The Market for Corporate Control: Takeover Likelihood of Underperforming Firms

Stefan Luthringshauser

A thesis submitted in fulfillment of the requirements for the award of Ph.D degree

March 2007
DECLARATION OF ORIGINALITY

'I hereby declare that this thesis has been composed by myself and has not been presented or accepted in any previous application for a degree. The work, of which this is a record, has been carried out by myself unless otherwise stated and where the work is mine, it reflects personal views and values. All quotations have been distinguished by quotation marks and all sources of information have been acknowledged by means of references including those of the Internet.'

Stefan Luthringshauser
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ABSTRACT

According to agency theory, the separation of ownership and control and the resulting misalignment of principal and agent interests can lead to corporate underperformance. Takeovers are often regarded as a direct response to these agency conflicts and the breakdown of internal corporate governance systems in companies. The literature claims that takeovers are the most efficient device in the market for corporate control since M&As rapidly transfer resources and control from inefficient managers to efficient ones.

This thesis examines whether the market for corporate control works effectively through takeovers. The relationship between underperformance and takeover likelihood is investigated using accounting- and stock market-based measurements from companies in the UK, US and Canada over a period of 17 years (1988 - 2004) applying hierarchical binary logistic regression.

Despite the general wisdom of the finance and economics literature that there are economies where the external market for corporate control is said to work actively as a disciplinary device through takeovers, this study could not confirm these outcomes. No significant association between takeovers and firm performance was detected, implying that the disciplinary takeover is statistically non-existent and that the market for corporate control does not work effectively through takeovers in the three countries under investigation. It has to be concluded that there is no consistent direction for investors confronted with acquisition opportunities who wish to maximise economic gain.
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<td>AMEX</td>
<td>American Stock Exchange</td>
</tr>
<tr>
<td>BVPS</td>
<td>Book Value per Share</td>
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<tr>
<td>Car</td>
<td>Cumulative Abnormal Return</td>
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<td>DAX</td>
<td>German Stock Index</td>
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<tr>
<td>CEO</td>
<td>Chief Executive Officer</td>
</tr>
<tr>
<td>Df</td>
<td>Degree of Freedom</td>
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<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
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<tr>
<td>IA</td>
<td>Intangible Assets</td>
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<tr>
<td>LBO</td>
<td>Leveraged Buy-out</td>
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<tr>
<td>Log TS</td>
<td>Natural Logarithm of Total Sales</td>
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<tr>
<td>LSE</td>
<td>London Stock Exchange</td>
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<td>M&amp;A</td>
<td>Mergers and Acquisitions</td>
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<tr>
<td>MBO</td>
<td>Management Buy-out</td>
</tr>
<tr>
<td>M&amp;M</td>
<td>Modigliani &amp; Miller</td>
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<tr>
<td>MVOE</td>
<td>Market Value of Equity</td>
</tr>
<tr>
<td>NASDAQ</td>
<td>National Association of Securities Dealers Automated Quotation</td>
</tr>
<tr>
<td>NOSH</td>
<td>Number of Shares</td>
</tr>
<tr>
<td>NPV</td>
<td>Net Present Value</td>
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<tr>
<td>NYSE</td>
<td>New York Stock Exchange</td>
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<tr>
<td>OLS</td>
<td>Ordinary Least Square</td>
</tr>
<tr>
<td>P</td>
<td>Average Stock Price per Month</td>
</tr>
<tr>
<td>PS</td>
<td>Preferred Stock</td>
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<tr>
<td>R&amp;D</td>
<td>Research and Development</td>
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<td>RFRUK</td>
<td>Risk Free Rate for the United Kingdom</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
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<td>RFRUS</td>
<td>Risk Free Rate for the United States</td>
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<td>Sig</td>
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<td>Standard and Poor’s 500 Largest Companies</td>
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<tr>
<td>TA</td>
<td>Total Asset</td>
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<tr>
<td>TD</td>
<td>Total Debt</td>
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<tr>
<td>TS</td>
<td>Total Sales</td>
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<tr>
<td>Tsq</td>
<td>Tobin’s q</td>
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<tr>
<td>TSX</td>
<td>Toronto Stock Exchange</td>
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<tr>
<td>TSX Venture</td>
<td>Toronto Stock Exchange Venture</td>
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<tr>
<td>UK</td>
<td>United Kingdom</td>
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<tr>
<td>US</td>
<td>United States of America</td>
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<tr>
<td>WACC</td>
<td>Weighted Average Cost of Capital</td>
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Chapter One
Introduction

The business world of today is increasingly turbulent. Fundamental technological, political, regulatory and economic forces are radically changing the global corporate environment. In such a climate sound strategic thinking, analysis and decision-making are considered to be of particular importance (Mills, 1994). Many corporations, however, are developing confidently in the wrong direction. While these companies are aiming to become leaders in their markets, they are turning into attractive targets for takeovers instead. Often the failure of a company has nothing to do with the quality of its products and services or employees; it is rather caused by incompetent management and poor strategy (Copeland, Koller and Murrin, 1990, Monks and Minow, 2002). According to the agency theory, this problem arises from the separation of ownership and control and its resulting incentive misalignment between the principal and agent. According to the literature, takeovers are regarded as one of the most efficient devices in the market for corporate control since they rapidly transfers resources and control from inefficient managers to efficient ones. Jensen (1986) takes the view that takeovers are a direct response to the breakdown of internal corporate governance systems and agency conflicts in companies. The success of mergers and acquisitions (M&As) in terms of overcoming agency conflicts, however, remains up to today unfounded in practice.

This thesis aims to empirically investigate:

(1) Whether the market for corporate control actually works, by measuring the extent to which companies are taken over following a period of underperformance in the US, UK and Canada over the period from 1987 until 2004 and

(2) Whether a relationship exists between financial characteristics and takeover likelihood of underperforming companies in the US, UK and Canada. Financial variables under investigation include underperformance, capital structure, asset structure and firm size, accounting also for industry and economic effects.

The most important feature of this thesis is that the study focuses solely on underperforming firms and their likelihood of being taken over as a result of their underperformance. This is critical since the market for corporate control should rectify underperformance through a
takeover and most studies do not focus on this particular aspect but investigate this area more broadly.

The literature review for this study investigates how corporate governance systems mitigate agency conflicts. It further analyses the role the market for corporate control plays in resolving agency conflicts, with a particular focus on M&As as an option for overcoming such problems. The literature in the field of corporate governance and agency theory is discussed in detail in Chapter Two. The implications that the separation of ownership and control and the resulting misalignment of management and shareholder interests have on the varying contracting parties in general and for mergers and acquisitions in particular are examined. A further focus of this chapter lies in the analysis of potential agency costs such as residual loss, monitoring and bonding costs as well as the potential of the latter two to overcome agency conflicts.

Chapter Three investigates the role the market for corporate control plays for corporate governance and discusses the five main control forces available for the market to control agency conflicts: (1) the board of directors, (2) legal and regulatory systems, (3) the capital markets and the managerial labour market, (4) the product and factor markets as well as (5) M&As. This chapter will in particular investigate the role takeovers play as a disciplining device.

The impact capital structure has on corporate governance and on the success of a firm is the focus of Chapter Four. The theory of an optimal capital structure and the impact debt has on corporate value is discussed in theory. One particular focus of this chapter is the mitigating role of debt on agency conflicts. Financial choice considerations are continuously related to mergers and acquisitions with a particular focus on the impact of capital structure on the likelihood of acquisitions and the resulting changes of capital structure due to acquisitions.

In Chapter Five this thesis reviews the literature on mergers and acquisitions as one important option of mitigating agency conflicts in the market for corporate control. It provides an analysis of takeover motives and downside risks, including economic, financial and corporate control considerations; as well as managerial aspects. As one further issue this chapter introduces and discusses various research areas in the field of M&A with a particular focus on research in the field of takeover likelihood models for takeover targets.
Chapter Six provides a description of the type of research design and methodology that will be used for the empirical study. In this thesis the relationship between underperformance and takeover likelihood will be examined empirically using stock market-based measurements and accounting-based financial data from companies in the UK, US and Canada over a period of 17 years (1988 - 2004) applying a hierarchical binary-logistic regression analysis. This study examines if companies are actually taken over following a period of underperformance. By applying a set of financial characteristics, relating to underperformance (Hypothesis 1), capital structure (Hypothesis 2), asset structure (Hypothesis 3) and firm size (Hypothesis 4), accounting also for industry and economy effects (Hypothesis 1a, 2a, 3a, 4a), this study additionally investigates the reasons why some underperforming companies are taken over whereas other underperforming companies are not.

In Chapter Seven this thesis provides a step-by-step explanation of the data compilation and data clearing process to come up with a sample of underperforming companies. This is a particularly vital part of this thesis’s methodology since the sample of underperforming firms forms the basis for the overall investigation into the likelihood of firms being taken over. This chapter will furthermore explain the selection process of the sample of acquired companies that is matched against the sample of underperforming companies.

Chapter Eight details and discusses the results of the study into the takeover likelihood of underperforming firms. Outcomes of the hierarchical binary-logistic regression model, which is to be applied to test the thesis’ four main hypotheses and its four sub-hypotheses for Canada, the UK and US, will be presented by analysing each of the financial variables on an individual basis. This study further applies a multinomial logistic regression analysis to all ten variables together in order to investigate their impact on the likelihood of becoming a takeover target for an underperforming firm. This analysis is regarded as particularly important since it takes all influencing factors into account, which might also result in counterbalancing effects. Research outcomes of this study will be related to the literature and previous empirical research and will be discussed on a per country basis.

In the concluding chapter (Chapter Nine), the preceding chapters and the main findings of the empirical study are summarised. In addition, this chapter describes the contribution and the limitations of this thesis and introduces potential areas for further research.
Chapter Two
Corporate Governance and Agency Theory

2.1 Introduction

The theory of the firm has been an important focus of theoretical and empirical research for almost a century. Research efforts have been particularly centred on the relations between markets and hierarchies, corporate governance systems and the agency problems caused by conflicts of interests among a firm’s contracting parties (Baker, Jensen and Murphy, 1988). The groundbreaking work by Jensen and Meckling (1976) has intensified research in this field, particularly investigating the nature of conflicts and the means available to solve them.

This chapter looks at the various corporate governance aspects associated with the problem of ownership and control separation and focuses in particular on agency problems as a motivating force behind takeover activity as well as takeover resistance (Walkling and Long, 1984, Lewellen, Loderer and Rosenfeld, 1985). In this context, the chapter investigates what effect the misalignment of managerial and owner interests have on the varying stakeholders. It introduces and discusses the monitoring and bonding mechanisms available to the various contracting parties in order to re-align interests and to reduce potential agency costs.

2.2 Corporate Governance

Monks and Minow (1995, 2002) define corporate governance as the relationship between the internal and external participants in a corporation. As pointed out by McMenamin (1999), corporate governance is not only concerned with the relationship between managers and owners but also with the interaction of the board, shareholders and other stakeholders such as creditors and employees. According to Bain and Band (1996) in McMenamin (1999; 56), ‘the central concern of governance is to add value to as much organisational stakeholders as is practicable ... that by having appropriate standards of governance the long-term performance is raised and total shareholder return is enhanced.’

Schmidt (2003) describes corporate governance as a system incorporating the entire range of mechanisms and arrangements that shape the way in which key decisions are made in
corporations. Essentially, corporate governance is about the distribution of decision and control rights; it is about governing and monitoring management; and it is about influencing business policy and about protecting stakes (Blair, 1995, Zingales, 1998, Schmidt, 2003). For authors including Shleifer and Vishny (1997), corporate governance is more narrowly concerned with the most effective system of making management act strictly in the interest of shareholders.

Thus, corporate governance is there to overcome potential efficiency losses resulting from conflicts of interests between the firm's various contracting parties. These conflicts have become one central focus of research in this field. As claimed by Jensen (1993), this research did not only enlighten the general field of corporate finance but also impacted on other areas such as the effects of leverage, governance arrangements and large shareholdings on incentives and organisational efficiency. This field of research has helped to better understand the interdependencies among the internal and external participants of a corporation. Megginson (1997) and Ferreira and Laux (2007) further highlight the critical importance of corporate governance issues for the individual firm. Governance issues such as the organisational form, corporate control rules and their effectiveness as well as managerial incentive policies all play an important role for the success of a firm.

As pointed out by Hart (1995), corporate governance problems in a corporation mainly result from two main aspects. First, Hart refers to the agency problem or conflict of interest between internal and external participants of the firm and second, he cites the transaction costs (agency costs), which result from this agency conflict. These aspects will be introduced and discussed in detail in the following sections.

2.3 Agency Theory

Berle and Means (1932) introduced the classical agency theory with their view that ownership and control were often separated in large corporations. They argue that the separation of

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1 Corporate governance encompasses aspects of company law, product markets, market for capital and labour as well as both the formal organisational structure of a company and any informal organisational arrangements, which may exist and function alongside the formal structure (Schmidt, 2003).

2 Governance is referred to as 'the top-level control structure, consisting of the decision rights being possessed by the board of directors and the CEO, the procedures for changing them, the size and membership of the board and the compensation and equity holdings of managers and the board'. (Jensen, 1993; 871)
ownership and control might result in management pursuing their own private goals and objectives, which in turn results in the waste of corporate resources to the detriment of the owner(s).

The agency problem is also an important component of the contractual theory of the firm, proposed by Coase (1937; 386), who describes the firm as ‘a nexus of contracts’, which comes into existence as a response to the inefficiencies of incomplete contracts in the market. As argued by Coase, a corporation is more than just the sum of all agreements between the contracting parties; a corporation has the advantage that the owner can simply direct his employees to do the right thing. Against these benefits of corporate integration, Coase recognises costs such as ‘diminishing returns to management’ (394) and ‘waste of resources’ (395).

Over half a century after these famous works, substantial progress has been made in developing the theories of Berle and Means and Coase further with important contributions by authors including Alchian and Demsetz (1972), Williamson (1975, 1985), Jensen and Meckling (1976), Klein, Crawford and Alchian (1978), Fama and Jensen (1983 a, b), Grossman and Hart (1986) and Hart and Moore (1990). As already highlighted by Berle and Means (1932) in the modern theory of the corporation, control and ownership are no longer exclusively attributed to the owner(s) or residual claimants. The owner no longer has control over his assets and wealth but is solely a capital provider and the ultimate risk taker. As a result, corporate control is attached to the agent (Berle and Means, 1932, Monks and Minow, 2002). This statement stands in direct contrast to claims made by Manne (1965, 1967) and Fama (1980) who see that, despite the separation of risk and control, the monitoring and disciplining of management remains largely the domain of the ‘entrepreneur’, the owner. Alchian and Demsetz (1972), however, object to the view that authority directs a firm’s activities but stress the role of contracts as the instrument of voluntary exchange.

In their approach, Jensen and Meckling (1976; 311) develop Coase’s (1937) and Alchian and Demsetz’s (1972) ‘nexus of contracts’ conception of the firm further by viewing the firm as a ‘set of contracting relationships among individuals’. They further stress that it is misleading to personalise the firm since it is not an individual but a legal fiction. By legal fiction Jensen and Meckling (1976; 310) mean ‘the artificial construct under the law, which allows certain organisations to be treated as individuals.’ The authors stress the complexity of the creation of
a contract, since it aims to bring the conflicting objectives of individuals internal and external to the corporation into equilibrium.

Jensen and Meckling (1976) were among the most important contributors in the field of agency theory. They define an agency relationship 'as a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf, which involves delegating some decision-making authority to the agent' (308). In general, the principal and the agent agree on a contract that clearly states what the agent is expected to do with the principal’s funds and how returns are shared between the agent and the principal.

According to the Jensen-Meckling theorem, the principal and the agent would sign a complete contract that identifies exactly what the agent does in each and every circumstance and how the profits are distributed. The authors stress the complexity of creating such an agency relationship contract, since it aims to bring the conflicting objectives of the agent and the principal into equilibrium. In practice, however, it is impossible to perfectly contract for every possible action between an agent and principal in advance. As the future holds for unforeseen events, complete contracts are unrealistic. This is the central focus of the original Jensen-Meckling argument.

The agency theory does not follow a uniform research method but, as pointed out by Jensen (1983), comprises two separate approaches which focus on distinct aspects of the problem. The principal-agent literature, often referred to as the formal agency literature, focuses on issues of efficient risk bearing and the normative aspects of the agency relationship including aspects of contract structure and how contracting costs can be minimised (Jensen and Meckling, 1976, Jensen 1983). The positive theory of agency in contrast, focuses in particular on the effects of market and institutional mechanisms on the contracting process. This second, less formal approach is concerned with 'the technology of monitoring and bonding on the form of … contracts and organisations’ (Jensen, 1983; 334).

The agency theory does not by itself see a role for corporate governance. However, corporate governance structures have become necessary since complete contracts are impossible to write. Governance systems help to allocate residual rights of control over the firm’s assets,
which have not been specified in the original contract (Grossman and Hart, 1986, Hart and Moore, 1990, Hart, 1995).

### 2.4 Agency Costs

In contrast to the original Jensen and Meckling (1976) zero-agency-cost-base case, where management owns 100% of the firm’s equity, the reality is that no publicly traded firm is entirely owned by management. When management owns less than 100% of the firm’s equity, it is impossible for the principal to guarantee that the agent will make all decisions in line with the principal’s objectives at zero cost. As pointed out by Ang, Cole and Lin (2000), if both the principal and the agent are utility maximisers, it is highly unlikely that the agent will always perform in the best interests of the principal but pursue his own objectives. Jensen and Meckling (1976) see this misalignment of interests between the firm’s agent and the firm’s principal(s) resulting in agency costs. Ang, Cole and Lin (2000) confirm the predictions made by Jensen and Meckling (1976) and conclude that agency costs are indeed higher among firms that are not 100% owned by their managers and that these costs increase as the managerial ownership stake of the agent declines.

Jensen and Meckling (1976) define agency costs as the sum of (1) residual losses, (2) monitoring costs and (3) incentive expenditures accrued to the corporation’s various stakeholders. Each of these potential agency cost factors will be discussed separately in the following sections. Williams (1987) regards residual loss as the key element since the other two only arise as a result of trying to reduce residual loss in a cost-effective way. As pointed out by Bolton and Scharfstein (1998), understanding the agency costs stemming from the divorce of ownership and control has become one of the central issues in corporate finance for some time. Taking the example of takeovers, Jensen and Meckling (1976) claim that since agency costs are evident to prospective buyers, bidders will only pay a price for the projected performance of the firm, which takes into account all three agency costs. As a direct consequence, ‘the (entrepreneur) will bear the entire wealth effects for these expected costs so long as the equity market anticipates these effects’ (Jensen and Meckling, 1976; 314).

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3 The risk that the agent pursues his own objectives is termed ‘managerialism’ (Arnold, 2002).
2.4.1 Residual Loss

Jensen and Meckling (1976) and Williams (1987) define residual loss as the costs resulting from the incomplete alignment of the agents’ and owner(s)’ interests and refer to it as the reduction in the value of the firm as a direct consequence of the transfer of profits as a result of managerialism induced by the dilution of ownership. Jensen and Meckling (1976) commonly refer to this as the moral-hazard problem.

As described by authors including Hart and Moore (1990) and Ang, Cole and Lin (2000), a manager may believe that, on an ex-post basis, he can beat the game by overpaying himself and by consuming on the job through shirking and perquisites. A considerable amount of empirical evidence, including authors such as Baumol (1959), Williamson, (1964), Jensen (1986) and Grossman and Hart (1988), has documented the prevalence of managerial behaviour that neither serves the interests of owners nor investors, particularly shareholders. Most of this evidence comes from the capital market in the form of event studies.

Jensen and Meckling (1976) and Shleifer and Vishny (1988) introduce the case of managers investing in inefficient but power-enhancing or empire-building projects, resulting in no gain for the firm, however, leading to a larger profit for themselves. According to Shleifer and Vishny (1988), takeovers are a good example for managers pursuing private benefits of control. Managers might pay too much for acquisitions or even boycott any takeover attempt only to achieve their private objectives such as expanding their empire or to protect their position. This in turn increases agency costs. Murphy (1985) and Jensen (1986, 1993) in this context, argue that managers may have incentives to grow their firm beyond the optimal size, for example, via M&As, since company growth increases managers’ power by increasing the resources under their control. Executive compensation and promotion are an increasing function of company size as described in studies by Baumol (1959), Donaldson (1984), Baker (1986), Stulz (1988) and Conyon and Murphy (2000). Baker, Jensen and Murphy (1988), for example, find that this relationship is independent of the acquisition’s impact on firm value. They suggest that this result may explain the large amount of corporate resources being spent inefficiently on value-destroying takeovers. Shleifer and Vishny (1997) remark that if the

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4 Moral hazard may be defined as actions of economic agents in maximising their own utility to the detriment of others, in situations where they do not bear the full consequences or, equivalently, do not enjoy the full benefits of their actions due to uncertainty and incomplete or restricted contracts, which prevent the assignment of full damages (benefits) to the responsible agent.
stock price declines following an agent's announcement, for example regarding a takeover, then the managerial action is implied to be more in the interest of managers, instead of shareholders. According to the economics and finance literature, share prices are often diminishing to reflect agency costs resulting from managerialism. Managerial aspects as a motivating force behind takeovers will be further discussed in detail in Chapter Five.

Murphy (1985) and Jensen (1986, 1993) further argue that there are agency costs associated with free cash flow, potentially resulting in over-investment. Cash provides managers with the flexibility to make investment decisions without being subjected to the monitoring of the capital market. If managers are empire-building and perquisite-consuming, cash allows them to pursue these activities (Pinkowitz, 2002). Jensen believes that self-interested managers have incentives to hoard and misuse free cash flow to benefit themselves rather than shareholders. Easterbrook (1984) adds that since managers may have incentives to expand firm size and purchase assets via takeovers, management have the option to use free cash flow to finance these projects internally. Jensen (1986) and Mann and Sicherman (1991) add that the use of free cash flow for takeovers is likely to be perceived negatively by shareholders, because they prefer a dividend increase or wish that the firm obtained capital externally through debt holders or in the capital market, which makes it easier to monitor managerial behaviour. The authors argue that share prices are often diminishing to reflect agency costs resulting from a firm's free cash flow abuse. The field of free cash flow will be further discussed in Chapter Four in relation to capital structure aspects and in Chapter Five in relation to being a takeover motivator.

Agency theory also claims that managers may have goals which are more beneficial to owner interests but that are still inconsistent with value maximisation (Fama, 1980, Hart, 1995, Ang, Cole and Lin, 2000). Donaldson (1984; 3) in his study concludes that managers are often not aiming to maximise the value of the firm but rather to increase corporate wealth, which he defines as 'the aggregate purchasing power available to management for strategic purchases during any given planning period'. In the worst-case scenario, another potential source of residual loss may be found in managers being incompetent to run the company. As argued in Jensen and Ruback (1983), poor managers who resist being replaced might be the costliest expression of the agency problem.

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5 Free cash flow is discretionary cash flow available to managers in excess of the funds necessary to finance all positive net present value investment projects (Mann and Sicherman, 1991).
Conflicting interests may also exist between shareholders and managers with regard to the timing of investment decisions. Whereas shareholders take an indefinite perspective with regards to future cash flows, management is only concerned with the cash flow for the time of their employment. Management is therefore somewhat short-term orientated, preferring investment opportunities with short-term high accounting returns instead of long-term positive net present value projects (McColgan, 2001).

Authors including Amihud and Lev (1981), Cremers and Nair (2003) and Scholten (2003) further point out that risk-taking is one area where the interests of managers and shareholders may oppose each other, leading to potential agency costs. Risk-averse managers generally tend to choose projects that reduce the uncertainty of their un-diversifiable ‘human capital’ investment in the firm and lessen the probability of bankruptcy (Jensen and Meckling, 1976), which, however, results in a lower expected return than for riskier ventures. Shareholders have the opposite preference and want managers to behave as risk takers. Bagnani, Milonas, Saunders and Travlos (1994) conclude that managers’ interests therefore are close to the interests of bondholders, who, like managers, are exposed to the downside risk of negative investment returns and do not share significantly in upside return outcomes.

Studies by Jensen and Meckling (1976), Shavell (1979) and Marcus (1982) confirm the theory of risk aversion on the part of managers as an additional source of agency costs. Amihud and Lev (1981), Donaldson (1984), Agrawal and Mandelker, (1987) and Baker, Jensen and Murphy (1988) argue that as management’s employment is dependent on changes in firm value, an increased variance of the firm’s returns reduces the certainty of his employment. The manager therefore has an incentive to reduce his employment risk by increasing firm size and by diversifying the firm’s portfolio. This is often seen as a motivation for unrelated M&A activity. Research by Lewellen, Loderer and Rosenfeld, (1989) and Cremers and Nair (2003) confirm these findings and show that M&As are often referred to as examples of risk-reducing investments which at times are taken knowing that the potential associated consequence is a decline in share prices.

Management, however, may not only reduce shareholder value through acquiring the wrong companies for the wrong reasons, they might also reduce shareholder value by resisting

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> 6 Net present value is defined as the difference between the present value of future cash flows and the present value of the investment’s cash outlays discounted at the firm’s cost of capital (McMenamin, 1999).
takeovers, even when acquirers offer large premiums (Bolton and Scharfstein, 1998). Jensen and Ruback (1983) remark in this context that management often actively seek to undermine any takeover potential of the firm since it may result in the loss of personal wealth and reputation. Bolton and Scharfstein (1998) remark that such managerial behaviour occurs in connection with low ownership stakes being held by management. In sum, as argued by Shleifer and Vishny (1997), evidence increasingly shows that managerial interests rather than shareholders interests direct a firm’s acquisitions, which will be further investigated in Chapter Five.

2.4.2 Monitoring Costs

According to Ang, Cole and Lin (2000), agency theory has not only investigated managerial discretion as one form of agency costs but has also put the various external and internal monitoring and bonding mechanisms at the centre of attention. Monitoring costs are defined by Fama and Jensen (1983b) as expenditures paid by the principal to supervise, measure and control managerial behaviour. Although the principal may initially pay for these costs, agents are the ultimate risk bearers since management compensation will be corrected to balance these expenses. Denis, Denis and Sarin (1997) add that effective monitoring is not only restricted to the principal but to a number of specific parties. As Easterbrook (1984) explains, managers, investors and other contracting participants all benefit from setting up controlling devices such as monitoring and bonding as well as incentive mechanisms to ensure that management acts in the investors’ interests.

Burkart, Gromb and Panunzi (1997) take a different view and claim that too much monitoring will affect managerial initiative and decision making negatively. Himmelberg, Hubbard and Palia (1999) suggest in that context that an optimal level of monitoring is dependent on a corporation’s unique contracting situation.

The work by Agrawal and Knoeber (1996) differentiates between seven control mechanisms: the first three broad mechanisms and the four ways to facilitate the fourth broad mechanism. The use of debt [as a bonding or monitoring mechanism] relies on the capital market for monitoring. Similarly, the market for managers relies on prospective employers; the market

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7 Monitoring costs may include the cost for audits, writing executive compensation contracts and eventually the cost of replacing managers (Fama and Jensen, 1983b).
for corporate control relies on prospective acquirers; insider (i.e. top management) shareholding relies on inside owners; institutional shareholding relies on institutional owners; block holding relies on large outside owners; and use (i.e. effectiveness) of outsiders on the board relies on these (same) board members’ (Agrawal and Knoeber, 1996; 380). The authors stress that the last three control mechanisms, however, cause their own agency conflicts and monitoring problems. It also needs to be stressed that there is a tendency of interaction between each type of control mechanism of the firm (McColgan, 2001). The following section investigates the firm’s various contracting parties, their monitoring activity and related potential costs more in detail.

2.4.3 Monitoring Activities of Contracting Parties

2.4.3.1 Minority Shareholders

As Easterbrook and Fischel (1982, 1983) show, agency costs for monitoring managers are high for each shareholder and as a result shareholders do not undertake enough monitoring activity, apart from having the right to participate in the election of the board of directors at the annual general meeting. Generally, there are two primary reasons for the shareholders’ limited monitoring activity. First, as noted by Berle and Means (1932), the large number of shareholders divides power among too many small parties and secondly, as pointed by Jensen and Meckling (1976), dispersed shareholders have little or no incentive to monitor management. As Easterbrook (1984) explains, a shareholder would incur all monitoring overheads but would benefit from his monitoring activity only proportionately to his shareholdings. This is due to the well-known free-rider problem in spending for quasi-public goods, such as monitoring efforts.

Research by Prowse (1994) found that ownership concentration is relatively low in the UK in comparison to the US, Japan and Germany. Research by Ang, Cole and Lin (2000) further shows that expenditure on monitoring by shareholders decreases as their individual share ownership declines and that shareholders pursue their monitoring function only when they are concerned about the firm’s profitability and its ability to pay off debt or secure future funds.

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8 Individual shareholders who invest in an equity stake of the firm are not guaranteed any payments in return, albeit dividends are paid out at the discretion of the board of directors. Shareholders furthermore have no claim on any of the firm’s specific assets. Their only principal right is the voting right for the board of directors, which is only of real use if individual shareholders concentrate their vote (Shleifer and Vishny, 1997).
With reference to Williams (1987) monitoring activity is expected to decline if the firm’s risk of bankruptcy is not imminent. As Sinha (2004) concludes, diffuse share ownership reinforces the separation of ownership and control as it encourages impersonal share ownership.

As minority shareholders have only a limited monitoring role, these shareholders prefer dividend payouts to potentially risky investments, which they cannot control. Dividends thereby indirectly limit the power of managers and control for potential agency problems (Jensen, 1986). Easterbrook (1984) points out that dividend payouts are perceived positive since they result in a higher debt-equity ratio, which keeps them from wasting money to bondholders and as pointed out by Jensen (1986) reduces financial slack\(^9\).

2.4.3.2 Large Shareholders and Block Holders

If control deficiencies allow managers to pursue their own goals rather than act in the interest of their owners, then according to Demsetz and Lehn (1985) a higher ownership concentration in form of large shareholdings or block holdings\(^10\) will help to develop a tighter controlling mechanism between managerial action and the shareholders’ interests, leading to higher profit rates.

Evidence on the significance of large shareholders as a monitor of management is increasing. Studies by Franks and Mayer (1990, 1996), Kaplan and Minton (1994) and Gorton and Schmidt (1996) all come to the conclusion that large shareholders are an important part of the corporate governance system for monitoring management. Jensen (1993) agrees and stresses the significance of large shareholders for a well-functioning governance structure since block holders are financially interested in assessing the firm’s management. Shleifer and Vishny (1997) agree and add that concentrated shareholdings most efficiently align cash flow and control rights between management and outside investors as block holders have the interest in getting their money back and they have the power to demand it. According to Burkart, Gomb and Panunzi (1997, 2000), by virtue of their proportionately large shareholdings, block holders are motivated to monitor management in order to be able to make more informed

\(^9\) Financial slack means having cash and/or spare debt capacity (Copeland and Weston, 1992).

\(^10\) If stakeholders own a share of at least 5% of the firm’s stock, they are referred to as block holders (Denis, Denis and Sarin, 1997).
decisions, which in turn will increase share value. Shleifer and Vishny (1997) remark in this context that large shareholders get round the traditional free rider problem.

Mikkelson and Ruback (1985) report that block purchases initially result in a positive market reaction, which, however, disappears immediately if no corporate restructuring follows this initial acquisition. McConnell and Servaes (1990) furthermore detect a positive relationship between large institutional ownership and market value.

Research by Burkart, Gomb and Panunzi (1997, 2000) shows that the expertise of large shareholders gives them greater discretion, since ordinary shareholders are prepared to leave the decision to the 'more informed' large shareholders. In addition, block holders accumulate substantial power to directly influence the firm's decision-making. This is especially the case when firms have an otherwise dispersed ownership. As Shleifer and Vishny (1986) comment, large shareholders have in some cases even enough voting rights to direct management through a takeover.

Hart (1995), Burkart, Gomb and Panunzi (1997) and Shleifer and Vishny (1997), however, add that a large shareholder may use his power to pursue his own interests, which at some instances may be at the expense of other dependent parties such as minority shareholders, creditors and employees. For example, as stated by Burkart (1995), the counter-bidding by large shareholders does reduce the likelihood of a takeover, which could, however, be in the other stakeholders' best interest. Holmstrom and Tirole (1993) state that large shareholdings can impact negatively on the liquidity of a stock and it can reduce the amount of company information being provided to the market. Grossman and Hart (1988) and Harris and Raviv (1988) further add that the large investors' own preferential treatment at the expense of other dependent parties is particularly apparent when their control rights are considerably above their cash flow rights. As research by Bethel, Liebeskind and Opler (1998) concludes, although block holders may be beneficial in influencing corporate governance, for example, in the case of takeover attempts, there is evidence that they are tempted to become as self-serving as the management they are intended to monitor.

\[11\] In this case, large investors have the additional power to distribute cash flow solely to themselves, instead of on a pro-rate basis (Shleifer and Vishny, 1997).
Morck, Shleifer and Vishny (1988 a) investigate the relationship between share ownership of block holders and the company’s profitability. Their study detects that profitability increases when share ownership ranges between 0 and 5%, however, they also find that profitability declines with higher ownership stakes than 5%. The authors explain their findings with the fact that if ownership exceeds a particular level, large stockholders have most of the control and are wealthy enough to use their power to expropriate private benefits of control. In sum, agency costs are not only rising in association with fragmented ownership but also as a result of large share ownership and entrenchment. Research has detected a concave relationship between block holdings and monitoring effectiveness (Morck, Shleifer and Vishny, 1988b, Stulz, 1988, Wruck 1989, McConnell and Servaes 1990). Hart (1995) concludes that although agency problems may be reduced, large shareholders do not eliminate them.

2.4.3.3 Large Creditors and Investors

The role of creditors in monitoring borrower behaviour has been the focus of much research including evidence from Diamond (1984), Berlin and Loeys (1988), Seward (1990) and Besanko and Kanatas (1993). Research by Fama (1985) on the financial role of large creditors portrays banks as ‘special’ as they provide a unique financial service. This view was consequently supported by evidence by James (1987) which suggests that what is ‘special’ is that banks fulfil a monitoring as well as a lending function. Schmidt (2003) and Jacoby (2007) points out that this view is particularly true in countries such as Germany and Japan, where relationship banking plays a key monitoring role as part of the national corporate governance system.

Lenders incur monitoring costs to secure individual interest payments and to protect their loans overall. Therefore, creditors force firms to become a more efficient operation with better-utilised assets. Creditors, in addition, often monitor the consumption of perquisites to improve financial performance. As a result, small creditors and shareholders are able to benefit from bank monitoring, which may lead to lower agency costs. Research by Ang, Cole and Lin (2000) also found some evidence that delegated monitoring of small firms by banks reduces agency costs. Empirical support is given to the theory that creditors are capable monitors and there is compelling legal and financial argument in support of extending the monitoring role of these investors (Black, 1992).
Amihud and Lev (1981) and Ang, Cole and Lin (2000) refer to large creditors being risk-averse investors resulting in potentially conflicting interests of bondholders and shareholders leading to agency costs. Risk-averse creditors generally tend to finance projects which reduce the uncertainty of their interest payments to protect their loans overall, which, however, might result in a lower expected return. Shareholders have the opposite preference and want creditors to also consider riskier ventures with an upside return potential. Hart (1995) adds that riskier ventures enrich shareholders at the expense of creditors, because shareholders do not pay any of the gains to bondholders, yet bondholders bear part of the risk of corporate failure.

Shleifer and Vishny (1997) see considerable similarities between large creditors and large shareholders. They believe that large investors might misuse their power to the disadvantage of managers and employees. When managers and employees feel too closely monitored by investors with the risk of easily losing their employment, they might cut down on their firm-specific human capital investments. Schmidt (1996) and Burkart, Gromb and Panunzi (1997) raise the particular issue that the high-powered incentives of principals can degrade the efforts of an agent. Research by Shleifer and Summers (1988) come to a similar conclusion by studying takeovers. It becomes apparent that large investors are, similarly to large shareholders, easily tempted to pursue their own objectives, which in turn impacts on managers’ incentive payments. This in turn has a negative impact on ex-ante managerial and employee incentives, which is the focus of the next section.

As already stated, countries differ widely in their regulatory regime applicable to the banking system. For example, there is no separation of commercial banking from securities and investment business in Germany. German banks therefore offer their customers custodial services for shares and vote on behalf of them at shareholder meetings. As a result, differences in banking regulations lead to very different roles played by banks in corporate governance. There is also considerable variation with regards to the legal limitations of bank ownership of non-financial firms across different countries. The ability of banks to own equity of firms enhances their ability to be effective monitors. Until recently banking regulation in the US such as the Glass-Steagall Act severely limited the banks’ ability to hold stocks in manufacturing firms and in general to combine banking and commerce. Countries with lender ability laws and equitable subordination laws also limit the ability of banks to be effective monitors. Economies like Germany and Japan, however, are described as effective
monitors and are characterised as having a low cost of bank monitoring. On the other hand, as stated by Kose and Simi (2002), economies, where the environment is not conducive to bank monitoring, are regarded as having a high cost of bank monitoring. Country differences in governance systems will be further discussed in detail in the next chapter.

In sum, whereas all contracting parties participate in setting up effective monitoring mechanisms, there is a tendency of interaction between each type of control mechanism within the firm and it has been shown that they all cause their own agency conflicts and monitoring problems.

2.4.4 Bonding and Incentive Costs

As explained by Shleifer and Vishny (1988), the incentive theory claims that managers, who are rewarded for good performance and penalised for poor performance, are motivated to improve corporate results and value. As pointed out by Baker, Jensen and Murphy (1988) and Denis and Kruse (2000), the optimal incentive/bonding contract should offer corporate management sufficient incentives to align their decisions with shareholders at the lowest possible cost to shareholders and bondholders. As described by Jensen and Meckling (1976) and Fama (1980) incentive contracts exist in various forms such as accounting-based performance bonus schemes, share ownership, stock options, long-term incentive plans or a threat of dismissal if income is below expectations.

Empirical literature on incentive contracts and management ownership indirectly dates back to Berle and Means (1932) who argue that in large firms management ownership is too small to make managers interested in profit maximisation. Some of the early studies, including Baumol (1959), Cyert and March (1963) and Williamson (1964), disagree with the view of Berle and Means and reject the classical model of an entrepreneur, or owner-manager, who single-mindedly operates the firm to improve profits. They prefer 'behavioural' and 'managerial' theories that look at the motivation of management who do not own but control, which is very different from the 'classical economic man'. These studies document a general positive relationship between pay and performance, thus rejecting the extreme hypothesis of complete separation of ownership and control. Gibbons and Murphy (1992) and Gaver and Gaver (1993) have investigated the extent to which compensation policies cause managers to emphasise long-term investments over short-term investments. Research by Murphy (1985)
and Ferreira and Laux (2007) finds that managers’ pay responds positively to stock performance. Studies by Brickley, Bhagat and Lease (1985) and Tehranian and Waegelein (1985) further show that stock prices improve when incentive-based compensation schemes are introduced. Bagnani, Milonas, Saunders and Travlos (1994) conclude that in the absence of any incentive mechanisms managers would pursue their own interests by choosing low-risk projects at the expense of the stockholders and to the general benefit of bondholders.

