associations between the value of ISO options granted and tax position.

2.4.4 Other Control Variables

Apart from financial reporting, tax and agency reasons, cash flow and firm size may also influence the granting of share options to executive directors.

2.4.4.1 Firm Size

Ceteris paribus, larger firms are likely to have greater sophistication in executive compensation and are therefore more likely to grant options (Klassen and Mawani (2000)). Smith and Watts (1992) suggested that the fixed costs and scale economies in the administration of share incentive plans are large, and such plans should therefore be observed more frequently in the large firms. Yermack (1997) and Klassen and Mawani (2000) used the logarithm of the market value of the firm's equity as a proxy for size and found that the firm's size is significantly positively related to the decision to grant options. Size was also found to be a significant variable by Gaver and Gaver (1993); Matsunaga (1995); Smith and Watts (1992) and Klassen and Mawani (2000). An unusual result was that of Murphy (1985) who found a significant negative relationship between firm size and option granting. Murphy agreed that his result was unexpected and could not provide a logical reason for it. Eaton & Rosen (1983), Matsunaga (1995) and

Mehran (1995) did not find a significant relationship between these two variables. Mehran (1995) suggested that this was possibly due to the calculation of his proxy for firm size, namely Tobin's Q[12].

2.4.4.2 Liquidity

Yermack (1995) identified companies facing liquidity constraints by using a dummy variable equal to one if a firm pays zero dividends during the year, and found that firms with current cash flow problems use share options to a greater degree than firms with sufficient cash in hand. This is due to the fact that share options do not require a cash payment by the firm. Klassen and Mawani (2000) used operating cash flow divided by the book value of equity as a measure of liquidity, and expected it to be significantly negatively correlated with the proportion of share options granted, although his results did not confirm this. Matsunaga (1995) used the opening balance of net current assets divided by the opening balance of total assets as a measure of liquidity, but did not find a significant relationship between liquidity and option granting. It is therefore uncertain whether option granting is driven by the firm's liquidity situation.

2.4.5 South African Studies

Modise (1993) published what appears to be the only study on executive remuneration in South Africa. He investigated the relationship between directors' compensation and the performance of their companies measured by abnormal shareholder returns[13]. He found a small, positive correlation between the two data sets. However, any increases in share options held by directors were excluded from the calculation of executive remuneration due to the poor quality of disclosure of JSE-listed companies at the time. Therefore, his conclusions do not shed any light on what the likely impact of South African companies that attain earnings above or below their targets will be on the proportion of share options granted to executive directors.

2.4.6 Summary of Previous Research

The following table contains a summary of the variables that have been found to be significantly associated with option granting by previous researches.

[12] Tobin's Q was calculated as the market value of the firm divided by the replacement cost of tangible assets.
[13] Abnormal shareholder returns are returns beyond what would be predicted from market movements alone.

Table 2A Significant Variables

	VARIABLE TESTED				
AUTHOR	FIRM SIZE	MONITORING DIFFICULTY	EXECUTIVE'S AGE	VARIANCE OF SHARE RETURN	SHARE RETURN
Eaton & Rosen (1983)	0	POSITIVE	0		
Murphy (1985)	NEGATIVE				0
Lewellen *et al* (1987)		POSITIVE	POSITIVE	POSITIVE	
Jensen & Murphy (1990)					POSITIVE
Smith & Watts (1992)	POSITIVE			POSITIVE	
Gaver & Gaver (1993)	POSITIVE			POSITIVE	
Bizjak *et al* (1993)					
Matsunaga (1995)	0	0			
Mehran (1995)	0	0			
Yermack (1995)		0	0		
Klassen and Mawani (2000)	POSITIVE	POSITIVE*		POSITIVE*	
Lambert and Larcker (1987)		POSITIVE			
Bushman *et al* (1996)					
Douglas *et al* (1997)					
Baber *et al* (1996)					
Sloan (1991)					
Ely (1991)					

	VARIABLE TESTED				
AUTHOR	USE OF ADDITIONAL EARNINGS PERFORMANCE MEASURES	BETA	LEVERAGE	LIQUIDITY	INDUSTRY
Eaton & Rosen (1983)					
Murphy (1985)					
Lewellen *et al* (1987)		NEGATIVE	POSITIVE		
Jensen & Murphy (1990)					
Smith & Watts (1992)					SIGNIFICANT
Gaver & Gaver (1993)					
Bizjak *et al* (1993)					
Matsunaga (1995)			0	0	
Mehran (1995)			0		
Yermack (1995)			0	NEGATIVE	SIGNIFICANT
Klassen and Mawani (2000)			POSITIVE	0	SIGNIFICANT*
Lambert and Larcker (1987)					
Bushman *et al* (1996)					
Douglas *et al* (1997)					
Baber *et al* (1996)					
Sloan (1991)	POSITIVE				
Ely (1991)					SIGNIFICANT

	VARIABLE TESTED			
AUTHOR	GROWTH OPPORTUNITIES	SHARES OWNED BY EXECUTIVES	FINANCIAL REPORTING COSTS	TAX STATUS
Eaton & Rosen (1983)				
Murphy (1985)				
Lewellen *et al* (1987)	POSITIVE	0		
Jensen & Murphy (1990)				
Smith & Watts (1992)	POSITIVE			
Gaver & Gaver (1993)	POSITIVE			
Bizjak *et al* (1993)	NEGATIVE			
Matsunaga (1995)	POSITIVE	0	POSITIVE	0
Mehran (1995)	POSITIVE	NEGATIVE		
Yermack (1995)	NEGATIVE	0	0	0
Klassen and Mawani (2000)	POSITIVE*		POSITIVE	NEGATIVE
Lambert and Larcker (1987)	POSITIVE			
Bushman *et al* (1996)	POSITIVE			
Douglas *et al* (1997)	POSITIVE			
Baber *et al* (1996)	POSITIVE			
Sloan (1991)				
Ely (1991)				

KEY:

POSITIVE	A significant positive relationship was found
NEGATIVE	A significant negative relationship was found
0	The variable was tested but no relationship was found
SIGNIFICANT	The variable was significant, but in no particular direction
*	The variable was included as a part of a factor, and factor analysis was conducted with the indicated result.

2.5 Summary

Share options have become an increasingly popular form of compensating directors and employees. Not only have share options been shown to reduce the agency costs prevalent within firms, they also offer financial reporting benefits due to the fact that no expense is required to be recognised in the income statement. Firms, however, cannot obtain a deduction when options are granted, so although there are benefits in the form of reduced agency costs and the avoidance of a profit impact, there is a disincentive to grant options from a tax perspective.

Share options are one of many forms of share-based compensation and have produced both positive and negative publicity within South Africa. For some employees, share options have been a successful source of wealth-creation. Other reports reveal that many share options have become worthless as a result of falling share prices. Re-pricing of share options has occurred to the benefit of directors but not shareholders; and directors have made large gains on the exercise of options prior to the company losing tremendous value. Thus, share option schemes have not always succeeded in aligning shareholder and management goals. Consequently, many schemes have recently been restructured to promote the retention of staff, focussing on long-term performance, and have become aligned with the core strategy of the firm.

The need for an accounting standard for the recognition of share-based payment was first pursued by the Financial Accounting Standards Board (FASB) in the United States in 1993 and resulted in tremendous upheaval. Consequently, a consensus was reached that a disclosure-based standard was sufficient. In 2000, the International Accounting Standards Board (IASB) having also embarked on developing a standard for share-based payment issued a Discussion Paper on this topic. They proposed that the transaction should be measured at the fair value of the options issued at vesting date, and that the expense must be accrued if performance is required between granting and vesting date. The Discussion Paper was applauded by most users of financial statements, however

many preparers thereof remained opposed to the IASB's proposals and reinforced the adequacy of a disclosure-based standard. Following from the Discussion Paper, an exposure draft (ED 160) that proposes the expensing of share options at the fair value of the options issued at grant date has recently been released in South Africa.

The use of share option schemes has been found to reduce the problem of agency, by aligning shareholder and management goals. Lewellen *et al* (1987) proposed that share-based compensation could assist in this alignment by raising the reward to executives from variance-increasing investments. A positive relationship between the variance of share returns and the proportion of share-based compensation was found. Lewellen *et al* (1987) also proposed and found that the proportion of the firm's long-term investment opportunities were positively associated with the proportion of share-based compensation. Gaver and Gaver (1993) found that growth firms as are also more likely to use share option plans as opposed to non-growth firms.

Younger executives were considered to be less wealthy than older executives and less willing to accept additional risk exposure from long-term forms of compensation. Lewellen *et al* (1987) therefore predicted and found a positive correlation between the proportion of share-based compensation and age. The debt-equity ratio was also examined because firms with large debt may prefer executives to be compensated by non-cash means, so as to preserve the cash to meet debt commitments. This variable was significantly positively related to the proportion of pay that consists of share-based payment.

A significant negative relationship was found to exist between the proportion of total pay that consisted of share-based payment and the beta of firm. Compensation packages were also found to differ across industries, and many authors used industry dummy variables to capture differences in agency costs across the sample of firms.

Sloan (1991) found that firms with a high amount of noise in share returns relative to market returns are more likely to use earnings performance measures when determining compensation. It was also discovered that these measures are more likely to be used by firms with executives who hold share-based forms of compensation. Furthermore Lambert and Larcker (1987) found that when the quality of manager's decisions do not provide a clear signal (which occurs when there's a high proportion of noise in earnings

relative to the noise in share price, remuneration committees can use share-based compensation as an alternative to revising executives' salaries.

Previous studies conducted on the financial reporting and tax affects of share option grants have been conducted in the United States by Yermack (1995) and Matsunaga (1995) and in Canada by Klassen and Mawani (2000). Yermack found that neither the firm's tax position nor its financial reporting position were significantly associated with options that are granted to executive directors. However, Matsunaga found that firms that attained earnings below their target level were more likely to grant options to executive directors. Consistent with the results of Yermack, Matsunaga found no significant association between the value of executive directors' share options and the firm's tax status. Klassen and Mawani obtained similar results to Matsunaga regarding financial reporting costs, and in addition found tax status to be significantly correlated with option granting behaviour. Thus conflicting results have been achieved and no research into the South African situation has been conducted thus far.

Apart from financial reporting, tax and agency reasons, cash flow and firm size may also influence the decision to grant share options to executive directors. Size was found to be a significant variable because larger firms are likely to have greater sophistication in executive compensation. Yermack (1995) found that firms with current cash flow problems use share options to a greater degree than firms with sufficient cash in hand, thus the liquidity of the firm was found to be significant.

CHAPTER 3

METHODOLOGY

3.1 Introduction

The objective of this chapter is to discuss the research methodology employed to achieve the objective of the study as detailed in Chapter 1. The objective may be summarised as whether or not share options granted to executive directors are explained by (i.e. significantly associated with) determined variables relating to agency costs and the firm's financial and tax situation.

This chapter contains a discussion on the sample selection process, an overview and a detailed description of the choice of variables used in this study (including a section that discusses a review of the manner in which the data was collected). The statistical procedure used to determine which of these variables are significantly associated with option granting is then addressed. Finally the limitations of the study are discussed.

3.2 Sample Selection

The initial sample consisted of the top one hundred South African companies as determined by their market capitalisation on the JSE Securities Exchange on the 31 October 2001. A list of these companies can be found in Appendix A. The financial statements of these companies for the financial years ending 2000 and 2001 were scrutinised for evidence of the existence of a share option scheme. This information was often contained within the Directors' Report, but was occasionally found within the share capital note to the financial statements or within a separate appendix. Where such evidence was found, the disclosure was examined to ascertain whether all of the variables required to calculate the Black-Scholes value of the share options granted to executive directors were provided. Companies with all the necessary information were included in the 'granted' sample, and the companies whose financial statements failed to provide all the necessary information were excluded from the sample.

The number of options granted during the year to executive directors was a key variable required but not disclosed. This figure was often grouped together with the number of

options granted to other employees, and was therefore not separately identifiable. Some companies confirmed the existence of a share option scheme but provided either limited or no detail regarding how many options were granted during the year or omitted the strike price[1] of the options. A further problem was that details of the share option scheme were frequently grouped together with details of other schemes such as share purchase schemes. Under these circumstances, the companies concerned were excluded from the sample.

Section 297 of the Company's Act (Strydom 1998) requires disclosure of the details of share option schemes, thus if no evidence of a share option scheme was provided it was assumed that such a scheme did not exist. For the purposes of this study, such companies were included in the 'not granted' sample.

Due to the lack of thorough disclosure concerning share option schemes, the sample size was reduced to 19 companies that granted share options in 2001; 14 that granted share options in 2000; 17 companies that did not grant share options in 2001 and 11 that did not grant share options in 2000. The sample therefore comprises a total of 61 companies over two years. A list of these companies is contained in Appendix B.

3.3 Overview of the Variables Selected

For the purposes of this study, one dependent variable representing the firm's option granting behaviour and thirteen independent variables that relate to either agency costs or the firm's financial or tax position were selected. This section continues with an outline of each of these variables.

3.3.1 Dependent Variable

The dependent variable (hereinafter 'the option ratio') is a proxy for the extent to which firm's use share options as a form of executive remuneration.

[1] The strike price of an option is the price that the option holder will pay when he exercises his option

3.3.1.1 The Option Ratio

The option ratio represents the proportion of the firm's executive directors total annual cash and share-based compensation that consists of share options that have been granted to them during the year. This variable is calculated as the Black-Scholes value of the options granted by the firm during the current year, divided by the sum of this value plus the cash salaries and bonuses paid by the firm during the year. The calculation of the option ratio follows the approach adopted by Klassen and Mawani (2000) in their study.

3.3.2 Independent Variables

The thirteen independent variables that have been selected can be categorised into those relating to agency costs, financial reporting or tax position or 'other'. Six variables have been identified as proxies for agency costs, two variables to represent the firm's financial reporting situation, two variables relating to the firm's tax position, and two other variables relate to size and liquidity. Finally, a dummy variable for the firm's industry classification was selected.

.

3.3.2.1 The Proxies for Agency Costs

Following the work done by Lewellen *et al* (1987), Smith and Watts (1992), Gaver and Gaver (1993) and Klassen and Mawani (2000), firm's that have highly variable share returns tend to compensate their managers with share-based payments to align their interests with the shareholders. The variance of shareholder returns was therefore selected as a proxy for agency costs.

Gaver and Gaver (1993), Baber *et al* (1996), Bushman *et al* (1996), Douglas *et al* (1997), and Klassen and Mawani (2000) found that growth firms are more likely to use share option plans as opposed to non-growth firms. For this reason, the ratio of research and development expenditure to the book value of assets was selected as a proxy for growth. A further proxy for growth selected was the five-year growth in assets as used by Lambert and Larcker (1987). Lambert and Larcker also included the growth in sales as a proxy for growth, however, this measure was excluded from this study as not all the firms in the sample have a sales figure in their income statement, and two proxies for growth were considered to be sufficient.

As a result of the findings of Smith and Watts (1992) and Lewellen *et al* (1987), that the proportion of total pay consisting of share-based payment is significantly positively associated with the proportion of a firm's investment opportunities that are long-term in nature, the market-to-book ratio of equity was selected as a proxy for investment opportunities. The reason for selecting this variable is due to the fact that it reflects the rate at which earnings and cash flows are expected to grow over time, which is determined by the volume of investment opportunities. Smith and Watts (1992) used the ratio of the book value of assets to the market value of the firm as a proxy for investment opportunities, however the market-to-book ratio appears to be appropriate based on its prevalence and consistent results in previous studies and was therefore used in this study.

Firms with a high amount of noise in share returns relative to market returns are more likely to use earnings performance measures in compensation contracts, and these in turn are more likely to be used by firms with executives who hold share-based forms of compensation (Sloan (1991) and Lambert and Larcker (1987)). The 60-month variance of market-adjusted returns to total market returns was selected as a measure for the noise in share price that is not attributable to the market. This measure was also used by Klassen and Mawani (2000).

According to Yermack (1995), Lambert and Larcker (1987) and Sloan (1991), more emphasis is placed on share-based compensation when the noise in earnings is high relative to the noise in the share price. A measure for the noisiness of earnings relative to the share price was calculated as the ratio of the variance in return on equity for the previous five years to the variance in daily share price for the previous five years, as used by Yermack (1995). Lambert and Larcker (1987) and Sloan (1991) used the ratio of the variance in earnings per share to the variance in the share price. However, return on equity was considered to be the better variable as it incorporates the entire equity on the balance sheet of the firm into the calculation, as opposed to simply the number of shares.

3.3.2.2 The Proxies for Financial Reporting Incentives

When firms fail to meet income targets, explicit costs arise from contracts that are based on the firm attaining those targets, and implicit costs arise as a result of shareholder dissatisfaction. Since firms do not have to recognise an expense when share options are

granted, their deviation from their target income may influence the decision to grant options or not. Therefore, the financial reporting incentive to grant options was calculated as the deviation from target return on equity (DROE). The DROE was used by Klassen and Mawani (2000), and is similar to the deviation from target net income used by Matsunaga (1995).

A further variable representing financial reporting costs is the debt-equity ratio. This variable represents the fact that firms that substitute debt for equity are closer to violating contracts that are based on the attainment of low debt-equity and similar financial ratios, and consequently closer to incurring costs as a result of the violation. In addition, firms with a large proportion of debt relative to equity will probably wish to retain cash for the financing of debt as opposed to cash salaries. For these reasons, firms that have high debt components in their capital structure are expected to substitute options for cash to preserve reported profits and cash. Klassen and Mawani (2000), Lewellen *et al* (1987), Yermack (1995) and Matsunaga (1995) used this variable in their study.

3.3.2.3 The Proxy for Tax Position

According to work done by Klassen and Mawani (2000), the firms' tax position might influence the decision to grant share options due to the fact that firm's do not obtain a tax deduction when share options are granted, but do obtain a deduction when cash salaries are paid. A measure for tax position suggested by Shevlin (1990) and Graham (1996) was used by Klassen and Mawani (2000) and used in this study. This measure categorises firms into high, moderate, and low marginal tax rate brackets, depending on the presence of assessed losses within the firm and whether the firm has positive or negative taxable income. These three categories are then coded by two indicator variables using binary code.

