

The Impact of Earnings per Share Targets in Executive Remuneration Contracts on Company Accounting Choices

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Colette Grey

Manchester Business School

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Abstract

This study concerns itself with executive share option plans that have earnings per share targets and examines whether the existence of such vesting criteria results in opportunistic behaviour by managers or represents efficient contracting. Accounting choices by management are studied to see whether earnings per share targets in various executive remuneration components are associated with (1) the disclosure of alternative earnings per share, (2) earnings management defined as abnormal working capital accruals and (3) earnings management defined as meeting or beating analysts' forecasts.

To begin with, the current study tests for an association between the disclosure of alternative earnings per share figures and earnings per share performance criteria in executive share options. Following Healy (1985) it is argued that situations might exist where executives are aware they will not meet the target or will overshoot the target giving rise to incentives to manage earnings downwards. There are also situations where executives expect to miss the target but have incentives (and scope) to manage earnings upwards. The study then proceeds to measure earnings management using a modified Jones (1991) model. A proxy for target growth in earnings per share is developed. The third and final section of the current study considers meeting or beating analysts' forecasts as the earnings management metric. Prior research provides evidence that meeting or beating analysts' forecasts is rewarded by the stock market and as the payout from executive share options is linked to share price, executives have incentives to meet or beat analysts' forecasts.

Regression analysis, in the form of either logit or ordinary least squares is employed in all three sections of this study. The results suggest that earnings management is associated with earnings per share vesting targets in executive share option plans. Moreover, the findings as a whole suggest that the introduction of earnings per share targets as a vesting criterion in executive share options resulted in opportunistic behaviour by management.

This thesis adopts an agency theory framework and contributes to the literature on corporate governance and executive remuneration by identifying a specific contractual setting where management is especially sensitive to reported earnings numbers. This particular setting is novel. Additionally, the research design facilitated the testing of whether or not executive share options with an earnings per share growth target result in opportunistic behaviour on the part of managers or represent efficient contracting.

Declaration

No portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification at this or any other university or other institute of learning.

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List of Abbreviations

ABI	Association of British Insurers
ASB	Accounting Standards Board
CEOs	Chief Executive Officers
EPS	Earnings per Share
ESOs	Executive Share Options
FIFO	First In, First Out
FRS	Financial Reporting Standard
GAAP	Generally Accepted Accounting Practice
I/B/E/S	Institutional Brokers' Estimate System
IFRS	International Financial Reporting Standard
JMBE	Just Meet or Beat Analysts' Expectations
LIFO	Last In, First Out
LTIPs	Long-Term Incentive Plans
MBE	Meet or Beat Analysts' Expectations
NAPF	National Association of Pension Funds
PAT	Positive Accounting Theory
RPE	Relative Performance Evaluation
RPI	Retail Price Index
SBC	Share-based Compensation
VIF	Variance Inflation Factor

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Dedication

To Donal, thank you for our happy life together.

Chapter 1

Introduction

1.1 Introduction

Executives in a company are in an agency relationship with the shareholders. The shareholders are the principals (owners) and the executives are employed as agents to manage the company on behalf of the owners. This separation of ownership and control results in the need to monitor the action of the agents in an effort to have the agent act in the best interest of the shareholders. Two developments have resulted from this separation of ownership and control. The first is the evolution of regulatory structures such as the legal requirement for an annual independent audit, the listing rules of the London Stock Exchange and various corporate governance reports and principles. The second, which is the focus of this thesis, is the design of management incentive schemes whose objective is the achievement of as much congruence as possible between an agent's own personal objectives and the shareholders' objective of wealth maximisation.

The above developments refer to the UK, but the same would be applicable to US firms in that they are subject to their own regulatory structures and legal requirements. Also, similar to the UK, US firms employ executive incentive schemes as part of the solution to the agency problem. An agency problem arises from the conflict of interest and information asymmetry between the uninformed principal and the informed agent.

Executive compensation is a subject that has received considerable interest from the media, academia and the public for several decades and is an area which continues to attract attention and controversy. Lumby and Jones (2003) maintain that it is generally recognised that incentive schemes have not been successful, except of course for the executives themselves.

The key question for this thesis is the issue of whether executive remuneration contracts, in particular the structure of those contracts, impact on various company accounting choices. In particular, it addresses the subject of whether executive remuneration contracts cause managers to behave in an opportunistic or optimal manner with regard to accounting and related disclosure decisions.

1.2 Current Remuneration Structure and Issues

Because managers are agents of the principals, the objective facing the designers of the components and structure of executive remuneration schemes is to do so in such a way as to ensure the agents act to maximise the wealth of the shareholders.

Executive compensation has many components: cash, bonus plans, executive share option plans (ESOs), long-term incentive plans (LTIPs) and pension contributions. Share options comprise a significant component of executive remuneration over the past two decades.

Much early accounting research and policy makers' deliberations into the issue of share options as part of executive remuneration centre on the debate as to how these options might be expensed in the accounts and the impact of any decision to require their expensing. As expensing became generally accepted accounting practice (GAAP) from 1 January, 2005, focus has moved from this debate. In designing executive remuneration, policy makers would like to know that the chosen design has the desired impact in aligning the interests of the agents and principals. One reason performance targets were considered desirable is their expected ability to change the focus of management's decision-horizon from the short term to the long term.

Recently the failure of firms such as Enron and WorldCom, where the use of ESOs was prevalent, brought about new legislation and regulation. Companies must now disclose more information related to executive remuneration, and the expensing of share option grants is now mandatory.

To address the agency problem, the vesting of ESOs, while originally contingent solely on the passage of time, is now often structured so that their vesting is also dependent on the achievement of performance criteria. In the UK, for ESOs, the performance criterion is generally a growth in earnings per share (EPS) over a three-year period.

The motivation of this thesis is to consider whether the introduction of a performance criterion, as an attempt to address the agency problem caused by the perceived long-term focus of shareholders and the short-term focus of management, has the desired outcome.

1.3 Research Questions

The substantive objective of this study is to develop and test hypotheses about the following accounting choices of firms with EPS targets in their ESOs:

- Disclosure of an alternative EPS figure.
- Earnings management.
- Whether EPS vesting targets are more important to the agent than meeting or beating analysts' forecasts.

Ex ante, it is impossible to discern whether the inclusion of a particular performance criterion in any component of executive remuneration will lead to opportunistic behaviour or efficient contracting. Thus, a research design is employed to test the hypothesis that the addition of an EPS performance criterion in executive remuneration components has resulted in management behaving either efficiently or opportunistically. The research design involves classifying companies by the distance between actual EPS growth and target EPS growth. Testing the hypothesis is mainly achieved through identifying whether the performance criterion can be met through earnings management, adopting two different indicators of earnings management:

1. abnormal working capital accruals.
2. whether EPS vesting targets are more important to the agent than meeting or beating analysts' forecasts.

The following research questions are addressed in this thesis:

1. What impact does an EPS target in bonus plans, ESOs and LTIPs have on the decision to disclose an alternative EPS figure?
2. Is an EPS target in ESOs related to earnings management?
3. How does the difference between actual EPS growth and target EPS growth impact on earnings management?
4. Does the direction of the distance between actual EPS growth and target EPS growth impact on the direction of earnings management?
5. What is the association between the probability of meeting or beating analysts' forecasts and the existence of an EPS target in ESOs?

6. Is the probability of meeting or beating analysts' forecasts higher in years when ESOs with EPS targets are due to vest?
7. Is the probability of meeting or beating analysts' forecasts dependent on the closeness to the target EPS growth required in order for ESOs to vest?
8. What impact do ESOs with EPS targets that are due to vest have on the probability of meeting or beating analysts' forecasts?
9. Are companies close to the target EPS more likely to meet or beat analysts' forecasts?

1.4 Research Contribution

The introduction of performance criteria into ESOs provides the motivation for this thesis. This represents a specific contractual structure which provides a unique setting in which to study the behaviour of management. Specifically, this thesis considers the impact a performance criterion has on the behaviour of management with respect to three accounting choice decisions.

The accounting choice decisions are (1) to disclose an alternative EPS figure, (2) to manage earnings relative to the EPS target in the ESOs and (3) meeting or beating analysts' forecasts.

During the period of this research, the majority of ESOs in the UK have three-year EPS growth targets which have to be met before any options vest. Consequently, EPS vesting targets are the focus of this thesis.

This research contributes to the literature as follows:

- It considers the possibility that contractual considerations may influence disclosure choice with respect to earnings performance measures.
- ESOs are identified as the component of executive remuneration most associated with the disclosure decision.
- As the definition of the EPS growth target is not disclosed, a proxy EPS growth target is devised. This proxy target is robust in the two studies in which it is used: (1) the earnings management study and (2) the analysts' forecast study. A methodology is developed to determine how close actual EPS growth is to the proxy growth target, allowing the firms in the sample to be classified by the incentive to manage earnings upwards or downwards.
- The inter-relationship between an EPS target in ESOs and the probability of meeting or beating analysts' forecasts is studied to determine whether management has a pecking order in its motivation between these two earnings figures.
- The findings in chapter 4 and chapter 5 provide evidence that executives act opportunistically when there is an EPS target in their share options.
- This research is important as it helps determine whether the behaviour of management as a consequence of a particular performance criterion in ESOs can be classified as efficient contracting (the purpose for which a performance criterion was introduced) or as opportunistic behaviour.
- Much of the agency research into executive remuneration is set in the US environment where EPS targets in ESOs are not common; in the UK

performance targets are common and this provides a unique opportunity to examine the impact of such targets.

This thesis contributes to the debate between those who argue that the targets represent efficient contracting, through better aligning of the principal and agent's incentives, and those who argue that the structure of executive remuneration is a result of managerial power, where performance targets are easy or agents have influence to manage earnings to these targets. The development of a proxy for the EPS growth target, along with the development of a methodology to classify executive behaviour as opportunistic or efficient contracting, is an important contribution to the study of the impact of executive compensation contract design.

Despite an effort to link executive remuneration to company performance, Clark (2009) states that even after the rapid escalation in Chief Executive Officers' (CEOs) salaries in the US in the boom years of the 1990s:

'Though there were more stringent efforts to link CEO compensation to performance, CEO reward remained at incredibly high levels whether the companies they managed did well or not' (Clark, 2009:6).

Given the above developments, the next section will outline the specific research questions addressed in this thesis.

1.5 Structure of the Thesis

Chapter 2 presents agency theory which provides the underlying theoretical framework for this research; it outlines the agency problem facing firms, as a result of the separation of ownership and control. The framework provides an understanding of where this study resides in the accounting and finance

disciplines. In addition, it discusses measures which are intended to reduce the agency problem.

Having presented the framework for thinking about executive remuneration, Chapter 3 provides the motivation for the interest in this topic, and investigates whether the existence of an EPS target in executive remuneration components has the potential to explain the choice management makes as to whether or not they disclose an alternative EPS figure. This chapter explores whether or not the structure of executive compensation contracts helps explain the decision by UK firms to disclose an alternative EPS figure.

As Chapter 3 finds that an EPS performance target in ESOs helps explain the alternative EPS disclosure decision, this leads this research to focus the remaining empirical studies on executive share option plans. Chapter 4 attempts to consider the earnings management decision of firms based on their chance of reaching the EPS target which is necessary for their ESOs to vest. This particular executive remuneration structure allows situations to be identified where the incentive is to manage earnings downwards. It also allows the identification of situations which might provide executives with incentives to manage earnings upwards.

Having established an association between the existence of an EPS target in ESOs with alternative EPS disclosure choice, and the direction of earnings management, Chapter 5 considers another accounting choice that management make; that is, meeting or beating analysts' forecasts. The creation of a proxy for target EPS growth, which allows measurement of the distance between target and actual growth, opens up opportunities to contribute to the literature on meeting or beating analysts' forecasts. This chapter considers the pecking order between two targets that management are expected to aspire to meet. It examines whether EPS vesting targets are more important to the agent than meeting or beating analysts' forecasts.

1.6 Conclusions

This thesis contributes to the literature on corporate governance and executive remuneration by identifying a specific contractual setting where management is particularly sensitive to reported earnings numbers. The study of ESOs with an EPS growth target enables the identification of the circumstances under which management use discretion to achieve a desired reporting objective.

The research design allows sample firm's executive behaviour to be considered under the opposing theories of (1) opportunistic behaviour on the part of management and (2) whether or not the inclusion of an EPS target in ESOs results in efficient contracting (the purpose for which it is intended). The research also adds to the literature as it considers a particular contractual arrangement, allowing the study of management behaviour regarding the *direction* of earnings management, as well as providing an opportunity to determine the preference of management among targets.

From the results, it can be concluded that when designing executive remuneration contracts, allowance needs to be made for the fact that these contracts may induce opportunistic accounting choices that undermine the quality of the information set available to investors. There is a trade-off between providing managers with an incentive to produce, on the one hand, value relevant information and, on the other, the use of accounting numbers for contracting.

Chapter 2

Evaluating Executive Remuneration Contracts: A Theoretical Framework

2.1 Introduction

The key question for this thesis is the issue of whether the structure of executive remuneration contracts impacts on various company accounting choices. In particular, it addresses the issue of whether executive remuneration contracts cause managers to behave in an opportunistic or optimal manner with regard to disclosure and accounting choice decisions.

Positive Accounting Theory (PAT) which is associated with key contributions developed by Watts and Zimmerman (1979) is concerned with predicting actions such as the choice of accounting policies by firm managers and also in predicting how managers will respond to new accounting standards. Under PAT, a firm is viewed as a nexus of contracts, that is, its organisation can be largely described by the set of contracts it enters into (Scott, 2003). Given the above, the motivation for the current chapter is to introduce the agency theory framework which emanates from a detailed exposition by Jensen and Meckling (1976). Agency theory (a version of game theory) models the process of contracting between two parties. Agency theory provides key concepts and insights which need to be understood before one can attempt to pose, let alone answer, the above question. Most research approaches the study of executive remuneration from an agency theory perspective.

One of the most important developments in the history of economic progress has been the formation of corporations, accompanied by the separation of ownership and control. As a result of this separation of ownership and control in the modern firm, economists describe the relationship between shareholders (principals) and management (agents) as one where the principals employ agents to take actions on their behalf. A basic assumption of agency theory is that individuals are rational, and will seek to maximise their own expected utilities; that is, the agent will pursue his or her own objectives rather than those of the principal.

Financial accounting information has a role in company valuation (determining share prices) and in governance (control). The focus here is on the governance role and addresses one such control mechanism, that is, executive remuneration compensation contracts. Agency theory provides a framework for modelling the process of contracting between principals and their agents.

Berle and Means (1932) were the first to document the development of the US quasi-public company. They note that the private, closely held company had given way to a quasi-public company:

'a corporation in which a large measure of separation of ownership and control has taken place through the multiplication of owners' (Berle and Means, 1932:4).

The image of the modern corporation as being owned by a large number of shareholders, each holding a small fraction of the company's shares, and being controlled by professional managers underlines both the agency literature and the corporate governance literature (Casson, 2000).

Section 2 provides an overview of the agency theory framework while Section 3 presents the agency costs that arise from the separation of ownership and control. Section 4, outlines the interplay between corporate governance and agency theory; Section 5 discusses how the design of executive remuneration contracts can address these costs. Section 6 presents some alternative theories and Section 7 concludes.

2.2 Theoretical Agency Framework

Agency theory models the process of contracting between two or more persons and since each party to a contract attempts to get the best deal, contracting under agency theory necessarily involves conflict.

Implicit in the complex set of contracts that a firm may be taken to represent are various forms of agency relationships. For example, one such relationship is between managers who must make decisions on behalf of the owners, and the owners themselves. Some of these decisions may lead to the managers' own wealth being maximised rather than that of the owners. Losses resulting from such decisions, and expenditures incurred to mitigate them, are referred to as agency costs.

Jensen and Meckling (1976) in a detailed theoretical exposition of agency theory define the managers of the company as 'agents' and the shareholder as the 'principal'. The principal delegates the day-to-day decision-making in the company to the executives who are the shareholder's agents. The problem that arises as a result of this system of corporate ownership is that the agents do not necessarily make decisions in the best interests of the principal. One of the main assumptions of agency theory is that the goals of the principal and agent conflict.

Jensen and Meckling (1976) state that agency costs comprise monitoring expenditures, bonding expenditures and a residual loss. By providing appropriate incentives for the agent (and incurring expenditure in monitoring the agent's actions) the principal can better align the interests of the agent with his own interests. Holmström (1979) shows that there are potential gains to monitoring, except in the unlikely situation in which the agent's actions cannot have negative consequences for the owner. While perfect monitoring may be impossible or too expensive, imperfect monitoring can be used in practice to alleviate "moral hazard" through penalizing the agent's dysfunctional behaviour. The agent has incentives to make expenditures to guarantee that he will not take certain actions to harm the principal's interest or that he will compensate the principal if he does; these are bonding costs. Watts (1977) explains residual loss as follows:

‘Finally, even with monitoring and bonding expenditures, the actions taken by the agent will differ from the actions the principal would take himself... the wealth effect of this divergence in actions [is defined] as “residual loss” (Watts, 1977:131).

During the 1960s and early 1970s, economists explored risk-sharing among individuals or groups (Arrow, 1971; Wilson, 1968). This literature describes the risk-sharing problem as one that arises when co-operating parties have different attitudes towards risk. Agency theory broadens this risk-sharing debate to include the problem that occurs when co-operating parties have different goals and there are divisions of labour (Jensen and Meckling, 1976; Ross, 1973).

Risk is considered as playing an important role in agency theory. Principals are assumed to be indifferent to the specific (unsystematic) risk of a single firm, because they can diversify this source of earnings variation away by holding a diversified portfolio of investments. However, this will not reduce their exposure to the variability in each firm’s returns that is systematically tied to the general economic uncertainties. Given two investment projects of equal systematic risk, principals will always prefer the project with the higher expected returns (Alchian and Woodward, 1988).

By contrast, agents are risk-averse and forcing managers to bear compensation risk is consistent with agency theory (Scott, 2003). As effort is unobservable pay is linked to observable output, but as output is a noisy performance measure, the risk-averse agent is exposed to risk in terms of payoff variations that are beyond his/her control. As rational risk-averse individuals, managers trade-off risk and return, consequently, the more risk the manager bears the higher must be their expected compensation. To motivate the manager at the lowest cost, executive remuneration plans must be designed to achieve the most motivation for a given amount of risk imposed.

The central premise of Jensen and Meckling’s (1976) agency theory model is that shareholding causes a *de facto* delegation of managerial responsibility from

a firm's principals (shareholders) to their upper echelon agents (executives). This delegation, in turn, causes a misalignment of incentives due to the following:

- (1) The goals of the principal and agent conflict due to each party attempting to get the best deal for himself.
- (2) It is difficult or expensive for the principal to verify the agent's effort which is unobservable.
- (3) The principal and agent have different preferences for risk.

The basic model involves a risk-averse agent taking unobservable actions which shift the statistical distribution over observable performance measures. The resolution is that the principal designs a compensation contract based on observable and enforceable performance measures to align the interests of the agent with those of the principal. According to Bushman and Smith (2001) the unobservability of the agent's actions, along with the agent's risk-aversion, results in a "second best" contract in which the principal must trade-off the desire to provide incentives against the risk premium that must be paid to the agent for bearing risk imposed by the contract.

2.3 Agency Costs

Under agency theory a conflict of interest exists between the principal and agents as a result of the possibility that agents are maximising their own utility to the detriment of the principal's utility. These agency problems cannot be resolved at no cost due to asymmetric information and the need for risk-sharing which means these relationships involve costs to all parties. As noted above, these costs can be defined as the sum of (1) monitoring expenditures by the principal, (2) bonding expenditures by the agent, and (3) the residual loss (Jensen and Meckling, 1976).

2.3.1 Information Asymmetry

Agency theory studies the design of contracts to motivate a rational agent to act on behalf of a principal when the agent's interests would otherwise conflict with those of the principal. Information asymmetry and agency theory play a central role in corporate finance and financial economics. Information asymmetry is said to occur when one group of participants has better or timelier information than other groups. An inevitable consequence of the separation of ownership and control is that the agent acquires information about the present and likely future performance of the firm that is superior to that acquired by the principal. Conflicting interests between agents and principals can lead to suboptimal allocation of resources within the firm particularly where at least some relevant information is known to some but not all parties. Moral hazard and adverse selection are both due to information asymmetry.

Moral hazard arises when an agent takes advantage of the fact that their behaviour is unobservable by the principal, for example when an agent shirks their responsibilities (Arrow, 1963). Other examples include excessive risk avoidance by the agent, or choosing projects that entrench them. In other words, the agent's choice problem is to decide on how much effort to devote to running the firm on behalf of the shareholders. Since effort is unobservable, the agent may be tempted to shirk on effort as they are assumed to bear no moral burdens. Agency theory assumes that agents seek to balance the return from, and costs of, their efforts. In addition, agents are perfectly willing, given the opportunity, to renege on pledges that they make during contract negotiations about the level of effort, skill and knowledge they will provide. This combined with the principal's inability to monitor completely creates the moral hazard problem and results in the need to monitor the agent's actions. Holmström (1979) suggests that:

'when the [agency relationship] repeats itself over time, the effects of uncertainty tend to be reduced and dysfunctional behaviour is more accurately revealed, thus alleviating the problem of moral hazard' (Holmström, 1979:90).

Adverse selection alludes to the various ways that managers and other insiders can exploit their information advantage at the expense of outsiders, for example, by managing the information released to investors. These actions may impact on the investor's ability to make good investment decisions. Also, if investors are concerned about the possibility of biased information release, they will be wary of buying firms' securities, which will result in both the capital and managerial labour markets not functioning optimally.

The principal will attempt to limit both moral hazard and adverse selection costs by designing appropriate incentives for agents and by incurring monitoring costs designed to limit actions that increase the agent's welfare at the expense of the principal.

2.4 Corporate Governance and Agency Theory

The influential book by Berle and Means (1932) sparked off analysis of the problem caused by separation of ownership and control. Jensen and Meckling (1976) were among the first to formalise the modern theory of the agency problem. Their work adopts the image of the modern corporation as developed by Berle and Means (1932). Other important contributions to the literature include Ross (1973), Mirrlees (1974, 1976), Holmström (1979, 1982), Fama (1980), Grossman and Hart (1983), and Holmström and Milgrom (1987).

The corporate governance system is formed by the interaction of a complex set of economic factors which help ensure managers act in the best interests of shareholders and include the following:

- Markets for labour, capital and products.
- The design of incentive contracts.
- Internal governance mechanisms, for example, the separation of the role of chairman and chief executive and the appointment of non-executive directors to the board.

Lambert (2001) maintains that agency theory is attractive to accounting researchers as:

'it allows us to explicitly incorporate conflicts of interest, incentive problems, and mechanisms for controlling incentive problems into our models' (Lambert, 2001:4)

Executive remuneration contracts are one corporate governance mechanism with which to align the principal and agent's incentives, that is, mitigate the agency problem. Basic agency models facilitate the study of the trade-off between risk-sharing and incentives in the optimal design of executive remuneration contracts. A key consideration in the design of these contracts is to balance the amount of risk the remuneration plan places on an agent against the strength of the incentive to perform well.

Corporate governance research has focused on determining and understanding the mechanisms that mitigate agency problems and thus facilitate this form of economic organisation (Bushman, Engel, Milliron and Smith, 2000). Product market competition (Alchian, 1950; Stigler, 1958), the market for corporate control (Manne, 1965) and labour market pressures (Fama, 1980) have been identified in the literature as pure market forces that discipline managerial behaviour. In other words, this school of thought maintains that these markets are, for the most part, efficient in aligning the interests of managers and shareholders.

2.5 The Role of Executive Remuneration

In addressing the moral hazard and adverse selection forms of information asymmetry, the principal has two options. One option is to discover the agent's behaviour by investing in information systems such as reporting processes and a board of directors. These would reveal the agent's behaviour to the principal and thus address the lack of information issue. The second option is to contract on the outcomes of the agent's behaviour. Eisenhardt (1989) argues that while the latter option aligns the agent's preferences with those of the principal, there is still a price in so far as risk is transferred to the agent. This occurs as outcomes are not only determined by behaviour; other factors (competitor actions, economic climate) may also influence outcomes. She also maintains:

'the heart of principal-agent theory is the trade-off between (a) the cost of measuring behavior and (b) the cost of measuring outcomes and transferring risk to the agent' (Eisenhardt, 1989:61).

This implies that through the provision of appropriate incentives for the agent and by incurring expenditure in monitoring the actions of the agent, the principal can better align the agent's interests with those of his own. An agent is considered to be more likely to act in the interests of the firm's principal (shareholders) if he gets a share of the firm's profit as part of his remuneration contract. Additionally, it may be effective for agents to incur expenditures in bonding themselves to act in ways consistent with the interests of the principal. It is generally impossible for the principal or the agent at zero cost to ensure that the agent will not take certain actions that will harm the principal. The monitoring and bonding expenditures are only incurred to the extent that they are expected to result in an equivalent reduction in the costs to the principals of divergences of interests. Thus, more likely than not, some divergence will remain, and the consequent reduction in firm value is called residual loss.

In a Jensen and Meckling (1976) framework, the firm is viewed as a nexus of contracts between all stakeholders. However, corporate finance concentrates on the following two contracts:

- (1) Those between the principal as owners and the management as their agent.
- (2) Those between the firm and its debt holders.

A compensation literature has evolved as a branch of governance research, and the role of financial accounting information in managerial incentive contracts is a large body of this research. With respect to executive compensation, Bushman and Smith (2001) evaluate the use of externally reported financial accounting data in control mechanisms; one such internal control mechanism being managerial incentive plans. Bushman and Smith (2001) categorise the empirical compensation research around three distinct approaches. The first approach examines agency theory inspired predictions using pay-performance sensitivities and relies primarily on the “informativeness principle” of Holmström (1979). The second takes the contract as exogenous and examines earnings management behaviour motivated by the contract structure and emanates from PAT. The third examines firm performance after the adoption of specific compensation plan features.

The informativeness principle contends that in the design of remuneration contracts, total value is increased by reducing the error with which the performance is measured. Whether executive remuneration plans’ performance measurement is based on accounting returns or market returns should reflect a trade-off between risk and incentives. A key consideration in designing a management compensation contract is the signal-to-noise measure (Baker, 1987), that is, the higher the signal-to-noise ratio, the more information about managerial effort captured in the performance measure can be distinguished from the random noise in the measure. Lambert and Larcker (1987) consider whether an accounting-based measure or a market-based measure is optimal.

They contend that market-based measures, while attractive to shareholders, may not be the best indicators of managerial effort. Given that share price and accounting income have different signal-to-noise ratios and communicate different information, it can often make sense to use both measures in combination.

The research in this thesis is based within the second category and concerns itself with decisions made by management given a specific contract design feature. This approach flows from the PAT literature whose main objective is to develop an empirically testable theory of accounting policy choice based on the value of accounting numbers in formal contracting arrangements, for example, compensation or debt contracts. One such study by Healy (1985) considers bonus plans with lower thresholds (bogey) and upper limits (cap). Guidry, Leone and Rock (1999) provide a comprehensive comparison of the empirical designs adopted in this literature.

Three accounting choices for executive compensation structures are examined in this thesis: the disclosure of an alternative EPS figure; accruals management; and meeting or beating analysts' forecasts. Fields, Lys and Vincent (2001) classify the accounting choice literature into three groups based on the market imperfection that makes accounting important in a given setting: agency costs, information asymmetries, and externalities affecting non-contracting parties. It is important to note that contracts are costly to write and often do not consider all possible outcomes or all possible responses by the agent. Managerial opportunism arguably arises when managers act to exploit imperfectly designed contracts to their own benefit.

2.5.1 The Role of Risk and Relative Performance Evaluation

From an efficient contracting perspective, excessive risk is costly to the firm. In the incentive compensation literature, principals (shareholders) base compensation on observable outcomes when they are unable to observe an

agent's efforts. When executives are risk-averse and shareholders are risk-neutral, Holmström (1982) demonstrates that compensating executives for the part of the outcomes under their control and filtering out the common uncertainty not under their control, results in more efficient incentive contracts.

This theory of relative performance evaluation (RPE), a risk-reducing device, was developed by Holmström (1982) with the intention of reducing extraneous risk, which should be an objective in the design of executive compensation contracts. The RPE concept states that by setting awards relative to the average performance of other firms in the industry, systematic risk will be filtered out of an incentive plan. This, Holmström (1982) maintains, is particularly true if the number of firms in the industry is large, implying that the result would be a closer association between effort and performance. This principle would lead to the conclusion that a manager's compensation should not be linked simply to the firm's share price or earnings performance but to the amount that the firm's share returns or earnings exceed the return on the market in general or other firms in the same industry. ESOs are an important component of executive remuneration in the UK (Main, 2006) and while these share options are generally not indexed to industry or market share movements they are, in general, indexed to common risk in the form of the Retail Price Index (RPI). As common risk meets the definition of RPE, relative performance plays a role in the remuneration contracts of UK firms.

2.5.2 Agency Theory and Executive Remuneration

As discussed above, information asymmetry in the forms of moral hazard and adverse selection creates the need for governance mechanisms. Agency theory maintains that goal conflict may arise because principals delegate authority to agents, and agents are independent actors (Gomez-Mejia and Wiseman, 2006). Costly contracting represents a possible solution to the inherent conflicts of interest between agents and principals. Fama (1980) maintains the extent to which it is necessary to rely upon costly contracting is

dependent in part on the nature of markets for managerial labour. A perfectly competitive management labour market will result in the present value of managers' future wages being adjusted to reflect excessive perquisite consumption. Such *ex post* settling up would discipline managers to behave in the firm's best interest. Likewise, in a perfect capital market, deviations from firm value maximisation would be identified and eliminated through takeovers. Given that the extent of competition in these markets is a moot point, this study is based on the assumption that the inherent conflicts between agents and principals are not resolved through these markets.

The original and foremost paradigm, optimal contracting, informs much of the research by financial economists on executive compensation. It is based on the incentive alignment hypothesis, which assumes that boards design compensation contracts to align managers' interests with those of shareholders thus mitigating agency problems (Hanlon, Rajgopal and Shelvin, 2003). It is believed that efficient compensation contracts should link pay to performance thus providing executives with incentives to maximise shareholder value. This research attempts to explain the various features of executive compensation and cross-sectional variation in compensation practices among firms. Surveys of this work include Murphy (1999) and Core, Guay and Larcker (2003).

Jensen and Murphy (2004) maintain that observed compensation practice is inconsistent with agency models of optimal contracting. The findings in Yermack (1995) are similar in spirit and he concludes that many leading principal-agent compensation theories are not supported by empirical findings. He tests theories as to why companies award share options to their top managers, and suggests that few theories based on the agency or financial contracting literature can explain actual awards of share options to CEOs. One theory supported is that firms facing internal liquidity problems shift the mix of pay away from cash salaries and bonuses and towards share options. Yermack (1995) maintains that share option incentives are not decreased as financial leverage increases, a move which would reflect attempts by firms to reduce agency costs of debt.

In contrast to the finding of Yermack (1995), and in support of the optimal contract approach, Core and Guay (1999) predict and find that firms set optimal levels of CEO equity incentives and that firms use new grants of equity incentives (share options and restricted shares) to correct deviations from these optimal incentive levels.

2.6 Alternative Theories

This research, based on the agency model, has led to more questions than it has answered, and has not provided satisfactory guidelines with respect to explaining the structuring of executive compensation remuneration. Consequently, there has been a search for alternative theories to explain executive compensation pay patterns and practices. Two such theories which are relatively new and have yet to provide proven insights, are the managerial power and the perceived cost perspectives.

2.6.1 The Managerial Power Approach

Under the optimal contracting approach, executive remuneration is set by a board of directors who aim to maximise shareholder value. In contrast, the managerial power approach suggests that boards do not operate at arm's length and that management extract excessive pay (rents). It is important to note that the proponents of the managerial power approach – Bebchuck, Fried and Walker (2002) – suggest that it be employed in tandem with the optimal contracting approach, not as an alternative. This makes their theory difficult to test, as it does not produce falsifiable propositions just *ex post* rationalisation. They argue that combining the optimal contracting approach and the managerial power approach is necessary as the optimal contracting fails, on its own, to explain executive compensation practices.

Bebchuck *et al.* (2002) argue that the influence of managerial power on executive compensation can better explain various features of executive compensation arrangements and cross-sectional variation in compensation practices among firms. They further claim that boards deviate from optimal contracting and executives can receive excess pay (rents). Inefficient pay structures can result from the need to camouflage or facilitate this extraction of rents. “Excessive” option grants is one of the primary means by which excessive pay is extracted. Other ways include backdating (adjusting grant dates to earlier dates when share prices were lower); spring-loading (the practice of scheduling an option grant before the release of good news); and bullet-dodging (the practice of delaying a grant until after bad news so the options are granted at a lower price).

A critical building block of the managerial power approach is that of “outrage” costs and constraints. The fact that executives can exert influence over their own pay does not imply that there are no constraints on their ability to do so. The more outrage a compensation arrangement is expected to generate, the more reluctant directors will be to approve the arrangement, and the more hesitant managers will be to propose it in the first instance (Bebchuck *et al.* 2002). Hence managers have an incentive to “camouflage” their extraction of rent to reduce outrage costs. This desire to camouflage might lead to the adoption of inefficient compensation structures.

Bebchuck *et al.* (2002) conclude that managerial power and rent extraction play a significant role in executive compensation and this conclusion has important implications for the study, regulation and practice of corporate governance.

Some basis for the managerial power hypothesis can be found, for example, in research that provides some evidence that members of the board of directors serve at the discretion of the CEO (Hermalin and Weisback, 1998; Shivdasani and Yermack, 1999).

2.6.2 The Perceived Cost Approach

Murphy (2002) refutes the managerial power argument with the following line of reasoning:

'The escalation in executive pay in the 1990s coincided with increasingly independent corporate boards; CEOs hired from outside with no ties to existing boards enjoy especially attractive packages; and trends in option grants continued despite increased disclosure, refuting the outrage consequences argument' (Murphy, 2002: 850).

Along with refuting the managerial power approach, Murphy (2002) also maintains that optimal contracting cannot explain the profusion of broad-based option plans. Two assumptions underpin his theory; first the Black and Scholes (1973) model overvalues options for undiversified, risk-averse employees, and second, companies perceive options to be inexpensive because of the favourable accounting treatment. This favourable accounting treatment meant that before 1 January 2005, no accounting expense was required to be recorded when a company granted share options. This theory generates predictions consistent with a variety of predictions and practices cited by Bebchuck *et al.* (2002) including the absence of relative performance criteria, uniform exercise prices, and repricing. Murphy (2002) maintains the perceived cost view also helps explain the growth of broad-based option plans, as the granting of share options to all employees is difficult to justify from either an optimal contracting or managerial power approach.

2.7 Conclusions

This chapter provides the framework in which this thesis resides. This research focuses on a particular structure of executive remuneration, that is, the existence of an EPS target in executive remuneration contracts. The structure

of executive remuneration contracts is one corporate governance mechanism with which to address the issues caused by the separation of ownership and control. This separation is at the core of agency theory, a perspective which maintains the principal and agent's motives diverge leading to agency costs. Corporate governance mechanisms represent ways to reduce these costs and principals would aim to structure executive remuneration so as to better align the interests of the principal and the agent.

All the initial approaches to the study of share options as a component of executive compensation were based on agency theory predictions (the incentive alignment perspective) which underpin a substantial body of research starting with Jensen and Meckling (1976). This view suggests that option contracts can help align managers' incentives with those of shareholders. Agency theory focuses on the contract between the principal and the agent and aims to indicate the most efficient contract alternative in a given situation. Being rooted in economics, it is dominated by a single paradigm, and a single view of human nature, self-interest (Eisenhardt, 1989). It has been found lacking and it is often recommended that it be used in tandem with other theories which will help capture some complexity of organisations that agency theory ignores. As this paradigm failed to explain actual executive remuneration practices, this resulted in a search for alternative theories to explain the level and/or structure of executive remuneration practice. Two widely cited alternative theories are the managerial power approach and the perceived cost approach.

The initial research into share options focused not on their effectiveness but on the question of how the accounting expense should be measured. Overall, there still remains a question over whether executive remuneration as structured, including the provision of ESOs, is such that it results in the achievement of a firm's objective, that is, maximising long-term shareholder value.

The company accounting choices observed in this thesis support the optimal contracting approach to the extent that the inclusion of a performance target in ESOs should result in a better alignment of the principal and agent's incentives. Assuming the performance measure - growth in EPS - conveys information about the agent's effort levels, the informativeness principle supports its use in remuneration contracts. In agreement with Bebchuck *et al.* (2002), managerial power explains the results if the composition of the EPS target is set by management, or if they are managing earnings to achieve the performance EPS figure, then rent extraction can occur. As Bebchuck *et al.* (2002) argue, managerial power will not, on its own, explain executive remuneration practice; presumably executives would prefer no performance criterion.

A caveat to the conclusions of this thesis is that only share options granted to executives are considered; this renders the perceived cost theory less relevant as broad-based share option plans are not taken into account. Residual loss under optimal contracting is unlikely to explain such relatively consistent results across the disclosure and accounting choice studies in this thesis. Furthermore, assuming the goal of the principal is long-term performance, an EPS target would conflict with this as it is a short-term performance measure.

The next chapter will consider one accounting choice available to managers, that is, whether or not an alternative EPS figure is disclosed. This choice will be examined with reference to three components of executive remuneration, namely the bonus plans, ESOs and LTIPs, with a view to testing for any association between the decision to disclose and the structure of executive remuneration. In particular, the existence of an EPS performance target in each of these executive remuneration components will be studied with a view to determining whether any association exists between an EPS target and the decision to disclose an alternative EPS figure.

This thesis involves investigating the association between an EPS performance target in executive remuneration contracts and accounting decisions. Each of the next three chapters will present and review the literature relevant to the

particular research questions addressed. Chapter 3 will review the accounting choice literature, Chapter 4 will review the earnings management literature and Chapter 5 will review the analysts' forecasts literature. While these three chapters present and consider literature specific to the research question they address, each is considered as falling within the ambit of the agency theory framework presented in this chapter.

Chapter 3

The Earnings per Share Disclosure Decisions of UK Firms: The Effect of Executive Compensation Contracts

3.1 Introduction

This chapter adopts an accounting choice perspective to understand why firms disclose an alternative EPS measure. The accounting choice literature has its foundation in PAT. The accounting choice which is of interest is whether or not firms choose to disclose an alternative EPS figure. Recent research in the UK (on which this chapter builds) by Choi, Lin, Walker and Young (2005) investigates the motives for disclosing an adjusted EPS figure. Their findings support the disclosure decision as an effort by management to report adjusted EPS when this is a better measure of sustainable earnings and also agree with the more recent findings in Choi, Lin, Walker and Young (2007). These findings are in line with those of Bhattacharya, Black, Christensen and Larson (2003) whose research is based on US firms and Choi, Lin, Walker and Young (2005). However, Choi *et al.* (2005) do not consider the possibility that contractual considerations may also influence disclosure choice with respect to earnings performance measures.

There are two perspectives for thinking about accounting choice. The first holds that managers are acting opportunistically to influence one or more of the firm's contractual arrangements. The main contracting arrangements considered are executive remuneration contracts and debt contracts. Under this perspective managers seek either to secure their jobs, reputation and compensation or to transfer wealth to shareholders from other bondholders.

The alternative perspective, efficient contracting (value maximising), maintains that managers make accounting choices that minimise agency costs, and thus their incentives are aligned with those of shareholders (Holthausen, 1990). It is often not easy to test which perspective is accurate as indeed it may be the case that some firms are opportunistic and others are not. In addition, it may be the case that some firms are only opportunistic under certain circumstances, for example, when times are bad or survival is threatened.

The objective of this chapter is to explore whether the existence of an EPS target in executive remuneration components has the potential to explain an accounting choice decision of management as to whether or not they disclose an alternative EPS figure.

Following Healy (1985), a number of papers have attempted to demonstrate a link between the details of the executive compensation contract and the accounting choices of firms. In his seminal article, Healy (1985) linked income-smoothing decisions to the structure of US bonus plans under which no bonus was paid until a minimum level of performance (bogey) was achieved and the bonus was capped beyond a certain specified level of performance.

For many executives, both in the UK and the US, share-based compensation (SBC) such as ESOs and LTIPs have become by far the most important form of performance-related pay, with the bonus element becoming relatively unimportant (Murphy, 2002).

Superficially, one might have expected SBC schemes to have broken the link between accounting-based measures of performance and performance-related pay. However, many firms use SBC contracts that make explicit use of accounting-based performance measures. For example, many executive compensation contracts require specific accounting-based performance targets to be achieved in order for options to vest.

In this chapter, the use of EPS performance vesting criteria in the executive compensation contracts of 276 UK-listed firms is documented. Then the relationship between the existence of an EPS performance criterion in various components of executive remuneration (bonus plans, ESOs and LTIPs) and the EPS disclosure choice of the firms in the sample is explored. While the results suggest that there is a link, the research design does not allow determination of whether this result is due to opportunism or efficient contracting. Chapters 4 and 5 adopt a research design which allows analysis of the findings in terms of

opportunism or efficient contracting and the results of those latter two chapters together allow a conclusion to be reached.

The research question of interest is whether or not the presence of an EPS target in executive compensation components increases the probability that firms will disclose an alternative EPS figure. The objective is to contribute to the literature on the effects of the *structure* of compensation contracts on accounting choices of firms. EPS is an appropriate focus for this research as (concurrent with the findings of this study) Conyon and Mallin (1997), and Stathopoulos, Espenlaub and Walker (2004) report that EPS was by far the most commonly employed performance criterion for ESOs.

