University of Strathclyde

Department of Accounting and Finance

An analysis of firm life cycle and financial distress: Evidence from UK divestitures

William Finlay

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'This thesis is the result of the author's original research. It has been composed by the author and has not been previously submitted for examination which has led to the award of a degree.'

Signed:

Date:

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An analysis of firm life cycle and financial distress: Evidence from UK divestitures

Abstract

This thesis examines the shareholder wealth effects of divestiture transactions via an analysis of event study announcement returns. It examines the factors determine changes in the level of returns, with a specific focus on the following areas:

What role does firm life cycle play in the observed abnormal returns to divesting UK firm shareholders? Motivated by a growing body of research utilising a cutting edge measure of firm life-cycle by De Angelo et al. (2006), chapter 4 examines the impact of firm life-cycle on the announcement returns to firms undertaking divestiture activity. Developing the early research by Pashley and Philippatos (1990, 1993) who try to examine divestiture activity and life-cycle for the first time, the chapter examines whether the stock market responds to divestiture announcement differently across a firm life-cycle stage and whether agency concerns or other factors influence the level of shareholder returns. The presence of agency costs have been shown by Kaiser and Stouraitis (2001) to have a significant impact on divestiture activity. The results show that the wealth impact of divestiture activity varies by different firm life-cycle stages, those firms at the later life-cycle stages experience higher abnormal returns than earlier stages. The results suggests support for the agency cost of managerial discretion hypothesis, firms are rewarded for reconfiguring their operations back to an optimal size and for reducing the agency costs of managerial discretion. There is limited evidence to suggest that agency cost concerns are associated with higher abnormal returns near the end of the firm life-cycle, however these results disappear when re-configuring life-cycle definitions. Separately, those firms with negative retained earnings outperformed those with positive retained earnings irrespective of life-cycle stage, suggesting financial distress plays an important role in the level of returns experienced by firms undertaking divestiture activity.

What role does the financial condition of the divestor have on the abnormal returns of UK firms? Chapter 5 examines the impact the impact of firm financial distress across multiple measures of firm-level financial distress (Taffler z-score, interest coverage measure and a net income measure). The chapter examines the financing hypotheses to assess whether firm level financial distress is a factor that influences the shareholder wealth effect to divesting firm shareholders. The financing hypothesis posits that asset sales by financially distressed firms will result in positive share price response given a reduction in the expected costs of financial distress (Lang et al., 1995). The positive announcement returns are attributable to divestiture activity representing a lower cost source of financing periods when a firm is facing financial distress. The results show that divestiture activity by financially distressed firms result in

significant wealth gains to divesting firms across all three separate measures of financial distress. The key findings support the financing theories of asset sales. The chapter contributes to the literature on firm financial distress by examining multiple measures of firm distress and extending these to examine distress is a multi-dimensional approach incorporating liquidity and leverage. Liquidity and leverage are found to be a significant factor in explaining abnormal returns experienced by divesting firms, it is observed that firms with a strong bargaining positions are able to extract better prices from the sale.

What role does the business environment (firm's industry and the macroeconomic environment) have on the observed abnormal returns of divestitures by UK firms? Chapter 6 examines the impact of financial distress, across firm level, industry level and the overall macroeconomic level on the market reaction to divestiture announcement. The chapter examines the conflicting financing and fire sale hypotheses in order to bring together the themes of external market conditions, availability of buyers and the financial condition of the divesting firms to assess these factors on the shareholders of firms that announce divestiture activity. The results show that shareholders experience significant wealth losses when firms sell assets during periods of industry distress. Natural buyers of the asset during this period are also likely to be distressed and as such the firms divesting assets will receive a lower level of cash proceeds from the asset sale (Shleifer and Vishny, 1992). Some evidence is found to support the financing hypothesis for those firms divesting during periods of firm and economic-distress. The chapter contributes to the literature on divestiture by examining the interactions between the financial distress conditions and the distress conditions in isolation. Industry conditions are found to dominate the results. Overall, the results show that fire sale conditions prevail during periods of industry distress, but the financing benefits at the firm level can offset the fire sale discount.

The evidence presented in this thesis contributes to the growing body of research on corporate divestitures. Specifically that the growth opportunities, the financial state of the seller, the bargaining position and the market conditions at the time of the divestiture can adversely impact the level of abnormal returns experienced by firms undertaking divestiture activity.

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Chapter 1: Introduction and summary of thesis

1.1. Introduction

This thesis examines the concept of divestitures. A mechanism that firms undertake involving a change in the firm's asset portfolio is accomplished by either spinning-off or selling off the unwanted assets (Rosenfeld, 1984). Since the late 1970s conglomerate firms dominated the corporate horizon and increasingly capital markets started to become critical of their bloated form (Brauer, 2006). Restructuring transactions became commonplace and firms started to undertake reconfiguration activity in order to reduce complexity, bloat and improve their financial performance. The increase in restructuring activity led to an increase in the research being undertaken on this topic.

A divestiture, to be distinguished from the sale or liquidation of an entire enterprise, involves the sale of the stock or assets of portions or segments of a business. These assets may range in scope from an entire subsidiary or division, to small, specialised individual products (Gole and Hilger, 2008). Assets sales are of importance as they allow firms to restructure their businesses in order to address poor performance or exploit strategic opportunities (Renneboog and Szilagyi, 2008).