3.3.2.4 Other Control Variables

To determine whether or not the type of industry within which a firm operates plays any role on its option granting behaviour, dummy variables were allocated to each firm depending on its industry classification to capture industry-specific differences. This follows Smith and Watts (1992), Ely (1991), Matsunaga (1995), Yermack (1995) and Klassen and Mawani (2000).

Yermack (1997) and Klassen and Mawani (2000) used the firm's market value as a proxy for size. Gaver and Gaver (1992) used the ratio of the market value of the firm to the book value of assets as a proxy for size, Matsunaga (1995) used the inverse of the opening balance of total assets and Smith and Watts (1992) used the log of real sales for unregulated industries and different measures for the four regulated industries. Although there are a number of possible proxies for size, the sample for this study was selected based on the firms' market values, and this measure appears to be an appropriate indication of size.

A proxy for the firm's liquidity was selected as the variable used by Klassen and Mawani (2000), namely the ratio of operating cash flow to the book value of equity. Yermack's (1995) proxy for liquidity was based on whether dividends were declared. This variable was not selected due to the fact that the majority of South African firms declare dividends which would render this variable meaningless. The variable selected by Matsunaga (1995) being the ratio of net current assets to total assets, was not selected for this study due to fact that net current assets may include certain non-cash current liabilities, which may create bias in the ratio.

3.4 The Variables Not Selected

Other proxies identified in Chapter 2 for agency costs, the firm's beta, share return, the executive's age and the fraction of the firm's shares held by the executive were not selected as independent variables for this study. These variables have not been key nor found to be frequently significant in prior research. Furthermore, some of the information required to calculate these variables is not publicly available. For these reasons, the variables have been excluded from the scope of this study.

3.5 The Variables in Detail

Following from the overview of the variables that was presented in 3.3, this section continues with a detailed discussion of each variable, including how the variable was measured and the relevant data obtained.

3.5.1 The Option Ratio

3.5.1.1 Description

The option ratio represents the proportion of the firm's executive directors total annual cash and share-based compensation that consists of share options that have been granted to them during the year. This variable is calculated as the Black-Scholes value of the options granted by the firm during the current year, divided by the sum of this value plus the cash salaries and bonuses paid by the firm during the year. This option ratio was used by Klassen and Mawani (2000), and its selection was due to its ability to control for the level of compensation paid, by suppressing factors that might affect the aggregate level of compensation. For these reasons, it is also considered to be more appropriate than simply using the Black-Scholes value of the options granted as in Matsunaga (1995). By including the value of options granted in the denominator, the option ratio provides a measure that is less skewed than the ratio of share options granted to cash compensation used by Yermack (1995).

3.5.1.2 Measurement

The dependent variable, known as the option ratio, is calculated as the Black-Scholes value of the options granted by the firm during the current year, divided by the sum of this value plus the cash salaries and bonuses paid by the firm during the year. The Black -Scholes formula was developed by Black and Scholes (1973). This formula was originally derived for the pricing of European options[2] on non-dividend paying shares, and may underestimate the true value of options where the holder has the right to exercise the option before maturity (namely American options) and where the option is on shares that pay dividends (Haugen 1993). Black-Scholes can however be used to value both American and European options (Haugen 1993). It is therefore appropriate for the valuing of South African share options, which are American by nature.

Since most South African companies pay dividends and the Black-Scholes model underestimates the value of options on shares that pay dividends, the model should be adjusted for this. The value of a share option will fall when a dividend is declared on the underlying share, as the market price of the share should fall by the value of the

[2] European options are options that can only be exercised at maturity.

dividend, and the option holder would not receive the dividends as he does not hold the shares but an option to acquire shares. The dividend yield is therefore a further variable in the Black-Scholes model and is defined as the dividend per share in the current year divided by the share price at year end (Merton 1973; Reilly & Brown 1994). The dividend yield serves as a discount factor to the current share price, and the Black-Scholes model adjusted for dividends is as follows:

$$V = (e^{[-D*T]})*S*N(d^1) - X*(e^{[-R*T]})*N(d^2) \quad \text{(Equation 1a)}$$

Where: $d^1 = [\ln((e^{(-D*T)})*S/X) + (R + 0.5\sigma^2)*T] / [\sigma*t^{1/2}]$

(Equation 1b)

And: $d^2 = d^1 - (\sigma*T^{1/2})$ (Equation 1c)

V = Black-Scholes option value
D = the annualised dividend yield
e = the constant: 2,71828182845904
S = share price on the date of grant
X = the strike price of the option
R = ln(1 + the risk-free rate)
T = time to maturity
σ^2 = the annualised variance of daily share returns from 1996 – 2001
$N(d^1)$ = the cumulative normal probability of d^1
$N(d^2)$ = the cumulative normal probability of d^2
* = multiply

Yermack (1995) identified that the Black-Scholes formula has limitations for share options granted to executive directors since these directors are unable to hedge the value of their options in the market. However, its prevalence in previous studies (Yermack (1995), Matsunaga (1995) and Klassen and Mawani (2000)) and the fact that the IASB proposed it as an appropriate measurement for calculating what should be expensed in the income statement (IASB 2000), supports its use in this study.

The Black-Scholes calculation includes a variable for the risk-free rate[3]. Klassen and Mawani (2000) used the 90-day Treasury Bill rate for the month of the grant, however in South Africa, Bankers' Acceptances are considered to be more liquid than Treasury Bills as Treasury Bills were previously prescribed liquid asset requirements for pension funds and insurance companies (Ross, Westerfield, Jordan and Firer, 1996). This study therefore uses the average Bankers Acceptance rate for the relevant year, as it is considered to be a better proxy for the risk-free rate in South Africa.

The annualised variance of daily share returns was estimated by using the daily share price for the preceeding five years. The natural logarithm of the share price at time t divided by the share price at time t-1, and the standard deviation was calculated using the statistical technique used in Excel, and annualised by multiplying it by the square root of 250, which represents the number of trading days in a typical year (Reilly & Brown 1994). This figure was then squared to obtain the variance of daily share returns. A South African derivative trading firm, Cadiz, confirmed that this was an appropriate measure for the volatility of the share.

The computed Black-Scholes option values and the total cash compensation values were combined to calculate the ratio of the option value to the sum of the option value and cash for each firm, using the following equation:

$$OR_t = V_t / [V_t + C_t] \qquad \text{(Equation 2)}$$

Where: OR = the option ratio at time t

V = the Black-Scholes value of options granted to executive directors at time t

C = the total of cash salary and bonuses paid during the year at time t

[3] The risk-free rate is the interest rate payable on short term government debt as it is virtually free from any default risk.

3.5.1.3 Data Collection

The first source for the collection of data was McGregors Securities Exchange Digest. When it was not provided in the Digest, the data was obtained directly from the financial statements. The data necessary for the calculation of the option ratio was obtained by analysing the financial statements of all the firms in the 'granted' sample and extracting the value of the executive directors' cash salary and bonuses. The remaining variables necessary to compute Black-Scholes were available in these companies' financial statements, apart from four companies that did not disclose the date that the options were granted. The option granting date is important because the share price on the date of grant is required to calculate the Black-Scholes value of the option. The company secretaries of these companies[4] were telephoned, and the date of grant was obtained telephonically or by email. In the instances where only the month of grant was provided in the financial statements, the average share price for that month was calculated to be the share price on the date of grant.

Where the strike price of the option was expressed in a foreign currency, the exchange rate at the date of grant was used to convert the strike price into Rands. The exchange rates were obtained from Reuters. The average Bankers Acceptance rate for the year was obtained from Datastream. The daily share prices were obtained from the database of Alliance Capital, an international financial institution.

The dividend per share data in 2000 used in the dividend yield calculation was obtained from McGregors Securities Exchange Digest. As McGregors Securities Exchange Digest did not contain all the companies' most recent dividend per share figures, the dividend per share in 2001 was obtained by extracting the dividend declared from the Statement of Changes in Equity of the relevant companies and dividing this by the number of shares in issue at the year end. The number of shares issued was computed by dividing the market capitalization by the share price at year end. Although two different methods were used to obtain the dividend per share in 2000 and 2001, the logic is the same and should not introduce any bias.

[4] The companies were Bidvest, Firstrand, Tigerbrands and AVI.

3.5.2 Financial Reporting Variables

3.5.2.1 Description

When reporting low levels of accounting earnings, implicit costs emerge as a result of shareholder dissatisfaction and possible violations of debt covenants (Yermack 1995). Firms therefore try to attain a target level of earnings in order to avoid these costs. Due to there being no recognition in the income statement of share options granted, firms that are achieving earnings below their target level, may be more likely to issue share options as opposed to cash salaries to their executives as compensation. The firm would thereby avoid recognising an expense, which may reduce the difference between actual and target earnings (Matsunaga 1995).

If a firm achieves earnings that are above its target level, there are no financial reporting costs that arise: shareholders' take comfort in the above-expected results and the firm's creditors will be confident of debt repayments. In this situation, the balance between cash salaries and share options cannot be predicted. The firm can either grant options to reward executive directors for the good results, or not grant options in order to smooth the level of earnings to approximate the target level (Matsunaga 1995). The correct statistical relationship between firms with earnings above its target and the decision to grant options is therefore not known.

Potential financial reporting costs may also affect the *proportion* of share options granted. A separate test that focuses only on companies in the 'granted' sample will be conducted for this purpose. Chapter 4.3.3 includes the results and a discussion regarding this test.

3.5.2.2 Measurement

Many firms and stakeholders use return on equity (ROE) as a measure of performance. It is considered to be superior to measures such as earnings per share (EPS) or revenue growth because it incorporates capital investment; however it is not a good indicator of value creation. Value is created if returns are in excess of the cost of capital, which ROE does not show (Solomou & Gustavsson 1999). However it is still widely used, and is therefore used in this study. ROE is calculated as:

$$ROE = \frac{\text{Income attributable to ordinary shareholders}}{\text{Ordinary shareholders' equity}}$$

(Equation 3)

This study follows a similar methodology to that used by Klassen and Mawani (2000), whereby the target ROE for each firm is assumed to follow a random walk with a drift. The drift is calculated as the geometrically declining weighted average of the change in ROE over the previous five years. The reason for this is that recent changes are more likely to influence expectations of the future as opposed to less recent changes, but the calculation is not restricted solely to the most recent year. If the firm had not been listed for five years, the drift for the target ROE was calculated as the geometrically declining weighted average based on the number of years the firm had been listed. The target and drift are calculated as follows:

$$ROE(Target_t) = (1+drift)*ROE_{t-1}$$

(Equation 4a)

$$drift = \tfrac{1}{2}[ROE_t - ROE_{t-1}] + \tfrac{1}{4}[ROE_{t-1} - ROE_{t-2}] + 1/8[ROE_{t-2} - ROE_{t-3}] + 1/16[ROE_{t-3} - ROE_{t-4}] + 1/16[ROE_{t-4} - ROE_{t-5}]$$

(Equation 4b)

The target is then adjusted so that neither the drift nor the target is negative. The target is therefore the greater of the amount calculated in equation 3, the previous year's ROE and zero.

The income attributable to ordinary shareholders for the current year is reduced by the after-tax Black-Scholes value of options granted, to reflect the situation if the options had been cash remuneration. If the value of the options had been cash remuneration, a tax deduction would have been obtained and hence the after-tax value is deducted. This calculation provides a fairer value for income attributable to ordinary shareholders as it incorporates the cost of remunerating executive directors with options. The adjusted figure is then divided by ordinary shareholders' equity, and the target is subtracted to derive a deviation from target ROE (DROE) as follows:

$$DROE = [NI_t - (1\text{-}etr)V_t] / BV_t - ROE(Target, _t)$$

(Equation 5)

Where: NI_t is net income before extraordinary items

etr is the effective tax rate

V is the Black-Scholes value of options granted

BV is ordinary shareholders' equity

Separate tests were conducted on firms with a DROE above target ROE (PDROE) and firms with a DROE below target ROE (NDROE), in order to ascertain which variables become significantly associated with option granting depending on whether the firm has achieved a positive or negative DROE. The results of these tests are discussed in 4.3.4 and 4.3.5 respectively.

The second financial reporting variable used in this study is the debt-equity ratio. Firms that substitute debt for equity are closer to violating contracts that are based on the attainment of financial ratios. Costs of violation will arise if these firms renege on their contracts. Firms with a large debt-equity ratio will probably substitute options for cash to preserve reported profits and cash. A positive relationship between the debt-equity ratio and option use is therefore anticipated.

3.5.2.3 Data Collection

The ROE figures, net income before extraordinary items, and the book value of shareholders' equity were all obtained from McGregors database. The effective tax rate was obtained from the financial statements.

The debt-equity ratio was calculated as the ratio of long-term liabilities to the book value of shareholders' equity. The long-term liabilities figure was also obtained from McGregors database.

3.5.3 Tax Status Variables

3.5.3.1 Description

To determine the tax position of a firm, a measure used by Shevlin (1990) was adopted. Firms with a positive taxable income and no assessed losses are categorised as high marginal tax rate firms. Firms with a positive taxable income and an assessed loss or a

negative taxable income and no assessed losses carried forward are categorised as moderate marginal tax rate firms. Firms that have negative taxable incomes and assessed losses carried forward are categorised as low marginal tax rate firms. It is an extension of Yermack's (1995) measure that was based solely on the existence of assessed losses within the firm. Matsunaga's (1995) measure of tax status was not appropriate as it was based on United States tax law, which is significantly different to our own and would therefore not be of assistance in providing a variable applicable to South African firms.

3.5.3.2 Measurement

The sign of taxable income was established by the following equation:

$$TIBL = NIBT - (\Delta DT / str) \quad \text{(Equation 6)}$$

Where: TIBL is taxable income before assessed losses
NIBT is net income before taxes
str is the statutory tax rate of 30%
ΔDT is the change in the deferred tax balance sheet amount for the year

This measure is then coded by two indicator variables. The high marginal tax rate indicator variable (HMTR) is equal to one if there are *both* no assessed losses carried forward and positive taxable income, and zero otherwise. The moderate marginal tax rate indicator variable (MMTR) takes the value of one if *either* there are no assessed losses *or* there is a positive taxable income but not both, and zero otherwise. The relationship between the firm's marginal tax rate and use of share options is expected to be negative as no tax deduction is available to the company.

3.5.3.2 Data Collection

It is a requirement in terms of AC102 paragraph 85(e) and (i) to disclose the amount of unused tax losses that have and have not been recognised. The existence of an assessed loss carried forward was therefore determined by scrutinising the taxation note to the financial statements for a commentary stating that tax losses are available for set-off against future taxable income and inspecting the deferred tax asset. The deferred tax note to the financial statements also provided evidence of this when a deferred tax asset

had been recognised as a result of an assessed loss. The deferred tax balances and net income before tax were extracted from the financial statements.

Another method of determining the sign of taxable income is to inspect the sign of the current tax figure within the taxation note to the financial statements. However, some firms are liable to both local and foreign tax authorities and split the current tax between these parties. Mining firms also split their taxation charge into mining and non-mining, and in some cases one of the amounts is positive and the other zero. It was considered more appropriate to use a formula that can be applied to all firms, as opposed to individual analysis of the taxation charge.

3.5.4 Agency Variables

A description of each of the following variables selected as proxies for agency costs has already been made in chapter 2.4.1 and reiterated in 3.2.2.1. This section therefore only contains a discussion on the measurement and the process used to collect the relevant data.

3.5.4.1 Variance of Share Returns

The variance of share returns was calculated as the 60-month variance of market adjusted returns. For the purposes of this study, the All Share Index (ALSI) was used as a proxy for the market, and the market-adjusted returns were calculated by subtracting the daily change in the ALSI from the daily change in the firm's share price. The variance was calculated from these returns. The change in share price was not adjusted for the effects of dividends declarations, as the dates that dividends were declared were not publicly available. An employee of Cadiz Holdings Ltd, a financial market strategist, confirmed that the lack of a dividend adjustment should not significantly effect the results of this study.

3.5.4.2 The Ratio of Research and Development Expenditure to Total Assets

The amount of research and development expenditure that was expensed during the year was obtained from the income statement or the notes thereto. It is a disclosure requirement in terms of AC129 paragraph 117 to disclose this figure separately, and if no such figure was disclosed, it was assumed that no expenditure on research and

development was incurred during the year. The book value of assets was obtained from McGregors' database.

As expenditure on research and development is not prevalent within the financial sector, a separate test was conducted on data that excluded the financial sector. The results of this test can be found in chapter 4.2.6.

3.5.4.3 Five-year Growth in Assets

Growth in assets was measured as the five-year growth in total assets, and such growth was expected to be positively correlated with the granting of options. If the firm had not been listed for five years, the growth in total assets was calculated for the period during which it was listed. This should not introduce any bias into the results.

3.5.4.4 The Market-to-Book Ratio

The market-to-book ratio was calculated by dividing the market value at the end of the firm's financial year by the book value of its equity as per McGregors' database. The market value was obtained from Alliance Capital.

3.5.4.5 The Ratio of the 60-month Variance of Market-adjusted Returns to Total Returns

The calculation of the 60-month variance of market-adjusted returns was discussed in 3.4.4.1. The 60-month variance of total returns was calculated from the daily share price of the firm for the previous five years, up until the year end. The ratio was then obtained by taking the former variance and dividing it by the latter. The daily share price was obtained from Alliance Capital.

3.5.4.6 The Ratio of the Variance in Return on Equity to the Variance in Share Returns

The variance in return on equity was calculated from the return on equity figures discussed in 3.5.2.1 above. The variance of shareholder returns was discussed in 3.5.4.1. The ratio was obtained by dividing the former variance by the latter variance.

3.5.4.7 Industry Variables

The firms were divided into nine industry categories. These are resources; basic industries; financials; non-cyclical consumer goods; cyclical consumer goods; cyclical services; general industrials; information technology and non-cyclical services. Appendix C shows the firms' industry classification based on its classification by the JSE Securities Exchange.

3.5.5 Other Control Variables

3.5.5.1 Market Value

The market value at the firm's year-end was used as a proxy for size and was obtained from the database of Alliance Capital.

3.5.5.2 The Ratio of Operating Cash flow to Equity

The operating cash flow figure was obtained from the Cash Flow Statement in the financial statements, and the book value of equity was the same as that used to calculate ROE in 3.4.2.1 above.