The rest of the chapter is organised as follows: Section 2 provides a brief explanation of ESOs, Section 3 presents the institutional background; Section 4 provides a brief review of the accounting choice literature; Section 5 looks at other studies which address the impact of compensation contracts on accounting choice; Section 6 outlines the data and methodology and presents the findings; and the last section concludes.

3.2 Executive Share Options

Executive share options are options granted to company executives to purchase company shares, for a price (exercise price) usually equal to or close to the share price on the options' grant date. ESOs generally extend for a period between three and ten years, and the holder of the options has no voting rights and receives no dividend prior to exercising the options. The grant date is the date at which the employer and the executive have a mutual understanding of the terms of the share options. Vesting date is the date on which an executive, having satisfied all the conditions necessary, becomes unconditionally entitled to the options. These conditions generally include the executive remaining in the company, usually until, at the earliest, the vesting date. In addition, the right to exercise the executive options may be contingent

upon the achievement of company performance targets, and not simply lapsed time (Canyon, Peck, Read and Sadler, 2000). These targets could be, for example, growth in EPS, growth in share price etc. In addition, executives cannot sell their options, and if they leave the company prior to the end of the vesting period, the options are generally forfeited. If executives leave the company after the vesting date, they must immediately exercise their options or forfeit them. Exercise date is the date the option to purchase shares is exercised by the executive.

Intrinsic value is the amount by which the market price of the underlying share exceeds the exercise price of an option. The fair value of a share option consists of both intrinsic value and time value. Time value is determined by the length of time until an option expires; the longer the time to expiry, the greater the time value of an option.

3.3 Institutional Background

SBC to executives continues to attract attention as a result of the high payouts and the perceived lack of a relationship between performance and pay. At first, the only SBC element of executive compensation plans were ESOs which traditionally had zero intrinsic value at the date of grant and had no performance conditions attached to their vesting. In other words, vesting was solely dependent on the lapsing of time. In the US, ESOs fell out of favour in the 1970s following a prolonged depression in the US stock market (Jensen and Murphy, 2004). During the period 1992–98, Jensen and Murphy (2004) estimate that the annual dollar value of option awards to CEOs increased by more than 300 percent.

In the UK, the Combined Code on Corporate Governance (2003) states that a significant proportion of executive directors' remuneration should be structured so as to link rewards to corporate and individual performance. Unlike the US,

the UK share options received by executives are often subject to performance criteria prior to vesting.

Since its original introduction (in the 1960s in the US), the SBC of executives has undergone two significant changes, namely the addition of LTIPs and the inclusion of performance criteria in both ESOs and LTIPs.

LTIPs were launched in the UK in 1995 (Buck, Bruce, Main and Udueni, 2003).

'Options in the United Kingdom became controversial in 1995, after executives in several recently privatised electric utilities exercised options worth millions of pounds. The influential Greenbury Report (1995) encouraged companies to replace their option plans with LTIP share plans' (Conyon and Murphy, 2000: 666).

Since LTIPs have a zero exercise price, their advantage from the firm's point of view is that firms may award less in number than under an executive share option plan whilst providing the same potential payout to the recipient. This reduction in the number of shares, in addition to addressing the concern over the large number of shares options granted, also dispelled some of the unrest over the dilutive effect of large option grants. Despite the introduction of LTIPs, large payouts continued even in firms where performance was bad which gave rise to the second change in SBC, that is, the attachment of performance criteria to many ESO plans and LTIPs (a recommendation of the 1995 Greenbury Report).

The attachment of performance criteria in the UK occurred after the Association of British Insurers (ABI) issued guidelines in July 1999 to cover many practical aspects of share schemes (*Share Incentive Schemes – A Statement of Principles*). These principles are endorsed by the National Association of Pension Funds (NAPF) and are intended to provide a framework for assessing company share schemes. They include a requirement that performance conditions should be challenging, that achievement should be demanding, be

measured relative to a peer group or other relevant benchmark, and be disclosed. While not legally binding, these guidelines have been influential, and consequently the majority of UK firms have included performance criteria in their ESOs and LTIPs.

During the period of this research evidence, share options are the dominant form of long-term incentives in the UK and many companies have both share option plans and LTIPs in place: 90.2 percent of mid-250 companies have ESOs and 47.1 percent have LTIPs for firms with year-ends between May 2002 and June 2003 (Directors' Pay Report, 2003). This is broadly consistent with the findings in this study: 93.1 percent of the sample firms have ESOs and 57.6 percent have LTIPs. The dominance of ESOs in executive remuneration contracts has reduced significantly in more recent years, for example, Ozkan (2009) reports that, in money terms, ESOs accounted for 45 percent of CEO compensation in 2000; this falls to 5.4 percent in 2005. This is believed to be due to the requirement to expense ESOs from 1 January 2005.

3.3.1 The Earnings per Share Financial Reporting Standard

The standard governing the disclosure of EPS in the UK is Financial Reporting Standard 3 (FRS 3), *Reporting Financial Performance* issued by the Accounting Standards Board (ASB) in 1992. FRS 3 requires only one basic EPS number to be included in published financial statements and importantly, the precise definition of how this basic EPS is to be calculated is provided in FRS 3. Basic EPS is calculated on earnings after both exceptional and extraordinary items. Where a firm chooses to disclose an alternative EPS measure, the standard requires the chosen alternative to be calculated consistently over time and the standard also requires that the alternative figure should be reconciled to the FRS 3 EPS figure. In addition, any alternative EPS figure should be disclosed with an equal or lower level of prominence as the FRS 3 EPS figure. FRS 3 *allows* but does not *require* firms to disclose an alternative EPS figure (Walker and Louvari, 2003).

The selection of the alternative EPS figure, as the variable of interest, is pertinent to the research question given the fact that management have control over whether or not an alternative EPS figure is disclosed and they can decide how it is calculated.

This study builds on a study by Choi *et al.* (2005) which examines the motives for disclosing an adjusted EPS figure. Their findings broadly support the hypothesis that the disclosure decision can be explained as an effort by management to report adjusted EPS when this is a better measure of sustainable earnings than the FRS 3 EPS figure. Their findings largely support the efficient contracting (value relevance) reason for disclosing alternative EPS as opposed to the disclosure decision being a manifestation of opportunistic behaviour by management. This study considers additional variables (the existence of an EPS performance criterion in three elements of managers' compensation contracts: bonus, options and LTIPs) which are added to the empirical model in Choi *et al.* (2005) with the intention of testing whether the goodness of fit of the model improves. The objective is to test for any evidence of a link between the existence of an EPS criterion in executive remuneration contracts and the disclosure of an alternative EPS figure. Finding evidence of a link would then provide grounds for expanding the research to see if this disclosure decision can be categorised as opportunistic behaviour or efficient contracting.

3.4 Accounting Choice Literature

Fields *et al.* 2001 who critique the accounting choice literature from the 1990s¹ provide a comprehensive definition of accounting choice:

'An accounting choice is any decision whose primary purpose is to influence (either in form or substance) the output of the accounting system in a

¹ Bernard (1989) and Dopuch (1989) review the accounting choice literature in the 1980s; Holthausen and Leftwich (1983), and Lev and Ohlson (1982) review the literature prior to the early 1980s.

particular way, including not only financial statements published in accordance with GAAP, but also tax returns and regulatory findings' (Fields et al. 2001:256).

While earnings management is a particular form of accounting choice, not all accounting choice is concerned with earnings management. In contrast, by definition all earnings management necessarily involves accounting choice. Examples of accounting choice decisions include the choice of LIFO versus FIFO, structuring a lease to be an operating lease as opposed to a finance lease, choices on the level of disclosure and choices on the timing of the adoption of a new standard. Increasing production to reduce cost of goods sold by reducing per unit costs, and reducing research and development expenditures to increase earnings, are often cited examples of real decisions that qualify under the definition of accounting choice above. Francis (2001) divides accounting choice activities between real decisions with direct cash flow implications and accounting decisions with no real effects. This classification is important:

'the motivation for a real decision may be unrelated to the accounting while the motivation for a purely accounting decision must be related to the outcome' (Francis, 2001:311).

The accounting choice literature has its foundation in PAT. This theory attempts to predict actions such as the accounting policy choice a firm is likely to make; it also examines the determinants of accounting choice. PAT is consistent with the existence of economic consequences as it considers the consequences of accounting choice.

The predictions made by PAT are largely organised around three hypotheses, formulated by Watts and Zimmerman (1986). The three hypotheses are as follows:

1. The bonus plan hypothesis which predicts that managers with bonus schemes are more likely to make accounting choices that shift reported earnings from future periods to the current period to increase reported income (Scott, 2003). Under this hypothesis, managers are assumed to maximise their own payout.
2. The debt covenant hypothesis predicts that closeness to debt covenants (may be in the form of predetermined levels of debt to equity, interest coverage, working capital, and shareholders' equity violations) induce income-increasing accounting choices. The underlying rationale of this hypothesis is that an increase in reported income reduces the probability of default for the firm. In cases of default, the debt agreements often impose penalties such as constraints on dividends or additional borrowing, which essentially restrict managerial actions. Both DeFond and Jiambalvo (1994) and Sweeney (1994) find that managers use accounting choices to avoid violating debt covenants. Under this hypothesis, managers are assumed to maximise the welfare of shareholders.
3. The political cost hypothesis predicts that the agent of very large firms (proxy for political costs faced by a firm) will choose more conservative accounting policies than managers of small firms, and will be less likely to oppose standards that may lower reported income (Watts and Zimmerman, 1986). Under this hypothesis, managers are assumed to maximise the value of the firm.

Empirical research has found support mainly for the bonus plan hypothesis, and slight support for the political cost hypothesis, but only weak support for the debt covenants hypothesis (Bowen, DuCharme and Shores, 1999; Fields *et al.* 2001; Holthausen, 1981).

Consistent with Watts and Zimmerman (1986) and Holthausen and Leftwich (1983), Fields *et al.* (2001) classify accounting choice issues by the purpose

they serve and the problem they overcome. They specify three goals or motivations for accounting choice:

- Contracting or managerial opportunism.
- Asset pricing or economic efficiency (signalling).
- Influencing external parties.

The following sections will now provide some insight into the research in each of these categories which will help place this research in context.

3.4.1 Contracting or Managerial Opportunism

PAT makes predictions as to how managers will act in response to the existence of bonus plans and/or debt covenants based on reported financial accounting numbers. These contracts aim to mitigate two conflicts: firstly, internal conflicts (owner-manager) in the case of management compensation contracts and secondly, external conflicts (bondholder-shareholder and current owner–potential owner) in the case of bond contracts.

PAT provides the motivation for studies on whether the existence of such contracts provides incentives to choose particular accounting methods to achieve desired financial reporting objectives. Two of the three hypotheses of PAT, the bonus plan hypothesis and the debt covenant hypothesis, will be discussed in this section. The third, the political cost hypothesis, is discussed in Section 3.4.3.

The bonus plan hypothesis claims that managers with bonus plans are more likely to choose accounting methods that shift reported earnings from future periods to the current period, *ceteris paribus*.

The debt covenant hypothesis postulates that the closer a firm is to violation of accounting-based debt covenants, the more likely the manager is to select accounting procedures that shift reported earnings from future periods to the current period, *ceteris paribus*.

Much research has studied the impact of executive compensation contracts on accounting choices (see Section 3.5.1) as the structure of managerial compensation contracts leads to interesting research questions. There may be a bonus linked to financial reporting numbers, share options where payout depends on share price performance or perhaps some element of executive remuneration linked to total shareholder return. One such question is why, in the first instance, executive compensation contracts allow managerial accounting discretion. Reasons suggested include:

- The potential for managers to signal.
- The cost of flexibility is less than the cost of eliminating all choice.
- It may be less costly to allow managers manipulate accruals than the alternative which is to manage real transactions, for example, reduce research and development expenditure.

Watts and Zimmerman (1986) suggest that although managers may increase their compensation when given financial reporting discretion, this discretion also improves the alignment of their interests with those of shareholders. It is possible that higher accounting earnings means higher share values or lower probability of debt covenant violations.

In general, researchers conclude that managers select accounting methods to increase their compensation and to reduce the likelihood of violating bond covenants. Fields *et al.* (2001) outline several research design problems, which they claim have impeded progress towards understanding accounting choice decisions. These include reliance on existing accruals models along with the

problem of multiple motivations for accounting choices. They argue that as accounting is used for multiple purposes, it is inappropriate to analyse one accounting issue or even one goal in isolation. They do admit that this would require the development of a comprehensive theory of accounting choice. In addition, they commend some attempts to extend the methodological boundaries by the application of simultaneous equations and instrumental variables techniques to accounting problems (Beatty, Chamberlain and Magliolo, 1995; Hunt, Moyer and Shevlin, 1996).

3.4.2 Asset Pricing or Economic Efficiency (Signalling)

This strand of the accounting choice literature examines the association between accounting numbers and share prices or returns, asking whether accounting choice decisions impact equity valuation or the cost of capital. This literature predicts that management make accounting choices to reveal their expectations regarding the firm's future cash flow stream. Subramanyam (1996) provides evidence consistent with the idea that managers employ their accounting discretion to signal future performance.

Erickson and Wang (1999) analyse firms using shares as a form of payment in acquisitions. Bidders, they postulate, will increase earnings through abnormal accruals to increase the share price and thus reduce the number of shares needed to complete the deal. Even though they find that bidders manage earnings upwards (abnormal accruals), Fields *et al.* (2001) contend that the results are unconvincing as their research design does not allow one to test if the earnings management was successful.

The disclosure policies of firms have been studied to see whether the firms whose managers choose higher levels of disclosure have lower costs of capital. Fields *et al.* (2001) consider a range of disclosure studies and note the findings are inconclusive as to whether increased disclosure leads to a reduction in the cost of capital. In addition, they provide examples of research based on the

efficient markets hypothesis (Beaver and Engel, 1996; Subramanyam, 1996; Hand, Hughes and Sefcik, 1990) and conclude that the results from the market efficiency literature have changed over time. Earlier research through to the 1970s generally finds evidence supporting market efficiency. In contrast they infer that it is impossible to conclude the markets are efficient or inefficient from the research during the 1980s and early 1990s. Healy and Palepu (1993) assume that managers have superior information on their firms' current and future performance than outside investors; there are conflicts of interest between managers and shareholders and imperfect accounting standards and auditing. They maintain that disclosure choices provide an avenue to impart such information and this is true even if capital markets are efficient.

3.4.3 Influencing External Parties

Watts and Zimmerman (1978) contend that politicians have the power to affect a firm's wealth redistribution through corporate taxes, regulations and subsidies. The magnitude of political costs is considered to be highly dependent on firm size. The third PAT hypothesis states that the greater the political costs faced by a firm, the more likely the manager is to choose accounting procedures that defer reported earnings from current to future periods, *ceteris paribus*. Both the bonus plan hypothesis and the debt covenant hypothesis predict that managers will choose less conservative accounting policies and will oppose any proposed accounting standards that may lower reported income or increase its volatility. In contrast, the political cost hypothesis predicts managers of very large firms (proxy for political costs faced by a firm) will choose more conservative accounting policies than managers of small firms, and will be less likely to oppose standards that may lower reported income.

Much of the empirical research with respect to the political cost hypothesis employs firm size as a crude proxy for political costs. It is argued that the use of this variable can be problematic due to its correlation with other firm characteristics such as profitability and risk. As the bonus plan and debt

covenant hypotheses predict the opposite to the political cost hypothesis in their accounting policy predictions, it is necessary to control for their effects in any study analysing the political cost hypothesis.

Fields *et al.* (2001) classify political costs research into accounting choice policy decisions by firms into two groups, namely firms selecting accounting methods to reduce or defer taxes and those motivated to avoid potential regulation. The former research is structured around changes in tax rates (Dhaliwal and Wang, 1992; Boynton, Dobbins and Plesko, 1992). They maintain the tax-related empirical research reports evidence that firms make accounting choices in order to reduce their tax burden. In common with other accounting choice studies, this research suffers from the drawback of focusing on tax issues in isolation.

Due to these factors, it is considered useful to investigate situations where political costs are particularly salient. Jones (1991) studies firms under consideration for import relief, that is, relief granted to firms that are affected by foreign competition. The granting of import relief to firms is, in part, a political decision (Scott, 2003). She studies 23 firms from five industries involved in import relief investigations and finds evidence of the predicted behaviour; for almost all firms in the sample, abnormal accruals are significantly negative in the investigation year. The study did not find significant negative accruals in the years immediately preceding or following the investigations. These results are evidence of firms choosing accrual policies consistent with the political cost hypothesis.

A different strand in the tax-related research vein takes the accounting choice as the starting point, mostly the LIFO versus FIFO decision. Firms adopting LIFO are assumed to benefit from tax savings and associated cash flows. This is a result of the requirement that firms that adopt LIFO for tax purposes must also adopt LIFO in the calculation of accounting income. Results of studies prior to the 1990s have been inconclusive and often inconsistent. Fields *et al.* (2001) state:

'Stock price reactions have not been consistently positive in reaction to the LIFO adoption announcement (assuming tax savings and associated cash inflows) nor have the announcement period returns for the first earnings announcement been consistently negative or zero' (Fields et al. 2001: 282).

As with the research focused on changes in the tax rates, stock market reaction to the LIFO/FIFO accounting policy choice is inconclusive. Other studies also show inconsistent results when they study the LIFO/FIFO decision (Tse, 1990; Hand, 1993; Kang, 1993).

While research motivated by regulation issues finds evidence consistent with expectations, as mentioned it is considered to suffer from a lack of consideration of multiple incentives and multiple methods.

Most of the research on the regulation theme focuses in the main on industry-specific regulations. For example, some research on the banking industry focuses on the setting by bank executives of the loan loss provisions amount, which is a provision against future loan losses, and earnings management.

While many studies attempted to demonstrate that banks manage accruals or transactions to meet capital, tax or earnings goals, these studies assume all other decisions are fixed. In contrast Beatty *et al.* (1995) develop a methodology that allows accrual and transactions decisions to be modelled simultaneously. They conclude that missing capital or earnings targets is costly and bank executives will trade-off accrual and financing discretion to meet these goals. Overall the evidence from these studies is interpreted as suggesting that loan loss provisions are a tool to manage capital level requirements even though some studies, like Collins, Shackelford and Wahlen (1995) find evidence to the contrary.

3.5 Share-based Compensation and Disclosure of an Alternative Earnings per Share Figure

As mentioned above, in response to the criticism that executives benefit from a general (as opposed to firm-specific) upward trend in the market from their SBC, many firms introduced performance criteria, where vesting of SBC to executives is contingent on the achievement of a performance criterion. The idea is to better align a manager's pay with his firm's performance, thus rewarding relative rather than absolute performance.

The objective of this chapter is to analyse the effect of an EPS performance criterion and the voluntary disclosure of an alternative EPS figure, the definition of which is within the control of management and is used here as a proxy for accounting choice (earnings management). *A priori* one would expect a positive relationship between the existence of an EPS figure as a performance criterion and the disclosure of an alternative EPS figure.

This intuition is based on two possibilities. The first is that basic EPS (net income) is a noisy measure so efficient contracting would suggest the application of a smoother measure; one such measure would be the alternative EPS figure. The second is that management have control over the definition of the alternative EPS figure and it thus provides a basis for opportunistic behaviour on the part of management.

3.5.1 The Impact of the Structure of Compensation Contracts on Accounting Choice

Watts and Zimmerman's PAT is concerned with predicting the actions of managers while assuming that managers are rational and will act to maximise their own expected utility (Watts, 1977; Watts and Zimmerman, 1978). Under the bonus plan hypothesis of PAT, managers are assumed to choose

accounting methods to maximise their compensation, which is often based on accounting numbers.

Healy's (1985) study, which is based on PAT, finds evidence that managers opportunistically manage net income so as to maximise their bonus. Healy (1985) shows that firms with caps on bonus awards are more likely to report accruals that defer income when that cap is reached than firms that have comparable performance but which have no bonus cap. This and other studies into the use of accruals provide significant evidence that managers use accruals to manage earnings so as to maximise their bonuses (Holthausen *et al.* 1995b; Gaver, Gaver and Austin, 1995; Burgstahler and Dichev, 1997).

A body of literature (see for example, Healy, 1985; Dye, 1988; Holthausen *et al.* 1995b; Healy and Wahlen, 1999) examines whether the **level** of equity-based compensation is related to accounting manipulation. In general, this research finds a positive relationship between the level of SBC and earnings management.

While earlier literature employs abnormal accruals² as the measure of earnings management, recent literature often considers other proxies (see Table 3.1) to measure earnings management. Some of these more recent studies include the consideration of the structure of executive compensation and ask whether the various components have a different impact on earnings management. Current executive compensation pay contracts usually include the following components:

- Salary.
- Bonus.
- Share options.
- LTIPs (restricted stock).

² There are some methodological issues with discretionary accruals measurement, see McNichols (2000) as an example. The general consensus is that this methodology has widespread use in large-scale empirical studies of earnings management.

The interesting question is whether there is a different influence on managerial behaviour between linear and non-linear payout compensation components. Different payout structures might induce different behaviour; for example, Guay's (1999) hypothesis is that to avoid or to mitigate the agency costs caused by risk-averse managers, firms add share options (convexity) to executive remuneration to encourage them to accept high-risk projects. Managers will be more willing to accept high risk projects if there is a possibility of receiving a higher payout. In contrast, an argument against the incentive alignment attribute of share options, is that the convexity gives managers the incentive to take excessive risk. In contrast, LTIPs (including restricted stock grants) have a linear relationship with share price movements. Kadan and Yang (2005) find that restricted stock (options with a zero exercise price and some conditions to vesting) induces more earnings management (discretionary accruals) than share option compensation.

Table 3.1 below provides an indication of some recent research, the measurements they employ as a proxy for earnings management together with their findings. This chapter attempts to investigate whether different components of executive compensation have varying impacts on the earnings management behaviour of managers.

Table 3.1**Studies on the structure of executive compensation**

Authors	Earnings Management Measure	Structure	Findings
Bartov and Mohanram (2004)	Large option exercises.	Option exercise. Sales of acquired shares.	High abnormal accruals prior to exercise.
Efendi, Spivastava and Swanson (2005)	Misstatements of financial statements.	Options granted. Restricted stock.	Restatements higher when CEOs hold in-the-money options.
Cheng and Warfield (2005)	Meet or just beat analyst earnings forecasts. Abnormal accruals.	SBC.	Positive link with MBE and abnormal accruals. Leads to less informative earnings.
Kadan and Yang (2005)	Abnormal accruals.	Restricted stock.	More earnings management.
Marquardt and Wiedman (2005)	Conversion criteria of convertible debt.	CEO's cash bonus.	Linked to CEO's cash bonuses. Related to reduction in diluted EPS.
Bergstresser and Philippon (2006)	Exercise of options. Selling of shares. Abnormal accruals.	Stock holding. Option holding. Option exercise. Selling of shares.	Abnormal accruals linked to all structures studied with respect to the CEO.
Burns and Kedia (2006)	Restatements.	Bonus. Option portfolio. Equity. Restricted stock.	CEO's option portfolio only positively related to misreporting.

Bartov and Mohanram (2004) analyse abnormally large option exercises by top-level executives to investigate whether these can predict future stock returns. They find positive earnings performance prior to exercise and disappointing earnings post-exercise. This pattern is mirrored by discretionary accruals (proxy for earnings management), but not by non-discretionary accruals, which are also abnormally high pre-exercise, and this is a factor in the positive earnings performance. This pattern is reversed in the post-exercise period with a reversal of the discretionary accruals. Bartov and Mohanram (2004) state:

'These findings are consistent with our hypothesis that, in an effort to increase the cash payout from option exercises and sales of acquired shares, managers inflate earnings through accruals management in the period leading up to the abnormally large exercises' (Bartov and Mohanram 2004, p. 891).

Efendi, Spivastava and Swanson (2005) study firms which misstated their financial statements during 2001 and 2002, and find that the likelihood of a restatement is considerably higher when the CEO holds in-the-money options (intrinsic value). Option grants during the year (valued using the Black-Scholes (1973) valuation model), restricted stock grants or restricted stock holding are not significant. In addition, they find CEOs at restatement firms realised more cash from exercising share options than their counterparts at the control firms. Interestingly, this realisation came from a small portion of their in-the-money options.

Burns and Kedia (2006) study US firms which had to restate their financial statements due to overstating revenue and understating costs. A restatement on either of these two grounds is taken as a proxy for more aggressive accounting. They investigate the relationship between the magnitude of the restatement and various components of executive compensation, salary, bonus, option portfolio, equity, restricted stock, long-term incentive payouts. Burns and

Kedia (2006) find that the sensitivity of the CEO's option portfolio to be the *only* component of executive compensation to be significantly positively related to the propensity to misreport. This, they argue is because of the convexity of share options. This contradicts the findings of Kadan and Yang (2005) above.

From the above studies it may be concluded that there is evidence in the extant literature that executive compensation contract design has some bearing on the incidence of earnings management. While Kadan and Yang (2005) find that restricted stock (options with zero exercise price) induces more earnings management (discretionary accruals) than share option (Black-Scholes) compensation, Burns and Kedia (2006) find share options (Black-Scholes) induce more earnings management than restricted stock.

This thesis complements the above research by considering a different structure (EPS performance target) of executive remuneration contracts to see whether the disclosure and accounting choices of management are associated with this particular structure. While the above research adopts various financial measures of managerial incentive, that is, intrinsic value or fair value, this study concentrates on the closeness of the firm to the target. This research thus avoids the issue surrounding the measurement of the incentive from the SBC from management's viewpoint.

Managerial incentives may result from managerial ownership and/or management compensation. Managers have some flexibility when reporting the financial performance of a firm; their behaviour may be opportunistic (Christie and Zimmerman, 1994; Warfield, Wild and Wild, 1995) or may be to provide value relevant information (Jones, 1991; Healy and Palepu, 1993). Agency theory (Jensen and Meckling, 1976) predicts that managers with high ownership are likely to make choices (including the use of discretionary accruals) to convey value relevant information while managers with accounting-based compensation are likely to behave opportunistically to improve their

compensation. Gul, Chen and Tsui (2003) provide evidence that accruals may be used for both opportunistic manipulation and information signalling depending on managers' incentives. Their results concur with those of Warfield, Wild and Wild (1995) who find that firms with low managerial ownership are more likely to manage earnings for opportunistic reasons.

3.5.2 Hypothesis Development

Management have choices, including the ones outlined above, by which they can influence the reported earnings and consequently the EPS figure. Given the evidence from this literature and the availability of choices, *a priori*, it would be expected that disclosure of an alternative EPS figure would be positively related to the existence of an EPS performance target in executive remuneration. The main hypothesis is thus:

H1: The disclosure of an alternative EPS figure is positively related to the existence of an EPS target in each or any of three components of executive remuneration contracts, namely, bonus plans, ESOs and LTIPs.

What will be interesting to observe is whether all three components have a similar impact on the disclosure decision.

As EPS is calculated as earnings divided by the number of outstanding shares, any accounting decision that results in a change in either the earnings or the number of outstanding shares will have an impact on the reported EPS figure. Kahle (2002) finds that repurchase decisions and levels are associated with the number of options outstanding. She finds that the stock market views repurchases that appear motivated to avoid dilution as less positive than repurchases that may be signalling undervaluation or a return of free cash flow to shareholders. Bens, Nagar and Wong (2002) find that repurchase decisions are associated with incentives to manage diluted EPS and to maintain a desired

rate of EPS growth. They also show that these repurchases crowd out real investment (research and development and capital expenditures). In addition, they find that such behaviour is associated with declines in future performance. A study by Young and Yang (2009) finds a strong association between share repurchase activity and the presence of EPS-based compensation arrangements in UK firms. Thus, evidence does exist to link share repurchases to option granting and exercise as claimed by Hirst, Ashbaugh-Skaife, Botosan, Davis-Friday, Fairfield, Hopkins, Mallett, Uhl, and Venkatachalam (2005).

3.6 Data and Methodology

This study has as its starting point a paper by Choi *et al.* (2005) which is based on data collected on adjusted EPS disclosures for three year-ends, 1993/94, 1996 and 2001. The sample for each year-end comprised the 500 largest London Stock Exchange-listed non-financial firms ranked by market capitalisation. Details of adjusted EPS disclosures were hand-collected from firms' published financial statements. I/B/E/S-defined EPS was obtained directly from I/B/E/S. Financial statement and market data were collected from Datastream.

The methodology for this study is borrowed from Choi *et al.* (2005) who test their hypothesis using logit regression analysis. They consider the probability of disclosure of an alternative EPS figure and find that adjusted EPS disclosure is an attempt by management to provide information on underlying sustainable earnings performance. They question the value relevance of the EPS figures and find that adjusted EPS disclosures are significantly more informative (earnings predictability, price-earnings associations and returns-earnings associations) about current and future performance than FRS 3 EPS.

The analysis in Choi *et al.* (2005) is extended by adding additional exploratory variables to see if these variables help explain the EPS disclosure choice of firms. Specifically, it considers the structure of executive remuneration

contracts, in particular whether or not various components (bonus plans, ESOs and LTIPs) have a vesting criteria based on some form of EPS performance. The purpose is to see whether these components of executive compensation contracts are associated with an accounting choice, namely, the decision to disclose an alternative EPS figure. This study contributes by considering a contractual motive for the decision to disclose an alternative EPS figure, in contrast to Choi *et al.* (2005) which considers a signalling motive.

This study, while drawing on the above, considers data from the 2001 year-end alone. The rationale for this is due to the exploratory nature of the study which has as an objective the identification of what information is available with respect to the required remuneration data.

3.6.1 Variable Definitions

The test, control and indicator variables which are as in Choi *et al.* (2005) are defined below.

The test variables include *NEGIBES*, *NEGPOS* and *MAGDIFF*. *NEGIBES* equals 1 if I/B/E/S defined EPS (EPS^{IBES}) is negative and 0 otherwise. *NEGIBES* is expected to be negatively associated with the disclosure of alternative EPS on the assumption that management will be keen to avoid reporting a loss.

NEGPOS takes the value of 1 if FRS 3 EPS (EPS^{FRS3}) is negative and I/B/E/S defined EPS is positive and 0 otherwise. The probability that an alternative EPS figure is disclosed is predicted to be positively related to *NEGPOS*. Choi *et al.* (2005) suggest that under these circumstances, management face strong incentives to report I/B/E/S defined EPS if this is deemed more informative regarding sustainable earnings.

MAGDIFF is a measure of the relative uninformativeness of FRS 3 EPS with respect to sustainable earnings. Evidence indicates that I/B/E/S EPS is informative about sustainable earnings. It is the measure of the price-scaled difference between FRS 3 EPS and the corresponding I/B/E/S EPS figure:

$$MAGDIFF = |EPS_{i,t}^{FRS3} - EPS_{i,t}^{IBES}| / P_{i,t} \quad (1)$$

Choi *et al.* (2005) cite evidence in Bradshaw and Sloan (2002) and Brown and Sivakumar (2003) to predict that the probability of management disclosing an alternative EPS figure will be positively related to *MAGDIFF*.

Choi *et al.* (2005) include the following control variables, *SIZE*, *MTB*, *NANAL* and *PAGES* which they draw from prior disclosure literature. There is an established link between size and disclosure policy (Lang and Lundholm, 1993; Tasker, 1998; Chen, DeFond and Park, 2002). *MTB*, the market-to-book value captures the presence of intangible assets, which Chen *et al.* (2002) finds to be associated with the level of voluntary disclosure. *NANAL* is the logarithm of the number of analysts from I/B/E/S following the firm at the year-end and controls for differences in the external information environment of firms (Lang and Lundholm, 1996; Bhushan, 1989; Chen *et al.* (2002)). *PAGES* is the natural logarithm of the number of pages in the published financial statements and measures a firm's general attitude towards disclosure (Walker and Louvari, 2003).

In addition to the test and control variables above, Choi *et al.* (2005) add two indicator variables. The first is *MAGDIFFINC* representing the interaction between *MAGDIFF* and an indicator variable taking the value of 1 where EPS^{IBES} is positive and materially greater than EPS^{FRS3} , and 0 otherwise. The second is *MAGDIFFDEC* representing the interaction between *MAGDIFF* and an indicator variable taking the value of 1 where EPS^{IBES} is positive and materially less than EPS^{FRS3} , and 0 otherwise.

The creation of the additional dependent exploratory variables, for the purpose of this study, is now outlined. Information on the existence of bonus, ESO and LTIP components of executive remuneration was hand-collected from financial statements along with the existence, or otherwise, of an EPS performance criteria for each of these remuneration components. For the purpose of this research, ESOs are defined as share option plans (schemes) which are open only to executives. All-employee share option plans and revenue approved share option plans are not considered. The reason for this is that the number of options allowed to be granted under the latter plans is restricted, and are therefore not expected to provide incentives to motivate executives to take actions to disclose an alternative EPS figure or to manage earnings. LTIPs are defined as share plans where the exercise price is zero, regardless of whether or not a performance condition is attached to their vesting. Information on the variables was hand-collected from the 2001 Annual Reports with the majority of the data derived from the Remuneration Report section.

Three independent dichotomous variables are defined as follows and are included in the logit regressions to analyse whether they are associated with the probability that an alternative EPS figure will be disclosed:

EPSTARGB = 1 if the bonus component of executive remuneration contains an EPS performance criterion; 0 otherwise.

EPSTARGO = 1 if the ESO component of executive remuneration contains an EPS performance criterion; 0 otherwise.

EPSTARGL = 1 if the LTIP component of executive remuneration contains an EPS performance criterion; 0 otherwise.

In line with the hypothesis, the above three variables are expected to be positively associated with the disclosure of an alternative EPS figure.

3.6.2 Descriptive Statistics

While Choi *et al.* (2005) originally used the 500 largest firms; information required for this study is only available for 276 firms in the sample year 2001.

Of those 276 firms, 266, 257 and 159 have bonus, ESOs and LTIPs plans respectively. Table 3.2 outlines the sample characteristics and explains the reasons for this attrition rate.

Table 3.2	
Sample selection	
2001 Sample year ^a	500
I/B/E/S EPS missing (traditional EPS definition) ^b	-61
I/B/E/S EPS missing (EPS before goodwill definitions) ^c	-98
Sample with complete EPS and price data	341
Less: Trimmed observations ^d	<u>-9</u>
	332
Firms disclosing adjusted EPS	255
Firms not disclosing adjusted EPS	<u>77</u>
	332*
Final sample for data analysis	
Insufficient remuneration data	<u>56</u>
	276
Firms disclosing adjusted EPS	214
Firms not disclosing adjusted EPS	<u>62</u>
Total	276

Notes:

^aIn the sample year, all UK-domiciled non-financial firms in the Datastream active files with earnings data reported in pounds sterling are ranked by year-end market capitalisation and the top 500 selected.

^bTraditional I/B/E/S-defined EPS. Earnings are defined before discontinued operations and exceptional items.

^cI/B/E/S-defined EPS before goodwill amortisation. Earnings are defined as earnings before discontinued operations, exceptional items and goodwill amortisation. For UK firms from 2001 onwards, I/B/E/S distinguishes between analysts who forecast traditional EPS and analysts who forecast EPS before discontinued operations, exceptional items and goodwill.

^dThe sample is trimmed according to the distributions of EPS, book value per share and share price prior to undertaking empirical tests. For each variable, the median from all observations is deducted and then exclude the one percent of cases with the largest absolute median-adjusted value.

*Source: Choi *et al.* 2005:33.

With respect to the trimmed observations, Choi *et al.* (2005) found some firms with extreme accounting and price data. To ensure these observations do not confound the analyses, they

'trim the sample based on the distributions of earnings per share, book value per share, and stock price prior to undertaking our empirical tests. For each variable, we deduct the median from all observations and then exclude the one percent of cases with the largest absolute mean value' (Choi *et al.* 2005:12).

Table 3.3 reports the frequency of a bonus, ESO and LTIP component in the executive compensation contracts of firms in the sample, in addition to the prevalence of an EPS-defined target in these components of executive remuneration. While the majority of firms have a bonus plan and grant ESOs as part of executive compensation contracts in 2001, just over half the firms in the sample had LTIPs. By far the most significant component of executive remuneration with an EPS target is ESOs of which 75 percent have an EPS target. An EPS target is not prevalent in bonus plans and is a criterion in just under half the LTIP plans.

Table 3.3**Frequency of EPS performance criteria according to executive remuneration contract component**

	Frequencies (%)			
	Plan		EPS Target if Plan = Yes	
	Yes	No	Yes	No
Bonus	96.38	3.62	29.70	70.30
ESOs	93.12	6.88	74.71	25.29
LTIPs	57.61	42.39	45.28	54.72

Table 3.4 below presents the characteristics of the adjusted EPS numbers for the 276 firms in the 2001 sample. These are consistent with the findings in Choi *et al.* (2005).

Table 3.4**Characteristics of adjusted EPS figures**

Number of adjusted EPS disclosed:	Frequencies (%)
No adjusted EPS figure	22.46
One adjusted EPS figure	69.57
Multiple adjusted EPS figures ^a	07.97
Adjusted EPS vs. FRS3 EPS:	
Adjusted EPS > FRS3 EPS	85.05
Adjusted EPS < FRS3 EPS	11.21
Adjusted EPS = FRS3 EPS	03.74

Notes:

^a For firms with multiple adjusted EPS disclosures, Choi *et al.* (2005) identify the 'primary' adjusted number using information reported in the accompanying notes to the financial statements.

Table 3.5

Descriptive statistics comparing firms that disclosed adjusted EPS on the face of the profit and loss account with firms that did not disclose

<i>Panel A: Earnings per share metrics</i>								
Variable ^a	Disclosers (n = 214)			Non-disclosers (n = 62)			<i>p</i> -values for differences ^b	
	Mean	Std. dev	Median	Mean	Std. dev	Median	Means	Medians
<i>EPS</i> ^{FRS3}	11.45	33.65	14.28	16.30	28.42	13.19	0.303	0.774
<i>EPS</i> ^{IBES}	24.51	18.89	21.00	20.06	26.59	16.12	0.141	0.096
<i>EPS</i> ^{ADJc}	24.52	19.07	20.75	-	-	-		

<i>Panel B: Firm-specific characteristics</i>								
Variable ^a	Disclosers (n = 214)			Non-disclosers (n = 62)			<i>p</i> -values for differences ^b	
	Mean	Std. dev	Median	Mean	Std. dev	Median	Means	Medians
<i>NEGIBES</i>	0.03	0.19	0.00	0.17	0.38	0.00	0.000	0.000
<i>NEGPOS</i>	0.17	0.38	0.00	0.04	0.21	0.00	0.012	0.012
<i>MAGDIFF</i>	0.07	0.17	0.01	0.01	0.03	0.00	0.012	0.000
<i>SIZE</i>	13.44	1.43	13.19	13.08	1.33	12.94	0.085	0.095
<i>MTB</i>	2.59	5.49	1.92	4.27	7.02	2.10	0.048	0.372
<i>NANAL</i>	9.64	5.48	8.50	8.78	5.42	7.50	0.143	0.209
<i>PAGES</i>	76.67	26.82	72.00	69.53	29.81	63.50	0.006	0.004
<i>PRICE</i>	378.57	255.33	318.50	359.76	296.26	316.00	0.837	0.974
<i>EPSTARGB</i>	0.31	0.46	0.00	0.26	0.44	0.00	0.530	0.529
<i>EPSTARGO</i>	0.80	0.40	0.00	0.59	0.50	0.00	0.001	0.001
<i>EPSTARGL</i>	0.49	0.50	0.00	0.29	0.46	0.00	0.043	0.043

Notes:

^a Variable definitions are as follows: *EPS*^{FRS3} is reported EPS computed according to FRS 3; *EPS*^{IBES} is I/B/E/S-defined EPS; *EPS*^{ADJ} is adjusted EPS (only available for disclosers); *NEGIBES* is an indicator variable that takes the value of 1 if $EPS^{IBES} \leq 0$ and 0 otherwise; *NEGPOS* is an indicator variable that takes the value of 1 if $EPS^{FRS3} < 0 < EPS^{IBES}$ and 0 otherwise; *MAGDIFF* is the absolute price-scaled difference between *EPS*^{IBES} and *EPS*^{FRS3}; *SIZE* is the natural logarithm of fiscal year-end market capitalisation; *MTB* is the market-to-book ratio defined as the year-end share price per share divided by the book value of shareholders' funds per share; *NANAL* is the number of analysts (from I/B/E/S) following the firm at the end of year *t*; *PAGES* is the number of pages in the firm's published annual report and accounts. *PRICE* is the fiscal year-end stock price per share. *EPSTARGB* is an indicator variable taking the value of 1 if the bonus component of executive remuneration contains an EPS performance

criterion and 0 otherwise. *EPSTARAGO* is an indicator variable taking the value of 1 if the ESO component of executive remuneration contains an EPS performance criterion and 0 otherwise. *EPSTARGL* is an indicator variable taking the value of 1 if the LTIP component of executive remuneration contains an EPS performance criterion and 0 otherwise.

^bTests of equality of sample means (medians) are based on two-tailed t- (Wilcoxon) tests.

^c - denotes not relevant.

Panel A of Table 3.5 reports descriptive statistics for the variables in the regression analysis, apportioned according to whether or not firms disclose adjusted EPS. As in Choi *et al.* (2005), disclosers have lower EPS^{FRS3} and higher EPS^{IBES} than non-disclosers.