To reduce potential agency costs, authors including Jensen and Meckling (1976) and Leland and Pyle (1977) regard managerial ownership as an important control tool for shareholders. Authors including Gompers, Ishi and Metrick (2003) agree and argue that increased managerial ownership has a direct impact on managerial diligence and perquisite consumptions, because managers bear their share of any potential costs resulting from poor management. Research by authors such as Amihud and Lev (1981) and Benston (1985) support this view. As further pointed out by Barron (1983), Walkling and Long (1984), Song and Walkling (1993) and Holmstrom and Kaplan (2001) managerial ownership provides an additional control tool to deter or accept acquisitions. Top management will only support acquisition offers, which provide an overall wealth gain both for management and shareholders, which in turn also potentially results in higher takeover premiums being negotiated by managers. Stulz (1988), Stulz, Walkling and Song (1990) and Song and Walkling (1993) support this view and claim that firms with large managerial ownership tend to be less likely acquisition targets, not only because they tend to be more expensive but also because increased managerial ownership reduces agency costs and thus any potential acquisition gains. Research, which supports this view include studies by Lewellen, Loderer and Rosenfeld (1985), Agrawal and Mandelker (1987), Mikkelson and Partch (1989) and Song and Walkling (1993).

As already pointed out earlier in this chapter, managerial risk aversion is known to be a source of potential agency costs. Empirical research by Ross (1973), Stiglitz (1975), Holmstrom, (1982), Agrawal and Mandelker (1987), Haugen and Senbet (1981) and Bagnani, Milonas, Saunders and Travlos (1994) gives evidence that when management holds large managerial share holdings, he is induced to choose riskier corporate investments, which is commonly in line with shareholder interests but potentially to the harm of bondholder interests (Haugen and Senbet, 1981, Bagnani, Milonas, Saunders and Travlos, 1994). Amihud and Lev (1981), on the other hand imply that the relation between managerial stock holdings and risk taking may
not always be positive. Their research outcome supports the view that managers with small shareholdings have an incentive to reduce the firm's overall risk. They refer to the fact that managers owning minimal stock holdings are often undertaking conglomerate mergers, presumably to reduce the variability and risk level. As argued by Agrawal and Mandelker (1987) and Goh (2006) this implies that decisions of corporate investment and financing may be dependent on the degree of managerial share holdings.

Other studies including Ross (1973), Stiglitz (1975) and Holmstrom (1982) come to the result that the optimal incentive contract is dependent on management's individual risk aversion. This might be one explanation for the fact that research, focusing on the relation between managerial ownership and risk taking in investment decisions, comes to conflicting results in terms of not always detecting a positive relationship.

Another problem with high-powered incentive contracts is, as noted by Shleifer and Vishny (1997), that they result in enormous opportunities for managerial self-dealings. Managerial ownership provides management with additional voting power, which they may exploit to pursue their own private wealth considerations and employment position. For example, Morck, Shleifer and Vishny (1988a, b, 1990), Gompers, Ishi and Metrick (2003) and Goh (2006) note that managers with a high ownership stake might become entrenched, which in turn may increase their ability to resist external discipline and may misalign interests between managers and shareholders as well as managers and bondholders. Their research, however, found out that in practice corporate executives generally own only a small share in the corporation.

Research by Morck, Shleifer and Vishny (1988a,b), McConnell and Servaes (1990), Hermalian and Weisbach (1991) and Bagnani, Milonas, Saunders and Travlos (1994) revealed a non-linear relation between the fraction of stock being held by management and firm performance. This implies, that management with an ownership stake display a preference for riskier investments only up to some threshold. They claim that when managerial shareholdings are very large their decision-making becomes more risk-averse since management starts to worry about their potentially non-diversifiable, non-human wealth and hence aim to protect their private benefits and personal objectives. In sum, managers with high ownership stakes align their interests not with shareholders anymore but their decision-making sympathises more
with bondholder interests. Shleifer and Vishny (1988) therefore conclude that it is problematic to infer that incentive contracts would totally resolve the agency problem.

Jensen and Meckling (1976) refer to another common bonding mechanism between management and shareholders by posing the issue of investors bribing the management with cash to ensure that management only undertakes efficient projects. As pointed out by Walkling and Long (1984) and Lambert and Larcker (1985), golden parachutes are good examples of bribing activity, since they induce managers to agree to hostile takeovers. Shleifer and Vishny (1997) remark that shareholders should not bribe managers since such threats would be against the managers’ legal ‘duty of loyalty’ to shareholders. Although this legal duty prevents efficient ex-post bargaining between managers and shareholders it, however, also avoids shareholders getting into the situation of having to constantly bribe managers to achieve any efficient action at all. Shleifer and Vishny (1997) conclude that shareholders should keep away from bargaining since it only exposes them to threats from management.

2.5 Conclusion

This chapter provided a review of the theory and research undertaken in the field of corporate governance with particular focus on agency theory. It investigated the implications that the separation of ownership and control and the resulting misalignment of management and residual claimants’ interests have on the varying contracting parties.

It was shown that the separation of ownership and control not only results in a residual loss due to costs arising from an agent’s action such as wasteful management but also through costs arising from monitoring and bonding agents in order to keep residual losses to a minimum. However, as pointed out by Morck, Shleifer and Vishny (1990), it is incorrect to state that existing monitoring and incentive tools keep managers from pursuing personal non-value maximising objectives.

Another conclusion, which can be drawn from the literature, is the reoccurring controlling importance of ownership on the relationship between all contracting participants. As has been shown, a certain level of ownership stake being held by the various stakeholders such as shareholder, bondholders and management itself can impact positively on agency costs,
whereas these positive impacts on agency conflicts disappear again beyond a certain level of ownership.

The following chapter will focus on the role the market for corporate control plays for corporate governance and agency conflicts.
Chapter Three
The Market for Corporate Control

3.1 Introduction

Whereas the previous chapter investigated the role agency conflicts play for the various contracting party of a firm, the following chapter analyses the role the market for corporate control plays with regard to corporate governance. Manne (1965, 1967) regards the external market for corporate control as an important tool to overcome the misalignment between managers’ decision-making and those that are best from the standpoint of shareholders and bondholders.

There is sizable empirical literature analysing the effect of the market for corporate control on these agency conflicts. In line with Jensen’s (1993) research, this chapter distinguishes between four control forces, which are internal control systems such as (1) the board of directors, (2) legal and regulatory systems, (3) the external capital and the managerial labour market as well as (4) the external product and factor markets. Varying practices across countries are highlighted and discussed for the various control systems. This chapter also investigates M&As as a fifth external control force, which is often referred to as the capital market’s last resort for rectifying managerial inefficiency and overcoming agency conflicts.

3.2 The Board of Directors

3.2.1 The Role of the Board of Directors

In theory, the most important legal right of shareholders is the privilege to elect the board of directors at the company’s annual general meeting. The board of directors is the main internal mechanism through which shareholders try to constrain managerial choices, since the board has at least nominal power to hire and fire the chief executive officer (CEO) and to block any major corporate investment decision including M&As (Manne, 1965, Easterbrook and Fischel, 1983). For this reason, the board of directors is recognised as an important element of corporate structure and governance (Blair, 1995, Monks and Minow, 2002).
The board can be defined as ‘the institution to which managers are accountable and the institution, which is accountable before the law for the company’s activities’ (Oxford Analytica Limited, 1992; p7). McMenamin (1999) and Monks and Minow (2002) add in this context that members of the board are regarded as the middlemen between the principals and the agents of a corporation. The authors refer to the board’s legal duties, the duty of care, in exercising reasonable caution and due diligence in making decisions, and secondly, the duty of loyalty, in demonstrating reliability to the company’s shareholders. Morck, Shleifer and Vishny (1989) and Hermalin and Weisbach (1998) see the important function of the board of directors in monitoring and controlling management and its performance and to enforce its replacement if necessary. Gertner (2000) further regards it as the board’s duty to advise and support management with expertise and experience in its decision-making.

3.2.2 Election and Structure of the Board

Until the mid-to-late 1980s, it was general practice to (re-)elect directors, which were nominated by executives, at each annual shareholder meeting. Blair (1995) in this context remarks that the voting rights of shareholders were limited in that shareholders could only vote for the directors, which were selected by the directors themselves, or could choose not to vote. The exceptions were proxy contests. Shleifer and Vishny (1997) and Blair (1995) further add that the election of the board by shareholders does not oblige directors to act in shareholders’ interests.

However, as a consequence of the takeover wave in the late 1980s, companies have started to implement the protective device of electing directors on a three-year term. This helped by reducing the risk of raiders seeking director votes from shareholders. As pointed out by Monks and Minow (2002), management argued that this staggered board structure assured a more continued board service, however, it ignored the interests of shareholders, who might have preferred to vote on an annual basis.

Another important determinant of the effectiveness of the board of directors is often referred to as board size. According to research by Yermack (1996) and Conyon and Peck (1998), a

12 The board’s responsibilities include the appointment and replacement of the CEO, negotiating the CEO’s compensation, nominating directors, monitoring and overseeing financial reporting and approving important strategic and financial decisions such as M&As (Gertner, 2000).
board, which comprises of too many directors, becomes inefficient. The benefits of improved monitoring through larger boards are offset by problems related to asymmetries of information. It is being suggested that a board should not exceed the size of ten members. Jensen (1993), for example, states that a board with more than seven or eight members is likely to act ineffectively and that larger boards are easier to control by the CEO.

The last twenty years have been characterised by the trend of increasingly including independent outside directors in the board of directors (Monks and Minow, 2002). In theory, outside directors are free from conflicts of interests and are in a better position to protect the owners' interests. Milgrom and Roberts (1992) and Cotter, Shivdasani and Zenner (1997) believe that outside directors have more incentives to promote shareholder interests and to be more objective in evaluating the costs and benefits of an investment decision, such as M&As.

However, the definition of director independence varies. According to one view, board members should be completely independent of the corporation’s business affairs and must have no connection to the company other than the seat on the board (Blair, 1995, Monks and Minow, 2002). As pointed out by Shleifer and Vishny (1988), this independence of board directors is often partly spoilt by the CEO asking the board to put interests of internal stakeholders before those of shareholders. An alternative theory of independence was outlined by Porter (1992) who proposes that boards of directors should not only comprise of insiders but of a combination of all important stakeholders in the firm, e.g. customers, suppliers, financial advisers, employees, etc.. Porter’s view is argued to have limitations when applied to large publicly listed corporations, however, his model has found wide application in many smaller businesses.

Some studies by authors including Weisbach (1988), Rosenstein and Wyatt (1990) Hermalin and Weisbach (1991), Black (1998) and Bhagat and Black (1999) show that a board of independent directors do a better job than a board comprising of non-independent members, particularly if the board’s most important task is the replacement of the CEO. The stock market thus values the importance of independent directors and studies have shown that stock prices increase as a result of appointing additional outside directors.

Another area of debate is the effectiveness of a dual or joint function of the CEO and chairman in a corporation. The majority of large US corporations have a CEO who is also the
chairman of the board. Views regarding the effectiveness of the CEO’s function as the board’s chairman are conflicting. Whereas one view stresses the importance of a company being led by one person, there are other authors who argue that separating the role of the CEO and chairman is of less importance, since the role of the chairman was only to chair the meetings. However, other authors including Monk and Minow (2002) argue that a board of directors, which is chaired by the CEO, cannot represent the interests of shareholders and impartially sit in judgement himself. A separation would help to more objectively evaluate the CEO and the corporate success thus creating an environment of greater accountability (Jensen, 1993, Monks and Minow, 2002). Empirical work in this particular field is limited, however, a study by Rechner and Dalton (1991) found that corporations separating the CEO and chairman position consistently outperform their peers with a joint leadership position.

3.2.3 Board Structures across Countries

Internal control systems vary greatly across the world, even across the developed countries. They range from two-tier supervisory and management boards in Germany with strong relationship-banking devices and insider-dominated boards in Japan to mixed boards in the UK and US (Charkham, 1994). Boardrooms are usually made up of internal top executives and external directors to the firm. However, countries vary considerably in their exact boardroom structure and in the mixture of executive and non-executive directors. A further country-specific distinction can be made with regard to the (non)separation of the chairman from the CEO position (Shleifer and Vishny, 1988, Constantinou and Constantinou, 2003).

The Anglo-Saxon economies, particularly US corporations, are often characterised by having only inside board members or in the case that outsiders are selected, the selection is strongly influenced by corporate insiders or the CEO himself. Research by Weisbach (1988) shows that boards in the US, particularly those which are dominated by outside directors, are sometimes in the position to remove top managers but only as a result of very poor performance. Mace (1971) and Jensen (1993) argue very strongly that, as a general rule, corporate executives dominate corporate boards in the US. CEOs in the US often serve as joint chairman of the board, whereas according to Jacobs (1993) UK chairmen of publicly traded companies are commonly outsiders.

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13 However, it needs to be borne in mind, that combining the two positions does not inevitably mean that a joined CEO/chairman certainly uses his power to manipulate the board.
Overall, the Anglo-Saxon economies are known to be much more stock market-oriented and the distinction between investors and managers is very strong. This heavy reliance on an active stock market is often regarded as an inefficient way to monitor and if necessary, correct corporate action (Shleifer and Vishny, 1988, Jensen, 1993). These externally controlled governance systems for example, rely heavily on the capital market for detecting managerial deficiencies with takeovers serving as an important means of rectifying these deficiencies.

Germany in contrast employs a two-tier board structure to supervise the company’s strategy and operation. The supervisory board consists of a large number of outside directors, which are representing the corporation’s various interest groups, with the strong universal banks taking an important role. In general, German banks have considerable power and influence on corporate governance, which is often significantly greater than for banks based in more stock market-oriented countries. The second board is referred to as the executive board whose role is to implement the strategy (Shleifer and Vishny, 1997). Overall, research by Jacobs (1991), Kester (1991) and Kaplan (1994 a, b), however, concludes that despite the presence of a separate independent supervisory board, German supervisory boards are rather passive.

In contrast to Anglo-Saxon countries, the stock exchange plays a less critical role in monitoring and guiding corporate actions in Germany and the rest of Continental Europe, thus takeover activity is almost non-existent. Instead debt finance providers play an important role in this principle agent relationship, which is in general, governed much more by rules and legal restrictions (Shleifer and Vishny, 1997).

Other European countries such as France and Italy are also principally controlled by executives who wield significant power and who are rarely challenged by the owners and other stakeholders (Thompson, 2001).

Japanese shareholders also tend to be passive and with little power, since the boards of directors are essentially regarded as a managerial extension with no independent power. Japan is characterised by large industrial groupings [Keiretsu], which are held together by a number of cross-shareholdings, joint ventures and product-development agreements. Typically, commercial banks are at the centre of such industrial groups, not only to satisfy any financial needs but also to exercise direct managerial control, particularly if the company encounters operating or financial difficulties (Aoki, 1990, Jacobs, 1991, Kester, 1991, Berglof and
As pointed out by Thompson (2001) and Rose (2007), corporate governance systems have an increasing impact on corporate strategies across all countries as a result of globalisation and cross-country takeovers and joint ventures. The effectiveness of the different kinds of board structures in various countries is controversial and evidence remains mixed (Shleifer and Vishny, 1997). Overall, despite a large variety of board systems and structures, corporations in many countries are still dominated by management with shareholders only taking a passive role. Interests of shareholders are thus often placed below those of the controlling management.

### 3.2.4 The Effectiveness of the Board of Directors

Fama and Jensen (1983) and Morck, Shleifer and Vishny (1989) remark that internal control devices such as the board of directors are cheap to operate and are more in line with long-term planning of the present management, which is in direct contrast to governance systems such as the rapid-fire mechanisms of takeovers.

Practice, however, has proven that boards of directors are rarely effective in stopping the non-value maximising behaviour of corporate executives. Despite the board’s theoretical relevance and despite the existence of a legal framework to monitor and control the board’s function, directors and managers have been involved in a large number of corporate scandals since the early 1980s (McMenamin, 1999). One of the most recent boardroom scandals involves Deutsche Bank’s CEO and his personal involvement as a non-executive director in the recent Mannesmann – Vodafone hostile takeover deal\(^\text{14}\). These scandals have highlighted and increased the general concern that the standards and the code of conduct of top executives in leading corporations are evidently deteriorating.

As a result, corporate governance by internal control systems has increasingly become an important issue of public debate. Many researchers have undertaking a vast amount of

\(^{14}\) One of the world largest hostile takeovers to date, the Mannesmann – Vodafone deal in 2000 for over a $ 100 billion has highlighted EU’s failure to adopt a Anglo-Saxon style, takeover-friendly common code. The Mannesmann battle has also drawn attention to the slow pace of Germany’s own corporate law overhaul, intended to replace a voluntary takeover code and remove a host of legally sanctioned anti-takeover defences open to target managements (Goldstein, 2000).
research into the field of internal control mechanisms in order to increase the understanding of
the ineffectiveness of corporate boards of directors. Particular areas of research include the
election and structure of the board, the board’s (dis)ability to fulfil its function (due to the lack
of information, involvement and consensus) as well as the lack of shareholdings being held by
directors, which will be discussed in more detail below.

Shleifer and Vishny (1988) and Jensen (1993) remark that the duty of the board of director to
shareholders is often restricted by a lack of involvement, insufficient knowledge and expertise
as well as the lack of consensus about goals and interests to be served, to assess and challenge
the corporation and its strategy effectively. Board members are not only dependent on the
information provided by the CEO and internal executives, which is often on purpose selective
and limited, but also on obtaining additional outside information which is costly and time-
consuming.

The effectiveness of the board as monitor of management is further weakened by the fact that
board members are not fully involved in the corporation’s activities and the industry as a
whole (Blair, 1995)\(^\text{15}\). As explained by Monks and Minow (2002), directors are responsible
for the overall picture, not the day-to-day business decisions which, however, makes it
difficult to monitor and evaluate the corporation correctly. Therefore, limitations on
information and involvement hinder the effectiveness of the board’s monitoring function
considerably and this constraint is often referred to as the biggest obstacle to the board’s
governance. Board members do not have adequate procedural mechanisms to obtain the most
effective overview.

The lack of consensus and the confusion about corporate priorities among the board members
are also regarded as an important reason for board ineffectiveness (Lorsch and Maclver,
1989). This lack of consensus among directors has also become a central element in the
Weisbach (1988) and Jensen (1993) show that boards of directors are not effective in the
monitoring function, resulting in limited corporate restructuring activity. Corporate
redirection often occurs only as a result of external threat and detection of legislative
misconduct. According to Mace (1971; 3) board directors are ornaments on a corporate
Christmas tree’.

\(^{15}\) Outside directors frequently hold senior offices of other companies or are accomplished professionals from
another field who may serve on numerous other boards (Blair, 1995).
Jensen (1993) sees another major problem of the board’s effectiveness arising from directors not owning shares themselves in the company. Independent directors of hostile takeover targets are generally known to have less stock in the corporation than their counterparts of directors of non-targets. Jensen (1993) and Black (1998) therefore recommend encouraging outside directors to hold considerable shareholdings in the company to emphasise their role as the ‘true advocates’ of shareholder interests. Monks and Minow (2002; 210) conclude that ‘no director is going to remain passive if his investment is at stake.’

Despite the many weaknesses and deficiencies of the boards of directors, Blair (1995) regards this internal control device as the most important corporate governance mechanism. Gertner (2000) also refers to the fact that a large number of board structure issues are being tackled and that corporate governance activists have strengthened board independence in order to overcome agency conflicts. As pointed out by Black (1998), recent efforts have been directed at giving independent directors appropriate structures for monitoring and evaluating corporations more effectively. Activities include issues such as board composition, compensation, retention, and succession. Boards are increasingly becoming more systematised through the institutionalisation of various board committees, namely the audit, remuneration and nomination committees. Shareholders are increasingly aiming to participate actively in setting board service criteria and in choosing board candidates themselves, which incorporates the important role of independent directors vis-à-vis other directors (Padgett and Shabbir, 2005). Non-statutory proposals recommend eliminating a joint CEO/chairman position for the board of directors, and advise to have at least three independently minded outside executives on the board. An increasing proportion of director compensation is being paid in form of stock and stock options to ‘incentivise’ board director performance (Monks and Minow, 2002).

Nevertheless authors including Black (1998) and Monks and Minow (2002) remark that despite the welcomed rise of independent outside directors, revised board structures have seldom contributed to a more effective monitoring and controlling management and that directors still do not act sufficiently in shareholders’ interests. As Gerner (2000) concludes, the board of directors still lacks power and instruments to become truly independent and to improve its ability as an informed judge of important strategic corporate decision-making on behalf of shareholders.
The effectiveness of the different kinds of board structures in various countries is controversial and evidence remains mixed (Shleifer and Vishny, 1997, Rose, 2007). Overall, despite a large variety of board systems and structures, corporations in many countries are still dominated by management with shareholders only taking a passive role. Interests of shareholders are thus often placed below those of the controlling management.

3.3 Legal, Political and Regulatory Systems

Legal, political and other regulatory systems are generally referred to as the principal remedy for agency conflicts, as they give outside investors, including shareholders, some degree of controlling power to secure their investment against managerial expropriation (La Porta, Lopes-de-Silanes, Shleifer and Vishny, 2000, Menjucq, 2006). As pointed out by Manne (1965) and Easterbrook and Fischel (1983), shareholders benefit from their legal right to vote on important corporate matters such as mergers and acquisitions as well as to elect the board of directors, who in turn represent shareholders’ interest vis-à-vis management.

As has already been mentioned in this chapter, a wide variety of legislation and other regulatory rules have been established across countries to align directors’ actions with the actions of shareholders. Shleifer and Vishny (1997) state that legal restrictions on managerial self-dealings are the most common aspects of the duty of loyalty. Common offences include outright theft from the firm, unjustifiable compensation or allocation of additional stock equity to the management or even family.

Many countries, including the UK, have seen the creation of a number of public committees, which attempt to improve the accountability of board members (Constantinou and Constantinou, 2003, Rose, 2007). Reports of these committees, which include the Cadbury Report (1992), the Greenbury Report (1995), the Hampel Report (1998) and the Higgs Report (2003), all share the view that the board’s prime responsibility lies in determining the corporate board strategy and ensuring its implementation. Legal practice in these countries is that companies confirm their compliance with criteria proposed in the committee reports on corporate governance mentioned above. Non-compliance needs to be declared in special statements (McCoglan, 2001).
La Porta, Lopes-de-Silanes, Shleifer and Vishny (2000) claim that legal protection does not only depend on the content of the laws; it further is largely reliant on the quality of law enforcement. The authors view the latter as an important tool to reduce agency costs. La Porta, Lopes-de-Silanes, Shleifer and Vishny (1998) refer to the fact that the degree of legal protection of outside investors varies a lot between countries, similarly to the boards of directors. Despite all the apparent benefits of legal regulation, Jensen (1993) remarks that the legal, political and regulatory system has the problem of being far too slow and bureaucratic to cope with wasteful managerial actions effectively.

Legislation has also become an important issue with regard to corporate governance systems in the particular case of takeovers (Menjucq, 2006). As pointed out by Copeland and Weston (1992), views regarding takeover regulations are conflicting. One view supports stricter tender offer regulations to protect shareholders from undesirable takeovers and to enable them to receive more information and time to make their decision. Other researchers, including Daines (2002), claim that legislation significantly alters the effectiveness of the market for corporate control. High levels of legal protection can increase competition and premium payments for a takeover through information leakage and thus reduce the effectiveness of market control (Marshall and Anderson, 2006). It is argued that although these higher premiums might be beneficial to target shareholders in the short-term, they also create an artificial barrier against takeovers, which in turn might reduce the incentive and likelihood of the acquisition overall. This might leave the shareholders worse off by regulation in the long run. Copeland and Weston (1992; 727) therefore conclude that ‘regulation is seen as providing an advantage to incumbent (positively inept) management and mitigating the disciplinary effect of the market for corporate control’.

Countries including the UK and US, in particular, with their well-developed national financial sectors have adopted takeovers as an important governance mechanism with functioning legal frameworks (Menjucq, 2006). Sinha (2004), for example, found out that the proportion of hostile takeovers in relation to total takeovers is significantly larger in the UK than in the US. Other countries, such as Continental Europe, however, are struggling to bring their

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16 For example, Daines (2002) shows how the Delaware Law makes firms more prone to takeovers.
governance practice in line with the more developed financial markets to emerge as a more unified and liberalised capital market (Dixon, 1999).

Much attention with regard to existing corporate governance systems have focused on the differences of the systems in the advanced economies of the world (Rose, 2007). On the one hand, in Japan and Germany, managers are monitored by a combination of banks and large corporate shareholders with little or no role for the market for corporate control. On the other hand in the US and UK, the market for corporate control is an important mechanism for disciplining management with little or no monitoring by banks and large shareholders (Kose and Simi, 2002).

### 3.4 Product Market Competition

Shleifer and Vishny (1997) regard product market competition as one of the most powerful forces to discipline managers and per se to improve economic efficiency. Jensen (1993) also emphasises the power of the product market competition, as its self-regulating punishment is inevitable. It is common rule of the product market, that firms, which do not provide a service or product that consumers want at a competitive price are destined to fail. However, as pointed out by Jensen (1993), product markets and factor markets are often too slow to react in time to save the company. Shleifer and Vishny (1997) and Cremers, Nair and Peyer (2007) further see the limits of product market competition to reduce agency costs and corporate governance issues. As they explain, product market competition is a suitable tool to reduce the amount of cash available for managers, however, managers are still in the position to expropriate any residual returns available.

### 3.5 Capital Market Mechanisms

In contrast to the corporate governance mechanism of product market competition, which comes into action when it is often too late to rectify the situation, capital markets present an efficient mechanism to force companies to change and correct their actions in order to avoid losses (Jensen, 1993). As mentioned earlier in the context of large shareholders and creditors, firms have a need to approach the external capital markets for additional funds from time to time. As La Porta, Lopes-de-Silanes, Shleifer and Vishny (2000) point out, funding provisions and related borrowing terms are very much dependent on the firm’s reputation and credit
rating which in turn controls managers in their expropriation activity. As shown by research by Jensen and Meckling (1976) Williamson (1985) and Grossman and Hart (1986), managerial opportunism, whether in form of expropriation of investors or misallocation of company funds, often leads to an ex-ante inefficiency, which reduces the amount of resources investors are willing to put up ex-ante to finance the firm. A study by Franks and Mayer (1996) finds that equity issues by financially distressed companies supply the most significant mechanism for disciplining management.

Kreps (1990) claims that reputation building is also regarded as an important motive for managers to fulfil their obligations. As shown by research including John and Nachman (1985) and Mann and Sicherman (1991), reputation building reduces agency costs, however, as pointed out Bulow and Rogoff (1989) within some limits. Although Shleifer and Vishny (1997) agree with the general importance of the reputation model, they, however, claim that reputation building is probably not the whole explanation for companies coming to the capital market.

Another important reputation issue is related to the labour market for managers. Fama (1980) takes the view that management’s remuneration is dependent on the market’s perception of the overall alignment of managerial activities with shareholder interests. Management’s employment and remuneration is therefore dependent on its reputation of achieving shareholder interests. Jensen and Murphy (1990) believe that the labour market mechanisms are likely to reduce the occurrence of poor managerial performance. Agrawal and Knoeber (1996) in this context regard the threat of displacement as a powerful tool to discipline underperforming managers. The danger of being fired and the related embarrassment as well as private monetary damages may motivate the agent to align its interests according to those of the shareholders or principal. However, as empirical evidence by Weisbach (1988) and Kaplan and Reishus (1990) and arguments by Jensen and Murphy (1990) show, it takes a prolonged period of poor performance to result in the removal of even the poorest managers.

Fama (1980) refers to the wage revision process, where managers will always be remunerated in accordance with their achievements in line with shareholders. Fama, however, admits that due to market imperfection a full ex-post settling up is not realistic. He nevertheless argues that the controlling function of the capital and labour markets are adequate to solve a variety of corporate governance issues. Managerial labour markets are rational and foresee any
managerial shortcomings. Managerial assessments of ex-post deviations from the employment contract, for example, can be automatically incorporated into contracts on an ex-ante basis, for example, through a wage adjustment.

3.6 Takeover Mechanisms

Much of the evidence of the effects of corporate governance arrangements on agency conflicts is derived from analysing managerial behaviour during takeover threats and from examining acquisition announcements (Manne, 1965, Goldstein, 2000, Scholeton, 2003). As already discussed in the previous chapters, agency conflicts are often the motivating force behind both acquisitions as well as takeover resistance. An enormous amount of research papers on mergers and acquisitions has emerged, studying areas such as takeover motives and potential downside risks, which is the focus of Chapter Five.

Takeover attempts are regarded as an important disciplining device of the external market for corporate control (Jensen and Ruback, 1983). The takeover market is often referred to as the ‘court of last resort’ for replacing inefficient corporate management (Megginson, 1997). As pointed out by Monks and Minow (2002), the takeover era created all kinds of financial tools to finance M&As of any kind and size, which challenged and threatened the decision-making of managers. Jensen (1986) takes the view that takeovers are a direct response to the breakdown of internal corporate governance systems in companies, which have inefficient board structures, financial slack and wasteful managerial policies. Jensen (1993), for example, holds the failures of the boards of directors responsible for the advent of hostile takeovers, which are the predominant instrument vis-à-vis friendly takeovers.

Research by Manne (1965), Jensen (1988) and Scharfstein (1988) supports the view that mergers and acquisitions are a good tool for solving governance problems. Authors including Palepu (1986) and Morck, Shleifer and Vishny (1988a, b, 1989) point out that takeover targets are often underperforming companies. The evidence in research by Morck, Shleifer and Vishny (1989), for example, shows that bidders take advantage of apparent managerial inefficiencies and poor internal control mechanism such as the board of directors and incentive pay. Research in the field of underperforming companies becoming takeover targets is investigated further, in detail, in Chapter Five and constitutes also the central focus of this study.
Research by Martin and McConnell (1991) shows that management is often replaced immediately after a successful takeover. As indicated by Jensen and Ruback (1983) profits of the combined firms are likely to increase after takeovers. They claim that target shareholders benefit in particular from takeovers with significant wealth increases, which implies the failure of previous management.

Megginson (1997), however, notes that although disciplinary takeovers might work effectively, they need to be regarded as the most brutal method of exercising corporate control. In addition, there are also a number of problems related to the effectiveness of M&As as a mechanism of corporate governance. There is not only a high level of organisational costs associated with takeovers but, as stressed by Grossman and Hart (1980), it is the takeover premium the bidder has to pay to target firm’s shareholders, which increases the costs of a takeover, often to unjustifiable levels. Considering the high level of associated costs of takeovers, alternative methods of corporate governance need to be investigated to align manager and shareholder interests. This is also discussed further in Chapter Five.

According to Monks and Minow (2002), takeovers are often combated strongly by the target’s board of directors and management, who jointly try to protect their companies from hostile threats, however, at the same time ignoring their shareholders’ interests. As pointed out by Black (1998), recent board structure reforms have also impacted on managerial acquisition behaviour. Boards with independent directors, for example, are less prepared to allow their bidding management to overpay the target. Research by Byrd and Hickman (1992) shows that bidders with majority-independent boards offer lower takeover premiums and earn roughly zero returns from acquisitions, while bidders with a board dominated by inside directors are prepared to pay higher premiums and thus often suffer losses.

3.7 Conclusion

This chapter has introduced and discussed the corporate governance function of the market for corporate control, particularly investigating the effectiveness of the board of directors, legal, political and regulatory systems, product market competition, capital market mechanisms including the labour market as well as the correcting function of takeovers in overcoming potential agency conflicts due to the separation of ownership and control.
All control functions prove their relevance in theory; however, empirical research showed that each of them displayed weaknesses and deficiencies in practice. Whereas the board of directors is still very much wielded by decisions made by corporate executives, legislation, product market competition, capital and labour market mechanisms are generally appreciated as one way of controlling management, however, law enforcement is weak in many countries and corrective action often occurs far too late.

This chapter has also investigated takeovers as part of the corporate governance system. M&As offer, within some limits, a last resort for replacing inefficient management. Takeovers have the advantage of speed and guaranteed corrective action; however, the associated high costs are one main disadvantage.

Overall, there is only one clear conclusion to be drawn from this literature review, which is also exemplified in takeovers, corporate governance mechanisms, which might be optimal in one particular situation for one company in one country might not be ideal for another. As Kole (1995) and Himmelberg, Hubbard and Palia (1999) summarise, agency conflicts are heterogeneous across different firms in different industries with differing contract environments.

After investigating various corporate governance mechanisms of the market of corporate control, the following chapter will now focus on the relevance of the choice of capital structure for mitigating agency conflicts.
Chapter Four
Capital structure

4.1 Introduction

There is a growing agreement among academics and practitioners that financial structure plays an important role in the running of corporations and that it can positively impact on corporate governance, as already mentioned in the previous chapters. Finance theory has long been concerned with the debate on the optimal capital structure and its effect on firm value in general and how the choice of debt and equity in a corporation mitigates agency conflicts in particular. The majority of work undertaken in this field has centred on what has been described by Lewellen and Emery (1986; 415) as the following question ‘whether the presence of debt when included as a component of a corporation’s capital structure, will favourably affect the market value of the firm.’

This chapter investigates the aspects which impact the choice of capital structure, including tax advantages of debt and bankruptcy costs. This forms the foundation for a review of relevant research in the field of optimal capital structure, particularly drawing on examples from M&A studies. This chapter furthermore examines the mitigating impact debt and equity has on agency conflicts. Financial choice considerations are continuously related to the particular case of merger and acquisitions. This chapter concludes with an investigation of the impact of capital structure on the likelihood of acquisitions and looks at capital structure changes, which were caused by M&As in particular.

4.2 The Theory of Capital Structure

According to Ross, Westerfield and Jaffe (2002) firms should choose a capital structure, which will result in the highest firm value and therefore will have the most valuable effect for stockholders. In choosing the most value-enhancing capital structure the firm needs to consider the characteristics of debt and equity. Whereas debt is a repayable amount with an additional cost in form of interest payments on the outstanding debt, equity is understood as an investment payment made in a firm, which, however, does not provide the shareholder with any guarantee of potential return (Ward, 1993). Williamson (1988) further claims that whereas debt is controlled by rules and is applicable for investments with highly deployable
assets, equity on the other hand allows discretion and is used for investments with less deployable assets.

The implications and consequences of the use of debt or equity as a means of financing have lead to wide controversy during the last decades. As pointed out by Ross, Westerfield and Jaffe (2002), one view claims that the financing of firms is cheaper when debt instead of equity is being used, since shareholders require a higher rate of return than creditors. This is based on the fact that debt is less risky than equity issues, since lenders have a priority in claims on income in the case of liquidation. Debt, in addition, often requires debtors to provide a security and imposes covenants. The use of debt capital is also cheaper than equity, due to tax advantages resulting from debt interest being deducted from profits before tax, which results in a lower annual tax bill. A further advantage of raising debt capital versus equity is that governance costs including agency costs are generally lower for raising and servicing debt than for equity. With regard to equity finance, Ward (1993) explains that while new equity issues restrict firms operationally to a much lower extent than debt, equity finance dilutes corporate ownership and thus increases agency costs.

However, as pointed out by authors including Brealey and Myers (2001) argues that while debt capital does not impact on operating risk, it nevertheless adds financial risk. This incorporates an additional cost factor due to the resulting increase in borrowing risk and cost of equity, which might outbalance the typical cost advantages of debt at some level.

4.2.1 Research into Capital Structure

Research into the field of capital structure and the implication of debt and equity was revolutionised by Modigliani and Miller (M&M) (1958, 1963) with their controversial theorem. They claim that in a world without taxes and bankruptcy costs, the market value of a company does not depend on its capital structure.\footnote{The average cost of capital to any firm [in the absence of bankruptcy costs and tax subsidies on the payment of interest] is completely independent of its capital structure and is equal to the capitalisation rate of a pure equity stream of its class' (M&M, 1958; 268/269).} It is argued that although debt seems to be cheaper than equity financing, a replacement of equity by debt cannot reduce the firm's overall cost of capital. A firm, which adds debt, increases the riskiness and cost of the remaining equity, which offsets the cost advantages achieved in the higher proportion of the firm's low-cost debt finance. Overall M&M (1958) demonstrate that these two effects

Overall M&M (1958) demonstrate that these two effects
precisely counterbalance each other, which results in that neither a firm’s value nor the overall cost of capital is affected by changes in debt or equity. With reference to their pie model, which constitutes the various financial claimants of the firm (debt and equity), M&M argue that whereas the proportion of debt and equity might change, the actual size of the pie, meaning the company’s value, does not.

Early works by authors including Myers (1968), Levy and Sarnat (1970), Schall (1972), Rubinstein (1973) and Higgins and Schall (1975) apply M&M’s approach to mergers and acquisitions and their research confirms the M&M proposition. They conclude that in a perfect capital market, M&As cannot only gain from financial effects. That does not mean that M&As have no potential of generating real synergies, which might lead to value enhancements but they stress that in the absence of real synergistic effects, an acquisition will not result in a change of the market value of the combined firms.

M&M’s (1958) groundbreaking idea led to wide controversy with a lot of researchers criticising M&M’s empirical work. Hamada (1969, 1971) and Rubinstein (1973), for example, argue that it is not correct to assume the same operating risk exists for all investment choices or projects. As pointed out by Copeland and Weston (1992), the cost of equity is dependent on the systematic risk of the individual firm’s after tax operating cash flows. Authors including Lewellen (1971), Lee and Barker (1977) and Marschall, Yawitz and Greenberg (1981) detect potential financial benefits resulting from capital structure choices due to imperfections in the capital market, which in fact do impact on value. According to Asquith and Kim (1982; 1211), examples of these financial benefits are ‘reductions in corporate tax liabilities, reductions in agency costs and reductions in expected bankruptcy costs’, which will be investigated in more detail in the next section.

Jensen (1993) also finds apparent counter examples for M&M’s theory based on evidence from M&As and leveraged restructurings. He claims that organisational efficiency and value creation can be affected dramatically through ownership structure changes in general and debt issues or payout policy in particular. Other authors agreeing with this research stream include Wruck (1990), Healy, Palepu and Ruback (1992) and Ofek (1993).
4.2.1.1 Tax Effects of Leverage

Following this controversy, M&M (1963) extended their original proposition (1958) to take tax and bankruptcy effects into consideration. They argue that since interest payments are potentially offset against taxable profits, tax subsidies provide large incentives for firms to maximise debt financing. This results in tax savings, which on the one hand lead to higher distributable payments to security holders and on the other hand, indirectly reduce the real cost of debt capital. As concluded by Kim (1978) Mauer and Lewellen (1987), firm value increases as debt replaces equity in the capital structure of the firm due to potential tax benefits, commonly referred to as tax shields.

Fama and Miller (1972) agree with M&M's revised proposition and attempt to quantify the potential value gain from tax benefits by claiming that risky debt will increase the value of the firm by the market value of the tax shields. They conclude that any potential gain in firm value will only be attributable to the equity providing an incentive to maximise the use of debt until the wealth effects of agency costs offset the wealth benefits resulting from tax subsidy.

The importance of tax shields for using debt for financing takeovers is also shown by Bruner (1988) and Maloney, McCormick and Mitchell (1993). They observed post-acquisition performance by highly leveraged firms and argue that M&A activity is often simply reflecting potential tax benefits of higher levels of debt. This means, if highly leveraged firms finance their acquisition with additional debt, the potential gain and value enhancement may just be a result of the anticipated tax shields of the leverage increase. As pointed out by Maloney, McCormick and Mitchell (1993), this argument, however, has the problem that if tax shields are profitable by themselves, the firms should already have taken advantage of them prior to the merger.