3.6 Regression Model

The relationship between the dependent variable and the independent variables can be established by performing multiple regression analysis. A regression equation is based on the assumption that a linear relationship exists between the dependent and independent variables. It is therefore necessary to test whether this is indeed the case. The correlation coefficients between each of the independent variables and the dependent variable indicate whether a liner relationship exists. The correlation coefficients for each of the variables can be found in Table 3.1, Panel A. The only variable that is significantly correlated with the option ratio is the market value. The DROE, HMTR, MMTR and debt-equity ratio do not appear to have a linear relationship with the option ratio.

Secondly, the assumption regarding the error term that applies to multiple regression is that the error ε must be normally distributed. Since the dependent variable (y) is a linear function of ε, and since α_i are constants, y must also be normally distributed (Van den

Honert 1997). To test whether the assumption of normality is apparent in the data, a non-parametric method known as the Kolmogorov-Smirnov (K-S) Test was conducted. The hypothesis tested was as follows:

H_0 : the data is normally distributed

H_1: the data is not normally distributed

The results appear in Table 3.1, Panel B and reveal that the null hypothesis for all of the variables was rejected at the 1% level. This shows that none of the variables in the regression equation are normally distributed, and consequently, multiple regression analysis cannot be performed on the raw data.. Table 3.1, Panel C contains descriptive statistics for the raw data.

Due to the non-normality and non-linearity of the data, two procedures known as Rank Regression and the normal scores approach were conducted on the data. Cooke (1998) suggested these approaches, together with log-of-the-odds ratio in 1998. He argued that when there is evidence of non-normality and non-independence of the error term; heteroscedasticity[5]; as well as problems of outliers and non-linearity, a transformation of the variables is necessary to make the statistical analysis more meaningful.

The Rank Regression procedure involves ranking the observations from smallest to largest, and undertaking a regression on the ranks. It has the advantage of being distribution-free, so that tests conducted on ranked data do not require the data to be normally distributed. It is also not necessary to standardize, log or undertake any power transformation, because these methods result in the same assignment of ranks. Furthermore, rank transformation is relatively insensitive to outliers, and is useful when the relationship between the dependent and independent variables is non-linear or unknown (Cooke 1998). Rank Regression is therefore a suitable option for this study. Log-of-the-odds ratio is only applicable when the assumptions of a linear regression model hold, and is therefore not suitable in this study.

The normal scores approach transforms the data to the normal distribution by dividing the distribution into the number of observations plus one regions on the basis that each region has equal probability. The ranks of the dependent variable are therefore

[5] Homeoscadasticity implies that the error term has a constant variance

substituted by scores on the normal distribution, and the regression analysis is performed using the normal scores as the dependent variable. Cooke also suggests that the transformation to normal scores should involve both the dependent and independent variables, because by changing only the dependent variable the relationship between the dependent and independent variables is also implicitly changed.

Cooke's (1998) reasons for supporting the normal scores approach were that the resulting tests have statistical properties because significance levels can be determined and the F and t-tests are meaningful. Furthermore, the regression coefficients derived from using normal scores are more meaningful than those derived from Rank Regression; and it is a means by which non-normal dependent variables can be transformed into normal ones, and a normally distributed dependent variable implies that the errors are also normally distributed. For these reasons, Cooke proposed that the advantages of using normal scores outweigh those of Rank Regression. However, for the purposes of this study, tests using both the ranked and the normal scores data were conducted. Three of the variables were not transformed into ranks and normal scores, namely the high and moderate marginal tax rate variables and the industry variable. This is due to the fact that these variables do not measure data, but are instead indicator variables for an underlying fact.

The normal scores of ranked data were calculated and tabulated by Harter (1961). These values were used to convert the ranked data in this study into normal data. Harter's normal scores are based on the following equation:

$$Z_i = \phi^{-1}(i / n+1) \qquad \text{(Equation 7)}$$

Where: zi = normal score

ϕ^{-1} = the inverse of the N(0,1) cumulative density function

i = rank i

The data was ranked using the sequential ranking function in Statistica, a statistical software package. Sequential ranking was selected as there were a number of firms with option ratios equal to zero, and the sequential function deals with this issue by ranking each tied value sequentially and does not give tied values the same rank. The descriptive

statistics for the ranked and normal scores data can be found in Table 3.2, Panel A and B respectively. It can be seen from Panel A that the mean of the ranked data is 31 and the standard deviations of each variable are the same, except for the three variables that were not ranked. Panel B also shows that the variable's means are close to zero. This is expected due to the fact that half of the normal scores are positive, and the other half are equal but negative, and had similar standard deviations. The residuals of both the ranked and normal scores transformations were displayed and were found to be normally distributed. Therefore, tests were conducted on both the ranked and the normal scores data, and the results are compared in Chapter 4.

Based on the fact that the data has been transformed into normal and linear data, multiple regression analysis could then be performed using Statistica. The following regression model was estimated:

$$OR = \alpha_0 + \alpha_1 DROE + \alpha_2 D/E + \alpha_3 HMTR + \alpha_4 MMTR + \alpha_5 OCF/BV + \alpha_6 MV + \alpha_7 MKT\_ADJ + \alpha_8 MADJ\_TOT + \alpha_9 G\_ASSETS + \alpha_{10} MV\_BV + \alpha_{11} R\_D + \alpha_{12} VROE\_VSP + \varepsilon \quad \text{(Equation 8)}$$

Where: OR = option ratio

DROE = deviation of ROE from target

D/E = long term debt divided by book value of equity

HMTR = high marginal tax rate indicator that equals one if there are (a) no assessed losses carried forward *and* (b) positive taxable income, and zero otherwise.

MMTR = moderate marginal tax rate indicator that equals one if *either* (a) or (b) above exists, and zero otherwise

OCF/BV = operating cash flow divided by the book value of shareholders' equity

MV = the firm's market value of equity

MKT_ADJ = the variance of market-adjusted returns

MADJ_TOT = the ratio of market-adjusted returns to total returns

G_ASSETS = the five-year growth in assets

MV_BV = the market value divided by the book vale of equity

R_D = the ratio of research and development expenditure to total assets

VROE_VSP = the ratio of the variance in return on equity to the variance in share price

An ordinary multiple regression analysis was conducted on the data, as well as a forward stepwise multiple regression analysis and an analysis after adjusting for the effects of multicollineraity. A forward stepwise regression procedure checks to see if the 'best' variable not yet in the regression model can enter the model, and those variables already in the model are checked to see if one can be removed from the model until such time as no further variables can enter or leave the model (van den Honert 1997). Multicollinearity exists when explanatory variables are highly correlated with one another. It is preferable to have explanatory variables that are as far as possible uncorrelated with one another, so that together they offer maximum explanation (van den Honert 1997).

All of these analyses were conducted on the overall data, firstly using the ranked data and secondly the normal scores data. Additional tests were also conducted on specific data, such as examining the overall data without firms from the financial sector included and examining the financial sector separately. These two tests were conducted because firms in the financial sector have no research and development expenditure and their composition of long-term debt is not the same as other sectors. A further test that was conducted was that the deviation from return on equity was given an absolute value (one or zero) depending on whether the firm was above or below its target ROE. This test was performed to determine whether the fact that the DROE is positive or negative is significantly associated with option granting. Furthermore, firms in the 'granted' sample were analysed separately. Finally, only those firms that had negative DROE's were examined to determine whether the fact that the firm is below its target ROE is significantly associated with option granting. A similar test was conducted on firms with only positive DROE's.

3.7 Limitations and Points of Consideration

3.7.1 The Appropriateness of using the Number of Options Granted in the Dependent Variable

The reason behind the granting of options has an important bearing on this study. If the decision regarding the granting of share options is at the discretion of the remuneration committee, and is not an agreed upon annual procedure outlined in the share option scheme, then the use of a dependent variable that is based on the number of options granted during the year is an appropriate variable for this study. However, if the share option scheme specifically states the quantity of options to be granted per annum, then the annual option grant cannot be influenced by the problem of agency, the tax or financial position of the company or any other firm-specific factors. In this situation, it would be more appropriate to use a variable based on the date on which the share option scheme arose.

This study assumes that the granting of options is a discretionary decision, and is dependent on the company's circumstances at that time.

3.7.2 The Appropriateness of the Tax Variable

The tax position of companies in this study is determined by the *group's* taxable income and assessed loss status. However, a possible situation could be a financially sound holding company that is granting options to its directors, whilst its subsidiary is doing poorly and has an assessed loss. From a group perspective, this company will have granted options, but would be classified as having either a moderate or low tax status as a result of the subsidiary's situation, even if the holding company itself has a high tax position. A more appropriate variable would therefore be based on the holding companies tax situation.

However, financial statements do not often disclose where the assessed loss arose and it is therefore difficult to attribute the assessed loss to either the holding company or its subsidiaries. Furthermore, in some group structures the holding company simply receives the dividends from its subsidiaries and does not conduct any business of its own

and would therefore not be liable for tax. In these situations, the tax position of the holding company would be an inappropriate variable. For these reasons the group's tax situation is used in this study.

3.7.3 The Effect of Goodwill Write-offs on Return on Equity

Companies that previously wrote off goodwill to share premium before AC131 *Business Combinations* became effective, will have distorted return on equity figures. In the year in which they wrote off goodwill in this way, return on equity would be unusually high, and every year thereafter would be affected as well as a result of the roll over of the equity figure.

Thus far no publicly available data has been adjusted for the effects of goodwill write-offs against share premium. If one were to adjust for this manually, it would require inspecting the financial statements of the companies in the sample for the year in which AC131 became effective (years commencing on or after 1 July 1999); identifying from the change in accounting policy note whether goodwill was previously written off against share premium; if so, adding this amount back to share premium; deciding on an appropriate amortisation period and adjusting the following year's net incomes by the amortised amount. Although it is acknowledged that an adjusted return on equity would improve the quality of the deviation from return on equity variable, the impact that the process of adjusting the data would have on the results of this study is not likely to make it a worthwhile exercise. For this reason, return on equity has simply been calculated as profit attributable to ordinary shareholders divided by ordinary shareholders' equity.

3.7.4 The Existence of a Remuneration Committee

This study assumes that the decision to grant options is not one that is partial to personal preferences, but rather one that is independent and based on the company's situation. If a company has a remuneration committee, it can be assumed that the decision to grant options is an independent one. However if no remuneration committee exists, then the option granting decision could possible be influenced by individual desires and not merely by the company's circumstances.

It is likely that most, if not all of the companies in the sample have a remuneration committee, as they are amongst the largest and most reputable companies in South Africa. It is also beyond the scope of this study to focus on the corporate governance issues of share option schemes, and for these reasons the existence of a remuneration committee has been disregarded.

3.7.5 Options Granted to Holding Company Directors

Some companies have granted options to the directors of their holding company. The primary reason why share options are granted to directors is that shareholder and management interests become more closely aligned as a result. When a subsidiary grants share options to its holding company's directors, it is effectively granting a share option to a shareholder, and the purpose for this is not the reduction of agency costs, but rather a strategy that unites the various parties of the group. For the purposes of this study, these options have been ignored, as they are not granted for the same reasons as those that companies grant to their own directors.

3.7.6 The Future Consequences of Granting Share Options

A large quantity of research has been conducted overseas pertaining to share option grants. It is important to reiterate that this study seeks solely to identify variables that explain whether a South African firm is likely to grant share options to its executive directors or not. This study does not intend to investigate the effects of share option grants on the firm's capital structure, or on shareholders or debt holders. Furthermore, no attempt is made to establish an optimal strike price for share options. The future consequences of granting share options are therefore beyond the scope of this study. This study focuses primarily on the current position within the firm, that is its present day financial reporting position, tax, size and liquidity situation, and agency related issues. Whether these characteristics of the firm change subsequent to the granting of share options is a matter for future research.

3.8 Summary

This chapter contains a discussion of the variables and the process by which the research was conducted. The initial sample consisted of the top one hundred South African companies as determined by their market capitalisation on the JSE Securities Exchange on the 31 October 2001. Both their 2001 and 2000 financial statements were examined for information pertaining to share options. Due to inadequate disclosure, the sample size was reduced to a total of 61 companies over two years.

The dependent variable, known as the option ratio, was calculated as the Black-Scholes value of the options granted by the firm during the current year, divided by the sum of this value and the cash salaries and bonuses paid by the firm during the year. Since most South African companies pay dividends, the dividend-adjusted Black-Scholes model was used.

Thirteen independent variables were selected to test whether they are significantly associated with option granting to executive directors. The first variable, the deviation from target return on equity (DROE), is based on the fact that when firms fail to meet income targets explicit costs arise from contracts that are based on the firm attaining those targets, and implicit costs arise as a result of shareholder dissatisfaction. The firms DROE may influence the decision of whether or not to grant options since firms do not have to recognise an expense when share options are granted. The debt-equity ratio was included as a variable because firms that have high debt components in their capital structure are expected to substitute options for cash to maintain their profits and cash.

Firms do not obtain a tax deduction when they grant options, and their current tax position may therefore influence the granting of options. The measure for tax position categorised firms into high, moderate, and low marginal tax rate brackets, depending on the presence of assessed losses within the firm and whether the firm has positive or negative taxable income. A negative association is anticipated between the option ratio and the tax status.

The variance of shareholder returns was selected as a proxy for agency costs. This variance was calculated as the 60-month variance of market-adjusted returns and the All Share Index (ALSI) was used as a proxy for the market. The ratio of research and development expenditure to the book value of assets was selected as a proxy for growth as was the five-year growth in assets. The 60-month variance of market-adjusted returns to total market returns was selected as a measure for the noise in share price that is not attributable to the market. A measure for the noisiness of earnings relative to the share price was calculated as the ratio of the variance in return on equity for the previous five years to the variance in daily share price for the previous five years. Industry-specific differences were captured by allocating dummy variables to each firm depending on its industry classification.

The firm's market value was selected as a proxy for the size of the firm and the firm's liquidity situation was represented by the ratio of operating cash flow to the book value of equity.

When the data for each variable was scrutinised, there was a lack of linearity between the option ratio and the independent variables and the option ratio data was not normally distributed. Due to the non-normality and non-linearity of the data, two procedures known as Rank Regression and the normal scores approach were conducted on the data as suggested by Cooke (1998). These procedures transformed the data into normal, linear data that could be used in multiple regression analysis.

A few limitations to this study were identified. It was considered appropriate to use a dependent variable that is reliant on the number of options granted as opposed to the date that a share option scheme was established because the granting of options is considered to be a discretionary decision that is dependent on the company's circumstances at that time. The use of the group's tax position as a proxy for tax status was also considered to be appropriate due to the difficulties of obtaining information regarding the holding company's tax position.

It was also acknowledged that firms that previously wrote off goodwill against share premium would have distorted annual return on equity figures since the write off occurred. However, it was not considered worthwhile to identify the firms in which this occurred and adjust their ROE's. This study also assumes that the decision to grant

options and the terms of the grant is an independent decision that is based on the company's situation and not influenced by personal preferences. Options that have been granted to directors of the firm's holding company have been ignored in this study, as often they are not granted for the same reasons as those that are granted to the firm's own directors. Finally, this study focuses primarily on the current position within the firm, and does not in anyway seek to research the future consequences of granting share options.

3.9 Tables

Key:

- All correlations at 5% or less are in **bold.**
- All correlations at greater than 5% but less than 10% have been marked with an asterisk*.

3.9.1 Glossary

OPTION_R	Option Ratio
DROE	Deviation from Target Return on Equity
HMTR	High Marginal Tax Rate
MMTR	Moderate Marginal Tax Rate
D_E	Debt-Equity Ratio
OCF-BV	Operating Cash flow to Book Value of Equity
MV	Market Value
MKT_ADJ	60-month Variance of Market-adjusted Returns
MADJ_TOT	Ratio of the 60-month Variance of Market-adjusted Returns to Total Returns
G_ASSETS	Five-year Growth in Assets
MV_BV	Market-to-Book Ratio
R_D	Ratio of research and development expenditure to Total Assets
INDUSTRY	Industry Dummy Variable
VROE_VSP	Ratio of The Variance in Return on Equity to the Variance in Share Returns

Table 3.1: STATISTICS BEFORE DATA TRANSFORMATION

Panel A: Correlation Matrix

	OPTION_R
OPTION_R	1.00000
DROE	-0.08785
HMTR	0.18912
MMTR	-0.11496
D_E	-0.06960
OCF_BV	-0.01273
MV	**0.35392**
MKT_ADJ	-0.12505
MADJ_TOT	-0.14451
G_ASSETS	0.07324
MV_BV	0.15458
R_D	**0.38536**
INDUSTRY	-0.04518
VROE_VSP	0.10789

Panel B: Kolmogorov-Smirnov Test

OPTION_R (allvar.sta)
K-S d=.26696, p<.01 ; Lilliefors
p<.01

		Cumul.	Percent	Cumul %	% of all	Cumul. %
	Count	Count	of Valid	of Valid	Cases	of All
-.2000 < x <= .00000	28	28	45.90164	45.90164	45.90164	45.90164
.00000 < x <= .20000	8	36	13.11475	59.01639	13.11475	59.01639
.20000 < x <= .40000	12	48	19.67213	78.68852	19.67213	78.68852
.40000 < x <= .60000	9	57	14.75410	93.44262	14.75410	93.44262
.60000 < x <= .80000	3	60	4.91803	98.36066	4.91803	98.36066
.80000 < x <= 1.0000	1	61	1.63934	100.00000	1.63934	100.00000
Missing	0	61	0.00000		0.00000	100.00000

Panel C: Descriptive Statistics

	Valid N	Mean	Minimum	Maximum	Std.Dev.
OPTION_R	61	0.18591	0.00000	0.83791	0.23020
DROE	61	-0.09897	-1.94660	0.74989	0.35669
HMTR	61	0.50820	0.00000	1.00000	0.50408
MMTR	61	0.36066	0.00000	1.00000	0.48418
D_E	61	0.52406	0.00000	5.62442	0.87617
OCF_BV	61	0.25336	-1.22248	1.17143	0.35605
MV	61	22,712,880,131	1,150,542,700	268,833,620,000	42,705,589,056
MKT_ADJ	61	103446	5770	3355179	436981
MADJ_TOT	61	0.37649	0.00185	8.37700	1.36025
G_ASSETS	61	18.80371	0.00000	29.39963	8.83691
MV_BV	61	0.69818	-0.54075	2.35710	0.66103
R_D	61	0.67442	0.00000	17.00000	2.82033
INDUSTRY	61	3.32787	1.00000	9.00000	2.24144
VROE_VSP	61	31.17489	0.00000	1044.74911	137.67717

Table 3.2: STATISTICS AFTER DATA TRANSFORMATION

Panel A: Descriptive Statistics for Ranked Data

	Valid N	Mean	Minimum	Maximum	Std.Dev.
OPTION_R	61	31	1	61	17.75293
DROE	61	31	1	61	17.75293
HMTR	61	0.508197	0	1	0.504082
MMTR	61	0.360656	0	1	0.484176
D_E	61	31	1	61	17.75293
OCF_BV	61	31	1	61	17.75293
MV	61	31	1	61	17.75293
MKT_ADJ	61	31	1	61	17.75293
MADJ_TOT	61	31	1	61	17.75293
G_ASSETS	61	31	1	61	17.75293
MV_BV	61	31	1	61	17.75293
R_D	61	31	1	61	17.75293
INDUSTRY	61	3.327869	1	9	2.241438
VROE_VSP	61	31	1	61	17.75293

Panel B: Descriptive Statistics for Normal Scores Data

	Valid N	Mean	Minimum	Maximum	Std.Dev.
DROE	61	0.007259	-1.94232	2.32556	0.960454
HMTR	61	0.5	0	1	0.504219
MMTR	61	0.366667	0	1	0.485961
D_E	61	0.021495	-1.94232	2.32556	0.96392
OCF_BV	61	0.023572	-1.94232	2.32556	0.963335
MV	61	-0.00078	-1.94232	2.32556	0.952673
MADJ	61	0.035247	-1.94232	2.32556	0.954835
MADJ_TOT	61	0.002764	-1.94232	2.32556	0.956631
G_ASSETS	61	-0.00218	-1.94232	2.32556	0.950884
MV_BV	61	-0.00764	-1.94232	2.32556	0.942639
R_D	61	0.021495	-1.94232	2.32556	0.96392
INDUSTRY	61	3.366667	1	9	2.239602
VROE_VSP	61	-0.00218	-1.94232	2.32556	0.950884

CHAPTER 4

RESULTS

4.1 Introduction

The objective of this chapter is to present the findings, based on the methodologies described in Chapter 3. In addition, the results are compared and contrasted to the findings of previous research and an attempt is made to explain the differences observed. This chapter begins with a section describing the overall results, followed by a review of various supplementary tests that were conducted, and finally a summary of the results is presented.