This study finds both the mean and median values of EPS^{FRS3} for disclosing and non-disclosing firms to be significantly lower ($p < 0.01$) than the corresponding values for EPS^{IBES} and EPS^{ADJ} . This is consistent with the findings of Choi *et al.* (2005) with the exception of non-disclosing firms where the latter study finds the mean (median) EPS^{FRS3} of non-disclosing firms to be equal (higher) than EPS^{IBES} . A problem with this exploratory study and the interpretation of the *t* test is that the number of firms in the non-disclosing sample is small ($n = 62$).

Panel B of Table 3.5 reports the descriptive statistics for the test, control, indicator and exploratory variables. With respect to the exploratory variables, the means of the EPS variables representing the existence or otherwise of an EPS target in bonus plans, ESOs and LTIPs are higher for firms which disclose an alternative EPS figure. While the mean difference is significant for ESOs, the existence on an EPS target in bonus plans is not significant and the existence of an EPS in the LTIPs is only marginally significant.

The parallel between the existence of an EPS target and disclosure choice is worthy of note: the percentage of firms with an EPS target in their bonus, ESOs and LTIPs component of the executive remuneration contract is roughly similar.

Table 3.6 below shows the percentage of earning per share targets in the remuneration components of firms categorised by disclosure choice.

Table 3.6**The existence of EPS targets and disclosure choice**

EPS target in	Frequency (%)		
	Bonus	ESOs	LTIPs
Disclosers	78.57	76.26	80.50
Non-disclosers	21.43	23.74	19.50

Table 3.7**Correlation matrix (n = 276)**

	<i>NDISCL</i>	<i>NEGIBES</i>	<i>NEGPOS</i>	<i>MAGDIFF</i>	<i>SIZE</i>	<i>MTB</i>	<i>NANAL</i>	<i>PAGES</i>	<i>MAGDIFFINC</i>	<i>MAGDIFFDEC</i>	<i>EPSTARGB</i>	<i>EPSTARGO</i>	<i>EPSTARGL</i>
<i>NDISCL</i>	1.00												
<i>NEGIBES</i>	-0.23***	1.00											
<i>NEGPOS</i>	0.15**	-0.11*	1.00										
<i>MAGDIFF</i>	0.15**	0.01	0.57***	1.00									
<i>SIZE</i>	0.10*	-0.10*	-0.03	-0.11*	1.00								
<i>MTB</i>	-0.12***	0.22***	-0.10*	-0.09	0.03	1.00							
<i>NANAL</i>	0.09	-0.13**	0.05	-0.01	0.70***	-0.04	1.00						
<i>PAGES</i>	0.17***	-0.03	0.05	0.08	0.64***	-0.07	0.48***	1.00					
<i>MAGDIFFINC</i>	0.13**	-0.18***	-0.33***	-0.13**	-0.04	-0.04	0.04	0.01	1.00				
<i>MAGDIFFDEC</i>	-0.05	-0.04	-0.07	0.14**	-0.05	-0.04	-0.12*	-0.03	-0.10	1.00			
<i>EPSTARGB</i>	0.04	-0.11*	0.05	0.03	0.04	-0.01	0.00	0.06	0.04	0.11*	1.00		
<i>EPSTARGO</i>	0.20***	-0.25***	0.03	-0.02	0.12*	-0.05	0.09	0.04	0.09	-0.04	0.20***	1.00	
<i>EPSTARGL</i>	0.16**	-0.01	0.00	0.09	0.05*	-0.04	0.04	0.06	-0.19*	0.03	0.03	0.28***	1.00

Notes: * / ** / *** indicate significance at 10% / 5% / 1%. A full definition of the variables is provided in Appendix A.

Table 3.7 above reports the correlation matrix for the variables appearing in the logit regression models. The results reveal a high positive correlation between size and the number of analysts following a firm which is not surprising as the number of analysts following a firm is known to vary with size (Walker and Louvari, 2003). Likewise the positive correlation between size and page numbers would be expected. Both the above correlations are significant at the 1% level. The other high correlation reported is between the variables *NEGPOS* and *MAGDIFF* and this would not be unexpected given that *NEGPOS* reflects the situation where FRS 3 EPS is negative and IBES EPS is positive and *MAGDIFF* is the price-scaled difference between these two variables. While this does potentially represent collinearity among these variables, the Variance Inflation Factor (VIF) measure for the regressions in this study report VIF of under 4 for all other variables which is generally considered acceptable. This suggests multicollinearity is not a problem (Hair, Black, Babin and Anderson, 2010).

With respect to the three exploratory variables added, *EPSTARGO* is positively and significantly correlated with both *EPSTARGB* and *EPSTARGL* at the 1% level. To some extent, this might be a reflection of the fact that many firms in the sample have only EPS as a target in their ESOs, whereas for bonus plans and LTIPS, there are mostly multiple performance targets.

3.6.3 Disclosure Choice and Executive Compensation Structure

Choi *et al.* (2005) test their hypothesis regarding the probability of adjusted EPS disclosure by estimating the following logit regression:

$$\begin{aligned}
 Prob(NDISCL) = F(\beta_0 + \beta_1 NEGIBES_{i,t} + \beta_2 NEGPOS_{i,t} + \beta_3 MAGDIFF_{i,t} + \\
 \beta_4 MAGDIFFINC_{i,t} + \beta_5 MAGDIFFDEC_{i,t} + \beta_6 SIZE_{i,t} + \beta_7 MTB_{i,t} + \beta_8 NANAL_{i,t} \\
 + \beta_9 PAGES_{i,t} + \beta_{10} YEAR96_{i,t} + \beta_{11} YEAR01_{1,t} + \varepsilon_{1,t}
 \end{aligned}
 \tag{2}$$

Table 3.8 presents the results of the logit regression analysis as per the main variables of Choi *et al.* (2005) for the sample firms in year t , $t = 2001$. The

dependent variable, *NDISCL*, takes the value of 1 if firm *i* discloses an adjusted EPS figure, and 0 otherwise. For each explanatory variable, regressions results are presented in stages (for the number of observations for each of the exploratory variables, *EPSTARGB*, *EPSTARGO* and *EPSTARGL*) using Equation 3, Equation 4 and Equation 5 respectively.

$$Prob(NDISCL = 1) = F(\beta_0 + \beta_1 NEGIBES_{i,t} + \beta_2 NEGPOS_{i,t} + \beta_3 MAGDIFF_{i,t} + \beta_4 MAGDIFFINC_{i,t} + \beta_5 MAGDIFFDEC_{i,t} + \beta_6 SIZE_{i,t} + \beta_7 MTB_{i,t} + \beta_8 NANAL_{i,t} + \beta_9 PAGES_{i,t} + \beta_{10} EPSTARGB_{i,t} + \varepsilon_{1,t}) \quad (3)$$

$$Prob(NDISCL = 1) = F(\beta_0 + \beta_1 NEGIBES_{i,t} + \beta_2 NEGPOS_{i,t} + \beta_3 MAGDIFF_{i,t} + \beta_4 MAGDIFFINC_{i,t} + \beta_5 MAGDIFFDEC_{i,t} + \beta_6 SIZE_{i,t} + \beta_7 MTB_{i,t} + \beta_8 NANAL_{i,t} + \beta_9 PAGES_{i,t} + \beta_{10} EPSTARGO_{i,t} + \varepsilon_{1,t}) \quad (4)$$

$$Prob(NDISCL = 1) = F(\beta_0 + \beta_1 NEGIBES_{i,t} + \beta_2 NEGPOS_{i,t} + \beta_3 MAGDIFF_{i,t} + \beta_4 MAGDIFFINC_{i,t} + \beta_5 MAGDIFFDEC_{i,t} + \beta_6 SIZE_{i,t} + \beta_7 MTB_{i,t} + \beta_8 NANAL_{i,t} + \beta_9 PAGES_{i,t} + \beta_{10} EPSTARGL_{i,t} + \varepsilon_{1,t}) \quad (5)$$

Equations 3, 4 and 5 are run in stages, with the first column of each model including only the test and control variables from Choi *et al.* (2005). The second column adds the indicator variables and to the last of these three models, the additional dichotomous variables are introduced, namely the existence of an EPS target in the compensation components, bonus, ESOs and LTIPs of executives in the sample firms.

Table 3.8 presents the results of the regressions of the three models which are included for comparative purposes. The last model includes the exploratory variable *EPSTARGB*. The same process is applied to *EPSTARGO* (*EPSTARGL*) with the results presented in Table 3.9 (Table 3.10) which will be discussed later.

The marginal effect of each variable is also reported. The marginal effect of a continuous independent variable x is the partial derivative, with respect to x , of the prediction function $f(x) = \frac{e^{\beta'x}}{1 + e^{\beta'x}}$. That is:

$$\frac{df}{dx} = \frac{e^{\beta'x}}{1 + e^{\beta'x}} \quad (6)$$

where $\beta'x$ is computed at the mean values of the independent variables (Greene, 1993).

Table 3.8**Logit analysis of the probability of alternative EPS disclosure as a function of test, control, indicator and EPS target variables in Bonus Plans**

Variable	Predicted Sign	Model 1	Model 2	Model 3	Marginal Effect
		Coefficient (z-stat) ^a	Coefficient (z-stat)	Coefficient (z-stat)	
<i>Intercept</i>	?	0.705 (0.838)	0.372 (0.915)	0.415 (0.904)	
<i>NEGIBES</i>	-	-2.414*** (0.000)	-2.216*** (0.001)	-2.298*** (0.001)	-0.400
<i>NEGPOS</i>	+	0.952 (0.347)	0.975 (0.254)	0.991 (0.233)	0.069
<i>MAGDIFF</i>	+	4.780* (0.071)	6.982* (0.061)	6.592* (0.067)	0.624
<i>SIZE</i>	?	-0.041 (0.882)	0.029 (0.920)	0.018 (0.948)	0.002
<i>MTB</i>	?	0.001 (0.965)	0.001 (0.976)	0.002 (0.921)	0.000
<i>NANAL</i>	?	0.458 (0.313)	0.320 (0.491)	0.299 (0.518)	0.267
<i>PAGES</i>	?	0.142 (0.900)	0.001 (0.999)	0.061 (0.957)	0.005
<i>MAGDIFFINC</i>	?		18.472 (0.380)	18.586 (0.366)	1.670
<i>MAGDIFFDEC</i>	?		-8.008 (0.124)	-7.488 (0.158)	-0.673
<i>EPSTARGB</i>	+			-0.367 (0.412)	-0.035
<i>Pseudo R²</i>		0.1394	0.1618	0.1654	
<i>LOG LIKELIHOOD</i>		-84.13	-81.94	-81.58	
<i>CHI-SQUARE</i>		23.44	23.06	24.76	
<i>P-VALUE</i>		0.00	0.01	0.01	
<i>OBSERVATIONS</i>		228	228	228	

Notes:

^az-stat in brackets; * / ** / *** indicate significance at 10% / 5% / 1%.

The dependent variable is *NDISCL* which takes the value of 1 if firm *i* discloses an adjusted EPS figure and 0 otherwise; *NEGIBES* is an indicator variable that takes the value of 1 if $EPS^{IBES} \leq 0$ and 0 otherwise; *NEGPOS* is an indicator variable that takes the value of 1 if $EPS^{FRS3} < 0$ $EPS^{IBES} > 0$, and 0 otherwise; *MAGDIFF* is the absolute price-scaled difference between EPS^{IBES} and EPS^{FRS3} ; *SIZE* is the natural logarithm of fiscal year-end market capitalisation; *MTB* is the market-to-book ratio defined as the year-end share price per share divided by the book value of shareholders' funds per share; *NANAL* is the number of analysts

(from I/B/E/S) following the firm at the end of year t ; *PAGES* is the number of pages in the firm's published annual report and accounts. *MAGDIFFINC* represents the interaction between *MAGDIFF* and an indicator variable taking the value of 1 where EPS^{IBES} is positive and materially greater than EPS^{FRS3} , and 0 otherwise. The second is *MAGDIFFDEC* represents the interaction between *MAGDIFF* and an indicator variable taking the value of 1 where EPS^{IBES} is positive and materially less than EPS^{FRS3} , and 0 otherwise. *EPSTARGB* is an indicator variable taking the value of 1 if the bonus component of executive remuneration contains an EPS performance criterion and 0 otherwise.

The results from Table 3.8 show:

- Although a positive sign is predicted, the sign of the *EPSTARGB* variable is negative, albeit insignificant, in all the regressions which include this variable as reported in Table 3.8 above.
- Besides *MAGDIFF*, *NEGIBES* is the only variable that remains significant in most versions of all three models. *NEGIBES* is negative and significant at 1% in all three models and in Model 3 which includes the exploratory variable *EPSTARGB*, it is significant at 1% (-2.298 , $P > |z| = 0.001$). As *NEGIBES* is where I/B/E/S-defined EPS is ≤ 0 , a negative relationship between it and the disclosure of an alternative EPS figure would be expected. This is the case in all of the regressions above.
- *MAGDIFF* is positive and significant at the 10% level in all the Models which could be interpreted as either opportunistic behaviour, managers use the 'better' EPS as the performance criteria. If interpreted as efficient contracting, it could be that the larger the difference, the more important management feel it is to provide a more value relevant EPS (the alternative EPS). In Model 3 which includes the exploratory variable, *EPSTARGB*, *MAGDIFF* is positive and significant at the 10% level (6.592 , $P > |z| = 0.067$).

Table 3.9

Logit analysis of the probability of alternative EPS disclosure as a function of test, control, indicator and EPS target variables in ESOs

Variable	Predicted Sign	Model 4 Coefficient (z-stat) ^a	Model 5 Coefficient (z-stat)	Model 6 Coefficient (z-stat)	Marginal Effect
<i>Intercept</i>	?	0.972 (0.761)	0.677 (0.883)	-0.635 (0.841)	
<i>NEGIBES</i>	-	-2.295*** (0.000)	-2.068*** (0.002)	-1.835*** (0.004)	-0.333
<i>NEGPOS</i>	+	-0.082 (0.904)	0.019 (0.978)	0.094 (0.882)	0.010
<i>MAGDIFF</i>	+	5.364* (0.031)	7.059** (0.020)	6.049** (0.037)	0.674
<i>SIZE</i>	?	0.372 (0.892)	0.093 (0.737)	0.051 (0.853)	0.006
<i>MTB</i>	?	0.004 (0.848)	0.004 (0.831)	0.001 (0.947)	0.000
<i>NANAL</i>	?	0.537 (0.218)	0.414 (0.355)	0.340 (0.445)	0.038
<i>PAGES</i>	?	-0.231 (0.834)	-0.346 (0.745)	-0.021 (0.984)	-0.002
<i>MAGDIFFINC</i>	?		19.200 (0.338)	18.570 (0.344)	2.068
<i>MAGDIFFDEC</i>	?		-7.489 (0.110)	-6.369 (0.149)	-0.709
<i>EPSTARGO</i>	+			0.946** (0.014)	0.126
<i>Pseudo R²</i>		0.1177	0.1400	0.1644	
<i>LOG LIKELIHOOD</i>		-88.98	-86.74	-84.26	
<i>CHI-SQUARE</i>		23.82	24.11	31.88	
<i>P-VALUE</i>		0.01	0.04	0.00	
<i>OBSERVATIONS</i>		218	218	218	

Notes:

^az-stat in brackets; * / ** / *** indicate significance at 10% / 5% / 1%.

The dependent variable is *NDISCL* which takes the value of 1 if firm *i* discloses an adjusted EPS figure and 0 otherwise; *NEGIBES* is an indicator variable that takes the value of 1 if $EPS^{IBES} \leq 0$ and 0 otherwise; *NEGPOS* is an indicator variable that takes the value of 1 if $EPS^{FRS3} < 0$ and 0 otherwise; *MAGDIFF* is the absolute price-scaled difference between EPS^{IBES} and EPS^{FRS3} ; *SIZE* is the natural logarithm of fiscal year-end market capitalisation; *MTB* is the market-to-book ratio defined as the year-end share price per share

divided by the book value of shareholders' funds per share; *NANAL* is the number of analysts (from I/B/E/S) following the firm at the end of year *t*; *PAGES* is the number of pages in the firm's published annual report and accounts. *MAGDIFFINC* represents the interaction between *MAGDIFF* and an indicator variable taking the value of 1 where EPS^{IBES} is positive and materially greater than EPS^{FRS3} , and 0 otherwise. The second is *MAGDIFFDEC* represents the interaction between *MAGDIFF* and an indicator variable taking the value of 1 where EPS^{IBES} is positive and materially less than EPS^{FRS3} , and 0 otherwise. *EPSTARGO* is an indicator variable taking the value of 1 if the ESO plan component of executive remuneration contains an EPS performance criterion and 0 otherwise.

The results from Table 3.9 show:

- Of the three exploratory variables added to the Choi *et al.* (2005) model, the only one which is significant is the EPS criterion in ESOs. This variable, *EPSTARGO*, is significant at the 5% level and as expected *a priori*, it is positively related to the disclosure of an alternative EPS (0.946, $P > |z| = 0.014$). The number of observations in Table 3.9 is 218.
- *MAGDIFF* is positive and significant at the 5% level in all the Models which could be interpreted as either opportunistic behaviour, managers use the 'better' EPS as the performance criteria. If interpreted as efficient contracting, it could be that the larger the difference, the more important management feel it is to provide a more value relevant EPS (the alternative EPS). In Model 6 which includes the exploratory variable, *EPSTARGO*, *MAGDIFF* is positive and significant at the 10% level (3.412, $P > |z| = 0.026$).

Table 3.10

Logit analysis of the probability of alternative EPS disclosure as a function of test, control, indicator and EPS target variables in LTIPs

Variable	Predicted Sign	Model 7 Coefficient (z-stat) ^a	Model 8 Coefficient (z-stat)	Model 9 Coefficient (z-stat)	Marginal Effect
<i>Intercept</i>	?	-0.161 (0.968)	-1.066 (0.797)	-1.397 (0.739)	
<i>NEGIBES</i>	-	-1.324 (0.161)	-0.958 (0.343)	-0.883 (0.342)	-0.108
<i>NEGPOS</i>	+	0.724 (0.535)	0.858 (0.438)	1.052 (0.344)	0.073
<i>MAGDIFF</i>	+	2.362** (0.217)	3.811** (0.015)	3.412** (0.026)	0.305
<i>SIZE</i>	?	0.034 (0.917)	0.160 (0.646)	0.204 (0.582)	0.018
<i>MTB</i>	?	0.001 (0.959)	0.001 (0.969)	0.004 (0.853)	0.000
<i>NANAL</i>	?	0.239 (0.703)	0.030 (0.963)	-0.085 (0.895)	-0.008
<i>PAGES</i>	?	0.210 (0.868)	0.035 (0.977)	-0.045 (0.972)	-0.004
<i>MAGDIFFINC</i>	?		25.761 (0.379)	28.63 (0.313)	2.559
<i>MAGDIFFDEC</i>	?		-4.881 (0.239)	-4.782 (0.026)	-0.427
<i>EPSTARGL</i>	+			0.603 (0.264)	0.054
<i>Pseudo R²</i>		0.0485	0.0865	0.0979	
<i>LOG LIKELIHOOD</i>		-50.84	-48.82	-48.21	
<i>CHI-SQUARE</i>		06.00	10.03	13.17	
<i>P-VALUE</i>		0.54	0.35	0.21	
<i>OBSERVATIONS</i>		138	138	138	

Notes:

^az-stat in brackets; * / ** / *** indicate significance at 10% / 5% / 1%.

The dependent variable is *NDISCL* which takes the value of 1 if firm *i* discloses an adjusted EPS figure and 0 otherwise; *NEGIBES* is an indicator variable that takes the value of 1 if $EPS^{IBES} \leq 0$ and 0 otherwise; *NEGPOS* is an indicator variable that takes the value of 1 if $EPS^{FRS3} < 0$ and $EPS^{IBES} > 0$, and 0 otherwise; *MAGDIFF* is the absolute price-scaled difference between EPS^{IBES} and EPS^{FRS3} ; *SIZE* is the natural logarithm of fiscal year-end market capitalisation; *MTB* is the market-to-book ratio defined as the year-end share price per share divided by the book value of shareholders' funds per share; *NANAL* is the number of analysts (from I/B/E/S) following the firm at the end of year *t*; *PAGES* is the number of pages in the firm's published annual report and accounts. *MAGDIFFINC* represents the interaction between

MAGDIFF and an indicator variable taking the value of 1 where EPS^{IBES} is positive and materially greater than EPS^{FRS3} , and 0 otherwise. The second is *MAGDIFFDEC* represents the interaction between *MAGDIFF* and an indicator variable taking the value of 1 where EPS^{IBES} is positive and materially less than EPS^{FRS3} , and 0 otherwise. *EPSTARGL* is an indicator variable taking the value of 1 if the LTIP plan component of executive remuneration contains an EPS performance criterion and 0 otherwise.

The results from Table 3.10 show:

- The existence of an EPS criterion in LTIPs is predicted to be positively related to the disclosure of an alternative EPS figure. This variable is not significant in Model 9 which includes the variable *EPSTARGL*, (0.603, $P > |z| = 0.264$). This result is not surprising on two counts: the number of observations is low (138) and more meaningfully, when reading the details of the majority of LTIPs, the performance criteria was rarely exclusively EPS and there was more likely to be some form of comparator group target making management less able to influence the achievement of the target.
- The focus will now be on the models as a whole rather than focusing on individual variables. To achieve this, the marginal effect is considered, the chi-square and likelihood-ratio test for the models with the variables, namely *EPSTARGB*, *EPSTARGO* and *EPSTARGL*.
- For Models, 3, 6 and 9, which add the exploratory variables *EPSTARGB*, *EPSTARGO* and *EPSTARGL*, respectively to the Choi *et al.* (2005) model, the marginal effect is reported. The results are interesting in that the marginal effect of an EPS target in bonus plans is negative but insignificant. The marginal effect of an EPS target in ESOs, suggests that the percentage increase of the probability of the disclosure of an alternative EPS figure is almost 13 percent. The marginal effect for LTIPs is not equal to zero.

The chi-square (χ^2) can be interpreted as a test of whether or not the independent variables jointly impact on the dependent variable; it provides an

indication of whether the chi-square statistic for the number of independent variables is significant at different levels.

- In Model 3, which includes the exploratory variable, *EPSTARGB*, the χ^2 statistic for the independent variables with 10 degrees of freedom is 24.76. This is beyond the critical value of 23.21 at the 1% level.
- In Model 6, which includes the exploratory variable, *EPSTARGO*, the χ^2 statistic for the independent variables with 10 degrees of freedom is 31.88. This is beyond the critical value of 23.21 at the 1% level.

It can thus be concluded that for Model 3 and Model 6, the independent variables jointly impact on the dependent variable (*NDISCL*).

- The result in Model 9, which includes the exploratory variable, *EPSTARGL*, shows the χ^2 statistic for the independent variables with 10 degrees of freedom is 13.17. This is less than the critical value of 18.31 at the 5% level indicating that the null hypothesis cannot be rejected. This might be a result of the sample size (138) or might reflect a weak relationship between the dependent and independent variables.

In addition to testing the exploratory variables for significance in the logit regression models, it is interesting to observe if the goodness of fit of the models improves as a result of the addition of the exploratory variables, *EPSTARGB*, *EPSTARGO* and *EPSTARGL*. The models with these variables (Models 3, 6 and 9) are tested for improvement in goodness of fit with the models including all other variables except these exploratory variables (Models 2, 5 and 8 respectively). For each of the Models 3, 6 and 9 the change in the log likelihood, albeit small, indicates these models have a better fit when the exploratory variables are included. With respect to the overall fit of these models, the likelihood-ratio test shows that only in the case of *EPSTARGO* (Model 6) does the extended model indicate a better model fit than the nested model as a result of the addition of an exploratory variable ($\text{Prob} > \chi^2 = 0.026$).

In summary, the findings suggest that the component of executive remuneration which exhibits the most potential in the study of the consequences of an EPS target in executive remuneration is ESOs. This confirms the *a priori* expectation that executive remuneration can play a role in explaining the decision to disclose an alternative EPS figure. The significance of the variable, *EPSTARGO* in this exploratory study provide grounds to expand the research based on ESOs.

The potential displayed by *EPSTARGO* is not surprising as it is one of the three components which, from the remuneration reports, can be seen to be mainly based on an EPS target. In addition, ESOs are the one component of the executive remuneration compensation contract whose payout is most likely to solely depend on an EPS target.

3.7 Conclusions

As outlined in Chapter 2, agency theory claims that granting executives share options will reduce agency costs and align managers' objectives with those of the principal. In contrast some recent studies question the efficiency of ESOs and ask whether they might lead to behaviour on the part of management that is opportunistic rather than in the best interests of the principal. This chapter investigates the probability of an alternative EPS figure being disclosed, and asks whether disclosure is related to the use of an EPS figure in any one of three components of executive remuneration. The objective of this chapter is to explore the relationship between an EPS target and a disclosure choice made by management.

Healy (1985) explained discretionary accruals decisions by managers to the structure of bonus plans under which no bonus was paid until a minimum level of performance was achieved, and the bonus was capped beyond a certain specified level of performance. This chapter, built on a study by Choi *et al.* (2005), finds evidence of a link between the structure of executive remuneration

and an accounting choice by firms (the voluntary disclosure) of an adjusted EPS figure.

In particular, this study finds a link between the disclosure of an alternative EPS figure by firms and the existence of an EPS criterion in ESOs. This link with share options (and not the bonus or LTIP components of executive remuneration) might be attributable to the convex relationship between share options and share price; option holders gain from any increase in share price but are protected from any decrease as they can avoid taking a hit by not exercising the options. This study provides evidence that the structure of executive compensation has an impact on the accounting choices of firms. As the magnitude of the incentive of the components of executive remuneration is not considered, an interesting extension to this research would be to include the sensitivity of each component of executive remuneration.

An alternative explanation could be that granting ESOs does reduce agency costs by encouraging the disclosure of an alternative EPS figure which Choi *et al.* (2005) finds to be a more informative indication of sustainable earnings than FRS3 EPS, thus providing outsiders (principals) with more information.

A main limitation of this study is the small sample size. As its objective was to explore the possibility of a link between the three structures of executive compensation contracts and the disclosure choice of firms, it can be considered to have achieved its objective by providing symptomatic results and thus encouraging further research into this relationship.

This chapter provided an overview of the extent of the use of an EPS target in executive remuneration components. It looks at one particular disclosure choice, the decision to disclose an alternative EPS measure. The rationale for this was twofold: firstly, to see if there was any link between an EPS target and the decision to disclose an alternative EPS figure, and secondly, to provide some insights as to what might be a fruitful avenue to further research the link between EPS targets and company accounting choices.

The remainder of this thesis will concern itself with gathering further evidence of the effects of compensation policy on other accounting choices of firms. The following chapter will consider the link between the existence of an EPS target in ESOs and earnings management in the form of abnormal working capital accruals. It will expand the number of observations by adding the years 2002 and 2003 to the sample, in addition to incorporating some measure of the incentives for managers to manage earnings upwards or downwards.

Following this, Chapter 5 will consider the association between the executive remuneration structure and whether firms meet or beat analysts' forecasts. As in Chapter 4, this chapter will include some measure of the incentives management have to make decisions regarding accruals to ensure their ESOs vest by incorporating some measure of the attainability of the performance target.

Chapter 4

Earnings Management and Earnings per Share Vesting Targets

4.1 Introduction

This chapter considers whether a particular form of vesting conditions (EPS target) applying to ESOs provides incentives to manage earnings, and if so, in what direction. This study is motivated by the significance of the ESOs component of executive remuneration and thus their potential to influence executives' behaviour to maximise the payout they receive. The objective is to carry out a study developing the work of Healy (1985). The research question is to investigate whether ESOs with EPS performance criteria impact on the accounting choices of management. Specifically, it considers whether an EPS performance criterion provides management with incentives to manage earnings downwards (if target is not going to be achieved), in addition to providing incentives to manage earnings upwards (to meet target).

The period of study (2001, 2002 and 2003) is particularly apt to address the research question as it is removed from the following GAAP changes:

- FRS 17, *Accounting for Retirement Benefits*, issued by the ASB, while originally due to be fully operational from 22 June 2003, an amendment in November 2002 changed that date to accounting periods beginning on or after 1 January 2005. This standard was expected to have a significant impact on financial statements.
- FRS 20, *Share-based Payment*, issued by the ASB in 2004 for application on or after 1 January 2005 to coincide with IFRS 2, *Share-based Payment*, issued by the International Accounting Standards Board in 2004, applicable from 1 January 2005.

During the period of this study, no expense was required to be charged to the Income Statement by firms as a result of granting share options. This accounting anomaly meant that options were often perceived as having no cost to the firm issuing them. Performance criteria which had to be met before options could vest were customary in UK executive share option schemes, allowing the study of the effect of such targets.

To date, no literature explores the link between the existence of an EPS target in ESOs and the impact these EPS targets have on the accounting choices of management. Examples of such accounting choices might include:

- Disclosing alternative EPS figures.
- Earnings management.
- Meeting or beating analysts' forecast.

As shown in Chapter 3, the existence of an EPS target in ESOs helps explain the decision to disclose an alternative EPS figure. This chapter focuses on earnings management and provides insights for those charged with setting executive remuneration contracts.

The current chapter investigates whether in years when targets are not attainable (even with earnings management) earnings are managed down with the intention of saving these 'excess' earnings for future accounting periods. It also considers whether in years when options are capable of vesting with earnings management, whether or not earnings are managed (upwards or downwards) to meet the target.

Agency theory postulates that the separation of ownership and control leads to agency costs and this results in a search for mechanisms to reduce those costs. One such mechanism is executive remuneration, in particular the components and structure of the remuneration package. In general, it is assumed that agents will focus on the short term and to counterbalance this, executive remuneration components are designed with the intention of rewarding executives on the basis of the long-term performance of a firm with a view to aligning the principal and agent's incentives. One solution has been to reward executives with shares (in the form of options or actual shares) which are intended to focus their decision-making on the long term. In a bull market, managers with shares (or share options) benefit even when the performance of their firm is poor. Addressing this, the Greenbury Report (1995) proposed that

long term incentive schemes, including share option schemes, should be payable only where stringent performance criteria are met, thus linking rewards with executive effort.

The ABI issued guidelines in 1999 to cover many practical aspects of share schemes; these principles are endorsed by NAPF and are intended to provide a framework for assessing company share schemes. Like Greenbury (1995), they require that performance conditions in executive remuneration components be challenging, demonstrate achievement is demanding, be measured relative to a peer group or other relevant benchmark, and be disclosed. While not legally binding, these guidelines are influential and consequently, the majority of UK firms have included performance criteria for SBC. This practice is not mirrored in the US. In agreement with Conyon and Mallin (1997), and Stathopoulos *et al.* (2004) this study finds that EPS is by far the most commonly employed criterion for the vesting of ESOs. Thus the UK provides a unique setting for studying the effects of the structure of executive compensation on the behaviour of managers.

Empirical research has investigated the effect of bonus plans on the managers' choice of accounting procedures (see Smith and Watts, 1982). The underlying assumption is that the bonuses awarded are a positive linear function of reported earnings. The resulting hypothesis can be stated as follows:

Bonus plan hypothesis. *Ceteris paribus*, managers of firms with bonus plans are more likely to choose accounting procedures that shift reported earnings from future periods to the current period.

Healy (1985) further developed the bonus plan hypothesis and found that in some years managers in US firms have an incentive to reduce earnings (see below for further details).

This research contributes to the literature on the relationship between the *structure* of compensation contracts and earnings management. Specifically, it contributes to corporate governance and earnings management literatures.

This it does by assessing whether the inclusion of an EPS performance criterion in ESOs is associated with significant changes in a firm's reported abnormal accruals, controlling for the corporate governance of the firms. *A priori*, it would be expected that firms with EPS vesting contracts and weak corporate governance are more likely to use abnormal accruals to game vesting targets.

The remainder of the chapter is organised as follows. Section 2 outlines the theoretical framework, reviews the related literature and develops the hypotheses. Section 3 defines earnings management and Section 4 presents the sample selection, definition of variables and the research design. Section 5 presents and discusses the empirical results and Section 6 concludes.

4.2 Theoretical Framework and Hypothesis Development

Earnings management has its origin in the PAT literature (Watts and Zimmerman, 1986 and Watts, 1977). Watts and Zimmerman (1986) were among the first to study the motivations for earnings management. This literature aims to develop an empirically testable theory of accounting policy choice based on the value of accounting numbers in formal contracting arrangements (for example, debt contracts and compensation contracts). The objective is to determine whether earnings management exists, rather than comment on efficiency issues such as contract design or the consequences of any observed earnings management.

Watts and Zimmerman (1986) is underpinned by the income-smoothing hypothesis proposed by Gordon (1964). Income-smoothing emerges as rational behaviour based on the assumptions that (1) managers act to maximise their utility, (2) fluctuations in income and the unpredictability of income are causal determinants of market risk measures, (3) the dividend payout ratio is a causal determinant of share values, and (4) managers' utility depends on the firm's share value (Watts and Zimmerman, 1986). The early literature on income-smoothing did not consider the incentives to smooth, it had as its objective to determine whether the observed time-series of earnings was

consistent with smoothing (Beattie, Brown, Ewers, John, Mason, Thomas and Turner, 1994).

From this theory two major hypotheses flow. First, the income-smoothing hypothesis postulates that managers take actions to reduce earnings fluctuations to a level considered normal for the firm, in order to:

- (1) better deliver management's expectations concerning the persistence of future earnings to investors (Barnea, Ronen and Sadan, 1975; Hand, 1989);
- (2) increase their job security with the firm (DeFond and Park, 1997); or
- (3) reduce the firm's borrowing costs (Trueman and Titman, 1988).

The second hypothesis, the bonus plan hypothesis, will be considered in the next section.

4.2.1 Bonus Plans and Executive Compensation

The second and competing hypothesis, the bonus plan hypothesis, contends that the existence of bonus plans with upper and lower bounds based on accounting numbers creates a conflict of interest between owners and managers. By smoothing income, managers can affect a transfer of wealth from shareholders to themselves.

Watts and Zimmerman (1978) and Ronen and Sadan (1981) provide the earliest theory of how income-related compensation schemes can induce smoothing behaviour. Moses (1987) supports this theory empirically by linking smoothing behaviour with the existence of bonus compensation plans.

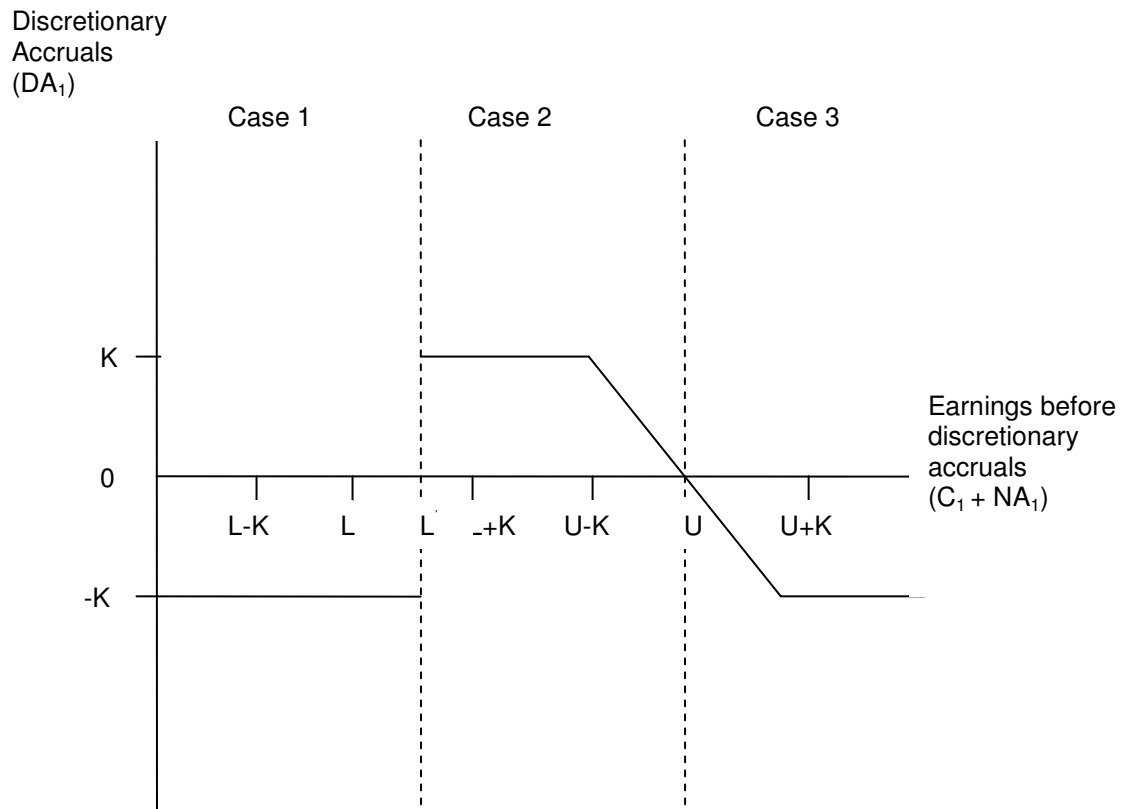
The seminal paper by Healy (1985) looks at the actual definitions and parameters used in bonus arrangements when empirically testing abnormal (discretionary) accrual accounting choices. By looking at the structure of bonus plans, Healy makes specific predictions of how, and under what circumstances, managers will engage in this type of earnings management. His study was confined to firms with compensation plans (bonus schemes) based on current reported net income only. All the bonus schemes in the sample had bogeys (below which the bonus is zero) but not all had caps (the bonus is a constant for earnings greater than the cap). In years when earnings fall sufficiently far below the lower bound or above the upper bound specified by the bonus plan, managers are expected to select negative abnormal accruals (see figure 4.1). This action increases the probability of receiving a bonus the following year. Positive abnormal accruals are expected in all other years. Shifting of earnings to future years when bonuses were at their maximum is also reported in Holthausen *et al.* (1995b) and Gaver *et al.* (1995).

This study finds its inspiration in Healy's (1985) paper which notes that management have inside information on a firm's net income before earnings management. Since outside parties, including the board itself, may be unable to learn what this number is, Healy predicts that managers would opportunistically manage earnings so as to maximise their bonuses under the firms' compensation plans.

Healy's paper is an extension of the bonus plan hypothesis, which states that managers of firms with bonus plans will maximise current earnings. From figure 4.1, it can be seen that the bonus increases linearly between the bogey and the cap. In general, the literature focuses on when situations might exist where executives are aware they will not meet the target so have incentives to manage earnings upwards. Healy (1985) extends this to explore if incentives might exist to manage earnings downwards in some circumstances.

Figure 4.1

Typical bonus scheme



'Managerial discretionary accrual decisions as a function of earnings before discretionary accruals and bonus plan parameters in the first period of a two period model. L = the lower bound defined in the bonus plan, U = the upper bound on earnings, L = a cut-off point which is a function of the lower bound, the manager's risk preference, expected earnings in period 2 and the discount rate, K = the limit on discretionary accruals, C = cash flows from operations, and NA = non-discretionary accruals'.

Source: Healy, 1985:90

Figure 4.1 shows that the incentives to manage reported earnings depend on where earnings are in relation to the bogey (L) and the cap (U).

Healy (1985) maintains that if earnings are below the bogey, managers, are motivated to adopt income-decreasing choices (for example, accruals and/or change accounting policies) as no bonus will be received if, even with maximum

abnormal accruals, reported earnings will not reach the lower bound. In this case managers might as well manage earnings downwards which would increase the probability of receiving a bonus in the following year as accruals reverse.

Equally, if earnings are above the cap, there is motivation to adopt income-decreasing choices. This would reduce reported earnings as any bonus on earnings above the cap would be permanently lost. Healy (1985) maintains that only when reported earnings are between the bogey and the cap are managers motivated to adopt income-increasing choices.

The literature preceding the widespread use of equity-based payments focuses on the impact of bonus schemes. Like Healy (1985), Gruidy, Leone and Rock (1999) find evidence that managerial accounting decisions are related to incentives provided by their bonus contracts. Holthausen *et al.* (1995b) find that managers manipulate earnings downwards when their bonuses are at their maximum. In contrast, Gaver *et al.* (1995) explain their findings as evidence of the income-smoothing hypothesis. They find that when earnings before abnormal accruals fall below the lower bound, managers seek income-increasing accruals and vice versa.

This study attempts to apply the approach in Healy (1985) to ESOs with EPS targets and identify:

- Whether, and under what conditions, there might be incentives to manage earnings downwards.
- Whether, and under what circumstances, there might be incentives to manage earnings upwards.

Effectively, the EPS target mirrors the bogey and cap, in that if reported EPS is below the target, no options vest, and any reported EPS above the target are lost for vesting purposes.

4.2.2 Equity Plans and Executive Compensation

The structure (as opposed to the level) of executive compensation has been the focus of some studies which consider whether or not the various components have an impact on earnings management. Current executive compensation pay contracts may include the following components:

- Salary.
- Bonus.
- Share options.
- LTIPs (restricted stock)³.

The existence of these different components has led to research dominated by a preoccupation with studying the influence of compensation contracts on managerial behaviour, in particular considering the linear and non-linear payout structures derived from the different components of the compensation package. Chapter 3 provides more details of these studies.

A recent study by Zhang, Bartol, Smith, Pfarrer and Khanin (2008) isolates certain categories of share-based incentives which may cause management to act contrary to the interest alignment argument which forms the basis of agency theory. They find that the effects of out-of-the money options lead to incentive misalignment. This, they argue, is explained by prospect theory, that is, in the context of possible gains, executives tend to forgo the possibility of a gain if pursuing that gain involves the perceived potential for loss relative to the current position.