Miller (1977) in his famous paper 'debt and taxes', challenges the M&M proposition and claims that firms are indifferent to alternative capital structures. However his attempts to explain this with the fact that in equilibrium, the personal tax disadvantage of debt is offset by the corporate tax advantage have not been successful. Myers (1984), for example, claims that Miller's model wrongly assumes that all firms have the same marginal tax rate.\footnote{Myers (1984; 579) argues that 'extensive trading of depreciation tax shields and investment tax credits through financial leases and other devices proves that plenty of firms face low marginal rates. Any firm paying a lower tax rate would see a net loss to corporate borrowing and a net gain to lending.'}

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M&M’s line of argument implies, as suggested by Salomon (1963; 103), that ‘the Modigliani-Miller proposition, amended to take the tax deductibility of interest into account, would postulate that ... the recipe for optimal leverage ... is that companies ought to be financed 99.9% with pure debt.’ The resulting conclusion – the higher the amount of debt the greater the value of the firm – however, is not of great intuitive appeal because the repayment and re-financing of debt has some associated risks as well (Baxter, 1967, Jensen and Meckling, 1976, Levy and Sarnat, 1988). With regards to this observed inconsistency, M&M (1963; 442) comment ‘the existence of a tax advantage for debt financing ... does not necessarily mean that corporations should at all times seek to use the maximum amount of debt in their capital structure. ... there are as we point out limitations imposed by lenders ... as well as other dimensions....’

As pointed out by Baxter (1967), it is impossible to obtain unlimited debt financing in the real world, since creditors normally secure their debt provision against a sufficient equity cushion to minimise the risk of bankruptcy. As soon as the maximum amount of debt is passed, the required rate of interest will increase to reflect the increased risk of default, which may result in a rise of the cost of capital for the debt-burdened firm.

4.2.1.2 Bankruptcy Effects of Leverage

Debt obligations require a firm to make regular and pre-determined interest and principal payments. As explained by Ross, Westerfield and Jaffe (2002), if firms do not comply with these obligations, they are confronted with the risk of financial distress, liquidation or bankruptcy. Financial distress is a result of payment obligations not being met or met with difficulties and according to Myers (1984, 580), ‘costs of financial distress include agency, moral hazard, monitoring and contracting costs’. There are also costs resulting from liquidation which include the indirect cost of reorganisation, various administrative payments to third parties and the loss of tax credits (Jensen and Meckling, 1976, Kim, 1978).

Whereas early authors, including Warner (1975), Jensen and Meckling (1976) and Haugen and Senbet (1978) generally claim that the average costs of bankruptcy are remarkably small, other theorists including Baxter (1967),Titman (1984) and Altman (1984) have taken the contrary view. As the risk of financial distress rises with the gearing ratio, bondholders
demand an increasing rate of return, which has a negative effect on the weighted average cost of capital (WACC) as the value of tax relief is offset by a rise in debt and in turn a reduction in firm value. Jensen and Meckling (1976), however, regard this theory as deficient, since it implies that debt should never be used unless tax subsidies exist and bankruptcy costs are minimal. Jensen and Meckling, in contrast argue, that even in the absence of tax benefits, debt would still be utilised if there were the potential of profitable investment opportunities, which exceeded the resources of the owner. Robicheck and Myers (1965), Baxter (1967) and Hirshleifer (1970) conclude that costs of financial distress are the key to the existence of an optimal capital structure. Altman (1984) extends this conclusion by suggesting that direct and indirect bankruptcy costs in sum are significant enough to provide proof for a theory of optimal capital structure.

4.2.2 Theory of Optimal Capital Structure

The conventional view is that a firm’s capital structure decision can be thought of as a ‘trade-off’ between the tax benefits of debt and the cost of financial distress. This approach is therefore referred to as the trade-off model of capital structure. The implication is, that under various assumptions regarding capital market imperfection and bankruptcy costs, there is claimed to be an optimum amount of debt for any individual firm. If the firm’s target debt level is not attained, firm value is not maximised (Myers, 1984, Ross, Westerfield and Jaffe, 2002). Whereas this trade-off model claims that there is the potential to improve performance by utilising the optimum amount of debt in the capital structure, it, however, does not explain actual company practice.

Copeland and Weston (1992) pose the important question: at what point does the increase in the present value of debt, equal the increase in present value of the tax shield? This level of debt results in an optimal capital structure, which reduces the WACC to the minimum and increases the value of the firm to a maximum. Beyond this optimal capital structure, costs of financial distress accelerate faster than the benefits of the tax shield, which results in a reduction of firm value if debt is further raised. In this context, it has been argued by Baxter (1967) that the relation between tax benefits arising from debt and the risk of bankruptcy appears not to be linear but rather ‘u-shaped’.
Early studies in this field which provide support for this optimal capital structure theory and a target debt level include Bosworth (1971), Stiglitz (1969, 1972) Kraus and Litzenberger (1973), Ang (1976), Scott (1977), Taggart (1977) and Kim (1978). One approach to determine the optimum debt level for a particular firm combines Miller’s (1977) model with the balancing theory of optimal capital structure (Kim, 1978, DeAngelo and Masulis, 1980, Kim, 1982, Brennan and Schwartz, 1984a, b). For example, the model by DeAngelo and Masulis (1980) develops a framework of optimal capital structure, which considers various tax shield impacts and find an individual firm’s unique optimum debt level reached when the expected tax shield of debt is in balance with the expected cost of debt.

Another stream of research investigates actual debt structures of companies and concludes that actual debt ratios are inconsistent across comparable firms. This would either mean that firms deviate from their targets for an extended period or that the target’s debt capacity is dependent on unknown aspects (Myers, 1984). A number of explanations have been proposed to explain the wide variation of debt-to-equity ratios across firms and industries. The most well-known approach, the pecking order framework, was introduced by Myers (1984). According to this framework, firms do not adhere to a target debt-to-equity ratio but base their financing decision on the basic assumptions that they prefer internal to external financing and debt to equity to avoid any potential dilution of shareholder wealth. This theory is criticised for not explaining all the capital structure regularities observed in practice. As pointed out by Jensen (1993), it lacks an explanation for how taxes and bankruptcy costs influence the company’s actual debt ratio. In addition, the pecking order theory ignores significant agency problems which can easily arise. Myers and Majluf (1984), for example, claim that managers would only consider issuing new equity in the case of the firm’s shares being overvalued or if the firm is already too highly geared. As pointed out by McColgan (2001) the pecking order of financing stands in direct contrast to the revised M&M proposition, which implies the existence of an optimal capital structure.

Further research has shown that there are numerous other issues influencing a company’s financial structure. These include the company’s sensitivity to economic activity and volatility of earnings (Baxter, 1967, Williamson, 1981, Bradley, Jarrell and Kim, 1984); differences in the type of assets held by the company (Williamson, 1981, Myers, 1984, Titman, 1984, Titman and Wessel, 1988); industry-specific structures (Scott, 1972, Ferri and Jones, 1979, Bradley, Jarrell and Kim, 1984, Brander and Lewis, 1986, Maksimovic, 1988, Maksimovic
and Zechner, 1991, Hart, 1995) and firm size (Smith, 1977, Warner, 1977, Ang, Chua and McConnell, 1982, Titman and Wessle, 1988). One stream of research in the field of M&A takes a related view and claims that a firm’s probability of acquisition likelihood is not only dependent on the single variable of leverage but a number of influencing factors, which are often only indirectly related to debt levels. This will be further discussed in detail in Chapter Five.

Despite the common agreement that there is a trade-off between tax benefits of leverage and potential bankruptcy costs and that there is an optimum amount of debt for each individual firm, it needs to be concluded that the difficulty of precisely establishing an optimum capital structure scientifically remains. There are many complicating multi-faceted factors, which influence the optimum capital structure adopted by firms and it remains difficult to express financial distress costs in a precise way. For this reason, it can be concluded, that although there might be a u shaped dependence between tax benefits arising from debt and potential bankruptcy costs, it is not possible to precisely estimate an optimum debt capacity. This could be one explanation for the great variation in debt levels across industries and comparable firms.

4.3 Agency Aspects of Debt

Most traditional capital structure models assume rather simplistically that a manager’s choice of capital structure is governed only by the interest of shareholders. However, as already shown in Chapter Two, research increasingly recognises that managers often pursue their own interests, which can lead to financing choices contradicting the interests of shareholders (Donaldson, 1969, Jung, Kim and Stulz, 1996).19 The agency costs of debt20, introduced by Jensen and Meckling (1976), have been widely discussed. One particular aspect refers to the potential mitigating effects of debt on agency problems, which include the role of debt as a control and bonding device and its incentive effect on management.

19 An early example is Donaldson’s (1969) field study of financing choices, which emphasised goals such as organisational survival and growth. Recently, Jung, Kim and Stulz (1996) identified security issue decisions that seem inconsistent with shareholder wealth maximisation.

20 The agency cost of debt in sum consists of the opportunity wealth loss caused by the impact of debt on the investment decisions of the firm, the monitoring and bonding expenditures, which are passed on as higher interest rates and the bankruptcy and reorganisation costs lowering the firm’s value (Jensen and Meckling, 1976).
4.3.1 Control Hypothesis of Debt

Jensen (1986; 324) refers to the potential benefits of debt in controlling and motivating managers and their organisation to be efficient as the ‘control hypothesis’ of debt creation and Harris and Raviv (1990; 321) describe debt as ‘a disciplining device’. The company’s choice of debt is one important source of disciplining managers (Berger and Bonaccorsi die Patti, 2006, De La Bruslerie and Latrous, 2007).

Jensen and Meckling (1976), Grossman and Hart (1982), Jensen (1986) and Stulz (1990) treat debt as a bonding device for management and its creditors. Jensen and Meckling (1976), for example, claim that managers prefer debt financing because it grants them a greater portion of the company’s equity and as claimed by Jensen (1986, 324), ‘debt creation ... enables managers to efficiently bond their promise to pay out future cash flows’. Grossman and Hart (1982), in addition, argue that the main benefit of debt comes from the diminishing tendency of managerial perquisites for three reasons: (1) bondholders tend to closely monitor debt-burdened firms; (2) companies with a debt-burdened capital structure have an increased bankruptcy risk, which (3) confronts management with the potential threat of personal embarrassment. The authors further claim that leverage is also a very good tool to discourage wasteful takeovers.

Easterbrook (1984) claims that managers who need to raise money consistently and periodically are likely to act both in bondholders’ and shareholders’ interest. Firms with debt finance have to provide their lenders with access to relevant information and must incur external capital market monitoring, thereby reducing managerial discretion over resources. As summarised by Maloney, McCormick and Mitchell (1993, 189/190), ‘the consensus of this theoretical research is that, while leverage has costs, the necessity of making periodic, legally mandated, unalterable payments to bondholders forces managers to take extra care in decision-making’.

In this context the issue of short-term versus long-term debt financing has become another important aspect in controlling agency problems (Harris and Raviv, 1990). Kanatas and Qi (2001) argue that whereas short-term debt is claimed to be an effective tool of controlling the agency problem, since it requires the borrower to apply for funds and refinancing more often, long-term debt is often only a continuation of the incentive conflict for the term of the credit.
Kanatas and Qi, however, state that short-term lenders often rely on the acquisition of firm information to control moral hazards. They further claim firm insiders have the incentive to manipulate the information reaching the lenders, which in turn will ensure refinancing. As a result, the control of one agency problem might result in another or may be useless. Furthermore, there are other parties who have an interest in manipulating the information purchased by the firm’s insiders. Kanatas and Qi (2001), in this context admit that a firm’s periodic refinancing need is a two-edged sword, since it also encourages the firm’s rivals to influence the creditor’s perception of the firm’s credit worthiness. Evidence by Chevalier (1995a,b) and Kanatas and Qi (2001) show that rival firms compete more aggressively against firms having significant amounts of debt.

Berger, Ofek and Yermack (1997) and De la Bruslerie and Latrous (2007) observe a positive correlation between several proxies for the ability of shareholders to control management and a firm’s debt level. For example, corporate executives tend to make more aggressive use of debt in the case of control threats or if they have an incentive to create shareholder value (e.g. stock-based compensation or outside directors). Lang, Ofek and Stulz (1996) and Berger and Bonaccorsi die Patti (2006) in this context, provide evidence that debt restrains firms from investing in poor projects.

A related stream of literature including authors such as Townsend (1978), Gale and Hellwig (1985), Harris and Raviv (1990) and Rajan and Winton (1995), regard debt as an optimal contract, to overcome agency problems, while research by Rajan and Winton (1995) claims that the presence of a debt contract extends the bank’s monitoring activity, since lenders and their returns become increasingly dependent on this information. According to Shleifer and Vishny (1997), it provides lenders with the power to practise their right of control. The latter, however, is debatable since creditors only obtain control when the firm is in financial distress (Bolton and Scharfstein, 1998).

As pointed out by Shleifer and Vishny (1997), this stream of research stands in contrast to the original capital structure theorem, which regarded debt only in relation to a particular cash flow stream. This new approach sees the important feature of a debt contract in the power of

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21 Debt is a contract in which a borrower receives some funds from the creditor, and assures to repay the loan with a pre-specified stream of future payments. In case the borrower breaks the contract and, particularly, if he defaults on interest payments, the creditor has certain rights and if comes to the worst the power to make the firm bankrupt (Shleifer and Vishny, 1997).
lenders to practise their right of control. This also means that if the borrower does not adhere to the contract, the lender is entitled to transfer some control rights from the borrower to the lender. This property rights approach (Grossman and Hart, 1986, Grossman and Moore, 1990) has been very useful for understanding the control issues related to the choice of capital structure with managers retaining power under non-default conditions and creditors taking control under default conditions. Research, which supports this view of control rights include Harris and Raviv (1989), Bolton and Scharfstein (1990), Stulz (1990), Diamond (1991) and Hart and Moore (1994). Hart and Moore (1994), for example, see the power of a debt contract in that the fear of potential default and bankruptcy secures debt repayments. A model by Bolton and Scharfstein (1990) shows that upon default, creditors gain sufficient power to take the firm off the capital market, which in turn blocks future financing altogether.

Some researchers investigate the debt contracts framework in more detail by focusing on the process of shifting control from managers to creditors. Aghion and Bolton (1992), for example, make use of this theory and describe leverage as a tool for creditors to grant managers control in good states of the world and creditors taking over control in bad states. In this context, Aghion and Bolton (1992) have proven that debt contracts and their potential control shifts can be regarded as an ideal device to overcome potential agency conflicts. Further authors who support the contract model of debt include Dewatripont and Tirole (1994) who refer to debt holders in bad times as ‘tough principal’ and shareholders as ‘soft principal’ in good times. Berglof and von Thadden (1994) further claim that short-term debt holders, which they describe as the ‘tough financiers’, should obtain control under bad conditions.

However, Schleifer and Vishny (1997) claim that the Aghion and Bolton model only incorporates the idea that control reverts to the creditors in the case of some sort of bad state, however, without considering the case of default. Authors including Bolton and Scharfstein (1998) criticise the deficiency of current debt contract models, as they cannot sufficiently explain the allocation of control implicit in capital structure decisions; for example, why creditors only obtain control when the firm is in financial distress. Mahrt-Smith (2000) further disapproves of the model, since it does not incorporate any considerations of ownership structure, monitoring, or institutional effects.
Chapter Two already introduced the importance of free cash flow on agency conflicts. According to the free cash flow hypothesis (Jensen, 1986)\textsuperscript{22}, debt is also acknowledged as an important tool to avoid wastage of free cash flow (Ross, Westerfield and Jaffe, 2002). Rozeff (1982), Easterbrook (1984), Jensen (1986, 1989) and Stulz (1990) argue that debt reduces free cash, limiting managerial resources to waste on unprofitable transactions. Instead of being wasted, free cash flow is committed to debt services which in turn decreases related agency costs and increases firm value (Smith and Kim, 1994). Jensen (1986) concludes that the free cash flow control effects of debt are important factors in determining capital structure.

Grossman and Hart (1982) further claim that debt services are more effective in restricting free cash flow than dividends, due to the direct threat of bankruptcy in case of default. Jensen (1986) adds that a debt contractually requires a manager to pay out future cash flow, which is not the case for dividend payouts, as they have no legal obligations. Ross, Westerfield and Jaffe (2002) therefore conclude that according to the free cash flow hypothesis, an increase in the debt proportion and the resultant reduction in the equity proportion will increase firm value.

Research by Jensen and Smith (1985) and Jensen (1986) applies the free cash flow theory to the field of mergers and acquisitions. They find that leverage-increasing transactions result in significantly positive increases in common stock prices. Consistent with this, the free cash flow theory predicts that debt issues tie management to use free cash flow for debt repayments, which in turn reduce shareholder concerns about free cash flow being wasted. In contrast, share prices will fall with a reduction in dividend payments or if management requests new equity injections instead of issuing debt. High levels of gearing have often accompanied merger activity in recent decades. Rees (1995) argues that although an increasing leverage may be desirable the debate over the issue of reaching an optimal capital structure prevails.

\textsuperscript{22} According to the free cash flow hypothesis, managers might be reluctant to distribute free cash flow to shareholders but rather prefer to use the funds for potentially unprofitable projects, which, however, makes firms grow in size and increases dependence on management (Servaes, 1994, Smith and Kim, 1994).
Some models of capital structure incorporate financial slack to illustrate the benefits of moderate leverage. This slack can become an extremely valuable tool to make profitable investments at any time. For this reason Smith and Kim (1994) see firms restricting debt levels below that of the 'optimal' gearing level. Myers (1977) and Myers and Majluf (1984) present a financial slack model, which claims that a firm with high debt lets a project with a low positive return and a low variance pass and justifies this with the fact that these projects tend to benefit bondholders rather than shareholders. Williamson (1988) refers to this line of thought as the ‘selective intervention’ problem.

Myers and Majluf (1984) recognise that according to the financial slack hypothesis managers and shareholders have asymmetric information about firm value, which provide managers with the advantage of identifying potential opportunities of value creation. According to Myers and Majluf (1984), a firm with slack can pursue new investment opportunities without issuing equity or other risky securities, which means that a certain degree of financial slack is of benefit to firms since according to the financial slack hypothesis information asymmetry between managers and shareholders lead to higher issuing costs.

Myers and Majluf (1984) also find that the particular case of M&A provides an option to transfer slack between the merging firms and that this avoids the asymmetry problems and the resultant adverse market response of new equity or debt issues. Lewellen (1971), in this context, points out that prospective acquirers can also take advantage of the target firm’s modest borrowing behaviour. As mentioned earlier in Chapter Two, the acquirer can carve out further valuation gains from merging two firms simply by correcting this deficiency and making use of the target’s latent debt capacity either as part of financing the merger or as part of the post-merger strategy. Lewellen (1971) recognises that the opportunity to realise such gains are not unique to the act of merging. It is rather the result of poor capital structure management, which can be overcome in exactly the same amount if the firms stay apart and just review their financial planning. This aspect will be discussed in more detail in Chapter Five.

4.3.3 The Incentive Effect of Debt

It is often being claimed that debt can be a more influential incentive instrument in controlling management than a typical incentive scheme. While an ordinary incentive scheme tries to
encourage managers to maximise performance and investment opportunities through presenting them with a financial reward, the incentive power of debt lies in that it can be more forceful in requesting management to hand over control in the case of default (Hart, 1995). According to Grossman and Hart (1982), debt increases the amount of resources available at the manager’s discretion. This in turn creates an incentive effect for the manager who aims to align these incentives with the firm’s shareholders, in order to benefit from the resulting market value effect and the diminishing threat of bankruptcy.

Bolton and Scharfstein (1998) in this context, however, regard ordinary managerial incentive schemes as a more direct and often less expensive way. Authors including Maloney, McCormick and Mitchell (1993) disagree with the incentive argument of debt and regard leverage more as an obstruction to management, since the focus is centred on providing adequate interest payments instead of running the corporation efficiently as a whole. This view appears to be supported by a wave of bankruptcy filings in the early 1990s by firms, which had dramatically increased their debt level.

Another important argument against the managerial incentive effect of debt was introduced by Myers (1975). Assuming that debt often matures after the options must be taken, companies are sometimes forced to refuse potential investment opportunities since they would only benefit bondholders instead of equity holders. As Jensen and Meckling (1976) describe, this potential decline in firm value shows that there are conditions under which incentive effects create agency costs of debt.

Research by Harris and Raviv (1988) and Stulz (1988) introduces an approach of financing preferences which is centred on managerial incentives, since management aims to defend its control stake and benefits of incumbency in the corporation (as an anti-takeover device). Their model shows that increased debt limits the value of outstanding equity, which in turn provides management with control over a larger equity stake with the same investment. As explained by Amihud, Lev and Travlos (1990) and Sinha (1991), substituting debt for equity reduces the proportion of votes held by passive investors, which are easily acquired by a potential raider. This reduces the risk for the manager to become a victim of a contest for corporate control.
Research on the relation between managerial ownership and leverage, however, shows a negative correlation, which according to Friend and Lang (1988) is a direct result of debt presenting a greater non-diversifiable risk to management than to public investors. Friend and Lang (1988) also argue that corporations with large managerial holdings display lower debt than firms with large outside shareholdings. In this context, Harris and Raviv (1988), Stulz (1988) and Israel (1991) explain that higher leverage impacts negatively on the equity’s total value and increases the risk of bankruptcy, which in turn potentially lowers the price for the potential bidder to take over control. Therefore, as pointed out by Lang (1987), this threat of bankruptcy and control loss might tempt management to use less than the optimum amount of debt. Authors including Grossman and Hart (1982) and Levy and Sarnat, (1988) and Bagnani, Milonas, Saunders and Travlos (1994) support this view. It can be concluded that the relation between the proportion of debt and managerial ownership is negative and non-linear.

However, it remains difficult to empirically test the relation between managerial shareholdings and the financing choices, since firms, as claimed by Amihud, Lev and Travlos (1990), are not providing information on individual investment projects publicly, with the exception of M&As. One focus of M&A research investigates the relationship between managerial financing choices and the likelihood of acquisitions. As claimed by authors including Harris and Raviv (1988), Israel (1988, 1991), Stulz (1988), Nolan (1999) and De la Bruslerie and Latrous (2007), debt can be used to consolidate and maintain control over the firm. Management avoids potential takeover attempts by higher debt levels and by using the proceeds to concentrate managerial shareholdings and voting rights. This proportionately reduces the amount of outside equity and thus makes it harder and more expensive to displace management through takeovers. As concluded by Amihud, Lev and Travlos (1990), debt financing concentrates the control with management and provides an important tool to discourage takeovers. However, it needs to be investigated if leverage provides an adequate proxy for insider shareholdings and in turn, if leverage provides a good indication of the degree of managerial entrenchment, which is, according to Hirshleifer and Thakor (1992), often not an ideal scenario from the shareholders’ point of view.

23 Friend and Lang (1988) find the correlation between debt and managerial ownership to be significantly negative. Their research suggests that debt decreases as the level of managerial shareholdings in the firm increases.
4.3.4 The Informational and Signalling Role of Corporate Debt

Debt also plays an important role in generating information. Harris and Raviv (1990), for example, emphasise the importance of debt in enabling investors to collect and generate information which is needed to effectively monitor and control management’s implementation of efficient operational decisions. Jensen (1989) regards the recent increase in corporate leverage in part as being the result of these debt-related information benefits.

Debt is also recognised by authors including Williamson (1988) as an important signalling tool to overcome information asymmetries between managers and investors. Healy and Palepu in Stern and Chew (1998) stress the importance of capital structure choice as a signal for management’s judgement of future earnings and risks. For this reason, capital structure changes present shareholders with essential information on the management’s expectations and the firm’s prospects. In earlier models by Ross (1977), Leland and Pyle (1977), Heinkel (1982), Myers and Majluf (1984) and Miller and Rock (1985), debt issues are signals of a firm’s high quality, since it exposes the firms to a higher risk of ruin and more stringent monitoring activities, which enables the stock market to review their share value. These models take the view that managers are better informed about their corporation than shareholders and investors. Management’s better knowledge of the (‘intrinsic’ value of the) firm’s prospects implies that capital structure changes are valid signals communicating inside information to investors. Leland and Pyle (1977), in this context, add that the manager’s willingness to invest in his own project can be regarded as a signal of the project’s superiority. The manager is understood to only maintain large shares in equity if prospects of future cash flows are high in relation to the corporation’s current value. Leland and Pyle (1977) detect a positive relationship between equity held by the owner and firm value, a prediction, which was also made by authors including Myers and Majluf (1984) and Miller and Rock (1985).

It can be concluded that the financial choice of debt can play an important role in reducing agency costs. Whilst it has been shown that debt provides an important tool to control managerial actions and decision-making (incorporating examples from free cash flow and financial slack theories), it has been claimed by authors including Bolton and Scharfstein (1990) that current debt contracts remain deficient. The review has shown that debt has the potential to take on an effective managerial incentive function, however, research has shown that the proportion of debt in the capital structure and managerial ownership tends to be
negative and non-linear, indicating that management prefers to stay below the optimal debt level. It was argued that debt could also play an important signalling function, which provides management with a tool to convey inside information about the value of the firm.

4.4 Capital Structure Changes through M&As

4.4.1 Debt-financed Takeovers

As previously pointed out in Chapter Two and Three, an investment decision such as an acquisition usually results in a change of capital structure of the combined firms. Maloney, McCormick and Mitchell (1993) claim that debt-financed takeovers are often accomplished by a leverage increasing restructuring of the bidder. Chowdhry and Nanda (1993), in this context, argue that a bidder with already high levels of debt may bid aggressively for targets with high financial slack, since part of the acquisition costs might be covered by the target’s latent debt capacity.

Research by Crabbe, Pickerung and Prowse (1990) and Schianchi and Mantovi (2006) investigate M&As and claim that takeover activity is often accompanied by high levels of debt rather than equity issues, which leads to the conclusion that M&As might force bidders to obtain a higher than optimal debt level. Higher levels of debt in an acquisition result in a higher financial risk profile and a larger appreciation of debt value of the merged firm, which automatically encourages creditors to require higher interest payments (Lev and Mandelker, 1972, Israel, 1991). As a result, there will be an increase in the cost of equity, which, under perfect capital market conditions, counterbalances any potential economic value gains by the acquisition. As summarised by Ward (1993, 163), ‘if the debt financing gain is not totally offset by the increased risk perception as may occur under real market conditions, the gain in value is not really generated by the acquisition of the target company but by the change in financial strategy of the acquiring company.’

This strategic motive for debt financing is inconsistent with the observation that merged firms often attempt to lower debt levels immediately after successful acquisitions. As pointed out by Leland (1989) and Kaplan (1989) such post-merger debt reduction is contradictory with the theory of tax benefits of debt and other agency theory explanations made by authors such as Jensen (1986).
4.4.2 The Coinsurance Effect of Corporate Debt

An effect of debt, which is unique to the case of M&As, was introduced by Lewellen (1971) as the ‘coinsurance effect for corporate debt’. According to authors such as Lewellen (1971), Lintner, (1971) Higgins and Schall (1975), Lee and Barker (1977) and Comment and Jarrell (1995) multi-division firms provide a greater earnings stability, spread the risk, reduce the probability of default and expected bankruptcy costs and thus raise debt capacity, which in turn provides tax advantages. A merger forces creditors to review debt capacity, which in the presence of a co-insurance effect should be higher than the debt limits of the bidder and target taken individually. As concluded by Lewellen (1971; 525) ‘mergers therefore create additional borrowing capacity as an inevitable consequence of consolidation.’ Lewellen (1971) in this context further stresses that this increased debt capacity is not the result of exploiting the merging firms’ unused debt capacity but that additional leverage is being made available due to the merged firm satisfying other debt service criteria. Lewellen concludes that conglomeration benefits stockholders.

However, it must be admitted that the coinsurance effect does not provide much of a rationale for related mergers, which for their justification appear to rely on realising certain operating efficiencies. The consolidation of unrelated companies, on the other hand, creates greater debt capacity as a result of the portfolio effect of debt24 (Lewellen, 1971). Higgins and Schall (1975), Galai and Masulis (1976) and Kim and McConnell (1977) agree with Lewellen. Kim and McConnel (1977), in particular, argue that the combination of uncorrelated assets reduces the merged firm’s risk of default. Higgins and Schall (1975), for example, argue that while total value remains unaffected by conglomeration, the value of equity tends to drop as a result of conglomerate mergers. This, however, might be counterbalanced by tax subsidies of debt, if there are any and coinsurance costs25.

Authors including Higgings and Schall (1975) and Kim and McConnel (1977) argue that Lewellen’s thesis fails to consider the effect of coinsurance on the value of the merging firms’ previously existing debt. Higgins and Schall (1975), for example, claim that coinsurance

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24 According to the portfolio theory by Markowitz, (1959), a relatively small number of unrelated firms are required in a portfolio to achieve a considerable reduction in the variability of earnings and to achieve the majority of potential value gains.

25 Higgins and Schall (1975; 106) define co-insurance cost as costs resulting from a loss of some of the limited liability advantages of holding equity in separate firms as opposed to merged firm.
potential can also be a threat of additional costs, which may deter potential bidders, an issue which was already highlighted by Rubinstein (1973). Shrieves and Stevens (1979) remark that in order for mergers to provide benefits to shareholders, the cost of co-insurance needs to be more than covered by the potential cost savings of tax shields. One further option to counteract or neutralise the coinsurance cost may be achieved through renegotiations with debt holders (Kim and McConnell, 1977, Billett, 1996). Higgins and Schall (1975), for example, suggest to retire all active debt at its pre-merger market value and to raise new debt for the combined firm. However, the costs of such transactions effectively diminish potential shareholder wealth gains of a merger (Kim and McConnell, 1977).

Despite all its theoretical relevance, the coinsurance effects of debt in conglomerations have not proven to result in value gains for the acquirer in practice. Research by Bhagat, Shleifer and Vishny (1990), Morck, Shleifer and Vishny (1990), Lang and Stulz (1994) and Comment and Jarrell (1995) shows that diversification results in low returns compared to other acquisitions.

4.5 Conclusion

This chapter has provided a review of research in the field of financing choices, highlighting tax advantages of debt, (Modigliani and Miller, 1958, 1963, Fama and Miller, 1972 and Miller 1977) and the threat of bankruptcy (M&M, 1963, Altman (1984), to provide the basis for a theorem of optimal capital structure (DeAngelo and Masulis 1980, Myers, 1984). A common agreement on the existence of one target debt-to-equity ratio, as suggested by the trade-off theory, however, could not be identified by the literature since there appear to be a variety of systematic influences on the leverage choices firms actually make.

The benefits of debt in mitigating agency conflicts have also become an important aspect to be incorporated in capital structure considerations (Jensen and Meckling, 1976, Grossman and Hart, 1982, Jensen, 1986, Harris and Raviv, 1990, Stulz, 1990). Mitigating effects of debt on agency problems include factors such as the control hypothesis of debt, the role debt plays to reduce free cash flow/financial slack and the incentive effect of debt as well as the informational role debt plays for a corporation. It can be concluded that all mentioned debt aspects play an important role in realigning owner and stakeholder interest in theory, however, practice has shown that agency problems are not overcome in reality.
The importance of leverage in financing acquisitions and the role of debt as an anti-takeover device is recognised in the finance and economics literature. It was further shown that the coinsurance effect of debt provides merging firms with the potential benefit to increase debt capacity but also with the potential burden of coinsurance costs, which might discourage potential acquisitions. It can be concluded that the choice of capital structure is a delicate balancing act of continuously adjusting the debt level to achieve the maximum amount of economic benefit. Increased leverage provides both potential benefits as well as disadvantages to the bidder as well as the target company.

After highlighting the main aspects, which impact the choice of capital structure and their implications on agency conflicts and acquisitions, the following chapter will introduce and discuss potential motivations and risks of takeovers.
Chapter Five
Mergers and Acquisitions

5.1 Introduction

Millions of Pounds are invested year-on-year in mergers and acquisitions presenting a rapid-fire mechanism to overcome agency conflicts and in turn to achieve control, power, growth and value. However, as the literature suggests, the predominant part of resources is being wasted on M&As and outcomes remain controversial.

The following chapter investigates the various motives and potential downside risks of M&As, incorporating economic and financial aspects, corporate control issues and managerial considerations. This chapter also provides an introduction into the various research areas of takeovers with the particular focus on the field of takeover likelihood. It concludes with an investigation into potential explanations for varying research outcomes.

5.2 Introduction to Mergers and Acquisitions

Mergers and acquisitions are characterised by a corporation transferring the control of the firm’s assets to a more effective management (Jarrell, Brickley and Netter, 1988) or as Ingham, Kran and Lovestram (1992) put it, a takeover is essentially a game of strategy in which the management of one company attempts to gain control over another. Lichtenberg and Siegel (1987) define an acquisition as a mechanism to correct for lapses in an inefficiently managed firm, which, according to Palepu (1986), can be rectified by taking the company over and in turn replacing its management. The expected economic benefits of the acquisition are the incremental cash flows generated by the combination of the previously independent firms (Halpern, 1983). Shleifer and Vishny (1997; 756) conclude: ‘Takeovers can thus be viewed as rapid-fire mechanisms for ownership concentration.’
There are several types of M&As, including mergers, takeovers, proxy contests and leveraged buyouts as well as others. In line with the majority of research, this literature review will use the terminology merger, acquisition and takeover interchangeably, however, bearing in mind that there are considerable differences in accounting terms and treatments. M&As are further distinguished between related (horizontal and vertical) and unrelated (conglomerate) takeovers.

Periods of accelerated merger activity of all types have been witnessed in the past century which are commonly referred to as merger waves. Whereas conglomerate mergers dominated the 1950s through to the 1970s, strategic related combinations of much broader scope marked the 1980s and 1990s (Grinblatt and Titman, 1998). However, since the 1980s, a trend toward increased corporate focus has been documented by authors including Liebeskind and Opler (1994), Berger and Ofek (1995), Comment and Jarrell (1995) and John and Ofek (1995). After several years of merger activity slowing down, partly as a result of global economic downturn in the early 2000s, not to mention the September 11th terrorist attacks, strong signs of a recovery in deal activity is being witnessed since 2003. Reasons for this can be partly attributed to the growing importance of globalisation, a sharp recovery of the equity markets, increasing levels of access corporate liquidity as well as attractive financing environments with low interest rates.

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26 In a merger, which is predominantly friendly, the acquirer reaches an agreement with the management of the target on the offer’s conditions, which is then decided and voted on by the target shareholders (Jarrell, Brickley and Netter, 1988, Damodaran, 1997).

27 The use of the word takeover is often preferred to describe a hostile acquisition, which is opposed by the target company’s management (Morck, Shleifer and Vishny, 1989, Ingham, Kran and Lovestam, 1992).

28 A proxy contest is characterised by a dissident group trying to gain control of the target’s management through obtaining support and the vote of the firm’s shareholders (Jarrell, Brickley and Netter, 1988).

29 Leverage buyouts are often initiated by a firm’s incumbent management, which is trying to buyout the shareholders’ equity. This type of acquisition is generally heavily financed by debt (Jarrell, Brickley and Netter, 1988).

30 Related acquisition is defined as the development away from present products and markets but still remaining ‘tangibly related to the collective skills and strength possessed originally by the firm’ (Rumelt, 1974: 11).
5.3 Motivations of Mergers and Acquisitions

Over the last decades a number of motives and theories have evolved concerning M&A activities which include (1) economic and financial considerations, (2) corporate control and (3) managerial motives.

5.3.1 Economic and Financial Motives

According to the value maximisation theory, the main motive of an acquisition lies in achieving an economic value gain for shareholders (Rappaport, 1998a). This most important economic motivation is captured by the term synergy, or the 2 + 2 = 5 phenomenon, in which the combined value of the two firms exceeds their value as two independent operations (Rumelt, 1974, Jensen and Ruback, 1983, Barney, 1988, Prahalad and Hamel, 1990). Grinblatt and Titman (1998) declare that synergistic gains are realised if the combined cash flow of the merged firms surpasses the combined cash flow of the previously separate firms. Copeland and Weston (1992) state that, considering long-term strategic planning, M&As present a less risky and hence more likely option to achieve a positive net present value. Shrieves and Stevens (1979) and Halpern (1983), however, stress that an acquisition only becomes economically feasible if the economic gain is not only allocated to the target shareholders but also if it provides the bidder with a normal rate of return for the investment.

According to Bradley (1980), Halpern (1983), Palepu (1986) and Morck, Shleifer and Vishny (1988a,b, 1989), an acquisition is primarily motivated by bidders’ desire to gain control over a poorly performing target. The bidder wants control over the target, for example, to substitute an incumbent management or to oblige current management to pursue the bidder’s own profit-maximising strategy. The overall aim is to earn a profit from operating the target more effectively (Bradley, 1980, Halpern, 1983, Martin and McConnell, 1991). Takeover targets tend to have poor prior performance as measured by, for example, the price to book value ratio (Schwartz, 1982) or by Tobin’s q³¹ (Hasbrouck, 1985, Palepu, 1986). Morck, Shleifer and Vishny (1988a, b) found that targets of hostile takeovers tend to be firms which have underperformed others in the industry. Underperforming firms and their likelihood of being

³¹ Tobin’s q is the ratio of the market value of shares to the replacement value of the company’s assets (Hasbrouck, 1985).
taken over will become the focus of this thesis’ investigation and will be discussed in more detail in the methodology chapter.

Authors including Porter (1985), Harrison, Hall and Nagundkar (1993) and Hitt, Harrison, Ireland and Best (1998) explain that synergistic benefits arise as a result of taking advantage of identified commonalities or strategic fits to be shared between the target and bidder. Potential sources of synergy can be divided into four main groups, namely revenue enhancement, cost savings, tax benefits and lower cost of capital, which will be discussed in the following sections.

5.3.1.1 Revenue Enhancement

Firms often pursue acquisitive strategies since they believe that a combined corporation may achieve higher revenues than separate ones, due to reasons such as potential strategic benefits and market power. Prahalad and Bettis (1986) and Hoskisson and Hitt (1990) believe that acquisitions provide a parent company with potential strategic benefits particularly with regard to the opportunity to capitalise on the firm’s dominant logic and distinctive competencies (Prahalad and Bettis, 1986, Thompson, 1993, Luffman, Sanderson and Kenny, 1996). The result is that these unique combinations of competencies might give firms a long-term competitive advantage, because they reduce the possibility of imitation (Teece, 1986, Harrison, Hitt, Hoskisson and Ireland, 1991). This in turn allows the corporation to demand a premium price for its higher innovation skills (product innovation, time-to-market, etc) (Grinblatt and Titman, 1998, Dickson, 2000). These value-creating skills of the parent company might also impact positively on efficiency and profitability (Weston, 1970, Chandler, 1977, Williamson 1986, Campbell, Goold and Alexander, 1995).

Enlarging an operation and reducing competition might also provide the corporation with increased market power and with potential elements of monopoly control (Halpern, 1983). According to empirical evidence, increased market power should not only benefit the acquirer

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32 Strategic fit can exist anywhere along the business’ respective value chain – in the relationship with suppliers, in research and development (R&D) and technology activities, in manufacturing, in sales and marketing, or in distribution activities (Thompson and Strickland, 1998).

33 Dominant logic is defined as the way in which managers develop the business and make critical resource allocation decisions, which are based on operating requirements prevailing in the firm’s dominant business. This logic affects the attitudes, knowledge, and ability of executives to manage conglomerate successfully (Prahalad and Bettis, 1986; 490).
but all firms in that sector, as the price of that industry product rises (Ross, Westerfield and Jaffe, 2002). Research by Stillmann (1983) and Eckbo (1983), however, suggests that such mergers do not positively affect the share performance of competitors.

5.3.1.2 Cost savings

It is often being claimed that efficiency improvements and thus cost reductions are the most basic reasons for mergers. Potential cost savings arise from economies of scale and/or scope and vertical integration, complimentary resources and managerial inefficiency elimination. As pointed out by Dickson (2000), acquisitions have traditionally been regarded as an effective tool of achieving economies of scale particularly in divisions such as manufacturing, research and development, administration, logistics and sales functions.