1.2. Issues investigated in this thesis

This thesis examines the shareholder wealth effects, via the event study methodology, of divestiture transactions and what factors determine the level of returns to those firms divesting assets in the United Kingdom, with a specific focus on the following areas:

1. Firm divestitures and life cycle: What role does firm life cycle play in the observed abnormal returns to UK divesting firm shareholders?
2. Firm divestitures and financial distress: What role does the financial condition of the divestor have on the abnormal returns of UK firms?
3. Firm, economic and industry distress: What role does the business environment (*firm's* industry and the macroeconomic environment) have on the observed abnormal returns of divestitures by UK firms?

The empirical research on divestitures finds, on average, that asset sales are associated with significantly positive increases in shareholder wealth as measured by the event study methodology. The majority of these gains are attributable to an improved focus reduction (Lang et al., 1995; Bates, 2005) and a reduction in the cost of financial distress (Lasfer et al., 1996). A full literature review is provided in Chapter 2 and an overview of the sample used in the study is provided in Chapter 3.

1.2.1. Firm divestitures and life-cycle

Chapter 4 will examine the decision to divest in conjunction with the life-cycle theory as developed by Mueller (1972). Mueller's primary focus is on the agency problem within the firm, primarily, the question of whether managers undertake wealth maximizing activities by acting on behalf of shareholders, or whether they pursue personal objectives

at the interest of shareholder wealth. The primary focus of this chapter is to examine how the stock market responds to divestiture announcement across a number of different life-cycle stages and whether agency concerns or other factors influence the levels of shareholder returns.

The research in the area of firm life-cycle is fragmented and is inconclusive in the number of actual life-cycle stages that are known to exist. Most research points to around four or five stages of firm life-cycle. Most of the existing literature in the field of firm life-cycle is conceptual in nature. However, this research expands on the early work by Pashley and Philippatos (1990, 1993) who try to examine divestiture activity and life-cycle for the first time. Motivated by a growing body of research utilising a cutting edge measure of firm life-cycle by De Angelo et al. (2006), this study undertakes an investigation in the wealth impact of firms that opt to divest assets or business units at different life-cycle stages.

Motivated by the framework provided by Mueller (1972), the chapter then investigates the impact of agency costs on divestiture activity. The wealth transfer hypothesis by Galai and Masulis (1976) stipulates that any proceeds that are raised through corporate restructuring activity will be closely observed by the market as an indicator of agency conflict. Those proceeds that are retained for investment purposes can be an indicator of agency costs, as any proceeds will increase the level of free cash flow and the ability for managers to undertake wealth destroying activities at shareholders' expense. The presence of agency costs have been shown by Kaiser and Stouraitis (2001) to have a significant impact on divestiture activity and Lee and Lin (2008) find that overall, agency concerns dominate the market reaction to divestiture announcements. The chapter investigates whether agency costs of managerial discretion influences the shareholder

response to divestiture activity and whether these agency concerns are condition on life-cycle stage.

The key contributions that chapter 4 makes to the literature in corporate finance is, *(i)* it adds to the increasing body of literature utilizing the De Angelo et al. (2006) earned/contributed capital mix as a proxy for firm life-cycle,[1] *(ii)* methodological improvements made in this study to the De Angelo et al. (2006) approach enhance the measure to more accurately reflect life-cycle stage, and *(iii)* this is the first study of divestiture and firm life-cycle since the early work of Pashley and Philippatos (1990, 1993). Using the life-cycle theoretical framework as developed by Mueller (1972) to examine life cycle has allowed a cross-section of results to be developed, this is an improvement over the majority of existing divestiture research that focuses at a single point in time. The chapter makes a positive contribution to the underdeveloped area of firm life-cycle research, examining a large sample of divesting firms through the use of the De Angelo et al. (2006) measure of firm life cycle.

Chapter 4 examines these issues via an event study analysis of the stock market price reaction to asset divestiture announcement of 8,593 sales by non-financial UK firms from 1988-2009. The key findings from the chapter show that divestiture activity is a wealth generating action undertaken by firm management, these results are consistent with existing literature in the field of divestitures (John and Ofek, 1995; Lang et al., 1995; Lasfer et al, 1996; Bates, 2005). Across the measures of life-cycle, later life-cycle periods experience higher abnormal returns, this is attributable to firms being rewarded for

[1] Mergers and acquisitions (Owen and Yawson, 2010); Dividend policy (De Angelo et al., 2006); Seasoned equity offerings (De Angelo et al. 2010); Capital structure (Bulan and Yan, 2009); Cash holdings (Drobetz et al., 2015)

reconfiguring their operations back to an optimal size (by divesting unrelated assets) and a reduction in the agency costs of managerial discretion. Empirically the findings highlight that aligning managerial and shareholder interests is welcomed by firm shareholders, with agency cost concerns being associated with higher abnormal returns near the end of the firm life-cycle. Finally, the study finds when examining those firms with negative retained earnings, these are observed to exhibit the highest announcement returns, suggesting costs of financial distress plays an important role in the level of returns experienced by firms undertaking divestiture activity.