In this case, executives (decision-makers) are loss avoiders rather than wealth maximisers. Zhang *et al.* (2008) maintain that considering agency theory and prospect theory together, outcome-based incentives could lead to serious misalignment (in the form of earnings management) between agents and the

³ Share options granted at zero exercise price. Another important component, mostly ignored in the literature, is pension contributions.

principal. This conclusion would lead to the idea that incentives exist – when the vesting of options is contingent on reaching an earnings target – for executives to manage earnings. This manipulation would represent opportunistic behaviour on the part of managers.

A study by Young and Yang (2009) finds a strong association between share repurchase activity and the presence of EPS-based compensation arrangements. In agreement with the findings of Zhang *et al.* (2008) they claim their findings support the following:

‘One possibility is that opportunistic executives use repurchases to maximise their compensation at the expense of external shareholders; and such behavior persists either because it represents an unavoidable agency cost associated with a second best contracting solution, or because management-friendly boards successfully appease external monitors by adopting performance targets that at the same time provide executives with ancillary earnings management opportunities’ (Young and Yang 2009: 4).

From the above, it is evident that prior research had found an association between executive compensation contract and earnings management.

4.2.3 Hypotheses

The motivation behind this study is an attempt to adapt Healy (1985) in an environment where the significance of the bonus element of executive remuneration has been replaced by ESOs, and where there is a ‘bogey’ and ‘cap’ element to this component of executive remuneration. *A priori*, it is expected that firms will manage earnings depending on where actual EPS are relative to the target in accordance with the following hypotheses:

H1: An EPS target will be positively related to earnings management.

H2: If actual EPS is well below target EPS: managers manage earnings downwards.

H3: If actual EPS is just below target EPS: managers manage earnings upwards to meet target and ensure ESOs vest.

H4: If actual EPS is just above target EPS: managers manage earnings downwards to meet target and store earnings for future years.

H5: If actual EPS is well above target EPS: managers manage earnings downwards and store excess earnings for future years.

The results in Chapter 3 suggest that the decision to disclose an alternative EPS figure is strongly associated with EPS vesting targets in ESOs.

This chapter looks at the effect of a specific performance criterion, namely, an EPS performance target in ESOs, in the context of corporate governance and contracting. The decision to focus on ESOs is supported by theoretical arguments (agents act in their own interest) and intuition (agents act to maximise their award) which would lead one *a priori* to expect that the existence of an EPS target in ESOs would motivate earnings management. Raw (signed) abnormal working capital accruals (*Raw AWCA*) are expected to be connected with the existence of an EPS performance criterion in the ESOs, their sign and magnitude being conditional on where the firms' unmanaged earnings are in relation to the target.

The EPS target in ESOs is generally based on the growth of EPS over a three-year period. This target is generally set at a percentage plus the increase in the RPI and is required to be achieved before any ESOs vest. As a result of this requirement for EPS to increase over a three-year period, there is potentially varying motivational influence in any individual year. That is, missing a target in one specific year does not necessarily mean that any particular tranche of

ESOs will fail to vest. In addition, there may potentially be several tranches of ESOs waiting to vest at any one year-end thus making exact measurement of the incentive difficult. Management, it is assumed, can influence reported earnings and thus have control over the vesting of their options. The non-linear payout from ESOs are expected to have the greatest impact on the likelihood that managers engage in earnings management to benefit from the vesting of the options (Burns and Kedia, 2006; Efendi *et al.* 2005).

Typical examples of the conditions applicable to UK executive share option schemes are:

Kewill plc, Annual Report and Accounts 2003, page 9:

‘Under the 1995 executive share option schemes, options issued to the executive directors (as shown below) may only be exercised provided the percentage increase in the group's annualised EPS over the relevant three-year period is at least 2% above the average annual percentage increase, if any, in the UK Retail Price Index over the three years prior to the exercise of the option’.

Luminar Group Holdings plc, Annual Report and Accounts 2003, page 21:

‘The criteria currently operated by the Committee is that growth in pre-tax Earnings Per Share (EPS) must exceed RPI + 3% compounded, over the relevant three-year period’.

The focus on share options is interesting as the sample includes 59 percent of sample years which have ESOs due to vest and given the convex nature of the payout to managers from share options. This is in contrast to bonus schemes where fewer than 30 percent of the bonus schemes have an EPS target. Besides, in contrast to bonus schemes and LTIPs, the vesting of share options was more often than not dependent *solely* on an EPS target. In general, bonus plans involve individual or divisional targets, and LTIPs tend to be exercisable on the basis of total shareholder return, often measured against a comparator group of firms. This suggests that these latter elements of executive

compensation have vesting targets which are less under the control of management in addition to being more difficult to observe.

Despite increased disclosure requirements relating to executive remuneration; it has proved impossible to determine the exact EPS target of the firms in the study. There are several reasons for this, among them the following:

1. The exact definition of EPS used in the target was generally not disclosed.
2. The exact starting and ending dates for the measurement period was not disclosed.
3. There was, in some instances (approximately 4 percent), an opportunity to reset the target and/or vesting dates.

The particular structure of ESOs selected for study provides a valuable opportunity to determine whether the EPS target represents efficient contracting or whether it causes management to behave opportunistically.

The main research focus is to determine whether firms manage earnings to: (1) meet an EPS target, if they are close to that target, or (2) take a hit if they are too far away from the target.

4.3 Earnings Management

Equity-based compensation was proposed as a means of ensuring managers act in the interests of shareholders, in particular to address the situations where managers focused exclusively on the short term. In order to avoid the situation where managers were being rewarded even when firms performed below par, reports like Greenbury (1995) maintained that including targets in SBC would avoid managers being rewarded when their firm was benefiting from a bull market (Oyer, 1998 and Murphy 1998). Earnings management provides an

approach to study the accounting choices of firms. The separation of ownership and control which leads to one potential agency cost, in the shape of earnings management, motivates this study.

4.3.1 Definition and Measurement of Earnings Management

While there appears to be no universally accepted definition of earnings management, the following definition is popular:

'Earnings management occurs when management use judgement in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company, or to influence contractual outcomes that depend on reporting accounting numbers' (Healy and Wahlen, 1999: 368).

Thus it can be said that earnings management is when managers select estimates and/or reporting methods that result in information in financial reports that does not reflect the firm's true position and performance. This can lead to either (1) the misleading of stakeholders and/or (2) the influencing of contractual outcomes which rely on reported accounting figures.

As previously stated, the research questions are firstly, does the existence of an EPS performance target in ESOs lead to earnings management and secondly, do these targets provide incentives to manage earnings downwards and/or incentives to manage earnings upwards. Consequently, this research is interested in earnings management in both directions.

Given that financial reporting involves management making judgements and estimates to comply with GAAP, the predicament is how to measure earnings management. Since any definition of earnings management involves consideration of managerial intent, which is not observable, it is by its nature difficult to measure. For example, Healy and Wahlen (1999) found that there is

limited evidence of actual earnings management, which they attribute in part to the problems with measurement.

A popular measure of earnings management is abnormal accruals. Total accruals are measured as the difference between net income before extraordinary items and operating cash flows. Total accruals are then decomposed into: (1) normal accruals i.e. accruals induced by normal business activities and (2) abnormal (discretionary) accruals i.e. accruals that are not a direct consequence of normal business and are subject to managerial judgement.

As the earnings management for the purpose of this study may be directional (that is, the existence of an EPS target in ESOs is hypothesised to create incentives to increase and decrease income) the raw value of abnormal working capital accruals is the main variable of interest. Working capital accruals are used (rather than total accruals) as literature suggests that working capital accruals offer a more attractive device for earnings management due to their recurring nature and the large degree of judgement involved in their estimation (McNichols and Watson, 1988). Long-term accruals (depreciation, amortisation, provisions for restructuring costs, large write-offs and losses from disposal of assets) are usually non-recurring and quite transparent to investors. As a result, they are a more costly device to manage earnings.

If managers are focused on the reported earnings figure, then the role of accruals as an earnings management tool becomes clear: for a given amount of cash from operations, reported income is increased by positive accruals and decreased by negative accruals (for example, increasing a provision for doubtful debts). Crucially, by their nature accruals reverse thus resulting in an increase in future periods' earnings (for example, the need to provide for say, the same provision for doubtful debt is removed).

Accrual choices are chosen as the earnings management instrument because, as Young (1999) points out, accruals are likely to represent a favoured instrument for manipulating reported earnings because of their relatively low

cost and opaque nature. One regularly cited disadvantage of using accruals is that they reverse in the future. From the perspective of this study, this feature of working capital accruals – their reversal – can cause them to be a particularly attractive device for managers with a three-year target. For example, if a manager sees that he is about to exceed the earnings target in the current year, then he can manage earnings down to the target and then store these managed earnings for future periods.

Healy's use of total accruals as a proxy for abnormal accruals is the subject of some criticism. Healy (1985) acknowledges that this method introduces biases that support his bonus-maximisation hypothesis. Normal accruals are adjustments to cash flow mandated by GAAP while abnormal accruals are adjustments to cash flow selected by managers. Total accruals thus include accruals over which the manager does not have control and this could lead to measurement error.

Other measures of earnings management adopted in the past include asset sales (Black, Sellers and Manley, 1998; Bartov, 1993), changes in research and development expenditure (Bushee, 1998; Bange and De Bondt, 1998), and accounting method choices (Watts and Zimmerman, 1986).

4.4 Sample and Definition of Variables

The initial sample for the disclosure study in Chapter 3 was the 500 largest UK-domiciled industrial firms in 2001. For the purpose of the earnings management study, the sample size is extended by the inclusion of the years 2002 and 2003 for the same 500 largest (in 2001) firms. The research required information on the actual executive remuneration structure in these UK firms in 2001, 2002 and 2003. This reduced the sample firms from the original 500 down to 376. The following provides the reasons for the attrition of firms from the original sample:

Table 4.1**Sample selection**

2001 sample	500
Insufficient information	-4
Did not file with Companies House	-4
Not in sterling	-3
Published 2 Annual Reports in 2003	-1
Fiscal year covered 16 months	-1
Merged/Acquired	-32
Taken private	-1
Delisted	-2
Receivership/Liquidation	-9
No reply	-23
Unable to locate	<u>-44</u>
Earnings Management sample	<u>376</u>

Concern is often expressed about survivorship bias in the sense that only successful firms remain in a sample. In this study the attrition of firms is not solely dependent on firms surviving but also on adequate disclosure of remuneration data. While it is practically impossible to ensure a perfectly random sample, the degree of representation (by industry) is consistent over the three years with the sample being a reasonable approximation to a random sample.

4.4.1 Measuring Target Earnings per Share

The ideal methodological approach would be to have full data and know the actual target EPS growth, and then use this to divide the firms by how far actual EPS are from target EPS. From this, a firm's incentive to manage earnings to meet the target and record the direction of earnings management to test the hypothesis could be measured. The findings could then be used to determine whether earnings were managed to meet the target, that is, to assess whether or not targets impact on the accounting choices of management.

As evident from the sample extracts from annual reports in the previous section, sufficient information (to determine the actual EPS target) is not disclosed prohibiting exact duplication of the Healy (1985) study. The definition of EPS which comprises the performance target is not disclosed nor is the measurement period (for example, the use of *any* three-year period). In addition to information being unavailable, there is an issue in measuring EPS growth if EPS is negative at the start of the period. To address these deficits a proxy EPS target was devised, whereby a normalised EPS is used as the denominator for calculating EPS growth. Normalised EPS is price per share at the start of the period multiplied by the cost of equity capital. As the cost of equity capital is unknown, a constant cost of equity capital of 10 percent is assumed. This is applied to the median three-year⁴ EPS growth for the industry to which a firm belongs, and the industry median is calculated based on all firms for whom data is available at the relevant year-end on Datastream, not just the firms in the sample. Therefore, the more observations there are in each industry, the more accurate the measure of industry growth will be. The median is chosen above the mean as it is less susceptible to the influence of outliers.

A similar approach is applied to calculating actual EPS growth. For actual EPS growth, the period of measurement ends in the year of interest whereas for the target EPS growth, the period of measurement ends in the year prior to the year of interest. This is based on the assumption that the target is based on historic growth rates.

⁴ The EPS growth target for the vast majority of firms in the sample is based on a three-year period. This is gleaned from the disclosures in the financial statements.

4.4.2 Research Design

The selection of the period of study, 2001 to 2003, is central. This period is *before* the changes in the accounting rules requiring the expensing of share options granted and *after* performance vesting ESOs were common practice in executive remuneration contracts in the UK.

4.4.3 Abnormal Accrual Model

The Jones (1991) model calculates total accruals for each firm in the sample and then predicts normal accruals for the year by estimating a regression which includes the change in revenues (revenues for firm i in year t less revenues for year $t-1$) to control for normal accruals of current assets and liabilities on the grounds that these depend on changes in business activity as measured by revenue. Jones also includes gross property, plant and equipment to control for the normal component of depreciation expense. The Jones model uses the unexplained part of a regression of total accruals on the change in revenue and gross property, plant and equipment as a proxy for abnormal accruals.

In later abnormal accruals research (DeFond and Park (1997), Subramanyam (1996) and Guidry *et al.* (1999)), the modified Jones model is employed to calculate abnormal accruals. The modified Jones model proposed by Dechow, Sloan and Sweeney (1995) classifies all increases in credit sales as discretionary and modifies the Jones model by removing change in receivables (REC) from the change in sales.

Kothari, Leone and Wasley (2005) further adapt the modified Jones model by excluding depreciation and calculating working capital accruals. Working capital accruals (WCA) is defined as:

$$WCA = \Delta\text{current assets} - \Delta\text{cash} - \Delta\text{current liabilities} + \Delta\text{short-term debt.}$$

This modified Jones model applies a cross-sectional approach with the objective of overcoming the survivorship bias inherent in the time-series version of the Jones (1991) model. A cost of the cross-sectional approach is that it ignores possible reversals of abnormal accruals of prior periods (Peasnell, Pope and Young, 2000).

To measure earnings management the model adopted is similar to that of Athanasakou, Strong and Walker (2006) whose study follows Kothari *et al.* (2005). The model estimates normal WCA by including lagged return on assets to control for operating performance. Similar to Athanasakou *et al.* (2006), the modified Jones model is extended as in Ball and Shivakumar (2006) to account for the fact that the recognition of gains and losses is asymmetric (Basu, 1997).

Basu (1997) notes the recognition of gains and losses is asymmetric, in that losses are recognised in a more timely fashion than gains in accrual accounting (accounting conservatism). Ball and Shivakumar (2006) argue that the relationship between accruals and cash flows cannot be linear and show that including changes in cash flow corrects for the fact that non-linear accruals models explain substantially more variation in accruals than equivalent linear models. Consequently, the Kothari model is extended to account for this timely loss recognition function of WCA by including negative changes in cash flows, as these are more likely to reflect bad current earnings news than just negative operating cash flows.

Three variables are added to the modified Jones model based on *changes* in operating cash flows rather than the level of cash flow, as negative changes in cash flows are more likely to reflect bad current earnings news than just negative operating cash flows. This regression is, in the first instance, run by industry year for all firms on the Datastream Active and Research files. It is run for each Datastream Level 3⁵ industry year at the relevant year-ends with available accruals data and where there were at least six firms in an industry

⁵ Most research uses Level 6 but this resulted in only medium and small firms remaining in the final sample due to the practice of requiring six observations for an industry to be included in Stage 2. Lara, Osma and Mora (2005) also use Level 3.

group. Including all firms ensures efficient parameter estimation from equation (1) below with the stipulation that the industry year combination has at least six observations. In addition, as the objective is to isolate abnormal earnings management, including all firms in every industry will provide a better reflection of any deviation from the industry norm. This will lead to more accurate and meaningful estimates of AWCA.

For each sample year, the following cross-sectional model is estimated for all firms available in Datastream matched by year and industry code:

$$\begin{aligned} \frac{WCA_{i,t}}{A_{i,t-1}} = & \lambda_0 \frac{1}{A_{i,t-1}} + \lambda_1 \frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{A_{i,t-1}} + \lambda_2 ROA_{i,t-1} \\ & + \lambda_3 \frac{\Delta CFO_{i,t}}{A_{i,t-1}} + \lambda_4 \Delta CFO_{i,t} NEG + \lambda_5 \frac{\Delta CFO_{i,t} NEG}{A_{i,t-1}} * \Delta CFO_{i,t} + e_{i,t} \end{aligned} \quad (1)$$

Where $\Delta REV_{i,t}$, $\Delta REC_{i,t}$ and $\Delta CFO_{i,t}$ are change in revenue, change in accounts receivable and change in operating cash flow respectively for firm i in period t . $ROA_{i,t-1}$ and $A_{i,t-1}$ are return on assets and total assets for firm i in period $t-1$. All variables (except indicator variables) are scaled by lagged total assets. $\Delta CFO_{i,t} NEG$ is an indicator variable taking the value of 1 if the change in cash flows from operations is negative and 0 otherwise. $CFO_{i,t} * CFONEG_{i,t}$ is an interaction term which is defined as $\Delta CFO_{i,t}$ multiplied by $\Delta CFONEG_{i,t}$.

For each individual firm in the sample the following equation is calculated solving for AWCA:

$$\frac{AWCA_{i,t}}{A_{i,t-1}} = \frac{WCA}{A_{i,t-1}} - \left[\begin{aligned} & \hat{\lambda}_0 \frac{1}{A_{i,t-1}} + \hat{\lambda}_1 \frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{A_{i,t-1}} + \hat{\lambda}_2 ROA_{i,t-1} \\ & + \hat{\lambda}_3 \frac{\Delta CFO_{i,t}}{A_{i,t-1}} + \hat{\lambda}_4 \Delta CFO_{i,t} NEG + \hat{\lambda}_5 \frac{\Delta CFO_{i,t}}{A_{i,t-1}} * NEG \end{aligned} \right] \quad (2)$$

WCA , $A_{i,t-1}$, ΔREV , ΔREC and $ROA_{i,t-1}$ are all the figures for the individual firm and

$\hat{\lambda}_0, \hat{\lambda}_1, \hat{\lambda}_2, \hat{\lambda}_3, \hat{\lambda}_4$ and $\hat{\lambda}_5$ are the regression estimates obtained from equation (1).

This model is estimated cross-sectionally within industry-years to correct for industry-wide economic conditions that might influence accruals independently of earnings management (Teoh, Welch and Wong, 1998) and to avoid contamination of abnormal accruals estimates by time-specific factors, such as interest rate fluctuations. The cross-sectional approach has the limitation that it assumes homogeneity across firms in the same industry.

Abnormal, or discretionary, WCA for a firm are the unexpected component reported by a company and are the differences between actual levels reported and the level expected to be reported by the firm for a period. Normal, or non-discretionary, accruals are the expected level of accruals for the firm based on factors such as revenue growth and industry classification (Jones, 1991; DeFond and Jiambalvo, 1994; Kothari *et al.* 2005).

Abnormal accruals can be manipulated through financial reporting discretion allowed under GAAP. This provides management with the capacity to either increase (positive abnormal accruals) or decrease (negative abnormal accruals) reported income for a period.

The objective here is to test whether managers use earnings management to meet an EPS growth target when that target needs to be achieved before their ESOs vest.

4.4.4 Variable Definitions

This study is interested in the direction of earnings management, not just to determine the existence of earnings management. Thus, the dependent variable is Raw AWCA.

The objective is to test for an association between earnings management and the existence of an EPS performance criterion in ESOs. The variable *EPSTARG* is an indicator variable which takes the value of 1 if the ESOs have an EPS target and 0 otherwise. The expected sign of this relationship is unknown.

The control variables are included as prior research finds they have some consequence for the earnings management behaviour of firms. Consistent with PAT (Watts and Zimmerman, 1978, 1979), they include leverage (*LEV*) as a proxy for agency costs. Highly leveraged firms would be expected to manage earnings to smooth income and avoid any fluctuations that might trigger covenant violations. A positive association between *LEV* and *Raw AWCA* is expected.

ISSUE is included following the finding of Teoh *et al.* (1998) of higher income growth in the issue year and the preceding fiscal period. Thus *ISSUE* would be expected to be positively related to earnings management.

GROWTH is controlled for following Young's (1999) findings that most abnormal accrual models do not adequately control for the growth rate of the firm. A negative association is expected between accounting discretion and growth as growth firms have strong incentives to meet earnings benchmarks in order to avoid increases in the cost of capital or to maintain access to capital (Bowen, Rajgopal and Venkatachalam (2008).

Prior research has reported that political costs (proxied by size) are negatively associated with $|AWCA|$ (Warfield *et al.* 1995, Bartov, Gul and Tsui, 2001, Klien 2002). In addition, the financial statements of large firms would be expected to face more scrutiny and so a negative association with *AWCA*s is anticipated. The mean (median) size of 13 (13) shows that the sample does not appear to be biased in the firms remaining in the final sample from the original 500 firms which had a mean size of 13 also. *SIZE* is defined as the natural logarithm of fiscal year-end market capitalisation. While, this study has as its dependent variable *Raw AWCA* rather than $|AWCA|$, size is included as it would be

expected to impact on the level, in addition to the amount, of earnings management.

Minton and Schrand (1999) find that firms with greater earnings volatility have higher costs of equity and debt capital. Hence, riskier firms might use abnormal accruals to reduce the perception of risk (Warfield *et al.* 1995) or to smooth earnings and lower their cost of capital. Volatility is captured using two measures:

(1) *RISK* is a measure of volatility. This is included to control for the fact that more volatile firms are expected to report more volatile earnings figures. *RISK* is measured as the volatility of share price over 60 monthly observations before the year of study similar to Aggarwal and Samwick (1999).

(2) *CVSALES* which is the coefficient of variation of sales.

These variables are expected to be positively associated with earnings management as high volatility increases the demand for income-smoothing. *VESTED* is a binary variable which takes the value of 1 if there is a tranche of ESOs due to vest in a year.

Year indicator variables (*YEAR2002* and *YEAR2003*) are included and take the value of 1 if the data refers to a particular year and 0 otherwise.

The research requires the defining of firms by the closeness of actual EPS growth to the performance target EPS. To capture this, three variables are devised and defined as follows. To reflect the growth in EPS, the variable *ACTUAL3* is included and defined as the three-year increase/decrease in actual EPS. To measure the performance target EPS, the variable *TARGET3* is defined as the three-year increase/decrease in target EPS. To capture how close a firm's actual growth in EPS is to its performance criterion growth in EPS, *MISS3* is defined as the actual increase/decrease in EPS over three years minus the industry median increase/decrease in EPS over three years

(target). Further details of these variables are presented in the following section.

Four corporate governance variables⁶, *BLOCK*, *BRDOWN*, *NEDS* and *BRDSIZE* are incorporated in the regression models, and the remaining corporate governance variables are used in robustness checks. Sound corporate governance structures are expected to reduce earning management practices in firms. These include:

- The existence of high block holders (*BLOCK*). This is an indicator variable which takes the value of 1 if the firm has an external stockholder owning ≥ 5 percent of the outstanding shares at the fiscal year-end and 0 otherwise.
- Greater ownership by board members (*BRDOWN*). The percentage of outstanding shares owned by members of the board at the fiscal year-end.
- Larger number of non-executive directors on the board (*NEDS*). The percentage of non-executive directors on the board.
- Total number of board members (*BRDSIZE*). The total number of board members.

The impact of board size is somewhat uncertain; in theory a larger board will reduce earnings management, the larger the board the less the influence of any one person or group of persons. In practice it may mean less efficient decision-making as it may be more difficult to achieve consensus.

⁶ Supplied by *Manifest Information Services Ltd.*

Corporate governance variables

The following alternative corporate governance variables are used for robustness tests. *DUAL* takes the value of 1 if the CEO is also the Chairman of the board and 0 otherwise. *CEOREM* takes the value of 1 if the CEO is a member of the Remuneration Committee and 0 otherwise. *INSTOWN* is the percentage of outstanding shares at each year-end held by outside block holders. *TEN* takes the value of 1 if the firm has an external stockholder owning greater than or equal to 10 percent of the outstanding shares at the fiscal year-end and 0 otherwise. *BIG4* takes the value of 1 if the firm is auditor by one of the Big 4 audit firms and 0 otherwise.

4.4.5 Vesting Performance Variables

From the remuneration reports of the firms in the sample, it appears that generally ESOs vest if a three-year target EPS growth rate is achieved, with the latter often linked to the RPI.

Adjusted EPS and adjusted share price are used to estimate the growth variables.

Target growth

As the actual target growth is not disclosed and sufficient information is not provided to enable it to be estimated, a proxy is employed as follows:

The target growth is based on *normalised* EPS growth over the three years prior to the year under study, so the target for 2003 is measured on the growth from 1999–2002 EPS figures.

Assuming a constant cost of capital of 10 percent as a rate investors would deem acceptable, *normalised* EPS is defined as the greater of 10 percent of the share price at the start of the measurement period (so for the 2003 target, the

greater of 10 percent of the 1999 closing share price is taken) and the starting EPS (1999). Taking the greater of these two figures was necessary to overcome the difficulty caused by the following two situations (1) starting EPS value being too low and (2) where the EPS is negative at the start of the period.

Figure 4.2 explains the timing of the calculation for the three-year growth rate for an individual firm with a 31 December year-end:

Figure 4.2			
Calculating target growth rate for 2003			
31 December		£	Growth Rate
1999	Share price	2.00	
2000	Normalised EPS	0.20	
	Reported EPS	-0.15	
2003	Reported EPS		-0.01
	Change in EPS		0.14 0.70 ⁷

The target is based on the median EPS growth for the industry to which a firm belongs. The industry median is calculated based on all firms, for whom data is available at the relevant year-end on Datastream. Therefore, the more observations there are in each industry, the more accurate the measure of industry growth will be. Also it is anticipated that some degree of consideration of an industry norm would be involved in setting a target for a firm.

Actual growth

The same procedure to measure the actual growth in EPS for each firm is followed over a three-year period except that for actual growth the period ends

⁷ 0.70 = .14/.20

in the year of interest. This is based on the assumption that this would be used to measure the achievement of actual growth.

From the target and actual growth, a variable *MISS3* is defined as *ACTUAL3* minus *TARGET3*.

4.4.6 Unmanaged Earnings per Share

By definition, reported earnings are equal to unmanaged earnings plus positive abnormal accruals minus negative abnormal accruals. From this the following can be inferred:

Unmanaged earnings = reported earnings
- positive abnormal accruals
+ negative abnormal accruals.

Unmanaged earnings are calculated on a per share basis, as per Lara, Osma and Mora (2005), as follows:

$$X_t^* = (EPS_t - DACCPs_t^*) / P_{t-1}$$

(X_t^*) :	unmanaged earnings
EPS_t :	earnings before extraordinary items per share
$DACCPs_t^*$:	abnormal accruals per share multiplied by lagged total assets
P_{t-1} :	share price at the beginning of the period

It is appropriate to use unmanaged earnings on a per share basis (*UMEPS*) as the incentive for managers is also measured on a per share basis.

4.4.7 Defining Incentives for Firms

Theory suggests that the earnings management behaviour of firms with EPS targets due to vest depends on the distance between unmanaged earnings and the target. Firms with unmanaged earnings far from the target are expected to manage earnings downwards as they have no realistic hope of reaching the target. Where firms are close but below the target, small positive accruals are expected to allow the firms to meet the target. Similarly, firms above the target are expected to have small negative accruals and thus store accruals for future periods.

The objective is to test the following hypothesis: that firms far below the target are expected to treat earnings management in a similar fashion to those with a bogey under Healy's (1985) theory and firms well above the target will manage earnings downwards as the EPS target acts as a cap as per Healy (1985).

VESTED is an indicator variable which takes the value of 1 if a tranche of ESOs with EPS performance targets are due to vest in the current year and 0 otherwise. An interaction variable, *TARVEST* is defined as *EPSTARG*VESTED* which captures years when ESOs with an EPS target are due to vest.

4.5 Group Definitions

The firms are defined by the distance of their actual EPS three-year growth (*ACTUAL3*) from the target three-year EPS (*TARGET3*) using two methods, Method A and Method B. The definition of both methods is presented in the following section.

4.5.1 Method A

To define the groups into below, below and close, above and close, and above, quartiles of the *MISS3* variable are employed; the *MISS3* variable is defined as the actual three-year growth in EPS (*ACTUAL3*) minus the target three-year growth in EPS (*TARGET3*):

GROUPA: firms in the bottom quartile of *MISS3*;

GROUPB: firms in the second quartile of *MISS3*;

GROUPC: firms in the third quartile of *MISS3*;

GROUPD: firms in the fourth quartile of *MISS3*.

Interaction terms are included to test whether there is any significance for the different groups when they have ESOs due to vest in that year. *GROUPATV* is defined as *GROUPA*TARVEST*, *GROUPBTV* as *GROUPB*TARVEST*, *GROUPCTV* as *GROUPC*TARVEST* and *GROUPDTV* as *GROUPD*TARVEST*.

4.5.2 Method B

In addressing the direction of the incentive to manage earnings, there is *GROUP1* which is unlikely to reach the target so the firms in this group are expected to have incentives to manage earnings downwards, and perhaps even take a bath as they have no hope of reaching the target. A major challenge in the research design, given the limited data provided in the remuneration reports, is to distinguish between firms close but below the target and firms close but above the target. Having these firms defined would allow the testing of the theory that firms just below the target are expected to have incentives to manage up to meet the target while firms close but above would be expected to manage down to the target and thus bank accruals for future years. Firms above but not close to the target are expected to manage earnings down. To capture the above, four groups are defined using quartiles of the *MISS3*

variable along with the *UMEPS* variable to differentiate the middle two groups as follows:

GROUP1: firms which fall into the first quartile of the *MISS3* variable and who are well below the target. If they have any capacity to manage earnings, it would likely lead them to manage downwards as they have no hope of hitting the target.

GROUP2: firms which are in the second and third quartile of the *MISS3* variable and *have negative UMEPS*. These firms are defined as being below but close to the target and would be expected to manage upwards to meet the target.

GROUP3: firms which are in the second and third quartile of the *MISS3* variable but *have positive UMEPS*. These firms are defined as being above but close to the target and would be expected to manage downwards to just meet the target.

GROUP4: firms which fall into the fourth quartile of the *MISS3* variable are firms which are well above the target and would be expected to manage downwards and keep any reserves for future years.

GROUP2 and *GROUP3* comprise firms that are close to the target, to further divide them the sign of *UMEPS* is employed.

GROUP2 are starting not too far from the target and would be expected to have the capacity to manage earnings upwards by the amount required to meet the target despite having negative unmanaged earnings.

In contrast, *GROUP3* firms starting with positive unmanaged earnings can manage earnings down and still meet the target.

Previous research validates the use of unmanaged earnings as a benchmark as it has been found that unmanaged earnings impact on the earnings

management behaviour of firms. For example, Park and Shin (2004) find that positive abnormal accruals occur when unmanaged earnings are below the target and firms manage earnings down when unmanaged earnings are above the target. Peasnell *et al.* (2000) argue and report that the incentive for income-increasing earnings management is particularly strong when unmanaged earnings are below target earnings.

As for Method A, interaction terms are included to test whether there is any significance for the different groups when they have ESOs due to vest in that year. *GROUP1TV* is defined as *GROUP1*TARVEST*, *GROUP2TV* as *GROUP2*TARVEST*, *GROUP3TV* as *GROUP3*TARVEST* and *GROUP4TV* as *GROUP4*TARVEST*.

4.6 Results

This section presents the results beginning with the descriptive statistics.

4.6.1 Descriptive Statistics

Table 4.2				
Executive share option plan characteristics⁸				
	2001	2002	2003	Total
N	212	212	279	703
ESOs with EPS targets	75%	77%	80%	78%
ESOs vesting in year	47%	60%	67%	59%

⁸ All 473 firms in the sample have an executive share option scheme, defined as a share option scheme open only to executives; excluded are both savings-based schemes and all-employee schemes.

Table 4.2 presents the percentage of firms with ESOs during the sample period which increases marginally. What is interesting to note, is that the percentage of firms with an EPS performance target in their ESOs which is due to vest increased from 47 percent in 2001 to 67 percent in 2003.

Table 4.3 presents the descriptive statistics for the *Raw AWCA* variable along with the absolute *AWCA* ($|AWCA|$) variable for each year and for the sample period as a whole. If the data for 2003 is considered, it would appear that looking at both the raw and absolute figures that this year has more earnings management but managing earnings upwards seems to be matched by downward earnings management. Table 4.2 and Table 4.3 suggest that 2003 is the year with the most incentive to meet a target, given the large percentage of firms with an EPS target and the high percentage of firms in that year with ESOs (with an EPS target) due to vest.

Table 4.3										
Earnings management variables										
	Mean	Median	Std. dev	Min	Max	1%	99%	Skewness	Kurtosis	Obs
	Raw AWCA^a									
Pooled	0.008	0.009	0.064	-0.342	0.366	-01.95	0.199	-0.338	8.121	703
2001	0.015	0.021	0.070	-0.342	0.221	-0.207	0.210	-0.964	7.370	212
2002	0.012	0.014	0.060	-0.173	0.366	-0.158	0.191	0.738	9.583	212
2003	0.000	-0.004	0.062	-0.289	0.242	-0.234	0.176	-0.470	8.054	279
	 AWCA ^b									
Pooled	0.044	0.031	0.047	0.000	0.366	0.000	0.234	2.540	12.175	703
2001	0.051	0.037	0.050	0.000	0.342	0.001	0.221	2.225	10.050	212
2002	0.042	0.029	0.045	0.000	0.366	0.001	0.191	2.958	17.167	212
2003	0.041	0.028	0.047	0.000	0.289	0.000	0.242	2.563	11.202	279

Notes:

^aThe means for 2002 and 2003 are statistically different.

^bThere is no statistical difference between the year means.

Table 4.4										
Raw AWCA by sign^a										
	Mean	Median	Std. dev	Min	Max	1%	99%	Skewness	Kurtosis	Obs
<i>NEGRAW^b</i>										
Pooled	0.042	0.026	0.051	0.000	0.342	0.000	0.236	2.572	11.264	302
2001	0.057	0.032	0.063	0.000	0.342	0.000	0.342	2.078	8.298	68
2002	0.040	0.024	0.042	0.000	0.173	0.000	0.173	1.566	4.602	79
2003	0.037	0.023	0.048	0.000	0.289	0.000	0.280	3.102	14.269	155
<i>POSRAW^c</i>										
Pooled	0.046	0.033	0.044	0.000	0.366	0.001	0.221	2.507	13.081	401
2001	0.048	0.038	0.041	0.000	0.221	0.001	0.218	1.877	7.568	144
2002	0.043	0.031	0.046	0.001	0.366	0.002	0.237	3.571	21.991	133
2003	0.046	0.030	0.045	0.000	0.242	0.000	0.229	1.875	7.390	124

Notes:

^a*NEGRAW* is the absolute value of the observations with negative *Raw AWCA*.

^bThe means for *NEGRAW* and *POSRAW* are not statistically different for the pooled data or for any individual year.

^c*POSRAW* is the observations with positive *Raw AWCA*.

Table 4.4 presents the statistics for *NEGRAW*, which is defined as the absolute value of negative observations of *Raw AWCA*, and the statistics for *POSRAW*, which is defined as the observations with positive *Raw AWCA*. The distributions are very similar in terms of the mean, median, skewness and kurtosis). Since this study is concerned with the direction of earnings management, and identifying circumstances under which earnings are managed downwards (upwards), the magnitude and not the sign is what is important in addressing the research question in this chapter.

The objective is to identify situations where management have incentives to manage earnings in a particular direction so *Raw AWCA* is the dependent variable rather than $|AWCA|$ as the *direction* of earnings management is what is of interest with respect to testing the hypotheses. $|AWCA|$ would be an appropriate dependent variable if the interest was in whether or not earnings management occurs.

Table 4.5 gives the growth in EPS over three years, broken down into actual growth, and target growth and it presents the results for the *MISS3* variables. *MISS3* is the actual increase/decrease in EPS over three years minus target (industry median). It is positive in two of the three years which is an indication that actual growth exceeded the target. As the target requires growth over a three-year period, individual years are not informative. This is because a firm could compensate in any year for missing the target in one or two other years of the (three-year) vesting period.

Table 4.5**Increase / decrease in EPS over three years**

	Mean	Median	Std. dev	Min	Max	1%	99%	Skewness	Kurtosis	Obs
<i>ACTUAL3</i>										
Pooled	0.117	0.009	0.809	-1.000	12.936	-1.000	2.404	8.784	125.832	703
2001	0.043	-0.001	0.495	-1.000	2.415	-1.000	1.590	1.256	6.981	212
2002	0.177	0.037	0.627	-1.000	3.318	-0.904	2.437	1.634	7.505	212
2003	0.127	0.014	1.077	-1.000	12.936	-1.000	2.400	9.020	99.873	279
<i>TARGET3</i>										
Pooled	0.106	0.094	0.178	-0.541	0.596	-0.409	0.596	-0.195	5.818	703
2001	0.200	0.173	0.111	0.059	0.539	0.059	0.539	2.149	6.901	212
2002	-0.006	0.022	0.176	-0.541	0.258	-0.541	0.258	-1.460	4.673	212
2003	0.120	0.061	0.175	-0.272	0.596	-0.272	0.596	1.036	4.477	279
<i>MISS3</i>										
Pooled	0.010	-0.068	0.804	-1.539	12.556	-1.150	2.030	8.435	119.366	703
2001	-0.157	-0.188	0.483	-1.539	2.030	-1.173	1.403	0.969	6.522	212
2002	0.182	0.087	0.627	-1.135	3.404	-1.008	2.415	1.535	7.589	212
2003	0.007	-0.050	1.055	-1.380	12.556	-1.181	2.117	9.077	100.885	279

Notes:

ACTUAL3 is defined as the actual three-year growth in EPS.

TARGET3 is defined as the target three-year growth in EPS.

MISS3 is defined as *ACTUAL3* minus *TARGET3*.

Figure 4.3 compares the level of *Raw AWCA* for firms that miss the target with firms that exceed the target. The means, whose difference is not significant, are:

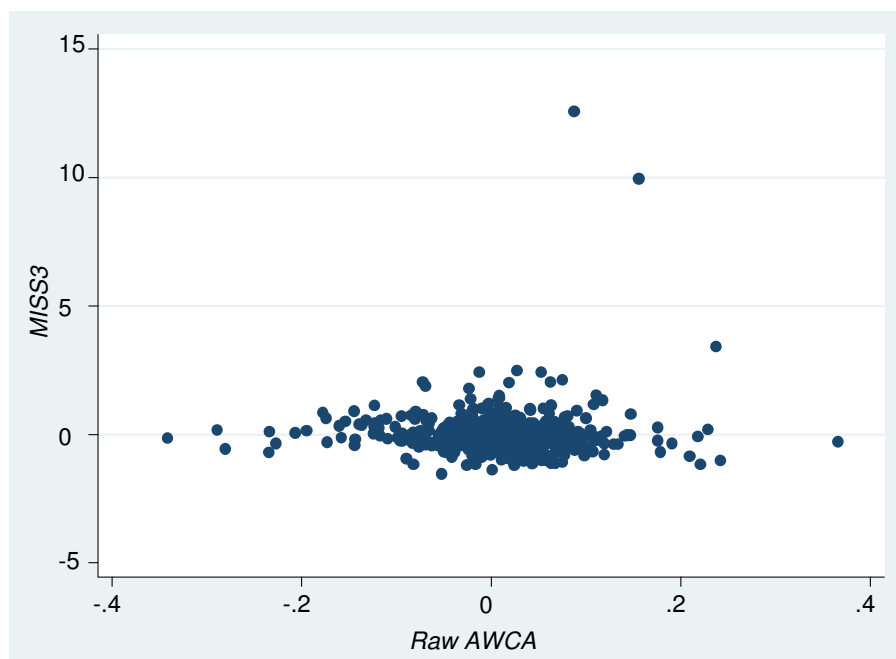
Firms missing target (406) *Raw AWCA*, mean = 0.0143

Firms exceeding target (297) *Raw AWCA*, mean = -0.0005

Figure 4.3 suggests a bunching of positive and negative *AWCA* when the target is missed, that is, when *MISS3* is near 0.

Figure 4.3

Raw AWCA* versus *MISS3



Notes:

MISS3 is defined as *ACTUAL3* minus *TARGET3*.

Raw AWCA is the signed measure of *AWCA*.

Table 4.6***UMEPS* versus actual growth in EPS**

	Mean	Median	Std. dev	Min	Max	1%	99%	Skewness	Kurtosis	Obs
<i>UMEPS</i>										
Pooled	-0.001	0.001	0.009	-0.130	0.009	-0.026	0.008	-6.042	114.641	703
2001	-0.000	0.000	0.009	-0.130	0.009	-0.008	0.003	-13.779	196.954	212
2002	0.000	0.000	0.002	-0.019	0.013	-0.007	0.007	-2.194	23.722	212
2003	-0.001	0.001	0.014	-0.133	0.110	-0.063	0.017	-2.912	55.234	279
<i>ACTUAL3</i>										
Pooled	0.117	0.009	0.809	-1.000	12.936	-1.000	2.404	8.784	125.832	703
2001	0.043	-0.001	0.495	-1.000	2.415	-1.000	1.590	1.256	6.981	212
2002	0.177	0.037	0.627	-1.000	3.318	-0.904	2.437	1.634	7.505	212
2003	0.127	0.014	1.077	-1.000	12.936	-1.000	2.400	9.020	99.873	279

Notes:

UMEPS is unmanaged EPS, that is, reported earnings minus positive abnormal accruals plus negative abnormal accruals.