Horizontal mergers can particularly provide cost savings by taking advantage of excess capacities in certain production factors and thereby increasing the variety of products which is commonly referred to as economies of scope. Authors including Nayyar (1992), Dranove and Shanley (1995) and Hitt, Ireland and Hoskisson (1997) regard economies of scope as an important motivation for an acquisition as it provides the opportunity to achieve cost savings by eliminating costs along the value chain by operating two or more businesses under the same corporate umbrella. Vertical mergers can also create synergistic gains by easing the co-ordination of closely related operations and thereby overcoming a number of co-ordination issues providing bargaining potentials between the customers and suppliers. As pointed out by Dickson (2000), for example, synergistic gains result from the merged firm’s ability to transfer resources and skills from one unit to the other. A merger provides the opportunity to gain access to competencies and capacities in a particular line of business, which are difficult, time-consuming and sometimes more expensive to develop from scratch in-house (Copeland and Weston 1992).

5.3.1.3 Cost of capital

As already pointed out in Chapter Two and in Chapter Four, one financial motive for takeovers stems from the potential to exploit unused debt capacity and to overcome financial slack.
Prospective acquirers, for example, can take advantage of the target firm’s modest borrowing behaviour. Stulz (1988) and Chowdhry and Nanda (1993), in this context, argue that firms which display high levels of unused debt capacity are seen as attractive targets, since those firms do not maximise their firm value to full potential. Palepu (1986) and Jensen (1988) further explain that the acquirer takes advantage of the unused debt capacity by either acquiring additional assets in order to gain extra value or by reducing the purchase cost since they use the target’s available debt capacity to finance the takeover. As pointed out by Stevens (1973), Agrawal and Mandelker (1987) and Nolan (1999) and Schianchi and Mantov (2006), M&A activity is often characterised by bidder firms taking on considerable amounts of debt, to finance acquisitions. However, Weston, Chung and Hoag (1990), Dranove and Shanley (1995) and Hitt, Ireland and Hoskisson (1997) see the increased debt capacity and the availability of capital at a lower cost as an important prospect for acquisitive investments.

A change in capital structure, however, is not only the result of the M&A financing instrument, but more interestingly, even unsuccessful takeover attempts are typically associated with leverage increases by the target firm to become less attractive for the bidder. Early research by Grossman and Hart (1982), Jensen (1986) and Palepu (1986) and Stulz (1988), for example, detects a negative relationship and explains this with the fact that an increase in leverage can discourage potential bidders as it limits any potential value gain being achieved from taking over control. Higher levels of debt make an acquisition less attractive due to the increasingly restrictive debt covenants and the diminishing possibility to raise further debt. However, the rising threat of bankruptcy in turn makes the debt-burdened company a potential takeover target.

Ambrose and Megginson (1992), in this context, show that acquirers seem to bid for companies with a high percentage of tangible assets since these companies tend to have greater debt capacities. The target’s own assets can even be taken as a security for debt financing the takeover, which in turn reduces the bidder’s direct acquisition costs. Furthermore, as pointed out by Eddey (1991), firms with a high proportion of tangible assets make ideal candidates for asset striping by ‘raiders’. However, authors including Dickerson,

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34 In accounting terms one can distinguish between asset tangibility and asset specificity (Williamson, 1988). There may be a secondary market for intangible tradable assets such as patents and trademarks which are in fact then becoming ‘tangible’. However, values are not determinable and therefore this distinction cannot be made in this study.
Gibson and Tsakalotos (2002) claim that the proportion of tangible assets in total assets has a negative impact on the probability of takeover.\(^{35}\)

Myers and Majluf (1984) also find that the particular case of M&A provides an option to transfer free cash flow or financial slack between the merging firms. Grossman and Hart (1982) and Jensen (1986) in this context suggest that takeover likelihood should be increasing in the amount of free cash flow available to bidders' managers. Song and Walkling (1993) add in this context that a firm's probability of becoming an acquisition target is also dependent on the target's excess liquidity. A firm with large amounts of free cash flow is an attractive target since it provides the bidder with the opportunity to achieve financial synergy by using the target's resources to finance the acquisition. Smith and Kim (1994) further extend this approach and claim that M&As can solve potential problems of resource allocation. This can be achieved by merging slack-poor bidders with targets high in free cash flow. Lewellen (1971) and Smith and Kim (1994) conclude that the opportunity to realise such gains is based partly on using acquisitions to resolve poor capital structure management by overcoming both under- and over-investment.

However, Bruner (1988) shows that bidders tend to have more financial slack than targets. It is also suggested that bidders with high free cash flow tend to pay considerably more for their targets. Lang, Stulz and Walkling (1991) conclude in this context, that firms with high free cash flow are more likely to make bad acquisitions.

This view goes in line with research by Harford (1999) and Pinkowitz (2002) who claim that target firms with financial slack are less likely targets of successful takeovers. This negative relationship of takeover likelihood and the holding of excess cash can be explained in terms of the takeover-deterrents effects of corporate activity. Excess cash enhances the ability of a target to defend itself against an unwanted bid. Such defences include repurchasing stock, acquiring a competitor of the bidder and filing private anti-trust legislation or turning around to acquire the suitor itself (Bagwell, 1991, Stulz, 1988 and Dann and De Angelo, 1988). In addition, excess cash held by the target increases the bidder's uncertainty about the value of the target since it can be used to engage in bidder-specific negative net present value activities. Thus holding excess cash may serve as a deterrent to would be bidders (Faleye,

\(^{35}\)Dickerson, Gibson and Tsakalotos (2002) explain that this circumstance is perhaps a reflection of the different opinions regarding firm valuation.
The literature therefore is ambivalent as to whether excess cash makes potential targets more likely to attract bidders.

Another cost of capital motivation refers to potential diversification benefits of an acquisition (Gort, 1962, 1966), which Lewellen defined as the ‘coinsurance effect of debt’ (see Chapter Four). According to authors such as Lewellen (1971), Lintner (1971) Higgins and Schall (1975), Lee and Barker (1977) and Comment and Jarrell (1995) multi-division firms provide a greater earnings stability, spread the risk and reduce the probability of default and thus expected bankruptcy costs. This in turn often leads to a greater debt capacity, potentially resulting in a lower cost of capital for the firm. Research by Morck, Shleifer and Vishny (1990), however, shows that diversification results in low returns compared to related acquisitions. Bhagat, Shleifer and Vishny (1990), Lang and Stulz (1994) and Comment and Jarrell (1995) confirm this finding by detecting that diversification has an adverse effect on company valuation.

5.3.1.4 Tax gains

Despite the financial burden associated with high premium payments and despite the associated negotiation and coordination costs, acquisitions present a considerable number of tax-related financial benefits. As already mentioned in Chapter Four, tax gains may be a powerful incentive for some acquisitions and it is generally acknowledged that acquisitions, which are primarily funded with debt, provide the acquirer with tax savings due to the fact that debt interest payments are tax deductible and paying taxes at personal income tax rates on ordinary income can be avoided (Grinblatt and Titman, 1998). A further potential tax advantage results from the acquisition being paid with stock, which results in capital gain taxes being deferred until the actual sale of the stock (Copeland and Weston 1992). Under US tax legislation, no taxes at all are paid on dividends remitted from the bidder in an acquisition (Ross, Westerfield and Jaffe, 2002).

Grinblatt and Titman (1998) refer to unused debt capacity as an important reason for acquisitions. In cases when the target and the bidder are under-leveraged for reasons such as incentive schemes and personal tax costs associated with increased leverage, an acquisition can be regarded as a method of raising their combined debt-to-equity ratio while keeping taxable costs at a minimum. Ross, Westerfield and Jaffe (2002) further emphasise the
advantage of using surplus funds to finance mergers instead of paying out taxable dividends or buying taxable shares. Authors including Jensen (1986), Goold and Campbell (1987), Very (1993) and Rotemberg and Saloner (1994) claim that if a corporation holds substantial taxable free cash flow then the investment into acquisitions might present an opportunity to avoid tax payments while at the same time achieving a positive net present value in order to maximise the company's financial resources. According to Halpern (1983), all of these tax influences on mergers result not only in avoiding tax payments but would also increase the market value of the equity after the acquisition. However, as claimed by Jensen's (1986) free cash flow theory, managers with large free cash flow and excess debt capacity often prefer to undertake low-benefit or even value-destroying takeovers.

5.3.2 Managerial Motives

Historically it has been argued that the managerial capital allocation process within a diversified firm is more efficient than by outside capital markets (Williamson, 1970, 1975, Teece, 1982). Executives are claimed to be in a better position to spot bargain-priced companies with substantial profit prospects (Bowman, 1987, Thompson and Strickland, 1998), and to control the post-acquisition process, enabling managers to allocate capital more efficiently across competing divisions (Myers and Majluf, 1984, Williamson, 1986). Bhide (1990), however, stresses that external capital markets have improved their efficiency since the 1980s, making external capital markets an increasingly superior method of investment allocation.

The growth maximisation theory refers to management pursuing an acquisitive strategy in order to maximise firm size (Reid, 1968 and Jensen and Murphy, 1990), increase market power (Stigler, 1968 and Steiner, 1975) and control a larger empire (Shrieves and Stevens, 1979, Halpern, 1983). Morck, Shleifer and Vishny (1990) and Rees (1995) stress that the management of a corporation often decides on acquisitions with their own short-term managerial interests in mind, even though these investments may destroy value for the shareholders. This has already been discussed in Chapter Two. Authors including Müller (1980), Jensen (1986), Shleifer and Vishny (1989, 1990) Stulz (1990) Rotemberg and Saloner (1994) and Goh (2006) claim that managers have an urge for corporate growth and empire building to satisfy their own personal motives such as improved personal image, prestige, power, increased indispensability and job security as well as remuneration. In this context,
authors including Rappaport (1998b) and Black, Wright and Bachman (1998) criticise the fact that executives are often encouraged to set such growth objectives and that they are often compensated on such short-term measures including turnover and return on sales.

According to the ‘hubris hypothesis’ by Roll (1986) and more recently Heaton (2002), manager’s exaggerated pride or self-confidence, can also be regarded as one important managerial motive for acquisitions. Executives simply overestimate their ability to run even the most difficult types of businesses successfully together. Authors including Malmendier and Tate (2003) provide empirical evidence on managerial optimism regarding takeover returns and find that overconfident managers make more acquisitions. Managers of acquiring companies might believe that they hold private information of the target company and claim to take advantage of information asymmetry in the market. According to Halpern (1983) and Rees (1995), acquiring managers believe that the acquisition announcement will be understood as a market signal, which will result in the resolution of the information asymmetry and the revaluation of the formerly ‘undervalued’ stock of the target firm. Müller (1989) and Datta, Pinches and Narayanan (1992) see this extreme confidence of bidding managers as one explanation for the often-unjustified premium payments, which were already discussed earlier. Dess, Picken and Janney (1998) refer to this aspect as the executive’s ‘egocentric machismo’ (p12), which in the extreme may restrict sound strategic planning and impact negatively not only on the acquisition itself but also on the core business.

Evidence by authors including Jensen (1983) suggests that managers of target firms often resist takeovers to protect their private benefits of control rather than to serve shareholders through value-enhancing takeovers. The literature refers to a selection of managerial survival strategies which might range from the relatively harmless share price amendment to the ‘green mail’36, ‘poison pills’37, ‘fair price provision’38 and ‘white knight defence’39

36 Green mail refers to a situation in which a large block of stock is held by an unfriendly company. This forces the target company to repurchase the stock at a substantial premium to prevent a takeover. It is also known as a ‘Bon Voyage Bonus’ or a ‘Goodbye Kiss’.

37 The term ‘poison pill’ refers to a class of defences that impose significant costs on the bidder by diluting his equity holdings, revoking his voting rights or forcing him to assume unwanted financial obligations upon ‘triggering’ the pill’ (Shleifer and Vishny, 1988; 13).

38 A fair price provision is a takeover defence amendment to corporate bylaws which requires special approval of a merger proposal, often by a super-majority of shareholders, in the event of dissent by one or more directors or a two-tiered tender offer for the company’s shares.

39 A ‘white knight’ is a company that comes to the rescue of a corporation that is being taken over. In general, it is considered one of the anti-takeover defence tactics used to counter tender offers.
Management ownership and acquisition activity both play key roles in the agency literature (Jensen and Meckling, 1976, Leland and Pyle, 1977). From the bidder’s perspective, research by authors including Larcker (1983) Lewellen, Loderer and Rosenfeld (1985), You, Caves, Henry and Smith (1986) and Datta, Pinches and Narayanan (1992) shows that bidders with small or no management ownership often pay large premiums, only with the aim of increasing the firm’s operating income, ignoring the long-term value implications. Rappaport (1998b)
concludes that these extremely high acquisition prices reduce the likelihood that bidding shareholders gain value from acquisitions. Sirower (1997) comments that these results are consistent with the hypothesis that managers are pursuing objectives other than wealth maximisation for their shareholders, as has already been stated in Chapter Two.

From the target’s perspective, an inverse relation between the probability of being a target and managerial ownership is being detected (Song and Walkling, 1993). As claimed by Morck, Shleifer and Vishny (1988), acquired firms are characterised to have smaller levels of managerial holdings compared to a control group. Stulz (1988) and Song and Walkling (1993) agree and show that firms with large managerial ownership are less likely to be a target of an acquisition. Song and Walkling (1993) claim that increased managerial ownership also reduces agency costs, which in turn reduces potential acquisition gains and decreases the probability of a firm becoming an acquisition target. In this context, these authors further argue that managerial ownership is positively related to the takeover premium being paid by the acquirer as managers negotiate more effectively. Managers aim to achieve the maximum wealth gain as a compensation for their lost benefits of incumbency (Barron, 1983, Walkling and Long, 1984), providing target shareholders with significantly positive returns (Song and Walkling, 1993). Ambrose and Megginson (1992), however, claim that insider ownership is not a significant determinant for a firm becoming a takeover target and there are many other factors influencing a takeover approach.

As has already been discussed in this chapter, during the 1960s and 1970s conglomerate acquisitions were regarded as an efficient way to reduce the risk by not having all eggs in one basket (Amihud and Lev, 1981, Jensen 1986, Prahalad and Bettis, 1986, Bowman 1987). This motive, however, has become highly controversial, since it is also argued that management aims to increase risk through acquisitions because this in turn may result in a higher return of managerial company shareholdings (Agrawal and Mandelker, 1987, Lewellen, Loderer and Rosenfeld 1989). Langetieg, Haugen and Wichern (1980) agree and confirm, that many takeovers cause the systematic as well as unsystematic risk of the combined firms to increase. Research by Lewellen, Loderer and Rosenfeld (1989) concludes that a minority of mergers have risk-reducing outcomes and that they found only weak cross-sectional evidence that large managerial shareholdings more often result in risk reducing acquisitions. In sum, it

40 Whereas systematic risk is common to all businesses, unsystematic risk is uniquely specific to one business. Mergers cannot eliminate the systematic variability, but unsystematic risk can be diversified away through mergers (Ross, Westerfield and Jaffe, 2002).
remains inconclusive whether managerial risk preference has an effect on their attitude towards M&As.

To conclude, growth maximisation strategies are often pursued by managers for personal reasons, such as power, control, prestige, hubris and survival. As managerial incentives tend to be measured against short-term achievements, management is even encouraged to pursue objectives, which are not in the long-term interests of shareholders. Personally motivated acquisitions tend to provide no economic gain for shareholders. Any potential positive value gains for the target shareholders as an inducement are often more than offset by a shortfall of value for the bidder’s shareholders (Morck, Shleifer and Vishny, 1990, Denis, Denis and Sarin, 1997).

5.3.3 Corporate Control Motives

As already pointed out in previous chapters, a great deal of theory and evidence supports the theory that takeovers address governance problems effectively (Manne, 1965, Jensen, 1988, 1993, Scharfstein, 1988 and Easterbrook and Fischel, 1991). Megginson (1997) values the importance of a dynamic takeover market for the general health of the economy, ‘because it weeds out inefficiencies and concentrates corporate control in the most capable hands’ (p22). Copeland and Weston (1992) in this context, regard the growing threat of a takeover as an important monitoring device. They believe that the increasing risk of being taken over forces management to align objectives more closely with shareholders’ interests. As already mentioned in Chapter Three, takeovers can be regarded as one of the most effective methods for shareholders to dispose of underperforming managers without bribing them (Shleifer and Vishny, 1988). In sum, the market for corporate control is regarded an essential device and antidote to eliminate inefficiencies and related agency problems.

However, according to the managerialism theory, it needs to be acknowledged that M&As are in part the result of agency problems, not the solution. Shleifer and Vishny (1997) further admit, that there remains some doubt about the real value of takeovers as a corporate governance mechanism. As takeovers are sufficiently expensive, due to most of the anticipated synergistic gains being paid up-front to target shareholders, not all performance fiascos make economic sense to be dealt with via a takeover.
In summary, takeovers are an approach, which is primarily driven by economic, financial and managerial motives and control considerations. M&As are only justifiable if they create value both for the target as well as the bidding shareholder. If the takeover enables the merged firm to create after-tax cash flows that exceed the sum of the after-tax cash flows of the individual firms (before the merger), then it can be concluded that value has been enhanced.

5.3.4 The Challenge of Achieving Synergistic Gains

The potential economic and financial benefits of M&As are considerable in theory; however, research has shown that such benefits are difficult to achieve in practice (Goold and Campbell, 1987). Authors including Grinblatt and Titman (1998) and Dickson (2000) remark that although synergistic gains are generally assumed to be considerable, empirical evidence on the extent of mergers creating synergistic advantages is limited. It is not only difficult to measure to what degree a merger has generated synergy but also it is even more difficult to establish the amount of value being created from synergies instead of other potential sources.

Another important potential downside of M&As is referred to by Slusky and Caves (1991) as the unjustified high acquisition price being paid, which often destroys any potential synergy advantages. Thompson (1993) remarks that acquisition prices often comprise not only those costs representing the target’s current value but also include extra premium payments incorporating the expected synergistic value gain. Ansoff (1987) explains these premiums payments from the target’s point of view as a compensation for the risks which had been taken to develop the business in the first place. Grossman and Hart (1980) and Hayward and Hambrick (1997), in contrast, take the buyer’s viewpoint in explaining premium payments as an indicator of how much additional value the buyer anticipates creating by managing the target firm. Sirower (1997) compares acquisition with some kind of game (acquisition game theory), bidders have to pay up front for the right to control the target firm with the future prospect to make financial profits. The risk of the gamble lies in the fact that while the premium payments are decided on up front, the future pay-offs are uncertain. Sirower sees the management challenge of achieving synergies in the fact that financial analysts already incorporate a target firm’s anticipated future performance in their share price valuations. Therefore, in order to gain any synergy advantages, synergy must result in a higher than already expected performance gain or net present value.
Rappaport (1998a) remarks that companies which fail to comprehend this key equation are in danger of falling into the synergy trap. Sirower (1997) points out that most acquisitions fail to achieve significant synergy advantages. Potential synergy advantages in form of economies of scale and scope as well as strategic fits are not only difficult to realise but also far too often more than outweighed by excessive premium payments. Synergy effects usually stay behind performance improvements required to cover the premium. These aspects are likely to convert synergy rather into a negative synergy or a $2 + 2 = 3$ equation, making acquisitions an unreliable way to create value. Considering the occurring additional costs of negotiation and coordinating the enlarged corporation after the acquisition, this would result in an overall economic loss. Hayward and Hambrick (1997) conclude that these excessive premium payments together with the related soft costs\(^{41}\) often have a devastating impact on the financial position of the whole corporation.

As pointed out by Hitt and Ireland (1985), managerial skills have a major effect on the corporation’s ability to achieve synergies. They claim that success or defeat of M&As predominantly depends on the acquirer’s management skills and expertise. Researchers including Cowlings, Stoneman and Cubbin (1980) and Kumar (1984), claim that the majority of acquirers fail to realise efficiency improvements in the post acquisition period, particularly during the implementation or adjustment stage. Porter (1985) argues that synergies are difficult to realise since they are often founded on intangible resources, which are difficult to determine or share. Prahalad and Bettis, (1986) and Dess, Picken and Janney (1998) see these difficulties arising from the target’s and bidder’s conflicting corporate cultures as well as from the target’s resistance to change and loss of autonomy. Authors including Drucker (1974), Ansoff (1987), Thompson and Strickland (1998) and Schianchi and Mantovi (2006) see the varying characteristics and competitive environments presenting an enormous challenge for corporate management to make sound decisions. They criticise the bidder’s executives for unwisely interfering in the target’s management and claim that the bidder’s strict corporate policies often have a weakening effect on the target, leading to inefficiency and value declines.

With reference to Dess, Picken and Janney (1998), acquisitions are often a result of companies picking the wrong partners for the wrong reasons. Acquisition decisions are often

\(^{41}\) Soft costs are indirect negotiation and coordination costs associated with the acquisition such as paying off golden parachutes and fees for advisory services such as lawyers, consultants, banks, etc. and related marketing expenses (Sirower, 1997).

5.4 Research areas in the field of M&A

Research into mergers and acquisitions plays an important role in the economic and finance literature. There are various particular research areas covered by a large amount of studies, the most important of which include (1) transactional aspects of M&As, (2) takeover patterns, (3) hostile takeover and defence strategies, (4) post-acquisition performance and shareholder wealth creation and (5) takeover likelihood and prediction of takeover targets. The following section provides a brief overview of those research areas in M&A.

5.4.1 Transactional aspects of M&As

One field of research in the takeover literature aims to investigate aspects of agency conflicts arising between the acquirer, target and its bondholders (shareholders, creditors, etc.) as well as representatives (e.g. investment banks) during merger negotiations. As has already been discussed in detail in the previous chapters, the scope of conflicts of interests between the parties involved potentially results in self-serving behaviour during the negotiation process. Research studies have shown that under the bargaining hypothesis this often results in overpriced acquisition premiums to the advantage of target shareholders and representatives (e.g. investment banks) and to the disadvantage of the acquirer (Kosnik and Shapiro, 1997, Servaes and Zenner, 1996, Kesner and Shapiro, 1994, Sudarsanam and Salami, 1999, Schwert, 2000). Another area of transactional aspects research includes the methods of financing an acquisition with its implications. Research studies aim to explain why the various methods of financing have different valuation effects on the acquirer's share values. These research outcomes clearly document the market reaction to the varying methods of financing, implying that cash offers are regarded as good news and stock offers are treated as bad news about the acquirer’s intrinsic value (Leland and Pyle, 1977, Fishman, 1984, 1989, Travlos, 1987, Ross, Westerfield and Jaffe, 2002). It is also being argued that the share price reaction on cash or share acquisition announcements is dependent to some degree on the

5.4.2 Takeover patterns

Another area of research focuses on takeover patterns such as the impact of economic, industry and regulatory changes on takeover activities in general. Industry shocks and economic patterns impacting on takeover activity and often resulting in takeover waves have been found by a number of studies including Shleifer and Vishny (1989), Mitchell and Mulherin (1996), Schoenberg and Reeves (1999), Weston and Jawien (1999) and Sikora (2000). Authors including Shleifer and Vishny (1989) point out that during recession many asset buyers are credit constraint and cannot pay the full value of assets. Sellers may try to postpone the transfer of the firm until markets become more liquid, thereby reducing merger activity. Bergström, Eisenberg, Sundgren and Wells (2005) point out that merger activity is much greater in prosperous periods than during recession. These findings support the view that market liquidity and capital market conditions influence merger activity (Shleifer and Vishny, 1989). The authors further found, that within a given merger wave, activity tends to focus on specific industries and that they tend to cluster over a period of two or three years within this given wave, signalling deal-making pressure.

The impact of legal restrictions such as anti-takeover laws has been well researched. Grinblatt and Titman (1998), for example, claim that regulations are unfavourable to bidding companies and also disadvantageous to increased competition among bidders (see Chapter Three). Jarrell and Bradley (1980) and Marschall and Anderson (2006) further regard regulations as damaging for the bidder since legislations indirectly increase acquisition prices, which in turn reduces the potential return for bidding companies. Legislative enhancements are often regarded as delaying the completion of mergers, which again reduces the gain potential for the acquirer. Regulations therefore indirectly diminish the profitability of takeovers and in turn reduce the amount of mergers taking place. According to research by Bertrand and Mullainathan (1998), business control laws have not only lessened takeover activity but also were detrimental to shareholder wealth. Comment and Schwert (1995),
however, document that there appears to be little evidence of takeover deterrence as a result of anti-takeover laws.

5.4.3 Hostile takeover and Defence Strategies

The area of hostile takeovers and defence strategies has seen a lot of research attention. Hostile takeovers as a method of exercising corporate control have already touched on in the Chapter Four. Research in this field provides evidence on the importance of the role of hostile takeovers in corporate control and in improving corporate performance. Questions being investigated include whether hostile takeover perform their disciplinary function successfully with outcomes remaining mixed (Franks and Mayer, 1996, Comment and Schwert, 1997, Cremers, Nair and Peyer, 2007).


5.4.4 Ex-ante and Ex-post Acquisition Performance

Two broad types of research are generally used to investigate this particular field of M&As. One research approach looks at the ex-ante market reaction to the announcement of a deal, considering both expected costs and benefits of the deal as well as the market’s expectation of whether the deal will actually be completed. This analysis typically investigates a timeframe of three to five years prior and after the merger, analysing target and bidder cash flows, accounts, etc. (Copeland, Koller and Murrin, 1990).

Another research approach assesses mergers after their consummation. Much of this ex-post performance research evaluates the effect of takeovers on share price performance around the merger-announcement date, both for target and bidding shareholders and came to ambiguous results (Jensen and Ruback, 1983, Bradley, Desai and Kim, 1988, Jarrell, Brickley and Netter, 1988, Agrawal, Jaffe and Mandelker, 1992, Berger and Ofek, 1995, Loughran and Vijh, 1997,
Grinblatt and Titman (1998) add in this context, that only the sum of both the bidder and target shareholder returns together determines if the merger creates value. Their research confirms that returns to bidders around the tender offer announcement are sometimes positive, neutral or even sometimes negative, and the average returns vary considerably over time. The validity of these event studies rests, however, on the assumption that stock markets are efficient in evaluating the impact of the event to determine abnormal returns \(^{42}\) (Rees, 1995).

In summary, empirical research has provided only little consistent explanation of the financial implication of acquisitions on value ex-ante and ex-post. There is no consistent direction to managers confronted with acquisition opportunities who wish to maximise the wealth of their shareholders (Hoskisson and Hit, 1990, Flanagan, 1996, Stimpert and Duhaime, 1997).

### 5.4.5 Likelihood and prediction models for takeover target

This particular field of research differentiates between two broad types, takeover likelihood and takeover prediction models. Many papers have sought a relation between the prior performance of target firms and the likelihood of receiving a takeover bid (Hasbrouck, 1985, Palepu, 1986, Morck, Shleifer and Vishny, 1988a, b, Mikkelsen and Partrh, 1989, Ambrose and Megginson, 1992, Song and Walkling, 1993, Comment and Schwert, 1995). A second related stream of research in this field is concerned with identifying and predicting takeover targets ex ante in order to investigate if the investment in such a portfolio of potential takeover targets would result in any economic gain (Dietrich and Sorensen, 1984, Hasbrouck, 1985, Palepu, 1986, Nuttal, 1999, Powell, 1997, 2001, Barnes, 2000).

As suggested by the literature in the field of the market for corporate control, poor performance is likely to make a company vulnerable to takeover as a disciplinary device (Shleifer and Vishny, 1988). Dickerson, Gibson and Tsakalotos (1998) see a number of factors potentially determining whether a company is likely to be taken over and a large selection of studies focuses on the impact various financial and governance characteristics have on the likelihood of becoming a takeover target. However, despite some common factors there is a general absence of consensus among researchers on the variables that should be used to assess each firm’s takeover likelihood. Variables investigated as part of takeover

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\(^{42}\) Abnormal returns refer to the difference between actual share returns and a market index or control group of stocks (Ross, Westerfield and Jaffe, 2002).
likelihood typically include accounting- and stock-market-based financial performance measures, dividend payouts, capital structure, free cash flow, asset structure, ownership structure, size and age. Some of the most important variables in determining acquisition likelihood will be discussed in more detail below.

5.4.5.1 Takeover Likelihood and Target Performance

Overall results in the literature are mixed with regards to target performance determining acquisition likelihood. While early studies show a negative relation between performance and the likelihood of becoming a takeover target (Palepu, 1986, Morck, Shleifer and Vishny, 1988a, b, 1989, Mitchell and Lehn, 1990, Weisbach, 1993) the overall trend over time goes towards finding no significant association between hostile takeovers and firm performance, implying that the disciplinary merger has statistically disappeared (Franks and Mayer, 1996, Argrawal and Jaffe, 2003, Bratton, 2005). Authors including Sinha (2004) found that none of the performance measures applied appear to be significant in influencing the likelihood of a takeover. Research by Bergström, Eisenberg, Sundgren and Wells (2005) and Bratton (2005), in this context, explain that the relation between firm performance and takeover likelihood is rather complex and difficult to define and measure.

Whereas these studies tend to focus on a sample of takeover companies to investigate their financial characteristics, this thesis’s study concentrates on a sample of underperforming firms to measure the likelihood of these companies being taken over following a period of underperformance. This is critical since the market for corporate control should rectify underperformance through a takeover and most studies do not focus on this particular aspect but investigate this area more broadly.

5.4.5.2 Takeover Likelihood and Asset Structure

As already been discussed in this chapter, there exists a relation between a firm’s asset structure\(^{43}\) and the probability of becoming a takeover target. It is being claimed that firms

\(^{43}\) Total assets are the sum of tangible assets (fixed plus current) and intangible assets plus investments. Tangible assets are the sum of physical assets such as land, building, equipment and plant as well as other long-term physical assets plus the sum of inventories, accounts receivable, cash and cash equivalents and miscellaneous short-term assets. Intangible assets are non-physical assets in the balance sheet such as patents, trademarks and goodwill as well as brand values.
with a high percentage of tangible assets in their total asset structure are attractive takeover targets for two potential reasons. These companies tend to have greater debt capacities (Ambrose and Megginson, 1992, Bergström, Eisenberg, Sundgren and Wells, 2005) and are ideal candidates for asset striping by raiders (Eddey, 1991). As has been mentioned before, the target’s own assets can even be taken as a security for debt financing the takeover, which in turn reduces the bidder’s direct acquisition costs. For this reason, the probability of being taken over is positively related to the level of tangible assets to total assets being held. However, it needs to be borne in mind that asset-rich targets might already take full advantage of their debt potential before the merger.

5.4.5.3 Takeover Likelihood and Capital Structure

Another stream of research into capital structure focuses in particular on the relation between debt and takeover likelihood (Jensen, 1986, Harris and Raviv, 1988, Israel, 1988, Stulz, 1988 and Hart and Moore, 1990). Research by Nolan (1999) has shown that debt does not only prevent prosperous firms being taken over but it also simultaneously prevents poor quality firms from engaging in M&A activity.

As already discussed in Chapter Four and earlier in this chapter the amount of debt being held by a company influences its attractiveness for potential bidders. Research which support the view that higher debt reduces the probability of a takeover include Jensen (1986), Palepu (1986), Harris and Raviv (1988), Stulz (1988), Zwiebel (1996), Comment and Schwert (1997) and Cremers and Nair (2003). Higher debt reduces the probability of a takeover since it commits the manager to performance improvements and results in stricter monitoring of managerial action. However, Cremers and Nair (2003) found that takeover targets are often financially distressed companies with higher levels of debt on the balance sheet.

It is also being argued that the potential acquirer could interpret low debt ratios as the inability of the target company’s management to maximize firm value (Bergström, Eisenberg, Sundgren and Wells, 2005). However, low debt could also indicate a lack of investment opportunities and hence render the company less attractive to bidders (Jensen, 1986).
5.4.5.4 Takeover Likelihood and Size

The firm size theory of takeovers has received large attention in the takeover literature (Levine and Aaronovitch, 1981, Palepu, 1986, Ambrose and Megginson, 1992, Powell, 1997, 2001, Cudd and Duggal, 2000, Chakraborty and Baum, 2003, Sinha, 2004). One stream of research suggests that takeover likelihood decreases with firm size, which is based on the premise that there are transaction costs of takeovers related to size making it more difficult for potential bidders to absorb large firms. Very large firms, even with significant gains, may be difficult to acquire because of lack of available credit and due to the ability of larger firms to engage in more prolonged and costly takeover defences. Another research stream including authors such as Barnes (2000), however, claims that if management acts in accordance with the growth-maximization behaviour theory, then managers shall prefer larger rather than smaller acquisitions. Nuttal (1999) agrees and adds that to the extent that agency problems are more severe in large firms where ownership control is weaker, one could expect large companies to underperform and thus become more attractive takeover targets.

Research by Song and Walkling (1993) further claims that target firms tend not to be of the smallest size but are somewhat more prominent in the middle range.

5.4.5.5 Takeover Likelihood and Managerial Ownership

As already been introduced in the previous chapters, it is being claimed that there is a relation between managerial ownership and the likelihood of becoming a takeover target. However, evidence remains mixed. Morck, Shleifer and Vishny (1988a, b), Stulz (1988), Mikkelson and Partch (1989) and Song and Walkling (1993) find that managerial ownership is negatively related to takeover attempts. Firms with increased amounts of managerial ownership are more costly to acquire and are less likely to be the target of an acquisition attempt. Managers aim to achieve the maximum wealth gain as a compensation for their lost benefits of incumbency (Barron, 1983, Walkling and Long, 1984). Song and Walkling (1993) claim that increased managerial ownership also reduces agency costs, which in turn reduces potential acquisition gains and decreases the probability of a firm becoming an acquisition target. Ambrose and Megginson (1992), however, claim that insider ownership is not a significant determinant for a firm becoming a takeover target and there are many other factors influencing a takeover approach.
As has been shown by the various outcomes of this large amount of research being conducted in the field of takeover likelihood and predictability, takeover bids appear to be the outcome of a complex set of factors and the problem of omitted variables always remains in any empirical evaluation of takeovers (Sinha, 2004). Studies have shown that on many occasions a firm may possess all the ‘right’ characteristics for being taken over but may never receive a bid.

Inconsistent research results in the past can also be attributed to a number of varying methodological issues, model specifications, sample size, timeframe, time periods and differing measurements and control devices applied as well as regulatory country differences. As pointed out by Dodd and Ruback (1977), Bradley (1980), Bradley, Desai and Kim (1983) and Travlos (1987), varying research outcomes have also been reported on studies that investigate different types of mergers such as tender offers, hostile takeovers and LBOs. However, many studies do not incorporate these differences and mix these acquisition types. A related issue refers to the fact that hostile takeovers, for example, mean different things to different people, since there is no clear definition and since takeover which were announced ‘hostile’ may in fact be concluded as ‘friendly’ as a result of the negotiation process.

5.5 Conclusion

This chapter has reviewed the literature on mergers and acquisitions as one important option of mitigating agency conflicts in the market for corporate control. It investigated potential merger motives including economic, financial and corporate control considerations as well as managerial aspects. Despite the importance of takeovers as a rapid-fire mechanism for overcoming corporate deficiencies and related agency problems with all potential value-creating benefits in theory, empirical research results have shown that outcomes are ambiguous. Indeed, as some argue, overall costs of merger activity overshadow any marginal and even possibly imaginary value gains (Scherer, 1988), which is in line with the general sceptical view about the likelihood of acquirers getting more back from an acquisition than they pay for. However, it needs to be emphasised that this does neither mean that acquirers never succeed nor that capital markets always react unfavourably. Some management teams and buyers have been successful in creating value.
Overall, research has provided only little consistent explanation for the likelihood of becoming a takeover target and there is no reliable direction for investors confronted with acquisition opportunities who wish to maximise economic gain. One main reason for these unsatisfactory research outcomes can be found in the varying methodologies and the large amount of differing variables applied to all kind of models. Another reason lies in that studies often do not differentiate between varying merger types. Whereas most studies tend to focus on a sample of takeover companies to investigate their financial characteristics, this thesis’s study concentrates on a sample of underperforming firms to measure the likelihood of these companies being taken over following a period of underperformance. This is critical since the market for corporate control should rectify underperformance through a takeover and most studies do not focus on this particular aspect but investigate this area more broadly.

The following chapter provides an overview of the study’s methodological approach and model which aims to investigate whether the market for corporate control is efficient in the sense that underperforming firms are being taken over as a consequence of their inefficiency and whether underperforming firms can be identified ex-ante according to a set of specific financial characteristics.
Chapter Six
Research Design and Methodology Outline

6.1 Introduction

This chapter provides an outline of the research design and methodology for this thesis. It introduces the overall research objectives for this study and presents the corresponding hypotheses. This chapter further outlines the methodological approach and introduces the model, which will be applied to test the proposed hypotheses. An analysis of underperformance and its measurements Tobin's q (Tsq) and Cumulative Abnormal Return (Car) will be provided. One further aim of this study is to investigate and contrast financial characteristics of underperforming firms by comparing underperforming companies taken over, with underperforming companies not taken over. The model's independent financial variables are introduced and their application to the model explained. The chapter concludes with a description of the data and the sample used for this study and presents and discusses available statistical software packages as well as justifies the chosen application.

6.2 Research Objectives

The overall aim of this thesis is to test the relationship between managerial underperformance and takeover likelihood. As discussed in detail in this study's literature review, there exists the view that a takeover offers one of the most efficient devices in the market for corporate control to overcome agency problems since it rapidly transfers resources and control from inefficient managers to efficient ones. Jensen (1986) takes the view that takeovers are a direct response to the breakdown of internal corporate governance systems and agency conflicts in companies. Research by many authors including Manne (1965), Scharfstein (1988), Ang, Cole and Lin (2000), Daines (2002) and Monks and Minow (2002) support the view that M&As are a good means of solving governance and agency problems.

As pointed out in Chapter Three, externally controlled governance mechanisms prevail in Anglo-Saxon countries with takeovers playing an important role as a means of reversing non-
value maximising strategies of underperforming companies\textsuperscript{44}. Therefore, this study will focus on countries where the external markets for corporate control are said to work actively as a disciplinary device, namely the US, UK and Canada (Chernoff, 1996, Schifffrin, 1996).

This thesis proposes to investigate one aspect of the disciplinary motive for takeovers. This study is not concerned with the issue of whether a performance improvement occurs after the takeover but rather aims to investigate in a first instance whether the market for corporate control works, meaning whether companies are actually taken over as a consequence of underperformance. For the purpose of this study, this thesis will extract a sample of underperforming companies by applying the performance measures of Tsq and Car to stock market-listed companies in the US, UK and Canada over a period of 17 years (1988 until 2004). This long time period was chosen in order to obtain a large sample of underperforming companies which have actually been taken over. The exact measurement of underperformance will be explained in detail in Section 6.4.

In a second step, this study examines financial characteristics\textsuperscript{45} of underperforming companies in order to investigate the reasons for why some underperforming companies are in fact being taken over (Group I) and other underperforming companies are not (Group II). This study only investigates actual takeovers (Group I) and not takeover announcements, which may not result in an actual takeover. The exact selection of the two sample groups will be explained in sections 6.5. The following figure presents the sample structure for clarification.

\textsuperscript{44} The absence of a market for corporate control in most of Continental Europe is attributable to the structure of capital markets with a small number of quoted companies and concentrated ownership in the hands of a small number of large investors (Franks and Mayer, 1996).

\textsuperscript{45} Although the literature review has highlighted the importance of governance characteristics (ownership and board structure, etc.), the lack of information for such a large sample and long time period made it impossible to examine such variables in the analysis.
This clustering into two groups already implies that the capital market does not (totally) work but this thesis aims to investigate the degree of efficiency of the market for corporate control and aims to determine the resulting likelihood of acquisition. This study examines if there are any differences between the financial characteristics of these two groups in order to provide a justification and explanation for the varying outcomes in terms of underperforming companies being taken over (Group I) and underperforming companies not being taken over (Group II).