4.2 Overall Results

As discussed in section 3.6, two separate regression analyses were conducted on the data. The first analysis was based on data that had been ranked, and the second analysis was based on the normal scores of the ranked data. The results of these two analyses are discussed separately below.

4.2.1 Ranked Data

The results of the regression analysis conducted on the ranked data are presented in the three sections according to the analyses that was performed: ordinary multiple regression, forward stepwise multiple regression and ordinary multiple regression after adjusting for the effects of multicollinearity[1].

All three sections contain a discussion of the variables that were found to be significant at 1%, 5% and 10%, and comparisons are made between the results of each of the three sections as well as the results of prior studies.

[1] Multicollinearity exists when explanatory variables are highly correlated with one another

The ordinary multiple regression section below also contains a discussion on the correlation analysis that was performed on the variables prior to conducting the multiple regression test. The section covering the multiple regression analysis after adjusting for the effects of multicollinearity includes a discussion on the correlations between the independent variables, and the variables that were selected to be eliminated from the analysis.

4.2.1.1 Ordinary Multiple Regression

The correlation between the dependent variable and each of the independent variables was computed, and can be seen in Table 4.1, Panel A[2]. Significant positive correlations were found between the option ratio and each of the market value of the firm, the research and development indicator variable, and the ratio of the variance in return on equity to the variance in share price. The implied positive linear relationship between the option ratio and these three independent variables means that as the size of the firm and the extent of research and development expenditure and the noise in earnings per share relative to share price increases, the proportion of options granted to total executive compensation will also increase.

The results of the regression analysis appear in Table 4.2, Panel B. This panel also includes statistical values such as R^2, adjusted R^2 and the standard error of the estimate. The coefficient of multiple determination (R^2) shows that the regression line explains 65% of the total error that would have been present had no regression line been fitted. After adjusting for the number of explanatory variables in the model, 55% (adjusted R^2) of the total error that would have been present had no regression line been fitted is explained by the regression line. The independent variables therefore explain a fairly significant percentage of the variation in the option ratio. The standard error of the estimate measures the extent to which the observed data points deviate from the fitted regression line. The calculated value of 11.843 implies that the regression line lies at some distance from the actual data points.

At the 1% significance level, the market value and research and development variables were found to be significantly positively associated with the option ratio. This suggests that larger

[2] All findings are shown in tables, and are presented at the end of Chapter 4.

firms and firms with growth opportunities are more likely to grant options. Firm size was also found to be a significant variable by Gaver and Gaver (1993); Smith and Watts (1992) and Klassen and Mawani (2000). The use of research and development expenditure as a proxy for growth opportunities was also found to be significant in studies conducted by Gaver and Gaver (1993); Baber *et al* (1996); Bushman *et al* (1996); Douglas *et al* (1997) and Klassen and Mawani (2000).

The industry dummy variable was significant at the 5% level, which suggests that option granting behaviour may differ across industries. Smith and Watts (1992), Ely (1991) and Klassen and Mawani (2000) and Yermack (1995) also found support for the fact that the granting of options may be influenced by the firm's industry.

The ratio of the variance of return on equity to the variance in share price was significantly positively associated with the option ratio at 10%. This is consistent with the theory suggested by Lambert and Larcker (1987), Eaton and Rosen (1993) and Lewellen *et al* (1987), namely that firms that experience a high variability in earnings relative to share price use share option granting as a means of compensation. It therefore appears that South African firms with erratic earnings performance relative to share price performance grant options to executive directors instead of constantly revising their salaries.

The high marginal tax rate variable was significant at slightly over 10%, consistent with the results of Klassen and Mawani (2000) and contrary to Matsunaga (1995) and Yermack (1995). Although a significant relationship exists, the sign of the beta coefficient was positive, which suggests that firms in a high marginal tax rate situation are more likely to grant options to their executive directors. The theory that the lack of a tax deduction will act as a disincentive to firms to grant options does not appear to apply in South Africa.

A possible reason for this is that many of the firms in the high marginal tax rate category of the 'granted' sample are established, successful, well-known and financially prosperous firms, and may see share options as a very appropriate and attractive form of compensation irrespective of the lack of a tax deduction.

4.2.1.2 Stepwise Multiple Regression

A forward stepwise regression was conducted on the data to determine whether similar results to those in 4.2.1.1 would be obtained if only the best explanatory variables are included in the model. The results can be seen in Table 4.1, Panel C.

The R^2 fell slightly to 62%, but the adjusted R^2 improved to 57% as did the standard error of the estimate to 11.606. Therefore, although less of the total error is explained by the stepwise regression model, based on the number of explanatory variables and the smaller distance between the observed points and the regression line, it appears to be a better model.

Market value and research and development were the most positively significant variables at 1%, the industry dummy variable was positively significant at 5% and the growth in assets was, surprisingly, negatively significant at 5%.

The results are therefore consistent with the ordinary regression model, except that the ratio of the variance of return on equity to the variance in share price was no longer significant in the stepwise model, although it was included as a variable. Furthermore, growth in assets became a significant variable but in the opposite direction to what was predicted. This was inconsistent with the results of Lambert and Larcker (1987). A possible reason for the negative relationship between the option ratio and growth in assets may be due to the fact that the majority of the firms in the sample experienced a growth in assets irrespective of whether they granted options or not: of the 61 firms in the sample, 52 firms' assets grew over the five-year period and only 5 firms in 'granted' sample and 4 firms in the 'not granted' sample did not achieve a growth in assets. The decline in assets of the 5 firms in the 'granted' sample was also larger than that of the 4 firms in the 'not granted' sample, which may have contributed towards the result that a negative growth in assets is associated with the granting of options.

4.2.1.3 After Adjusting for the Effects of Multicollinearity

Multicollinearity exists when explanatory variables are highly correlated with one another. It is preferable to have explanatory variables that are as far as possible uncorrelated with one another, so that together they offer maximum explanation (van den Honert 1997). One way of overcoming multicollinearity is to eliminate one of the two correlated variables from the model.

The correlations between the independent variables can be seen in Table 4.1, Panel D. As a result of the large correlations shown in bold, the following variables were eliminated from the analysis: the high marginal tax rate variable; the ratio of the variance of market adjusted returns to the variance of total returns; the variance of market adjusted returns and the ratio of operating cash flow to the book value of equity. Although other independent variables were significantly correlated at the 5% level, only the pairs of variables that had correlation coefficients between them of more than 0.5 or less than -0.5 were scrutinised for elimination.

The regression summary can be seen in Table 4.1, Panel E. The adjusted R^2 was 55%, which indicates that the amount of explanatory power of the remaining variables is still as strong as the original multiple regression model, although the standard error of the estimate increased slightly. Interestingly, the four variables that were significant in the stepwise regression model were once again significant, and in the same direction. These variables were market value and research and development at 1%, industry at 5% and growth in assets at 10%. Therefore, performing two different tests, namely adjusting for the effects of multicollinearity and performing a stepwise regression procedure, achieved very similar results.

4.2.2 Normal Scores Data

The results of the normal scores data are presented in the following three sections according to the analyses that were performed. These sections follow the same structure as that described in 4.2.1.

4.2.2.1 Ordinary Multiple Regression

The ranked data were converted to normal scores and the correlations between the independent variables and the option ratio were calculated, as shown in Table 4.2, Panel A. These results reveal that only the market value of the firm and the research and development expenditure variable are statistically correlated with the option ratio at 5%. The conversion from ranked data to normal scores therefore resulted in the exclusion of the ratio of the variance in return on equity to the variance in share price as a highly correlated variable with the option ratio.

The results of the multiple regression analysis are contained within Table 4.2, Panel B. The R^2 value of 48% and the adjusted R^2 of 33% were lower than those of the multiple regression analysis on the ranked data. The regression equation that emerged from the normal scores data is therefore less proficient at explaining the amount of error inherent in the data than the equation that emerged from the ranked data. However, the standard error of the estimate was substantially reduced to 0.79049, which reveals that there is hardly any difference between the observed data points and the fitted regression line. Thus although there is still a great amount of unexplained variation in the data, the regression line that has been formulated lies very near to the observed points.

Consistent with the results of the ranked data, the market value of the firm was positively significant at 1%. The only other significant variable was the market-to-book value of equity, which was significantly negatively correlated at 10%. This result is contrary to the findings of Smith and Watts (1992) and Lewellen *et al* (1987) who found a significant positive association between option granting behaviour and the market-to-book ratio used as a proxy for investment opportunities. A possible explanation is that on average, firms in the 'not granted' sample had a higher market-to-book ratio than firms in the 'granted' sample. Specifically, only Anglo Platinum, Implats, Tigerbrands and Bidvest in the 'granted' sample had large market-to-book ratios. Most of the other firms in the 'granted' sample had market-to-book ratios of just over one, whereas the firms in the 'not granted' sample consistently had market values of one, two and three times the book value of equity.

4.2.2.2 Stepwise Multiple Regression

The stepwise regression results can be seen in Table 4.2, Panel C. As with the stepwise procedure using the ranked data, the R^2 value declined from the ordinary multiple regression's R^2 value of 48% to 44%, but the adjusted R^2 value improved from 33% to 39%. Therefore based on the adjusted R^2 values, the stepwise regression procedure provided a better explanation of the total error than ordinary multiple regression. The standard error of the estimate of 0.75208 was once again low, implying that the regression line lies close to the observed data points.

The results show that the same three variables that were significant in the stepwise regression procedure using ranked data were significant using normal scores data. The market value of the firm was positively significant at 1%, as was the research and development expenditure variable at 5% and the growth in assets was once again negatively significant at 10%. The stepwise model did not select the industry dummy variable that was significant using ranked data. In addition, the market-to-book ratio was not found to be significant, contrary to the findings using ordinary multiple regression model.

4.2.2.3 After Adjusting for the Effects of Multicollinearity

The correlation matrix in Table 4.2, Panel D reveals that some of the independent variables are correlated between themselves. Once again, one of the variables from each pair of variables that were highly correlated between themselves were eliminated from the regression model, namely the high marginal tax rate variable and the ratio of the variance of market adjusted returns to the variance of total returns.

The results of the regression model adjusted for the effects of multicollinearity can be seen in Table 4.2, Panel E. The R^2 value of 47% reveals that although two variables have been excluded, the amount of error explained by the regression line has hardly decreased from what was explained by ordinary multiple regression. This is expected as two or more variables were explaining the same error in the ordinary multiple regression model. The adjusted R^2 of 35% reveals that when the explained variation is adjusted by the number of

explanatory variables in the model and the effects of multicollinearity it is a better fit than the ordinary multiple regression model.

The market value of the firm was significantly positively associated with the option ratio at 1%, and the market-to-book ratio and the research and development expenditure variable were respectively, significantly negatively and positively associated with the option ratio at 10%. These results are similar to those obtained using ordinary multiple regression (in 4.2.2.1 above) except that the research and development variable became significant when the effects of multicollineraity was adjusted for. This may be due to the fact that the research and development variable and the ratio of the variance of market adjusted returns to the variance of total returns were correlated at the 10% level, thus the elimination of the latter may have contributed towards the significance of the former.

4.2.3 Preliminary Summary

The overall results therefore imply that South African firms are not influenced by tax or financial performance nor by liquidity, but rather by firm size and reduced agency costs by pursuing long-term investment opportunities. The firm's industry classification has also been found to influence the decision to grant share options. The table below summarises the results thus far:

Table 4A Preliminary Summary

		Significance level		
Data Type	Test Type	<1%	<5%	<10%
RANKED	Ordinary Multiple Regression	MV, R_D	INDUSTRY	VROE_VSP
	Stepwise Multiple Regression	MV, R_D	INDUSTRY, G_ASSETS	
	Adjusted for the Effects of Multicollinearity	MV, R_D	INDUSTRY	G_ASSETS
NORMAL SCORES	Ordinary Multiple Regression	MV		MV_BV
	Stepwise Multiple Regression	MV	R_D	G_ASSETS
	Adjusted for the Effects of Multicollinearity	MV		MV_BV, R_D

Key:

G_ASSETS Five-year Growth in Assets

INDUSTRY Industry Dummy Variable

MV	Market Value
MV_BV	Market-to-Book Ratio
R_D	The Ratio of Research and Development Expenditure to Total Assets
VROE_VSP	The Ratio of The Variance in Return on Equity to the Variance in Share Returns

Thus it appears from the overall ranked and normal scores results that the larger the market value, the ratio of research and development expenditure to total assets and the lower the growth in assets, the more likely it is that firms will grant options. Furthermore, the results suggest that option granting behaviour may differ across industries. There is some evidence that the lower the firm's market-to-book ratio and the higher the noise in earnings relative to share price, the more likely it is that the firm will grant options.

4.2.4 Variables that were Not Significant

The following variables were found not to be significant. Possible reasons for this are provided below.

4.2.4.1 Deviation from Target Return on Equity

Unlike Klassen and Mawani (2000) and Matsunaga (1995), but consistent with Yermack (1995) the deviation from target return on equity was not found to be significantly associated with the granting of options. A possible reason for this is that firms may decide to grant options at a time when the financial outcome for the year cannot be accurately predicted: the extent to which a firm's return on equity is above or below a target may only be known at the end of the financial year, whereas the decision to grant options can be made at any stage during the year. An additional explanation may be that in South Africa, the consequences of a firm not attaining a specific target may not be as severe as the consequences in the United States and Canada, and the need to avoid recognising an expense may not be as large.

In addition, shareholders, executive directors and employees may also have a different perception of what the target return on equity is, which would change the extent of the computed deviation. A final reason may be that South African firms are not influenced by

financial reporting benefits when they decide to grant options. The implication of this is that the introduction of ED160 should not affect option granting behaviour, as the current non-recognition of a share option expense does not appear to motivate firms below their target ROE to grant options or influence firms above their target ROE in any way.

4.2.4.2 Tax Status

Contrary to Klassen and Mawani (2000) once again, but consistent with Matsunaga (1995) and Yermack (1995) the firm's tax situation did not appear to be a highly significant factor to the firm when deciding whether or not to grant options. Indeed, the high marginal tax rate variable was only significant at just over 10%, and it was positively significant even though a negative relationship had been predicted. A reason for this is possibly due to the composition of the data in that the 'granted' sample contained a lot of financially successful firms that were generally classified in the 'high marginal tax rate' bracket. This would have contributed to the positive relationship. However overall there was not much support for the tax variables, which implies that firms are not influenced by the non-deductibility of options when deciding whether or not to grant them.

4.2.4.3 Debt-Equity Ratio

The debt-equity ratio was also not significant, consistent with the results of Matsunaga (1995), Mehran (1995) and Yermack (1995), but contrary to the results of Lewellen *et al* (1987) and Klassen and Mawani (2000). It therefore appears that South African companies do not substitute cash salaries for options when they are in high debt situations. Perhaps this is due to the fact that South African firms with large debt give priority to other matters that are affected by their level of debt, and do not allow their debt situation to affect their decision of whether or not to grant options. Furthermore, only four firms in the 'granted' sample had debt in excess of equity, as did only three firms in the 'not granted' sample. Thus, the small number of firms with high debt-equity ratios may have contributed towards the lack of statistical significance of the ratio.

A further unusual result was that the multiple regression analysis on the ranked data resulted in a negative relationship between the debt-equity ratio and the option ratio, whereas the

multiple regression conducted on the normal scores data suggested a positive relationship between the two, as was the predicted relationship. A possible reason for the negative relationship was suggested by Yermack (1995) who argued that if managers have strong incentives to maximise the value of equity, debt holders will demand a higher risk premium for supplying capital because they will fear that management will pursue overly risky investment projects that transfer wealth from debt holders to equity holders. These conflicting results do however reaffirm that the correct statistical relationship between the debt-equity ratio and the option ratio is not known, even for South African firms.