1.2.2. Firm divestitures and financial distress

De Angelo et al. (2006) argue that firms with negative retained earnings are early stage life cycle firms. However, whilst this proxy is a measure of life cycle stage, high levels of negative retained earnings are also driven by firms recording losses over one or more periods prior to divestiture activity, therefore observing negative retained earnings can also imply that a firm is suffering from financial distress. Early empirical research by Fitzpatrick (1932) highlighted that negative retained profit to equity ratio was one of the best indicators of potential future bankruptcy. Therefore in order to investigate this further, an analysis of financial distress and divestiture activity takes the focus for empirical investigation in this chapter. The key motivating factor for this investigation is the finding in Chapter 4 that shows firms with negative retained earnings are observed to experience higher announcement date abnormal returns, relative to those firms with positive retained earnings. It is expected that the financing theory of asset sales will prevail, that is, those firms that are suffering from financial distress, use divestiture activity in order to generate proceeds in order to mitigate the costs of financial distress.

It is hypothesised that those firms suffering from high levels of financial distress will benefit the most from undertaking divestiture activity and therefore the expected shareholder announcement returns will be greater for highly distressed firms.

The existing empirical research on divestitures finds, on average, that asset sales are associated with significantly positive increases in shareholder wealth. The majority of these gains are attributable to an improved focus on the core business activities of the remaining assets (John and Ofek, 1995), debt reduction (Lang et al. 1995; Bates, 2005) and a reduction in the cost of financial distress (Lasfer et al., 1996). This chapter will examine the role of financial distress, especially how the stock market responds to the announcement of divestiture activity for those firms that are considered be to distressed or non-distressed.

Chapter 5 provides an overview of financial distress modelling, including that of accounting-based interest coverage measures (Asquith et al. 1994; Ahn et al. 2006; Acharya et al. 2007), net income measures (John et al. 1992; Bhagat et al. 2005; Ang and Mauck, 2011) and measures generated via multiple discriminant analysis (MDA) (Altman, 1968; Taffler 1983). It then expands on the classification of financial distress by examining the use of financial distress modelling in the divestiture literature. Hite et al. (1978), Chen and Guo (2005) and Denis and Shome (2005) highlight that poorly performing firms divest assets in order to improve operating efficiency.

The main theoretical framework that will be investigated in chapter 5 is the financing theory of asset sales. Asset sales allow a firm to obtain access to financing that can be difficult to source from other sources, especially during periods when firms are suffering from internal financial problems (Asquith et al., 1994; Lang et al., 1995). Divestiture

activity can allow a firm to reduce the direct/indirect cost of financial distress/bankruptcy if the proceeds from the sale are used to reduce the probability of bankruptcy, financial distress or to pay down debt. Any divestiture activity that reduces the cost of financial distress/bankruptcy is expected to lead to wealth gains by the divesting firm shareholders. The support for the financing explanation for divestiture activity is mixed. Some studies show that a positive stock market response to divestiture announcements that reduce the expected costs of financial distress (Asquith et al., 1994; Lang et al. 1995) and find contrasting evidence (Brown et al., 1994; Alexandrou and Sudarsanam, 2001). Therefore, chapter 5 will bring together the themes of divestiture, financial distress and the interaction between distress configurations. The key issues that are examined in the chapter are: *(i)* What classification approaches are used to determine whether a firm is distressed or non-distressed? *(ii)* How do firms that are classified as distressed, across a number of financial distress measures, respond to the announcement of divestiture activity? *(iii)* Extending the analysis beyond the traditional financial distress measures, what role does the short-term liquidity and *(iv)* leverage position provide on the market reaction to the divestiture announcements? *(v)* How does the interaction between the measures of firm distress and liquidity/leverage position impact the observed market reaction to the announcements?

Chapter 5 examines these issues via an event study analysis of the stock market price reaction to asset divestiture announcement of 10,718 sales by non-financial UK firms from 1988-2009. Firm distress is measured using the Taffler (1983) UK z-score approach, a measure of interest coverage and a measure of net income. These varying measures of financial distress capture between 15.4% and 22.9% of the sample as 'distressed.'

The empirical results show that consistent with the prior literature in the area, divestiture activity as a whole is a wealth generating activity for firms to engage in. Over a three day event window, parent firms that divestiture assets experience abnormal returns of 0.681%, a result similar in magnitude to Sicherman and Pettway (1992) and Borisova et al. (2013). The study then divides the sample into distressed and non-distressed subgroups and finds higher stock market gains on the announcement of divestiture activity by financially distressed firms, these results are consistent across the three measures of financial distress classification utilized. The positive reaction supports financing theories of divestiture for the selling firm, as these firms can use the proceeds from the sale to provide financing that may have been otherwise difficult to obtain. This study suggests that the market interprets the sale of assets as a mechanism to reducing and mitigating the costs of financial distress (Asquith et al. 1994; Lang et al., 1995). The subsequent sections then examine cross-sectional determinants of abnormal returns. Liquidity and leverage are found to be a significant factor in explaining abnormal returns experienced by divesting firms, it is observed that firms with a strong bargaining positions are able to extract better prices from the sale. For those firms with high levels of debt overhang or low liquidity, they appear to suffer a poor bargaining position and subsequently experience fire sale discounts on the sale of assets. Finally, the study brings the major three components of the multivariate analysis together, leverage, liquidity and financial distress to examine the interaction between these variables via a cross-sectional analysis. The key finding is that the financial position is an important factor when divesting. Divesting parent firms that have lower levels of leverage and higher levels of liquidity are more likely to be in a better financial position and therefore better able to negotiate a better price for the divested asset or business unit compared to being in a weakened financial position.