The selection of financial characteristics to form part of an explanatory or predictive model raises several problems. Firstly, it remains uncertain which variables are related to the probability of a takeover since the market for corporate control may be motivated by different factors at different times in different countries. Secondly, not only are several alternative measurements available as proxies for a particular financial characteristic, but it is often unclear which is the best, since alternatives are not so much substitutes but have overlapping informational content, leading to potential multicollinearity in the estimation data and misspecification of and bias in, the statistical model estimates (Palepu, 1986).

Independent variables applied in this study include the two variables already used to measure underperformance (Tsq and Car). In addition, capital structure, asset structure and firm size will be analysed. Based on these financial characteristics this thesis aims to determine the likelihood of acquisition as a result of managerial underperformance.
The objectives for this thesis are as follows:

**OBJECTIVE ONE:**

1. Investigating if the market for corporate control actually works by measuring to what degree companies are taken over following a period of underperformance in the US, UK and Canada. Measurements of underperformance are a combination of Tobin’s q and cumulative abnormal return.

**OBJECTIVE TWO:**

2. Testing for a relationship between financial characteristics and takeover likelihood of underperforming companies in the US, UK and Canada. Financial variables under investigation include underperformance (Tsq and Car), capital structure, asset structure and firm size, accounting also for industry and economic effects.

The study is divided into separate phases of investigation. Firstly we test whether underperformance is actually followed by a takeover (Objective One). Secondly, an investigation into separate financial characteristics of underperforming companies is undertaken to test what influence these financial variables have on the likelihood of becoming a takeover target, incorporating and accounting for economic and industry effects (Objective Two). The independent variables under investigation will be explained and discussed in the following Section 6.3.

In addition to the individual financial company variables a number of corresponding industry and economy control variables will be determined. As has been shown by a number of studies (Liebeskind and Opler, 1994, Berger and Ofek, 1995, Comment and Jarrell, 1995, John and Ofek, 1995), takeovers tend to occur in waves which appear to be related to certain economic circumstances characterized by, for example; short- and long-term interest rates, inflation and generic economic prosperity. This thesis will apply GDP as a measurement of a country’s general economic condition since it incorporates the effects of the above-mentioned indicators.
This thesis also accounts for industry effects to adjust to the fact that industries vary considerably from each other in their financial variables and characteristics (Tsq, asset structure, capital structure and size). For this reason, individual firm characteristics always need to be related to their industry counterparts. Therefore this analysis uses the financial variables (e.g. Tsq, asset structure, capital structure and size) in absolute terms as well as expressed as a variance (difference) to their industry counterparts.

6.3 The Hypotheses

According to the research objectives introduced above, the following hypotheses will be investigated as part of this study. The hypotheses are structured in line with both objectives One and Two, according to the four financial variables under investigation. The inclusion of economic and industry effects will be investigated separately for modelling reasons (hierarchical regression), which will be explained in Section 6.7.

6.3.1 Hypothesis One - Underperformance

H10: There is no relation between the degree of underperformance and takeover likelihood.

H11: There is a positive relation between the degree of underperformance and takeover likelihood.

H1a0: There is no relation between underperformance and takeover likelihood taking into account industry and economic effects.

H1a1: There is an increasing positive relation between underperformance and takeover likelihood taking into account industry and economic effects.

The literature claims that the market for corporate control is one of the most efficient devices to rectify managerial underperformance and inefficiencies in corporations. Takeovers are often regarded as a direct response to the breakdown of internal corporate governance systems in companies and agency conflicts (Manne, 1965, Jensen, 1986, Palepu, 1986, Scharfstein, 1988). As a consequence, a positive relation between the degree of underperformance and takeover likelihood can be assumed.

46 For example, there are industries, which have typically high asset specificities (e.g. manufacturing) and thus this needs to be considered for and related accordingly to each individual firm.
Hypothesis H1a provides an extended investigation into the relationship by including a set of industry effects and economic variables (GDP). Statistically there is the possibility that the inclusion of industry and economic effects might change the level of significance, therefore this will be tested accordingly.

6.3.2 Hypothesis Two - Capital Structure

H20: There is no relation between capital structure and the likelihood of underperforming companies being acquired.

H21: The level of corporate debt is negatively / positively related to the likelihood of underperforming companies being acquired.

H2a0: There is no relation between capital structure and the likelihood of underperforming companies being acquired taking into account industry and economic effects.

H2a1: The level of corporate debt is negatively / positively related to the likelihood of underperforming companies being acquired taking into account industry and economic effects.

As already discussed in the literature review, the amount of debt being held by a company influences its attractiveness for potential bidders. However, so far research outcomes remain contradictory in terms of debt being positively or negatively related to takeover likelihood. On the one hand, it is being argued that higher debt reduces the probability of a takeover since it commits the manager to performance improvements and it results in stricter monitoring of managerial action. It is further being claimed that a potential acquirer could interpret low debt ratios as the inability of the target company’s management to maximize firm value. The majority of studies assume that the level of corporate debt is negatively related to the likelihood of being taken over. Research, which support this view include Jensen (1986), Palepu (1986), Harris and Raviv (1988), Stulz (1988), Zwiebel (1996), Comment and Schwert (1997), Cudd and Duggal (2000) and Bergström, Eisenberg, Sundgren and Wells (2005).

On the other hand, there is research indicating a positive relation between debt levels and takeover likelihood. Research by authors including Cremers and Nair (2003), for example, found that takeover targets are often financially distressed companies with higher levels of debt on the balance sheet. It can be argued that acquiring companies with financial slack or a
low-debt-to-equity ratio view a company with high levels of debt (debt-burdened) as a good takeover target in order to optimise their own capital structure which is even seen as a cheaper option than issuing new debt.

The variable used to test this hypothesis is total leverage, which is calculated by dividing total debt by the sum of total debt, market value of equity and preferred stock. This thesis compares the capital structure variable outcomes of Group I with Group II in order to detect any variations.

Hypothesis H2a provides an extended investigation into this relation by including a set of economic and industry effects. Statistically there is the possibility that the inclusion of industry effect might change the level of significance, therefore this will be tested accordingly.

6.3.3 Hypothesis Three – Asset Structure

H30: There is no relation between the asset structure and the likelihood of underperforming companies being acquired.

H31: The proportion of tangible assets to total assets is positively related the likelihood of underperforming companies being acquired.

H3a0: There is no relation between the level of tangible assets and the likelihood of underperforming companies being acquired taking into account industry effects.

H3a1: The proportion of tangible assets to total assets is positively related to the likelihood of underperforming companies being acquired taking into account industry effects.

According to the literature, a relationship between a firm’s asset structure and the probability of becoming a takeover target has been detected. As already pointed out in Chapter Five, firms with a high percentage of tangible assets in their total asset structure are attractive takeover targets for two potential reasons. These companies tend to have greater

47 Total assets are the sum of tangible assets (fixed plus current) and intangible assets plus investments. Tangible assets are the sum of physical assets such as land, building, equipment and plant as well as other long-term physical assets plus the sum of inventories, accounts receivable, cash and cash equivalents and miscellaneous short-term assets. Intangible assets are non-physical assets in the balance sheet such as patents, trademarks and goodwill as well as brand values.
debt capacities (Ambrose and Megginson, 1992) and are ideal candidates for asset stripping by raiders (Eddey, 1991). For this reason, the probability of being taken over is positively related to the level of tangible assets to total assets being held.

The variable used to test this hypothesis is the proportion of tangible assets being held to total assets. This thesis will apply this variable and compare outcomes between Group I and Group II in order to detect any variations.

Hypothesis H3a provides an extended investigation into this relation by including an industry effect variable. Statistically, there is the possibility that the inclusion of the industry effect variable might change the level of significance, therefore this will be tested accordingly.

6.3.4 Hypothesis Four – Size

H4₀: There is no relation between firm size and the likelihood of being acquired.
H4₁: Firm size is negatively / positively related to the likelihood of being taken over.

H4a₀: There is no relation between the company size and the likelihood of underperforming companies being acquired taking into account industry effects.
H4a₁: Firm size is positively / negatively related to the likelihood of underperforming companies being acquired taking into account industry effects.

As discussed in Chapter Five, the size of a firm can have an impact on the likelihood of becoming an acquisition target. One stream of research suggests that takeover likelihood decreases with firm size, which is based on the premise that transaction costs of takeovers are related to size, making it more difficult for potential bidders to absorb large firms. Very large firms may be difficult to acquire because of the lack of available credit and due to the ability of larger firms to engage in more prolonged and costly takeover defences. In addition, a smaller firm might also be easier to be integrated into the acquirer’s operation, hence smaller firms should be preferred over large ones (Levine and Aaronovitch, 1981, Palepu, 1986, Ambrose and Megginson, 1992, Powell, 1997, Cudd and Duggal, 2000, Chakraborty and Baum, 2003, Sinha, 2004). Thus, it can be argued that firm size is negatively related to takeover likelihood.
However, in accordance with the growth-maximisation behaviour theory, the literature claims that large companies are more attractive to acquirers. Large companies do not only provide smaller companies with a rapid source of expansion but it is also being argued that agency problems are more severe in large firms, potentially resulting in underperformance and thus these companies may become an attractive takeover target (Nuttal, 1999, Barnes, 2000). For this reason, some researchers assume that firm size is positively related to takeover likelihood although there is generally more support in the literature for a negative relationship.

There is generally no consensus in the variable specification for size. Many studies use the logarithm of annual total assets, the logarithm of annual total sales or market capitalisation as well as the number of employees as a measure of size. For the purpose of this study the logarithm of total assets seemed to be most appropriate since it is important to also account for the exact amount of assets the acquirer is actually purchasing in a transaction. This thesis will apply this variable and compare outcomes between Group I and Group II in order to detect any variations.

Hypothesis H4a also includes an industry effect variable of size. Statistically, there is the possibility that the inclusion of the industry effect variable might change the level of significance, hence this will be tested accordingly.

The following table provides a summarised overview of all proposed hypotheses and their expected signs.
Table 1: Summary of Hypotheses

<table>
<thead>
<tr>
<th>Hypotheses under Investigation</th>
<th>Expected sign, as suggested by the literature</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1₁ There is a positive relation between the degree of underperformance and takeover likelihood.</td>
<td>+</td>
</tr>
<tr>
<td>H1₁a₁ There is an increasing positive relation between underperformance and takeover likelihood taking into account industry and economic effects.</td>
<td>+</td>
</tr>
<tr>
<td>H2₁ The level of corporate debt is negatively / positively related to the likelihood of underperforming companies being acquired.</td>
<td>+/-</td>
</tr>
<tr>
<td>H2₁a₁ The level of corporate debt is negatively / positively related to the likelihood of underperforming companies being acquired taking into account industry and economic effects.</td>
<td>+/-</td>
</tr>
<tr>
<td>H3₁ The proportion of tangible assets to total assets is positively / negatively related to the likelihood of underperforming companies being acquired.</td>
<td>+</td>
</tr>
<tr>
<td>H3₁a₁ The proportion of tangible assets to total assets is positively / negatively related to the likelihood of underperforming companies being acquired taking into account industry effects.</td>
<td>+</td>
</tr>
<tr>
<td>H4₁ Firm size is negatively / positively related to the likelihood of underperforming companies being acquired.</td>
<td>+/-</td>
</tr>
<tr>
<td>H4₁a₁ Firm size is positively/negatively related to the likelihood of underperforming companies being acquired taking into account industry effects.</td>
<td>+/-</td>
</tr>
</tbody>
</table>

6.4 Analysis and Measurement of Underperformance

This section provides an introduction and discussion of underperformance with its relevant measurements to be applied in this thesis. If managers are pursuing goals other than value maximisation then it results in firm underperformance. As stated by Palepu (1986) and Morck, Shleifer and Vishny (1988a, b), targets of takeovers are often firms which have underperformed others in the same industry. As a result, company performance would be lower than that of value-maximising firms (Asquith, 1983, Kennedy and Limmack, 1996). Existing empirical work in this field does indeed suggest that takeover targets are more likely to be less profitable and efficient and hence are to be disciplined by the market for corporate control (Singh, 1971, 1975, Meeks, 1977, Levine and Aaronovitch, 1981, Cosh, Hughes and Singh, 1984, Padgett and Shabbir, 2005).

A variety of financial ratios are applied widely as key variables to measure corporate performance. However, in the economic and finance literature there is no common agreement on the application of a particular set of financial ratios to measure performance. Particular
controversy exists with regard to whether accounting- or stock market-based measures are the more appropriate to be applied. Authors including Bromiley (1986), Thompson (1993) and Quian (1997) regard accounting-based measures as more appropriate and claim that they accurately reflect the firm’s economic performance. However, accounting-based ratios have been criticised for being single period measurements, which do not take into account the cost of capital and which ignore any future outlook (Dubovsky and Varadarajan, 1987, Hoskisson, Hitt, Johnson and Moesel, 1993). Seth (1990), Black, Wright and Bachman (1998) and McMenamin (1999) further criticise the ambiguous and subjective accounting allocation procedures, which are dependent on personal preferences and individual country practices. McMenamin (1999) see further difficulties in using accounting-based ratios as a means of performance measure due to the fact that the numerator and the denominator may be taken from separate financial statements. Although accounting-based measures have often been condemned in the financial and economic literature (Fisher and McGowan, 1983, Benston, 1985) they are still commonly used for reasons of availability.

According to authors such as Goold, Campbell and Alexander (1994) and Flanagan (1996), stock market-based measurements are good indicators of a firm’s performance since they stand for a firm’s future value and incorporate a company’s investment decision in its stock value. This opinion goes in line with Fama’s (1970) efficient market hypothesis, which suggests that all available information is immediately impounded without bias in stock prices. Rappaport (1998b) adds that investors instantly readjust, possibly occurring incorrect share price valuations. Mills (1994) concludes: ‘There is no way to beat the market’ (p12).

6.4.1 Applied Measurements of Underperformance

Given that this thesis is primarily concerned with the operation of the market for corporate control in disciplining underperforming management, a set of measurements need to be found in order to assess managerial underperformance. Measurements applied in this study will be Tobin’s q and cumulative abnormal return, which will be applied in combination. The exact measurement and definition of managerial underperformance is critical to this study and only

48 For example, whereas the profit refers to the Profit and Loss Account covering a whole period, the net assets or equities refer to the Balance Sheet, which investigates a single point of time.

49 The efficient market hypothesis (semi-strong form) assumes that the stock market immediately adjusts share prices to reflect any new information as soon as it becomes publicly available. The key foundation of the efficient market hypothesis lies in the two assumptions that investors are rational in their trading action and guided only on new information and not on intuition (Fama, 1970).
companies with a three-year moving average $Tsq$ value of below 1 and a negative three-year Cumulative Abnormal Return value falling within exactly the same time interval will be defined as underperforming firms. Since $Tsq$ generally has an upward-bias arbitrage, meaning values for Tobin’s $q$ tend to be overstated, it is of importance that companies need to fulfil both criteria simultaneously.

The period of three-year underperformance was considered to be the most reasonable choice. The selection of a shorter period to for example, two years would have potentially resulted in a much bigger sample, however, the distortion effect would become much larger, meaning that one particularly bad year of underperformance could potentially overshadow the average performance. Increasing the window of underperformance to for example, four years would reduce the sample drastically and would only filter out companies, which are considerably underperforming. Therefore choosing the window of three years of underperformance appears most reasonable.

The following sections will introduce and explain the exact measurement and calculation of Tobin’s $q$ (Section 6.4.1.1) and cumulative abnormal return (Section 6.4.1.2).

**6.4.1.1 Tobin’s $q$ ($Tsq$)**

Tobin’s $q$ is a well-accepted measurement of performance (Hasbrouck, 1985, Lang, Stulz and Walkling, 1991, Servaes, 1991). The $Tsq$ ratio divides the market value of all of the firm’s debt plus equity (market value of common stock and preferred stock) by the replacement value of the firm’s total assets (Lloyd and Jahera, 1994, Perfect and Wiles, 1994$^{50}$). The following formula will be applied to calculate Tobin’s $q$:

\[
\frac{(MVOE + TD)}{TA},
\]

where $MVOE$ refers to the market of equity, $TD$ refers to total book value of debt and $TA$ represents total assets.

$^{50}$ $Tsq$ can also be expressed as the present value of future cash flows divided by the replacement cost of tangible assets (Hall, Ladermanns and Mundy, 1988, Morck, Shleifer and Vishny, 1988a,b) which is in particular applicable for unlisted firms.
Tsquared (Tsq) has been applied by numerous studies in the financial and economics literature to identify the extent to which firms have positive net present value (NPV) opportunities (Lang and Litzenberger, 1989, Lang, Stulz and Walkling, 1991, Denis, Denis and Sarin, 1994, Dickerson, Gibson and Tsakalotos, 1998). Schwartz (1982) and Hasbrouck (1985), for example, found that using Tsq makes it possible to distinguish between well-managed (high Tsq) and poorly managed firms (low Tsq). Hasbrouck (1985) further argues that target companies have relatively low values of Tsq, which suggests that target shares are often selling at a value below their replacement cost. Servaes (1991, p409) states that 'the best takeovers in terms of value creation, are those where a high Tsq firm takes over a low Tsq firm.' The author concludes that interpreting Tobin's q as a measurement of managerial performance supports the view that better performing firms create value by taking over poorly performing companies. Morck, Shleifer and Vishny (1988a, b) agree and note that the probability of a takeover is strongly negatively related to Tobin's q.

As pointed out by Lang and Stulz (1994), Tsq also measures the contribution of the firm's intangible assets to its market value. They argue that management's actions directly affect the value of intangible assets since managerial entrenchment can be regarded as an intangible asset with negative value. Hence, management can add or subtract value from the firm's total assets whose replacement value is the denominator of the Tsq formula, making Tobin's q a good measure of managerial underperformance.

The measure Tobin's q avoids many but not all of the difficulties associated with accounting and capital market measures of performance (Wernerfelt and Montgomery, 1988, Jose and Stevens, 1986). Lang and Stulz (1994) claim that Tsq has the advantage of being comparable among companies regardless of size and industry effects. In particular, there is neither a need for risk adjustments nor normalisation.

Calculating the market value of a firm raises a number of issues. Multiplying the average share price per annum by the average annual number of ordinary shares generates the market value of ordinary shares. Since this does not incorporate other share capital (mainly preference shares), this study furthermore uses the book value of other shares in the calculation of the market value. Finally, the definition of market value includes the market value of the firm's debt. However, as pointed out by Lang and Stulz (1994) and Dickerson, Gibson and Tsakalotos (2002), the lack of information on the maturity of debt and on current
market prices for debt precludes any straightforward debt valuation. Therefore it is most common to apply the book value of debt.

For the purpose of this study, companies will be identified as underperforming when the three-year moving average of Tsq falls below 1. Mathematically, the rolling Tobins'q formula becomes:

\[
TQ = \begin{cases} 
< 1 & \text{included} \\ 
\geq 1 & \text{excluded} 
\end{cases}
\]

where,

\[
TQ = \sum_{k=0}^{20-1} \frac{1}{3} \sum_{t=k+1}^{k+3} U_{jt}
\]

(2)

6.4.1.2 Abnormal Returns / Cumulative Abnormal Return (Car)

Abnormal returns and cumulative abnormal returns are established stock market-based measurements of performance, commonly used for an event time methodology (Weisbach, 1988, Kang and Shivdasani, 1995). Under the assumption of the semi-strong market efficiency, companies with inefficient management should be penalised by poor share prices. As a consequence of low share price performance, underperforming companies are likely to become attractive acquisition targets (Manne, 1964, 1965). The measurement of Car helps to identify firms, which underperform their peer group in terms of share price performance after controlling for industry, size and time-varying systematic risk effects.

6.4.1.2.1 Abnormal Returns

This model argues that returns on security \( j \) are linearly related to returns on a ‘market’ portfolio. Abnormal returns are defined as the difference between a firm’s security returns and the return of an equal- and value-weighted market portfolio for a certain period. The differences are known as residuals; thus,

\[
U_{jt} = ACR_{jt} - ER_{jt},
\]

(3)
where

\[ U_{jt} = \text{the residual for security } j \text{ in time period } t. \]  
This is the difference between the actual return and the expected return. The residual \( U_{jt} \) is expected to have a mean value of zero.

\[ ACR_{jt} = \text{the actual return on security } j \text{ in time period } t; \text{ and} \]

\[ ER_{jt} = \text{the expected return on security } j \text{ in time period } t. \]

The expected return \( ER_{jt} \) is derived from the following market model relationship, suggested by Sharp (1963), which can be mathematically described as:

\[ ER_{jt} = \alpha_j + \beta_j R_{mt} + \epsilon_{jt}, \tag{4} \]

where

\[ R_{mt} = \text{the return on a value-weighted market portfolio in period } t; \]

\[ \alpha_j, \beta_j = \text{security specific parameters to be estimated and vary from one security to another}. \]

\( \alpha \) represents the intercept and \( \beta_j \) is known as systematic risk and expresses the covariance between the returns on security \( j \) and the returns on the market index.

The exact calculation of beta is described in Section 6.4.1.2.3.

\( \epsilon_{jt} = \text{random disturbance term of security } j \text{ in time period } t. \) This stochastic error term assumes to be independently normally distributed and satisfies the normal assumptions of a linear regression model.

Thus the expected return for period \( t \) is calculated by:

\[ ER_{jt} = \hat{\alpha}_j + \hat{\beta}_j R_{mt}. \tag{5} \]

The parameters \( \hat{\alpha}_j \) and \( \hat{\beta}_j \) are calculated by regressing monthly returns for security \( j \) on the monthly returns of the market index. The market model in its original version, however, is criticised for two main reasons, (1) being that it assumes \( \beta_j \) to stay constant over the period under investigation and (2) that it does not allow for value-weighted size differences.
In order to overcome this problem, this thesis uses an adjusted market model, which allows for time-varying systematic risk ($\beta_{jt}$) and size, as applied by Ibbotson (1975), Dimson and Marsh (1986), Lakonishok and Vermaelen (1990) and Ikenberry and Lakonishok (1993). The abnormal return for firm $j$ in month $t$, $\text{ABR}_{jt}$, is thus computed as:

$$\text{ABR}_{jt} = R_{jt} - S_{jt} - (\beta_{jt} - \beta_{sj})(R_{mt} - R_{jt})$$

where

- $R_{jt}$ is the return to firm $j$ in period $t$;
- $S_{jt}$ is the return of the firm's corresponding peer group in period $t$;
- $\beta_{jt}$ is the systematic risk of firm $j$ in period $t$;
- $\beta_{sj}$ is the systematic risk of the firm's peer group, which is simply the average of the betas of all securities $j$ in the peer group portfolio, thus:

$$\beta_{sj} = \frac{1}{n} \sum_{j=1}^{n} \beta_{jt}$$

- $R_{mt}$ is the return of the security's overall industry in period $t$.

The calculation of the peer group return requires the selection of a directly comparable industry group composed of firms from the same industry (Datastream item 'INDXFS'\textsuperscript{51}) also taking into account firm size as measured by total sales. Companies included in the peer group need to have a total sales figure which is only up to 50% above or below the total sales figure of the company under investigation. Since the peer group already only incorporates companies of similar size, a simple average of the peer group's return is applied. The peer group is calculated on an annual basis and hence its composition is likely to change year-on-year.

There are a number of possibilities to calculate an industry return, two of which are common in finance theory and practice. The industry return can be a weighted return index, weighting each company according to its market value of equity (MVOE), meaning, companies with a higher MVOE will account for a greater proportion within the industry index. For example, the German DAX Index and the S&P500 Index

\textsuperscript{51} Please refer to Table 4 Datastream Mnemonics of Master Data and their Definitions in Section 7.2 for an explanation INDXFS.
follow this procedure. The alternative procedure would be to simply equally weigh each company within the portfolio/index, meaning calculating the non-weighted average portfolio return. The Dow Jones Index applies this procedure.

This thesis tested both methods and came to the conclusion that a weighted return index produces the more appropriate results and hence this procedure was followed. Companies, especially those listed in the NASDAQ and TSX Venture, which tend to include small and very volatile firms, often record extremely positive and negative monthly returns. By simply taking the non-weighted average index return, those volatile firms would affect and skew the average industry return index disproportionately.

\[ R_f = \text{the risk-free rate in period } t \text{ (in the US, UK and Canada used correspondingly).} \]

6.4.1.2.2 Cumulative Abnormal Returns

Ikenberry and Lakonishok (1993) explain that computing abnormal returns for individual companies forms the basis for producing Car for the observation period. The average abnormal return for a particular time period is calculated as the sum of the abnormal returns for individual companies. Car of a company's security is measured as the sum of the average residuals over a specific time period, thus:

\[ CAR_i = \sum_{t=k}^{T} U_{jt} . \quad (8) \]

For the purpose of this study, underperformance is further defined as Car being negative over a period of three cumulative years on a rolling monthly basis. Mathematically, the general form of the Car formula therefore becomes:

\[ CAR = \begin{cases} < 0 & \text{included} \\ \geq 0 & \text{excluded} \end{cases}, \]

where,

\[ CAR = \sum_{k=0}^{240-k} \left( \sum_{t=k}^{T} U_{jt} \right) . \quad (9) \]
6.4.1.2.3 Calculation of Beta

The derivation of average monthly betas for each stock applied by Datastream is based on the methodology described by Cunningham (1973). This method assumes that stock market movements and individual equity movements are inter-related and that the relationship can be described as:

\[ y = \alpha x^\beta, \]  

(10)

where \( y \) is the movement within the equity and \( x \) is the movement in the market expressed as a logarithm as detailed in Step 1 below. The terms \( \alpha \) and \( \beta \) are the coefficients. Cunningham (1973) showed that the \( \alpha \) coefficients are effectively constant across all stocks and that they are important to this description only in that they are necessary for the derivation of the \( \beta \) for a stock. The calculation of beta can be broken up into the following four steps:

Step One: Monthly equity prices over the last 60 months are converted to a series of logarithmic index changes, using the following formula for each stock:

\[ \log \left( \frac{\text{Price}_{i+j}}{\text{Price}_j} \right) \]  

(11)

Similarly, the monthly price indices are converted for each market. These values are used in the calculation described in Step Two below.

Step Two: For each equity the alpha and beta coefficients \( \alpha_E \) and \( \beta_E \) are calculated as follows:

\[ \beta_E = \frac{\left( N \sum E \cdot M - \sum E \sum M \right)}{N \sum M^2 - (\sum M^2)}, \]  

(12)

\[ \alpha_E = \frac{\left( \sum E - \beta_E \sum M \right)}{N}, \]
\[
\alpha_E = \frac{1}{N-1} \left( \sum E^2 - \frac{\left( \sum E \right)^2}{N} \right),
\]

\[
\beta_E = \frac{\left( \sum \left( E - \alpha_E - M \beta_E \right) \right)^2}{(N-1) \sum M^2 - \left( \sum M \right)^2}.
\]

where, \( E \) is the logarithmic index change for a stock, \( M \) is the logarithmic index change for a market and \( N \) is the number of periods - 1.

Step Three: The average alpha and beta for the markets (\( \alpha_M \) and \( \beta_M \)) are derived as the sum of equity values over the number of equities, and the variance of the market beta, \( \beta_M \), can then be calculated as:

\[
\beta_M \frac{\sum \beta_E^2}{N-1} - \left( \sum \beta_E \right)^2 \frac{\sum VAR. \beta_E}{N},
\]  

(13)

where:

\( E \) is the logarithmic index change for a stock;

\( M \) is the logarithmic change for a market; and

\( N \) is the number of periods – 1.

Step Four: Finally, the beta estimate and correlation are calculated for each stock. The formula for this estimate is displayed below:

\[
\beta_{est} = \beta_M + \frac{\sum M \cdot (\alpha_E - \alpha_M) + \sum M^2 \cdot (\beta_E - \beta_M)}{\sum \alpha_E \cdot \left( N - 1 \right) \cdot \sum M^2 - \left( \sum M \right)^2} \cdot \left( \frac{1}{N-2} \frac{\sum \beta_E \cdot \left( N - 2 \right) \cdot \sum M^2 + \sum M^2}{\sum \alpha_E \cdot \left( N - 1 \right) \cdot \sum M^2 - \left( \sum M \right)^2} \right).
\]  

(14)

The formula used for beta correlation is:

\[
\beta_E^* = \sqrt{\frac{\sum M^2 - \left( \sum M \right)^2}{\sum E^2 - \left( \sum E \right)^2}} \frac{1}{N-1},
\]  

(15)
The beta for each individual stock forms the basis of calculating a beta for the peer group, which is simply the average of the betas of all firms belonging to the peer group in this particular year.

6.5 Sampling Procedure of Takeover Companies

By examining financial characteristics of underperforming companies, this study aims to investigate in a second step the reasons for some underperforming companies in fact being taken over (Group I) whereas other underperforming companies are not (Group II). (Please refer to Figure 1 in Section 6.2 for a sample structure.) For the purpose of this study a sample of takeover companies needs to be identified in each of the three countries over the period under investigation and then matched against the sample of underperforming firms. As a result, Group I only incorporates those companies which are underperforming and taken over. Takeovers were identified via SDC Platinum, an M&A database by Thomson Financial, which stores information on worldwide merger and acquisition deals. Group II in contrast refers to underperforming companies, which have not been a successful acquisition target. These two groups form the basis for meeting the objectives of this study, as has already been stated in Section 6.2:

a) Investigating if the market for corporate control actually works by measuring to what degree companies are taken over following a three-year period of underperformance in the US, UK and Canada. Measurements of underperformance are a combination of Tobin's q and cumulative abnormal return.

b) Testing for a relationship between financial characteristics and takeover likelihood of underperforming companies in the US, UK and Canada. Financial variables under investigation include underperformance (Tsq and Car), capital structure, asset structure and firm size, accounting also for industry and economic effects.

To ensure that the takeover is associated with this underperformance it needs to take place within a time period of 24 months following the occurrence of underperformance. An increase of this 24-month time period to for example 36 months would limit the possibility of the takeover being directly related to the occurrence of underperformance. Reducing the time period to for example 12 months would limit the sample. Since this study only considers...
effective dates of takeovers and not takeover announcement dates, 12 months do not appear long enough for the legal and regulatory implications to take full effect and to actually complete the takeover. Therefore the timeframe of up to 24 months from the event of underperformance appears to be the most reasonable.

The variables, which will be calculated for the three-year period of underperformance, are described in the table below. An industry control variable for cumulative abnormal returns, however, is obsolete since this ratio already incorporates an industry component in its formula by definition.

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tobin’s q</td>
<td>( \frac{(MVOE + TD)}{TA} )</td>
</tr>
<tr>
<td>Cumulative Abnormal Return</td>
<td>See Section 6.4.1.2.1</td>
</tr>
<tr>
<td>Asset Structure</td>
<td>( \frac{TA - IA}{TA} )</td>
</tr>
<tr>
<td>Capital Structure</td>
<td>( \frac{TD}{TD + MVOE + PS} )</td>
</tr>
<tr>
<td>Firm Size</td>
<td>Log TS (natural Logarithm of total sales)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Control Variables</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry Tsq</td>
<td>The individual company’s Tsq variance from the non-weighted average Tsq for the industry as a whole</td>
</tr>
<tr>
<td>Industry Asset Structure</td>
<td>The individual company’s asset ratio variance from the non-weighted average asset ratio for the industry as a whole</td>
</tr>
<tr>
<td>Industry Capital Structure</td>
<td>The individual company’s debt ratio variance from the non-weighted average debt ratio for the industry as a whole</td>
</tr>
<tr>
<td>Industry Firm Size</td>
<td>The individual company’s firm size ratio variance from the non-weighted average firm size ratio for the industry as a whole</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross domestic product</td>
</tr>
</tbody>
</table>

**Table 2: Independent Variables under Investigation**

6.6 The Approach to Modeling

This section outlines the detailed research design and introduces the model applied for this study. It provides an introduction into and discussion of regression and probability analysis, which forms the basis of this study’s model used to investigate the likelihood of underperforming companies being taken over following a period of underperformance.
6.6.1 Regression Analysis

In order to test the above hypotheses a regression analysis will be applied. Menard (2001) states that in single linear regression analysis it is possible to test whether two variables are linearly related and to calculate the strength of this linear relationship. This relationship between the variables can be described by the following equation:

\[ Y = \alpha + \beta X, \quad (16) \]

where \( Y \) is the variable being predicted and \( X \) is a variable whose values are being used to predict \( Y \). The population parameters \( \alpha \) and \( \beta \) are to be estimated. The parameter \( \alpha \) (intercept) represents the value of \( Y \) when \( X = 0 \). The parameter \( \beta \) represents the change in \( Y \) associated with a one-unit increase in \( X \) or the slope of the line that provides the best linear estimate of \( Y \) and \( X \).

The multiple linear regression model is used to study the relationship between a dependent variable and more than one independent or explanatory variable (Greene, 2003). In multiple regression there are several predictor variables. If \( n \) denotes the number of independent variables, the equation becomes as follows:

\[ Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_n X_n, \quad (17) \]

and \( \beta_1, \beta_2, \ldots, \beta_n \) are called partial slope coefficients, reflecting the fact that any one of the \( n \) predictor variables \( X_1, X_2, \ldots, X_n \) provides only a partial explanation or prediction for the value of \( Y \). The equation is sometimes written in a form which explicitly recognises that the prediction of \( Y \) and \( X \) may be imprecise,

\[ y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_n X_n + \varepsilon, \quad (18) \]
where $\varepsilon$ is the error term, a random variable which represents the error in predicting $Y$ from $X$ (Menard, 2001). The observed value of $Y$ is the sum of two parts, a deterministic part and the random part $\varepsilon$.

According to Menard (2001) and Greene (2003) there are several assumptions which must all be met for the classical linear regression model to be applicable:

**Linearity:**

$$y = \alpha + \beta_1x_1 + \beta_2x_2 + \ldots + \beta_nx_n + \varepsilon.$$ The model specifies a linear relationship between $Y$ and $X_1, \ldots, X_n$.

**Measurements:**

All independent variables are interval, ratio, or dichotomous and the dependent variable is continuous, unbounded and measured on an interval or ratio scale.

**Full rank:** There is no exact linear relationship between any of the explanatory/independent variables in the model. This assumption is necessary for estimating the parameters of the model.

**Exogeneity of the independent variables:**

$$E[\varepsilon_i | x_1, \ldots, x_n] = 0.$$ This states that the expected value of the disturbance at observation $i$ in the sample is not a function of the independent variables noted at any observation point, including this one. This means that the independent variables will not carry useful information for prediction of $\varepsilon_i$.

**Homoscedasticity and non-autocorrelation:**

Each distribution $\varepsilon_i$ has the same finite variance, $\sigma^2$, and is uncorrelated with every other disturbance, $\varepsilon_j$. This assumption limits the generality of the model.

---

52 Greene (2003) refers to the term $\varepsilon$ as a random disturbance because it disturbs an otherwise stable relationship. The disturbance arises for several reasons, primarily because the model cannot capture every influence on an economic variable in a model, no matter how elaborate. The net effect, which can be positive or negative, of these omitted factors is captured in this disturbance.
Exogenously generated data:
The data in \((x_1, x_2, \ldots, x_n)\) may be any mixture of constant and random variables. The process of generating the data operates the assumptions of the model — that is, independently of the process that generates \(\varepsilon_i\).

Normal distribution: The disturbances \(\varepsilon_i\) are normally distributed.

Since linear regression analysis requires the dependent variable to be continuous and the explanatory variables to be either continuous or categorical, the classical form of linear regression cannot be used in situations where the dependent variable takes a discrete number of mutually exclusive and collectively exclusive values (Borooah, 2003), as is the case in this study. For such circumstances in which the dependent variable is categorical (non-continuous) and the independent variables are categorical and/or continuous data, either logistic regression or log-linear regression models should be used. Logistic regression describes the relationship between one categorical response variable and one or more continuous and/or categorical explanatory variables. Log-linear models are preferred if in a contingency table there are a minimum of two response variables. It is a useful approach since it describes association patterns among a set of categorical response variables.

6.6.2 The Model Applied in this Thesis

6.6.2.1 Introduction to Probability/Prediction Models

Prediction models employ multiple regressions, as described above, and have been employed by researchers to assess the impact of explanatory, independent variables on the probability that an event or outcome will occur. This outcome is characterised as the dependent variable. Prediction models summarise information contained in a firm’s financial statements by using statistical aggregations to assess a firm’s financial status. The takeover literature has employed this technique widely to assess the impact of financial data on the likelihood of becoming a takeover target (Simkowitz and Monroe, 1971, Stevens, 1973, Belkaoui, 1978, Dietrich and Sorenson, 1984, Palepu, 1986, and Rose, 1988, Greene, 2003).

Overall, there are two broad types of probability analysis, namely fixed and random effects models. Fixed effects models are concerned with deterministic probability, meaning that the
output is uniquely determined by the input, which will always produce exactly the same result for exactly the same input. Random effects models, on the other hand, use stochastic probability, meaning they will be applied to processes which have random characteristics. Stochastic models use random variables or refer to patterns resulting from random effects. As the individual outcomes of firms studied in this thesis are fixed (takeover) we will use a deterministic probability model.

In general, the probability of an event, deterministic or stochastic, can have just two types of attributes, namely binary or multinomial. Binary choice probability models distinguish between just two outcomes, whereas multinomial prediction models have the possibility of several outcomes, meaning more than two. Many previous research studies including authors such as Palepu (1986) applied a binomial logit model where takeover targets were treated as one homogenous group. However, as already highlighted in Chapter Five, this let to controversy since takeovers may occur for many reasons (e.g. friendly vs. hostile, etc.), thus a multinomial framework should have been preferred to a binomial choice outcome (Powell and Yawson, 2007). Morck, Shleifer and Vishny (1988b) note that takeover targets are not a homogenous group per se and that ignoring these differences may result in biased takeover probabilities and poor predictive performance. However, since this thesis is only investigating underperforming companies as one homogenous group this critique does not apply here and a binary choice outcome of an event can appropriately be used in the form of either the binary logit or probit model (Powell, 1997).

Various models have been applied to determine takeover likelihood by researchers. The most prominent models applied for this probability analysis include the univariate and multivariate logit and probit model. Whereas earlier studies predominantly used multiple discriminant analysis and or factor analysis to study acquisition targets (Simkowitz and Monroe, 1971, Stevers, 1973, and Wansley, 1984), Morck, Shleifer and Vishny (1988a) and Comment and Schwert (1995) in contrast applied a probit model for their investigation of takeover likelihood. However, more recent studies applied a logit model to predict mergers and acquisitions (Dietrich and Sorensen, 1984, Hasbrouck, 1985, Palepu, 1986, Nuttal, 1999, Powell, 2001).

53 An example for situations where stochastic models are applied, meaning where the outcome is random, includes option pricing.
6.6.2.2 Conditional Logit or Probit Model with a Binary Outcome

In logit and probit analysis the dependent response variable is defined as \( Y \). This dependent variable is conditional upon the vector \( X \), which represents all of the independent explanatory variables. Explanatory variables are often financial ratios and are used to measure the probability \( P \) ex-post.