4.2.4.4 The Ratio of Operating Cash Flow to the Book Value of Equity

The ratio of the operating cash flow to the book value of equity was also not found to be significantly associated with option granting. This finding is contrary to that of Yermack (1995), but supports the results of Klassen and Mawani (2000) and Matsunaga (1995). This result suggests that firms in a low liquidity situation are not more likely to grant options. Perhaps this is due to the fact that low liquidity is a characteristic of an under-performing firm, and remuneration in the form of share options may not be attractive to the executives unless the firm has positive future prospects. It is worth noting however, that the beta coefficient for this variable was negative as predicted.

4.2.4.5 The Variance of Market-Adjusted Returns and the Ratio of the Variance of Market-Adjusted Returns to Total Returns

The variance of market-adjusted returns and the ratio of the variance of market-adjusted returns to total returns were also not significant. The former result suggests that South African firms do not align their interests with shareholders by granting shares to executive directors when they embark on variance-increasing investments, as was proposed by Lewellen *et al* (1987) and supported by Smith and Watts (1992), Gaver and Gaver (1993) and Klassen and Mawani (2000). A possible reason for this result was noted by Lewellen *et al*, namely that variance-increasing investments increase the executives personal risk exposure and might make the executives reluctant to chose such investments in the first place. Another reason might be the fact that options on a share whose price is highly volatile might not be seen as an appealing form of compensation, unless the executives believe that the price will eventually rise. Once again, the correct statistical relationship between this

variable and the option ratio cannot be accurately defined, as the beta coefficient was negative using the ranked data and positive using the normal scores data.

A reason for the ratio of the variance of market-adjusted returns to total returns not being significant might also be as a result of the reasons suggested above, as well as the fact that the firm's share price movement that is attributable to the market may not influence option granting. Perhaps a further reason is that firms consider their own specific circumstances when deciding whether to grant options, instead of looking at their own performance relative to the market. The beta coefficient of this variable was however positive as predicted.

4.2.5 A Possible Reason for the High Significance of Market Value

In this study, the firms in the 'granted' sample for 2001 and 2000 were much larger than those in the 'not granted' sample: the mean total assets of the firms in the 2001 'granted' sample was R54 billion, whereas the mean total assets in the 2001 'not granted' sample was R9 billion. This is due to the fact that mainly the larger firms provided the information required to compute option values. Either these firms are listed on the London Stock Exchange and are required to disclose the relevant information in terms of United Kingdom Generally Accepted Accounting Practice, or the high quality of disclosure that often exists in larger firms resulted in the availability of the necessary data (Graham 2001). It is therefore reasonable, that market value would have a greater association with option granting.

4.2.6 Overall Results Excluding the Financial Sector

The financial sector differs to the other sectors firstly because these firms do not incur expenditure on research and development, and secondly because their long term debt and assets include unique components, such as amounts owing to or due from depositors and policyholders. Thirdly, the liquidity status of such firms is often calculated differently to other firms. As a result of these issues, separate tests were conducted on the ranked data excluding the financial sector.

4.2.6.1 Ordinary Multiple Regression

The results of the ordinary multiple regression analysis are presented in Table 4.3, Panel A. The R^2 and adjusted R^2 values were 65% and 52% respectively, and the standard error of the estimate was 11.771. These values are very similar to the values obtained using the overall ranked data in 4.2.2.1 above, and the regression model is therefore just as meaningful.

At the 1% level both market value and research and development continued to be significantly positively associated with the option ratio, as did the industry variable at 5%. These results support those obtained using the overall ranked data, which suggests that the financial sector did not bias the previous results. However, one different result was that the moderate marginal tax rate variable was positively significant at 10%. These results suggest that non-financial firms are more likely to grant share options when they are in a moderate marginal tax rate position, although (as shown in 4.2.2.1) the sample of firms as a whole are more likely to grant share options when they are in a high marginal tax rate position.

4.3 Additional Tests and Results

4.3.1 Normal Scores with Absolute Variable for DROE

The objective of this test was to determine whether the fact that the DROE was above or below target return on equity would result in this variable being significantly associated with the option ratio. The tests already discussed in 4.2 evaluated the extent to which the DROE was associated with the option ratio, whereas this test sought to determine whether positive or negative DROE's are significant drivers of option granting behaviour. If the DROE was positive it was given a value of one, and if it was negative, it was given a value of zero. The data used for the analysis was the normal scores data.

4.3.1.1 Ordinary Multiple Regression

The correlations between each of the independent variables and the option ratio can be seen in Table 4.4, Panel A. The market value of the firm and the research and development expenditure variable were both positively correlated with the option ratio at 5%. These two

variables were also significantly correlated with the option ratio in 4.2.2.1, before adjusting the DROE.

The regression results are presented in Table 4.4, Panel B, and reveal an improved R^2 of 62% and adjusted R^2 of 51%. The standard error of the estimate also improved from the original normal scores regression analysis to 0.64993. Therefore, this adjustment to the DROE has contributed towards a better regression model than the model from the original normal scores data.

As was the case in 4.2.2.1 above, the market value of the firm was positively significant at 1%, but contrary to the above findings, research and development expenditure was positively significant at 1% and the industry variable and growth in assets were negatively significant at 10%. The market-to-book ratio which was previously significant was not found to be significant in this test. In fact, the p-values of all the variables changed quite substantially, which implies that the other independent variables are quite sensitive to the DROE variable. The DROE itself was still not at all significant, even though it added significantly to the explanation of the error.

4.3.1.2 Stepwise Multiple Regression

A stepwise procedure was performed in order to determine whether the DROE would be selected as a variable. .The results contained within Table 4.4, Panel C, show that it was indeed selected. This reinforces the point made in 4.3.1.1 above that although the absolute variable of the DROE is not a significant variable, it does help explain a large amount of error in the data, possibly because the amount of error that the other variables were capable of explaining was being reduced by the noise within the DROE variable.

The four significant variables were identical to those that were significant in 4.3.1.1 above, however the industry and growth in assets variables became negatively significant at 5% instead of the previous 10% level.

4.3.2 The Resources Sector

Due to the fact that the industry variable has been a significant variable on numerous occasions, further tests conducted on industries in isolation were considered meaningful. The industry that included the largest number of firms in the sample (twenty in total) is the resources sector. A multiple regression analysis was conducted on the ranked data pertaining to the resources sector, and the results are detailed in the sections below.

4.3.2.1 Ordinary Multiple Regression

The results of the multiple regression model for the resources sector are in Table 4.5, Panel A, and reveal that the model was a good fit for the data, with an R^2 of 89% and an adjusted R^2 was 71%. Although the standard error of the estimate was quite large at 9.8805, it was still smaller than that of the ranked data in 4.2.1.1, and this model therefore appears to be one of the most accurate models so far.

The results were unusual compared to the overall results, in that the high marginal tax rate was significantly positively associated with option granting at 5%. The market value and research and development expenditure variables were also significant, but only at 10%. It therefore appears that the factors driving option granting behaviour in the resources industry differ to those driving the sample of firms as a whole. A common characteristic is that large resource firms with growth opportunities appear to be more likely to grant options, and a unique characteristic is that resource firms in positive tax positions are more likely to grant options. This may also be as a result of the peculiarities of the taxation of mining companies with certain capital expenditure being deductible – these provisions essentially place mining companies in a more favourable tax position than other companies and so they perhaps do not require the deduction for granting options. The limited life of the mine may also promote the use of share schemes.

4.3.2.2 After Adjusting for the Effects of Multicollinearity

Many of the independent variables within the resources sector were highly correlated amongst themselves as can be seen in Table 4.5, Panel B. For this reason, the moderate

marginal tax rate variable, the ratio of the variance of market-adjusted returns to total returns and the market-to-book ratio were eliminated from the data.

The results of the multiple regression analysis conducted on the remaining variables is in Table 4.5, Panel C. The R^2 and adjusted R^2 remained high at 86% and 73% respectively, which implies that the model is still explaining a large amount of the total error in the sample. Interestingly, the three variables that were significant using ordinary multiple regression were all positively significant at 5%, as was the ratio of the variance in return on equity to the variance in share price. However, the variance of market-adjusted returns was significantly negatively associated with option granting at 5%, which is inconsistent with the results of Lewellen *et al* (1987), Smith and Watts (2992) and Gaver and Gaver (1993). Possible reasons for this were highlighted in 4.2.4.5

Therefore, it appears that resource firms are not only more likely to grant share options when they are large with growth opportunities and in a positive tax position, they also appear to be more likely to grant options when there is small variance in the share price. Furthermore, when the noise in return on equity is large relative to the noise in the share price, resource firms appear to grant more options, as was the case in Lambert and Larcker (1987) and Yermack (1995).

4.3.3 'Granted' Firms

The firms that granted share options were examined separately to determine whether the proportion of options granted was significantly associated with any of the independent variables, given that options were granted in the first place.

4.3.3.1 Ordinary Multiple Regression

The results of the ordinary multiple regression analysis are contained in Table 4.6, Panel A It can be seen from these results that the F-test (which tests the significance of the regression equation) was found not to be statistically significant, given the p-value of 0.27275. This implies that reliance on these results is not appropriate. However for comparative purposes with respect to 4.3.3.2, a discussion of these results is still included.

The low R^2 value of 49% and in particular the low adjusted R^2 value of 12% and the high standard error of the estimate further suggest that the model does not fit the data well. The results show that the variance of market-adjusted returns is significantly negatively associated with the proportion of options granted at 5%. The reason for this may be due to the fact that the majority of firms in the 'granted' sample are resource firms, and in 4.3.2.2 it was found that option granting was negatively associated with the variance of market-adjusted firms in the resources sector. The market value and market-to-book ratio are found to be significantly positively associated with the proportion of options granted at 10%.

The results (on which reliance should not be placed) therefore suggest that firms grant a greater proportion of options to executive directors when the variance in the firm's share price is low, and when the firm is large and has growth opportunities.

4.3.3.2 Stepwise Multiple Regression

A stepwise multiple regression analysis was performed in order to establish whether a better model for the data was available. The results in Table 4.6, Panel B reveal an improved adjusted R^2 value of 26% and a smaller standard error of the estimate. The stepwise model is therefore a better fit for the data, and yet the results are the same as those from the ordinary multiple regression model, except that the variance of market adjusted returns is negatively significant at 1% rather than 5%. These results therefore support those in 4.3.3.1.

4.3.4 Firms with a Positive DROE

An additional test was performed on a sample of firms with a positive DROE to investigate what additional characteristics these firms possess with regard to option granting. Two multiple regression equations were conducted, firstly on the ranked data, and secondly on normal scores data. The following s results were obtained:

4.3.4.1 Ordinary Multiple Regression on Ranked Data

The results are presented in Table 4.7, Panel A. The R^2 of 73% and the adjusted R^2 of 43% suggest a good fit, but the standard error of the estimate of 11.679 implies that the regression line does not sit closely to the actual data values. At 5%, the ratio of the

operating cash flow to book value of equity is negatively significant, which suggests that firms that have a positive DROE tend to grant options when liquidity is low which supports the results of Klassen and Mawani (2000) and Yermack (1995). The market value of the firm was also significantly positively associated with the option ratio, as it has been in all of the previous results.

4.3.4.2 Ordinary Multiple Regression on Normal Scores Data

These results are presented in Table 4.7, Panel B. Although the R^2 and adjusted R^2 values declined to 63% and 39% respectively, the standard error of the estimate improved substantially to 0.80279. Thus, although the regression model from the ranked data explained more of the total error in the data, this regression model based on normal scores lies closer to the observed data points, and the results of both models should both be analysed.

The results differ substantially from those in 4.3.4.1. At 5% the moderate marginal tax rate variable was significantly positively associated with option granting, and the high marginal tax rate variable, market value and research and development expenditure variable were all significantly positive at 10%. This implies that firms with a positive DROE grant options when they are in both moderate and high tax positions, when the firm is large (which is consistent with 4.3.4.1) and when their expenditure on research and development is large. The liquidity variable was not significant using normal scores, however only six companies in the entire sample had negative liquidity which reduces the likelihood of this variable being significant. The reasons for the differences between the results from the ranked data and those from the normal scores data are not known. Perhaps a similar study using a larger sample size will reveal clearer results.

Based on the lack of definite results, it is not possible to ascribe to firms with a positive DROE certain characteristics with regard to their option granting behaviour.

4.3.5 Firm's with a Negative DROE

The firms that had negative DROE's were also separately analysed to determine whether any other characteristics relating to option granting occur in such firms. Once again, the analysis was performed on both ranked and normal scores data, and the following results were obtained:

4.3.5.1 Ordinary Multiple Regression on Ranked Data

The results of the multiple regression analysis that was performed on ranked data is in Table 4.8, Panel A. The R^2 and adjusted R^2 values of 81% and 69% respectively imply that the model is very good. The standard error of the estimate was however quite large at 10.641. The results show that the market value is significantly positive at 1%, the research and development expenditure variable is significantly positive at 5% and the debt-equity ratio is significantly negative at 5%. The latter finding is inconsistent with Klassen and Mawani's (2000) results that a positive relationship exists between the debt-equity ratio and the option ratio.

These results suggest that firms with a negative DROE are more likely to grant options when they are large and research and development expenditure is high, both of which have been common significant variables in the previous results. The results also imply that firms with a negative DROE are more likely to grant options when debt is low relative to equity. A possible reason for this is that firms who are not achieving a desired ROE may also be firms with high proportions of debt, and consequently options on the firm's shares may not appear to be very attractive way of remunerating and motivating executives. Hence such firms would not grant options when debt levels are high, but rather when they are low.

4.3.5.2 Ordinary Multiple Regression on Normal Scores Data

Table 4.8, Panel B contains the results of this analysis. Although the R^2 was a high 72%, the adjusted R^2 was a low 23%, and no variables from the model were significantly associated with option granting. Based on the low explanatory power of the normal scores model and the lack of any results, the results from the analysis on the ranked data suggest that the only

unique characteristic that can be attributed to firms with a negative DROE is a low debt-equity ratio when granting share options.

4.3.6 Summary of Additional Test Results

The results of the tests described in 4.3.1 - 4.3.5 have been summarised in the table below.

Table 4B Summary of Additional Test Results

		Significance level		
Test	Test Type	<1%	<5%	<10%
Normal Scores with Absolute Variable for DROE	Ordinary Multiple Regression	MV, R_D		INDUSTRY, G_ASSETS
	Stepwise Multiple Regression	MV, R_D		INDUSTRY, G_ASSETS
Resources Sector	Ordinary Multiple Regression		HMTR	MV, R_D
	Adjusted for the Effects of Multicollinearity		HMTR, MV, MKT_ADJ, R_D, VROE_VSP	
Granted' Firms	Ordinary Multiple Regression		MKT_ADJ	MV, MV_BV
	Stepwise Multiple Regression	MKT_ADJ		MV, MV_BV
Firm's with a Positive DROE	Ordinary Multiple Regression: Ranked Data		MV, OCF_BV	
	Ordinary Multiple Regression: Normal Scores Data		MMTR	HMTR, MV, R_D
Firm's with a Negative DROE	Ordinary Multiple Regression: Ranked Data	MV	D_E, R_D	HMTR
	Ordinary Multiple Regression: Normal Scores Data			

Key:

D_E	Debt-Equity Ratio
G_ASSETS	Five-year Growth in Assets
HMTR	High Marginal Tax Rate
INDUSTRY	Industry Dummy Variable
R_D	The Ratio of Research and Development Expenditure to Total Assets
MKT_ADJ	60-month Variance of Market-adjusted Returns
MMTR	Moderate Marginal Tax Rate
MV	Market Value
VROE_VSP	Ratio of The Variance in Return on Equity to the Variance in Share Returns

4.4 Summary

The results of this study presented in this chapter are based on the methodologies outlined in Chapter 3 and indicate that South African firm's with a high market value or a high ratio of research and development expenditure to total assets or a low growth in assets are more likely to grant share options to executive directors. In Chapter 1, it was stated that the areas that have been found to influence share option granting internationally are the pursuit of reduced agency costs, the firm's financial and tax position and finally size and/or liquidity. The results therefore imply that South African firms are not influenced by tax or financial performance nor by liquidity, but rather by firm size and reduced agency costs by pursuing long-term investment opportunities.

Specifically, when the ranked data was analysed, market value and the ratio of research and development expenditure to total assets were significant at 1%. One variable that appeared to be significantly negatively associated with the option ratio was the growth in assets. This negative association was contrary to the theory presented in previous research and the inconsistency is thought to relate to the fact that a greater number of firms in the 'granted' sample had a large negative growth in assets.

Other variables that were found to be significantly positively associated with the option ratio were the industry dummy variable, the ratio of the variance in return on equity to the variance in share price, and to a small extent the high marginal tax rate variable. Contrary to the outcome, the latter variable was predicted to be negatively associated with the option ratio. A possible reason for the contradicting result is that many of the firms that granted options were large successful firms that typically do not have assessed losses and are generally in a positive taxable income situation. As a result, they fell into the high marginal tax rate category and contributed towards the positive association. A multiple regression analysis was conducted on the ranked data excluding the financial sector and the results were consistent with those of the overall data, except that the moderate marginal tax rate variable became positively significant.

When the normal scores data was assessed, the equation that was produced explained less of the error in the data than the equation processed from the ranked data. It did however have a lower standard error of the estimate, which implies that the liner equation lies very close to the observed values. This model revealed that the market value was significantly positively associated with the option ratio, which reinforced the results from the ranked data. The ratio of research and development expenditure to total assets was found to be significantly positively associated with option granting, and growth in assets was once again negatively associated with the option ratio. The market-to-book ratio was found to be significantly negatively associated with the option ratio, although a positive relationship was predicted. A possible reason for this was that on average the firms in the 'not granted' sample had a higher market-to-book ratio.