1.2.3. Firm, economic and industry distress

The external business environment has been highlighted in previous research as affecting the levels of corporate financing activity taking place (Alexandrou and Sudarsanam, 2001), John et al. (1992) highlight that the most common reason given for a performance decline within a company is due to poor economic conditions, and Kruse (2002) finds that external causes such as recessions and periods of economic decline were cited by firms for the reductions in firm financial performance. Similarly, research by Shleifer and Vishny (1992) argue that the conditions of the industry that firms find themselves in will impact the returns sellers experience on disposal of an asset.

Chapter 6 builds on the previous chapter examining firm financial distress, by expanding the scope and focus of distress to examine two contrasting theories to evaluate how the stock market responds to divestiture activity during periods of economic-, industry- and firm-distress. The motivation for this study is to examine the financial distress resolution hypothesis and the fire-sale hypothesis, these conflicting theories motivate the investigation in this chapter. The first of those theories focuses on firm financing, that is, the financial distress resolution hypothesis. Existing research shows that a positive stock market response to divestiture announcements that reduce the expected costs of financial distress (Asquith et al., 1994; Lang et al. 1995). These gains are derived from two main sources *(i),* the reduction in the cost of financial distress whereby asset sales represent a lower cost source of available finance than alternative methods of financing, and *(ii)* the act of divesting assets represents a greater net present value to the business than retaining them.

The second competing theory is based around the work of Shleifer and Vishny (1992), who put forward the view that during periods of financial distress assets are likely to be sold off at below their full economic value. The fire sale hypothesis suggests that given distress conditions, industry bidders for the assets are less likely to be in a position in order to pay the full economic worth of the assets, therefore the scope for them being acquired by non-industry users at a lower value is high. These non-industry bidders are unlikely to pay the full economic value of the asset. This fire sale hypothesis suggests firms suffering from distress are forced to sell assets at below their full economic worth in order to ensure a successful sale (Shleifer and Vishny, 1992; Diamond and Rajan, 2011). Therefore, any gains to divestiture activity are accumulated during periods when firms are not in industries suffering from distress and losses made when divesting during periods of industry distress.

The external business environment is one which can have an influence on the amount of corporate financing activity that a firm undertakes. In the M&A literature, it is well known that merger and acquisition activity falls and rises with economic cycles (Andrade et al. 2001; Martynova and Renneboog, 2008) and divestiture activity is similarly influenced by macroeconomic factors. Research on economic distress is very much underdeveloped in the divestiture literature and it was suggested by Kahl (2002) that future research would benefit from investigating the extent that firm restructuring and economic distress are linked.

Therefore chapter 6 of the thesis brings together the themes of external market conditions, availability of buyers and the financial condition of the divesting firm to assess these factors via stock market returns to the announcement of divestiture activity. The key issues that are to be examined in chapter 6 are; *(i)* how do poor macroeconomic conditions

influence the observed stock price response to divestiture announcements, *(ii)* how does financial distress for firms influence the observed announcement returns to the divestiture news, *(iii)* how do industry distress periods and potential fire sale discount conditions affect the observed returns, and *(iv)* how does the interaction between all of these financial distress conditions (economic-, industry- and firm-distress) affect the observed stock market response to the announcements?

Chapter 6 examines these issues via an event study analysis of the stock market price reaction to asset divestiture announcement of 10,718 sales by non-financial UK firms from 1988-2009. The period covers two recessions, a stock market crash by technology companies around 2000/2001 and a global financial crisis in 2008, and a significant level of variation in firm and industry distress levels. Such a large sample will allow the impact of specific distress conditions to be isolated and measured via the stock price response to the divestiture announcement.

The results show that during periods of industry distress, divesting firms experience a significantly negative stock price response on the announcement of an asset sale. These findings support that of Shleifer and Vishny (1992) who put forward the argument that under industry distress conditions, assets are likely to be sold at fire sale prices in order to encourage distressed industry buyers to bid for the assets or to encourage non-industry buyers to bid for them. There is some evidence found in support of the financial distress resolution theory, especially for those firms divesting during periods of economic and firm distress. This chapter contributes to the literature on divestiture activity when examining the interactions between these three forms of distress, as the conflicting importance of these factors in explaining the market reaction in prior studies motivate the investigation. Industry distress conditions dominate in the results when examining the

interaction between all three forms of distress and the stock market response. In isolation and with economic distress, industry distress is found to produce a negative stock price reaction. Firm distress is observed to mitigate the negative stock market response for industry distressed sellers, however this leads to abnormal returns that are insignificantly different from zero. This provides limited support for the financing explanation of asset sales. Overall, the results show that fire sale conditions prevail during periods of industry distress, but the financing benefits at the firm level can offset the fire sale discount.

1.3. Structure of thesis

The remainder of this thesis takes the following structure.

Chapter 2 examines the existing literature on corporate restructuring, divestitures and the motivations to divestiture. Chapter 3 describes the data sample used throughout this thesis and provides a discussion on the variables used throughout the empirical chapters. Chapters 4, 5 and 6 examine the empirical issues. To conclude, chapter 7 provides an overview of the thesis, the implications of the results and possible avenues of future research.

Chapter 2: Literature Review

2.1. Introduction

Undertaking 'divestiture activity' is a corporate response that firms may undertake, usually on a voluntary basis that involves a change in the firm's asset portfolio. A divestiture is accomplished by either spinning-off, carving out, or selling off the unwanted assets (Rosenfeld, 1984).