When \( Y \) is dichotomous it can take either the value of 0 or 1. This binary form of the logit and probit model has only two distinct outcomes i.e. firm is acquired (\( Y = 1 \)), versus not acquired (\( Y = 0 \)), where \( Y \) is the dependent variable. Thus the probability model becomes

\[
P(Y = 1) = \sum_{k=1}^{n} \beta_k x_k = F(x, \beta)
\]

\[
P(Y = 0) = 1 - \sum_{k=1}^{n} \beta_k x_k = 1 - F(x, \beta).
\]

Binary models are usually designated as latent variable specification in which the response variable \( Y \) is linearly related to a set of \( n \) explanatory variables, \((x_1, x_2, \ldots, x_n)\) as is defined by the regression relationship:

\[
Y = \sum_{k=1}^{n} \beta_k x_k + \varepsilon,
\]

here, \( Y \) are the unobserved values and \( \varepsilon \) is the random disturbance (error term) with zero mean and its distribution function \( F_\varepsilon \). This is the general form to observe the dependency between \( Y \) and \( X \). Here, \( F \) can take any form of distribution.

\[
P(Y = 1) = p(y > 0)
\]

\[
= P\left(\sum_{k=1}^{n} \beta_k x_k + \varepsilon > 0\right)
\]

\[
= P\left(\varepsilon > -\sum_{k=1}^{n} \beta_k x_k\right)
\]

\[
= 1 - P\left(\varepsilon \leq -\sum_{k=1}^{n} \beta_k x_k\right)
\]
If we substitute the general form of distribution $F_e$ by the logistic distribution $L$ we then get the famous logit model with a binary choice, as can be seen in the equation (22) below:

$$
P(y = 1) = 1 - L\left(-\sum_{k=1}^{n} \beta_k x_k\right) = L\left(\sum_{k=1}^{n} \beta_k x_k\right) = \frac{\exp\left(\sum_{k=1}^{n} \beta_k x_k\right)}{1 + \exp\left(\sum_{k=1}^{n} \beta_k x_k\right)}.
$$

(22)

The general form of the logit equation can be applied to this thesis and can thus be rewritten as:

$$
P_{ij} = \frac{e^{x_{ij} \beta}}{1 + e^{x_{ij} \beta}},
$$

(23)

where $X_{i,t-1}$ is the data matrix, in which $t-1$ is used to compute the probability $p$ at time $t$ and $\beta = (\alpha_1, \beta_1, \ldots, \beta_n)$.

Under the assumption that $\varepsilon$ is standard normally distributed, meaning $\varepsilon \sim N(0,1)$, we get the probit model with a binary choice, as can be seen in equation (24):

$$
P(y = 1) = 1 - F\left(-\sum_{k=1}^{n} \beta_k x_k\right) = F\left(\sum_{k=1}^{n} \beta_k x_k\right) = \Phi\left(\sum_{k=1}^{n} \beta_k x_k\right).
$$

(24)

The general form of the probit equation can be applied to this thesis and can thus be rewritten as:

$$
P(Y = 1) = \Phi(X_{i,t-1} \beta).
$$

(25)

For the logit and probit models, $\beta$ is the parameter to be estimated.
6.6.2.3 The Estimation of the Parameter $\beta$

There are several methods of estimating $\beta$; however, mathematically the most prominent and theoretically sound are the ordinary least square (OLS) estimator as well as the maximum likelihood method.

In order to use the OLS estimator, all assumptions of the classical linear regression, which have been described in the previous section, must be met. Some of these assumptions are easier to meet than others, however, the assumption that the dependent variable is continuous has serious consequences for OLS interpretation if not met. If instead the dependent variable is discrete, consisting of two or more outcome categories, as is the case here (logit and probit), then OLS poses serious inference problems. Because of the nature of logit and probit, we therefore will use the maximum likelihood method to estimate the parameter $\beta$. The classical formula of maximum likelihood (Greene, 2003) and the applied version for this model is described in detail below:

$$P(Y_1 = y_1, Y_2 = y_2, \ldots, Y_n = y_n, | X) = \prod_{y_{ij}} \left[ 1 - F \left( \sum_{k=1}^{n} \beta_k x_k \right) \right] \prod_{y_{ij}} \left[ F \left( \sum_{k=1}^{n} \beta_k x_k \right) \right].$$

(26)

where $(Y_1 = y_1, \ldots, Y_n = y_n)$ take either the value 0 or 1 (not takeover and takeover) by $n$ observations of different firms and takeovers. The equation above can thus be rewritten as:

$$L(\beta \mid \text{data}) = \prod_{i=1}^{n} \left[ F \left( \sum_{k=1}^{n} \beta_k x_k \right) \right]^{y_i} \left[ 1 - F \left( \sum_{k=1}^{n} \beta_k x_k \right) \right]^{1-y_i}. \quad (27)$$

In equation (28) below, we use the positive characteristic of a logarithm $i$ function to simplify the equation above.

$$\ln L = \sum_{i=1}^{n} \left[ y_i \ln F \left( \sum_{k=1}^{n} \beta_k x_k \right) + (1 - y_i) \ln \left[ 1 - F \left( \sum_{k=1}^{n} \beta_k x_k \right) \right] \right].$$

(28)

After this simplification, we then use the likelihood equation to compute the maximum of the function $\ln L$ over $\beta_k$. In the equation below we compute the first partial differentiation:
\[
\frac{\partial \ln L}{\partial \beta_k} = \sum_{i=1}^{n} \left[ \frac{y_i f_i}{F_i} + (1 - y_i) \frac{-f_i}{(1-F_i)} \right] x_i = 0, \quad k = 1, \ldots, n
\] (29)

where \( f_i \) is the density, \( dF_i \left| d \sum_{k=1}^{n} \beta_k x_k \right. \) and \( F = F \sum_{k=1}^{n} \beta_k x_k \). To simplify the equation above we get the following formula:

\[
\frac{\partial \ln L}{\partial \beta} = \sum_{i=1}^{n} (y_i - \hat{\lambda}) x_i = 0,
\] (30)

here, \( \hat{\lambda} \) is the logistic cumulative distribution function. Also, note that \( \hat{\lambda}_i = \Lambda \left( \sum_{k=1}^{n} \beta_k x_k \right) \).

In the next step we look for the solution \( x = (x_1, \ldots, x_n) \) of the linear system in the equation above. After computing the extreme point, using the classical method of linear algebra, we will then test this point by using the Hessian matrix (second partial differentiation):\[
H = \frac{\partial^2 \ln L}{\partial \beta \partial \beta'} = \sum - \lambda_i \left( \lambda_i + \left( \sum_{k=1}^{n} \beta_k x_k \right) \right) x_i x_i'.
\] (31)

As can be seen from the formula above, \( \beta \) is the maximum of \( L \) and is called the maximum likelihood estimator.

**6.6.2.4 Should the Logit or Probit Model be chosen?**

One question which is often being posed is whether logit is preferred over probit, or vice-versa. Generally, as shown in the formulas above, differences are limited between the logit and the probit model. On a univariate analysis the model formulas provide similar results in the majority of cases (Borooah, 2003). In certain circumstances, however, results of the probit and logit model differ, fundamentally due to the distribution \( F \) of the error term \( \varepsilon \), logistic \( L \) versus normal \( N \). Particularly, if investigation samples are extremely large with a dominance of occurrences in the tails of the distribution\(^54\), the probit model is preferred over logit. In other cases, it is more common to use the logit model.

\(^{54}\) This relates to a probability moving towards 0 or 1, if this is high then a probit model should be used.
However, the probit model can only be applied to univariate analysis. For this reason, the probit model is insufficient for this thesis, which undertakes a multivariate analysis using hierarchical regression. Therefore, this thesis will apply the model of logit regression.

6.7 Hierarchical Regression

The regression model explained above will be applied hierarchically to test if there is any relation between the chosen independent variables and the likelihood of a takeover for underperforming companies for each of the three countries. It also aims to examine to what degree the independent variable explains the output (takeover/dependent variable), which is measured as probability $p$.

Similar to any standard linear regression model, the output of the hierarchical regression analysis comprises two levels of investigation. Firstly, the effect of each independent variable is investigated on an individual basis (according to each hypothesis) and its unique contribution and explanation to the overall predictability of the regression will be tested in terms of strength ('odds ratio') and significance of the determination\textsuperscript{55}. This particular step of analysis is referred to as Test 1 in this thesis. As already mentioned, this study's hierarchical regression model additionally incorporates industry and/or economic effects into the analysis of each hypothesis, which is referred to as Test 2. The model tests if the inclusion of these control variables results in a change of significance for each hypothesis, meaning whether the results of Test 1 differ statistically from the results of Test 2. A further level of analysis tests the combined effect of the independent and control variable(s) of each hypothesis together on the dependent variable. This study refers to this particular step of analysis as Test 3 and measures its outcome in terms of strength and significance.

In addition to applying the model to each of the four hypotheses separately on a per country basis, a last step of investigation of this thesis will be the application of a multinomial logistic regression to all ten variables together, in order to investigate their impact on the likelihood of becoming a takeover target for an underperforming firm in each of the three countries. This procedure is analogue and in line with any standard linear regression model. However, the uniqueness of a binary-logistic regression analysis lies in that the results are furthermore detailed in a classification table, which lists the output in terms of correct and incorrect

\textsuperscript{55} The significance of determination is particularly important to test if the outcomes are not the result of pure coincidence, meaning that the determination coefficient is not exactly '0'.

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allocations (predictors) before and after the regression. This aspect of the hierarchical regression analysis and its procedure will be explained in more detail in Section 8.5.

6.8 Statistical Software Packages

There are many statistical software programmes, which are widely used among econometricians or statisticians to evaluate statistical outcomes. The most widely used packages include E-Views, Gauss, LIMDEP, RATS, SAS, Shazam, SPSS, Stata, MICROFIT and TSP. Statistical software packages in general vary, for example, in size, complexity, cost and the amount of programming required from the user. Because of statistical sufficiency and simplicity of the programme this thesis will use SPSS.

6.9 Conclusion

This chapter provided a detailed description of the type of research and methodology to be used for the empirical research. The overall objective of this thesis is to examine the relationship between managerial underperformance and takeover likelihood by testing if the market for corporate control works, meaning if companies are actually taken over as a consequence of underperformance. With reference to the literature, this study examines a set of financial characteristics, meaning underperformance (Hypothesis 1), capital structure (Hypothesis 2), asset structure (Hypothesis 3) and firm size (Hypothesis 4), accounting also for industry and/or economic effects (Hypothesis 1a, 2a, 3a, 4a), to investigate the reasons for some underperforming companies in fact being taken over whereas other underperforming companies are not.

After introducing the research objectives and its corresponding four hypotheses and four sub-hypothesis, this chapter outlined the methodology approach and the model concept in detail. It provided an analysis of underperformance and a discussion of its relevant measurements (Tobin's q, Cumulative Abnormal Return) to extract a sample of underperforming stock market-listed companies in the UK, US and Canada. This chapter also described the selection process of the corresponding sample of takeover companies to be matched against the sample of underperforming companies. This process resulted in the creation of two sample groups; underperforming companies being taken over (Group I) and underperforming companies not being taken over (Group II). This chapter also introduced and analysed the model to be applied in this study. The model was introduced as being binary logistic. The chapter
concluded with a description and analysis of available statistical software packages including this study’s choice being the statistical software SPSS.

The following chapter will provide a detailed step-by-step approach of the data compilation and clearing process necessary for the creation of a sample of underperforming companies.
Chapter Seven

Data Description and Sample Processing

7.1 Introduction

This chapter introduces the data compilation process, which is a particular vital part of this thesis’s methodology, since the sample of underperforming firms forms the basis for the overall investigation. The data compilation process will be explained step-by-step; from collecting the raw data for the stock market-listed companies in the UK, US and Canada from secondary sources, to the creation and programming of a tailor-made database, which was necessary to extract a sample of underperforming companies as defined in the previous chapter. This chapter also describes the data clearing procedure and explains the application of the variables of underperformance (Tsqv and Car) to come up with a sample of underperforming companies fulfilling all the necessary requirements. This chapter will also describe the M&A sample data compilation process necessary to obtain a listing of companies, which have been taken over within the period of investigation in the three countries to be matched against the sample of underperforming companies.

7.2 Data Compilation

As already mentioned in the previous chapter, all data used in this study were gathered from secondary sources. The main sources of information are Datastream and SDC Platinum, which contain published accounts data, stock prices and M&A information worldwide. This study uses financial data and other company information from Datastream, which is operated by the company Thomson Financial. This database collects a wide selection of information for companies listed on most international stock exchanges, including historic accounting and stock market-related data as well as providing economic country-specific information.

Required financial data and other information points were downloaded in a three-step process:

1. Company master-data: Generic company information
   (e.g. company name, classification code, financial year-end information);
2. Financial company data: Annual accounts and monthly stock market-related results; and
3. Economic data: Country-specific information (e.g. GDP)

This study focuses on companies listed on the following stock exchanges:

- **UK** London Stock Exchange (LSE);
- **US** American Stock Exchange (AMEX);
  New York Stock Exchange (NYSE);
  National Association of Securities Dealers Automated Quotation (NADSAQ)
- **Canada** Toronto Stock Exchange (TSX); and
  Toronto Stock Exchange Venture (TSXV).

As already mentioned in the previous chapter, the takeover period under investigation falls between 1988 and 2004. However, as the measurements of underperformance, Tsq and Car, require a three-year period for the underperformance evaluation, the data compilation process begins already with the year 1985.

The database includes a total of 30,225 live\(^{56}\) and dead\(^{57}\) companies over the mentioned investigation period. This total sample can be divided in the following sub-samples per country:

**Table 3: Number of Companies Listed on the UK, US and Canadian Stock Exchanges over the Period 1985 – 2004**

<table>
<thead>
<tr>
<th>Country</th>
<th>Live</th>
<th>Dead</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>2,021</td>
<td>4,681</td>
<td>6,702</td>
</tr>
<tr>
<td>US</td>
<td>7,940</td>
<td>9,220</td>
<td>15,139</td>
</tr>
<tr>
<td>Canada</td>
<td>3,970</td>
<td>4,414</td>
<td>8,384</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>11,910</td>
<td>18,315</td>
<td>30,225</td>
</tr>
</tbody>
</table>

\(^{56}\) Live companies refer to firms, which are listed on a specific stock exchange up to the time of data collection in July 2005.

\(^{57}\) Dead companies refer to firms, which were de-listed from a specific stock exchange during the period under investigation. This could have been the result of take-over, insolvency, MBOs and/or privatisation, etc.
The following company master-data was collected for each of the 30,225 firms. All gathered Datastream Mnemonics are presented in the following table with a brief description.

### Table 4: Datastream Mnemonics - Master Data and Definitions

<table>
<thead>
<tr>
<th>Datastream Mnemonic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE</td>
<td>TYPE refers to a six-digit Datastream classification code or company ID.</td>
</tr>
<tr>
<td>NAME</td>
<td>NAME refers to the actual exact name of the company.</td>
</tr>
<tr>
<td>GEOGN</td>
<td>GEOGN states the country where the company has its main stock market listing. This is important since companies will only be incorporated with their main stock market listing but not with a second or third listing. For example, the English company Vodafone has its main listing in the UK but may also have a second listing in the US.</td>
</tr>
<tr>
<td>INDM</td>
<td>INDM refers to the industry grouping, which the company directly belongs to. For example, an airline company’s direct industry grouping is matched to the ‘Airlines and Airports’ category. INDM is expressed as a letter coding.</td>
</tr>
<tr>
<td>INDG</td>
<td>INDXFS is identical to INDM but is expressed as a number coding.</td>
</tr>
<tr>
<td>INDXFS</td>
<td>INDXFS refers to a generic or subordinated industry grouping. For example, the airline company which is mapped to ‘Airlines and Airports’ in the INDM coding, will also be part of the ‘Transport’ category in their INDXFS coding. Several INDM classifications will be summarised in one INDXFS grouping.</td>
</tr>
<tr>
<td>BDATE</td>
<td>BDATE refers to the exact date when the company entered the stock market (date of first listing).</td>
</tr>
<tr>
<td>TIME</td>
<td>TIME refers to the exact date the company’s exit of the stock market. This is particular important for dead firms.</td>
</tr>
<tr>
<td>EXNAME</td>
<td>EXNAME refers to the name of the exact stock exchange within one country. This is particular important for the US and Canada where several stock exchanges are in place. There are also several exchanges in these countries, which this study does not focus on and hence companies were excluded. Examples for excluded country-specific stock exchanges in the US are ‘OTC, Philadelphia, Boston, Pacific, Midwest’ and for Canada ‘Alberta, Montreal’, etc.</td>
</tr>
<tr>
<td>Financial Year End</td>
<td>Financial Year-End refers to the exact date of the company’s year-end. This data point is downloaded for every year within the investigation period since it may change over time under investigation.</td>
</tr>
</tbody>
</table>
The next step included the collection of annual accounting and monthly stock market-related results for each firm. All gathered Datastream variables are presented in the following table below and are briefly described.

Table 5: Datastream Mnemonics - Financial Variables and Definitions

<table>
<thead>
<tr>
<th>Datastream Mnemonic</th>
<th>Notation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WC03255</td>
<td>TD</td>
<td>Total Debt represents all interest bearing and capitalized lease obligations. It is the sum of long and short-term debt.</td>
</tr>
<tr>
<td>WC02649</td>
<td>IA</td>
<td>Intangible Assets represent other than fixed assets not having a physical existence. The value of these assets lies in their expected future return.</td>
</tr>
<tr>
<td>WC01001</td>
<td>TS</td>
<td>Net Sales or Revenues represent gross sales and other operating revenue less discounts, returns and allowances.</td>
</tr>
<tr>
<td>CMA#(X)</td>
<td>P</td>
<td>Average Stock Price per month.</td>
</tr>
<tr>
<td>WC03451</td>
<td>PS</td>
<td>Preferred Stock represents the preferred shareholders' claim on share earnings and assets in the event of liquidation prior to the common shareholders.</td>
</tr>
<tr>
<td>WC02999</td>
<td>TA</td>
<td>Total Assets represent the sum of total current assets, long-term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment and other assets.</td>
</tr>
<tr>
<td>WC09802</td>
<td>BETA</td>
<td>Here, BETA refers to the annual average of monthly betas. Beta is calculated based on monthly observations extending over 5 years (i.e. 60 months). For each of the proceeding 60 months, return on security (Rj) is calculated for every security and regressed against market rates (Rm).</td>
</tr>
<tr>
<td>NOSH</td>
<td>NOSH</td>
<td>Number of Ordinary Shares represents the total amount of shares being issued per year by the company.</td>
</tr>
<tr>
<td>UKGBILL3</td>
<td>RFRUK</td>
<td>Risk Free Rate for United Kingdom</td>
</tr>
<tr>
<td>USTBL3M</td>
<td>RFRUS</td>
<td>Risk Free Rate for United States</td>
</tr>
<tr>
<td>CDN3MTB</td>
<td>RFRCN</td>
<td>Risk Free Rate for Canada.</td>
</tr>
<tr>
<td>MV</td>
<td>MVOE</td>
<td>Market Value of Equity is the share price multiplied by the number of ordinary shares in issue at calendar year end.</td>
</tr>
</tbody>
</table>

Finally, the following historic economic data for the three countries under investigation were collected.
Table 6: Datastream Mnemonics - Economic Variables and Definitions

<table>
<thead>
<tr>
<th>Datastream Mnemonic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UKDGDP</td>
<td>UKDGDP refers to the annual real growth of the Gross Domestic Product for the UK.</td>
</tr>
<tr>
<td>USDGDP</td>
<td>USDGDP refers to the annual real growth of the Gross Domestic Product for the US.</td>
</tr>
<tr>
<td>CNDGDP</td>
<td>CNDGDP refers to the annual real growth of the Gross Domestic Product for Canada.</td>
</tr>
</tbody>
</table>

7.3 Databank/Software Description

An in-depth analysis for any kind of mass-data is often only practicable with the assistance of tailor-made programming tools. For this reason, a databank was programmed especially for the purpose of this investigation. This database was programmed by applying the software development tool ‘Sun Java Development standard Edition (J2SE 1.4.2)’ and the development tool ‘IDE: Eclipse 3.02’. In comparison to any standard Windows applications such as Excel or Access, this Java-based database has the advantage of handling mass data virtually without any limit of capacity extremely fast over various dimensions. In addition, the main benefit of this programme lies in its user-uniqueness, since any kind of data sorting, intensive data calculations and analysis can be programmed according to specific user requirements.

All company information and data points were originally downloaded from DATASTREAM in an Excel format and afterwards imported and converted into the Java Databank via a software tool called ‘JXL Java Excel API 2.5.9; Log4j 1.2.9’. Furthermore, a Database Access Layer was incorporated which is called ‘Java Database Connectivity JDBC 3.0 with MySQL Connector-J’ and RDBMS / Database Server: MySQL 4.1.7 in order to facilitate the programming and reporting function.

7.4 Data Clearing Process

As already discussed in the methodology chapter, this thesis is primarily concerned with the operation of the market for corporate control in disciplining underperforming management. Thus this investigation focuses solely on underperforming firms, which need to be identified in a first step.
For the identification and compilation of a sample of underperforming companies it was necessary to operate various programming tools. First of all it made a data clearing process necessary to facilitate the exclusion of the companies with incomplete master data (e.g. missing BDATE, TIME, TYPE, NAME, Financial Year End, etc.). In addition, this clearing process excludes companies which are part of industry groupings, which this study does not focus on. The following table presents a detailed overview of industry groupings, which were excluded from the sample.

Table 7: List of Industries Excluded from the Study

<table>
<thead>
<tr>
<th>Generic Industry</th>
<th>Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>BANKS</td>
<td>Banks</td>
</tr>
<tr>
<td>INSUR</td>
<td>Insurance Non-Life, Insurance Brokers, Re-Insurance, Other Insurance</td>
</tr>
<tr>
<td>LESUR</td>
<td>Gambling</td>
</tr>
<tr>
<td>LIFEA</td>
<td>Life Assurance</td>
</tr>
<tr>
<td>MNING</td>
<td>Mining Finance</td>
</tr>
<tr>
<td>RLEST</td>
<td>Property Agencies, Real Estate Development.</td>
</tr>
<tr>
<td>SPFIN</td>
<td>Consumer Finance, Asset Managers, Investment Banks, Other Finance, Mortgage Finance</td>
</tr>
<tr>
<td>SUPSV</td>
<td>Transaction &amp; Payroll</td>
</tr>
</tbody>
</table>

This study also considered variances in financial reporting periods. To create comparable sets of data with regards to the varying fiscal year end dates of companies, the sample only includes companies with their fiscal year ending between October 1st and March 31st. Companies whose fiscal year does not fall within this time period will be excluded from the sample. This procedure was applied to overcome a potential weakness of the sample due to a potential time lag for the individual companies. Since the majority of companies report within the time frame October to March anyway, the sample was only reduced by a limited extent.

7.5 Extraction of Underperforming Companies

As previously discussed in the methodology chapter, this investigation identifies underperforming firms by applying two financial measurements in combination; three-year

---

58 The fiscal year for companies reporting within the period 1st January and 31st March will be allocated to the previous year (e.g. fiscal year-end 31 March 2000 is allocated to the actual accounting year 1999).
moving average Tobin’s q and three-year cumulative abnormal return. Underperforming firms are defined to satisfy the following two requirements, which are tested in a two-step process:

- Three-year moving average Tsq < 1; and
- Cumulative three-year abnormal return < 0;

7.5.1 Tobin’s q (Tsq)

As a first step, Tobin’s q will be calculated for each firm for each available year over the period 1985 until 2004. In case one or more of the formula's variables are not available for one year for a company, the investigation will ignore this year for the analysis. If one or more variables are non-existent for the entire time frame under investigation, this study will exclude the company from the analysis.

After having calculated all possible single Tsq values for each firm over the investigation period, a moving three-year average Tsq value is calculated in order to see whether a company’s three-year average Tsq falls below 1.

7.5.2 Cumulative Abnormal Return (Car)

Only companies with a three-year rolling average Tsq < 1 are considered for the application of the measurement Car falling below 0, which is calculated exactly for the same time intervals for which Tsq falls below 1. For example, if the three-year Tsq fell below 1 in the year 2000, then Car will only be calculated for the same time interval 1998 until 2000.

For the purpose of this study it is necessary to determine a cumulative three-year Car value by simply adding 36 months of abnormal returns for each company. If this cumulative three-year Car value is negative within the same time interval as well as the rolling average three-year Tobin’s q falling below 1, then the company under investigation is considered as underperforming.

It can happen that companies have several three-year time intervals with Tsq falling below 1 and Car below 0 and it is important to note that time intervals can also be overlapping, meaning that the three-year moving average Tsq can fall below 1 and Car below 0 in the year
2000 as well as 2001, etc. Therefore, this data-clearing process did not only extract a listing of underperforming company names but more importantly a much larger listing of three-year company data intervals of underperformance over a twenty year period. For this reason if this thesis refers to ‘underperforming companies’ by definition it means company data intervals of underperformance.

7.5.3 Data extraction results

The measurements of Tsq and Car were applied to the overall sample of approximately 70,000 three-year company data intervals available in the UK, US and Canada. The analysis resulted in a total of 2,241 company data intervals.

Table 8: Number of Underperformance Intervals in the Research Period in the UK, US and Canada

<table>
<thead>
<tr>
<th>Country</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>920</td>
</tr>
<tr>
<td>US</td>
<td>1,151</td>
</tr>
<tr>
<td>Canada</td>
<td>170</td>
</tr>
<tr>
<td>TOTAL</td>
<td>2,241</td>
</tr>
</tbody>
</table>

7.6 M&A Data Clearing Process

To obtain a listing of companies taken over in the countries under investigation, a second source of data was necessary. M&A data and information was downloaded from a specialised database by Thomson Financial, which is called ‘SDC Platinum’. The following information was requested for each takeover, which occurred during the timeframe 1988 – 2004:

- Name of target;
- Announcement date of the takeover; and
- Completion date of takeover;

The following restrictions must apply:

- All target companies must be stock-market listed;
- The target company has been fully taken over (100 %), not only majority rights;
- MBOs and LBOs are excluded; and
• Target companies with business activities focusing on finance, investment or real estate are excluded.

This investigation is only interested in companies which are taken over following a period of underperformance (market for corporate control). Hostile takeovers are the most predominant route for the market for corporate control to discipline underperformance. However, it appeared to be difficult to extract a sample of hostile takeover targets since definitions of hostile takeovers vary. Thomson Financial for example, refers to hostile takeovers only if the completion is hostile and does not differentiate between hostile and friendly takeover announcements. The problem that arises here is that most takeovers, which have originally been announced as hostile, come to a friendly agreement at completion and therefore will overall be registered as friendly by Thomson.

Over the 17-year period under investigation only 302 hostile takeovers were recorded by Thomson Financial in US, UK and Canada. Unfortunately, the large majority of these companies are not covered by DATASTREAM and only two matches of underperforming firms taken over in a hostile deal were recorded.

For this reason, although the most ideal scenario would have been to include only hostile takeovers, this investigation also considers takeovers which have been completed on a friendly basis. However, since the focus of this study is takeovers associated with underperformance and not the issue of the takeover being hostile or friendly, it can be argued that if the market for corporate control acts efficiently it should result in a takeover irrelevant of friendly or hostile. This provides for a larger selection of matches for underperforming companies being taken over.

The following table presents the outcome of companies which have been taken over based on the SDC Platinum database matched against the sample of underperforming companies. Matches were only considered if the actual takeover date as registered by SDC Platinum fell within a time period of 24 months after the occurrence of underperformance as has been discussed previously.
Table 9: Sample of Underperforming Firms being Taken Over and Underperforming Firms not being Taken Over

<table>
<thead>
<tr>
<th>Country</th>
<th>Takeover</th>
<th>Not Takeover</th>
<th>TOTAL</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>67</td>
<td>853</td>
<td>920</td>
<td>7.3%</td>
</tr>
<tr>
<td>US</td>
<td>65</td>
<td>1,086</td>
<td>1,151</td>
<td>5.6%</td>
</tr>
<tr>
<td>Canada</td>
<td>18</td>
<td>152</td>
<td>170</td>
<td>10.6%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>150</td>
<td>2,091</td>
<td>2,241</td>
<td>6.7%</td>
</tr>
</tbody>
</table>

It becomes evident that only a small proportion of underperforming companies were taken over following their underperformance. Whereas the US reports the least amount of takeovers following underperformance (5.6 %), Canada reports the highest ratio outcome of 10.6 %. Hence it becomes apparent that the market for corporate control does not, to a large extent, work as claimed in the literature for each of the three countries. This will be investigated and analysed in more detail in the following chapter.

7.7 Conclusion

This chapter provided a step-by-step explanation of the data compilation process which is a particular vital part of this thesis’s methodology, since the sampling of underperforming firms forms the basis for the overall investigation. The database Datastream records a sample of 30,225 stock market-listed companies in the UK, US and Canada over the period 1988 until 2004.

The data clearing process resulted in a sample of approximately 70,000 three-year company data intervals available in the UK, US and Canada. The application of the measurements of underperformance

- Three-year moving average $T_{sq} < 1$; and
- Cumulative three-year abnormal return $< 0$.

resulted in a total of 2,241 company data intervals, which reported underperformance as defined above.

Based on M&A data made available by Thomson Financial (SDC Platinum database) the sample of companies being taken over within the period of investigation in the three countries was matched against the results of underperforming companies. Matches were only
considered if the actual takeover date as registered by SDC Platinum fell within a time period of 24 months after the occurrence of underperformance. Of the sample of underperforming companies only 7% were actually taken over in the UK, 6% in the US and 11% in Canada implying that the market for corporate control does not work in any of the three countries (Objective 1).

After having introduced and explained the data collection and clearing process for this empirical study the following chapter will present the results of the binary logistic regression model applied to test the four hypotheses for each of the three countries.
Chapter Eight
Logistic Regression Model: Results and Discussion

8.1 Introduction

The following chapter presents the results of the binary logistic hierarchical regression model, which was applied to test the thesis' four main hypotheses and its four sub-hypotheses for Canada, the UK and US. The first section displays the descriptive statistic results and comments briefly on the outcomes for each country. After this the chapter briefly describes the procedure of z-standardisation and presents the z-standardised values for each of the three countries. The next section outlines and explains the procedure of applying the binary logistic hierarchical regression model. Then each of the hypotheses will be tested accordingly in the aforementioned three steps to determine if there is any relation between the chosen independent variables and the likelihood of a takeover for underperforming companies for each country. As a last step of investigation this thesis applies multinomial logistic regression to all ten variables (independent and control variables) together in order to investigate their impact on the likelihood of becoming a takeover target for an underperforming firm in each of the three countries. The chapter concludes with the analysis of the overall results of this binary logistic hierarchical regression model for each of the three countries.

8.2 Summary of Overall Descriptive Statistics

As already detailed in Chapter Seven, the table overleaf provides a brief description of each variable plus the abbreviation used for this thesis.
### Table 10: Description of the Independent Variables under Investigation

<table>
<thead>
<tr>
<th>Explanatory Variables</th>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tobin’s q</td>
<td>Tsq</td>
<td>See Section 6.4.1.1. for a detailed calculation</td>
</tr>
<tr>
<td>Car</td>
<td>Car</td>
<td>See Section 6.4.1.2. for a detailed calculation</td>
</tr>
<tr>
<td>Asset Structure</td>
<td>Asset Structure</td>
<td>TA - IA / TA</td>
</tr>
<tr>
<td>Capital Structure</td>
<td>Capital Structure</td>
<td>TD / (TD + MVOE + PS)</td>
</tr>
<tr>
<td>Firm Size</td>
<td>Size log Total Assets</td>
<td>Log TS (natural Logarithm of total sales)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Control Variables</th>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry Tsq</td>
<td>Industry Tsq Variance</td>
<td>The individual company’s Tsq variance from the non-weighted average Tsq for the industry as a whole</td>
</tr>
<tr>
<td>Industry Asset Structure</td>
<td>Industry Asset Structure Variance</td>
<td>The individual company’s Asset Structure variance from the non-weighted average Asset Structure for the industry as a whole</td>
</tr>
<tr>
<td>Industry Capital Structure</td>
<td>Industry Capital Structure Variance</td>
<td>The individual company’s Capital Structure variance from the non-weighted average Capital Structure for the industry as a whole</td>
</tr>
<tr>
<td>Industry Firm Size</td>
<td>Industry Size log Total Assets Variance</td>
<td>The individual company’s Size log Total Assets variance from the non-weighted average Size log Total Asset for the industry as a whole</td>
</tr>
<tr>
<td>Gross Domestic Product</td>
<td>GDP</td>
<td>Year-on-year growth of gross domestic product</td>
</tr>
</tbody>
</table>

Descriptive statistics report on the mean, median, standard deviation and minimum/maximum values, which cover the overall spread of the potentially occurring values. All variables have been clearly interval-scaled. The following descriptive statistics refer to raw (non-standardised) figures.

As can be seen from the table overleaf, ten independent variables have been applied to a total of 2,241 occurrences of underperformance in all three countries together. It needs to be kept in mind that according to the set filters of underperformance, outlined in Chapter Six, all companies display, by definition, a Tsq value below 1 and a negative Car value.
The table above shows that the average Tsq for all firms is around 0.83 with a Car value of -0.39. The variable Asset Structure reveals a surprisingly high value with almost 92% of assets being tangible for the underperforming sample. The Capital Structure variable of the underperforming sample lies at around 49%, which is difficult to comment upon since capital structure ratios are very much industry-dependent. However, the underperformance sample has a capital ratio, which is nearly twice as high as the relevant corresponding industry (Industry Capital Structure Variance). The descriptive statistics reveal that the firm size (log Total Assets) of the underperforming companies is of approximately the same size as their respective industry counterparts. It needs to be kept in mind that the table above refers to the total group of underperforming companies, meaning underperforming companies taken over as well as underperforming firms not taken over. For clarification purposes, please find the descriptive statistics for each group separately (underperforming firms taken over and underperforming firms not taken over) in Appendix 1.

### 8.3 Summary of Descriptive Statistics per Country

The following section looks at the descriptive statistics by separating the results by country. Outcomes will only be commented upon if they vary from the overall sample.

#### 8.3.1 Descriptive Statistics for Canada

The Canadian sample of underperforming companies consists of a total of 170 companies.
Table 12: Overall Descriptive Statistics for all Underperforming Companies in Canada

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>170</td>
<td>170</td>
<td>170 170 170 170 170</td>
<td>170 170 170 170</td>
<td>170 170 170 170</td>
<td>1.0326 0.8111 -0.3924 0.9180</td>
<td>19.7124 0.5199 0.9180 1.7664</td>
<td>1.0184</td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td>0</td>
<td>0</td>
<td>0 0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0.0337 0.8350 -0.3096 0.9928</td>
<td>19.4983 0.5169 0.9928 1.7664</td>
<td>1.0091</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>0.01236</td>
<td>0.15300</td>
<td>0.31334</td>
<td>0.15799</td>
<td>0.28620</td>
<td>1.37050</td>
<td>0.16536 1.07396</td>
<td>0.5743 0.0569</td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>0.0</td>
<td>0.32</td>
<td>-1.50</td>
<td>0.926</td>
<td>0.00</td>
<td>16.01</td>
<td>0.19 0.00</td>
<td>0.42 0.88</td>
<td></td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>0.05</td>
<td>0.99</td>
<td>-0.01</td>
<td>1.00</td>
<td>1.00</td>
<td>22.84</td>
<td>0.88 5.03</td>
<td>4.50 1.19</td>
<td></td>
</tr>
</tbody>
</table>

The Canadian sample shows the highest year-on-year GDP growth of all countries, indicating that underperformance of the individual companies fell within years of good economic growth. The underperforming companies in Canada further report a considerably higher Capital Structure ratio 58%, which is 88% above the respective Canadian industry average. In addition, Appendix 2 provides descriptive statistic results differentiating between underperforming companies taken over and underperforming companies not taken over in Canada.

8.3.2 Descriptive Statistics for the UK

There are 920 underperforming companies included in the UK sample.

Table 13: Overall Descriptive Statistics for all Underperforming Companies in the UK

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>920</td>
<td>920</td>
<td>920 920 920 920 920</td>
<td>920 920 920 920</td>
<td>920 920 920 920</td>
<td>0.0220 0.8073 -0.4112 0.9639</td>
<td>17.6626 0.5200 1.8885 1.0474</td>
<td>0.9890</td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td>0</td>
<td>0</td>
<td>0 0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0.0263 0.8400 -0.3476 1.0000</td>
<td>17.4895 0.5405 1.7842 1.0176</td>
<td>0.9817</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>0.01259</td>
<td>0.15625</td>
<td>0.34111</td>
<td>0.09918</td>
<td>0.20870</td>
<td>1.39759</td>
<td>0.15151 1.17154</td>
<td>0.14097 0.07428</td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>0.0</td>
<td>0.16</td>
<td>-3.32</td>
<td>.19</td>
<td>.00</td>
<td>14.18</td>
<td>.03 .00</td>
<td>.29 .80</td>
<td></td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>0.04</td>
<td>1.22</td>
<td>.00</td>
<td>1.00</td>
<td>0.97</td>
<td>22.94</td>
<td>.88 9.57</td>
<td>1.75 1.22</td>
<td></td>
</tr>
</tbody>
</table>

The UK sample reports the lowest year-on-year GDP growth of the overall sample (2.2%). The descriptive statistics reveal that the UK sample of underperforming companies report a proportion of 96% tangible assets, which is the highest of all three countries, however, only around 5% above the corresponding industry average. With regard to the log-size of the sample companies it can be pointed out that in the UK they are not only the smallest companies compared to the other two countries but it is also worth noting that the
underperforming companies are also smaller than their industry counterparts. Please refer to Appendix 3, which provides the results of the descriptive statistics differentiating between underperforming companies taken over and underperforming companies not taken over in UK.

8.3.3 Descriptive Statistics for the US

The US sample of underperforming companies consists of a total of 1,151 firms and is therefore the largest sample of the three countries.

Table 14: Overall Descriptive Statistics for all Underperforming Companies in the US

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>1151</td>
<td>1151</td>
<td>1151</td>
<td>1151</td>
<td>1151</td>
<td>1151</td>
<td>1151</td>
<td>1151</td>
<td>1151</td>
<td>1151</td>
</tr>
<tr>
<td>Missing</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mean</td>
<td>.0290</td>
<td>.8413</td>
<td>-.3765</td>
<td>.8809</td>
<td>.5382</td>
<td>20.1672</td>
<td>.4547</td>
<td>2.1061</td>
<td>1.7907</td>
<td>1.0219</td>
</tr>
<tr>
<td>Median</td>
<td>.0297</td>
<td>.8767</td>
<td>-.3100</td>
<td>.9251</td>
<td>.5812</td>
<td>20.1442</td>
<td>.4300</td>
<td>2.0000</td>
<td>1.5343</td>
<td>1.0173</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>.00898</td>
<td>.13793</td>
<td>.30901</td>
<td>.14328</td>
<td>.23111</td>
<td>1.70900</td>
<td>.17156</td>
<td>1.21261</td>
<td>.79817</td>
<td>.07616</td>
</tr>
<tr>
<td>Minimum</td>
<td>.02</td>
<td>.32</td>
<td>-2.46</td>
<td>.19</td>
<td>.00</td>
<td>14.69</td>
<td>.09</td>
<td>.00</td>
<td>.29</td>
<td>.77</td>
</tr>
<tr>
<td>Maximum</td>
<td>.04</td>
<td>1.46</td>
<td>.00</td>
<td>1.00</td>
<td>.96</td>
<td>25.08</td>
<td>.95</td>
<td>10.31</td>
<td>7.99</td>
<td>1.24</td>
</tr>
</tbody>
</table>

The US sample of underperforming firms reports the highest average Tsq and Car value of the three countries, which is, however, only marginally higher with a value of 0.84 and -0.38 respectively. Therefore, the US reports the overall lowest level of underperformance. The US sample further reports the lowest Asset Ratio of all three countries (88 %), which is, however, 79 % higher than the corresponding industry average. This means that corresponding companies in the US in general tend to be structured with a proportionately higher degree of intangible assets. The US sample of underperforming firms comprises the largest companies of the three countries, which are also larger compared to their industry counterparts. Appendix 4 provides descriptive statistic results differentiating between underperforming companies taken over and underperforming companies not taken over in the US.