The variables that consistently lacked significance were the deviation from target return on equity; the moderate marginal tax rate variable; the debt-equity ratio; the ratio of the operating cash flow to book value of equity; the variance of market-adjusted returns and the ratio of the variance of market-adjusted returns to the variance in total returns. Other tests that were conducted included substituting the DROE variable with one or zero depending on whether the deviation from target return on equity was positive or negative, and performing a multiple regression analysis. This test was conducted to provide an indication of whether the fact that the deviation was positive or negative revealed any further firm characteristics relating to option granting. The DROE variable was found not to be significant, but the market value, ratio of research and development expenditure to total assets, growth in assets and industry variables continued to be significantly positively associated with option granting. When the resources sector was separately analysed, the results showed that firms in the resources sector are more likely to grant share options when they are in a high taxable income position; are large; have high expenditure on research and development relative to total assets and have more noise in their earnings relative to share price. Furthermore, and contrary to theory, when resource firms have a *low* variance in their share price, they are more likely to grant options.

The firms that granted options were also analysed separately, and support was provided that the proportion of options granted to total remuneration is negatively associated with the

variance of the firm's share price and positively associated with the firm's market value and market-to-book ratio. When the firms with a positive DROE were scrutinised, conflicting results were obtained, and thus no conclusion was drawn as to the drivers of option granting in such firms. The drivers of option granting for firms with a negative DROE were also unclear, but a low debt-equity ratio was found to be a unique significant factor.

4.5 Tables

Key:

- All significant relationships at 1% or less are in ***bold italics***
- All significant relationships at greater than 1% but less than 5% are in **bold.**
- All significant relationships at greater than 5% but less than 10% have been marked with an asterisk*.
- All correlations at 5% or less are in **bold.**
- All correlations at greater than 5% but less than 10% have been marked with an asterisk*.

4.5.1 Glossary

OPTION_R	Option Ratio
DROE	Deviation from Target Return on Equity
HMTR	High Marginal Tax Rate
MMTR	Moderate Marginal Tax Rate
D_E	Debt-Equity Ratio
OCF-BV	Operating Cash flow to Book Value of Equity
MV	Market Value
MKT_ADJ	60-month Variance of Market-adjusted Returns
MADJ_TOT	Ratio of the 60-month Variance of Market-adjusted Returns to Total Returns
G_ASSETS	Five-year Growth in Assets
MV_BV	Market-to-Book Ratio
R_D	Ratio of research and development expenditure to Total Assets
INDUSTRY	Industry Dummy Variable
VROE_VSP	Ratio of The Variance in Return on Equity to the Variance in Share Returns

TABLE 4.1 RANKED DATA

Panel A: Correlations with Dependent Variable

	OPTION_R
OPTION_R	1.00000
DROE	0.18540
HMTR	0.10616
MMTR	-0.07756
D_E	-0.09339
OCF_BV	0.05992
MV	**0.66383**
MKT_ADJ	0.22332
MADJ_TOT	-0.12316
G_ASSETS	0.02105
MV_BV	0.18345
R_D	**0.29519**
INDUSTRY	-0.05319
VROE_VSP	**0.26478**

Panel B: Ordinary Multiple Regression

Regression Summary for Dependent Variable: OPTION_R
R= .80709090 R^2= .65139572 Adjusted R^2= .55497326
F(13,47)=6.7556 p<.00000 Std.Error of estimate: 11.843

		St. Err.		St. Err.		
	BETA	Of BETA	B	of B	t(47)	p-level
Intercept			-8.93887	12.02254	-0.74351	0.46087
DROE	0.00787	0.11961	0.00787	0.11961	0.06582	0.94780
HMTR	0.25159	0.15062	8.86074	5.30449	1.67042	0.10148
MMTR	0.17328	0.14665	6.35356	5.37723	1.18157	0.24332
D_E	-0.16379	0.13463	-0.16379	0.13463	-1.21662	0.22982
OCF_BV	-0.12404	0.11817	-0.12404	0.11817	-1.04965	0.29925
MV	*0.83261*	0.11227	0.83261	0.11227	7.41630	*0.00000*
MKT_ADJ	-0.09155	0.17368	-0.09155	0.17368	-0.52710	0.60060
MADJ_TOT	0.12571	0.18519	0.12571	0.18519	0.67880	0.50059
G_ASSETS	-0.17322	0.10890	-0.17322	0.10890	-1.59062	0.11840
MV_BV	-0.04944	0.12970	-0.04944	0.12970	-0.38117	0.70480
R_D	*0.27874*	0.10025	0.27874	0.10025	2.78036	*0.00779*
INDUSTRY	0.25300	0.11194	2.00384	0.88661	2.26012	0.02849
VROE_VSP*	0.21117*	0.11949	0.21117	0.11949	1.76724	0.08368*

Panel C: Stepwise Multiple Regression

Regression Summary for Dependent Variable: OPTION_R
R= .78895453 R^2= .62244925 Adjusted R^2= .57258406
F(7,53)=12.483 p<.00000 Std.Error of estimate: 11.606

		St. Err.		St. Err.		
	BETA	Of BETA	B	of B	t(53)	p-level
Intercept			1.97720	6.98705	0.28298	0.77829
MV	*0.82416*	0.10431	0.82416	0.10431	7.90127	*0.00000*
R_D	*0.28043*	0.09315	0.28043	0.09315	3.01060	*0.00399*
INDUSTRY	0.24815	0.10262	1.96545	0.81278	2.41820	0.01907
G_ASSETS	-0.21473	0.09075	-0.21473	0.09075	-2.36603	0.02167
D_E	-0.13191	0.09395	-0.13191	0.09395	-1.40412	0.16612
MKT_ADJ	-0.16001	0.11003	-0.16001	0.11003	-1.45427	0.15177
VROE_VSP	0.12730	0.08938	0.12730	0.08938	1.42423	0.16024

Panel D: Correlations between Independent Variables

	DROE	HMTR	MMTR	D_E	OCF_BV	MV	MKT_ ADJ	MADJ_ TOT
DROE	1.00000							
HMTR	-0.11733	1.00000						
MMTR	-0.02908	-0.76348	1.00000					
D_E	0.25605	-0.20487	0.25207	1.00000				
OCF_BV	0.00677	0.31102	-0.15512	0.11951	1.00000			
MV	0.12068	0.05029	-0.07562	-0.01195	0.18630	1.00000		
MKT_ADJ	0.21333	0.11361	-0.05623	-0.22073	0.17652	0.51824	1.00000	
MADJ_TOT	-0.03813	-0.14527	0.07368	0.55949	-0.09286	-0.23908	-0.69180	1.00000
G_ASSETS	-0.18720	0.05587	-0.00582	-0.14707	0.18879	0.28614	0.30000	-0.38604
MV_BV	0.06891	0.16762	-0.07756	-0.00243	0.58070	0.39852	0.34722	-0.16161
R_D	0.12713	0.11547	-0.13767	-0.33860	0.02184	0.14352	0.28144	-0.29212
INDUSTRY	0.09927	-0.04667	0.13494	0.29947	0.09382	-0.34345	-0.44900	0.27267
VROE_VSP	0.42216	-0.10802	0.05429	0.01660	0.26711	0.21560	0.18868	-0.33792

	G_ASSETS	MV_BV	R_D	INDUSTRY	VEPS_VSP
G_ASSETS	1.00000				
MV_BV	0.39952	1.00000			
R_D	0.12797	-0.00714	1.00000		
INDUSTRY	-0.10094	0.02262	-0.30157	1.00000	
VROE_VSP	0.13913	0.28889	-0.00661	0.09633	1.00000

Panel E: Adjusted for the Effects of Multicollinearity

Regression Summary for Dependent Variable: OPTION_R
R= .79082117 R^2= .62539813 Adjusted R^2= .55047775
F(10,50)=8.3475 p<.00000 Std.Error of estimate: 11.903

		St. Err.		St. Err.		
	BETA	of BETA	B	of B	t(50)	p-level
Intercept			2.02871	7.18037	0.28254	0.77870
DROE	-0.00341	0.11362	-0.00341	0.11362	-0.03003	0.97616
MMTR	-0.00033	0.09178	-0.01228	3.36540	-0.00365	0.99710
D_E	-0.13079	0.10598	-0.13079	0.10598	-1.23414	0.22292
MV	*0.84127*	0.11064	0.84127	0.11064	7.60346	*0.00000*
MKT_ADJ	-0.14443	0.12111	-0.14443	0.12111	-1.19254	0.23868
G_ASSETS*	-0.19767*	0.10269	-0.19767	0.10269	-1.92488	0.05994*
MV_BV	-0.06650	0.10671	-0.06650	0.10671	-0.62322	0.53598
R_D	*0.27592*	0.09930	0.27592	0.09930	2.77857	*0.00767*
INDUSTRY	0.26195	0.10890	2.07475	0.86255	2.40537	0.01990
VROE_VSP	0.13759	0.10381	0.13759	0.10381	1.32543	0.19105

TABLE 4.2: NORMAL SCORES DATA

Panel A: Correlations with the Dependent Variable

	OPTION_R
OPTION_R	1.00000
DROE	0.14260
HMTR	-0.11645
MMTR	0.09486
D_E	-0.01923
OCF_BV	0.03360
MV	0.56214
MADJ	0.19218
MADJ_TOT	-0.08701
G_ASSETS	-0.05911
MV_BV	0.06065
R_D	0.32938
INDUSTRY	0.09291
VROE_VSP	0.18742

Panel B: Ordinary Multiple Regression

Regression Summary for Dependent Variable: OPTION_R
R= .68955188 R^2= .47548180 Adjusted R^2= .32724839
F(13,46)=3.2077 p<.00173 Std.Error of estimate: .79049

		St. Err.		St. Err.		
	BETA	Of BETA	B	Of B	t(46)	p-level
Intercept			0.13394	0.34031	0.39359	0.69570
DROE	-0.03552	0.12476	-0.03565	0.12519	-0.28473	0.77713
HMTR	0.01163	0.18051	0.02222	0.34503	0.06440	0.94893
MMTR	0.13177	0.17954	0.26132	0.35607	0.73390	0.46674
D_E	0.03978	0.16821	0.03977	0.16819	0.23647	0.81412
OCF_BV	-0.10028	0.13333	-0.10032	0.13338	-0.75211	0.45582
MV	*0.69930*	0.15561	0.70744	0.15742	4.49386	*0.00005*
MADJ	0.05297	0.14805	0.05347	0.14943	0.35779	0.72213
MADJ_TOT	0.10667	0.18368	0.10746	0.18504	0.58075	0.56424
G_ASSETS	-0.18583	0.13891	-0.18835	0.14079	-1.33779	0.18754
MV_BV*	-0.25947*	0.14249	-0.26528	0.14569	-1.82091	0.07513*
R_D	0.21574	0.13344	0.21570	0.13342	1.61670	0.11278
INDUSTRY	-0.15551	0.13689	-0.06692	0.05891	-1.13603	0.26183
VROE_VSP	0.14765	0.13397	0.14965	0.13578	1.10213	0.27614

Panel C: Stepwise Multiple Regression

Regression Summary for Dependent Variable: OPTION_R
R= .66531817 R^2= .44264826 Adjusted R^2= .39104162
F(5,54)=8.5774 p<.00000 Std.Error of estimate: .75208

		St. Err.		St. Err.		
	BETA	of BETA	B	Of B	t(54)	p-level
Intercept			0.01578	0.09713	0.16247	0.87155
MV	*0.58624*	0.11532	0.59306	0.11666	5.08358	*0.00000*
G_ASSETS*	-0.20947*	0.11247	-0.21230	0.11399	-1.86242	0.06799*
R_D	0.24410	0.11231	0.24406	0.11230	2.17333	0.03416
VROE_VSP	0.17207	0.10564	0.17440	0.10707	1.62878	0.10918
MV_BV	-0.19672	0.12119	-0.20113	0.12391	-1.62321	0.11037

Panel D: Correlations between Independent Variables

	DROE	HMTR	MMTR	D_E	OCF_BV	MV	MADJ	MADJ_TOT
DROE	1.00000							
HMTR	0.07780	1.00000						
MMTR	-0.09320	-0.76089	1.00000					
D_E	0.14393	0.18089	-0.22726	1.00000				
OCF_BV	-0.13239	-0.32256	0.17245	0.12408	1.00000			
MV	0.07492	-0.18142	0.10187	-0.01143	0.25171	1.00000		
MADJ	0.09543	-0.10759	0.05768	-0.21790	0.16039	0.28935	1.00000	
MADJ_TOT	0.00426	0.12959	-0.05380	0.58703	-0.12111	-0.18979	-0.61788	1.00000
G_ASSETS	-0.21033	-0.26445	0.19538	-0.24936	0.19756	0.27762	0.12556	-0.10672
MV_BV	0.02239	-0.10168	0.19169	0.03676	0.00015	0.38621	0.24393	-0.11601
R_D	0.03248	-0.10838	0.13747	-0.30693	-0.01278	0.33277	0.29218	-0.28002
INDUSTRY	-0.08624	0.03002	0.03011	0.15019	-0.02309	0.38523	-0.14630	0.26807
VROE_VSP	0.39899	0.04520	-0.08479	-0.02655	-0.20605	0.16735	0.17205	-0.03946

	G_ASSETS	MV_BV	R_D	INDUSTRY	VROE_VSP
G_ASSETS	1.00000				
MV_BV	0.40301	1.00000			
R_D	0.16604	0.33622	1.00000		
INDUSTRY	0.10910	0.00936	-0.10460	1.00000	
VROE_VSP	0.15320	0.19353	-0.05161	-0.08275	1.00000

Panel E: Adjusting for the Effects of Multicollinearity

Regression Summary for Dependent Variable: OPTION_R
R= .68664605 R^2= .47148280 Adjusted R^2= .35036428
F(11,48)=3.8927 p<.00048 Std.Error of estimate: .77679

		St. Err.		St. Err.		
	BETA	of BETA	B	Of B	t(48)	p-level
Intercept			0.11453	0.22472	0.50966	0.61262
DROE	-0.03858	0.12249	-0.03871	0.12292	-0.31492	0.75418
MMTR	0.13560	0.11397	0.26892	0.22603	1.18971	0.24001
D_E	0.09983	0.12956	0.09981	0.12954	0.77051	0.44477
OCF_BV	-0.11272	0.12797	-0.11277	0.12803	-0.88081	0.38281
MV	*0.68208*	0.14900	0.69001	0.15073	4.57784	*0.00003*
MADJ	0.00475	0.12076	0.00479	0.12189	0.03930	0.96881
G_ASSETS	-0.17571	0.13253	-0.17809	0.13432	-1.32584	0.19117
MV_BV*	-0.26707*	0.13636	-0.27305	0.13941	-1.95858	0.05599*
R_D*	0.22574*	0.13008	0.22570	0.13006	1.73537	0.08909*
INDUSTRY	-0.13582	0.12965	-0.05845	0.05579	-1.04756	0.30009
VROE_VSP	0.15779	0.13045	0.15992	0.13222	1.20953	0.23238

TABLE 4.3: OVERALL RESULTS EXCLUDING THE FINANCIAL SECTOR

Panel A: Ordinary Multiple Regression

Regression Summary for Dependent Variable: OPTION_R
R= .80481683 R^2= .64773013 Adjusted R^2= .52052157
F(13,36)=5.0919 p<.00005 Std.Error of estimate: 11.771

		St. Err.		St. Err.		
	BETA	of BETA	B	of B	t(36)	p-level
Intercept			-15.79565	13.68924	-1.15387	0.25616
DROE	0.00748	0.14690	0.00709	0.13916	0.05093	0.95966
HMTR	0.32221	0.19521	10.87946	6.59125	1.65059	0.10752
MMTR*	0.34697*	0.18970	12.16446	6.65087	1.82900	0.07569*
D_E	-0.26089	0.15974	-0.24512	0.15008	-1.63325	0.11113
OCF_BV	-0.06073	0.14087	-0.06252	0.14502	-0.43110	0.66897
MV	*0.87257*	0.15817	0.85068	0.15420	5.51676	*0.00000*
MKT_ADJ	-0.18392	0.21153	-0.16861	0.19391	-0.86950	0.39034
MADJ_TOT	0.19456	0.20991	0.18696	0.20171	0.92686	0.36017
G_ASSETS	-0.14294	0.13147	-0.14127	0.12994	-1.08721	0.28417
MV_BV	-0.06004	0.16294	-0.05721	0.15525	-0.36850	0.71466
R_D	*0.41160*	0.13023	0.41009	0.12976	3.16042	*0.00319*
INDUSTRY	0.30356	0.13848	2.08548	0.95140	2.19201	0.03493
VROE_VSP	0.16690	0.15105	0.15766	0.14269	1.10493	0.27652

TABLE 4.4: NORMAL SCORES WITH ABSOLUTE VARIABLE FOR DROE

Panel A: Correlations with the Dependent Variable

	OPTION_R
OPTION_R	1.00000
DROE	0.23374
HMTR	-0.08910
MMTR	0.05525
D_E	-0.10979
OCF_BV	0.00447
MV	**0.60998**
MADJ	0.21735
MADJ_TOT	-0.14072
G_ASSETS	-0.03995
MV_BV	0.12444
R_D	**0.36120**
INDUSTRY	0.06403
VROE_VSP	0.23720

Panel B: Ordinary Multiple Regression

Regression Summary for Dependent Variable: OPTION_R
R= .78722079 R^2= .61971657 Adjusted R^2= .51224516
F(13,46)=5.7663 p<.00000 Std.Error of estimate: .64993

		St. Err.		St. Err.		
	BETA	Of BETA	B	of B	t(46)	p-level
Intercept			0.56644	0.29294	1.93366	0.05932
DROE	0.09095	0.10769	0.17264	0.20441	0.84458	0.40272
HMTR	-0.24397	0.15569	-0.45054	0.28751	-1.56702	0.12396
MMTR	-0.17623	0.14972	-0.34097	0.28967	-1.17708	0.24522
D_E	-0.06934	0.13591	-0.07049	0.13816	-0.51020	0.61235
OCF_BV	-0.11749	0.11966	-0.11418	0.11629	-0.98185	0.33131
MV	*0.75175*	0.11842	0.73434	0.11568	6.34824	*0.00000*
MADJ	-0.09392	0.15474	-0.09078	0.14958	-0.60694	0.54687
MADJ_TOT	0.08136	0.18698	0.07962	0.18299	0.43513	0.66551
G_ASSETS*	-0.19379*	0.10796	-0.18966	0.10566	-1.79494	0.07923*
MV_BV	-0.02373	0.13148	-0.02342	0.12980	-0.18045	0.85759
R_D	*0.32208*	0.09985	0.31155	0.09659	3.22565	*0.00232*
INDUSTRY*	-0.21504*	0.12058	-0.08935	0.05010	-1.78339	0.08112*
VROE_VSP	0.19108	0.11832	0.18701	0.11580	1.61497	0.11316