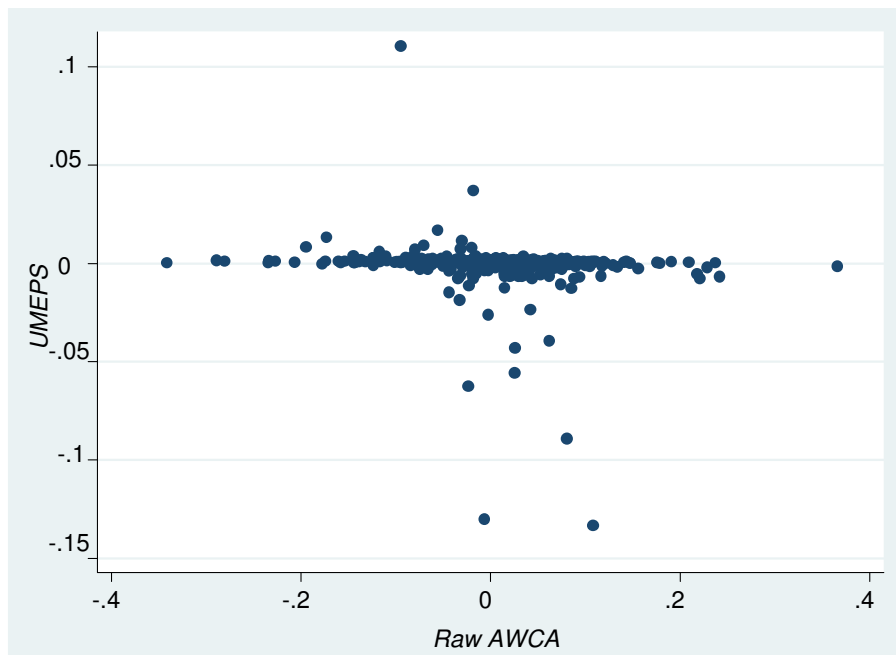
ACTUAL3 is defined as the actual three-year growth in EPS.

Table 4.6 above shows that the means of unmanaged EPS (*UMEPS*) per annum are much lower than the means of reported (actual) EPS three-year average growth. This makes sense as reported earnings can be defined as unmanaged earnings plus positive (or minus negative) abnormal accruals.

Figure 4.4 below compares the level of unmanaged earnings (*UMEPS*) for firms which have positive *Raw AWCA* (manage earnings upwards) with firms which have negative *Raw AWCA* (manage earnings downwards).

Figure 4.4

Raw AWCA* versus *UMEPS



Notes:

UMEPS is unmanaged EPS, that is, reported earnings minus positive abnormal accruals plus negative abnormal accruals.

Raw AWCA is the signed measure of *AWCA*.

Firms with negative <i>UMEPS</i> (198)	<i>Raw AWCA</i> , mean = 0.031
Firms with positive <i>UMEPS</i> (505)	<i>Raw AWCA</i> , mean = -0.000

Tests for differences in means:

Raw AWCA if *UMEPS* is negative versus *Raw AWCA* if *UMEPS* is positive, significantly different, $\Pr(|T| > |t|) = 0.000$

This confirms the findings in Peasnell *et al.* (2000) who document that UK firms with negative unmanaged earnings (and changes) have positive mean *AWCAs*. Their result holds for the pre-Cadbury (1992) period and they find that the increased level of governance post-Cadbury restrained the use of income-increasing *AWCAs* to avoid losses or earnings decline. The results of this study support the findings of Peasnell *et al.* (2000) over this study period which is post-Cadbury.

Table 4.7 below shows the descriptive statistics for the variables included in the regression models as control variables. These are included as prior research finds they have some consequence for the earnings management behaviour of firms. Consistent with PAT (Watts and Zimmerman, 1978, 1979), they include leverage (*LEV*) as a proxy for agency costs. Highly leveraged firms would be expected to manage earnings to smooth income and avoid any fluctuations that might trigger covenant violations. A positive association between *LEV* and *Raw AWCA* is expected.

From Table 4.7, just under half the firm years have ESOs with EPS targets due to vest (mean = 47 percent). This is represented by the variable *TARVEST*, an interaction term which is *EPSTARG*VESTED*. It captures years when ESOs with an EPS target are due to vest.

Table 4.7**Control variables (n = 703)**

Variable	Mean	Median	Std. dev	Min	Max	Skewness	Kurtosis
<i>LEV</i>	0.249	0.236	0.178	0.000	1.365	1.141	6.583
<i>ISSUE</i>	0.051	0.000	0.221	0.000	1.000	4.072	17.582
<i>GROWTH</i>	0.044	0.012	0.279	-0.811	2.760	2.827	22.315
<i>SIZE</i>	12.902	12.702	1.522	7.450	18.623	0.444	3.581
<i>RISK</i>	0.036	0.033	0.014	0.012	0.123	1.689	7.251
<i>CVSALES</i>	0.283	0.220	0.231	0.014	1.894	2.545	12.879
<i>VESTED</i>	0.589	1.000	0.492	0.000	1.000	-0.361	1.131
<i>TARVEST</i>	0.474	0.000	0.500	0.000	1.000	0.105	1.011

Notes:

LEV is the total book value of debt over total assets; *ISSUE* is an indicator variable that takes the value of 1 if the number of shares outstanding increases by more than 10 percent in the next accounting period and 0 otherwise; *GROWTH* is the change in the book value of assets over lagged assets; *SIZE* is the natural logarithm of fiscal year-end market capitalisation; *RISK* is measured as the volatility of share price over 60 monthly observations before the year of study similar to Aggarwal and Samwick (1999); *CVSALES* is the coefficient of variation of sales equal to standard deviation of the previous 5 years sales / mean of the previous 5 year sales; *VESTED* is an indicator variable that takes the value of 1 if ESOs are due to vest in the current year and 0 otherwise; *TARVEST* is an interaction term defined as $EPSTARGT * VESTED$.

Table 4.8 presents the four corporate governance variables, *BLOCK*, *BRDOWN*, *NEDS* and *BRDSIZE* which are incorporated in the regression models. The remaining corporate governance variables are used in robustness checks. Sound corporate governance structures are expected to reduce earnings management practices in firms. These include:

- The existence of high block holders (*BLOCK*).
- Greater ownership by board members (*BRDOWN*).
- Larger number of non-executive directors on the board (*NEDS*).
- Total number of board members (*BRDSIZE*).

The impact of board size is somewhat uncertain; in theory a larger board will reduce earnings management, as the larger the board the less the influence of any one person or group of persons. In practice it may mean less efficient decision-making as it may be more difficult to achieve consensus.

Table 4.8

Corporate governance variables (n = 703)

Variable	Mean	Median	Std. dev	Min	Max	Skewness	Kurtosis
<i>BLOCK</i>	0.849	1.000	0.358	0.000	1.000	-1.952	4.810
<i>BRDOWN</i>	0.061	0.007	0.126	0.000	0.820	3.135	13.609
<i>NEDS</i>	0.529	0.500	0.137	0.000	0.875	-0.193	3.211
<i>BRDSIZE</i>	8.596	8.000	2.394	3.000	20.000	0.759	4.098
<i>INSTOWN</i>	29.335	27.740	17.581	0.000	88.300	0.540	3.127
<i>DUAL</i>	0.087	0.000	0.282	0.000	1.000	2.936	9.620
<i>CEOREM</i>	0.020	0.000	0.140	0.000	1.000	6.873	48.235
<i>TEN</i>	0.562	1.000	0.497	0.000	1.000	-0.249	1.062
<i>BIG4</i>	0.950	1.000	0.218	0.000	1.000	-4.140	18.138

Notes:

BLOCK is an indicator variable which takes the value of 1 if the firm has an external stockholder owning ≥ 5 percent of the outstanding shares at the fiscal year-end and 0 otherwise; *BRDOWN* is the percentage of outstanding shares owned by members of the board at the fiscal year-end; *NEDS* is the percentage of non-executive directors on the board; *BRDSIZE* is the total number of board members; *DUAL* takes the value of 1 if the CEO is also the Chairman of the board and 0 otherwise; *CEOREM* is an indicator variable that takes the value of 1 if the CEO is a member of the Remuneration and 0 otherwise; *INSTOWN* is the percentage of outstanding shares at each year-end held by outside block holders committee and 0 otherwise; *TEN* is an indicator variable takes the value of 1 if the firm has an external stockholder owning greater than or equal to 10 percent of the outstanding shares at the fiscal year-end and 0 otherwise; *BIG4* is an indicator variable takes the value of 1 if the firm is auditor by one of the Big 4 audit firms and 0 otherwise.

Table 4.9 and Table 4.11 report the Pearson correlations between the variables defined using Method A (explained in Section 4.6.3 below) and Method B (explained in Section 4.6.4 below). Contrary to the *a priori* expectation, the presence of an EPS target in ESOs is negatively related to both *Raw AWCA* and $|AWCA|$. A possible explanation is the multi-period nature of the target, that

is, the growth in the target is over a three-year period rather than based on a single year's results.

Both Method A and Method B define the firms on the basis of *MISS3*. As *UMEPS* is used in Method B to further define the firms, it is important to note the correlation between it and *Raw AWCA*. Although significantly correlated at the 1% level, it is merely 13%. While *|AWCA|* is expected to be positively correlated with *CVSALES* as high sales volatility increases the demand for income-smoothing, there is no correlation between these two variables. In contrast, *RISK* is positively and significant correlated at the 1% level with *|AWCA|* as expected.

To test for collinearity among these variables, the Variance Inflation Factor (VIF) measures for the regressions in this study report VIF of under 5 for all other variables, which is generally considered acceptable. This suggests multicollinearity is not a problem (Hair, Black, Babin and Anderson, 2010).

Table 4.9

Correlation matrix – Groups defined using Method A (n = 703)

	AWCA	Raw AWCA	EPSTARG	LEV	ISSUE	GROWTH	SIZE	RISK	CVSALES	YEAR2001	YEAR2002	YEAR2003	BLOCK	BRDOWN
AWCA	1.00													
Raw AWCA	0.02	1.00												
EPSTARG	-0.13***	-0.08**	1.00											
LEV	-0.10***	0.04	0.04	1.00										
ISSUE	0.02	-0.10***	-0.09**	0.03	1.00									
GROWTH	0.05	-0.09**	-0.04	-0.04	0.37***	1.00								
SIZE	-0.08**	0.06	0.11***	0.14***	0.00	0.11***	1.00							
RISK	0.13***	-0.01	-0.18***	-0.09**	0.04	-0.20***	-0.38***	1.00						
CVSALES	0.00	-0.03	-0.17***	-0.08**	0.14***	0.06	-0.07*	0.28***	1.00					
YEAR2001	0.09**	0.07*	-0.05	0.02	0.16***	0.21***	0.07*	-0.20***	0.01	1.00				
YEAR2002	-0.03	0.04	0.00	0.03	0.04	-0.09**	-0.07*	-0.02	0.01	-0.43***	1.00			
YEAR2003	-0.06	-0.10***	0.05	-0.05	-0.19***	-0.11***	0.00	0.21***	-0.02	-0.53***	-0.53***	1.00		
BLOCK	0.02	0.01	-0.04	-0.07*	-0.01	-0.06	-0.38***	0.17***	0.02	0.00	0.00	0.00	1.00	
BRDOWN	0.07**	-0.07*	0.08**	-0.10**	-0.05	0.05	-0.18***	0.03	0.05	0.02	0.00	-0.02	-0.04	1.00
NEDS	-0.11***	0.05	0.01	0.14***	0.00	-0.11***	0.13***	0.11***	-0.01	-0.09**	0.01	0.07*	-0.02	-0.10***
BRDSIZE	-0.10***	0.05	0.09	0.20***	-0.01	0.01	0.55***	-0.24***	0.03	0.02	0.01	-0.03	-0.16***	-0.08**
GROUPA	0.04	0.08**	-0.04	0.07**	0.00	-0.15***	-0.21***	0.08**	-0.08**	0.15***	-0.12***	-0.03	0.11***	-0.06
GROUPB	-0.03	0.01	-0.06	-0.09**	-0.02	-0.04	-0.03	0.11***	0.02	0.07*	-0.10***	0.03	0.04	-0.01
GROUPC	-0.04	-0.01	0.05	0.07**	-0.04	0.05	0.20***	-0.10***	-0.06	-0.11***	0.00	0.10***	-0.10***	-0.02
GROUPD	0.02	-0.09***	0.06	-0.06	0.06	0.15***	0.05	-0.10***	0.12***	-0.12***	0.22***	-0.10**	-0.05	0.10**
VESTED	-0.09**	-0.03	0.08**	-0.02	0.05	0.00	0.02	0.12***	0.05	-0.16***	0.01	0.14***	0.02	-0.06
TARVEST	-0.12***	-0.05	0.51***	0.01	-0.01	0.01	0.12***	-0.04	-0.07*	-0.14***	0.00	0.13***	-0.03	-0.02
GROUPATV	-0.02	0.01	0.19***	0.05	0.04	-0.07*	-0.10***	0.07*	-0.05	0.02	-0.06*	0.04	0.09**	-0.04
GROUPBTV	-0.08**	0.00	0.19***	0.04	-0.06*	-0.06	0.03	0.00	-0.06	-0.03	-0.05	0.08**	-0.02	0.04
GROUPCTV	-0.05	-0.01	0.20***	0.00	-0.03	0.03	0.20***	-0.06*	-0.04	-0.09**	-0.04	0.12***	-0.08**	-0.03
GROUPDTV	-0.03	-0.09**	0.20***	-0.07*	0.03	0.10***	0.05	-0.07*	0.04	-0.11***	0.16***	-0.05	-0.03	0.00
UMEPS	0.00	-0.13***	0.01	0.05	0.02	0.00	-0.03	-0.07	-0.01	0.01	0.04	-0.04	-0.05	-0.09**
MISS3	0.07	0.03	0.03	-0.09**	0.02	0.10***	0.07**	-0.02	0.20***	-0.14***	0.14***	0.00	-0.04	0.01

Notes: * / ** / *** indicate significance at 10% / 5% / 1%. A full definition of the variables is provided in Appendix B.

Continued...

Table 4.9 *Continued*

Correlation matrix – Groups defined using Method A (n = 703)

	<i>NEDS</i>	<i>BRDSIZE</i>	<i>GROUPA</i>	<i>GROUPB</i>	<i>GROUPC</i>	<i>GROUPD</i>	<i>VESTED</i>	<i>TARVEST</i>	<i>GROUPATV</i>	<i>GROUPBTV</i>	<i>GROUPCTV</i>	<i>GROUPDTV</i>	<i>UMEPS</i>	<i>MISS3</i>
<i>NEDS</i>	1.00													
<i>BRDSIZE</i>	-0.02	1.00												
<i>GROUPA</i>	0.11***	-0.14***	1.00											
<i>GROUPB</i>	0.04	0.00	-0.37***	1.00										
<i>GROUPC</i>	-0.06	0.10***	-0.34***	-0.33***	1.00									
<i>GROUPD</i>	-0.10**	0.04	-0.34***	-0.32***	-0.30***	1.00								
<i>VESTED</i>	-0.06*	0.10***	-0.07*	0.00	0.06	0.02	1.00							
<i>TARVEST</i>	-0.03	0.14***	-0.07*	-0.03	0.06	0.05	0.79***	1.00						
<i>GROUPATV</i>	0.05	-0.04	0.58*	-0.21***	-0.20***	-0.20***	0.30***	0.38***	1.00					
<i>GROUPBTV</i>	-0.01	0.04	-0.22**	0.61***	-0.20***	-0.20***	0.30***	0.38***	-0.13***	1.00				
<i>GROUPCTV</i>	-0.04	0.15***	-0.23***	-0.22***	0.68**	-0.20***	0.31***	0.40***	-0.14***	-0.14***	1.00			
<i>GROUPDTV</i>	-0.06	0.06	-0.23***	-0.22***	-0.20***	0.68***	0.31***	0.39***	-0.13***	-0.13***	-0.14***	1.00		
<i>UMEPS</i>	0.03	-0.06	0.05	0.03	-0.04	-0.03	-0.04	-0.05	0.02	0.06	-0.08**	-0.08**	1.00	
<i>MISS3</i>	-0.08**	0.06	-0.44***	-0.12***	0.05	0.54	0.07*	0.06*	-0.24***	-0.07*	0.03	0.37***	-0.05	1.00

Notes: * / ** / *** indicate significance at 10% / 5% / 1%. A full definition of the variables is provided in Appendix B.

4.6.2 Empirical Models and Results

This section presents the results from the ordinary least squares regression (OLS) models. The firms are defined by the distance of their EPS from the target EPS using two methods, Method A and Method B. Both methods are defined and the results are presented in the following sections.

4.6.3 Method A

Model 1 represents the basic model which includes control variables, year dummies, corporate governance variables and the variable of interest, that is, *EPSTARG*.

This model represents variables expected to influence whether or not a firm manages earnings. The objective of this regression is to test the first hypothesis (H1) which is whether an EPS target in ESOs helps explain earnings management. Also of interest are both the sign and the magnitude of the relationship between *Raw AWCA* and the EPS target in ESOs.

To investigate the role of the variable of interest, that is, the existence of an EPS target in ESOs, the ordinary least squares regressions below are estimated on the pooled data. To define the groups into below, below and close, above and close, and above, quartiles of the *MISS3* variable are employed; the *MISS3* variable is defined as the actual three-year growth in EPS minus the target three-year growth in EPS:

GROUPA: firms in the bottom quartile of *MISS3*;

GROUPB: firms in the second quartile of *MISS3*;

GROUPC: firms in the third quartile of *MISS3*;

GROUPD: firms in the fourth quartile of *MISS3*.

Model 1 in Table 4.9 presents the regression results with *Raw AWCA* as the dependent variable. The results are presented in phases, with Model 1 showing

the EPS target variable and control variables from prior literature. Model 2 includes the groups and Model 3 adds the variable which tells whether or not ESOs are due to vest in that particular sample year.

Years when it is anticipated that managers have greater incentives to manage earnings are identified by the inclusion of an interaction term, *TARVEST*, which is *EPSTARG*VESTED*. The interaction terms between *GROUP* and *TARVEST* are to capture the scenario when there is an EPS target and some ESOs are due to vest in the year of observation.

Model 1⁹

$$Raw AWCA = \beta_0 + \beta_1 EPSTARG_{i,t} + \beta_2 LEV_{i,t} + \beta_3 ISSUE_{i,t} + \beta_4 GROWTH_{i,t} + \beta_5 SIZE_{i,t} + \beta_6 RISK_{i,t} + \beta_7 CVSALES_{i,t} + \beta_8 YEAR2002_{i,t} + \beta_9 YEAR2003_{i,t} + \beta_{10} BLOCK_{i,t} + \beta_{11} BRDOWN_{i,t} + \beta_{12} NEDS_{i,t} + \beta_{13} BRDSIZE_{i,t} + \varepsilon_{i,t}$$

Model 2

Model 2 includes, along with the variables from Model 1, sample firms defined by where they fall on the *MISS3* (*ACTUAL3 – TARGET3*) continuum. Those who are in the second quartile of the *MISS3* variable are considered to be below but close to the target. Here the sign and magnitude of the *GROUP* variables are of interest. This regression is designed to test the second two hypotheses outlined in 4.2, that is, to test the direction of earnings management behaviour. The direction is predicted depending on where actual EPS are in relation to the target. For example, in line with H2 (H3), firms in *GROUP2* (*GROUP3*) would be expected to manage earnings up (down) by a small amount to meet the target given that they are close to the target prior to any earnings management.

⁹Model 4 in Table 4.12 is a replicate of Model 1. While the results do not change, Model 4 is included in Table 4.12 as it provides a benchmark to compare the other models using Method B.

$$\begin{aligned}
Raw\ AWCA = & \beta_0 + \beta_1 EPSTARG_{i,t} + \beta_2 LEV_{i,t} + \beta_3 ISSUE_{i,t} + \beta_4 GROWTH_{i,t} + \\
& \beta_5 SIZE_{i,t} + \beta_6 RISK_{i,t} + \beta_7 CVSALES_{i,t} + \beta_8 YEAR2002_{i,t} + \beta_9 YEAR2003_{i,t} + \\
& \beta_{10} BLOCK_{i,t} + \beta_{11} BRDOWN_{i,t} + \beta_{12} NEDS_{i,t} + \beta_{13} BRDSIZE_{i,t} + \beta_{14} GROUPB_{i,t} + \\
& \beta_{15} GROUPEC_{i,t} + \beta_{16} GROUPD_{i,t} + \varepsilon_{i,t}
\end{aligned}$$

Model 3

Model 3 expands Model 2 by the inclusion of interaction terms which are the result of interacting the *GROUP* variables with *TARVEST* to represent firms which have ESO targets in their ESOs and have some ESOs due to vest in the year. Table 4.10 below presents the regression results from these models. This regression is designed to test whether or not there are stronger incentives to manage earnings in years when ESOs with an EPS target are due to vest. This is tested by the significance and sign of the interaction terms, *GROUPBTV*, *GROUPCTV* and *GROUPDTV*. While both *GROUPBTV* and *GROUPDTV* have the expected sign, none of the three interaction terms have any significance.

$$\begin{aligned}
Raw\ AWCA = & \beta_0 + \beta_1 EPSTARG_{i,t} + \beta_2 LEV_{i,t} + \beta_3 ISSUE_{i,t} + \beta_4 GROWTH_{i,t} + \\
& \beta_5 SIZE_{i,t} + \beta_6 RISK_{i,t} + \beta_7 CVSALES_{i,t} + \beta_8 YEAR2002_{i,t} + \beta_9 YEAR2003_{i,t} + \\
& \beta_{10} BLOCK_{i,t} + \beta_{11} BRDOWN_{i,t} + \beta_{12} NEDS_{i,t} + \beta_{13} BRDSIZE_{i,t} + \beta_{14} GROUPB_{i,t} + \\
& \beta_{15} GROUPEC_{i,t} + \beta_{16} GROUPD_{i,t} + \beta_{17} VESTED_{i,t} + \beta_{18} TARVEST_{i,t} + \\
& \beta_{19} GROUPBTV_{i,t} + \beta_{20} GROUPCTV_{i,t} + \beta_{21} GROUPDTV_{i,t} + \varepsilon_{i,t}
\end{aligned}$$

Table 4.10

Coefficient estimates and model summary statistics for OLS regressions of *Raw AWCA* on the existence of an EPS performance criterion in ESOs with control and corporate governance variables. Firms are categorised in Model 2 and Model 3 as per their hypothesised incentive to manage earnings.

Variables	Predicted Sign	Model 1 Coefficient (p-value) ^a	Model 2 Coefficient (p-value)	Model 3 Coefficient (p-value)
<i>Intercept</i>		-0.025 (0.385)	-0.026 (0.361)	-0.022 (0.457)
<i>EPSTARG</i>	?	-0.014** (0.031)	-0.014** (0.041)	-0.017 (0.108)
<i>LEV</i>	+	0.009 (0.566)	0.006 (0.679)	0.005 (0.734)
<i>ISSUE</i>	+	-0.032** (0.029)	-0.033** (0.026)	-0.032** (0.032)
<i>GROWTH</i>	+	-0.014 (0.185)	-0.010 (0.339)	-0.010 (0.342)
<i>SIZE</i>	-	0.003 (0.133)	0.003* (0.061)	0.003* (0.074)
<i>RISK</i>	+	0.158 (0.515)	0.135 (0.577)	0.153 (0.539)
<i>CVSALES</i>	+	-0.008 (0.500)	-0.005 (0.707)	-0.005 (0.710)
<i>YEAR2002</i>	?	-0.005 (0.448)	-0.001 (0.916)	-0.001 (0.918)
<i>YEAR2003</i>	?	-0.020*** (0.002)	-0.018*** (0.007)	-0.018*** (0.007)
<i>BLOCK</i>	-	0.005 (0.520)	0.005 (0.544)	0.005 (0.518)
<i>BRDOWN</i>	-	-0.026 (0.280)	-0.022 (0.366)	-0.023 (0.329)
<i>NEDS</i>	-	0.015 (0.414)	0.010 (0.601)	0.010 (0.597)
<i>BRDSIZE</i>	?	0.000 (0.681)	0.000 (0.675)	0.005 (0.646)
<i>GROUPB</i>	+		-0.008 (0.249)	-0.011 (0.263)
<i>GROUPC</i>	-		-0.008 (0.275)	-0.011 (0.330)
<i>GROUPD</i>	-		-0.016** (0.048)	-0.014 (0.245)
<i>VESTED</i>	?			-0.005 (0.667)
<i>TARVEST</i>	?			0.004 (0.792)
<i>GROUPBTV</i>	+			0.007 (0.571)
<i>GROUPCTV</i>	-			0.005 (0.697)
<i>GROUPDTV</i>	-			-0.004 (0.754)
N		703	703	703
R-squared		0.0500	0.0567	0.0583
F-stat		3.04	3.00	2.41

Notes:

^ap-values in brackets; * / ** / *** indicate significance at 10% / 5% / 1%.

The dependent variable is *Raw AWCA*; *EPSTARG* is an indicator variable that takes the value of 1 if there is an EPS target in ESOs and 0 otherwise; *LEV* is the total book value of debt over total assets; *ISSUE* is an indicator variable that takes the value of 1 if the number of shares outstanding increases by more than 10 percent in the next accounting period and 0 otherwise; *GROWTH* is the change in the book value of assets over lagged assets; *SIZE* is the natural logarithm of fiscal year-end market capitalisation; *RISK* is measured as the volatility of share price over 60 monthly observations before the year of study similar to Aggarwal and Samwick (1999); *CVSALES* is the coefficient of variation of sales = standard deviation of the previous 5 years sales / mean of the previous 5 year sales; *VESTED* is an indicator variable that takes the value of 1 if ESOs are due to vest in the current year and 0 otherwise; *YEAR2002* is an indicator variable that takes the value of 1 if the year is 2002 and 0 otherwise; *YEAR2003* is an indicator variable that takes the value of 1 if the year is 2003 and 0 otherwise; *BLOCK* is an indicator variable which takes the value of 1 if the firm has an external stockholder owning ≥ 5 percent of the outstanding shares at the fiscal year-end and 0 otherwise; *BRDOWN* is the percentage of outstanding shares owned by members of the board at the fiscal year-end; *NEDS* is the percentage of non-executive directors on the board; *BRDSIZE* is the total number of board members; *DUAL* takes the value of 1 if the CEO is also the Chairman of the board and 0 otherwise; *GROUPA* includes firms in the second quartile of *MISS3*; *GROUPB* includes firms in the third quartile of *MISS3*; *GROUPC* includes firms in the fourth quartile of *MISS3*; *VESTED* is an indicator variable that takes the value of 1 if ESOs are due to vest in the current year and 0 otherwise; *TARVEST* is an interaction term defined as *EPSTARGT*VESTED*; *GROUP2TV* is an interaction term defined as *GROUP2TV*TARVEST*; *GROUP3TV* is an interaction term defined as *GROUP3TV*TARVEST*; *GROUP4TV* is an interaction term defined as *GROUP4TV*TARVEST*.

Model 1 in Table 4.10 presents the results from the OLS regression of *Raw AWCA* on an EPS target in ESOs, variables found to be related to earnings management, year variables and corporate governance variables.

Model 1 results show:

- *EPSTARG* is negative and significant at the 5% level (-0.014 , $P > |z| = 0.031$).
- *ISSUE* is negative and significant at the 5% level (-0.032 , $P > |z| = 0.029$). As the dependent variable is *Raw AWCA*, this could be an indication of managing earnings downwards and upwards.
- *YEAR2003* is negative and significant at the 1% level (-0.021 , $P > |z| = 0.002$). The year variable is important as the incentive to manage earnings could be different from one year to another depending on the incentives faced by management. These incentives include the amount

of gain from options vesting if a target is met, whether other tranches of options are exercisable and/or the desire to influence the share price downwards if options are being rewarded.

- *GROWTH* is not significant and for all three versions of the model it is negative. Like *ISSUE*, perhaps this can be explained by the use of *Raw AWCA* which is not a reflection of the amount of earnings management, but a measure of the direction of any earnings management.

Model 2 results show:

- *EPSTARG* is negative and significant at the 5% level (-0.014, $P > |z| = 0.041$).
- *ISSUE* is negative and significant at the 5% level (-0.033, $P > |z| = 0.026$).
- *YEAR2003* is negative and significant at the 1% level (-0.018, $P > |z| = 0.007$), as it was in Model 1.
- This model contains the *GROUP* variables and both *GROUPE* and *GROUPD* manage earnings in the direction expected (downwards) the results for *GROUPD* are negative and significant at the 5% level (-0.016, $P > |z| = 0.048$). *GROUPB* being close but below the target was expected to manage earnings upward to meet target but the sign of the coefficient is negative.

Model 3 includes interaction terms which are designed to capture years in which there is an incentive to manage earnings due to an EPS target in ESOs which are due to vest in the year in question.

Model 3 results show:

- *ISSUE* is negative and significant at the 5% level (-0.032, $P > |z| = 0.032$).

- *YEAR2003* is negative and significant at the 1% level (-0.018 , $P > |z| = 0.007$).
- None of the interaction terms are significant but both *GROUPBTV* and *GROUPDTV* have the expected signs, positive and negative respectively.

Summarising, some negative association is found between *EPSTARG*, *ISSUE* and *YEAR2003* and *Raw AWCA*, indicating ESOs with an EPS target have some incentives for management to maximise the payout from the ESOs. While the direction of the association with the GROUP variables is as expected, apart from *GROUPD*, there is no significant association found.

4.6.4 Method B

As mentioned in Section 4.5.2 above a major challenge in the research design, given firms being close to the target and the limited data provided in the remuneration reports, is to distinguish between firms close but below the target and firms close but above the target. Having these firms defined would allow the testing of the theory that firms just below the target are expected to have incentives to manage up to meet the target while firms close but above would be expected to manage down to the target and thus bank accruals for future years. Firms above but not close to the target are expected to manage earnings down. To capture the above, four groups are defined using quartiles of the *MISS3* variable along with the *UMEPS* variable to differentiate the middle two groups as follows:

GROUP1: firms which fall into the first quartile of the *MISS3* variable and who are well below the target. If they have any capacity to manage earnings, it would likely lead them to manage downwards as they have no hope of hitting the target.

GROUP2: firms which are in the second and third quartile of the *MISS3* variable and also *have negative UMEPS*. These firms are defined as being below but close to the target and would be expected to manage upwards to meet the target.

GROUP3: firms which are in the second and third quartile of the *MISS3* variable but *have positive UMEPS*. These firms are defined as being above but close to the target and would be expected to manage downwards to just meet the target.

GROUP4: firms which fall into the fourth quartile of the *MISS3* variable are firms which are well above the target and would be expected to manage downwards and keep any reserves for future years.

GROUP2 and *GROUP3* comprise firms that are close to the target, to further divide them the sign of *UMEPS* is employed.

GROUP2 are starting not too far from the target and would be expected to have the capacity to manage earnings upwards by the amount required to meet the target despite having negative unmanaged earnings.

In contrast, *GROUP3* firms starting with positive unmanaged earnings can manage earnings down and still meet the target.

As indicated in Section 4.2.3 a major challenge this research faces is the fact that vesting targets apply to a three-year performance target. To address this, interaction terms between *GROUP* and *TARVEST* are defined to capture the scenario when there is an EPS target and some ESOs are due to vest in the year of observation.

Table 4.11 presents the correlations for the variables in the study where the *GROUPS* are defined using Method B, that is, *UMEPS* is used along with quartiles of *MISS3*. It is evident that no issues arise from any two variables being highly correlated.

Table 4.11

Correlation matrix – Groups defined using Method B (n = 703)

	AWCA	Raw AWCA	EPSTARG	LEV	ISSUE	GROWTH	SIZE	RISK	CVSALES	YEAR2001	YEAR2002	YEAR2003	BLOCK	BRDOWN
AWCA	1.00													
Raw AWCA	0.02	1.00												
EPSTARG	-0.13***	-0.08**	1.00											
LEV	-0.10***	0.04	0.04	1.00										
ISSUE	0.02	-0.10***	-0.09**	0.03	1.00									
GROWTH	0.05	-0.09**	-0.04	-0.04	0.37***	1.00								
SIZE	-0.08**	0.06	0.11***	0.14***	0.00	0.11***	1.00							
RISK	0.13***	-0.01	-0.18***	-0.09**	0.04	-0.20***	-0.38***	1.00						
CVSALES	0.00	-0.03	-0.17***	-0.08**	0.14***	0.06	-0.07*	0.28***	1.00					
YEAR2001	0.09**	0.07*	-0.05	0.02	0.16***	0.21***	0.07*	-0.20***	0.01	1.00				
YEAR2002	-0.03	0.04	0.00	0.03	0.04	-0.09**	-0.07*	-0.02	0.01	-0.43***	1.00			
YEAR2003	-0.06	-0.10***	0.05	-0.05	-0.19***	-0.11***	0.00	0.21***	-0.02	-0.53***	-0.53***	1.00		
BLOCK	0.02	0.01	-0.04	-0.07*	-0.01	-0.06	-0.38***	0.17***	0.02	0.00	0.00	0.00	1.00	
BRDOWN	0.07**	-0.07*	0.08**	-0.10**	-0.05	0.05	-0.18***	0.03	0.05	0.02	0.00	-0.02	-0.04	1.00
NEDS	-0.11***	0.05	0.01	0.14***	0.00	-0.11***	0.13***	0.11***	-0.01	-0.09**	0.01	0.07*	-0.02	-0.10***
BRDSIZE	-0.10***	0.05	0.09**	0.20***	-0.01	0.01	0.55***	-0.24***	0.03	0.02	0.01	-0.03	-0.16***	-0.08**
GROUP1	0.04	0.08**	-0.04	0.07**	0.00	-0.15***	-0.21***	0.08**	-0.08**	0.15***	-0.12***	-0.03	0.11**	-0.06
GROUP2	-0.02	0.18***	0.01	-0.03	0.00	0.01	0.12***	-0.03	-0.02	0.01	-0.01	-0.01	-0.02	0.01
GROUP3	-0.04	-0.13***	-0.02	0.00	-0.05	0.00	0.07*	0.03	-0.02	-0.04	-0.08**	0.12***	-0.04	-0.03
GROUP4	0.02	-0.09**	0.06	-0.06	0.06	0.15**	0.05	-0.10***	0.12***	-0.12***	0.22***	-0.10**	-0.05	0.10**
VESTED	-0.09**	-0.03	0.08**	-0.02	0.05	0.00	0.02	0.12***	0.05	-0.16***	0.01	0.14***	0.02	-0.06
TARVEST	-0.12***	-0.05	0.51***	0.01	-0.01	0.01	0.12	-0.04	-0.07*	-0.14***	0.00	0.13***	-0.03	-0.02
GROUP1TV	-0.02	0.01	0.19	0.05	0.04	-0.07*	-0.10***	0.07*	-0.05	0.02	-0.06*	0.04	0.09**	-0.04
GROUP2TV	-0.08**	0.07*	0.15***	-0.01	-0.04	-0.03	0.07*	-0.01	-0.03	-0.04	-0.01	0.05	-0.01	0.05
GROUP3TV	-0.06*	-0.05	0.24***	0.04	-0.05	0.00	0.16***	-0.05	-0.06	-0.08**	-0.08**	0.14***	-0.08**	-0.03
GROUP4TV	-0.03	-0.09**	0.20***	-0.07*	0.03	0.10***	0.05	-0.07*	0.04	-0.11***	0.16***	-0.05	-0.03	0.00
UMEPS	0.00	-0.13***	0.01	0.05	0.02	0.00	-0.03	-0.07*	-0.01	0.01	0.04	-0.04	-0.05	-0.09*
MISS3	0.07*	0.03	0.03	-0.09**	0.02	0.10***	0.07**	-0.02	0.20***	-0.14***	0.14***	0.00	-0.04	0.01

Notes: * / ** / *** indicate significance at 10% / 5% / 1%. A full definition of the variables is provided in Appendix B.

Continued...

Table 4.11 *Continued*

Correlation matrix – Groups defined using Method B (n = 703)

	<i>NEDS</i>	<i>BRDSIZE</i>	<i>GROUP1</i>	<i>GROUP2</i>	<i>GROUP3</i>	<i>GROUP4</i>	<i>VESTED</i>	<i>TARVEST</i>	<i>GROUP1TV</i>	<i>GROUP2TV</i>	<i>GROUP3TV</i>	<i>GROUP4TV</i>	<i>UMEPS</i>	<i>MISS3</i>
<i>BRDSIZE</i>	-0.02	1.00												
<i>GROUP1</i>	0.11***	-0.14***	1.00											
<i>GROUP2</i>	-0.03	0.07*	-0.24***	1.00										
<i>GROUP3</i>	0.00	0.04	-0.46	-0.30***	1.00									
<i>GROUP4</i>	-0.10**	0.04	-0.34***	-0.22***	-0.41***	1.00								
<i>VESTED</i>	-0.06*	0.10***	-0.07*	0.01	0.05	0.02	1.00							
<i>TARVEST</i>	-0.03	0.14***	-0.07	0.03	0.00	0.05	0.79***	1.00						
<i>GROUP1TV</i>	0.05	-0.04	0.58***	-0.14***	-0.27***	-0.20***	0.30***	0.38***	1.00					
<i>GROUP2TV</i>	-0.01	0.09**	-0.17***	0.68***	-0.20***	-0.15***	0.23***	0.29***	-0.10***	1.00				
<i>GROUP3TV</i>	-0.04	0.11***	-0.28***	-0.18***	0.61***	-0.25***	0.38***	0.48***	-0.16***	-0.12***	1.00			
<i>GROUP4TV</i>	-0.06	0.06	-0.23***	-0.15***	-0.28***	0.68***	0.31***	0.39***	-0.13***	-0.10***	-0.17***	1.00		
<i>UMEPS</i>	0.03	-0.06	0.05	-0.22***	0.14***	-0.03	-0.04	-0.05	0.02	-0.19***	0.10***	-0.08**	1.00	
<i>MISS3</i>	-0.08*	0.06	-0.44***	-0.03	-0.04	0.54***	0.07*	0.06*	-0.24***	-0.01	-0.02	0.37***	-0.05	1.00

Notes: * / ** / *** indicate significance at 10% / 5% / 1%. A full definition of the variables is provided in Appendix B.

Model 4

Model 4 is a repeat of Model 1 which represents the basic model which includes control variables, year dummies, corporate governance variables and the variable of interest, that is, *EPSTARG*. This model includes variables expected to influence whether or not a firm manages earnings. The focus of this regression is the sign and magnitude of the relationship between *Raw AWCA* and the existence of an EPS target in ESOs.

It is presented here in order to enable comparison with Model 5 and Model 6. These models define the GROUPS using *UMEPS* (which was not the case in Model 2 and Model 3 under Method A above).

$$\begin{aligned} \text{Raw AWCA} = & \beta_0 + \beta_1 \text{EPSTARG}_{i,t} + \beta_2 \text{LEV}_{i,t} + \beta_3 \text{ISSUE}_{i,t} + \beta_4 \text{GROWTH}_{i,t} + \\ & \beta_5 \text{SIZE}_{i,t} + \beta_6 \text{RISK}_{i,t} + \beta_7 \text{CVSALES}_{i,t} + \beta_8 \text{YEAR2002}_{i,t} + \beta_9 \text{YEAR2003}_{i,t} + \\ & \beta_{10} \text{BLOCK}_{i,t} + \beta_{11} \text{BRDOWN}_{i,t} + \beta_{12} \text{NEDS}_{i,t} + \beta_{13} \text{BRDSIZE}_{i,t} + \varepsilon_{i,t} \end{aligned}$$

Model 5

Model 5 is based on Model 4, with additional variables relating to where firms fall on the *MISS3* (actual EPS – target EPS) continuum. Those who are in the second quartile and third quartile of the *MISS3* variable are further defined by the sign of *UMEPS*. The firms in the second and third quartile and with negative *UMEPS* are considered to be below but close to the target. Moreover, the firms in the second and third quartile and with positive *UMEPS* are considered to be above but close to the target. Here the sign and magnitude of the GROUP variables is of interest.

$$\begin{aligned} \text{Raw AWCA} = & \beta_0 + \beta_1 \text{EPSTARG}_{i,t} + \beta_2 \text{LEV}_{i,t} + \beta_3 \text{ISSUE}_{i,t} + \beta_4 \text{GROWTH}_{i,t} + \\ & \beta_5 \text{SIZE}_{i,t} + \beta_6 \text{RISK}_{i,t} + \beta_7 \text{CVSALES}_{i,t} + \beta_8 \text{YEAR2002}_{i,t} + \beta_9 \text{YEAR2003}_{i,t} + \\ & \beta_{10} \text{BLOCK}_{i,t} + \beta_{11} \text{BRDOWN}_{i,t} + \beta_{12} \text{NEDS}_{i,t} + \beta_{13} \text{BRDSIZE}_{i,t} + \beta_{14} \text{GROUP2}_{i,t} + \\ & \beta_{15} \text{GROUP3}_{i,t} + \beta_{16} \text{GROUP4}_{i,t} + \varepsilon_{i,t} \end{aligned}$$

Model 6

Model 6 expands Model 5 by the inclusion of interaction terms which are the result of interacting the GROUP variables with *TARVEST* to represent firms which have ESO targets in their ESOs and have some ESOs due to vest in the year. Table 4.12 below presents the regression results from these models. The GROUPS are defined using Method B.

$$\begin{aligned} Raw\ AWCA = & \beta_0 + \beta_1 EPSTAR_{i,t} + \beta_2 LEV_{i,t} + \beta_3 ISSUE_{i,t} + \beta_4 GROWTH_{i,t} + \\ & \beta_5 SIZE_{i,t} + \beta_6 RISK_{i,t} + \beta_7 CVSALES_{i,t} + \beta_8 YEAR2002_{i,t} + \beta_9 YEAR2003_{i,t} + \\ & \beta_{10} BLOCK_{i,t} + \beta_{11} BRDOWN_{i,t} + \beta_{12} NEDS_{i,t} + \beta_{13} BRDSIZE_{i,t} + \beta_{14} GROUP2_{i,t} + \\ & \beta_{15} GROUP3_{i,t} + \beta_{16} GROUP4_{i,t} + \beta_{17} VESTED_{i,t} + \beta_{18} TARVEST_{i,t} + \\ & \beta_{19} GROUP2TV_{i,t} + \beta_{20} GROUP3TV_{i,t} + \beta_{21} GROUP4TV_{i,t} + \varepsilon_{i,t} \end{aligned}$$

Table 4.12

Coefficient estimates and model summary statistics for OLS regressions of Raw AWCA on the existence of an EPS performance criterion in ESOs with control and corporate governance variables. Firms are categorised in Model 5 and Model 6 as per their hypothesised incentive to manage earnings.