8.4 Z-Standardisation of the Ten Variables

The regression model uses z-standardised values, which display the standard deviation of each individual value from the mean value of the total data. This data transformation has the advantage that each value can be directly compared across all independent variables (e.g. the
z-value of Tsq can directly be compared to the z-value of GDP. Table 15 below presents the Z-standardisation result of the ten variables under investigation.

<table>
<thead>
<tr>
<th>Variable (Industry)</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zscore (Tsq)</td>
<td>28.616</td>
<td>2</td>
<td>14.308</td>
<td>14.480</td>
<td>.000</td>
</tr>
<tr>
<td>Between Groups</td>
<td>2211.384</td>
<td>2238</td>
<td>.988</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2240.000</td>
<td>2240</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within Groups</td>
<td>5.893</td>
<td>2</td>
<td>2.947</td>
<td>2.952</td>
<td>.052</td>
</tr>
<tr>
<td>Total</td>
<td>2234.107</td>
<td>2238</td>
<td>.998</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2240.000</td>
<td>2240</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zscore (Car)</td>
<td>86.130</td>
<td>2</td>
<td>43.065</td>
<td>44.747</td>
<td>.000</td>
</tr>
<tr>
<td>Between Groups</td>
<td>2153.870</td>
<td>2238</td>
<td>.962</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2153.870</td>
<td>2238</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zscore (GDP)</td>
<td>242.866</td>
<td>2</td>
<td>121.433</td>
<td>136.078</td>
<td>.000</td>
</tr>
<tr>
<td>Between Groups</td>
<td>1997.134</td>
<td>2238</td>
<td>.892</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2240.000</td>
<td>2240</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zscore (Capital)</td>
<td>155.274</td>
<td>2</td>
<td>77.637</td>
<td>83.345</td>
<td>.000</td>
</tr>
<tr>
<td>Between Groups</td>
<td>2084.726</td>
<td>2238</td>
<td>.932</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2200.000</td>
<td>2240</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zscore (Industry)</td>
<td>19.126</td>
<td>2</td>
<td>9.563</td>
<td>9.637</td>
<td>.000</td>
</tr>
<tr>
<td>Between Groups</td>
<td>2220.874</td>
<td>2238</td>
<td>.992</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2220.874</td>
<td>2238</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zscore (Asset)</td>
<td>195.467</td>
<td>2</td>
<td>97.734</td>
<td>106.982</td>
<td>.000</td>
</tr>
<tr>
<td>Between Groups</td>
<td>2044.533</td>
<td>2238</td>
<td>.914</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2200.000</td>
<td>2240</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zscore (Industry)</td>
<td>598.159</td>
<td>2</td>
<td>299.079</td>
<td>407.676</td>
<td>.000</td>
</tr>
<tr>
<td>Between Groups</td>
<td>1641.841</td>
<td>2238</td>
<td>.734</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2240.000</td>
<td>2240</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zscore (Size)</td>
<td>838.844</td>
<td>2</td>
<td>419.422</td>
<td>669.923</td>
<td>.000</td>
</tr>
<tr>
<td>Between Groups</td>
<td>1401.156</td>
<td>2238</td>
<td>.626</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2240.000</td>
<td>2240</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zscore (Industry)</td>
<td>99.490</td>
<td>2</td>
<td>49.745</td>
<td>52.011</td>
<td>.000</td>
</tr>
<tr>
<td>Between Groups</td>
<td>2140.510</td>
<td>2238</td>
<td>.956</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2240.000</td>
<td>2240</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Before analysing and interpreting the actual results presented above, a brief theoretical background and explanation of the statistics applied is provided:

**Significance (Sig.)**

The significance is the central result of this analysis. It determines if the probability of any mean differences between the three countries are a result of pure coincidence. It aims to prove that there are no systematic differences between the data of all three countries. If the
probability is small or even zero, then the data for the three countries do not systematically differ.

All other statistical values (sum of squares, df, mean square, F) are just components of the significance calculation, which are presented here for documentation purposes only and are of minor importance for the interpretation of this analysis.

**Sum of Squares:**
The sum of squares refers to the variance between a mean value of one case and the mean value of a predefined sample. For the calculation, the mean value for each case is firstly squared and all square values are then added up. Its result determines the degree of variation within the sample. The results are expressed in hierarchical order as explained below:

- The result for **between groups** refers to the variance of the sum of squares between the three groups (Canada, UK, US);
- The result for **within groups** refers to the variance of the sum of squares between each value and the corresponding group (Canada, UK or US); and
- The result of the **total group** refers to the total variance of the sum of squares for the overall sample of all three groups together (Canada, UK, US).

As has already been mentioned above, the calculation of the sum of squares is only a step towards the calculation of significance.

**Degree of Freedom (df)**
The degree of freedom is part of the formula for calculating the significance and is purely the summation of the number of cases under investigation minus one (N-1). The degree of freedom is always N-1 since the last value cannot vary freely if the total mean value is calculated.

**Mean Square**
The mean square refers to the sum of squares divided by the degree of freedom, which is also part of the formula of significance.
F-Distribution (F)

The F-value is solely a test value for the significance, since it determines the distribution of probability. This means, there are several probability distribution types available and each degree of freedom combination has a particular F-distribution of probability. As a result, combining each F-value with its degree of freedom accordingly results in an exact value of probability, the significance.

The variance analyses for each country individually and all three countries together, report that all values differ systematically and highly significantly from each other. The exception is the variable Car, which only marginally fails to achieve a 5% level of significance. This outcome justifies and calls for a regression analysis for each of the countries separately.

8.5 Description of the Process of Hierarchical Binary-Logistic Regression

This section tests each of the four main hypotheses (independent variables) and its sub-hypotheses (control variables) by applying a binary logistic hierarchical regression model in order to investigate the relation between each independent variable and the likelihood of takeover following a period of underperformance. The binary logistic hierarchical regression analysis is divided into the following phases of investigation:

Foundation Classification:

The general process of hierarchical regression starts with introducing a classification table, which simply compares the number of underperforming companies being actually taken over for each of the three countries with the number of underperforming companies not being taken over. The outcome, which does not entail any regression analysis, is presented in percentage terms and provides a starting point for the logistical regression analysis, which will be undertaken separately.

Effect of the Individual Predictors (Test 1 and Test 2)

As already explained in Section 6.7 this study applies a hierarchical regression analysis, which means the regression analysis is undertaken in several phases. First of all, this study investigates whether there is any relation between each of the independent variables and the likelihood of each underperforming firm being taken over for each hypothesis separately (Test 1). This study additionally applies control variables to incorporate industry and economy effects (Test 2) to check if the relationship outcomes differ from the outcome of the
independent variable (Test 1). This analysis is of particular importance since it reveals not only the explanatory power of each independent variable (e.g. Asset Structure) but also since it tests the explanatory power of a company's deviation from the industry average. This logistic regression applies the -2 Log likelihood and the coefficient of determination Nagelkerke R² to test the explanatory power and significance of each individual variable. In addition, the regression model applies an ‘omnibus test’, which investigates if there is any significance in the results of Nagelkerke R² applying the statistical variables Chi² and df. This model is further utilised to examine how the overall prediction outcome variable p differs across countries as it has been stated in Section 6.2.

**Effect of all Predictors for each Hypothesis (Test 3)**

This hierarchical binary-logistic regression also investigates if there is any relation between the independent variable and its control variable(s) taken together (Test 1 and Test 2) for each hypothesis and the likelihood of a takeover for underperforming firms. This particular step of investigation is referred to as Test 3 in this study. Statistics under investigation in this logistic regression are also the -2 Log likelihood and the coefficient of determination (Nagelkerke R²) to test the explanatory power and its significance of the independent variable and its control variable together for each country. The omnibus test is also incorporated for the Test 3 analysis applying the statistical variables Chi² and df. Test 3 is further utilised to examine how the overall prediction outcome variable p differs across countries as it has been stated in Section 6.2.

59 The statistical variable -2 Log likelihood compares the maximum likelihood prediction of the predictor variables with the maximum likelihood prediction without using these predictors. This results in a probability relation, which will be expressed as a natural logarithm to be multiplied by -2. The outcome is used to determine whether the predictor variables are meaningful in their contribution to the regression analysis and hence whether it makes actually sense to use those prediction variables.

60 Nagelkerke R² determines the strength of influence of the independent variable on the dependent variable. This means, to what extent does the independent variable (e.g. underperformance) explain or predict the dependent variable (takeover) across the whole sample. The formula of Nagelkerke R² determines how well the probability of the regression analysis matches the real outcomes. If the coefficient of determination reaches 100 % than all actual takeovers (1) and non-takeovers (0) were predicted by the independent variable. As we are using a binary regression, the probability always lies between zero and one. A coefficient of determination of 30 % would mean that 30 % of the wrong prediction (Fehleinschätzung) of the foundation classification could be eliminated by the independent variable information. Thus this measure determines the degree of improving the prediction of the foundation table (base line) through the application of this independent variable.

61 Chi² is also a statistical test value, which is similarly to the variance analysis (2 Log likelihood) applied to determine a level of significance. In contrast to the variance analysis, Chi² does not use a F-distribution but a Chi² distribution, which determines the deviation between observed and predicted values. For each degree of freedom combination there is a particular probability function, meaning if we can determine the Chi² value and its degree of freedom for our data sample, then it is possible to determine the probability and thus its significance.
Advanced Classification

The advanced classification table provides the outcome of the hierarchical binary regression model for each of the three countries. This analysis measures how many takeovers were actually predicted correctly by using this regression model. Please note, that the outcome of this advanced classification does not necessary lead to an improved prediction as takeovers can also be predicted incorrectly by this model, meaning companies which were not taken over where predicted as takeovers by the model.

Multinominal Regression of all Ten Variables

As a last step of investigation this thesis applies a multinomial logistic regression to all ten variables (independent and control variables) in order to investigate their explanatory power together on the likelihood of becoming a takeover target for an underperforming firm in each of the three countries. This analysis is particularly important as it takes all influencing factors into account, which might also result in counterbalancing effects.

8.6 Test of the four Hypotheses

The next section will apply the hierarchical binary logistic regression to each of the hypotheses and will discuss their outcome in detail.

8.6.1 Hypothesis 1

Based on the discussion in the literature review a positive relation between underperformance and the likelihood of being taken over can be expected. Therefore the first hypothesis to be tested for each of the three countries under investigation is as follows:

\[ \text{H}_0 \quad \text{There is no relation between underperformance and takeover likelihood.} \]

\[ \text{H}_1 \quad \text{There is a positive relation between underperformance and takeover likelihood.} \]

\( \text{H}_0 \) will be accepted if the results of the data analysis for each of the three countries lead to the conclusion that there is no relationship between underperformance and takeover likelihood.
8.6.1.1 Foundation Classification

The classification table below shows how many of the underperforming company time intervals in each of the three countries resulted in a takeover. As can be seen already, the proportion of underperforming companies not being taken over is much greater than underperforming companies being taken over.

Table 16: Simple Classification Table for all three Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Underperforming Company Time Intervals</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>Total Sample 170</td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td>Not Takeover 152</td>
<td>89.4%</td>
</tr>
<tr>
<td></td>
<td>Takeover 18</td>
<td>10.6%</td>
</tr>
<tr>
<td>UK</td>
<td>Total Sample 920</td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td>Not Takeover 853</td>
<td>92.7%</td>
</tr>
<tr>
<td></td>
<td>Takeover 67</td>
<td>7.3%</td>
</tr>
<tr>
<td>US</td>
<td>Total Sample 1,151</td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td>Not Takeover 1,086</td>
<td>94.4%</td>
</tr>
<tr>
<td></td>
<td>Takeover 65</td>
<td>5.6%</td>
</tr>
</tbody>
</table>

As has previously been pointed out, without using any regression model, it becomes evident that the probability of an underperforming company being taken over lies at 10.6% in Canada, 7.3% in the UK and 5.6% in the US. This outcome shows that there is a very low tendency towards takeover following a period of underperformance for each of the three countries. This classification table remains constant for each of the four hypotheses and therefore will only be displayed once here. As has already been stated in Section 7.6 the results indicated that the market for corporate control does not (at all) work as claimed in the literature for all three countries. This, however, does not mean that the application of a regression model is obsolete since the model, which has been introduced in the methodology chapter, will now be applied to investigate if and how this outcome of the relationship will change when applying logistic regression analysis.

8.6.1.2 Application of the Logistic Regression Model to H1

The logistic regression model to be applied is:

\[ P_{ij} = \frac{e^{X_{ij} \beta}}{1 + e^{X_{ij} \beta}}; \]

where \( X_{ij} \) is the data matrix, in which \( t-1 \) is used to compute the probability \( p \) at time \( t \).
Table 17: Determination Coefficient for H1

<table>
<thead>
<tr>
<th>Country</th>
<th>-2 Log Likelihood</th>
<th>Nagelkerke R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>114.809</td>
<td>.001</td>
</tr>
<tr>
<td>UK</td>
<td>480.017</td>
<td>.000</td>
</tr>
<tr>
<td>US</td>
<td>495.762</td>
<td>.010</td>
</tr>
</tbody>
</table>

The regression analysis for the independent variables \( T_{sq} \) and \( Car \) (z-standardised) results only in a marginally improved predictability of takeover likelihood for all countries. Whereas Canada reports a slight increase in the determination of coefficient (Nagelkerke \( R^2 \)) of 0.1% and the US of 1%, the UK does not show any improvements at all.

The omnibus test, which is presented in the table below, investigates if there is any significance in the results of Nagelkerke \( R^2 \).

Table 18: Omnibus Tests of Model Coefficients for H1

<table>
<thead>
<tr>
<th>Country</th>
<th>Test 1*</th>
<th>Chi²</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>Test 1*</td>
<td>.049</td>
<td>2</td>
<td>.976</td>
</tr>
<tr>
<td>UK</td>
<td>Test 1*</td>
<td>.018</td>
<td>2</td>
<td>.991</td>
</tr>
<tr>
<td>US</td>
<td>Test 1*</td>
<td>4.116</td>
<td>2</td>
<td>.128</td>
</tr>
</tbody>
</table>

* Test 1 investigates whether there is any relation between each of the independent variables and the likelihood of each underperforming firm being taken over.

It becomes apparent that all marginal influences on the sample are clearly not significant, which means the overall outcome cannot be generalised and therefore it is not possible to eliminate the applicability of the null hypothesis. As both variables \( T_{sq} \) and \( Car \) taken together do not show any level of significance, any further investigation into each of the two variables separately is superfluous, however, the relevant statistics are presented in Appendix 5. Therefore, we must accept the null hypothesis for Hypothesis 1.

8.6.2 Hypothesis 1a

Even though the variables \( T_{sq} \) and \( Car \) did not prove to be of any significance, this hypothesis provides an extended investigation into the relationship by including a set of industry effects (variance of each company from the industry \( T_{sq} \) mean) and economic variables (GDP). Statistically there is the possibility that the inclusion of industry and economic effects might change the level of significance and hence this will be tested accordingly.
H1a0 There is no relation between underperformance and takeover likelihood taking into account industry and economic effects.

H1a1 There is an increasing positive relation between underperformance and takeover likelihood taking into account industry and economic effects.

8.6.2.1 Application of the Logistic Regression Model to H1a

The model to be tested is:

\[ P_{i,t} = \frac{e^{X_{i,t-1}\beta}}{1 + e^{X_{i,t-1}\beta}}, \]

where \( X_{i,t-1} \) is the data matrix, in which \( t-1 \) is used to compute the probability \( p \) at time \( t \).

Table 19: Determination Coefficient for H1a

<table>
<thead>
<tr>
<th>Country</th>
<th>-2 Log likelihood</th>
<th>Nagelkerke R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>110.705</td>
<td>.049</td>
</tr>
<tr>
<td>UK</td>
<td>474.390</td>
<td>.015</td>
</tr>
<tr>
<td>US</td>
<td>494.621</td>
<td>.013</td>
</tr>
</tbody>
</table>

The additional inclusion of the two variables, Industry Tsq Variance and GDP (z-standardised), in the logistic regression model results in a slightly higher, however, still very limited determination coefficient (Nagelkerke R²) of 4.9 % in Canada, 1.5 % in the UK and 1.3 % in the US. Despite the limited additional explanatory power of industry and economic effects in this logistic regression analysis, it is, however, worthwhile noting that the regression analysis for each of the three countries shows that it has the largest additional explanatory impact in Canada, whereas the US does not show any change in impact at all.
Table 20: Omnibus Tests of Model Coefficients for H1a

<table>
<thead>
<tr>
<th>Country</th>
<th>Test 2**</th>
<th>Chi²</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td></td>
<td>4.104</td>
<td>2</td>
<td>.128</td>
</tr>
<tr>
<td></td>
<td>Test 3***</td>
<td>4.153</td>
<td>4</td>
<td>.386</td>
</tr>
<tr>
<td>UK</td>
<td>Test 2**</td>
<td>5.626</td>
<td>2</td>
<td>.060</td>
</tr>
<tr>
<td></td>
<td>Test 3***</td>
<td>5.645</td>
<td>4</td>
<td>.227</td>
</tr>
<tr>
<td>US</td>
<td>Test 2**</td>
<td>1.141</td>
<td>2</td>
<td>.565</td>
</tr>
<tr>
<td></td>
<td>Test 3***</td>
<td>5.257</td>
<td>4</td>
<td>.262</td>
</tr>
</tbody>
</table>

** Test 2 applies industry and/or economy control variables to test if the relationship outcomes differ from the outcome of the independent variable (Test 1).
*** Test 3 investigates if there is any relation between the independent variable and its control variable(s) taken together (Test 1 and Test 2).

Overall, it can be concluded that the change in explanatory power from Test 1 (the original two independent variables Tsq and Car) to Test 2 (industry and economy-effect variables) does not prove any level of significance for each of the three countries. It is, however, of note that the UK only just fails a 5% level of significance in this investigation. Furthermore, it can be stated that the two independent variables and their two industry and economy-effect variables taken together (Test 3) do not provide any statistical explanatory power. It is not possible to imply a relation beyond any pure coincidence between the independent variables of underperformance and its control variables together and takeover likelihood. As all underperformance variables together do not report any level of significance any further investigation into each of the two variables separately is obsolete, however, the relevant statistics are presented in Appendix 6. Hence for Hypothesis 1a the null hypothesis must be accepted.

In conclusion, both independent variables (Tsq, Car) together show that they have no statistical explanatory power on the likelihood of being taken over as a consequence of underperformance. This applies for each of the three countries. Including industry and economy effects in the regression did not result in any improvement of statistical significance of the independent and control variables and the null hypothesis was accepted for Hypothesis 1 and 1a.

Comparing the above results with outcomes of previous research studies it becomes evident that it goes in line with more recent research outcomes, which report no significant association between takeovers and firm performance (Franks and Mayer, 1996, Argrawal and Jaffe, 2003, Bratton, 2005). Authors including Sinha (2004) found that none of the performance measures applied, appear to be significant in influencing the likelihood of a
takeover. Research by Bergström, Eisenberg, Sundgren and Wells (2005) and Bratton (2005), in this context, explain that the relation between firm performance and takeover likelihood is rather complex and difficult to define and measure.

8.6.3 Hypothesis 2

In the literature it is argued that the proportion debt is positively / negatively related to the likelihood of being taken over. Therefore the second hypothesis to be tested for each of the three countries under investigation is as follows:

**H2_0**: There is no relation between capital structure and the likelihood of underperforming companies being acquired.

**H2_1**: The level of corporate debt is negatively / positively related to the likelihood of underperforming companies being acquired.

H2_0 will be accepted if the result of the data analysis for each of the three countries leads to the conclusion that there is no relationship between capital structure and takeover likelihood.

8.6.3.1 Application of the Logistic Regression Model to H2

The model to be tested is:

\[ P_{ij} = \frac{e^{X_{ij} \beta}}{1 + e^{X_{ij} \beta}} \]

where \( X_{ij} \) is the data matrix, in which \( t-1 \) is used to compute the probability \( p \) at time \( t \).

Table 21: Determination Coefficient for H2

<table>
<thead>
<tr>
<th>Country</th>
<th>-2 Log likelihood</th>
<th>Nagelkerke R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>114.817</td>
<td>.000</td>
</tr>
<tr>
<td>UK</td>
<td>478.435</td>
<td>.004</td>
</tr>
<tr>
<td>US</td>
<td>498.055</td>
<td>.004</td>
</tr>
</tbody>
</table>

Taking only the independent variable Capital Structure (z-standardised) into consideration it becomes apparent that there is no relation between this variable on its own and the likelihood
of being taken over following a period of underperformance. The determination coefficient (Nagelkerke R²) lies below 0.1 % in Canada and 0.4 % in the UK and US.

Table 22: Omnibus Tests of Model Coefficients for H2

<table>
<thead>
<tr>
<th>Country</th>
<th>Chi²</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>0.042</td>
<td>1</td>
<td>.838</td>
</tr>
<tr>
<td>UK</td>
<td>1.600</td>
<td>1</td>
<td>.206</td>
</tr>
<tr>
<td>US</td>
<td>1.823</td>
<td>1</td>
<td>.177</td>
</tr>
</tbody>
</table>

* Test 1 investigates whether there is any relation between each of the independent variables and the likelihood of each underperforming firm being taken over.

As can be seen from the omnibus test table above, the marginal influence of the independent variable on the sample is clearly not significant. Any additional statistics are presented in Appendix 7. The displayed data show that the null hypothesis should be accepted overall.

8.6.3.2 Hypothesis 2a

Even though the variable Capital Structure did not prove to be of any significance, this hypothesis provides an extended investigation into the relation by including an industry effect variable (expressed as the variance of each company’s capital structure to the mean industry capital structure). Statistically there is the possibility that the inclusion of industry effects might change the level of significance and hence this will be tested accordingly.

H2a₀: There is no relation between capital structure and the likelihood of underperforming companies being acquired taking into account industry effects.

H2a₁: The level of corporate debt is negatively / positively related to the likelihood of underperforming companies being acquired taking into account industry effects.

8.6.3.3 Application of the Logistic Regression Model to H2a

The model to be tested is:

\[ P_{ij} = \frac{e^{X_{ij} \beta}}{1 + e^{X_{ij} \beta}} \]
where \( X_{t-1} \) is the data matrix, in which \( t-1 \) is used to compute the probability \( p \) at time \( t \).

Table 23: Determination Coefficient for H2a

<table>
<thead>
<tr>
<th>Country</th>
<th>-2 Log likelihood</th>
<th>Nagelkerke R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>112.864</td>
<td>.024</td>
</tr>
<tr>
<td>UK</td>
<td>476.621</td>
<td>.009</td>
</tr>
<tr>
<td>US</td>
<td>496.632</td>
<td>.008</td>
</tr>
</tbody>
</table>

Taking the additional variable Industry Capital Structure into consideration for the logit regression analysis then the determination of coefficient for the independent and control variable together increases to 2.4 % for Canada and 0.9 % and 0.8 % for the countries UK and US respectively. Although the explanatory power of the two variables increases the most for Canada, it needs to considered that the overall Nagelkerke R² remains extremely minimal for this regression analysis.

Table 24: Omnibus Tests of Model Coefficients for H2a

<table>
<thead>
<tr>
<th>Country</th>
<th>Test 2**</th>
<th>Chi²</th>
<th>Df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>Test 2**</td>
<td>1.953</td>
<td>1</td>
<td>.162</td>
</tr>
<tr>
<td>UK</td>
<td>Test 2**</td>
<td>1.814</td>
<td>1</td>
<td>.178</td>
</tr>
<tr>
<td>US</td>
<td>Test 2**</td>
<td>1.423</td>
<td>1</td>
<td>.233</td>
</tr>
</tbody>
</table>

** Test 2 applies industry and/or economy control variables to test if the relationship outcomes differ from the outcome of the independent variable (Test 1).

*** Test 3 investigates if there is any relation between the independent variable and its control variable(s) taken together (Test 1 and Test 2).

Based on the results presented in the omnibus test table above, none of the countries reports any change of significance in explanatory power if the second explanatory variable (Test 2) is run by the logit regression analysis. Taking the independent and control variable together, (Test 3) no statistical significance is apparent in each of the three countries, implying that the null hypothesis is accepted for Hypothesis 2a. Additional statistics are shown in Appendix 8.

It can be concluded that the variable Capital Structure on its own does not report any statistical significance for companies being taken over as a consequence of their underperformance for each of the three countries. In addition, there is neither a statistical significance change in explanatory power from Test 1 to Test 2 nor any significance for the
variables Capital Structure and the control variable Industry Capital Structure together (Test 3) in any of the three countries. Thus the null hypothesis is accepted for Hypothesis 2 and 2 a.

As already discussed in the literature review, research studies, which focused on the relation of capital structure and the likelihood of being taken over report contradictory outcomes; whereas researchers such Jensen (1986), Palepu (1986), Harris and Raviv (1988), Stulz (1988), Zwiebel (1996), Comment and Schwert (1997), Cudd and Duggal (2000) and Bergström, Eisenberg, Sundgren and Wells (2005) report that the level of corporate debt is negatively related to the likelihood of being taken over, other studies including research by authors including Cremers and Nair (2003) indicate a positive relation between debt levels and takeover likelihood. This study, which focuses solely on underperforming companies, did not reveal any significance in the relation between capital structure and takeover likelihood at all and therefore stands in contrast to all of the research outcomes above.

8.6.4 Hypothesis 3

Research claims that the proportion of tangible assets in relation to total assets is negatively related to the likelihood of being taken over. Therefore the third hypothesis to be tested for each of the three countries under investigation is as follows:

H30: There is no relation between the proportion of tangible assets to total assets and the likelihood of underperforming companies being acquired.

H31: The proportion of tangible assets to total assets is positively related to the likelihood of underperforming companies being acquired.

H30 will be accepted if the result of the data analysis for each of the three countries leads to the conclusion that there is no relationship between the proportion of tangible assets and the likelihood of underperforming companies being acquired.
8.6.4.1 Application of the Logistic Regression Model to H3

The model to be tested is:

\[ P_{ij} = \frac{e^{X_{ij} \beta}}{1 + e^{X_{ij} \beta}} \]

where \( X_{i,p} \) is the data matrix, in which \( t-1 \) is used to compute the probability \( p \) at time \( t \).

Table 25: Determination Coefficient for H3

<table>
<thead>
<tr>
<th>Country</th>
<th>-2 Log likelihood</th>
<th>Nagelkerke R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>114.706</td>
<td>.002</td>
</tr>
<tr>
<td>UK</td>
<td>479.897</td>
<td>.000</td>
</tr>
<tr>
<td>US</td>
<td>484.107</td>
<td>.039</td>
</tr>
</tbody>
</table>

The logistic regression analysis, which only takes into account the independent variable Asset Structure in \( z \)-standardised form, results in no improvement of the determination coefficient (Nagelkerke R²) for the countries Canada and the UK (below 0.1 % and 0.2 % respectively). For the US, there exists a limited explanatory power between the variable Asset Structure and takeover likelihood with a determination coefficient of 3.9 % being detected. However, as a result of the high number of underperforming company year intervals in this country sample, the determination coefficient has only small explanatory power.

Table 26: Omnibus Tests of Model Coefficients for H3

<table>
<thead>
<tr>
<th>Country</th>
<th>Chi²</th>
<th>Df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>.153</td>
<td>1</td>
<td>.696</td>
</tr>
<tr>
<td>UK</td>
<td>.138</td>
<td>1</td>
<td>.710</td>
</tr>
<tr>
<td>US</td>
<td>15.771</td>
<td>1</td>
<td>.000</td>
</tr>
</tbody>
</table>

* Test 1 investigates whether there is any relation between each of the independent variables and the likelihood of each underperforming firm being taken over.

As can be seen from the omnibus test table above, the marginal influence of the independent variable on the sample is clearly not significant for Canada and the UK. For this reason, the null hypothesis must be accepted for the countries Canada and UK and hence no further analysis is undertaken. However, significance at the 1 % level is detected in the US. Out of this reason the table below provides a further analysis into the coefficients of determination.
for the individual predictors in this country. Additional statistics for all countries are presented in Appendix 9.

Table 27: Variables in the Equation for H3

<table>
<thead>
<tr>
<th>Country</th>
<th>Sig.</th>
<th>Exp(B)</th>
<th>95.0% C.I. for EXP(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>.000</td>
<td>.686</td>
<td>.578</td>
</tr>
<tr>
<td>Z Asset Structure</td>
<td></td>
<td></td>
<td>.814</td>
</tr>
</tbody>
</table>

The most important predictors for this kind of analysis is again the significance, however, statistical relevance is also allocated to the value Exp(B) as well as the Interval of Confidence of the Exp(B).

It can be stated that an increase by one standard deviation of the Asset Structure variable results in a decrease of the likelihood of takeover by at 68.6 % in the US. There is a negative relationship between the independent variable Asset Structure and the likelihood of being taken over. However, the explanatory power is only moderate, since it needs to be considered that an increase by one standard deviation is a considerable change whereas the resulting decrease in takeover likelihood is relatively moderate (68.6 %). It furthermore needs to be noted that the reduction in takeover likelihood to 68.6 % is only a best guess for the US sample. Considering the Interval of Confidence, it becomes evident that with a probability of 95 %, the correct value of this probability change ranges between a reduction of 57.8 % and 81.4 %. This interval of confidence can be regarded as wide thus implying a poor quality of prediction.

Overall, it can be concluded that the null hypothesis should be accepted overall for the countries Canada and the UK, however, a significance at the 1 % level was detected for the

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62 The value Exp(B) is used to measure the change in probability if the value of a predictor is increased by one standard deviation, which is commonly referred to as 'odd ratios'. Exp(B) determines how strong the effect of the change in one standard deviation is on each predictor and its corresponding sign (positive or negative relation). Exp(B) values of below 1 mean that the probability declines and values of above 1 mean that the probability increases by this factor.

63 The value Exp(B) is only an estimate and depending on how good the regression analysis works the estimate of the value Exp(B) can be more or less accurate. The interval of confidence of the Exp(B) value determines the potential accurateness of Exp(B). This statistical variable measures the interval in which the real value of Exp(B) lies, assuming a probability of 95 %. The Interval of Confidence is usually expressed by its lower and upper value. It can be generally said the wider the interval of confidence, the poorer the quality of the prediction. The narrower the interval of confidence, the better the predictability.
US. The Exp(B) was, however, only moderate and since the interval of confidence was relatively widely spread, the quality of prediction remains poor.

8.6.4.2 Hypothesis 3a

This hypothesis investigates the relation of the variable Asset Structure further by including an industry control variable (expressed as the variance of each company's asset structure to the mean industry asset structure). Statistically, there is the possibility that the inclusion of the industry effect variable might change the level of significance and therefore this will be tested accordingly.

H3a₀ There is no relation between the level of tangible assets and the likelihood of underperforming companies being acquired taking into account industry effects.

H3a₁ The proportion of tangible assets to total assets is positively related to the likelihood of underperforming companies being acquired taking into account industry effects.

8.6.4.3 Application of the Logistic Regression Model to H3a

The model to be tested is:

\[ P_{ij} = \frac{e^{X_{ij} \beta}}{1 + e^{X_{ij} \beta}} \]

where \( X_{ij} \) is the data matrix, in which \( t - 1 \) is used to compute the probability \( p \) at time \( t \).

Table 28: Determination Coefficient for H3a

<table>
<thead>
<tr>
<th>Country</th>
<th>-2 Log likelihood</th>
<th>Nagelkerke R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>107.850</td>
<td>.082</td>
</tr>
<tr>
<td>UK</td>
<td>479.897</td>
<td>.000</td>
</tr>
<tr>
<td>US</td>
<td>483.891</td>
<td>.039</td>
</tr>
</tbody>
</table>

The inclusion of the industry effect variable for the country Canada results in a clear increase (change from Test 1 to Test 2) of the determination coefficient from 0.2 % to 8.2 %. The
countries UK and US do not report a change in explanatory power as a result of analysing the industry effect variable; the determination coefficient remains below 0.1 % and at 3.9 % respectively.

Table 29 below provides an investigation of significance for the three countries.

### Table 29: Omnibus Tests of Model Coefficients for H3a

<table>
<thead>
<tr>
<th>Country</th>
<th>Chi²</th>
<th>Df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>Test 2** 6.856</td>
<td>1</td>
<td>.009</td>
</tr>
<tr>
<td></td>
<td>Test 3*** 7.009</td>
<td>2</td>
<td>.030</td>
</tr>
<tr>
<td>UK</td>
<td>Test 2** .001</td>
<td>1</td>
<td>.979</td>
</tr>
<tr>
<td></td>
<td>Test 3*** .138</td>
<td>2</td>
<td>.933</td>
</tr>
<tr>
<td>US</td>
<td>Test 2** .216</td>
<td>1</td>
<td>.642</td>
</tr>
<tr>
<td></td>
<td>Test 3*** 15.987</td>
<td>2</td>
<td>.000</td>
</tr>
</tbody>
</table>

** Test 2 applies industry and/or economy control variables to test if the relationship outcomes differ from the outcome of the independent variable (Test 1).

*** Test 3 investigates if there is any relation between the independent variable and its control variable(s) taken together (Test 1 and Test 2).

It should be noted that the change from Test 1 (Asset Structure variable) to Test 2 (Industry effect variable) results in a significance at the 5% level in Canada. In contrast, the regression analysis of the variable industry effect results in no change of significance for the countries UK and US. The regression analysis of the independent and control variables together (Test 3) results in a statistical non-significance in Canada and the UK. In the US the statistical significance at the 1% level continues to exist for both variables taken together.

For this reason, the null hypothesis must be accepted for the UK, hence no further analysis is undertaken. Significance at the 5% level was detected for Test 2 in Canada and at the 1% level for Test 3 in US. Out of this reason the table below provides a further analysis into the coefficients of determination for the individual predictors in the countries Canada and US.

### Table 30: Variables in the Equation for H3a

<table>
<thead>
<tr>
<th>Country</th>
<th>Sig.</th>
<th>Exp(B)</th>
<th>95.0% C.I. for EXP(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
</tr>
<tr>
<td>Canada</td>
<td>.149</td>
<td>.727</td>
<td>.472</td>
</tr>
<tr>
<td></td>
<td>.009</td>
<td>2.287</td>
<td>1.225</td>
</tr>
<tr>
<td>US</td>
<td>.000</td>
<td>.667</td>
<td>.543</td>
</tr>
<tr>
<td></td>
<td>.635</td>
<td>1.061</td>
<td>.830</td>
</tr>
</tbody>
</table>
The variable Industry Asset Structure Variance proves to be significant at the 1% level in Canada. The increase of the asset variable by one standard deviation results in an increase of takeover likelihood to approximately 2.3 times, as a best estimation. The Interval of Confidence ranges between 1.2 times and 4.3 times of the original probability, which leads to the conclusion of a poor quality of prediction. In the US a statistical significance of the relation between the variable Asset Structure and takeover likelihood becomes apparent and its relation is negative. If the asset value increases by one standard deviation it results in decrease of the takeover likelihood of the underperforming company sample to approximately 66.7% of the original probability. The Interval of Confidence ranges between 54% and 82%, which also leads to the conclusion of a poor quality of prediction. Additional statistics for all countries are presented in Appendix 10.

The advanced classification table below shows that the results remain unchanged for the countries UK and US since the application of the logistic regression model comes to a similar result. In Canada, however, one takeover has been predicted correctly, the degree of correct allocation increases from 89.4% to 90% just by using the information of the Asset Structure variables and its control variable.

<table>
<thead>
<tr>
<th>Country</th>
<th>Underperforming Company</th>
<th>Predicted</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Time Intervals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td>Total Sample</td>
<td>170</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Not Takeover</td>
<td>152</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Takeover</td>
<td>17</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Overall Percentage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UK</td>
<td>Total Sample</td>
<td>920</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Not Takeover</td>
<td>853</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Takeover</td>
<td>67</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Overall Percentage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>US</td>
<td>Total Sample</td>
<td>1151</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Not Takeover</td>
<td>1086</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Takeover</td>
<td>65</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Overall Percentage</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In summary, Hypothesis 3 investigated the impact of the variable Asset Structure on the likelihood of underperforming firms being taken over and it can be stated that the variable Asset Structure on its own (Test 1), has a significant negative influence of limited explanatory power in the US, however not in the countries Canada and the UK. Only Canada reports a significant change of explanatory power from Test 1 to Test 2. The other countries, UK and US, in contrast, do not report a change in explanatory power by re-running the regression analysis with the industry control variable. Considering the variables Asset Structure and
Industry Asset Structure Variance together (Test 3), the US continues to report an overall statistically negative significance on takeover likelihood. The Canadian and UK samples report no significance of the Asset Structure and its control variable taken together and takeover likelihood.

Overall, it can be concluded that the null hypothesis should be accepted for the UK. Significance at the 5% level was detected for Test 2 in Canada and at the 1% level for the Model in US. However, the Interval of Confidence for the Canadian underperformance sample ranges between 1.2 times and 4.3 times of the original probability implying a poor quality of prediction. For the US, the Interval of Confidence ranges between 54% and 82%, which also leads to the conclusion of a poor quality of prediction. Whereas the results of the advanced classification table show no changes for the countries UK and US, Test 3 predicted takeovers correctly in Canada, thus the degree of correct allocation increases from 89.4% to 90% just by using the information of the Asset Structure variables and its control variable.

As has already been discussed in the literature review, there should be a positive relation between a firm’s asset structure and the probability of becoming a takeover target. Studies found that firms with a high percentage of tangible assets in their total asset structure are attractive takeover targets for two potential reasons. These companies tend to have a greater debt capacity (Ambrose and Megginson, 1992) and are ideal candidates for asset stripping by raiders (Eddey, 1991). For this reason, the probability of being taken over is positively related to the level of tangible assets to total assets.

This study, which focuses solely on underperforming companies, did reveal varying outcomes for the three countries. For Canada the relation between Asset Structure and takeover likelihood is positive at the 5% level, however, with a poor quality of prediction (Interval of Confidence). This means that the asset variable on its own cannot confidently explain any takeover likelihood in Canada. The UK did not report any significant levels and therefore our results stand in direct contrast to the above studies. In addition, the relation between Asset Structure and the likelihood of underperforming firms being acquired is significantly negative at the 1% level in US with poor quality of predictability. Therefore similarly to the Canada the Asset Structure variable on its own has no relevance in predicting takeover likelihood of underperforming companies.
8.6.5 Hypothesis 4

Research argues that the size of the target companies is positively / negatively related to the likelihood of underperforming firms being taken over. Therefore the fourth hypothesis to be tested for each of the three countries under investigation is as follows:

H₄₀ There is no relation between firm size and the likelihood of underperforming companies being acquired.

H₄₁ Firm size is positively / negatively related to the likelihood of underperforming companies being acquired.

8.6.5.1 Application of the Logistic Regression Model to H₄

The model to be tested:

\[ P_{ij} = \frac{e^{X_{ij} \beta}}{1 + e^{X_{ij} \beta}} \]

where \( X_{ij} \) is the data matrix, in which \( t-1 \) is used to compute the probability \( p \) at time \( t \).