A divestiture – to be distinguished from the sale or liquidation of an entire enterprise – involves the sale of the stock or assets of portions or segments of a business. These assets may range in scope from an entire subsidiary or division, to small, specialised individual products (Gole and Hilger, 2008).

This chapter examines the key concepts that have been explored on the divestiture research to date. Section 2.2. starts by examining the concept of corporate restructuring. Section 2.3. looks at divestitures and their formations. Section 2.4. provides an overview of the industry and firm specific determinants of divestitures and their associated stock market responses. Section 2.5. looks additional event study gains to divestiture activity and finally, Section 2.6. concludes the chapter.

2.2. Corporate Restructuring

The modern business corporation has grown and now finds itself of central importance to economic activity both nationally and internationally. The rise and success of the firm in the twentieth century has been advantageous to society, bringing growth, wealth, innovation and new ideas, however such growth cannot be assumed to be sustainable (Lazonick, 2004). Significant reductions in the barriers to international trade and large pools of free capital have fuelled the desire to reduce inefficiencies and to maintain a competitive edge in an increasingly global marketplace. Driven by technological shocks, market deregulation and the increasingly intense international competition for capital supply, firms have engaged in the act of 'corporate restructuring' to address (i) poor performance, (ii) exploit strategic opportunities and (iii) to correct valuation errors (Renneboog and Szilagyi, 2008).

Corporate restructuring is defined by Hoskisson and Turk (1990, pg. 459) as a "*major change in the composition of a firm's assets compared with a major change in corporate strategy*." Restructuring offers organizations the opportunity to improve their financial performance, reputations and the ability to exploit new strategic opportunities. In markets with high levels competition, the act of restructuring can determine whether a company survives or dies (Gilson, 2001). The act of restructuring to the firm represents some of the most substantial (Gandolfi, 2006) and problematic (Mirabal and DeYoung, 2005) issues facing the modern corporation.

The literature outlines three major types of corporate restructuring: *Portfolio, Organisational and Financial* (Stewart and Glassman, 1988; Bowman and Singh, 1993; Gibbs, 1993; Bowman, et al., 1999; Heugens and Schenk, 2004).

2.2.1. Portfolio restructuring

Portfolio restructuring consists of significant changes to the structure of the firm and configuration of business operations. Such forms of restructuring may be achieved through mergers and acquisitions, sell-offs, spin-offs or equity carve outs. Managers may conduct portfolio restructuring in response to poor firm performance or firm financial distress (Dranikoff, et al., 2002; Denis and Shome, 2005). Alternatively, portfolio restructuring may be used simply to correct firm size and scope (Gibbs, 1993; Bergh, 1997).

Research by John et al. (1992) studies the policy response of large US firms in the 1980s to poor performance. They categorise such responses as:

(i) Contraction policies, these policies shrink the firm's scope of control or its size;

(ii) Expansion policies that increase the size and scope of an organization and;

(iii) Changes in firm policies, these include changes in the company management structure, marketing mix, changes in production methods or other responses.

John, et al. (1992) find contraction policies are the predominantly observed form of portfolio restructuring. 63% of firms in their sample opt to sell assets, divest, spin-off or sell businesses in response to poor performance. Interestingly, they discover that 26% of firms opt to restructure by increasing the scope of their operations and adopting expansion policies.[2] However, the majority of these studies find that contraction policies are a

[2] John, et al. (1992) list most frequently cited expansion policies are: Acquiring new raw materials, introducing new products, entering new markets, diversifying and issuing equity.

predominant reaction to poor performance, such as the studies by Blackwell et al. (1990), John and Ofek (1995) and Lang et al. (1992).

2.2.2. Financial restructuring

Financial restructuring consists of changes to a firm's capital and ownership structure in response to poor performance. Many of the theories in this area centre on the use of debt as a constraining mechanism for managers who might otherwise waste any available free cash flow on less efficient projects (Jensen, 1986), even when managers consider the projects to be value maximizing (Roll, 1986; Sitkin and Pablo, 2004). The assumption is that the pressure and influence of interest payments on any company debt would ensure that managers focus on their core business operations rather than less wealth generating activities. However, the empirical evidence is inconclusive on the wealth impact; shareholders have found to have no wealth gains from debt announcements (Eckbo, 1986; Akhigbe et al., 1997), there is mixed evidence on the impact of issuing debt on bondholders (Kolodny and Schler, 1988; Akhigbe et al., 1997) and there is a positive wealth impact to those firms that repurchase equity through debt financing (Comment and Jarrell, 1991; Ikenberry and Vermaelen, 1996).

2.2.3. Organisational restructuring

A third form of restructuring is organisational restructuring. It is usually embarked upon when managers make changes to company structures, processes and personnel (Palmer, 2004). Such examples of these include changes in the workforce size, company structure and location of operations. McKinley and Scherer (2000) highlight that organisational restructuring excludes changes that are part of business or portfolio structuring, however

these types of re-organisation can be correlated, taking place at the same time as organisational restructuring as part of a reconfiguration of business operations.