Variables	Predicted Sign	Model 4 Coefficient (p-value) ^a	Model 5 Coefficient (p-value)	Model 6 Coefficient (p-value)
<i>Intercept</i>		-0.025 (0.385)	-0.017 (0.537)	-0.012 (0.674)
<i>EPSTARG</i>	?	-0.014** (0.031)	-0.014** (0.033)	-0.016 (0.121)
<i>LEV</i>	+	0.009 (0.566)	0.008 (0.573)	0.007 (0.635)
<i>ISSUE</i>	+	-0.032** (0.029)	-0.034** (0.017)	-0.034** (0.019)
<i>GROWTH</i>	+	-0.014 (0.185)	-0.010 (0.354)	-0.010 (0.343)
<i>SIZE</i>	-	0.003 (0.133)	0.003 (0.136)	0.002 (0.233)
<i>RISK</i>	+	0.158 (0.515)	0.140 (0.540)	0.158 (0.498)
<i>CVSALES</i>	+	-0.008 (0.500)	-0.005 (0.710)	-0.005 (0.686)
<i>YEAR2002</i>	?	-0.005 (0.448)	-0.001 (0.842)	-0.001 (0.839)
<i>YEAR2003</i>	?	-0.020*** (0.002)	-0.017*** (0.009)	-0.018*** (0.009)
<i>BLOCK</i>	-	0.005 (0.520)	0.003 (0.649)	0.004 (0.625)
<i>BRDOWN</i>	-	-0.026 (0.280)	-0.025 (0.295)	-0.025 (0.302)
<i>NEDS</i>	-	0.015 (0.414)	0.013 (0.495)	0.015 (0.411)
<i>BRDSIZE</i>	?	0.000 (0.681)	0.000 (0.663)	0.001 (0.543)
<i>GROUP2</i>	+		0.021*** (0.005)	0.030*** (0.005)
<i>GROUP3</i>	-		-0.018*** (0.008)	-0.024*** (0.009)
<i>GROUP4</i>	-		-0.015 (0.062)	-0.012 (0.293)
<i>VESTED</i>	?			-0.002 (0.839)
<i>TARVEST</i>	?			0.002 (0.919)
<i>GROUP2TV</i>	+			-0.017 (0.199)
<i>GROUP3TV</i>	-			0.014 (0.248)
<i>GROUP4TV</i>	-			-0.005 (0.744)
N		703	703	703
R-squared		0.0500	0.0923	0.0992
F-stat		3.04	5.60	4.47

Notes:

^ap-values in brackets; * / ** / *** indicate significance at 10% / 5% / 1%.

The dependent variable is *Raw AWCA*; *EPSTARG* is an indicator variable that takes the value of 1 if there is an EPS target in ESOs and 0 otherwise; *LEV* is the total book value of debt over total assets; *ISSUE* is an indicator variable that takes the value of 1 if the number of shares outstanding increases by more than 10 percent in the next accounting period and 0 otherwise; *GROWTH* is the change in the book value of assets over lagged assets; *SIZE* is the natural logarithm of fiscal year-end market capitalisation; *RISK* is measured as the volatility of share price over 60 monthly observations before the year of study similar to Aggarwal and Samwick (1999); *CVSALES* is the coefficient of variation of sales = standard deviation of the previous 5 years sales / mean of the previous 5 year sales; *VESTED* is an indicator variable that takes the value of 1 if ESOs are due to vest in the current year and 0 otherwise; *YEAR2002* is an indicator variable that takes the value of 1 if the year is 2002 and 0 otherwise; *YEAR2003* is an indicator variable that takes the value of 1 if the year is 2003 and 0 otherwise; *BLOCK* is an indicator variable which takes the value of 1 if the firm has an external stockholder owning ≥ 5 percent of the outstanding shares at the fiscal year-end and 0 otherwise; *BRDOWN* is the percentage of outstanding shares owned by members of the board at the fiscal year-end; *NEDS* is the percentage of non-executive directors on the board; *BRDSIZE* is the total number of board members; *GROUP2* includes firms which are in the second and third quartile of the *MISS3* variable and also *have negative UMEPS*; *GROUP3* includes firms which are in the second and third quartile of the *MISS3* variable but *have positive UMEPS*; *GROUP4* includes firms which fall into the fourth quartile of the *MISS3* variable; *VESTED* is an indicator variable that takes the value of 1 if ESOs are due to vest in the current year and 0 otherwise; *TARVEST* is an interaction term defined as *EPSTARGT*VESTED*; *GROUP2TV* is an interaction term defined as *GROUP2TV*TARVEST*; *GROUP3TV* is an interaction term defined as *GROUP3TV*TARVEST*; *GROUP4TV* is an interaction term defined as *GROUP4TV*TARVEST*.

Model 5 results show:

- *EPSTARG* is negative and significant at the 5% level (-0.014, $P > |z| = 0.033$).
- *ISSUE* and *YEAR2003* remain negative and significant.
- *GROUP2* (below but close to the target) is positive as expected and significant at the 1% level, (0.021, $P > |z| = 0.005$). This suggests that firms in this GROUP manage earnings upwards to meet the target as hypothesised.
- *GROUP3* (above but close to the target) is negative and significant at the 1% level as hypothesised (-0.024, $P > |z| = 0.009$).
- *GROUP4* is not significant. The direction of the coefficient is as expected, suggesting these firms manage earnings downwards to avoid 'wasting' earnings.

Model 6 tests the hypotheses stated in 4.2 which are as follows:

H2: Actual EPS well below target EPS: Managers manage earnings downwards.

H3: Actual EPS just below target EPS: Managers manage earnings upwards to meet target and ensure ESOs vest.

H4: Actual EPS just above target EPS: Managers manage earnings downwards to meet target and store earnings for future years; and

H5: Actual EPS well above target EPS: managers manage earnings downwards and store excess earnings for future years.

H3 uses firms in *GROUP2*, which as predicted, manage earnings upwards to meet the target to which they are close.

H4 uses firms in the *GROUP3* definition and they, as predicted, manage earnings down to the target and thus avoid 'wasting' earnings which can be used in subsequent years.

H5 covers firms in *GROUP4* and the sign of the relationship is negative as expected. However, unlike the findings for firms in *GROUP2* and *GROUP3*, the results for *GROUP4* are not significant.

Model 6 reports much the same results as Model 5, which is disappointing as it was anticipated that the interaction terms would capture the strength of the incentive effect on the firms depending on their juxtaposition to the target EPS.

Model 6 results show:

- *ISSUE* is negative and significant at the 5% level as in Model 5. This is not the expected sign as firms would be expected to manage earnings

upwards prior to issuing new shares to make the issue attractive to potential shareholders.

- For the interaction terms between *TARVEST* and the groups which were defined to capture the earnings management in a year when ESOs with EPS targets vest, the coefficients are not significant. Perhaps this is in some way due to research design which does not isolate or measure the incentive effect in any one year. The lack of information on the value of ESOs, granted, vesting and exercised in any one year restricts the further development of this research question.

4.6.5 Robustness Tests

This section reports the results of some additional analysis to assess the sensitivity of the Table 4.12 results to alternative variable measurement of the quality of corporate governance of firms. The motive behind these tests is that it would be anticipated that some corporate governance variables would be significant, as good corporate governance should reduce earnings management by firms. Whether the particular selection of corporate governance variables was important is therefore of interest. Substituting *TEN*, *INSTOWN*, *DUAL*, *CEOREM* and *BIG4* as the corporate governance variables gives the following results reported in Table 4.13 below:

- In Model 4, all the variables are unchanged apart from *SIZE* which becomes significant at the 1% level (0.005, $P > |z| = 0.000$).
- In Model 5, *SIZE* is significant at 1%, *YEAR2003* is significant at 5%, *INSTOWN* is significant at 5% and *GROUP4* becomes significant at 5% as opposed to 1%. *INSTOWN* is positive and significant at 5% level (0.000, $P > |z| = 0.018$) indicating institutional owners have some influence in reducing earnings management in firms. *GROUP4* increases in significance to 5%. This indicates that the choice of corporate

governance variables may impact the results of an earnings management study.

- In Model 6, *SIZE* is significant at 1%, *INSTOWN* is significant at 5% and the significance of *GROUP3* is now 5% as opposed to 1% in Model 6 applying the alternative corporate governance variables.

Table 4.13

Coefficient estimates and model summary statistics for OLS regressions of Raw AWCA on the existence of an EPS performance criterion in ESOs with control and alternative corporate governance variables. Firms are categorised in Model 5 and Model 6 as per their hypothesised incentive to manage earnings.

Variables	Predicted Sign	Model 4 Coefficient (p-value) ^a	Model 5 Coefficient (p-value)	Model 6 Coefficient (p-value)
<i>Intercept</i>		-0.043 (0.084)	-0.033 (0.175)	-0.028 (0.260)
<i>EPSTARG</i>	?	-0.014** (0.028)	-0.014** (0.031)	-0.015 (0.122)
<i>LEV</i>	+	0.011 (0.448)	0.010 (0.489)	0.009 (0.531)
<i>ISSUE</i>	+	-0.030** (0.042)	-0.032** (0.026)	-0.032** (0.028)
<i>GROWTH</i>	+	-0.016 (0.125)	-0.011 (0.281)	-0.012 (0.260)
<i>SIZE</i>	-	0.005*** (0.000)	0.005*** (0.001)	0.005*** (0.001)
<i>RISK</i>	+	0.185 (0.447)	0.166 (0.472)	0.189 (0.422)
<i>CVSALES</i>	+	-0.009 (0.476)	-0.005 (0.664)	-0.006 (0.640)
<i>YEAR2002</i>	?	-0.004 (0.567)	0.000 (0.977)	0.000 (0.976)
<i>YEAR2003</i>	?	-0.019*** (0.002)	-0.017** (0.011)	-0.017** (0.010)
<i>TEN</i>	-	-0.003 (0.671)	-0.005 (0.398)	0.006 (0.323)
<i>INSTOWN</i>	-	0.000** (0.016)	0.000** (0.018)	0.000** (0.013)
<i>DUAL</i>	-	0.009 (0.420)	0.005 (0.629)	0.006 (0.599)
<i>CEOREM</i>	?	0.011 (0.615)	0.013 (0.541)	0.012 (0.561)
<i>BIG4</i>	-	-0.015 (0.165)	-0.014 (0.201)	-0.015 (0.188)
<i>GROUP2</i>	+		0.020*** (0.006)	0.030*** (0.004)
<i>GROUP3</i>	-		-0.018*** (0.008)	-0.024** (0.011)
<i>GROUP4</i>	-		-0.017*** (0.037)	-0.013 (0.248)
<i>VESTED</i>	?			-0.002 (0.857)
<i>TARVEST</i>	?			0.002 (0.904)
<i>GROUP2TV</i>	+			-0.018 (0.155)
<i>GROUP3TV</i>	-			0.014 (0.273)
<i>GROUP4TV</i>	-			-0.006 (0.658)
N		703	703	703
R-squared		0.0577	0.0984	0.1057
F-stat		3.74	5.84	4.72

Notes:

^ap-values in brackets; * / ** / *** indicate significance at 10% / 5% / 1%.

The dependent variable is *Raw AWCA*; *EPSTARG* is an indicator variable that takes the value of 1 if there is an EPS target in ESOs and 0 otherwise; *LEV* is the total book value of debt over total assets; *ISSUE* is an indicator variable that takes the value of 1 if the number of shares outstanding increases by more than 10 percent in the next accounting period and 0 otherwise; *GROWTH* is the change in the book value of assets over lagged assets; *SIZE* is the natural logarithm of fiscal year-end market capitalisation; *RISK* is measured as the volatility of share price over 60 monthly observations before the year of study similar to Aggarwal and Samwick (1999); *CVSALES* is the coefficient of variation of sales = standard deviation of the previous 5 years sales / mean of the previous 5 year sales; *VESTED* is an indicator variable that takes the value of 1 if ESOs are due to vest in the current year and 0 otherwise; *YEAR2002* is an indicator variable that takes the value of 1 if the year is 2002 and 0 otherwise; *YEAR2003* is an indicator variable that takes the value of 1 if the year is 2003 and 0 otherwise; *TEN* is an indicator variable which takes the value of 1 if the firm has an external stockholder owning ≥ 5 percent of the outstanding shares at the fiscal year-end and 0 otherwise; *INSTOWN* is the percentage of outstanding shares at each year-end held by outside block holders; *DUAL* is an indicator variable taking the value of 1 if the CEO is also Chairman of the board and 0 otherwise; *CEOREM* is an indicator variable taking the value of 1 if the CEO is a member of the Remuneration Committee and 0 otherwise; *BIG4* is an indicator variable taking the value of 1 if the firm is audited by one of the Big 4 audit firms and 0 otherwise; *GROUP2* includes firms which are in the second and third quartile of the *MISS3* variable and also *have negative UMEPS*; *GROUP3* includes firms which are in the second and third quartile of the *MISS3* variable but *have positive UMEPS*; *GROUP4* includes firms which fall into the fourth quartile of the *MISS3* variable; *VESTED* is an indicator variable that takes the value of 1 if ESOs are due to vest in the current year and 0 otherwise; *TARVEST* is an interaction term defined as *EPSTARGT*VESTED*; *GROUP2TV* is an interaction term defined as *GROUP2TV*TARVEST*; *GROUP3TV* is an interaction term defined as *GROUP3TV*TARVEST*; *GROUP4TV* is an interaction term defined as *GROUP4TV*TARVEST*.

To adjust for possible influential outliers, all variables were winsorised at 1% and 99% and there were no changes to the results (not reported) in the three models using *Raw AWCA* as the dependent variable.

To consider whether the results were sensitive to the choice of the signed AWCA, the results were re-estimated using $|AWCA|$ as the dependent variable. As these results were not significant, they support the finding that the direction of earnings management, as opposed to earnings management *per se*, impacts on the accounting choices of management with ESOs with an EPS performance criterion.

4.7 Conclusions

This research examines the impact of an EPS target in ESOs on the AWCA choices of management. Using UK non-financial firms during the period 2001

through 2003, there is a statistically significant link between an EPS target and the earnings management behaviour of firms. The direction of the earnings management seems to be linked to the position of the firm relative to the target.

The existence of an EPS target is significant in all of the regressions, with *Raw AWCA* as the dependent variable, apart from Model 3 and Model 6. The study postulates that the existence of an EPS target in ESOs will lead to earnings management. The direction of the earnings management is dependent on how close or far the firm is from the earnings target. This is consistent with there being a cap on the payout to management, but reporting earnings above that cap is not optimal. It also coincides with the scenario where a target is beyond available accrual management, where managers use negative abnormal accruals to store earnings for future years.

Models 5 and 6 support the following expectations:

- Firms close but below the target (*GROUP2*) will use positive abnormal accruals.
- Firm close but above the target (*GROUP3*) will use negative abnormal accruals.
- For firms above the target (*GROUP4*), abnormal accruals are negative in agreement with the hypothesis but the association is not significant.

When firms in the sample issue shares in subsequent years, this significantly reduces earnings management. This is in contrast to prior research that shows firms increase earnings management prior to issuing shares.

Corporate governance mechanisms are designed to address the problems associated with the separation of ownership and control. Strong corporate governance mechanisms are expected to reduce agency problems by

monitoring managers. *INSTOWN*¹⁰ is the only corporate governance variable to reduce earnings management in this sample of UK firms.

This study is subject to a number of limitations: first, the value of the ESOs held by the executives is not known, and therefore cannot be included in the regressions. Supposedly, the larger the potential benefit, the higher the incentive to manage earnings. Second, the information provided in the remuneration reports was not sufficient to allow the determination of the actual target. To overcome this, a proxy was developed to capture the targets. Third, there may be many tranches of ESOs (options granted, options not due to vest, options vesting and options vested but unexercised) all with various monetary values. This might be responsible for the insignificant *TARVEST* result.

Future research would benefit greatly from having an actual target to test the theories explored in this research in addition to some measure of the level of the incentive in any particular year.

The key finding of this chapter is that the incentives management receive from ESOs with an EPS target might not be consistent with the thinking behind the introduction of such targets. The results show:

- If a target is not going to be met, there are incentives to manage earnings downwards. (As Healy (1985) found when there were bogeys and caps on bonus payments).
- If unmanaged earnings are above the required target, firms have incentives to manage earnings downwards.

Considerable research documents that firms manage reported earnings to meet certain reporting goals. The next chapter will focus on the role played by an EPS target in ESOs with respect to the relationship between an EPS target in ESOs and the firm's propensity to meet or beat annual analysts' earnings

¹⁰ The percentage of outstanding shares at each year-end held by outside block holders.

forecasts. It will examine circumstances where an EPS target might be expected to lead managers to focus on short-term objectives, in this case, meeting or beating analysts' forecasts.

The purpose of Chapter 5 is to study the inter-relationship between an EPS target in ESOs and the probability of meeting or beating analysts' EPS forecasts. In addition to considering the existence of an EPS target, as in this chapter, the research will be extended to include various situations, defining firms by how close they are to the EPS target.

Chapter 5

Does an Earnings per Share Target in Executive Share Options Help Explain Whether a Firm Meets or Beats Analysts' Forecasts?

5.1 Introduction

The main objective of regulators in developing a model for reporting financial performance is the provision of information that is relevant for economic decision-making in addition to being adequately reliable. Although comprehensive income is considered suitable for assessing stewardship, it is affected by temporary shocks in performance. As a result, managers, analysts and investors increasingly rely on adjusted earnings, which exclude transitory income elements. While firms may use adjusted earnings to provide an indicator of sustainable profitability, they may opportunistically remove items in an attempt to hide poor underlying performance.

The disclosure of alternative EPS (a voluntary decision, whose precise definition is chosen by management) was found in Chapter 3 to have a positive relationship with the existence of an EPS target in ESOs. In other words, an EPS target in ESOs increases the likelihood that management will choose to disclose an alternative EPS figure.

There are three generally agreed purposes for accounting choices made by management as outlined in Chapter 3: contracting motivations, external party considerations and asset pricing motivations (Fields *et al.* 2001).

Accounting choices for contractual incentives affect the firms' cash flows either by managers choosing the most efficient methods to maximise firm value or by behaving opportunistically leading to a transfer wealth from the firm to themselves. In Chapter 3, the research design did not allow the testing of whether the disclosure decision represented opportunistic behaviour on the part of management or an attempt to provide a better measure of sustainable earnings. The objective was to explore whether an EPS target in any executive's remuneration component (bonus, ESOs and LTIPs) could help explain the accounting choices made by management. The results indicated that an EPS target in ESOs did increase the probability that an alternative EPS figure was disclosed by firms. This encouraged the continuation of the study of the impact of an EPS target in ESOs on other accounting decisions executives

make. The increase in the probability of the disclosure of an alternative EPS figure encouraged the development of a research design to test whether management were managing earnings to the EPS performance target in their ESOs.

The increased importance of SBC in UK executive remuneration contracts, and the tendency for some of these contracts to be based, at least in part, on accounting measures of performance, lead to a renewed interest in the link between earnings management and executive compensation. The earnings management study in Chapter 4 also found evidence that executives act opportunistically when there is an EPS target in their ESOs. The results showed that firms which were below but close to the EPS target managed earnings upwards in a vesting year to meet the target, and the relationship was significant. In agreement with Healy (1985), Chapter 4 shows that management have incentives to manage earnings downwards. For example where firms beat a target, that is, where actual EPS growth is greater than target EPS growth, then downwards earnings management would result in any surplus earnings being carried forward to future accounting periods.

A major issue in the accounting literature with respect to earnings management research is a debate about earnings management identification and estimation models (McNichols 2000; and Guay, Kothari and Watts, 1996). This debate questions the suitability of accruals models like the model applied in Chapter 4. Some recent research avoids these issues by adopting other proxies for earnings management. For example, Cheng and Warfield (2005) test whether or not reported earnings meet or just beat analysts' forecasts while Bergstresser and Philippon (2006) use option exercise, and selling of shares in addition to abnormal accruals. Studies of earnings management have indicated that the disproportionate likelihood of meeting or just beating analysts' forecasts is an important manifestation of earnings management (Degeorge, Patel and Zeckhauser, 1999; Burgstahler and Eames, 2003).

Considerable research documents that firms manage reported earnings to meet certain reporting goals (see for example, Healy, 1985; Holthausen, Larcker and

Sloan, 1995a; Moerhle, 2002). In addition, evidence in Matsumoto, 2002; Bartov, Givoly and Hayn, 2002; Richardson, Teoh and Wysocki, 2004, shows that firms guide analysts' forecasts downward in order to make earnings targets more achievable. Degeorge *et al.* (1999) provide evidence of earnings management driven by three thresholds in the following hierarchical order: report positive profits; sustain prior year earnings level and lastly, analysts' forecasts.

A UK study by Athanasakou, Strong and Walker (2009) explores whether UK firms engage in earnings management or forecast guidance to meet or beat analysts' forecasts. Their results indicate that UK firms are more likely to engage in earnings forecast guidance, or for a subset of larger firms, in classification shifting, rather than in accruals management, to avoid missing analysts' forecasts. Another impact of earnings benchmarks, such as the consensus analyst forecast, is that they have been found to play an important role in capital markets. Several studies (including Bartov *et al.* 2002; Kasznik and McNichols, 2002) find that investors assign a valuation premium to firms that meet or beat a benchmark level of expected earnings after controlling for the earnings forecast error for the period. Consistent with investors' focus on earnings benchmarks, Graham, Harvey and Rajgopal (2005) provide survey evidence that 80 percent of financial executives would take value-decreasing actions to meet or beat the consensus earnings forecast.

The incentives that managers have to meet analysts' forecasts is the evidence from prior research which suggests the stock market rewards firms meeting current earnings expectations (Bartov *et al.* 2002; Kasznik and McNichols, 2002). As the payout from ESOs is tied to share price performance, and with the market rewarding firms that meet or beat analysts' forecasts, managers of firms with ESOs face heightened incentives to meet or beat analysts' expectations (Bauman and Shaw, 2006).

Other research also shows that firms manage reported earnings to meet certain reporting goals (see for example, Healy, 1985; Holthausen *et al.* 1995a; Moerhle, 2002). In addition, there is evidence that managers are willing to sacrifice economic value to meet short-term earnings targets. As mentioned

above, the evidence in the Graham *et al.* (2005) survey reports that a majority of managers would forgo a project with positive net present value if the project would cause them to fall short of the current quarter consensus forecast. When asked what actions they might take to meet an earnings target, approximately 80 percent suggest they would decrease discretionary spending, including research and development and advertising expenditure.

In view of the above, the objective of this chapter is to study the inter-relationship between an EPS target in ESOs and the probability of meeting or beating analysts' EPS forecasts. The research will consider earnings surprise as the dependent variable in an effort to determine whether management have a pecking order with respect to meeting analysts' forecasts or, where one exists, an EPS target in their ESOs. In addition to considering the existence of an EPS target, the research is extended to examine various situations where firms are defined by how close they are to the EPS target. As in the earnings management study, firms which are below, close or above the target EPS are compared and an interaction term is incorporated, the latter being based on whether ESOs are due to vest in a year. This is an effort to establish whether meeting analysts' expectations or the EPS target in their ESOs takes priority.

Two views might be expected to play a role when the interplay between meeting analysts' forecasts and ESOs with an EPS target is considered, they are as follows:

- (1) The presence of an EPS target¹¹ makes it easier for analysts to forecast the EPS because a target provides useful information to the analysts. Because of this, this would be expected to lead to a positive relationship between the EPS target and the propensity to meet or beat (assuming some imperfect information) analysts' forecasts.

¹¹ As previously noted, the EPS target managers are generally required to meet is measured over a three-year period.

- (2) Managers rewarded on the achievement of an EPS target, internalise that target and see that target (which has a direct impact on their income) as taking precedence over meeting analysts' forecasts.

Using a sample of UK non-financial firms, logit regressions of the probability of meeting or beating analysts' forecasts (and just meeting or beating) on incentives are estimated.

Insights will be developed into particular patterns of earnings management that Healy (1985) and Degeorge *et al.* (1999) highlight through the classification of the firms according to their position relative to the targets thresholds they are anticipated to be aiming to meet with respect to their ESOs. The research will test whether there are firms with an EPS performance criterion in their ESOs who will manage earnings upwards to meet these targets, regardless of the impact on meeting or beating analysts' forecasts. Likewise, the research will test whether there are firms with motives to manage downwards, where for example the firms are far from the performance target or have excess earnings which can be saved for use in future periods, and do manage earnings downwards irrespective of whether or not this leads them to miss analysts' forecasts.

The results provide some support for the idea that an EPS target in ESOs is a more important benchmark for managers than meeting analysts' forecasts.

This study makes several contributions to the literature as follows:

1. This study contributes to current research by including the existence of an EPS target in the ESOs along with earnings targets that the literature claims to be important to management (that is, positive earnings, an increase in earnings on the previous year, meeting or beating analysts' forecasts) and control variables that prior studies have deemed relevant.
2. It confirms the findings of prior research that management are concerned with reporting positive earnings and a positive growth in profit.

3. It suggests that the existence of an EPS target in ESOs reduces the probability that a firm will meet or beat analysts' forecasts.
4. The significant negative coefficients on EPS target and firms grouped by the distance actual EPS is from target EPS¹² and whether or not ESOs are due to vest in that year, suggests that analysts are not aware of the EPS target. If analysts are aware of the target, one would expect their forecasts to reflect the target and thus firms would be more likely to meet analysts' forecasts.

The remainder of this chapter is organised as follows. Section 2, outlines the theoretical framework and develops the hypotheses. Section 3 provides the research design and outlines the sample selection and definition of variables. Section 4 presents and discusses the empirical results and Section 5 concludes.

5.2 Literature Review and Hypotheses Development

There are two strands of accounting research covering analysts' forecasts. The most popular stream focuses on the reporting objectives and reporting strategies of managers. Another significant stream focuses on the incentives and forecasting strategies of analysts as there are incentives for analysts to correctly forecast earnings, for example, large earnings surprises hurt analysts' reputations and even threaten their job security (Stickel 1992; Mikhail, Walther, and Willis, 1999). See Kothari (2001) for a review of the literature covering the analysts' incentives.

This chapter focuses on the former strand of research and examines evidence to establish whether managers of firms with ESOs whose vesting is contingent on the achievement of an EPS target, have stronger incentives to report earnings that meet or beat analysts' forecasts. This study extends the literature

¹² The target to be reached for ESOs to vest.

to include consideration of the role played by an EPS target in managers' ESOs.

5.2.1 Meeting Targets with Abnormal Accruals

In the literature which considers the methods that firms use to meet or beat analysts' forecasts, two methods are the focus of the majority of this research: positive abnormal accruals and earnings forecast guidance.

There is a plethora of studies supporting the use of WCA to meet earnings targets which are well documented in Athanasakou *et al.* (2009). These include Burgstahler and Dichev (1997) who find evidence of the use of WCA to avoid losses or earnings declines. They observe high changes in working capital for earnings just above target, giving rise to a discontinuity in their earnings distribution.

Payne and Robb (2000) find that when the mean of analysts' forecasts is greater than unmanaged earnings in the month preceding the annual earnings announcement, abnormal accruals are significantly negative. Dechow, Richardson and Tuna (2000) find that firms with zero annual earnings surprise have significantly higher abnormal accruals than other firms, while Das and Zhang (2003) document that managers use WCA to round up reported EPS to meet analysts' forecasts. Abarbanell and Lehavy (2003) find that abnormal accruals are the main source of both the tail and middle asymmetry in the distribution of forecast errors, indicating the use of accruals to meet analyst expectations in the current period or to increase the likelihood of hitting the target in the future. Matsumoto (2002) finds a greater frequency of positive abnormal accruals for firms reporting earnings that meet or beat analysts' consensus quarterly earnings forecasts. These findings are consistent with earnings management to meet or beat the consensus forecast.

5.2.2 Meeting Targets with Forecast Guidance

In the period after the fiscal year-end and before the announcement date, management has more flexibility with respect to moving items below the line to meet analysts' forecasts, which are known and constantly changing up to the announcement date. This is a disclosure choice and does not flow through the accounting system. In contrast, management is constrained in the ability to use income-increasing (or indeed income-decreasing) AWCA¹³ after the fiscal year-end as they require judgement and booking through the accounting system.

Regarding earnings forecast guidance, Matsumoto (2002) constructs a measure of expected earnings based on previous earnings change and prior returns. She finds a greater frequency of consensus forecasts which are less than this expectation, for firms that meet or exceed the consensus forecast than for firms that do not. She interprets this as evidence of firms managing analysts' forecasts downward to achieve positive earnings surprises. Bartov *et al.* (2002) find fewer negative surprises for forecasts issued late in the quarter as opposed to early forecasts, and interpret this as evidence of downward forecast management to meet or beat analysts' forecasts at the earnings announcement. More recently, Koh, Matsumoto and Rajgopal (2008) find that the propensity of US managers to rely on income-increasing, abnormal accruals to meet analyst expectations has decreased.

Prior research finds that firms with managers more heavily compensated with share options, report quarterly earnings that meet or beat analysts' forecasts more frequently (Bauman and Shaw, 2005; Cheng and Warfield, 2005). Bauman, Braswell and Shaw (2005) study two methods that option-granting firms might draw on to more frequently meet analysts' forecasts; these are income-increasing accounting choices and analyst guidance. They find that firms employ analyst guidance and not income-increasing accounting accruals. Likewise, evidence in Matsumoto (2002), Bartov *et al.* (2002), Richardson *et al.* (2004) shows that firms guide analysts' forecasts downward in order to make

¹³ Examples would include accelerating sales, deferrals, accrued expenses and provisions.

earnings targets more achievable. If meeting or beating analysts' forecasts can increase share prices, managers can increase their payout through earnings management which increases the value of the shares. The increased payout results from the increased difference between the share price and the exercise price of ESOs held by management.

The existence of an EPS target (which has to be met in order for ESOs to vest) provides an opportunity to extend the literature by the inclusion of an additional incentive when considering managers' reporting choices. For example, Bauman and Shaw (2005) show that meeting or beating analysts' forecasts is positively related to the use of options in executives' compensation plans and the more options, the more the firms just meet or beat analysts' earnings forecasts. While they define management incentive as the percentage of SBC in total executive compensation, this study uses as its measure whether or not ESOs with an EPS target are due to vest. Cheng and Warfield (2005) find that managers with high equity incentives are more likely to report earnings that meet or just beat analysts' forecasts compared to managers with low equity incentives. Their additional analyses indicate that high equity incentive managers are less likely to report large positive earnings surprises, consistent with earnings smoothing, particularly for firms with persistent equity incentives. This is achieved by reserving surplus income in good years thus providing the opportunity to more easily meet or beat analysts' forecasts in future years.

These studies, which are based on US data, give some evidence that ESOs provide managers with incentives to manage earnings to maximise the payout from their options. The UK provides a unique environment for the purposes of this research as the vesting of ESOs is contingent on the passage of time and on a performance target. In the US, the vesting of ESOs is contingent on the passage of time only.

As mentioned, in the UK the share options granted to executives usually include a performance target, i.e. growth in EPS. The intention was to reduce agency costs and reward managers only on the performance of their firm and not on a general rise in share prices. This study considers a scenario where managers

gain disproportionately, due to the convex nature of the payout from share options, if these targets in their ESOs are met.

Earlier research by Degeorge *et al.* (1999) identifies analysts' forecasts as the last target management aim to meet; reporting positive earnings is first and prior year earnings are second. Athanasakou *et al.* (2009) argue that the importance of analysts' forecasts as an earnings target appears to have risen over the last decade.

Bartov *et al.* (2002) suggest that the market rewards firms that consistently beat analysts' expectations as compared with firms that only occasionally beat expectations. Other studies including Kasznik and McNichols (2002) and DeFond and Park (2001) also present evidence of positive market responses to meeting or beating analysts' earnings forecasts. Skinner and Sloan (2002) and Kinney, Burgstahler and Martin (2002) document significant share price declines associated with even small negative earnings surprises. Further, while the premium to meeting or beating expectations is lower in cases where earnings or expectations management is most likely to exist, the discount is not economically significant - Bartov *et al.* (2002). Brown and Caylor (2005) find that from the mid-1990s, managers sought to avoid negative earnings surprises more than avoiding reporting losses or earnings decreases. The authors rationalise the switch in the target hierarchy by reporting evidence of a significantly higher reward (penalty) for achieving (missing) analyst expectations than for achieving (missing) the other two earnings targets. They attribute the higher premium to temporal increases in the accuracy and the precision of analysts' forecasts, media attention on meeting or beating analyst expectations and the number of firms followed by analysts. Beyer's (2008) findings support her core premise, that analysts anticipate earnings management when issuing a forecast, evidence supported in Burgstahler and Eames (2003) and Liu (2004).

There are three reasons which underlie the choice of meet or beat analysts' forecasts as the dependent variable. Firstly, the evidence that Habib and Hossain (2008) cite which contends that academic research provides strong evidence of positive valuation consequences associated with meeting or just

beating analysts' forecasts. Meeting or beating analysts' forecasts would be perceived by managers as potentially increasing the payout received from their ESOs. Secondly, the prospect theory of Kahneman and Tversky (1979) postulates that decision-makers derive value from gains and losses with respect to a reference point, rather than from absolute values of wealth. Burgstahler and Dichev (1997) draw from this theory and show that managers manage earnings to meet or beat earnings benchmarks. Thirdly, as prior research uses meet or beat as the dependent variable it is possible to compare the results in this study with results from prior studies.

This study examines the relationship between ESOs with an EPS target and the probability of meeting or beating analysts' forecasts. It considers the potential priority managers give to analysts' forecasts versus the EPS target depending on whether or not ESOs are due to vest in a particular year. The following are the hypotheses:

- H1:** The probability of meeting or beating analysts' forecasts is positively related to the existence of an EPS target in ESOs.
- H2:** The probability of meeting or beating analysts' forecasts is higher in years when ESOs with EPS targets are due to vest.
- H3:** The probability of meeting or beating analysts' forecasts is dependent on the closeness to the target EPS growth required in order for ESOs to vest.

In addition to the above, this research considers a dependent variable defined as just meeting or beating analysts' forecasts. Brown and Pinello (2007) maintain that firms reporting earnings that beat or fall short of analysts' forecasts by large amounts are less likely to be engaged in the earnings surprise games than firms reporting earnings that are close to analysts' forecasts. In relation to this study, managers may have incentives to manage earnings downwards in years when earnings will be short of the target EPS needed in order for their ESOs to vest and in years when earnings are greater

than the required EPS target. Earnings smoothing is a possibility as it is difficult, if not impossible, to manage earnings upward consistently. Through managing earnings downwards in good years, managers can increase earnings in the future (Cheng and Warfield, 2005). Since the benefits from ESOs are recurring, managers will be concerned about share prices in the future; if they miss analysts' forecasts in the future, they bear negative consequences. Cheng and Warfield (2005) postulate that one way to smooth earnings is to avoid large earnings surprises and they find unexercisable options reduces the odds of large positive earnings surprises. Given this link between incentives faced by management and earnings smoothing, the following hypotheses are designed to test whether managers with an EPS target in their ESOs engage in smoothing earnings.

H4: The probability of just meeting or beating analysts' forecasts is positively related to the existence of an EPS target in ESOs.

H5: The probability of just meeting or beating analysts' forecasts is higher in years when ESOs with EPS targets are due to vest.

H6: The probability of just meeting or beating analysts' forecasts is dependent on the closeness to the target EPS growth required in order for ESOs to vest.

5.3 Research Design

The objective is to examine the impact of an EPS target in ESOs on whether or not UK firms meet or beat analysts' forecasts. Then the study will consider whether any understanding can be gathered of the interplay between meeting analysts' forecasts and the EPS target in ESOs. The research design controls for other profit targets that have been found to influence management, and these are reporting positive earnings, and reporting an increase on prior year's earnings. The research design also controls for factors found in prior research to impact on whether a firm meets or beats analysts' forecasts.

5.3.1 Sample Selection

The initial sample used the 500 largest UK-domiciled non-financial firms in 2001. The research design required information on the actual executive remuneration structure for those firms in 2001, 2002 and 2003 and this was available for only 376 of these firms. The following reasons explain the reduction in sample size:

2001 Sample	500
Insufficient information	-4
Did not file with Companies House	-4
Not in sterling	-3
Published 2 Annual Reports in 2003	-1
Fiscal year 16 months	-1
Merged/Acquired	-32
Taken private	-1
Delisted	-2
Receivership/Liquidation	-9
No reply	-23
Unable to locate	<u>-44</u>
Final Sample	<u>376</u>

For the purpose of this research, it is a requirement that the firms are followed by I/B/E/S and have the required data available on Datastream. This restricts the final sample from the potential 1,128 observations to 760 firm-year observations. This is composed of 245, 238 and 277 for the years 2001, 2002 and 2003 respectively.

5.3.2 Meet or Beat Analysts' Forecasts

To define whether or not a firm meets or beats analysts' forecasts, the latest forecast prior to the earnings announcement for the year is used. The selection of this is based on the evidence that most recent forecasts are more accurate than mean analysts' forecasts as they are more likely to capture the most complete information set available just prior to earnings release (O'Brien, 1988; Brown, 1991). The most recent forecast has also been shown to be less susceptible than the mean forecast to the overweighting of common analyst information (Kim, Lim and Shaw, 2001). In line with Athanasakou *et al.* (2009) earnings surprise is defined as actual I/B/E/S EPS minus the most recent forecast at least three days before the announcement date. Bartov *et al.* (2002) propose the three day criterion to avoid contamination of the forecast by actual earnings.

Consistent with other research meeting analysts' forecasts, the dichotomous dependent variable meet or beat analysts' forecasts (*MBE*) equals 1 if the earnings surprise is 0 or positive, and 0 otherwise.

5.3.3 Just Meet or Beat Analysts' Forecasts

Following prior studies including Athanasakou *et al.* (2009) and Doyle, McNichols and Soliman (2004), this study runs a logit regression with a dichotomous dependent variable, *JMBE*, which represents firms that meet or beat analysts' forecasts by small amounts. This is designed to test H3, H4 and H5 hypotheses. *JMBE* is equal to 1 if the earnings surprise (*SURP*) is in the interval $£0.00 \leq SURP < £0.02$ and zero if the earnings surprise is in the interval $-£0.02 \leq SURP < £0.00$ as is common in other UK studies, for example, Athanasakou *et al.* (2009).

5.3.4 Methodology and Variable Definitions

The purpose of this chapter is to study the inter-relationship between an EPS target in ESOs and the probability of meeting or beating analysts' EPS forecasts. Hence, the regression includes an indicator variable *EPSTARG* that takes the value of 1 if there is an EPS target in ESOs, and 0 otherwise. As mentioned above, prior literature establishes a hierarchy of earnings targets which Degeorge *et al.* (1999) first document on US firms. They construe a pecking order, with profits first, prior year earnings second and analysts' forecasts third. They conclude that meeting analysts' forecasts matters only if the other targets are met. As evidence on the priority of earnings targets is not agreed and Athanasakou *et al.* (2009) maintain that the association between the three earnings targets in the UK remains an empirical question, any empirical model would need to include profits and earnings increases as control variables. Similar to their study, a profit indicator, *PROFIT*, an indicator variable that takes the value of 1 if I/B/E/S actual EPS is positive in the current accounting period, and 0 otherwise; and *POSΔEARN*, an indicator that takes the value of 1 if annual change in I/B/E/S actual EPS is positive, are included in the regressions. Consistent with prior research, these variables are expected to be positively related to the dependent variables, *MBE* and *JMBE* given the evidence that these profit targets are given priority over analysts' forecasts (Graham *et al.* 2005).

Consistent with Matsumoto (2002) and Athanasakou *et al.* (2009), the value relevance of earnings (*VREARN*) is included to capture investors' reaction to earnings surprises, and it is predicted that firms with low value relevance of earnings are less likely to be concerned about hitting analysts' forecasts since investors put little emphasis on a poor indicator of performance. Matsumoto (2002) argues that the underlying reason for this evidence is the low value relevance of loss-making firms and not merely the sign of contemporaneous earnings. Matsumoto (2002) suggests:

'if the value relevance of a firm's earnings is low (i.e., earnings are a poor indicator of future cash flows and firm value), then shareholders likely react less strongly to negative earnings surprises', (Matsumoto, 2002:493).

Additionally, firms with low value relevance of earnings are less likely to meet or beat analysts' expectations as a discontinuity of earnings surprise around zero is not evident in loss-making firms. Moreover, Choi *et al.* (2007) document that one of the main purposes of alternative EPS disclosures in the UK is to provide more value relevant earnings metrics. Decile portfolios are formed by sorting R^2 s from industry (DataStream Level 3/6) specific regressions by year of excess returns (cumulated from the month following year $t-1$ earnings announcement to the month of the year t earnings announcement) on annual change in I/B/E/S actual EPS. Excess returns are firm returns less market returns using the FTSE All Shares Index. Returns are from Datastream. Consistent with Athanasakou *et al.* (2009) the value of 0 is assigned to firms in the smallest decile through 9 for firms in the largest decile. *VREARN* is expected to be positively associated with the probability of *MBE*.