Panel C: Stepwise Multiple Regression

Regression Summary for Dependent Variable: OPTION_R
R= .76882756 R^2= .59109581 Adjusted R^2= .53605102
F(7,52)=10.738 p<.00000 Std.Error of estimate: .63387

		St. Err.		St. Err.		
	BETA	Of BETA	B	of B	t(52)	p-level
Intercept			0.19373	0.19069	1.01597	0.31435
MV	*0.73031*	0.10892	0.71340	0.10640	6.70502	*0.00000*
R_D	*0.33512*	0.09476	0.32417	0.09166	3.53662	*0.00086*
INDUSTRY*	-0.20836*	0.10748	-0.08658	0.04466	-1.93849	0.05800*
G_ASSETS*	-0.21487*	0.09588	-0.21029	0.09383	-2.24111	0.02931*
DROE	0.10783	0.09279	0.20467	0.17612	1.16210	0.25050
VROE_VSP	0.12513	0.09358	0.12246	0.09158	1.33717	0.18699
MADJ	-0.11757	0.11551	-0.11365	0.11165	-1.01784	0.31347

TABLE 4.5: RESOURCES SECTOR

Panel A: Ordinary Multiple Regression

Regression Summary for Dependent Variable: OPTION_R
R= .94547118 R^2= .89391575 Adjusted R^2= .71205703
F(12,7)=4.9154 p<.02170 Std.Error of estimate: 9.8805

		St. Err.		St. Err.		
	BETA	Of BETA	B	of B	t(7)	p-level
Intercept			-14.03876	35.33325	-0.39732	0.70296
DROE	-0.26274	0.23349	-0.26480	0.23533	-1.12525	0.29758
HMTR	**0.64188**	0.24984	23.51463	9.15276	2.56913	**0.03705**
MMTR	0.29073	0.26719	11.38591	10.46406	1.08810	0.31259
D_E	-0.24033	0.42056	-0.22760	0.39827	-0.57146	0.58556
OCF_BV	-0.12320	0.27817	-0.11712	0.26444	-0.44289	0.67121
MV*	0.58031*	0.24958	0.59797	0.25718	2.32512	0.05299*
MKT_ADJ	-0.46867	0.35779	-0.60641	0.46294	-1.30990	0.23158
MADJ_TOT	0.38446	0.61350	0.36711	0.58582	0.62667	0.55076
G_ASSETS	0.02812	0.21540	0.03208	0.24572	0.13055	0.89981
MV_BV	-0.02204	0.47226	-0.02477	0.53082	-0.04666	0.96409
R_D*	0.49585*	0.22657	0.63292	0.28920	2.18854	0.06482*
VROE_VSP	0.51578	0.33336	0.47751	0.30862	1.54722	0.16573

Panel B: Correlations between Independent Variables

	DROE	HMTR	MMTR	D_E	OCF_BV	MV	MKT_ADJ	MADJ_TOT
DROE	1.00000							
HMTR	0.46311	1.00000						
MMTR	**-0.53675**	**-0.80178**	1.00000					
D_E	-0.22850	0.07432	0.05412	1.00000				
OCF_BV	0.07035	0.51900	-0.43924	0.01132	1.00000			
MV	0.10976	0.13947	-0.08520	0.16918	0.31980	1.00000		
MKT_ADJ	0.33082	0.31052	-0.22340	-0.25675	0.20909	0.34010	1.00000	
MADJ_TOT	-0.34495	-0.10861	0.11030	**0.81222**	-0.10104	-0.16664	-0.48486	1.00000
G_ASSETS	-0.00728	-0.03763	0.01110	-0.10411	0.06902	**0.62359**	0.46992	-0.24114
MV_BV	0.31816	0.21861	-0.15990	-0.20602	0.51305	**0.60128**	**0.64949**	-0.28924
R_D	0.48963	0.03484	-0.15986	-0.44946	-0.26240	0.10491	0.09722	-0.39696
VROE_VSP	0.34597	0.09477	0.00844	-0.45009	0.23240	0.42029	0.27828	-0.71697

	G_ASSETS	MV_BV	R_D	VROE_VSP
G_ASSETS	1.00000			
MV_BV	0.58498	1.00000		
R_D	0.29187	0.17310	1.00000	
VROE_VSP	0.22699	0.45974	0.16960	1.00000

Panel C: Adjusted For the Effects of Multicollinearity

Regression Summary for Dependent Variable: OPTION_R
R= .92529636 R^2= .85617335 Adjusted R^2= .72672937
F(9,10)=6.6142 p<.00337 Std.Error of estimate: 9.6255

		St. Err.		St. Err.		
	BETA	of BETA	B	of B	t(10)	p-level
Intercept			3.46918	15.43172	0.22481	0.82666
DROE	-0.33723	0.18864	-0.33987	0.19012	-1.78763	0.10413
HMTR	0.40935	0.17488	14.99599	6.40650	2.34075	0.04129
D_E	0.07109	0.20262	0.06732	0.19189	0.35083	0.73300
OCF_BV	-0.13354	0.16994	-0.12695	0.16155	-0.78583	0.45018
MV	0.50455	0.21403	0.51991	0.22055	2.35739	0.04013
MKT_ADJ	-0.51750	0.17085	-0.66958	0.22106	-3.02901	0.01270
G_ASSETS	0.03098	0.19307	0.03535	0.22026	0.16048	0.87570
R_D	0.49477	0.19932	0.63154	0.25442	2.48229	0.03242
VROE_VSP	0.46779	0.18304	0.43308	0.16946	2.55563	0.02859

TABLE 4.6: 'GRANTED' FIRMS

Panel A: Ordinary Multiple Regression

Regression Summary for Dependent Variable: OPTION_R
R= .69181112 R^2= .47860262 Adjusted R^2= .12185705
F(13,19)=1.3416 p<.27275 Std.Error of estimate: 9.0613

		St. Err.		St. Err.		
	BETA	of BETA	B	of B	t(19)	p-level
Intercept			20.70072	15.51970	1.33383	0.19803
DROE	-0.07884	0.25926	-0.07884	0.25926	-0.30408	0.76437
HMTR	0.06201	0.34748	1.19462	6.69460	0.17845	0.86026
MMTR	-0.11221	0.35747	-2.26649	7.22048	-0.31390	0.75702
D_E	0.26798	0.27995	0.26798	0.27995	0.95726	0.35046
OCF_BV	-0.43673	0.24729	-0.43673	0.24729	-1.76605	0.09345
MV*	0.36754*	0.21358	0.36754	0.21358	1.72086	0.10152*
MKT_ADJ	**-0.95309**	0.35449	-0.95309	0.35449	-2.68866	**0.01454**
MADJ_TOT	-0.50560	0.40085	-0.50560	0.40085	-1.26133	0.22246
G_ASSETS	-0.13902	0.28084	-0.13902	0.28084	-0.49501	0.62627
MV_BV*	0.53909*	0.31167	0.53909	0.31167	1.72969	0.09990*
R_D	0.34660	0.21275	0.34660	0.21275	1.62916	0.11975
INDUSTRY	0.16183	0.20957	0.78021	1.01035	0.77221	0.44949
VROE_VSP	0.23650	0.27380	0.23650	0.27380	0.86375	0.39850

Panel B: Stepwise Multiple Regression

Regression Summary for Dependent Variable: OPTION_R
R= .64676553 R^2= .41830565 Adjusted R^2= .25543123
F(7,25)=2.5683 p<.03863 Std.Error of estimate: 8.3437

		St. Err.		St. Err.		
	BETA	of BETA	B	of B	t(25)	p-level
Intercept			21.17536	8.89703	2.38005	0.02525
MKT_ADJ	*-0.86578*	0.26541	-0.86578	0.26541	-3.26206	*0.00319*
MV*	0.29896*	0.16775	0.29896	0.16775	1.78219	0.08687*
MV_BV*	0.44533*	0.23402	0.44533	0.23402	1.90298	0.06862*
MADJ_TOT	-0.25281	0.23698	-0.25281	0.23698	-1.06682	0.29625
OCF_BV	-0.30238	0.19166	-0.30238	0.19166	-1.57772	0.12720
R_D	0.23406	0.16426	0.23406	0.16426	1.42493	0.16654
VROE_VSP	0.19701	0.18544	0.19701	0.18544	1.06244	0.29819

TABLE 4.7: FIRM'S WITH A POSITIVE DROE

Panel A: Ordinary Multiple Regression on Ranked Data

Regression Summary for Dependent Variable: OPTION_R
R= .85158699 R^2= .72520041 Adjusted R^2= .42750085
F(13,12)=2.4360 p<.06660 Std.Error of estimate: 11.679

		St. Err.		St. Err.		
	BETA	Of BETA	B	of B	t(12)	p-level
Intercept			42.08958	29.09480	1.44664	0.17361
DROE	-0.34073	0.20246	-0.68760	0.40856	-1.68297	0.11820
HMTR	0.36948	0.22967	11.31902	7.03588	1.60876	0.13365
MMTR	0.37867	0.26776	12.04703	8.51842	1.41423	0.18271
D_E	0.06076	0.33499	0.05115	0.28204	0.18137	0.85911
OCF_BV	**-0.65098**	0.28213	-0.49812	0.21589	-2.30732	**0.03967**
MV	**0.62533**	0.22050	0.54081	0.19070	2.83600	**0.01501**
MKT_ADJ	-0.22000	0.38721	-0.19571	0.34446	-0.56817	0.58040
MADJ_TOT	-0.42046	0.45570	-0.38075	0.41266	-0.92268	0.37435
G_ASSETS	-0.27653	0.23642	-0.24564	0.21001	-1.16966	0.26484
MV_BV	0.46744	0.33546	0.35586	0.25538	1.39343	0.18876
R_D	0.01848	0.22289	0.01636	0.19730	0.08291	0.93529
INDUSTRY	0.19932	0.28844	1.49161	2.15860	0.69101	0.50271
VROE_VSP	0.48307	0.29386	0.52965	0.32220	1.64387	0.12613

Panel B: Ordinary Multiple Regression on Normal Scores Data

Regression Summary for Dependent Variable: OPTION_R
R= .79310162 R^2= .62901018 Adjusted R^2= .39292574
F(14,22)=2.6643 p<.01930 Std.Error of estimate: .80279

		St. Err.		St. Err.		
	BETA	of BETA	B	of B	t(22)	p-level
Intercept			-0.64094	0.54090	-1.18496	0.24868
DROE	0.11404	0.15361	0.17790	0.23962	0.74242	0.46568
HMTR*	0.46922*	0.24257	0.96258	0.49762	1.93436	0.06603*
MMTR	**0.54406**	0.24981	1.18120	0.54235	2.17791	**0.04041**
D_E	0.02788	0.28676	0.02881	0.29627	0.09723	0.92343
OCF_BV	-0.02761	0.16227	-0.03218	0.18913	-0.17014	0.86646
MV*	0.68820*	0.35505	0.76706	0.39573	1.93834	0.06552*
MADJ	0.03083	0.19571	0.03057	0.19402	0.15754	0.87626
MADJ_TOT	0.35407	0.27029	0.36866	0.28143	1.30995	0.20373
G_ASSETS	-0.15419	0.20173	-0.16427	0.21493	-0.76431	0.45280
MV_BV	-0.14978	0.21365	-0.19419	0.27700	-0.70106	0.49062
R_D*	0.32122*	0.18587	0.33026	0.19110	1.72818	0.09797*
INDUSTRY	-0.29064	0.19864	-0.12755	0.08717	-1.46318	0.15756
VE_VSP	0.09816	0.34280	0.10912	0.38106	0.28635	0.77729
VROE_VSP	0.02411	0.21109	0.02708	0.23713	0.11422	0.91010

TABLE 4.8: FIRM'S WITH A NEGATIVE DROE

Panel A: Ordinary Multiple Regression on Ranked Data

Regression Summary for Dependent Variable: OPTION_R
R= .89941296 R^2= .80894367 Adjusted R^2= .69067070
F(13,21)=6.8396 p<.00006 Std.Error of estimate: 10.641

		St. Err.		St. Err.		
	BETA	of BETA	B	of B	t(21)	p-level
Intercept			-17.16616	15.39561	-1.11500	0.27745
DROE	-0.02208	0.12030	-0.04122	0.22463	-0.18352	0.85615
HMTR*	0.47406*	0.24550	18.06485	9.35537	1.93096	0.06710*
MMTR	0.33100	0.23238	12.91828	9.06937	1.42439	0.16903
D_E	-0.34070	0.15998	-0.38878	0.18256	-2.12963	0.04520
OCF_BV	-0.02945	0.13491	-0.03516	0.16106	-0.21827	0.82932
MV	*0.91501*	0.14935	0.97787	0.15961	6.12660	*0.00000*
MKT_ADJ	-0.22100	0.18434	-0.23511	0.19611	-1.19886	0.24394
MADJ_TOT	0.23541	0.20083	0.24362	0.20783	1.17219	0.25425
G_ASSETS	0.01336	0.13654	0.01443	0.14750	0.09783	0.92299
MV_BV	-0.11147	0.15006	-0.13463	0.18125	-0.74281	0.46583
R_D	0.28927	0.13668	0.30348	0.14339	2.11639	0.04642
INDUSTRY	0.20304	0.13388	1.62344	1.07044	1.51661	0.14428
VROE_VSP	0.06664	0.17074	0.07214	0.18483	0.39030	0.70024

Panel B: Ordinary Multiple Regression on Normal Scores Data

Regression Summary for Dependent Variable: OPTION_R
R= .84945401 R^2= .72157211 Adjusted R^2= .23432330
F(14,8)=1.4809 p<.29391 Std.Error of estimate: .75495

		St. Err.		St. Err.		
	BETA	of BETA	B	of B	t(8)	p-level
Intercept			0.50723	0.76566	0.66248	0.52629
DROE	-0.37167	0.33102	-0.72210	0.64313	-1.12279	0.29409
HMTR	-0.70269	0.40663	-1.21493	0.70306	-1.72807	0.12224
MMTR	-0.52429	0.43411	-0.89242	0.73893	-1.20772	0.26164
D_E	-0.02825	0.38623	-0.02671	0.36526	-0.07314	0.94349
OCF_BV	-0.11338	0.33130	-0.09686	0.28304	-0.34222	0.74100
MV	0.60232	0.65614	0.51119	0.55686	0.91798	0.38547
MADJ	-0.20377	0.34492	-0.21517	0.36423	-0.59075	0.57099
MADJ_TOT	-0.10204	0.41834	-0.09690	0.39725	-0.24392	0.81343
G_ASSETS	-0.44930	0.26615	-0.43054	0.25504	-1.68811	0.12987
MV_BV	0.14478	0.42513	0.10754	0.31577	0.34056	0.74220
R_D	0.13896	0.36598	0.13078	0.34444	0.37969	0.71405
INDUSTRY	-0.03438	0.23137	-0.01409	0.09483	-0.14860	0.88554
VE_VSP	-0.28532	0.63255	-0.25429	0.56374	-0.45107	0.66391
VROE_VSP	0.57343	0.37594	0.58356	0.38258	1.52534	0.16568

CHAPTER 5

CONCLUSIONS

5.1 The Research Study

Research conducted overseas has shown that firm's grant share options to executive directors to firstly align their interests with those of the shareholders so as to reduce agency costs; secondly because there is no requirement to expense share options in the income statement and a financial reporting benefit therefore exists; and thirdly to utilise situations when the firm is paying low levels of taxation because firms cannot obtain a tax deduction when they grant share options. Although the international evidence appears to be conclusive that the pursuit of reduced agency costs is a key driver for share option granting, the studies conducted have occasionally yielded conflicting results with regard to identifying proxies for agency costs that are significantly associated with option granting and the financial reporting and taxation issues surrounding share option granting.

Prior to this study, none of the theories suggested overseas had been tested in South Africa. The objective of this study was therefore to determine which of the relevant factors previously tested overseas influence share option granting to South African executive directors. Specifically, this study sought to determine whether firms are more likely to grant share options to executive directors (a) in order to reduce agency costs, and/or (b) to capitalise on financial reporting benefits, and/or (c) to take advantage of their taxable income situation.

To accomplish this, 61 firms over the period 2000 to 2001 were selected, and the proportion of the value of share options granted to total executive compensation (known as the option ratio) was regressed against thirteen independent variables comprising proxies for agency costs, financial reporting and taxation status, firm size and liquidity. This methodology was used by Klassen and Mawani (2000), and is similar to that used by Matsunaga (1995), Yermack (1995) and Lewellen, Loderer and Martin (1987).

The dividend-adjusted Black-Scholes model was used to value the share options granted, and the option ratio was calculated as this value divided by the sum of this value and total cash compensation for the year. The proxies for agency costs included the variance of market-adjusted returns to represent the type of investments management are pursuing; the market-to-book ratio, the ratio of research and development expenditure to total assets and the five-year growth in assets to represent long-term investments and growth opportunities, the variance of market-adjusted returns to total returns to represent the noise in share price relative to the market; the variance of return on equity to the variance of share price to capture the noise in earnings relative to the noise in the share price, and an industry dummy variable to capture differences in option granting behaviour across industries.

The two financial reporting proxies were the deviation from the firm's target return on equity had an expense been recognised for share options and secondly the debt-equity ratio to capture cash flow constraints resulting from debt. The firm's tax status was determined by whether the firm had positive or negative taxable income and whether there were any assessed losses. Firm size was represented by market value and liquidity constraints were measured by the ratio of operating cash flow to the book value of equity.
Due to the non-normality and non-linearity of the data, the data was normalised using two techniques suggested by Cooke (1998) namely, rank regression and normal scores.