Bowman et al. (1999) highlight that organizational restructuring had the weakest impact on company performance compared to Portfolio and Organizational restructuring. Prechel (1994) asserted that this can explained by the nature of this form of restructuring as a "by-product" of portfolio or financial restructuring, rather than the sole aim as a form of restructuring for increased efficiency.[3] However overall, organizational restructuring has received less attention in academic writing than portfolio or financial restructuring. (Bowman and Singh, 1993; Bowman et al.,1999; and McKinley and Scherer, 2000)

2.2.4. Conclusion

An overview of portfolio, financial and organisational restructuring have been outlined in this section. Driven by portfolio the restructuring literature that highlights asset reductions as the primary response to poor firm performance, firm divestitures will be examined in depth in this thesis.

[3] This is generated by changes in the strategic and financial capital structures of a firm which generally necessitate changes in a firm's management hierarchies (Prechel, 1994) and internal decision making processes (Carbery and Garavan, 2005).

2.3. Divestiture

As previously highlighted, undertaking divestiture is a corporate response that firms may undertake usually on a voluntary basis that involves a change in the firm's asset portfolio and is accomplished by either spinning-off or selling off the unwanted assets (Rosenfeld, 1984).

A divestiture – to be distinguished from the sale or liquidation of an entire enterprise – involves the sale of the stock or assets of portions or segments of a business. These assets may range in scope from an entire subsidiary or division, to small, specialised individual products (Gole and Hilger, 2008).

The divestiture decision is generally made to meet market needs and preferences to optimally restructure and therefore creating the ability to gain future profitability, and in due course to increase shareholder value. Undertaking divestiture activity has been coined as 'downscoping' by Hoskisson and Hitt (1994) to distinguish such action from other forms of restructuring such as layoffs and downsizing etc.

A divestiture is a form of corporate restructuring, whereby a firm adjusts its ownership and business portfolio (Mulherin and Boone, 2000) which can take several forms;

2.3.1. Sell-Off

A sell-off represents a firm disposing of an asset, subsidiary or division ("business unit") to a third party in exchange for cash or securities. (Afshar, et al., 1992). The disposed asset, subsidiary or division is usually fully separated from the operations of the original owner and shareholders. Sell-offs are beneficial to the parent of the business unit as they generate a cash inflow to the business (Lee and Lin, 2008), without the need to go to the

external market for financing (Slovin, et al., 1995), such inflow of cash can be used to pursue future investments (Hite, et al., 1987) or relieve financial distress (Ofek, 1993). However, Slovin et al. (1995) point out that the private nature of sell-offs yields little public disclosure and this information asymmetry itself is found to lead to less favourable reactions for shareholders (Sicherman and Pettway, 1992; Krishnaswami and Subramaniam, 1999). Menon et al. (2004) state that in an efficient market, the announcement of a voluntary corporate sell-off should lead to positive abnormal share price returns on the announcement to the seller, these gains that are significantly different from zero arise from two key areas, (i) an increase in the asset focus of a divesting firm and, (ii) use of the proceeds gained from the sell-off. The asset focusing hypothesis posits that the elimination of non-core assets within a firm will allow firms to concentrate on their existing core business operations and activities, therefore this is turn minimizes the diversification discount attributable to the firm and will lead to an increase in performance as the firm's managers are able to focus their resources and expertise in the remaining assets. This increase in performance of the existing core area of the business will lead to an increase in value to the divesting firm (Berger and Ofek, 1999; Kaiser and Stouraitis, 2001). The use of proceeds theories of sell-offs highlights that the gains arise from two major areas, firstly from a resolution of financial distress. Afshar et al. (1992), Lang et al. (1994) and Dittmar and Shivdasani (2003) highlight that the cash flow from sell-off activity allows firms to pay down debt to reduce the direct and indirect costs of financial distress, therefore creating abnormal returns different from zero as the market responds positively to reducing or eliminating the associated costs of bankruptcy. Secondly, a reduction in the agency costs of managerial discretion is an associated theory that has been used to explain what the source of gains are from the announcement of divestiture

activity. Lang et al. (1994) and Bates (2005) show that firms with high agency costs trade at a discount as the market discounts the agency costs within the firm, therefore by paying out the proceeds to investors, it signals a reduction in the agency costs of managerial discretion as managers are unable to squander cash in personal projects that increase the scope of the firms' operations. Consequently, the buyer should also experience abnormal returns should the acquired asset be strategically purchased in order to maximize shareholder wealth (Berger and Ofek, 1995; Kaiser and Stouraitis, 2001).[4]

Lee and Lin (2008) state that corporate sell-offs are informative events and as such, they infer information or news in the divestiture process. Table 2.01. provides an overview of some of the empirical event studies that have examined sell-offs. There have been a large number of event studies that examine stock price response undertaken in this area, especially in the United States:

[4] A full overview of the source of gains from divestiture activity will be examined in section 2.4., 'The determinants of divestitures and the stock market response.'