Table 32: Determination Coefficient for H₄

<table>
<thead>
<tr>
<th>Country</th>
<th>-2 Log likelihood</th>
<th>Nagelkerke R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>114.780</td>
<td>.001</td>
</tr>
<tr>
<td>UK</td>
<td>479.400</td>
<td>.002</td>
</tr>
<tr>
<td>US</td>
<td>499.742</td>
<td>.000</td>
</tr>
</tbody>
</table>

Taking into consideration only the size variable Size log Total Assets (z-standardised) as an influencing variable then there are only very minimal levels of determination coefficient (Nagelkerke R²) detectable. Canada reports 0.1 %, UK 0.2 % and the US below 0.1%.

The next table overleaf presents the ‘omnibus test’ for Hypothesis H₄ (Test of Significance).
Table 33: Omnibus Tests of Model Coefficients for H4

<table>
<thead>
<tr>
<th>Country</th>
<th>Test 1</th>
<th>Chi²</th>
<th>Df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td></td>
<td>.078</td>
<td>1</td>
<td>.780</td>
</tr>
<tr>
<td>UK</td>
<td></td>
<td>.635</td>
<td>1</td>
<td>.426</td>
</tr>
<tr>
<td>US</td>
<td></td>
<td>.136</td>
<td>1</td>
<td>.713</td>
</tr>
</tbody>
</table>

* Test 1 investigates whether there is any relation between each of the independent variables and the likelihood of each underperforming firm being taken over.

As can be seen in the table above the independent variable Size is clearly non-significant in determining the relationship between size of underperforming companies and takeover likelihood in all three countries. As already previously mentioned, the logistic regression analysis can already be interrupted at this point since the table of coefficients will come to the same conclusion. Additional statistics are presented in Appendix 11.

8.6.6 Hypothesis H4a

The last hypothesis to be tested additionally includes an industry effect variable of size (talin) (expressed as the variance of each company’s log size to the mean industry log size). Statistically, there is the possibility that the inclusion of the industry effect variable might change the level of significance and hence this will be tested accordingly.

H4a0 There is no relation between company size and the likelihood of underperforming companies being acquired taking into account industry effects.

H4a1 Firm size is positively/negatively related to the likelihood of underperforming companies being acquired taking into account industry effects.

8.6.6.1 Application of the Logistic Regression Model to H4a

The model to be tested is:

\[
P_{i,t} = \frac{e^{X_{i,t-1} \beta}}{1 + e^{X_{i,t-1} \beta}}
\]

where \(X_{i,t-1}\) is the data matrix, in which \(t - 1\) is used to compute the probability \(p\) at time \(t\).
Table 34: Determination Coefficient for H4a

<table>
<thead>
<tr>
<th>Country</th>
<th>-2 Log likelihood</th>
<th>Nagelkerke R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>114.649</td>
<td>.003</td>
</tr>
<tr>
<td>UK</td>
<td>479.394</td>
<td>.002</td>
</tr>
<tr>
<td>US</td>
<td>499.660</td>
<td>.001</td>
</tr>
</tbody>
</table>

As can be seen from the table above, taking the Industry Size log Total Assets Variance (z-standardised) as an influencing variable into consideration, there are only very minimal levels of determination coefficient detectable. Canada reports an increase from 0.1 % to 0.3 % and the US from below 0.1 % to 0.1 %. The determination coefficient remains unchanged for the UK. There is an extremely limited increase in the determination coefficients of the sample for two of the three countries under investigation.

Table 35: Omnibus Tests of Model Coefficients for H4a

<table>
<thead>
<tr>
<th>Country</th>
<th>Test 2**</th>
<th>Df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>.131</td>
<td>1</td>
<td>.717</td>
</tr>
<tr>
<td>Test 3***</td>
<td>.209</td>
<td>2</td>
<td>.901</td>
</tr>
<tr>
<td>UK</td>
<td>.006</td>
<td>1</td>
<td>.936</td>
</tr>
<tr>
<td>Test 2**</td>
<td>.641</td>
<td>2</td>
<td>.726</td>
</tr>
<tr>
<td>Test 3***</td>
<td>.083</td>
<td>1</td>
<td>.774</td>
</tr>
<tr>
<td>US</td>
<td>.218</td>
<td>2</td>
<td>.897</td>
</tr>
</tbody>
</table>

** Test 2 applies industry and/or economy control variables to test if the relationship outcomes differ from the outcome of the independent variable (Test 1). 
*** Test 3 investigates if there is any relation between the independent variable and its control variable(s) taken together (Test 1 and Test 2).

It can be concluded that the independent variable Size log Total Assets (Test 1) does not have any statistical impact on the likelihood of underperforming firms being taken over in each of the three countries. The Industry Size variable (Test 2) does not have any changing effect on the level of significance for each of the three countries. The inclusion of both size variables together (Test 3) also results in no statistical significance of the relationship to the likelihood of underperforming firms being acquired. Additional statistics are presented in Appendix 12.

As discussed in Chapter Five, the size of a firm can have an impact on the likelihood of becoming an acquisition target. One stream of research suggests that takeover likelihood decreases with firm size, which is based on the premise that there are transaction costs of takeovers related to size making it more difficult for potential bidders to absorb large firms (Levine and Aaronovitch, 1981, Palepu, 1986, Ambrose and Megginson, 1992, Powell, 1997,
2001, Cudd and Duggal, 2000, Chakraborty and Baum, 2003, Sinha, 2004). However, in accordance with the growth-maximisation behaviour theory, the literature claims that large companies are more attractive to acquirers. Large companies do not only provide smaller companies with a rapid source of expansion, but it is also argued that agency problems are more severe in large firms, potentially resulting in underperformance and thus these companies may become an attractive takeover target (Nuttal, 1999, Barnes, 2000). Research by Song and Walkling (1993) finds that target firms tend not to be of the smallest size but are somewhat more prominent in the middle range.

Our study, which focuses solely on underperforming companies, did not reveal any significance in the relation between size and takeover likelihood at all and therefore stands in contrast to all of the research outcomes above.

8.7 Application of the Logistic Regression Model to All Ten Independent Variables Together

To conclude this logistic regression analysis an additional binary-logistic regression with all ten independent variables of the four hypotheses is conducted. The foundation classification table remains unchanged for this analysis and thus is not displayed again. Please refer to Table 16. The table below presents the results of the determination coefficient (Nagelkerke R²) for all ten variables.

The model to be tested is:

\[
P_t = \frac{e^{X_{i,t-1}\beta}}{1 + e^{X_{i,t-1}\beta}}
\]

where \(X_{i,t-1}\) is the data matrix, in which \(t-1\) is used to compute the probability \(p\) at time \(t\).

Table 36: Determination Coefficient for all Ten Variables

<table>
<thead>
<tr>
<th>Country</th>
<th>-2 Log likelihood</th>
<th>Nagelkerke R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>90.858</td>
<td>.268</td>
</tr>
<tr>
<td>UK</td>
<td>469.586</td>
<td>.028</td>
</tr>
<tr>
<td>US</td>
<td>471.752</td>
<td>.069</td>
</tr>
</tbody>
</table>
The results for each of the three countries show varying degrees of explanatory power for the influence of the ten independent variables on the likelihood of underperforming firms being acquired. In Canada the determination coefficient of all ten independent variables taken together reaches a level of 26.8%, which is not high, however, remains a noteworthy level. In the UK, in contrast, the determination coefficient of all ten independent variables reaches only 2.8% and in the US 6.9%.

The next table below presents the omnibus test for all ten variables (Test of Significance).

**Table 37: Omnibus Tests of Model Coefficients for all Ten Variables**

<table>
<thead>
<tr>
<th>Country</th>
<th>Chi²</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>24.001</td>
<td>10</td>
<td>.008</td>
</tr>
<tr>
<td>UK</td>
<td>10.449</td>
<td>10</td>
<td>.402</td>
</tr>
</tbody>
</table>

* Test 1 investigates whether there is any relation between each of the independent variables and the likelihood of each underperforming firm being taken over.

For nearly a quarter of the sample in Canada the determination coefficient is highly significant at the 1% level, which leads to the conclusion that the influences of all ten independent variables taken together are clearly of no coincidence. A similar outcome can be drawn for the much weaker determination coefficient in the US; here the high number of occurrences of underperformance impacts on the level of significance. The logistic regression analysis does not show any clear significance for the ten independent variables in the UK. For this reason no further analysis is being undertaken for the UK underperformance sample.

A further investigation includes a test of the impact of each of the ten variables on the significance of the relationship. Statistics in detail are presented in Appendix 13.
<table>
<thead>
<tr>
<th>Country</th>
<th>Variables in the Equation for all Ten Variables</th>
<th>Sig.</th>
<th>Exp(B)</th>
<th>95.0% C.I. for EXP(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
</tr>
<tr>
<td>Canada</td>
<td>Zscore (Tsq)</td>
<td>.054</td>
<td>2.517</td>
<td>.986</td>
</tr>
<tr>
<td></td>
<td>Zscore (Car)</td>
<td>.752</td>
<td>1.100</td>
<td>.611</td>
</tr>
<tr>
<td></td>
<td>Zscore (Industry Tsq Variance)</td>
<td>.006</td>
<td>.142</td>
<td>.035</td>
</tr>
<tr>
<td></td>
<td>Zscore (GDP)</td>
<td>.132</td>
<td>1.723</td>
<td>.850</td>
</tr>
<tr>
<td></td>
<td>Zscore (Capital Structure)</td>
<td>.025</td>
<td>4.139</td>
<td>1.192</td>
</tr>
<tr>
<td></td>
<td>Zscore (Industry Capital Structure Variance)</td>
<td>.008</td>
<td>.080</td>
<td>.012</td>
</tr>
<tr>
<td></td>
<td>Zscore (Asset Structure)</td>
<td>.036</td>
<td>.574</td>
<td>.341</td>
</tr>
<tr>
<td></td>
<td>Zscore (Industry Asset Structure Variance)</td>
<td>.012</td>
<td>2.974</td>
<td>1.268</td>
</tr>
<tr>
<td></td>
<td>Zscore (Size log Total Assets)</td>
<td>.879</td>
<td>.858</td>
<td>.121</td>
</tr>
<tr>
<td></td>
<td>Zscore (Industry Size log Total Assets)</td>
<td>.643</td>
<td>.684</td>
<td>.137</td>
</tr>
<tr>
<td>US</td>
<td>Zscore (Tsq)</td>
<td>.201</td>
<td>.780</td>
<td>.533</td>
</tr>
<tr>
<td></td>
<td>Zscore (Car)</td>
<td>.029</td>
<td>.760</td>
<td>.594</td>
</tr>
<tr>
<td></td>
<td>Zscore (Industry Tsq Variance)</td>
<td>.662</td>
<td>1.126</td>
<td>.662</td>
</tr>
<tr>
<td></td>
<td>Zscore (GDP)</td>
<td>.946</td>
<td>1.012</td>
<td>.720</td>
</tr>
<tr>
<td></td>
<td>Zscore (Capital Structure)</td>
<td>.634</td>
<td>.885</td>
<td>.536</td>
</tr>
<tr>
<td></td>
<td>Zscore (Industry Capital Structure Variance)</td>
<td>.393</td>
<td>.782</td>
<td>.445</td>
</tr>
<tr>
<td></td>
<td>Zscore (Asset Structure)</td>
<td>.000</td>
<td>.645</td>
<td>.520</td>
</tr>
<tr>
<td></td>
<td>Zscore (Industry Asset Structure Variance)</td>
<td>.809</td>
<td>1.032</td>
<td>.796</td>
</tr>
<tr>
<td></td>
<td>Zscore (Size log Total Assets)</td>
<td>.683</td>
<td>1.187</td>
<td>.520</td>
</tr>
<tr>
<td></td>
<td>Zscore (Industry Size log Total Assets)</td>
<td>.759</td>
<td>.900</td>
<td>.460</td>
</tr>
</tbody>
</table>

Comparing the relevance of the individual independent variables on the likelihood of underperforming companies being acquired in Canada, five of the ten variables show strong explanatory power. The strongest influence has the variable Industry Capital Structure Variance, which means that an increase by one standard deviation reduces the likelihood of a takeover for the underperforming firm to an Exp(B) value of 8% of the original takeover likelihood. The independent variable with the second strongest explanatory power is Industry Tsq Variance. An increase by one standard deviation results in a decline of takeover likelihood to approximately 14% of the original takeover likelihood. An increase of the variable Capital Structure by one standard deviation in contrast increases the takeover likelihood.
likelihood to more than four-times the level. By increasing the standard deviation by one, the independent variable Industry Asset Structure Variance increases its takeover likelihood to just three times the original level and the independent variable Asset Structure reduces its takeover likelihood to just over 50% of the original likelihood in the foundation classification table.

To conclude, for Canada the independent variables Capital Structure and Industry Asset Structure Variance report a positive relationship whereas the independent variables Industry Capital Structure Variance, Industry Tsq Variance and Asset Structure report a negative relation with the likelihood of underperforming firms being acquired. The ranking of the independent variables according to their descending explanatory power is: Industry Capital Structure Variance, Industry Tsq Variance, Capital Structure, Industry Asset Structure Variance and Asset Structure.

US
In the US only Car and Asset Structure report a significance at the 5% level and the 1% level respectively of the ten independent variables. If increased by one standard deviation the variable Asset Structure reports a decrease in takeover likelihood to approximately 65%. Increasing the variable Car by one standard deviation results in a decline of the likelihood to 76% of the original probability. Both relationships are significantly negative.

Table 39: Advanced Classification Table for all Ten Variables

<table>
<thead>
<tr>
<th>Country</th>
<th>Underperforming Company</th>
<th>Predicted</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Time Intervals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td>Total Sample</td>
<td>170</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not Takeover</td>
<td>151</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Takeover</td>
<td>15</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Overall Percentage</td>
<td>90.6%</td>
<td></td>
</tr>
<tr>
<td>UK</td>
<td>Total Sample</td>
<td>920</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not Takeover</td>
<td>853</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Takeover</td>
<td>67</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Overall Percentage</td>
<td>92.7%</td>
<td></td>
</tr>
<tr>
<td>US</td>
<td>Total Sample</td>
<td>1,151</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not Takeover</td>
<td>1085</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Takeover</td>
<td>65</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Overall Percentage</td>
<td>94.3%</td>
<td></td>
</tr>
</tbody>
</table>

The regression classification table above shows that there are no variations to the original classification table for the sample of underperformance in the UK; there is no regression function of any significance.
Looking at the sample of underperforming companies in Canada it becomes evident that three of a total of 18 takeovers were classified correctly according to the logistic regression analysis of all ten variables together. However, it needs to be mentioned that one takeover case was identified incorrectly as a takeover target by the regression function. The number of predicted takeovers which have actually not taken place following a period of underperformances increases the probability of not being taken over from 89.4% to 90.6%.

The underperformance sample of the UK does not report any relationship of the ten independent variables taken together on takeover likelihood of underperforming companies.

For the US there is, despite the level of significance in the regression function (albeit with a weak determination coefficient), a decline in the successful allocation of takeover cases for the overall sample. The number of actual takeovers following a period of underperformance decreases slightly from 94.4% in the original classification table to 94.3% after applying the regression model to the sample. The reason for this change lies in the fact that one case of underperformance was classified incorrectly as being acquired by the regression function while none of the actual takeovers were forecasted correctly.

In summary it can be concluded that for the Canadian sample five of the ten independent variables are statistically significant, however, with an overall weak determination coefficient of only approximately 25% of the total variability of the independent variables (takeover yes/no). The independent variables Capital Structure and Industry Asset Structure Variance report a positive relationship to takeover likelihood and the independent variables Industry Capital Structure Variance, Industry Tsq Variance and Asset Structure a negative relationship.

For the US it can be concluded that there is only a weak relationship between the ten independent variables together and the likelihood of underperforming firms being taken over. However, the high number of occurrences of underperformance in this country, result in that this weak relationship reports a level of significance. The independent variables Asset Structure and Car report a negative relationship with takeover likelihood of underperforming firms.

Overall it can be concluded that, since there is either no significance (UK) or only a weak significance (Canada, US) being detected for the relation of the ten variables taken together
and the likelihood of underperforming firms being acquired and since this significance has a wide spread interval of confidence, the predictability and its quality is poor.

8.8 Conclusion

Chapter Eight detailed the results of the hierarchical binary logistic regression model, which was applied to test the thesis’ four main hypotheses and its four sub-hypotheses for Canada, the UK and US. As a starting point, the chapter presented the descriptive statistic and z standardisation results for each country and commented on them briefly. A simple analysis of the number of takeovers of underperforming companies resulted in a first conclusion that the market for corporate control does not work. The aim of this thesis, however, focused on testing each of the stated hypotheses in terms of whether there is any relation between the chosen independent and control variables and the likelihood of a takeover following a period of underperformance for each country. The outcome of each hypothesis is summarised briefly below.

Hypothesis 1, which tested whether there is a positive relation between the degree of underperformance and takeover likelihood, was rejected as both independent variables Tsq and Car (Test 1) show that they have no statistical explanatory power for the likelihood of underperforming companies being taken over. Hypothesis 1a, which added industry and economy effects to the above regression model (Test 2, Test 3), did not result in any improvement of statistical significance. This applies for each of the three countries. Therefore the general argument, often used in the industry, that the market for corporate control works in disciplining underperforming management through takeover mechanisms is therefore invalid and must be rejected. This outcome goes in line with recent research outcomes by authors including Franks and Mayer (1996), Argrawal and Jaffe, (2003), Sinha (2004) Bergström, Eisenberg, Sundgren and Wells (2005) and Bratton (2005).

Hypothesis 2, which investigated if the level of corporate debt is negatively / positively related to the likelihood of being taken over, was rejected as no statistical significance was reported. The inclusion of industry and economic effects (Hypothesis 2a) resulted in no further significance improvements. Therefore none of the two contradicting arguments generally used in the literature, which proposed that capital structure is either positively related (Cremers and Nair, 2003) or negatively related to takeover likelihood (Cudd and
Duggal, 2000, Bergström, Eisenberg, Sundgren and Wells, 2005) could be verified for our sample of underperforming companies for the chosen investigation period.

Hypothesis 3 investigated the impact of the variable Asset Structure on the likelihood of being taken over. Our study, which focuses solely on underperforming companies, did reveal varying outcomes for the three countries. The logistic regression analysis for the UK sample did not show any significance for Hypothesis 3 and 3a at all and thus the null hypothesis was accepted. The relation between Asset Structure and the likelihood of underperforming firms being acquired (Test 1 - 3) is significantly negative at the 1% level in the US with poor quality of predictability. This negative relation stands in contrast to the literature and empirical research. For Canada the relation between Asset Structure and takeover likelihood is positive at the 5% level, however, with a poor quality of prediction (Interval of Confidence). This means that the asset variable on its own cannot confidently explain any takeover likelihood in Canada. Even though the Canadian sample outcomes show parallels to previous research including authors (Eddey, 1991, Ambrose and Megginson, 1992) it must be noted that the Interval of Confidence is very wide, implying a poor quality of prediction.

Hypothesis 4, which tested if firm size is positively / negatively related to the likelihood of underperforming firms being taken over, concluded that firm size (Test 1) has no statistical impact in each of the three countries. The inclusion of industry and economic effects in Hypothesis 4a (Test 2, Test 3) did not have any effect on the level of significance for each of the three countries. Therefore the null hypothesis needs to be accepted for all three countries and stands in contrast to research outcomes by authors including Nuttal (1999), Barnes (2000), Cudd and Duggal (2000), Chakraborty and Baum (2003) and Sinha (2004).

As a last step of investigation this thesis applied multinomial logistic regression to all ten variables together (independent and control variables) in order to investigate their impact on the likelihood of becoming a takeover target for an underperforming firm in each of the three countries. This analysis is particularly important as it takes all influencing factors into account, which might also result in counterbalancing effects. The underperformance sample of the UK does not report any relationship of the ten independent variables taken together on takeover likelihood of underperforming companies. For the Canadian sample five of the ten independent variables are statistically significant, however, with an overall weak determination coefficient of only approximately 25% of the total variability of the
independent variables (takeover yes/no). The independent variables Capital Structure and Industry Asset Structure Variance report a positive relationship to takeover likelihood and the independent variables Industry Capital Structure Variance, Industry Tsq Variance and Asset Structure, a negative relationship in Canada. For the US it can be concluded that there is only a weak relationship between the ten independent variables together and the likelihood of underperforming firms being taken over. However, the high quantity of occurrences of underperformance in this country results in a level of significance despite the reported weak relationship. The independent variables Asset Structure and Car report a negative relationship with takeover likelihood of underperforming firms.

It can be concluded that, since there is either no significance (UK) or only a weak significance (Canada, US) being detected for the relation of the ten variables taken together and the likelihood of underperforming firms being acquired and since this significance has a wide spread interval of confidence, the predictability and its quality is poor.

Overall, the hierarchical binary logistic regression model, which was applied to test the thesis’ four main hypotheses and its four sub-hypotheses for Canada, UK and US found out that the probability of takeovers following a period of firm underperformance (disciplinary takeovers) did not prove to be significant. This outcome is supported by recent studies including Franks and Mayer (1996), Argrawal and Jaffe (2003) and Sinha (2004), who all concluded that there is no significant association between takeovers and firm performance, implying that the disciplinary takeover is statistically non-existent. Thus the market for corporate control does not work effectively through takeovers.
Chapter Nine
Summary and Conclusions

9.1 Introduction

In this thesis the relationship between underperformance and takeover likelihood was examined theoretically and empirically using stock-market-based measurements and accounting-based financial data from companies in the UK, US and Canada over a period of 17 years (1988 - 2004) applying hierarchical binary logistic regression analysis.

According to the theory the market for corporate control plays an important role for corporate governance and agency conflicts. There exists the view that managers often pursue goals other than value maximisation resulting in poor corporate performance. According to the agency theory, this problem arises from the separation of ownership and control and its resulting incentive misalignment between the principal and agent. According to the literature, takeovers are regarded as one of the most efficient devices in the market for corporate control since it rapidly transfers resources and control from inefficient managers, to efficient ones. Jensen (1986) takes the view that takeovers are a direct response to the breakdown of internal corporate governance systems and agency conflicts in companies.

This thesis aimed to empirically investigate whether the market for corporate control works in the sense that underperforming firms are being taken over as a consequence of their poor performance. This study further examined financial characteristics of underperforming firms in a hierarchical binary logistic regression to measure the likelihood of these companies being taken over following a period of underperformance.

In this concluding chapter, we will summarise the preceding chapters and discuss the results of the empirical study. In addition, we will describe the contribution and the limitations of this thesis and introduce potential areas for further research.
9.2 Summary of Chapters

The literature in the field of corporate governance and agency theory, which was discussed in detail in Chapter Two, investigated the implications that the separation of ownership and control and the resulting misalignment of management and residual claimants’ interests have on the varying contracting parties. It was shown that the separation of ownership and control not only results in residual loss due to costs arising from an agent’s action, such as wasteful management, but also through costs arising from monitoring and bonding agents in order to keep residual loss to a minimum. However, as pointed out by Morck, Shleifer and Vishny (1990), it remains illusive and incorrect to assume that existing monitoring and bonding tools keep managers from pursuing personal non-value maximising objectives. Another conclusion which can be drawn from the literature, is the reoccurring controlling importance of ownership on the relationship between all contracting participants. As has been shown, a certain level of ownership stake being held by the various stakeholders such as shareholder, bondholders and management itself can impact positively on agency costs, whereas these positive impacts on agency conflicts disappear again beyond a certain level of ownership.

Chapter Three introduced and discussed the corporate governance function of the market for corporate control, particularly investigating the effectiveness of the board of directors, legal, political and regulatory systems, product market competition, capital market mechanisms including the labour market as well as the correcting function of takeovers in monitoring and overcoming potential agency conflicts due to the separation of ownership and control. All control functions prove their relevance in theory; however, empirical research showed that each of them displayed weaknesses and deficiencies in practice. Overall, there is only one clear conclusion to be drawn from the literature in this field, which is also exemplified in takeovers and corporate governance mechanisms, which might be optimal in one particular situation for one company in one country might not be ideal for another. As Kole (1995) and Himmelberg, Hubbard and Palia (1999) summarise, agency conflicts are heterogeneous across different firms in different industries with differing contract environments.

Chapter Four provided a review of research in the field of financing choices, highlighting tax advantages of debt, (Modigliani and Miller, 1958, 1963, Fama and Miller, 1972 and Miller 1977) and the threat of bankruptcy (M&M, 1963, Altman (1984), to provide the basis for a theorem of optimal capital structure (DeAngelo and Masulis 1980, Myers, 1984). The benefits
of debt in mitigating agency conflicts have also become an important aspect of capital structure considerations. It can be concluded that the various debt aspects, such as the control hypothesis of debt, the role of debt in reducing free cash flow/financial slack and the incentive effect of debt as well as its informational aspects, all play an important part in realigning owner and stakeholder interest in theory. However, practice has shown that agency problems are not overcome in reality. The important role of leverage in the field of financing acquisitions, removal of financial slack and/or increase in share price as well as its role as an anti-takeover device (Harris and Raviv, 1988) is recognised in the finance and economics literature. It can be concluded that the choice of capital structure is a delicate balancing act of continuously adjusting the debt level to achieve the maximum amount of economic benefit. Increased leverage provides both potential benefits as well as disadvantages to the bidder as well as the target company.

In Chapter Five this thesis reviewed literature on mergers and acquisitions as one important option of mitigating agency conflicts in the market for corporate control. It investigated potential merger motives including economic, financial and corporate control considerations as well as managerial aspects. Despite the importance of takeovers as a rapid-fire mechanism for overcoming corporate deficiencies and related agency problems with all potential value-creating benefits in theory, empirical research has shown that outcomes are ambiguous. Overall, research has provided only little consistent explanation for the likelihood of becoming a takeover target and there is no consistent direction for investors confronted with acquisition opportunities who wish to maximise economic gain. One main reason for these unsatisfactory research outcomes can be found in the varying methodologies and the large amount of differing variables applied to all kind of models. Whereas most studies tend to focus on a sample of takeover companies to investigate their financial characteristics, this thesis’s study concentrates on a sample of underperforming firms to measure the likelihood of these companies being taken over following a period of underperformance.

Chapter Six provided a description of the type of research and methodology, which was used for the empirical research. The overall objective of this thesis was to test for the relationship between underperformance and takeover likelihood by testing if the market for corporate control works, meaning if companies are actually taken over as a consequence of underperformance. With reference to the literature, this study examined a set of financial characteristics, meaning underperformance (Hypothesis 1), capital structure (Hypothesis 2),
asset structure (Hypothesis 3) and firm size (Hypothesis 4), accounting also for industry and
economic effects (Hypothesis 1a, 2a, 3a, 4a), to investigate the reasons and patterns for some
underperforming companies in fact being taken over whereas other underperforming
companies are not. The table below provides a listing of all hypotheses including their
expected sign.

**Table 40: Summary of Hypotheses**

<table>
<thead>
<tr>
<th>Hypotheses under Investigation</th>
<th>Expected Sign</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1 There is a positive relation between the degree of underperformance and takeover likelihood.</td>
<td>+</td>
</tr>
<tr>
<td>H1a There is an increasing positive relation between underperformance and takeover likelihood taking into account industry and economic effects.</td>
<td>+</td>
</tr>
<tr>
<td>H2 The level of corporate debt is negatively / positively related to the likelihood of underperforming companies being acquired.</td>
<td>+/-</td>
</tr>
<tr>
<td>H2a The level of corporate debt is negatively / positively related to the likelihood of underperforming companies being acquired taking into account industry and economic effects.</td>
<td>+/-</td>
</tr>
<tr>
<td>H3 The proportion of tangible assets to total assets is positively / negatively related to the likelihood of underperforming companies being acquired.</td>
<td>+</td>
</tr>
<tr>
<td>H3a The proportion of tangible assets to total assets is positively / negatively related to the likelihood of underperforming companies being acquired taking into account industry effects.</td>
<td>+</td>
</tr>
<tr>
<td>H4 Firm size is negatively / positively related to the likelihood of underperforming companies being acquired.</td>
<td>+/-</td>
</tr>
<tr>
<td>H4a Firm size is positively/negatively related to the likelihood of underperforming companies being acquired taking into account industry effects.</td>
<td>+/-</td>
</tr>
</tbody>
</table>

This chapter outlined the methodology approach and the model concept in detail. The choice of measurements of underperformance (Tobin’s q, Cumulative Abnormal Return) for the selection of a sample of underperforming stock market-listed companies as well as the selection process of a corresponding sample of takeover companies was described. The main focus of this chapter was, however, to introduce and explain in detail the modelling of this analysis which was introduced as being hierarchical binary-logistic.

Chapter Seven provided a step-by-step explanation of the data compilation process. This study used all stock market-listed companies reported on the database Datastream in the UK, US and Canada over the period 1988 until 2004. The sample comprised a total of 30,225
companies. The data clearing process and the application of the measurements of underperformance (Tsq < 1 and Car < 0) were applied to the overall sample of approximately 70,000 three-year company data intervals to identify a set of underperforming companies. This analysis resulted in a total of 2,241 company data intervals, which reported underperformance as defined above. Based on M&A data made available by Thomson Financial (SDC Platinum database) the sample of companies being taken over within the period of investigation in the three countries was matched against the results of underperforming companies (matching time period of 24 months after underperformance). Only 7% of underperforming companies were actually taken over in the UK, 6% in the US and 11% in Canada, implying that the market for corporate control does not work in these countries (Objective 1).

Chapter Eight detailed the results of the hierarchical binary-logistic regression model, which was applied to test the thesis' four main hypotheses and its four sub-hypotheses for Canada, UK and US. It can be summarised that Hypothesis 1, 2 and 4 were rejected, which means that neither underperformance and capital structure nor size reported a statistical significance on the likelihood of underperforming companies being taken over. For these three hypotheses it can be concluded that the general argument of an existing relation between these variables and the takeover likelihood was proved to be invalid for our sample of underperforming firms. Especially, arguments introduced in the agency literature (e.g. Jensen, 1986), which claim that takeovers are the most efficient device in the market for corporate control to transfer resources from inefficient agents to efficient ones (Hypothesis 1), were rejected by our study outcomes. Furthermore, our study results confirm the general argument that the choice of capital structure (Hypothesis 2) can be regarded as a delicate balancing act of continuously adjusting the debt level to achieve the maximum amount of economic benefit. Hypothesis 3, which investigated the impact of the variable Asset Structure on the likelihood of underperforming firms being taken over, revealed varying outcomes for the three countries. Whereas the null hypothesis was accepted for the UK sample of underperforming firms, the US reported a significantly negative relation at the 1% level for the variable Asset Structure (Test 1 - 3) with poor quality of predictability. For Canada the relation between Asset Structure and takeover likelihood is positive at the 5% level. Even though the Canadian sample outcomes show parallels to previous research including authors (Eddey, 1991, Ambrose and Megginson, 1992) it must be noted that the quality of prediction is poor. The following table summarises the outcomes of the stated hypotheses.
### Table 41: Summary of Hypotheses Outcomes

<table>
<thead>
<tr>
<th>Hypotheses under Investigation</th>
<th>Expected Sign</th>
<th>Approved</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>H1</strong> There is a positive relation between the degree of underperformance and takeover likelihood.</td>
<td>+</td>
<td>CN: No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UK: No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>US: No</td>
</tr>
<tr>
<td><strong>H1a</strong> There is an increasing positive relation between underperformance and takeover likelihood taking into account industry and economic effects.</td>
<td>+</td>
<td>CN: No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UK: No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>US: No</td>
</tr>
<tr>
<td><strong>H2</strong> The level of corporate debt is negatively / positively related to the likelihood of underperforming companies being acquired.</td>
<td>+/-</td>
<td>CN: No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UK: No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>US: No</td>
</tr>
<tr>
<td><strong>H2a</strong> The level of corporate debt is negatively / positively related to the likelihood of underperforming companies being acquired taking into account industry and economic effects.</td>
<td>+/-</td>
<td>CN: No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UK: No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>US: No</td>
</tr>
<tr>
<td><strong>H3</strong> The proportion of tangible assets to total assets is positively related to the likelihood of underperforming companies being acquired.</td>
<td>+</td>
<td>CN: No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UK: No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>US: No</td>
</tr>
<tr>
<td><strong>H3a</strong> The proportion of tangible assets to total assets is positively related to the likelihood of underperforming companies being acquired taking into account industry effects.</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>US: No</td>
</tr>
<tr>
<td><strong>H4</strong> Firm size is negatively / positively related to the likelihood of underperforming companies being acquired.</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>UK: No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>US: No</td>
</tr>
<tr>
<td><strong>H4a</strong> Firm size is positively/negatively related to the likelihood of underperforming companies being acquired taking into account industry effects.</td>
<td>+/-</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>UK: No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>US: No</td>
</tr>
</tbody>
</table>

As a last step of investigation this chapter applied multinomial logistic regression to all ten variables together (independent and control variables) in order to investigate their impact on the likelihood of becoming a takeover target for an underperforming firm in each of the three countries. This analysis was particularly important as it takes all influencing factors into account, which might also result in counterbalancing effects. It can be concluded that, since there is either no significance (UK) or only a weak significance (Canada, US) being detected for the relation of the ten variables taken together and the likelihood of underperforming firms being acquired and since this significance has a wide spread interval of confidence, the predictability and its quality is poor. In sum, both the univariate and multinomial analysis did not provide any statistical relevance with an underlying narrow spread of the interval of confidence.
9.3 Contributions and Implications of the Study

After summarising the results of this thesis, it needs to be assessed whether this study has advanced the knowledge of the role mergers and acquisitions play in the field of the market for corporate control. The study extends the literature and related empirical work in how effective the market for corporate control acts in disciplining underperforming companies through takeovers.

9.3.1 Contributions of this Study

Most previous research studies have analysed the performance of companies, which have actually been taken over to determine financial and governance patterns of these target firms to come up with a likelihood of being taken over according to these characteristics. The primary focus of these studies lies in investigating a sample of takeover companies, which, however, does not differentiate between underperforming and (over-)performing companies. The results of these studies are mixed and more recent studies come increasingly to the conclusion that the relation between firm performance and takeover likelihood is complex and difficult to define and measure. The most important feature of this thesis is that the study focuses solely on underperforming firms and their likelihood of being taken over as a result of their underperformance. This is critical since the market for corporate control should rectify underperformance through a takeover and most studies do not focus on this particular aspect but investigate this area more broadly.

Additionally, this study investigated a combination of accounting-based and stock market-based measurements to counterbalance any potential drawbacks of focusing on one financial measurement type. Many studies in this field either concentrate purely on accounting- or on stock market-based measurements which, as been shown in the literature can lead to misspecifications. One further advantage of this study is that it not only considered financial characteristics as explanatory variables of underperforming firms being acquired but it also incorporated industry and economic control variables for improving the accuracy of the analysis. There are many studies which neglect the potential impact of these control variables on the study outcomes. A further advantage of this study’s model is that it did not only apply a binary-logistic regression but enhanced its model through the application of a hierarchical order. This thesis’ model not only allowed for an investigation on a univariate level but also
measured the actual change in significance by adding industry and/or economic control variables to the regression analysis.

Furthermore, most studies investigate takeovers in one particular country, with a bias towards the US market, without contrasting outcomes between countries. Our study, however, focused on individual countries where externally controlled governance mechanisms such as takeovers prevail (Canada, UK, US) and contrasted the individual outcomes per country. Another important aspect of this study is the long timeframe under investigation (17 years), which most studies do not cover (much shorter periods).

9.3.2 Implications of this Study

Overall it can be concluded that the hierarchical binary logistic regression model, which was applied to test the thesis’ four main hypotheses and its four sub-hypotheses for Canada, the UK and US came to the result that the probability of takeovers following a period of firm underperformance (disciplinary takeovers) did not prove to be significant.

Despite the general wisdom of the financial literature that Anglo-Saxon Economies are countries where the external markets for corporate control are said to work actively as a disciplinary device through takeovers, our study could not confirm these outcomes statistically. There appears to be no significant association between takeovers and firm performance, implying that the disciplinary takeover is statistically non-existent. Thus the market for corporate control does not work effectively through takeovers in the three countries under investigation. It can be concluded that takeover motives can be described as heterogeneous across different firms in different industries and countries with differing contract environments. It has to be concluded that there is no consistent direction for investors confronted with acquisition opportunities who wish to maximise economic gain.

9.4 Limitations of the Study

The study’s implications need to acknowledge the following research limitations. One important limitation of this study lies in the data compilation process. As has previously been stated, all data was gathered from secondary sources, Datastream and SDC Platinum, both operated by Thomson Financial. Unfortunately, not all companies listed on these databases provide the full scale of financial information required to undertake this analysis. There are
many companies which do not report data at all and are purely listed by name, thus reducing the sample drastically in the first place. This is particularly true for very small corporations listed on secondary stock exchanges such as the NASDAQ and the TSX Venture. In addition, companies listed on Datastream do not necessarily match the companies listing on the SDC Platinum database, which resulted in a considerable reduction of the sample of takeover companies able to be investigated as part of this study.

A further limitation to be mentioned is that the study did not incorporate an analysis of Corporate Governance variables to measure the likelihood of companies being taken over following a period of underperformance.

This study applied an event time methodology which, however, only rests on the assumption that stock markets are efficient in evaluating the impact of the event to determine abnormal returns.

9.5 Suggestions for Further Research

Future research in the field of the market for corporate control and takeover likelihood of underperforming companies is recommended to consider the following potential study areas:

- As there have been changing patterns of M&A activity (merger waves) over the last century, it could be of interest to split up the investigation period of 17 years into several sub-periods (3-4) to investigate if the market for corporate control changes in its effectiveness through takeovers.
- It could also be of interest to enhance the study through the additional investigation of corporate governance characteristics. Measurements could include monitoring mechanisms of the various stakeholders, bonding mechanisms (managerial incentive schemes) and board structure (e.g., supervisory versus executive board, executive versus non-executive directors).
- More research could also be undertaken into the acquiring companies. It is one side of the equation to investigate companies which are underperforming, however, the other side of the equation is what companies are there to consider the acquisition of this underperforming company for what reason.
• A further interesting point includes the investigation if underperforming companies are part of an attractive industry grouping or if these underperformers are part of dying industry sectors. (e.g. coal mining in the UK in the 1980s). This aspect could possibly be incorporated into the modelling.
BIBLIOGRAPHY


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Stigler, G.J. (1968) *The Organisation of Industry*, Richard D. Irwin


Appendix 1

Overall Descriptive Statistics for Underperforming Companies split between Takeover and Non-takeovers

1. Underperforming Companies Taken over

<table>
<thead>
<tr>
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<td>.88489</td>
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<td>-.3664</td>
<td>.96308</td>
<td>.44907</td>
<td>18.976</td>
<td>.49225</td>
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2. Underperforming Companies not Taken over

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<td>.000</td>
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</table>
Appendix 2

Descriptive Statistics for Underperforming Companies split between Takeover and Non-takeovers in Canada

1. Underperforming Companies Taken over

<table>
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</tr>
<tr>
<td>Mean</td>
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<td>-0.4058</td>
<td>0.90391</td>
<td>0.57034</td>
<td>19.627</td>
<td>0.49385</td>
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<td>0.830</td>
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<td>0.98325</td>
<td>0.53023</td>
<td>19.818</td>
<td>0.50053</td>
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<td>Std. Deviation</td>
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<td>-0.566667</td>
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<td>0.682</td>
<td>21.141</td>
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<td>3.041</td>
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<td>0.049</td>
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<td>21.141</td>
<td>0.638</td>
<td>3.041</td>
<td>4.500</td>
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2. Underperforming Companies not Taken over

<table>
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Appendix 3

Descriptive Statistics for Underperforming Companies split between Takeover and Non-takeovers in the UK

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Appendix 4

Descriptive Statistics for Underperforming Companies split between Takeover and Non-takeovers in the US

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### Appendix 13

Variables in the Equation for all Ten Variables

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