Skinner and Sloan (2002) contend that if managers of growth firms are aware that their firms' share prices suffer more than non-growth firms, with downward adjustments when they report negative earnings surprises, they may have strong incentives to avoid negative earnings surprises. *GROWTH* is controlled for using change in the book value of assets over lagged assets consistent with the measure used in the disclosure study in Chapter 3.

Bartov *et al.* (2002) argue that meeting or beating analysts' forecasts can help avoid costly litigation that could potentially be triggered by unfavourable earnings surprises. Matsumoto (2002) uses an industry dummy, *LIT*, to control for this effect. She classifies biotechnology, computers, electronics and retailing as being high-risk industries and assigns one to firms that belong to these industries. On the basis that these firms have greater incentives to meet or beat analysts' forecasts, a positive coefficient on *LIT* is expected.

Similar to Matsumoto (2002) and Athanasakou *et al.* (2009), more firms are expected to meet or beat analysts' forecasts when there is an increase in industrial production growth, and as a proxy for this growth in industrial production *INDPROD* is added, which is expected to have a positive coefficient. Larger firms, being more subject to public scrutiny, have greater incentives to meet or beat analysts' forecasts. *INDPROD* is the average annual growth in industrial production adjusted for inflation provided by Datastream. *SIZE* is controlled for and expected to have a positive coefficient. *SIZE* is measured as the natural logarithm of fiscal year-end market capitalisation similar to the measure used in Chapter 3.

Kaszniak and McNichols (2002) find that the market assigns a greater value to firms that meet expectations, and continues to do so as they meet expectations consistently. This provides a greater incentive for firms to meet or beat analysts' forecasts in the current year, if they had met forecasts in the previous year. To control for this lagged *MBE* is added, that is MBE_{t-1} and a positive coefficient is predicted. Year indicator variables (*YEAR2002* and *YEAR2003*) are included and take the value of 1 if the data refers to a particular year and 0 otherwise.

The research requires the defining of firms by the closeness of actual EPS growth to the performance target EPS. To capture this, three variables are devised and defined as follows. To reflect the growth in EPS, the variable *ACTUAL3* is included and defined as the three-year increase/decrease in actual EPS. To measure the performance target EPS, the variable *TARGET3* is defined as the three-year increase/decrease in target EPS. To capture how close a firm's actual growth in EPS is to its performance criterion growth in EPS, *MISS3* is defined as the actual increase/decrease in EPS over three years minus the industry median increase/decrease in EPS over three years (target). Further details of these variables are presented in the following section.

To explore whether the existence of an EPS target in ESOs can explain firms meeting or beating analyst expectations (H1), the following logit regression of

the probability that a firm meets or beats analysts' forecasts at the earnings announcement date is estimated:

$$\begin{aligned}
 Prob(MBE = 1) = F(\beta_0 + \beta_1 EPSTARG_{i,t} + \beta_2 PROFIT_{i,t} + \beta_3 POS\Delta EARN_{i,t} + \\
 \beta_4 VREARN_{i,t} + \beta_5 GROWTH_{i,t} + \beta_6 LIT_{i,t} + \beta_7 SIZE_{i,t} + \beta_8 MBE_{i,t-1} + \\
 \beta_9 YEAR2002_{i,t} + \beta_{10} YEAR2003_{i,t} + \varepsilon_{i,t})
 \end{aligned} \tag{1}$$

In equation (1), *MBE* refers to whether a firm meets or beats analysts' expectations. *EPSTARG* is the test variable of interest here. It reflects the existence, or otherwise, of an EPS target in the firms' ESOs. *PROFIT* and *POSΔEARN* control for other reporting goals (incentives) which prior research finds management aim to meet. *VREARN*, *GROWTH*, *LIT* are included to represent additional incentives faced by management in meeting or beating analysts' forecasts. *SIZE* reflects that large firms are expected to have greater incentives to meet or beat. *MBE_{t-1}* represents the desire to maintain a pattern of meeting or beating analysts' forecasts. *SIZE* and *MBE_{t-1}* are both included as control variables.

To explore if the distance of actual EPS from the target EPS three-year growth rate (H2 and H3) can explain the probability that a firm meets or beats analysts' forecasts the following equation is estimated:

$$\begin{aligned}
 Prob(MBE = 1) = F(\beta_0 + \beta_1 EPSTARG_{i,t} + \beta_2 PROFIT_{i,t} + \beta_3 POS\Delta EARN_{i,t} + \\
 \beta_4 VREARN_{i,t} + \beta_5 GROWTH_{i,t} + \beta_6 LIT_{i,t} + \beta_7 SIZE_{i,t} + \beta_8 MBE_{i,t-1} + \\
 \beta_9 YEAR2002_{i,t} + \beta_{10} YEAR2003_{i,t} + \beta_{11} VESTED_{i,t} + \beta_{12} TARVEST_{i,t} + \beta_{13} GROUP2_{i,t} \\
 + \beta_{14} GROUP3_{i,t} + \beta_{15} GROUP4_{i,t} + \beta_{16} GROUP2TV_{i,t} + \beta_{17} GROUP3TV_{i,t} \\
 + \beta_{18} GROUP4TV_{i,t} + \varepsilon_{i,t})
 \end{aligned} \tag{2}$$

Equation (2) adds *VESTED* and *TARVEST* to equation (1). *VESTED* shows whether ESOs are due to vest in the year in question and *TARVEST* is an interaction term equal to *EPSTARG* * *VESTED* to represent a year in which ESOs with an EPS target are due to vest. The *GROUP* variables are defined by the distance between the actual EPS growth and target EPS growth. The *GROUP* variables are interacted with *TARVEST* (for example, *GROUP2TV*) to

indicate whether firms in the groups have ESOs due to vest in the year in question.

As in Chapter 4, when addressing the definition of the sign of the incentive to manage earnings, firms are defined into *GROUP* by the *MISS3* variable (*ACTUAL3* minus *TARGET3*). Four groups are defined using quartiles of the *MISS3* variable along with *UMEPS* variable to differentiate the middle two groups as follows:

GROUP1: firms which fall into the first quartile of the *MISS3* variable and who are well below the target. If they have any capacity to manage earnings, it would likely lead them to manage downwards as they have no hope of hitting the target.

GROUP2: firms which are in the second and third quartile of the *MISS3* variable and *have negative UMEPS*. These firms are defined as being below but close to the target and would be expected to manage upwards to meet the target.

GROUP3: firms which are in the second and third quartile of the *MISS3* variable but *have positive UMEPS*. These firms are defined as being above but close to the target and would be expected to manage downwards to just meet the target.

GROUP4: firms which fall into the fourth quartile of the *MISS3* variable are firms which are well above the target and would be expected to manage downwards and keep any reserves for future years.

GROUP2 and *GROUP3* comprise firms that are close to the target, to further divide them the sign of *UMEPS* is employed.

GROUP2 are starting not too far from the target and would be expected to have the capacity to manage earnings upwards by the amount required to meet the target despite having negative unmanaged earnings.

In contrast, *GROUP3* firms starting with positive unmanaged earnings can manage earnings down and still meet the target.

Interaction terms are included to test whether there is any significance for the different groups when they have ESOs due to vest in that year. *GROUP1TV* is defined as *GROUP1*TARVEST*, *GROUP2TV* as *GROUP2*TARVEST*, *GROUP3TV* as *GROUP3*TARVEST* and *GROUP4TV* as *GROUP4*TARVEST*.

To explore whether the existence of an EPS target in ESOs can explain firms just meeting or beating analyst expectations (H4), the following logit regression of the probability that a firm meets or beats analysts' forecasts at the earnings announcement date is estimated:

$$\begin{aligned} Prob(JMBE = 1) = F(\beta_0 + \beta_1 EPSTARG_{i,t} + \beta_2 PROFIT_{i,t} + \beta_3 POS\Delta EARN_{i,t} + \\ \beta_4 VREARN_{i,t} + \beta_5 GROWTH_{i,t} + \beta_6 LIT_{i,t} + \beta_7 SIZE_{i,t} + \beta_8 MBE_{i,t-1} + \\ \beta_9 YEAR2002_{i,t} + \beta_{10} YEAR2003_{i,t} + \varepsilon_{i,t}) \end{aligned} \quad (3)$$

As with the MBE regressions, variables are used to investigate whether the distance of the firm from the target EPS three-year growth rate (H2 and H3), can explain the probability that a firm just meets or beats analysts' forecasts. The following equation is estimated:

$$\begin{aligned} Prob(JMBE = 1) = F(\beta_0 + \beta_1 EPSTARG_{i,t} + \beta_2 PROFIT_{i,t} + \beta_3 POS\Delta EARN_{i,t} + \\ \beta_4 VREARN_{i,t} + \beta_5 GROWTH_{i,t} + \beta_6 LIT_{i,t} + \beta_7 SIZE_{i,t} + \beta_8 MBE_{i,t-1} + \\ \beta_9 YEAR2002_{i,t} + \beta_{10} YEAR2003_{i,t} + \beta_{11} VESTED_{i,t} + \beta_{12} TARVEST_{i,t} + \beta_{13} GROUP2_{i,t} \\ + \beta_{14} GROUP3_{i,t} + \beta_{15} GROUP4_{i,t} + \beta_{16} GROUP2TV_{i,t} + \beta_{17} GROUP3TV_{i,t} \\ + \beta_{18} GROUP4TV_{i,t} + \varepsilon_{i,t}) \end{aligned} \quad (4)$$

Equations (3) and (4) are similar to equations (1) and (2) with *JMBE* replacing *MBE* as the dependent variable. The independent variables in (3) and (4) are the same as those in (1) and (2).

5.4 Results

Table 5.2 presents the annual distribution for *MBE*, *JMBE*, *EPSTARG* and *VESTED*. It is interesting to note that the *MBE* figures for the years covered in both studies are similar to those reported in Athanasakou *et al.* (2009) for a much larger sample of UK firms; this study has 44 percent (43 percent) for 2001 and 46 percent (46 percent) for 2002.

The statistics for *EPSTARG* and *VESTED* suggest that in 2003, there are possibly greater incentives to be gained from executives meeting the EPS target in their ESOs given that more ESOs have an EPS target and of these a greater percentage are due to vest.

Table 5.2 Distribution of <i>MBE</i>, <i>EPSTARG</i>, <i>VESTED</i> and <i>JMBE</i>				
Frequency of meeting analysts' forecasts (<i>MBE</i> = 1), frequency of an EPS target in ESOs (<i>EPSTARG</i> = 1). Frequency of ESOs vesting in a year and frequency of just meeting analysts' forecasts (<i>JMBE</i> = 1).				
<i>N</i>	760		386	
	<i>MBE</i> = 1 Frequency (%)	<i>EPSTARG</i> = 1 Frequency (%)	<i>VESTED</i> = 1 Frequency (%)	<i>JMBE</i> = 1 Frequency (%)
All Years	47.89	74.86	59.74	54.40
2001	43.67	70.20	50.20	52.94
2002	46.22	74.37	59.66	52.25
2003	53.07	78.70	68.23	57.55

Notes:

MBE is an indicator variable that takes the value of 1 if the earnings surprise (SURP) is 0 or positive, and 0 otherwise; *EPSTARG* is an indicator variable that takes the value of 1 if there is an EPS target in ESOs and 0 otherwise; *VESTED* is an indicator variable that takes the value of 1 if ESOs are due to vest in the current year and 0 otherwise; *JMBE* is an indicator variable that takes the value of 1 if the earnings surprise (SURP) is in the interval $£0.00 \leq \text{SURP} < £0.02$ and 0 if the earnings surprise is in the interval $-\£0.02 \leq \text{SURP} < -£0.00$.

Table 5.3 presents the descriptive statistics for this sample. The mean (median) *MBE* is 48 percent (0 percent), while the mean (median) *JMBE* is 54

percent (100 percent). MBE_{t-1} has the same mean as the MBE , that is, 48 percent with a median of 100 percent. The mean (median) $EPSTARG$ is 75 percent (100 percent) and the mean (median) of firms reporting a positive earnings figure is 84 percent (100 percent). In this sample of firms, 52 percent report an increase in profits compared with the previous year and 62 percent of firms have ESOs due to vest in one of the years. 47 percent of the firms have options with an EPS target due to vest.

Table 5.3**Descriptive statistics (N= 760)**

<i>Variable</i>	<i>N</i>	<i>Mean</i>	<i>Std.dev</i>	<i>1st Quartile</i>	<i>Median</i>	<i>3rd Quartile</i>	<i>Min</i>	<i>Max</i>	<i>Skewness</i>	<i>Kurtosis</i>
<i>MBE</i>	760	0.48	0.50	0.00	0.00	1.00	0.00	1.00	0.08	1.01
<i>JMBE</i>	386	0.54	0.50	0.00	1.00	1.00	0.00	1.00	-0.18	1.03
<i>EPSTARG</i>	760	0.75	0.44	0.00	1.00	1.00	0.00	1.00	-1.13	2.28
<i>PROFIT</i>	760	0.84	0.37	1.00	1.00	1.00	0.00	1.00	-1.86	4.47
<i>POSΔEARN</i>	760	0.52	0.50	0.00	1.00	1.00	0.00	1.00	-0.08	1.01
<i>VREARN</i>	760	4.31	2.86	2.00	4.00	7.00	0.00	9.00	0.04	1.79
<i>GROWTH</i>	760	0.07	0.34	-0.06	0.02	0.14	-0.81	2.93	3.39	23.22
<i>LIT</i>	760	0.20	0.40	0.00	0.00	0.00	0.00	1.00	1.48	3.19
<i>SIZE</i>	760	12.80	1.49	11.80	12.67	13.75	7.45	17.09	0.26	3.30
<i>MBE_{t-1}</i>	760	0.48	0.25	0.00	0.00	1.00	0.00	1.00	0.06	1.00
<i>YEAR 2002</i>	760	0.31	0.46	0.00	0.00	1.00	0.00	1.00	0.81	1.65
<i>YEAR 2003</i>	760	0.36	0.48	0.00	0.00	1.00	0.00	1.00	0.56	1.32
<i>VESTED</i>	760	0.60	0.49	0.00	0.60	1.00	0.00	1.00	0.17	1.03
<i>TARVEST</i>	760	0.46	0.50	0.00	0.46	1.00	0.00	1.00	-0.40	1.16
<i>GROUP2</i>	760	0.11	0.32	0.00	0.11	0.00	0.00	1.00	2.42	6.86
<i>GROUP3</i>	760	0.34	0.47	0.00	0.34	1.00	0.00	1.00	0.67	1.45
<i>GROUP4</i>	760	0.30	0.46	0.00	0.30	1.00	0.00	1.00	0.85	1.73
<i>GROUP2TV</i>	760	0.05	0.22	0.00	0.05	0.00	0.00	1.00	4.07	17.54
<i>GROUP3TV</i>	760	0.16	0.37	0.00	0.16	0.00	0.00	1.00	1.85	4.42
<i>GROUP4TV</i>	760	0.13	0.34	0.00	0.13	0.00	0.00	1.00	2.15	5.61

Notes:

MBE is an indicator variable that takes the value of 1 if the earnings surprise (SURP) is 0 or positive, and 0 otherwise; *JMBE* is an indicator variable that takes the value of 1 if the earnings surprise (SURP) is in the interval $£0.00 \leq \text{SURP} < £0.02$ and 0 if the earnings surprise is in the interval $-£0.02 \leq \text{SURP} < £0.00$; *EPSTARG* is an indicator variable that takes the value of 1 if there is an EPS target in ESOs and 0 otherwise; *PROFIT* is an indicator variable that takes the value of 1 if I/B/E/S actual EPS is positive in the current accounting period, and 0 otherwise; *POSΔEARN* is an indicator variable that takes the value of 1 if annual change in I/B/E/S actual EPS is positive, and 0 otherwise; *VREARN* is decile portfolios formed each year by sorting R^2 s from industry (Datastream Level 3/6) specific regressions of excess returns (cumulated from the month following year $t-1$ earnings announcement to the month of the year t earnings announcement) on annual change in I/B/E/S actual EPS. Excess returns are firm returns less market returns using the FTSE All Shares Index; *GROWTH* is the change in the book value of assets over lagged assets; *LIT* is an indicator variable that takes the value of 1 if the firm belongs to a high-risk industry (biotechnology, computers, electronics and retail), and 0 otherwise; *SIZE* is the natural logarithm of fiscal year-end market capitalisation; *MBE_{t-1}* is an indicator variable that takes the value of 1 if the firm met or beat analysts' forecasts in the prior year, and 0 otherwise; *YEAR2002* is an indicator variable that takes the value of 1 if the year is 2002 and 0 otherwise; *YEAR2003* is an indicator variable that takes the value of 1 if the year is 2003 and 0 otherwise; *VESTED* is an indicator variable that takes the value of 1 if ESOs are due to vest in the current year and 0 otherwise; *TARVEST* is an interaction term defined as *EPSTARGT*VESTED*; *GROUP2* includes firms which are in the second and third quartile of the *MISS3* variable and also have negative *UMEPS*; *GROUP3* includes firms which are in the second and third quartile of the *MISS3* variable but have positive *UMEPS*; *GROUP4* includes firms which fall into the fourth quartile of the *MISS3* variable; *GROUP2TV* is an interaction term defined as *GROUP2TV*TARVEST*; *GROUP3TV* is an interaction term defined as *GROUP3TV*TARVEST*; *GROUP4TV* is an interaction term defined as *GROUP4TV*TARVEST*.

Table 5.3 above reports descriptive statistics for the variables in the sample and Table 5.4 shows the results of univariate analyses which compare firms which meet or beat analysts' forecasts with firms that miss analysts' forecasts. The firms in the sample which meet or beat analysts' forecasts are statistically more likely to report a profit, as well as an increase in reported profit on the previous year. They are also larger and more likely to have an earnings surprise in the previous year. The differences are statistically different for both the means and medians of *PROFIT*, *POSΔEARN*, *SIZE* and *MBE_{t-1}*.

Table 5.5 reports correlations between the key variables. While the frequency of meeting or beating analysts' forecasts is positively correlated, as expected, with reporting profit and increasing profit compared to the previous year, it is negatively related to the existence of an EPS target in ESOs. Reporting continuous good news seems to be important given the positive and significant relationship between *MBE* and *MBE_{t-1}*.

Since all the control variables (with the exception of *LIT* and *INDPROD*) are correlated with *MBE*, it is important to control for these factors. The correlations among the incentive and control variables are not large indicating no multicollinearity with the exception of the *INDPROD* variable and *YEAR2003*. The latter causes *INDPROD* to be dropped from a regression which includes both variables. The coefficient of *INDPROD* in the regressions when not controlling for year effects is significant but given the high correlation (.99***) between *YEAR2003* and *INDPROD*, the decision is made to include the year dummies over the *INDPROD* variable.

Table 5.4

Descriptive statistics comparing firms that meet or beat analysts' forecasts with firms that missed analysts' forecasts

<i>N</i>	<i>364</i>			<i>396</i>			<i>p-values</i>	<i>p-values</i>
	<i>MBE = 1</i>			<i>MBE = 0</i>			<i>for</i>	<i>for</i>
<i>Variable</i>	<i>Mean</i>	<i>Std. dev</i>	<i>Median</i>	<i>Mean</i>	<i>Std. dev</i>	<i>Median</i>	<i>differences</i>	<i>differences</i>
<i>EPSTARG</i>	0.74	0.44	1.00	0.76	0.43	1.00	0.553	0.553
<i>PROFIT</i>	0.90	0.31	1.00	0.79	0.41	1.00	0.000	0.000
<i>POSΔEARN</i>	0.64	0.48	1.00	0.41	0.49	0.00	0.000	0.000
<i>VREARN</i>	4.49	2.87	5.00	4.15	2.84	4.00	0.107	0.105
<i>GROWTH</i>	0.10	0.36	0.04	0.05	0.32	0.01	0.060	0.065
<i>LIT</i>	0.21	0.41	0.00	0.20	0.40	0.00	0.686	0.686
<i>SIZE</i>	12.95	1.39	12.80	12.67	1.56	12.46	0.008	0.008
<i>MBE_{t-1}</i>	0.55	0.50	1.00	0.43	0.50	0.00	0.001	0.001
<i>YEAR2002</i>	0.30	0.46	0.00	0.32	0.47	0.00	0.533	0.533
<i>YEAR2003</i>	0.40	0.49	0.00	0.33	0.47	0.00	0.031	0.031
<i>VESTED</i>	0.62	0.49	1.00	0.58	0.49	1.00	0.332	0.332
<i>TARVEST</i>	0.47	0.50	0.00	0.45	0.50	0.00	0.580	0.579
<i>GROUP2</i>	0.13	0.34	0.00	0.10	0.30	0.00	0.149	0.149
<i>GROUP3</i>	0.33	0.47	0.00	0.35	0.48	0.00	0.440	0.440
<i>GROUP4</i>	0.35	0.48	0.00	0.27	0.44	0.00	0.015	0.015
<i>GROUP2TV</i>	0.06	0.23	0.00	0.05	0.21	0.00	0.446	0.445
<i>GROUP3TV</i>	0.17	0.37	0.00	0.15	0.36	0.00	0.612	0.612
<i>GROUP4TV</i>	0.13	0.34	0.00	0.13	0.34	0.00	0.975	0.975

Notes:

MBE is an indicator variable that takes the value of 1 if the earnings surprise (SURP) is 0 or positive, and 0 otherwise; *PROFIT* is an indicator variable that takes the value of 1 if I/B/E/S actual EPS is positive in the current accounting period, and 0 otherwise; *POSΔEARN* is an indicator variable that takes the value of 1 if annual change in I/B/E/S actual EPS is positive, and 0 otherwise; *VREARN* is decile portfolios formed each year by sorting R^2 s from industry (Datastream Level 3/6) specific regressions of excess returns (cumulated from the month following year $t-1$ earnings announcement to the month of the year t earnings announcement) on annual change in I/B/E/S actual EPS. Excess returns are firm returns less market returns using the FTSE All Shares Index; *GROWTH* is the change in the book value of assets over lagged assets; *LIT* is an indicator variable that takes the value of 1 if the firm belongs to a high-risk industry (biotechnology, computers, electronics and retail), and 0 otherwise; *SIZE* is the natural logarithm of fiscal year-end market capitalisation; *MBE_{t-1}* is an indicator variable that takes the value of 1 if the firm met or beat analysts' forecasts in the prior year, and 0 otherwise; *YEAR2002* is an indicator variable that takes the value of 1 if the year is 2002 and 0 otherwise; *YEAR2003* is an indicator variable that takes the value of 1 if the year is 2003 and 0 otherwise; *VESTED* is an indicator variable that takes the value of 1 if ESOs are due to vest in the current year and 0 otherwise; *TARVEST* is an interaction term defined as $EPSTARGT * VESTED$; *GROUP2* includes firms which are in the second and third quartile of the *MISS3* variable and also *have negative UMEPS*; *GROUP3* includes firms which are in the second and third quartile of the *MISS3* variable but *have positive UMEPS*; *GROUP4* includes firms which fall into the fourth quartile of the *MISS3* variable; *GROUP2TV* is an interaction term defined as $GROUP2TV * TARVEST$; *GROUP3TV* is an interaction term defined as $GROUP3TV * TARVEST$; *GROUP4TV* is an interaction term defined as $GROUP4TV * TARVEST$.

Table 5.5

Correlation matrix between key sample variables

	<i>MBE</i>	<i>EPSTARG</i>	<i>PROFIT</i>	<i>POS_Δ</i> <i>EARN</i>	<i>VREARN</i>	<i>GROWTH</i>	<i>LIT</i>	<i>INDPRD</i>	<i>SIZE</i>	<i>MBELAG</i>	<i>YEAR</i> <i>2002</i>	<i>YEAR</i> <i>2003</i>	<i>VESTED</i>	<i>TARVEST</i>	<i>GROUP</i> <i>2</i>	<i>GROUP</i> <i>3</i>	<i>GROUP</i> <i>4</i>	<i>GROUP</i> <i>2TV</i>	<i>GROUP</i> <i>3TV</i>	<i>GROUP</i> <i>4TV</i>
<i>MBE</i>	1.00																			
<i>EPSTARG</i>	-0.02	1.00																		
<i>PROFIT</i>	0.14***	0.30***	1.00																	
<i>POS_Δ</i> <i>EARN</i>	0.23***	0.07*	0.24***	1.00																
<i>VREARN</i>	0.06	-0.06	-0.04	-0.03	1.00															
<i>GROWTH</i>	0.07*	-0.12***	0.12***	0.15***	-0.01	1.00														
<i>LIT</i>	0.01	-0.11***	-0.22***	0.01	-0.17***	-0.00	1.00													
<i>INDPRD</i>	0.08**	0.07*	-0.01	0.09**	-0.01	-0.11***	-0.01	1.00												
<i>SIZE</i>	0.10***	0.16***	0.28***	0.14***	0.09***	0.07*	-0.15***	0.04	1.00											
<i>MBELAG</i>	0.12***	-0.06*	0.08**	-0.05	0.08**	0.12***	0.05	-0.02	0.03	1.00										
<i>YEAR 2002</i>	-0.02	-0.00	-0.03	-0.03	0.03	-0.10***	-0.00	-0.61***	-0.10***	0.05	1.00									
<i>YEAR 2003</i>	0.08**	0.07**	-0.01	0.09**	-0.00	-0.13***	-0.01	0.99***	0.03	-0.03	-0.51***	1.00								
<i>VESTED</i>	0.04	0.05	-0.04	0.02	-0.04	0.04	0.10***	0.12***	0.04	0.03	-0.00	0.13***	1.00							
<i>TARVEST</i>	0.02	0.53***	0.15***	0.05	-0.07*	-0.03	-0.03	0.13***	0.15***	0.01	-0.02	0.13***	0.75***	1.00						
<i>GROUP2</i>	0.05	-0.01	0.02	0.01	0.05	-0.02	0.03	-0.01	0.11***	-0.00	-0.00	-0.00	-0.02	-0.01	1.00					
<i>GROUP3</i>	-0.03	-0.01	-0.02	0.02	0.02	0.03	0.01	0.14***	0.09**	0.02	-0.10***	0.14***	0.05	0.02	-0.26***	1.00				
<i>GROUP4</i>	0.09**	-0.00	0.11***	0.18***	-0.04	0.10***	-0.04	-0.11***	-0.02	0.07*	0.18***	-0.09**	-0.01	-0.02	-0.24***	-0.48***	1.00			
<i>GROUP2TV</i>	0.03	0.14***	0.00	0.01	-0.00	-0.04	0.05	0.02	0.07**	0.01	0.01	0.02	0.19***	0.25***	0.65***	-0.17***	-0.15***	1.00		
<i>GROUP3TV</i>	0.02	0.26***	0.11***	0.05	-0.03	-0.01	-0.05	0.16***	0.19***	-0.00	-0.09***	0.16***	0.36***	0.48***	-0.16***	0.61***	-0.29***	-0.10***	1.00	
<i>GROUP4TV</i>	0.00	0.23***	0.12***	0.16***	-0.02	0.05	-0.06*	-0.03	0.05	0.06	0.13***	-0.01	0.32***	0.43***	-0.14***	-0.28***	0.60***	-0.09**	-0.17***	1.00

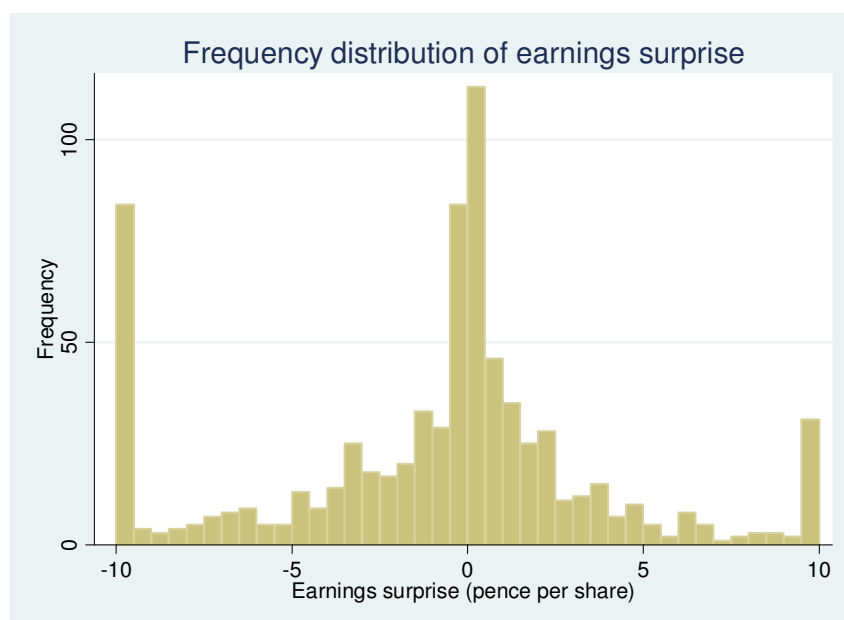
* / ** / *** indicate significance at 10% / 5% / 1%. A full definition of the variables is provided in Appendix C.

Following Athanasakou *et al.* (2009) earnings surprises are aggregated into equally sized intervals (bins) and figure 5.1 reports the findings. The size of each is set to 0.05p.

As the main research interest is on meeting or beating analysts' forecasts, this study concentrates on those firms close to meeting or beating the analysts' forecast. This allows the aggregation of all surprises below -10p and all earnings surprises above 10p. Consistent with prior research this study finds a discontinuity around 0 caused by the higher frequency of small positive compared with small negative earnings surprises¹⁴.

Figure 5.1

Frequency distribution of earnings surprise



The sample consists of 760 observations during the period 2001-2003 for UK firms meeting the sample selection criteria. The earnings surprise is the difference between I/B/E/S actual EPS and the latest analyst forecast made prior to the earnings announcement date.

Earnings surprise observations are aggregated into equally sized intervals (bins). The size of each bin is 0.5p. All earnings surprises below -10p are aggregated to the 20th bin below zero and all earnings surprises above 10p are aggregated to the 20th bin above zero.

¹⁴ Athanasakou *et al.* (2009), Gore, Pope and Singh (2007), Durtschi and Easton (2005) and Bhojraj, Hribar, Piconi and McInnis (2009).

5.4.1 Meet or Beat Analysts' Forecasts

Table 5.6

Logit analysis of the probability of meeting or beating analysts' forecasts as a function of the test variable and a series of other targets and controls.

Variable	Predicted Sign	Model 1		Model 2	
		MBE Coefficient (z-stat) ^a	Marginal Effect	MBE Coefficient (z-stat)	Marginal effect
<i>Intercept</i>	?	-3.697*** (0.003)		-4.017*** (0.002)	
<i>EPSTARG</i>	?	-0.177 (0.381)	-0.044	-0.269 (0.329)	-0.067
<i>PROFIT</i>	+	0.852*** (0.002)	0.202	0.840*** (0.003)	0.200
<i>POSΔEARN</i>	+	0.909*** (0.000)	0.223	0.938*** (0.000)	0.229
<i>VREARN</i>	+	0.046 (0.109)	0.011	0.050* (0.089)	0.012
<i>GROWTH</i>	+	0.098 (0.707)	0.025	-0.040 (0.886)	0.010
<i>LIT</i>	+	0.167 (0.463)	0.042	0.121 (0.610)	0.030
<i>SIZE</i>	+	0.059 (0.319)	0.015	0.053 (0.400)	0.013
<i>MBE_{t-1}</i>	+	0.502*** (0.002)	0.124	0.515*** (0.001)	0.128
<i>YEAR2002</i>	?	0.221 (0.260)	0.055	0.188 (0.356)	0.047
<i>YEAR2003</i>	?	0.461** (0.016)	0.115	0.453** (0.023)	0.113
<i>VESTED</i>	+			0.017 (0.960)	0.004
<i>TARVEST</i>	+			0.779 (0.105)	0.192
<i>GROUP2</i>	?			0.574 (0.127)	0.142
<i>GROUP3</i>	?			0.083 (0.782)	0.021
<i>GROUP4</i>	?			0.768** (0.011)	0.190
<i>GROUP2TV</i>	?			-0.688 (0.222)	-0.164
<i>GROUP3TV</i>	?			-0.418 (0.320)	-0.103
<i>GROUP4TV</i>	?			-1.339*** (0.002)	-0.299
<i>INDUSTRY DUMMIES</i>		YES		YES	
<i>Pseudo R²</i>		0.0813		0.0945	
<i>LOG LIKELIHOOD</i>		-483.36		-476.41	
<i>CHI-SQUARE</i>		77.18		86.86	
<i>P-VALUE</i>		0.000		0.000	
<i>OBSERVATIONS</i>		760		760	

Notes:

^az-stat in brackets; * / ** / *** indicate significance at 10% / 5% / 1%.

The dependent variable is *MBE* which is an indicator variable that takes the value of 1 if the earnings surprise (*SURP*) is 0 or positive, and 0 otherwise; *EPSTARG* is an indicator variable that takes the value of 1 if there is an EPS target in ESOs and 0 otherwise; *PROFIT* is an indicator variable that takes the value of 1 if I/B/E/S actual EPS is positive in the current accounting period, and 0 otherwise; *POSΔEARN* is an indicator variable that takes the value of 1 if annual change in I/B/E/S actual EPS is positive, and 0 otherwise; *VREARN* is decile portfolios formed each year by sorting R^2 s from industry (Datastream Level 3/6) specific regressions of excess returns (cumulated from the month following year $t-1$ earnings announcement to the month of the year t earnings announcement) on annual change in I/B/E/S actual EPS. Excess returns are firm returns less market returns using the FTSE All Shares Index; *GROWTH* is the change in the book value of assets over lagged assets; *LIT* is an indicator variable that takes the value of 1 if the firm belongs to a high-risk industry (biotechnology, computers, electronics and retail), and 0 otherwise; *SIZE* is the natural logarithm of fiscal year-end market capitalisation; MBE_{t-1} is an indicator variable that takes the value of 1 if the firm met or beat analysts' forecasts in the prior year, and 0 otherwise; *YEAR2002* is an indicator variable that takes the value of 1 if the year is 2002 and 0 otherwise; *YEAR2003* is an indicator variable that takes the value of 1 if the year is 2003 and 0 otherwise; *VESTED* is an indicator variable that takes the value of 1 if ESOs are due to vest in the current year and 0 otherwise; *TARVEST* is an interaction term defined as $EPSTARGT * VESTED$; *GROUP2* includes firms which are in the second and third quartile of the *MISS3* variable and also have negative *UMEPS*; *GROUP3* includes firms which are in the second and third quartile of the *MISS3* variable but have positive *UMEPS*; *GROUP4* includes firms which fall into the fourth quartile of the *MISS3* variable; *GROUP2TV* is an interaction term defined as $GROUP2TV * TARVEST$; *GROUP3TV* is an interaction term defined as $GROUP3TV * TARVEST$; *GROUP4TV* is an interaction term defined as $GROUP4TV * TARVEST$.

Model 1 in Table 5.6 presents results from the logit of *MBE* on the test variable, *EPSTARG* and incentive and control variables. The table also reports the marginal effect of the independent variables.

Model 1 results show:

- *EPSTARG* is negative but not significant. The marginal effect suggests that the existence of an EPS target in ESOs reduces the probability of meeting or beating analysts' forecasts by 4%.
- As predicted, the coefficients on *PROFIT*, *POSΔEARN*, *VREARN*, *GROWTH*, *LIT*, *SIZE* and MBE_{t-1} are positive. In line with previous research, *PROFIT*, *POSΔEARN*, and MBE_{t-1} are all significant. In contrast with previous research, *VREARN* is not significant. The marginal effects on earnings targets (*PROFIT*, *POSΔEARN* and MBE_{t-1}) verify the prior findings in this study that these benchmarks are important to management. The percentage increase of the probability of meeting

or beating analysts' forecasts are 20%, 22% and 12% respectively for each of these variables.

Model 2 extends Model 1 to include the incentives that management face with respect to their ESOs compensation component with an EPS target. All variables are in accordance with predicted signs with the exception of *GROWTH* which is negative..

Model 2 results show:

- *PROFIT*, *POSΔEARN* and *MBE_{t-1}* are all positive and significant as in Model 1.
- *VREARN* (0.050, $P > |z| = 0.089$) is positive and significant at the 10% level.
- *LIT* is not significant as in Matsumoto (2002) and Athanasakou *et al.* (2009), and consistent with the latter, these results substantiate that the UK is not a litigious business environment.
- Firms in *GROUP4* are positively and significantly related to whether or not a firm meets or beats analysts' forecasts (0.768, $P > |z| = 0.011$) at the 5% level; belonging to this group increases the probability of meeting or beating analysts' forecasts by 19%. *GROUP4* includes firms whose EPS growth is above the EPS target in their ESOs so it is no great revelation that they would beat the analysts' forecasts. These represent firms which do not have ESOs due to vest.
- *TARVEST*, which represents firms in any GROUP with EPS targets in their ESOs which are due to vest in the year, has a marginal effect of 19%. This gives some credence to the premise which suggests analysts are aware of the targets and forecast to these targets.

- The interaction term, *GROUP4TV*, represents firms which report profits greater than EPS target in their ESOs, and have ESOs due to vest in that year. This variable is negative and significant, (-1.339, $P > |z| = 0.002$) at the 1% level. Belonging to this group decreases the probability of meeting or beating analysts' forecasts by 30%. This infers that the EPS target in the ESOs is given priority by managers over meeting or beating analysts' forecasts.

Summarising the *MBE* regression results provide evidence that managers place priority on maximising their own income, when there are ESOs with EPS targets, over meeting or beating analysts' expectations. In line with the findings in the earnings management study, this chapter provides further evidence that EPS targets in ESOs lead to opportunistic behaviour by managers and do not represent optimal contracting. The findings would suggest that analysts do not have noticeably better information as a result of an EPS target in ESOs.

5.4.2 Just Meet or Beat Analysts' Forecasts

JMBE equals 1 if the earnings surprise is in the interval $£0.00 \leq \text{SURP} < £0.02$ and 0 if the earnings surprise is in the interval $-£0.02 \leq \text{SURP} < £0.00$. The results for the *JMBE* regressions are presented in Table 5.7. The table also reports the marginal effect of the independent variables.

The weak results are attributed to two factors. Firstly, the evidence from the *MBE* regressions that suggest the dominance of the EPS target in ESOs over meeting or beating analysts' expectations. This implies that just meeting or beating analysts' forecasts is not the priority of the management when the payout from their ESOs needs a different EPS figure to be achieved before their ESOs vest. Secondly, the small number of observations in this sample along with the small percentage of the total sample (51 percent) for the *JMBE* regressions in this study. As mentioned, this is lower than Bauman and Shaw (2005) where 73 percent of the firms in their sample fall into the *JMBE* category and Athanasakou *et al.* (2009) with 71 percent in the *JMBE* category.

Table 5.7

Logit analysis of the probability of just meeting analysts' forecasts as a function of the test variable and a series of other targets and controls.

Variable	Predicted Sign	Model 3		Model 4	
		JMBE Coefficient (z-stat) ^a	Marginal effect	JMBE Coefficient (z-stat)	Marginal effect
<i>EPSTARG</i>	+	-0.098 (0.736)	-0.024	-0.289 (0.476)	-0.071
<i>PROFIT</i>	+	0.363 (0.443)	0.090	0.344 (0.496)	0.086
<i>POSΔEARN</i>	+	0.571** (0.016)	0.141	0.571** (0.033)	0.141
<i>VREARN</i>	+	0.048 (0.222)	0.012	0.046 (0.259)	0.011
<i>GROWTH</i>	+	-0.044 (0.759)	-0.011	-0.111 (0.775)	-0.028
<i>LIT</i>	+	0.026 (0.931)	0.006	0.039 (0.898)	0.010
<i>SIZE</i>	+	-0.078 (0.269)	-0.019	-0.088 (0.244)	-0.022
<i>MBE_{t-1}</i>	+	0.387* (0.079)	0.095	0.378* (0.090)	0.093
<i>YEAR2002</i>	?	-0.064 (0.818)	-0.016	-0.071 (0.803)	-0.018
<i>YEAR2003</i>	?	0.222 (0.387)	0.055	0.245 (0.351)	0.060
<i>VESTED</i>	+			-0.316 (0.495)	-0.078
<i>TARVEST</i>	+			1.068 (0.118)	0.257
<i>GROUP2</i>	?			0.765 (0.162)	0.178
<i>GROUP3</i>	?			0.494 (0.243)	0.120
<i>GROUP4</i>	?			0.568 (0.163)	0.138
<i>GROUP2TV</i>	?			-1.487* (0.065)	-0.339
<i>GROUP3TV</i>	?			-0.845 (0.155)	-0.208
<i>GROUP4TV</i>	?			-0.760 (0.195)	-0.187
<i>INDUSTRY DUMMIES</i>		YES		YES	
<i>Pseudo R²</i>		N/A ^b		N/A ^b	
<i>LOG LIKELIHOOD</i>		-253.54		-251.02	
<i>CHI-SQUARE</i>		24.17		28.55	
<i>P-VALUE</i>		0.150		0.332	
<i>OBSERVATIONS</i>		386		386	

Notes:

^az-stat in brackets; * / ** / *** indicate significance at 10% / 5% / 1%.

^b*Pseudo R²* is not reported by Stata due to the fact that it is negative.