Table 2.01 Wealth effects associated with sell-offs (Derived from Lasfer, et al., 1996)

Study	Country	Research Period	Obs.	Event window	CAR (%)
Hearth and Zaima (1984)	US	1979-1981	58	(-5,5)	3.55%***
Alexander, et al. (1984)	US	1965-1973	53	(-1,0)	0.40%
Linn and Rozeff (1984)	US	1977-1982	77	(-1,0)	1.45%***
Rosenfeld (1984)	US	1963-1981	62	(-1,0)	2.3%***
Jain (1985)	US	1976-1978	1062	(-5,-1)	0.09%***
Hearth and Zaima (1986)	US	1975-1982	75	(-1,0)	1.42%***
Klein (1986)	US	1970-1979	202	(-2,0)	1.12%***
Hite et al. (1987)	US	1963-1983	55	(-1,0)	1.66***
Hirschey and Zaima (1989)	US	1975-1982	64	(-1,0)	1.64%***
Hirschey and Zaima (1989) b	US	1975-1982	26	(-1,0)	2.83%***
Hite and Vetsuypens (1989)	US	1973-1985	468	(-1,0)	1.12%***
Hirschey, et al. (1990)	US	1975-1982	75	(-1,0)	1.47%***
Denning and Shastri (1990)	US	1970-1981	50	(-6,6)	0.01%
Sicherman and Pettway (1992)	US	1981-1987	278	(-1,0)	0.92%***
Brown et al. (1994)	US	1979-1988	62	(-1,0)	0.10%
Lang, et al. (1995)	US	1984-1989	93	(-1,0)	1.41%**
John and Ofek (1995)	US	1986-1988	321	(-2,0)	1.50%***
Bates (2005)	US	1990-1998	372	(-1,1)	1.20%
Borisova et al. (2013)	US	1998-2008	1458	(-1,0)	1.91%*
Clayton and Reisel (2013)	US	1990-2004	435	nr	0.99%*
Afshar, et al. (1992)	UK	1985-1986	178	(-1,0)	0.85%***
Lasfer, et al. (1996)	UK	1985-1986	142	(-1,0)	0.82%***
Alexandrou and Sudarsanam (2001)	UK	1987-1993	1941	(-2,0)	0.39%***
Kaiser and Stouraitis (2001)	UK	1984-1994	124	(-1,0)	1.10%
Clubb and Stouraitis (2002)	UK	1984-1994	187	(-1,1)	0.9%
Gadad and Thomas (2005)	UK	1985-1991	74	(0)	0.81%***
Lee and Lin (2008)	UK	1993-1997	655	(-1,1)	1.38%***
Hillier et al. (2009)	UK	1993-2000	413	(-1,1)	0.499***
Ataullah et al. (2010)	UK	1992-2005	195	(-1,1)	2.00%**

CAR around the announcement of the sell-off

*** sig at 1% level, ** sig at 5% level and * sig at 10% level

The results show that significant abnormal returns (ARs) are experienced through the divestiture mechanism of sell-offs in both the United States and the United Kingdom. In the United States, the ARs range between 0.09% (Jain, 1985) and 3.55% (Hearth and Zaima, 1984). For studies using the interval of (-1,0), the ARs measured ranged between 0.92% (Sicherman and Pettway, 1992) and 2.33% (Hirschey and Zaima, 1989). In the

United Kingdom, significant abnormal returns have been observed to be between 0.39% (Alexandrou and Sudarsanam, 2001) and 1.38% (Lee and Lin, 2008).

2.3.2. Equity Carve-out

An equity carve-out occurs when a parent firm sells no more than two-thirds of their ownership in a business unit to the public market (Thompson and Apilado, 2009). This method is considered as an alternative to raising new equity (Desai and Jain, 1999; Allen and McConnell, 1998) and is considered similar in characteristics to an initial public offering (Slovin et al., 1995; Vijh, 2002). An equity carve-out allows the benefit of a cash/security injection from the sale of a business unit, whilst retaining a large shareholding in the new business unit. Existing research is split into two distinct areas; gains attributed to the carve-out activity (Schipper and Smith, 1986; Allen, 1998) and gains attributed to events that subsequently follow the carve-out (for example, further acquisitions or merger and acquisition activity) (Klein et al, 1991; Vijh, 2002; Gleason et al., 2006). Schipper and Smith (1986) and Allen (1998) attribute the gains from managerial incentives from options provided to managers after undertaking an equity carve-out.

Prior research on equity carve-outs finds that they generate positive cumulative abnormal returns for shareholders. A number of studies have examined why carve-out transactions experience abnormal returns that are different from zero, Nanda (1991), Slovin, et al. (1995), Slovin and Sushka (1997) and Powers (2003) focus on an informational asymmetry perspective for the positive market reaction, they highlight that carve-out activity is a mechanism that is used to exploit overvalued equity markets, therefore during periods where a subsidiary is overvalued relative to the parent company, then firms will

carve-out the overvalued assets/subsidiary to maximize the amount received from the transaction. Additionally, Schipper and Smith (1986) and Allen (1998) highlight that agency costs of managerial discretion are minimized by an equity carve-out, as the transaction provides a market based incentive for firm managers to reduce agency concerns, therefore the monitoring impact provided by the market should create value by reducing inefficiency and poor investment decisions. Finally, post carve-out, Klein et al. (1991) highlights that a source of wealth gains are attributable to subsequent corporate financing events such as M&A and reacquisitions. The merger literature strongly finds that target firm shareholders generally always gain at the expense of bidding firms in a merger transaction (Alexandridis et al. 2010).

Table 2.02. outlines the limited number of studies in the area.