The results suggest that South African firms are more likely to compensate their executive directors with share options when the firm is large and has future growth opportunities (represented by the ratio of research and development to total assets), which is consistent with the theory that firm's grant options to reduce the costs of agency between management and shareholders. Two variables were statistically significant but in the opposite direction to what was expected: growth in assets and the market-to-book ratio. Having analysed the data however, a larger sample size may have provided a different result.

The variables that were not found to significantly influence option granting were the financial reporting, tax and liquidity variables, as well as two proxies for agency costs (the variance of market-adjusted returns and the ratio of the variance of market-adjusted returns to total returns). Unlike firms overseas, South African firms do not appear to grant options

when they have highly variable share returns and/or highly variable share returns relative to the market. The results also suggest that the lack of a requirement to recognise an expense for share options, the lack of a tax deduction, and low liquidity within the firm do not influence the decision to grant share options in South Africa. This implies that the release of ED 160 *Share-based Payment* should not effect the firm's decision to grant options. Other implications are that if SARS were to consider allowing a tax deduction for share options granted, this should also not effect the firm's decision of whether or not to grant options.

Additional tests that were conducted included analysing only the firms that granted options. It was found that the larger the firm and its growth opportunities (represented by the market-to-book ratio) and the lower the variance of its share returns, the greater the proportion of options granted. The resources sector was also separately analysed and the variables that were found to drive share option granting by these firms were the same as those that were identified for the sample as a whole, except that firm's with a high taxable income position and a low share price variance were also more likely to grant options. Another test was conducted to indicate whether the fact that the deviation from target return on equity was positive or negative influenced the granting of options. The results showed that it was not a significant driver of share option granting. Other tests that were conducted on firms with only positive or only negative deviations from their target return on equity revealed conflicting results.

5.2 Future Research

A number of possible areas of future research have been identified through this study. Some of the more significant areas are discussed below.

The results have not succeeded in revealing why so many share option schemes have failed in South Africa. Had the financial reporting and taxation proxies been found to be significant then an implication of this would have been that firm's grant options depending on their own monetary circumstances, and not necessarily because it is the most appropriate form of compensation for all parties concerned. Future research exists in the form of exploring the reasons for major share option scheme collapses.

This study may also reveal different results if it can be repeated on a larger scale. If the quality of share option disclosure improves, this may be a worthwhile exercise.

A similar study using different variables or measurement techniques to determine proxies for agency, financial or taxation may also provide further insight into option granting behaviour. If the tax position of the company, instead of the group, can be ascertained, more meaningful results may be found.

Finally, a study that examines the future consequences of share option grants, such as whether characteristics of the firm change subsequent to the granting of share options may be useful.

5.3 Closing Remarks

This study has provided some guidance as to what the key drivers of share option grants in South Africa are. It has resulted in a deeper understanding of why and when firms decide to grant share options. Furthermore, it has provided some insight into the potential future impact of ED 160 *Share-based Payments* on the decision to grant share options and any possible future tax amendments regarding the deductibility of share options. It has empirical results that can be compared to those found internationally, and has identified variables that stakeholders and analysts may wish to consider when anticipating share option grants.

APPENDICES

Appendix A: 100 LARGEST FIRMS BASED ON MARKET CAPITALISATION AT 1/10/01 ON THE JSE SECURITIES EXCHANGE

ABI	Kersaf
Absa	Liberty
AECI	Liberty International
Aflife	Lonmin
African Bank	M Cell
Afrox	Malbak
Afrox Health	Massmart
Alexander Forbes	Mediclinic
Allan Gray Properties	Metro Cash & Carry
Allied Technologies	Metropolitan Life
Anglo American	MIH
Anglo Platinum	Mnet
Anglogold	Murray & Robberts
Aspen	Mutual & Federal
Assmang	Nampak
Aveng	Naspers
Avgold	Nedcor
AVI	Nedcor Investment Bank
Avmin	Netcare
Barloworld	New Clicks
BHP Billiton	Northam
Bidvest	Old Mutual
BoE	OTK
Capital	Pick 'n Pay
Caxton	PPC
Comparex	Rand Merchant Bank Holdings
Copi	Rebhold
Coronation Holdings	Remgro
CTP	Reunert
Delta	Richemont
Didata	SA Breweries
Discovery	SA Eagle
Distell	Sanlam
Durban Deep Roodepoort	Santam
Edcon	Sappi
Ellerine	Sasol
Energy Africa	Shoprite
Firstrand	Stanbic

Foschini	Steinhoff
Goldfields	Sun International
Harmony	Supergroup
HLH	Tiger
Illovo	Tigon
Imperial	Tongaat
Implats	Truworths
Investec	Unitrans
Iscor	Venfin
JD Group	Western Areas
Johnnic Communications	Wooltru
Johnnic Holdings	Woolworths

Appendix B: THE SAMPLE

2001	2000
GRANTED	GRANTED
Anglo American	Anglo American
Anglo Platinum	Anglo Platinum
Anglovaal Mining	Anglogold
Avgold	AVI
AVI	Barloworld
Barloworld	Bidvest
Bidvest	Implats
Firstrand	Liberty
Implats	Liberty International
Kersaf Investments	Lonmin
Liberty	Old Mutual
Lonmin	SAB
Nedcor	Stanbic
NIB	Tigerbrands
Old Mutual	
Reunert	
SAB	
Stanbic	
Tigerbrands	

NOT GRANTED	NOT GRANTED
Allied Technologies	AECI
Assmang	Afrox
Anglogold	Allied Technologies
Bhpbilliton	Assmang
Discovery	Discovery
Distell	Harmony
Ellerine	NIB
Goldfields	PPC
Iscor	Sun International
Johnnic Communications	Supergroup
Johnnic Holdings	Western Areas
Malbak	
Metcash	
PPC	
Sun International	
Supergroup	

Appendix C: INDUSTRY SECTORS

Gold mining	1
Platinum	2
Mining Finance	3
Food Producers and Processors	4
Diversified Industrials	5
Chemicals	6
Other mineral Extractors and Mines	7
Steel and other metals	8
Construction and Building Materials	9
Banks	10
Speciality and other finance	11
Life assurance	12
Insurance	13
Real Estate	14
Beverages	15
General Retailers	16
Support Services	17
Media and Photography	18
Electronic and Electrical Equipment	19
Telecommunications	20
Leisure, entertainment and hotels	21
Transport	22
Packaging	23

2001		2000	
Share Options		**Share Options**	
GRANTED	**SECTOR**	**GRANTED**	**SECTOR**
Anglo American	3	Anglo American	3
Anglo Platinum	2	Anglo Platinum	2
Anglovaal Mining	3	Anglogold	1
Avgold	1	AVI	4
AVI	4	Barloworld	5
Barloworld	5	Bidvest	17
Bidvest	17	Implats	2
Firstrand	10	Liberty	12
Implats	2	Liberty International	14
Kersaf Investments	21	Lonmin	2
Liberty	12	Old Mutual	12
Lonmin	2	SAB	15
Nedcor	10	Stanbic	10
NIB	11	Tigerbrands	4
Old Mutual	12		
Reunert	19		
SAB	15		
Stanbic	10		
Tigerbrands	4		

2001		2000	
Share options		Share Options	
NOT GRANTED	SECTOR	NOT GRANTED	SECTOR
AECI	6	AECI	6
Allied Technologies	19	Afrox	6
Assmang	7	Allied Technologies	19
Anglogold	1	Assmang	7
Bhpbilliton	7	Discovery	13
Discovery	13	Harmony	1
Distell	15	Nedcor Investment Bank	11
Ellerine	16	PPC	9
Goldfields	1	Sun International	21
Iscor	8	Supergroup	22
Johnnic Communications	18	Western Areas	1
Johnnic Holdings	20		
Malbak	23		
Metcash	16		
PPC	9		
Sun International	21		
Supergroup	22		

BIBLIOGRAPHY

Baber, W.R., Janakiraman, S.N. & Kang, S-H. 1996, 'Investment opportunities and the structure of executive compensation', *Journal of Accounting and Economics*, vol. 21, no.3, pp. 297-318.

Bidoli, M. 2002, 'No gain, so bosses take a little pain', *Financial Mail*, 15 February, p. 22.

Bizjak, J.M., Brickley, J.A., Coles, J.L. 1993, 'Stock-based incentive compensation and investment behaviour', *Journal of Accounting and Economics*, vol. 16, pp.349-372.

Black, F. and Scholes, M. 1973, 'The Pricing of Options and other Corporate Liabilities', *Journal of Political Economy*, vol .81, no.3, pp.637-654.

Bushman, R.M., Indjejikian, R.J. & Smith, A. 1996, 'CEO Compensation: The role of individual performance evaluation', *Journal of Accounting and Economics*, vol. 21, no. 2, pp. 161-193.

Cohen, T. 2001a, 'Shareholders take knock in mid-sized banks' bids to retain staff', *Business Day*, 28 February.

Cohen, T. 2001b, 'Going down with the ship, or taking the lifeboat?', *Business Day*, 26 April.

Cooke, T.E. 1998, 'Regression Analysis in Accounting Disclosure Studies', *Accounting and Business Research*, vol. 28, no 3, pp.209-224.

Douglas, A., Scott, W., Boyle, P. & Zhang, P. 1997, 'A model of the valuation and intensity of stock options', Working Paper, *University of Waterloo.*

Eaton, J. & Rosen, H.S. 1983, 'Agency, delayed compensation, and the structure of executive remuneration', *Journal of Finance*, vol. 38, pp. 1489-1505.

Ely, K.M. 1991, 'Inter industry differences in the relation between compensation and firm performance variables', *Journal of Accounting Research*, vol. 29 (Spring), pp. 37-58.

Fama, E. 1976, *Foundations of Finance*, Basic Books, New York.

Gaver, J.J. & Gaver, K.M. 1993, 'Additional evidence on the association between the investment opportunity set and corporate financing, dividend, and compensation policies', *Journal of Accounting and Economics*, vol. 16, no. 1, pp. 125-160.

Graham, J.R. 1996, 'Proxies for the Corporate marginal tax rate', *Journal of Financial Economics*, vol.42, no. 2, pp. 187-221.

Graham, M. 2001, 'The Impact of Firm Size and Industry Type on the Extent of Disclosure in the Annual Report', *South African Journal of Financial Accounting*, January.

'G4+1 Discussion Paper – "Share-based Payments". Summary of "Big 5" Comment Letters' [Online], Available: http://www.fei.org/gr/news/stocks.cfm [2002, April 17]

Hall, J.H. 1998, 'The agency problem, agency cost and proposed solutions thereto: A South African perspective', *Meditari Accounting Review*, vol.6, pp. 145-161.

Hall, B. & Liebman, J. 1998, 'Compensation: Refining CEO stock options', *Harvard Business Review*, Sep/Oct, pp. 15-18.

Hasenfuss, M. 2001, 'Stealing value from holders', *Financial Mail*, 16 November.

Harter, H.L. 1961, 'Expected values of normal order statistics', *Biometrika*, vol.48, pp. 151-165.

Haugen, R.A. 1993, *Modern Investment Theory*, Third Edition, Prentice-Hall International, New Jersey.

Haugen, R.A. & Senbet, L.W. 1981, 'Resolving the Agency Problems of External Capital through Options', *The Journal of Finance*, vol. 36, no.3, pp. 629-647.

Hemmer, T. 1993, 'Risk-free incentive contracts: Eliminating agency cost using option based compensation schemes', *Journal of Accounting Research*, vol.16, pp. 447-473.

Henderson, M. 2001, 'Vantage Points: Rethinking share options', *Business Day*, 19 April.

Hill, A. & Durr, B. 2002, 'Coke to treat stock options as expenses', *Financial Times*, 15 July.

Huxham, K., Associate Professor at the University of Cape Town 2002, Conversation regarding tax treatment of share options, 10 July 2002.

Huxham, K. & Haupt, P. 2002, *Notes on South African Income Tax*, Hedron Tax Consulting and Publishing CC, Roggebaai.

The Institute of Directors in Southern Africa 1994, *The King Report on Corporate Governance*, Johannesburg.

The Institute of Directors in Southern Africa 2002, *The King Report on Corporate Governance*, Johannesburg.

International Accounting Standards Board 2000, *G4+1 Discussion Paper: Accounting for Share-Based Payment'*, Publications Department, London.

International Accounting Standards Board 2002a, 'Share-Based Payment', *IASB Insight*, April.

International Accounting Standards Board 2002b, 'Share-Based Payment', *IASB Insight*, May.

International Employee Stock Option Coalition 2001, *Sir David Tweedie. Chairman, International Accounting Standards Board* [Online], Available: http://www.fei.org/gr/news/stocks.cfm [2002, April 19]

Jensen, M. and Meckling, W.H. 1976, 'Theory of the firm: managerial behaviour, agency costs and ownership structure', *Journal of Financial Economics*, vol. 3 (October), pp.305-360.

Jensen, M.C and Murphy, K.J. 1990, 'Performance pay and top management incentives', *Journal of Political Economy*, vol. 98, pp. 225-264.

Klaasen, K.J. & Mawani, A. 2000, 'The Impact of Financial and Tax Reporting Incentives on Option Grants to Canadian CEO's', *Contemporary Accounting Research*, vol. 17, no.2, pp. 229-262.

Kruger, P. 2002, 'Share option schemes counterproductive', *Business Day*, 26 February.

Lambert, R.A. & Larcker, D.F. 1987, 'An Analysis of the Use of Accounting and Market Measures of Performance in Executive Compensation Contracts', *Journal of Accounting Research*, vol. 25 (Supplement), pp. 85-125.

Lewellen, W., Loderer, C. & Martin, K. 1987, 'Executive Compensation and Executive Incentive Problems. An Empirical Analysis', *Journal of Accounting and Economics*, vol. 9, no. 3, pp. 287-310.

Matsunaga, S.R. 1995, 'The Effects of Financial Reporting Costs on the Use of Employee Stock Options', *The Accounting Review*, vol.70, no.1, pp. 1-26.

Matsunanga, S.R., Shevlin, T. & Shores, D, 1992, 'Disqualifying dispositions of incentive stock options: Tax benefits versus financial reporting costs', *Journal of Accounting Research*, vol. 30 (supplement), pp. 37-76.

Mehran, H. 1995, 'Executive compensation structure, ownership, and firm performance', *Journal of Financial Economics*, vol. 38, pp.163-184.

Merton, R.C. 1973, 'Theory of rational option pricing', *Bell Journal of Economics and Management Science*, vol. 4 (Spring), pp. 145-166.

Meyerowitz, S.C. 2001, 'Option Contracts', in *Meyerowitz on Income Tax*, ed. Eileen Eagar, Creda Communications (Pty) Ltd, Cape Town.

Modise, J.R.D. 1993, 'Executive Compensation and corporate performance', MBA, University of the Witwatersrand, Johannesburg.

Murphy, K.J. 1985, 'Corporate performance and managerial remuneration: An empirical analysis', *Journal of Accounting and Economics*, vol. 7, pp. 11-42.

Newberry, S. 2001, 'Reciprocal and Non-Reciprocal Transactions: The FASB's Stock-Based Compensation Project', *Abacus*, vol. 37, no. 2, pp. 177-187.

Press, E.G. & Weintrop, J.B. 1990, 'Accounting-based constraints in public and private debt agreements: Their association with leverage and impact on accounting choice', *Journal of Accounting and Economics*, vol. 12 (January), pp. 65-95.

PricewaterhouseCoopers & Institute of Directors, 2000, *The JSE Listing Requirements. A Summary*, The Institute of Directors, Johannesburg.

'The Professional – Share schemes can sting', 2000, *Business Day*, 27 October.

Reilly, F.K. and Brown, 1994, *Investment Analysis and Portfolio Management*, The Dryden Press, Orlando.

Ross, S.A., Westerfield, R.W., Jordan, B.D. & Firer, C. 1996, *Fundamentals of Corporate Finance*, First South African Edition, Richard D. Irwin, London.

SAB 2001, Annual Financial Statements.

SAICA 2002, 'ED 2 Share-based Payment', *PWC Technical Support Database*, November 2002.

Shevlin, T. 1990, 'Estimating corporate marginal tax rates with asymmetric tax treatment of gains and losses', Journal of the American Taxation Association, Spring, pp. 51-66.

Sloan, R.G. 1993, 'Accounting earnings and top executive compensation', *Journal of Accounting and Economics*, vol. 16, no.1, pp. 55-100.

Smith and Watts. 1992, 'The investment opportunity set and corporate financing, dividend and compensation policies', *Journal of Financial Economics*, vol. 32 (Dec), pp. 263-292.

Solomou, P. & Gustavsson, F. 1999, 'UK Remuneration Practices. Do UK Incentives Align Managers with Shareholders?', *EVAluation* [Electronic], vol. 1, no. 1, pp. 1-20, Available: http://www.eva.com/content/evaluation/info/v1n1.pdf [2002, June 13]

South African Institute of Chartered Accountants 2001, 'AC116', in *SAICA Handbook Accounting Volume 1A 2001/2002*, Natal Witness Commercial Printers, pp. 52-54.

Stewart, G.B. 2002, 'How to Structure Incentive Plans that Work', *EVAluation* [Electronic], vol. 4, no. 4, pp. 1-16, Available: http://www.eva.com/evaluation/info/042002.pdf [2002, June 13]

'Stock Options (or expropriating the shareholders)', 2001, *Financial Times*, 11 January.

Strydom, E.M.L. 1998, *Company Legislation Handbook 1998*, 11th Edition, Butterworths, Durban.

Van der Honert, R. 1997, *Intermediate Statistical Methods for Business and Economics*, University of Cape Town Press, Cape Town.

Van Niekerk, M. 2000, 'Offer of shares not always the wisest option', *Business Day*, 13 November.

Wood, S. 2002, 'Share Incentive Schemes. Avoid Pitfalls', *Financial Mail*, 19 April., pp. 111-112.

Yermack, D. 1995, 'Do corporations award CEO stock options effectively?', *Journal of Financial Economics*, vol. 39, no. 2, pp. 237-269.

Yermack, D. 1997, 'Good timing: CEO stock option awards and company news announcements', *Journal of Finance*, vol. 52, no. 2, pp 449-76.

Zmijewski, M.E. & Hagerman, R.L. 1986, 'An income strategy approach to the positive theory of accounting standard setting/choice', *Journal of Accounting and Economics*, (August), pp. 129-149.