The dependent variable *JMBE* is an indicator variable that takes the value of 1 if the earnings surprise (SURP) is in the interval £0.00 ≤ SURP < £0.02 and 0 if the earnings surprise is in the interval -£0.02 ≤ SURP < £0.00; *EPSTARG* is an indicator variable that takes the value of 1 if there is an EPS target in ESOs and 0 otherwise; *PROFIT* is an indicator variable that takes the value of 1 if I/B/E/S actual EPS is positive in the current accounting period, and 0 otherwise;

POSΔEARN is an indicator variable that takes the value of 1 if annual change in I/B/E/S actual EPS is positive, and 0 otherwise; *VREARN* is decile portfolios formed each year by sorting R^2 s from industry (Datastream Level 3/6) specific regressions of excess returns (cumulated from the month following year $t-1$ earnings announcement to the month of the year t earnings announcement) on annual change in I/B/E/S actual EPS. Excess returns are firm returns less market returns using the FTSE All Shares Index; *GROWTH* is the change in the book value of assets over lagged assets; *LIT* is an indicator variable that takes the value of 1 if the firm belongs to a high-risk industry (biotechnology, computers, electronics and retail), and 0 otherwise; *SIZE* is the natural logarithm of fiscal year-end market capitalisation; *MBE_{t-1}* is an indicator variable that takes the value of 1 if the firm met or beat analysts' forecasts in the prior year, and 0 otherwise; *YEAR2002* is an indicator variable that takes the value of 1 if the year is 2002 and 0 otherwise; *YEAR2003* is an indicator variable that takes the value of 1 if the year is 2003 and 0 otherwise; *VESTED* is an indicator variable that takes the value of 1 if ESOs are due to vest in the current year and 0 otherwise; *TARVEST* is an interaction term defined as *EPSTARGET*VESTED*; *GROUP2* includes firms which are in the second and third quartile of the *MISS3* variable and also *have negative UMEPS*; *GROUP3* includes firms which are in the second and third quartile of the *MISS3* variable but *have positive UMEPS*; *GROUP4* includes firms which fall into the fourth quartile of the *MISS3* variable; *GROUP2TV* is an interaction term defined as *GROUP2TV*TARVEST*; *GROUP3TV* is an interaction term defined as *GROUP3TV*TARVEST*; *GROUP4TV* is an interaction term defined as *GROUP4TV*TARVEST*.

While the number of observations in this sample that fall into the *JMBE* classification is small the results, although weak, appear to confirm that firms are more concerned with the target to be met in order for their ESOs to vest rather than in just meeting or beating analysts' forecasts.

In Table 5.7 above, both Model 3 and Model 4 are run without a constant due to the lack of observations and the number of categorical variables in the models. The results in the *JMBE* regressions, allowing for the comparatively small number and the relatively low percentage of firms falling into the *JMBE* classification would appear to provide some evidence that managers, rewarded on the achievement of an EPS target, internalise that target and see it as more important. This motivates the earnings management activities more than meeting or beating analysts' forecast.

The signs on the coefficients are as predicted and, as was the case in the *MBE* regressions, include the negative coefficient on the *EPSTARG* variable.

Model 3 results show:

- The only variable which is significant is the *POSΔEARN* variable (0.571, $P > |Z| = 0.016$) which is positive and significant at the 5% level.

- The marginal effect figures substantiate the findings in the *MBE* regressions that the presence of an EPS target in ESOs reduces the probability that a firm will just meet or beat analysts' forecasts by 2 percent, which compares with 4 percent for meeting or beating analysts' forecasts.
- MBE_{t-1} increases the probability by 10% and *YEAR2003* increases it by 6%. Even with the small number of observations, the results appear to support the results found in the *MBE* regressions.

Model 4 in Table 5.7 reports a negative coefficient for the *GROWTH* variable as did the extended *MBE* model (Model 2). Model 4 with *JMBE* as the dependent variable, reports a negative coefficient on the *SIZE* variable; otherwise the sign of the coefficients are as predicted.

5.4.3 Robustness Tests

An array of robustness tests are performed, none of which alter the main inferences. The results are robust when the measure of growth is replaced with that used in Skinner and Sloan (2002) and Athanasakou *et al.* (2009), that is, *MTB* in both Model 1 and Model 2. Following Bauman and Shaw (2005) and substituting *LNASSET* for *SIZE*, both Model 1 and Model 2 return the same results. Table 5.8 presents the results of the models with *LNASSET* and *MBE* as the dependent variable. The table also reports the marginal effect of the independent variables.

Table 5.8

Logit analysis of the probability of meeting analysts' forecasts as a function of the test variable and a series of other targets and controls. Substituting *LNASSET* for *SIZE*.

Variable	Predicted Sign	Model 1		Model 2	
		MBE Coefficient (z-stat) ^a	Marginal effect	MBE Coefficient (z-stat)	Marginal effect
<i>Intercept</i>	?	-3.253*** (0.009)		-3.624** (0.007)	
<i>EPSTARG</i>	+	-0.165 (0.415)	-0.041	-0.273 (0.323)	-0.068
<i>PROFIT</i>	+	0.893*** (0.001)	0.211	0.875*** (0.002)	0.207
<i>POSΔEARN</i>	+	0.921*** (0.000)	0.225	0.946*** (0.000)	0.231
<i>VREARN</i>	+	0.047 (0.103)	0.012	0.050 (0.085)	0.013
<i>GROWTH</i>	+	0.106 (0.687)	0.026	0.044 (0.875)	0.011
<i>LIT</i>	+	0.166 (0.464)	0.042	0.121 (0.608)	0.030
<i>LNASSET</i>	+	0.021 (0.727)	0.005	0.018 (0.774)	0.004
<i>MBE_{t-1}</i>	+	0.502*** (0.002)	0.125	0.514*** (0.001)	0.128
<i>YEAR2002</i>	?	0.205 (0.295)	0.051	0.171 (0.399)	0.043
<i>YEAR2003</i>	?	0.457** (0.017)	0.114	0.446** (0.025)	0.111
<i>VESTED</i>	+			0.005 (0.988)	0.001
<i>TARVEST</i>	+			0.802* (0.096)	0.198
<i>GROUP2</i>	?			0.607 (0.106)	0.150
<i>GROUP3</i>	?			0.103 (0.730)	0.026
<i>GROUP4</i>	?			0.783** (0.010)	0.193
<i>GROUP2TV</i>	?			-0.685 (0.224)	-0.163
<i>GROUP3TV</i>	?			-0.409 (0.333)	-0.100
<i>GROUP4TV</i>	?			-1.338*** (0.002)	-0.298
<i>INDUSTRY DUMMIES</i>		YES		YES	
<i>Pseudo R²</i>		0.0804		0.0939	
<i>LOG LIKELIHOOD</i>		-483.79		-476.73	
<i>CHI-SQUARE</i>		76.49		86.46	
<i>P-VALUE</i>		0.000		0.000	
<i>OBSERVATIONS</i>		760		760	

Notes:

^az-stat in brackets; * / ** / *** indicate significance at 10% / 5% / 1%.

The dependent variable is *MBE* which is an indicator variable that takes the value of 1 if the earnings surprise (*SURP*) is 0 or positive, and 0 otherwise; *EPSTARG* is an indicator variable

that takes the value of 1 if there is an EPS target in ESOs and 0 otherwise; *PROFIT* is an indicator variable that takes the value of 1 if I/B/E/S actual EPS is positive in the current accounting period, and 0 otherwise; *POSΔEARN* is an indicator variable that takes the value of 1 if annual change in I/B/E/S actual EPS is positive, and 0 otherwise; *VREARN* is decile portfolios formed each year by sorting R^2 s from industry (Datastream Level 3/6) specific regressions of excess returns (cumulated from the month following year $t-1$ earnings announcement to the month of the year t earnings announcement) on annual change in I/B/E/S actual EPS. Excess returns are firm returns less market returns using the FTSE All Shares Index; *GROWTH* is the change in the book value of assets over lagged assets; *LIT* is an indicator variable that takes the value of 1 if the firm belongs to a high-risk industry (biotechnology, computers, electronics and retail), and 0 otherwise; *LNASSET* is the natural logarithm of the end of year total assets; MBE_{t-1} is an indicator variable that takes the value of 1 if the firm met or beat analysts' forecasts in the prior year, and 0 otherwise; *YEAR2002* is an indicator variable that takes the value of 1 if the year is 2002 and 0 otherwise; *YEAR2003* is an indicator variable that takes the value of 1 if the year is 2003 and 0 otherwise; *VESTED* is an indicator variable that takes the value of 1 if ESOs are due to vest in the current year and 0 otherwise; *TARVEST* is an interaction term defined as $EPSTARGT * VESTED$; *GROUP2* includes firms which are in the second and third quartile of the *MISS3* variable and also have negative *UMEPS*; *GROUP3* includes firms which are in the second and third quartile of the *MISS3* variable but have positive *UMEPS*; *GROUP4* includes firms which fall into the fourth quartile of the *MISS3* variable; *GROUP2TV* is an interaction term defined as $GROUP2TV * TARVEST$; *GROUP3TV* is an interaction term defined as $GROUP3TV * TARVEST$; *GROUP4TV* is an interaction term defined as $GROUP4TV * TARVEST$.

Table 5.9 below presents the results of the models with *LNASSET*. In both Model 3 and Model 4, the models are run without a constant due to the lack of observations and the number of categorical variables in the models. The table also reports the marginal effect of the independent variables. In Model 3, substituting *MTB* for *GROWTH* results in no changes to the results. Likewise, replacing *SIZE* with *LNASSET* causes no changes in the results. In Model 4, substituting *MTB* for *GROWTH* returns in *GROUP2TV* becoming significant at 5% rather than significant at 10% (-1.679 , $P > |Z| = 0.041$). The results are robust to the replacement of *SIZE* with *LNASSET*.

Table 5.9

Logit analysis of the probability of just meeting analysts' forecasts as a function of the test variable and a series of other targets and controls. Substituting *LNASSET* for *SIZE*.

Variable	Predicted Sign	Model 3	Marginal effect	Model 4	Marginal effect
		<i>JMBE</i> Coefficient (z-stat) ^a		<i>JMBE</i> Coefficient (z-stat)	
<i>EPSTARG</i>	+	-0.087 (0.764)	-0.021	-0.287 (0.479)	-0.070
<i>PROFIT</i>	+	0.380 (0.422)	0.095	0.364 (0.473)	0.091
<i>POSΔEARN</i>	+	0.550** (0.019)	0.136	0.558** (0.025)	0.138
<i>VREARN</i>	+	0.048 (0.223)	0.012	0.045 (0.266)	0.011
<i>GROWTH</i>	+	-0.060 (0.870)	-0.015	-0.124 (0.751)	-0.031
<i>LIT</i>	+	0.028 (0.925)	0.007	0.040 (0.896)	0.010
<i>LNASSET</i>	+	-0.086 (0.198)	-0.021	-0.092 (0.196)	0.023
<i>MBE_{t-1}</i>	+	0.383* (0.082)	0.094	0.377* (0.091)	0.093
<i>YEAR2002</i>	?	-0.044 (0.873)	-0.011	-0.043 (0.880)	-0.011
<i>YEAR2003</i>	?	0.238 (0.356)	0.059	0.263 (0.320)	0.065
<i>VESTED</i>	+			-0.321 (0.488)	-0.079
<i>TARVEST</i>	+			1.086 (0.113)	0.261
<i>GROUP2</i>	?			0.724 (0.182)	0.169
<i>GROUP3</i>	?			0.449 (0.286)	0.110
<i>GROUP4</i>	?			0.530 (0.187)	0.129
<i>GROUP2TV</i>	?			-1.503* (0.063)	-0.342
<i>GROUP3TV</i>	?			-0.844 (0.156)	-0.208
<i>GROUP4TV</i>	?			-0.780 (0.184)	-0.192
<i>INDUSTRY DUMMIES</i>		YES		YES	
<i>Pseudo R²</i>		N/A ^b		N/A ^b	
<i>LOG LIKELIHOOD</i>		-253.34		-250.86	
<i>CHI-SQUARE</i>		24.33		28.50	
<i>P-VALUE</i>		0.145		0.334	
<i>OBSERVATIONS</i>		386		386	

Notes:

^az-stat in brackets; * / ** / *** indicate significance at 10% / 5% / 1%.

^b*Pseudo R²* is not reported by Stata due to the fact that it is negative.

The dependent variable *JMBE* is an indicator variable that takes the value of 1 if the earnings surprise (SURP) is in the interval $£0.00 \leq \text{SURP} < £0.02$ and 0 if the earnings surprise is in the interval $-£0.02 \leq \text{SURP} < £0.00$; *EPSTARG* is an indicator variable that takes the value of 1 if

there is an EPS target in ESOs and 0 otherwise; *PROFIT* is an indicator variable that takes the value of 1 if I/B/E/S actual EPS is positive in the current accounting period, and 0 otherwise; *POSΔEARN* is an indicator variable that takes the value of 1 if annual change in I/B/E/S actual EPS is positive, and 0 otherwise; *VREARN* is decile portfolios formed each year by sorting R^2 s from industry (Datastream Level 3/6) specific regressions of excess returns (cumulated from the month following year $t-1$ earnings announcement to the month of the year t earnings announcement) on annual change in I/B/E/S actual EPS. Excess returns are firm returns less market returns using the FTSE All Shares Index; *LNASSET* is the natural logarithm of the end of year total assets; *MTB* is the market-to-book ratio defined as the year-end share price per share divided by the book value of shareholders' funds per share; *LIT* is an indicator variable that takes the value of 1 if the firm belongs to a high-risk industry (biotechnology, computers, electronics and retail), and 0 otherwise; *LNASSET* is the natural logarithm of the end of year total assets; *MBE_{t-1}* is an indicator variable that takes the value of 1 if the firm met or beat analysts' forecasts in the prior year, and 0 otherwise; *YEAR2002* is an indicator variable that takes the value of 1 if the year is 2002 and 0 otherwise; *YEAR2003* is an indicator variable that takes the value of 1 if the year is 2003 and 0 otherwise.

Matsumoto (2002) includes institutional ownership as a control variable following Lang and McNichols (1997) who present evidence consistent with institutional investors trading based on earnings surprise. When *INSTOWN* is included in Model 2, this variable is negative and not significant and the number of observations falls to 747 due to the unavailability of this variable for some firms in the sample. The only change is that *TARVEST* becomes significant at the 10% level (0.889, $P > |Z| = 0.066$). This is particularly interesting as institutional investors backed the introduction of a performance target in ESOs to reduce agency costs in an attempt to focus management on the long term. This result would seem to suggest that managers are more motivated to meet the EPS performance target in a year when there are ESOs with an EPS performance target due to vest.

Including *INSTOWN* has no impact on Model 1. Including *INSTOWN* in Model 2 results in *YEAR2003* being significant at the 10% level as opposed to being significant at 5% when *INSTOWN* is not included in the model. When *INSTOWN* is included in Model 3, *MBE_{t-1}* is no longer significant and *INSTOWN* is significant at the 5% level (-0.16, $P > |Z| = 0.019$) and the number of observations is reduced by one to 385. Likewise, in the extended *JMBE* model, the number of observations is reduced to 385 and *MBE_{t-1}* is no longer significant and *INSTOWN* is significant at the 5% level (-0.16, $P > |Z| = 0.019$).

The following corporate governance variables are included; *BLOCK*, *BRDOWN*, *NEDS* and *BRDSIZE*, although these are not usually included in MBE studies¹⁵ to see whether they have any impact on the regression results. These corporate governance variables have no impact on the significance levels of variables in Model 1, Model 2 and Model 3. In Model 4 MBE_{t-1} is no longer significant and *GROUP2TV* becomes significant at 5% rather than 10% when these corporate governance variables are not included.

When *GROWTH* and *SIZE* are winsorised at the 99% level, there are no changes in the significance of the variables in Model 1. In Model 2, *TARVEST* becomes significant at the 10% level (-0.825, $P > |Z| = 0.089$) and *GROUP4* becomes significant at the 1% level (-0.841, $P > |Z| = 0.007$). Both Model 1 and Model 2 have *MBE* as the dependent variable.

In Model 3, where *JMBE* is the dependent variable, winsoring *GROWTH* and *SIZE* at the 99% level has no impact on the results of the model. The only change in Model 4 which has *JMBE* as the dependent variable, *TARVEST* becomes significant at the 10% level (1.152, $P > |Z| = 0.096$).

5.5 Conclusions

The objective of this chapter was to study the inter-relationship between an EPS target in ESOs and the probability of meeting or beating analysts' EPS forecasts. Given the presence of an EPS target in ESOs, there are two possible consequences. Firstly, the presence of an EPS target might make it easier for analysts to make accurate forecasts on the premise that the targets provide analysts with useful information. Under this scenario, a positive association would be expected between an EPS target and *MBE*. Secondly, managers awarded on the achievement of an EPS target, internalise that target and see it as more important than meeting or beating analysts' forecasts.

¹⁵ Apart from studies specifically interested in the association between governance and forecast accuracy like Bhat, Hope and Kang (2006).

It is impossible to predict *ex ante* which of the above will be the consequence of an EPS target in ESOs.

The evidence in this chapter, in particular the significant negative relationship between firms in *GROUP4TV* and *MBE* suggests that opportunistic behaviour by management dominates the meeting or beating analysts' forecasts game. Firms with EPS larger than the growth required to allow the vesting of their ESOs, would appear to give precedence to managing earnings downwards rather than managing to meet or beat analysts' expectations.

While the *JMBE* results appear to confirm the findings, the interpretation of the results is very limited due to the small number of firms falling into this category. Again, the fact that the growth in EPS is a cumulative three-year growth figure renders both *MBE* and *JMBE* less important, given the research design which compares one year of *MBE* and *JMBE* with a three-year growth rate target. Intuitively, *MBE* would be a more appropriate measure to decide between the incentives faced by managers regarding meeting or beating analysts' forecasts and meeting an EPS target in their ESOs. The reasoning behind this claim is that because the EPS target in ESOs is cumulative, there are firms which will need to not just meet but beat analysts' forecasts by large amounts if they have poor EPS growth in either, or both of, the two previous years which are included to determine whether the conditions for vesting have been met.

The separation of ownership and control in firms, has led policy makers and interested parties, for example institutional investors, to try to structure executive compensation in such a way that the interests of owners and their agents will be aligned. One such effort involves attaching performance conditions to ESOs, so that they are vesting not just on the passage of time but on the achievement of a performance target also. In the UK, the most popular target in ESOs is the achievement of a specified rate of growth in EPS, usually above the RPI over a three-year period. The objective is an attempt to focus managers' efforts on long-term achievements as opposed to short-term goals, which was the situation prior to Greenbury (1995). The Greenbury Report was

the first to propose the idea of performance targets being attached to executive remuneration components.

A limitation to this study, is the practice whereby EPS targets in ESOs are cumulative in the majority of firms over a three-year period, meaning that whether or not the target is met in a particular vesting year is dependent on the growth in EPS in that year along with being dependent on the growth over the previous two years. A second limitation is that the number of observations is relatively small.

The results seem to support the growing evidence that managers are willing to sacrifice economic value to meet short-term earnings objectives. In particular, it appears from the results in this chapter, and those of Chapters 3 and 4, that managers with an EPS target in their ESOs behave opportunistically in an effort to maximise the payouts from their ESOs. In other words, the inclusion of an EPS target in ESOs does not result in an efficient contract.

Chapter 6

Conclusions

6.1 Introduction

The central aim of this thesis is to classify the behaviour of executives as opportunistic or efficient through a study of the impact of an EPS target in components of executive remuneration on company accounting choices. This required in the first instance, a study to test for any association between an EPS target and various components of executive remuneration. The sample firms are UK-based, where practice has evolved to include an EPS growth target that is required to be met before any payout from ESOs is earned.

The research design contributes to the literature on corporate governance and executive remuneration by identifying a specific contractual setting where management is particularly sensitive to reported earnings numbers. This particular setting is novel. Additionally, the research design facilitated the testing of whether or not executive share options with an EPS share growth target results in opportunistic behaviour on the part of managers or represents efficient contracting. Additionally, it provided an opportunity to determine the preference of management among various earning measures. From the results, it can be concluded that overall the design of executive remuneration affects managerial accounting choices in ways that may serve to reduce the informativeness of accounting earnings.

The remainder of this chapter highlights the main theoretical, methodological and empirical conclusions regarding executive compensation which can be drawn from the research undertaken for this thesis.

6.2 Summary of the Main Findings

The research starts from the premise presented in Chapter 2, which is agency theory. According to this theory, the shareholders are the principal (owners) and the executives are employed as agents to manage the company on behalf of the owners. This separation of ownership and control results in the need to

monitor the actions of the agents and to encourage the agents to act in the best interest of the principal. As outlined in Chapter 2, a basic assumption of agency theory is that individuals are rational, will seek to maximise their own expected utilities, and are resourceful and innovative in so doing.

Financial accounting information has a role in valuation (determining stock prices) and in governance (control). This thesis focuses on the latter and addresses one control mechanism, that is, executive remuneration compensation contracts. Agency theory plays an important role in providing a framework for modelling this conflict of interests, the design of compensation contracts and in analysing contract effectiveness.

The disclosure study in Chapter 3 establishes that an EPS target in ESOs is positively and significantly associated with the probability of the decision to disclose an alternative EPS figure. The addition of the exploratory variable, *EPSTARGO*, increases the probability that an alternative EPS will be disclosed by 13 percent. Also, both the chi-square test and the likelihood-ratio test indicated that the extended model with the *EPSTARGO* is a better fit than the nested model which excludes this variable. The results show a negative association between bonus plans and the disclosure decision and find no association with LTIPs and the disclosure of an alternative EPS figure. The findings in Chapter 3 suggest that contractual considerations do influence the disclosure choice. This adds to prior research findings which find the disclosure decision as an effort by management to report adjusted EPS when this is a better measure of sustainable earnings.

Given that Chapter 3 finds ESOs to be the only component of executive remuneration to be significantly associated with the decision to disclose an alternative EPS figure, Chapter 4 and Chapter 5 both focus on this component of executive remuneration. For the empirical studies in Chapters 4 and 5, the sample size is increased by the addition of two further sample years. This is to allow sufficient observations in the various groups to permit meaningful statistical analysis. These chapters are concerned with classifying executive

behaviour in conjunction with a measure of how close or otherwise they are from the EPS growth target which needs to be reached in order for the ESOs to vest. This required defining a proxy for the EPS growth target as information to calculate the actual EPS growth target is not provided in the Annual Reports and Accounts.

Chapter 4 has as the dependent variable raw AWCA which are used to reflect the earnings management choices of firms. The raw AWCA is used as opposed to absolute AWCA as the *direction* of earnings management is what is of interest with respect to testing the hypotheses. Absolute AWCA would be an appropriate dependent variable if the interest was in whether or not earnings management occurs and if the study was not concerned with the direction of any such earnings management. Earnings management is when managers select estimates and/or reporting methods that result in information in financial reports that does not reflect the firm's true position and performance. This can lead to either (1) the misleading of stakeholders and/or (2) the influencing of contractual outcomes which rely on reported accounting figures.

By classifying firms as to how close they are to the EPS growth target, this thesis finds evidence similar to Healy (1985) which is that there are situations when managers, as a result of their remuneration contract, have incentives to manage earnings downwards in addition to there being situations where managers have incentives to manage upwards. The analysis here would be strengthened, in all probability, if the sample size was larger. Again, not having the actual EPS growth target meant a proxy had to be defined for this. Having the true EPS growth target would further enhance the research. Despite this, the results from this earnings management study together with the meet or beat study, the proxy appears to reflect what it is designed to measure, that is, the actual EPS growth target. As a policy implication, all firms should be required to publish the targets and the specific EPS measure used to define the targets.

The findings in Chapter 4 show that 78 percent of the sample firms have ESOs with an EPS target. The existence of an EPS target is significant in all of the

regressions, with raw AWCA as the dependent variable. Broadly the findings are in agreement with managers behaving opportunistically. Firms are classified as to the distance between the actual EPS growth and the target EPS growth.

When a further criteria is used, that is, the sign of unmanaged EPS to determine whether firms are close to the target EPS growth the results find that firms close to but below the target will use positive abnormal accruals, firms close to but above the target will use negative abnormal accruals and for firms above the target, abnormal accruals are negative as expected but the association is not significant. If a target is not going to be met, there are incentives to manage earnings downwards and the findings show that if unmanaged earnings are above the required target, firms have incentives to manage earnings downwards.

Prior research establishes that management have a hierarchy when reporting earnings numbers (Degeorge *et al.* 1999). Chapter 5 considers one such potential member of this hierarchy, namely, analysts' forecasts of EPS from I/B/E/S which ties in nicely with the variable of interest, alternative EPS, as the I/B/E/S EPS is regarded as being close to the alternative EPS figure that firms report.

Chapter 5 studies the inter-relationship between an EPS target in ESOs and the probability of meeting or beating analysts' EPS forecasts. Bauman and Shaw (2005) show that meeting or beating analysts' forecasts is positively related to the use of options in executives' compensation plans and the more options, the more the firms just meet or beat analysts' earnings surprises. They define management incentive as the percentage of SBC in total executive compensation. Chapter 5 has as the measure of incentive whether or not ESOs with an EPS target can meet the target and thus vest. The evidence in this chapter, in particular the significant negative relationship between firms which are above the required EPS growth target and meeting or beating analysts' forecasts suggests that opportunistic behaviour by management to

maximise payout from their ESOs takes precedence over meeting or beating analysts' forecast. As in Chapter 4, there is a need to add a caveat regarding the number of observations.

The results of the logit regression confirm prior findings that reporting a positive profit figure, an increase on the prior year's profit and lagged *MBE* are all significant and positively related to whether or not the firm meets or beats analysts' forecasts. The existence of an EPS target in ESOs is significant and negative at the 10% level when the GROUP variables are not included in the logit model. The existence of an EPS target in ESOs, while negative is not significant in the model which includes the GROUP variables. However, the marginal effect suggests that the existence of an EPS target in ESOs reduces the probability of meeting or beating analysts' forecasts by 8 percent.

For firms in any GROUP with EPS targets in their ESOs which are due to vest in a particular year, there is a marginal effect of 19 percent which gives some credence to the premise that analysts are aware of the targets and forecast to these targets.

The interaction term representing firms which report profits greater than EPS target in their ESOs, and have ESOs due to vest in that year is negative and significant at the 1% level. This leads to the inference that the EPS target in the ESOs is given priority by managers over meeting or beating analysts' forecasts.

In summary, the evidence from the earnings management and MBE studies together, while weak, suggests that some managers with ESOs with an EPS target appear to be seeking to achieve their target and game the reporting system. These managers are likely less interested in shareholders' interests than their own.

6.3 Policy Implications

SBC as a component of executive remuneration is an attempt to align the interests of agents and principals. Awarding ESOs is one such form of SBC. During bull markets, executives benefited from these share options even when their firm performed poorly. This gave rise to the introduction of performance criteria into ESOs as an attempt to address this. A performance criterion in ESOs was introduced in an attempt to better align the principal and agents incentives, in particular, to reward executives for the performance of their firm and not for market performance. A second motivation was to change the decision-making focus of an executive's decision horizon away from the short term towards the long term.

This research suggests that as a policy decision to address the perceived shortcomings of awarding share options which do not have performance criteria, the introduction of an EPS performance criteria in ESOs may not have had the desired effect. The performance criterion of an EPS target in ESOs, suggests that managers may be able to circumvent the performance demands of their EPS targets by gaming the reporting system rather than actually achieving the target. This suggests that more needs to be done to tighten up the contracts so far as EPS targets are concerned. The targets should be made public, and the ability to make accounting choices to achieve EPS targets should be controlled. Boards and directors, audit committees and remuneration committees should be required to take the measures necessary to prevent corporate executives from influencing accounting choices in their favour at the expense of shareholders.

6.4 Limitations

The substantial data requirements skew the sample toward larger firms, so the results may not generalise. In addition, evidence on the opportunistic behaviour of management depends on the effectiveness of abnormal accruals as a proxy

for earnings management. Earnings management (accounting discretion) is estimated, not observed, which leaves our inferences subject to the standard caveats regarding inherent measurement error in the earnings management measure (raw AWCA).

Similarly, although this study is among the first to investigate the impact of an EPS target in ESOs in the UK, the persuasiveness of the evidence in this thesis depends critically on the proxy for the EPS growth target which ESOs have to attain in order to vest.

Additionally, the EPS growth targets in ESOs are cumulative for the majority of ESOs over a three-year period. Whether or not the target is met in a particular vesting year is dependent on the growth in EPS in that year along with being dependent on the growth over the previous two years.

This study focuses on the short-term discretion by management (disclosure of an alternative EPS figure, raw AWCA and meeting or beating analysts' forecasts) which is one stream of research in financial accounting, and does not address a second stream which consists of valuation-oriented papers that show that accruals predict future cash flow and earnings.

The measurement of the incentives for management from their ESOs applied in this study, does not incorporate a consideration of the monetary value. Rather it considers incentives which arise from ESOs *per se* and incentives from whether or not some ESOs are due to vest in a particular year.

6.5 Opportunities for Future Research

The studies in this thesis do not provide evidence that managers (or their firms) are better off as a result of taking actions as a consequence of the existence of an EPS target in their ESOs. A natural extension of research to address this

question would examine the extent to which the stock market can undo the effect of any opportunism in the accounting choices of management.

To find out more about the behaviour of management, an obvious avenue to pursue would be to increase the sample size and carry out a longitudinal study consisting of a greater number of firm-year observations.

Along with considering the particular accounting choices in this thesis – disclosure of an alternative EPS figure, earnings management, and meeting or beating analysts' forecasts – other discretionary choices by management could be considered, of which a prime example would be the repurchase of shares.

6.6 Conclusions

This thesis has contributed to the literature on corporate governance and executive remuneration, by considering a contractual motivation for the decision to disclose an alternative EPS figure by UK firms. This adds to the literature whose findings support the disclosure decision as an effort by management to report adjusted EPS when this is a better measure of sustainable earnings (Choi *et al.* 2005).

The development of a proxy for the EPS growth target along with the development of a methodology to classify firms as to whether or not they are close to the EPS growth target which must be met before their ESOs vest, contributes to the literature on the impact of a particular executive remuneration practice in the design of executive remuneration compensation contracts.

This thesis identifies a specific contractual setting where management is particularly sensitive to reported earnings numbers, that is, there is an EPS target which has to be achieved in order for ESOs to vest. This particular setting is novel and results in an interesting study of the tensions that management face with respect to multiple earnings measures, which include

reporting positive profit, reporting an increase in profit, meeting or beating analysts' forecasts, and any EPS target in their compensation structure. It adds to the considerable literature which documents that firms manage reported earnings to meet certain reporting goals. Examples of three such oft-cited thresholds from Degeorge *et al.* (1999) are to report positive profits; sustain prior year earnings level; and analysts' forecasts. This study adds an additional threshold, which is an EPS target in ESOs.

As much of agency research into executive remuneration is set in the US environment where EPS targets in ESOs are not common, the UK provides a unique opportunity to examine the impact of such targets. This thesis contributes to the debate between those who argue whether the design of executive remuneration represents efficient contracting or is a result of managerial power.

The findings of this thesis suggest that when designing executive remuneration contracts it is necessary to be cognisant of the fact that such contracts have the ability to induce opportunistic accounting choices. Consequently, the quality of the information set available to investors may be undermined.

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Appendix A

Definition of Variables: Chapter 3

Variable Definition

Dependent Variable

NDISCL Takes the value of 1 if the firm discloses an adjusted EPS figures, 0 otherwise.

Test Variables

NEGIBES Takes the value of 1 if $EPS^{IBES} \leq 0$, 0 otherwise.

NEGPOS Takes the value of 1 if $EPS^{FRS3} < 0$ $EPS^{IBES} > 0$, 0 otherwise.

MAGDIFF $MAGDIFF^{16}$ is the absolute price-scaled difference between EPS^{IBES} and EPS^{FRS3} .

Control Variables

SIZE The natural logarithm of fiscal year-end market capitalisation.

MTB The market-to-book ratio.

NANAL The natural logarithm of the number of analysts from I/B/E/S following a firm at the end of year t .

PAGES The natural logarithm of the number of pages in the published financial statements for the year t .

¹⁶ $MAGDIFF = |EPS^{FRS3} - EPS^{IBES}| / P_{i,t}$

Indicator Variables

MAGDIFFINC Interaction between *MAGDIFF* and an indicator variable taking the value of 1 where EPS^{IBES} is positive and materially greater than EPS^{FRS3} , 0 otherwise.

MAGDIFFDEC Interaction between *MAGDIFF* and an indicator variable taking the value of 1 where EPS^{IBES} is positive but materially less than EPS^{FRS3} , 0 otherwise.

Exploratory Variables

EPSTARGB Takes the value of 1 if the bonus plan has an EPS performance target, 0 otherwise.

EPSTARGO Takes the value of 1 if the ESO plan has an EPS performance target, 0 otherwise.

EPSTARGL Takes the value of 1 if the LTIP plan has an EPS performance target, 0 otherwise.

Appendix B

Definition of Variables: Chapter 4

Variable	Definition
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Dependent Variable

<i>Raw AWCA</i>	Signed abnormal working capital accruals.
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Exploratory Variable

<i>EPSTARG</i>	Takes the value of 1 if the ESOs have an EPS target, 0 otherwise.
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Control Variables

<i>LEV</i>	Total book value of debt over total assets.
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<i>ISSUE</i>	Takes the value of 1 if the number of shares outstanding increases by more than 10 percent in the next accounting period, 0 otherwise.
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<i>GROWTH</i>	Change in the book value of assets over lagged assets.
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<i>SIZE</i>	Natural logarithm of fiscal year-end market capitalisation.
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<i>RISK</i>	Measured as the volatility of share price over 60 monthly observations before the year of study similar to Aggarwal and Samwick (1999).
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<i>CVSALES</i>	Coefficient of variation of sales =
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Standard deviation of the previous 5 years sales

Mean of the previous 5 year sales

<i>YEAR2001</i>	Takes the value of 1 if year is 2001, 0 otherwise.
<i>YEAR2002</i>	Takes the value of 1 if year is 2002, 0 otherwise.
<i>YEAR2003</i>	Takes the value of 1 if year is 2003, 0 otherwise.
<i>UMEPS</i>	Following Lara, Osma and Mora (2005) UMEPS is equal to earnings before extraordinary items per share minus abnormal accruals per share, deflated by share price at the beginning of the period.
<i>VESTED</i>	Takes the value of 1 if ESOs are due to vest in the current year, 0 otherwise.
<i>TARVEST</i>	<i>EPSTARG* VESTED.</i>
<i>ACTUAL3</i>	Three-year increase/decrease in actual EPS.
<i>TARGET3</i>	Three-year increase/decrease in target EPS.
<i>MISS3</i>	Actual increase/decrease in EPS over three years minus the industry median increase/decrease in EPS over three years (target).

Corporate Governance Variables

(Supplied by *Manifest Information Services Ltd.*)

<i>BLOCK</i>	Takes the value of 1 if the firm has an external stockholder owning $\geq 5\%$ of the outstanding shares at the fiscal year-end, 0 otherwise.
<i>BRDOWN</i>	Percentage of outstanding shares owned by members of the board at the fiscal year-end.
<i>NEDS</i>	Percentage of non-executive directors on the board.
<i>BRDSIZE</i>	Total number of board members.

Alternative corporate governance variables used for robustness tests

<i>TEN</i>	Takes the value of 1 if the firm has an external stockholder owning $\geq 10\%$ of the outstanding shares at the fiscal year-end, 0 otherwise.
<i>INSTOWN</i>	The percentage of outstanding shares at each year-end held by outside block holders.
<i>DUAL</i>	Takes the value of 1 if the CEO is also the Chairman of the board, 0 otherwise.
<i>CEOREM</i>	Takes the value of 1 if the CEO is a member of the Remuneration Committee, 0 otherwise.
<i>BIG4</i>	Takes the value of 1 if the firm is audited by one of the Big 4 audit firms, 0 otherwise.

Group Definitions

Method A

GROUPA Takes the value of 1 if *MISS3* is in the bottom quartile, 0 otherwise.

GROUPB Takes the value of 1 if *MISS3* is in the second quartile, 0 otherwise.

GROUPC Takes the value of 1 if *MISS3* is in the third quartile, 0 otherwise.

GROUPD Takes the value of 1 if *MISS3* is in the top quartile, 0 otherwise.

GROUPATV Equals $GROUPA * TARVEST$.

GROUPBTV Equals $GROUPB * TARVEST$.

GROUPCTV Equals $GROUPC * TARVEST$.

GROUPDTV Equals $GROUPD * TARVEST$.

Method B

GROUP1 Takes the value of 1 if *MISS3* is in the bottom quartile, 0 otherwise.

GROUP2 Takes the value of 1 if *MISS3* is in the second quartile and *UMEPS* < 0, 0 otherwise.

<i>GROUP3</i>	Takes the value of 1 if <i>MISS3</i> is in the third quartile and <i>UMEPS</i> >0, 0 otherwise.
<i>GROUP4</i>	Takes the value of 1 if <i>MISS3</i> is in the top quartile, 0 otherwise.
<i>GROUP1TV</i>	Equals <i>GROUP1* TARVEST</i> .
<i>GROUP2TV</i>	Equals <i>GROUP2* TARVEST</i> .
<i>GROUP3TV</i>	Equals <i>GROUP3* TARVEST</i> .
<i>GROUP4TV</i>	Equals <i>GROUP4* TARVEST</i> .

Appendix C

Definition of Variables: Chapter 5

Variable Definition

Dependent Variables

MBE Takes the value of 1 if the earnings surprise (SURP) is 0 or positive, 0 otherwise. SURP is the difference between I/B/E/S actual EPS and the latest forecast for the year made prior to the earnings announcement date (AFO). In line with Bartov, Givoly and Hayn (2002) and Athanasakou *et al.* (2009), the latest forecast to precede the earnings release date by at least three days is chosen to ensure knowledge of the actual earnings figure does not contaminate the forecast, 0 otherwise.

JMBE Takes the value of 1 if the earnings surprise (SURP) is in the interval $£0.00 \leq \text{SURP} < £0.02$ and 0 if the earnings surprise is in the interval $-£0.02 \leq \text{SURP} < £0.00$.

Exploratory Variable

EPSTARG Takes the value of 1 if the ESOs have an EPS target, 0 otherwise.

Incentive Variables

PROFIT Takes the value of 1 if I/B/E/S actual EPS is positive in the current accounting period, 0 otherwise.

POS Δ EARN Takes the value of 1 if annual change in I/B/E/S actual EPS is positive, 0 otherwise.

VREARN Decile portfolios formed each year by sorting R^2 s from industry (Datastream Level 3/6) specific regressions of excess returns (cumulated from the month following year $t-1$ earnings announcement to the month of the year t earnings announcement) on annual change in I/B/E/S actual EPS. Excess returns are firm returns less market returns using the FTSE All Shares Index. Returns are from Datastream. Consistent with Athanasakou *et al.* (2009) the value of 0 is assigned to firms in the smallest decile through 9 for firms in the largest decile.

GROWTH Change in the book value of assets over lagged assets.

LIT Takes the value of 1 if the firm belongs to a high-risk industry (biotechnology, computers, electronics and retail), 0 otherwise.

Control Variables

SIZE Natural logarithm of fiscal year-end market capitalisation.

MBE_{t-1} Lagged *MBE*.

INDPROD Average annual growth in industrial production adjusted for inflation.

Other Variables

YEAR2001 Takes the value of 1 if year is 2001, 0 otherwise.

YEAR2002 Takes the value of 1 if year is 2002, 0 otherwise.

YEAR2003 Takes the value of 1 if year is 2003, 0 otherwise.

<i>VESTED</i>	Takes the value of 1 if ESOs are due to vest in the current year, 0 otherwise.
<i>TARVEST</i>	<i>EPSTARGET*VESTED</i> .
<i>MTB</i>	The market-to-book ratio defined as the year-end share price per share divided by the book value of shareholders' funds per share.
<i>LNASSET</i>	The natural logarithm of the end of year total assets.
<i>INSTOWN</i>	The percentage of outstanding shares at each year-end held by outside block holders.
<i>MISS3</i>	Actual increase/decrease in EPS over three years minus the industry median increase/decrease in EPS over three years (target).
<i>UMEPS</i>	Following Lara, Osma and Mora (2005) <i>UMEPS</i> is equal to earnings before extraordinary items per share minus abnormal accruals per share, deflated by share price at the beginning of the period.

Group Definitions

<i>GROUP1</i>	Takes the value of 1 if <i>MISS3</i> ¹⁷ is in the bottom quartile, 0 otherwise.
<i>GROUP2</i>	Takes the value of 1 if <i>MISS3</i> is in the second quartile and <i>UMEPS</i> < 0, 0 otherwise.

¹⁷ *MISS3* is defined in chapter 4 as the difference between the actual three-year EPS growth (*ACTUAL3*) minus the performance target three-year EPS growth (*TARGET3*).

<i>GROUP3</i>	Takes the value of 1 if <i>MISS3</i> is in the third quartile and <i>UMEPS</i> >0, 0 otherwise.
<i>GROUP4</i>	Takes the value of 1 if <i>MISS3</i> is in the top quartile, 0 otherwise.
<i>GROUP1TV</i>	Equals <i>GROUP1</i> * <i>TARVEST</i> .
<i>GROUP2TV</i>	Equals <i>GROUP2</i> * <i>TARVEST</i> .
<i>GROUP3TV</i>	Equals <i>GROUP3</i> * <i>TARVEST</i> .
<i>GROUP4TV</i>	Equals <i>GROUP4</i> * <i>TARVEST</i> .