Table 2.02 - Wealth effects of equity carve outs (to parent company)
Reproduced from Otsubo (2009)

Study	Country	Research Period	Obs.	Event window	CAR (%)
Schipper and Smith (1983)	US	1965–1983	76	(−4,0)	1.83**
Klein et al. (1991)	US	1966-1983	52	(−4,0)	2.75***
Slovin et al. (1995)	US	1980-1991	32	(0,1)	1.23*
Allen and McConnell (1998)	US	1978-1993	188	(−1,0)	2.12***

CAR around the announcement of the carve-out

*** sig at 1% level / ** sig at 2% level / * sig at 5% level

The short run positive abnormal returns experienced are similar regardless of the event window of the study (Otsubo, 2009). Significant positive abnormal returns in the equity carve-out studies range from 1.23% (Slovin et al, 1995) to 2.75% (Klein et al., 1991). Research by Pojezny (2006) finds a volume of equity carve-outs to the value of €91billion in 13 European countries for the period from 1984-2004 (with IPOs in the similar time

period amounting to €580billion) and he finds the European results are similar to that of the US. On the announcement of equity carve outs, Pojezny (2006) finds an event day abnormal return of 1.34%[5]. However research by Michaely and Shaw (1995), Chemmanur and Paeglis (2001), Madura and Nixon (2002) and Boone et al. (2003) find that whilst returns in the short run are generally positive, the long-run stock and operating performances are negative. There does not appear to be a consistent view in explaining long run negative performance for carve-outs. Madura and Nixon (2002) attribute the negative effects to the parent the carve-out firm. They observe that these results are driven by distressed firms, with the proceeds from the carve-out failing to provide sufficient funds to alleviate financial distress. Chemmanur and Paeglis (2001) attribute the long run negative performance due to the lower likelihood of long term takeover prospects.

2.3.3. Spin-Off

The creation of a spin-off occurs when a parent firm, creates a new publically traded independent company and distributes all the shares it owns in a controlled business unit to existing firm shareholders on a pro-rata basis (Schipper and Smith, 1983; Hearth and Zaima, 1986; Desai and Jain, 1999). Unlike sell-offs and equity-carve outs, there are no cash-flow implications for the parent firm, new business unit or shareholders - as no cash is received as part of a spin-off transaction (Afshar et al., 1992). Research by Veld and Veld-Merkoulova (2008) finds that the popularity of spin-offs vary widely across different countries. They find spin-offs are popular in the United States, as the country

[5] Pojezny (2006) does however find negative abnormal returns in the two days after the announcement, which cancels some of the gains. The AR returns one day after the event observed as -0.17% and on the second day after as -0.55% (significant at the 5% level).

has few legal obstacles to spin-offs and treats the form of divestiture as a tax-free transaction. Such favourable treatment is not however universal. Gibbs (1999) states that spin-offs have a low frequency of divestiture choice in France, Germany and Switzerland – attributing only seven spin-offs in the period 1987-2000. However this may be explained by the less favourable tax treatment in these countries during that period. Veld and Veld-Merkoulova (2004) document 102 announced spin-offs in the United Kingdom.

Table 2.03. Studies of the wealth effects associated with spin-off announcements
Veld and Veld-Merkoulova (2008)

Study	Country	Research Period	Obs.	Event window	CAAR (%)
Schipper and Smith (1983)	US	1963–1981	93	(−1,0)	2.84***
Hite and Owers (1983)	US	1963–1981	123	(−1,0)	3.3***
Miles and Rosenfeld (1983)	US	1963–1980	55	(0,1)	3.34***
Rosenfeld (1984)	US	1963–1981	35	(−1,0)	5.56***
Copeland et al. (1987)	US	1962–1982	188	(−1,0)	3.03***
Denning (1988)	US	1970–1982	42	(−6,6)	2.58
Seifert and Rubin (1989)	US	1968–1983	51	(−1,0)	3.26***
Ball et al. (1993)	US	1968–1990	39	(−1,0)	2.55
Vijh (1994)	US	1964–1990	113	(−1,0)	2.90***
Allen et al. (1995)	US	1962–1991	94	(−1,0)	2.15***
Michaely and Shaw (1995)	US	1981–1988	9	(−1,1)	3.19n.r.
Slovin et al. (1995)	US	1980–1991	37	(0,1)	1.32**
Seward and Walsh (1996)	US	1972–1987	78	(−1,0)	2.6***
Johnson et al. (1996)	US	1975–1988	104	(−1,0)	3.96***
Daley et al. (1997)	US	1975–1991	85	(−1,0)	3.4***
Desai and Jain (1999)	US	1975–1991	144	(−1,1)	3.84***
Krishnaswami and Subramaniam (1999)	US	1978–1993	118	(−1,1)	3.28***
Mulherin and Boone (2000)	US	1990–1999	106	(−1,1)	4.51***
Maxwell and Rao (2003)	US	1976–1997	79	(0,1)	3.59***
Veld and Veld-Merkoulova (2008)	US	1995–2002	91	(−1,1)	3.07***
Kirchmaier (2003)	Western Europe	1989–1999	48	(−1,1)	5.4***
Veld and Veld-Merkoulova (2004)	Western Europe	1987–2000	156	(−1,1)	2.62***
Sudarsanam and Qian (2007)	Western Europe	1987–2005	157	(−1,1)	4.82***
Murray (2000)	UK	1992–1998	25	(−1,1)	−0.19
Schauten et al. (2001)	UK	1989–1996	23	(−1,1)	2.13
Sin and Ariff (2006)	Malaysia	1986–2002	85	(−1,0)	1.80*

CAAR around the announcement dates of the spin-offs
*** sig at 1% level / **sig at 5% level / *sig at 10% level

Table 2.03. highlights some of the empirical research on spin-offs. The favourable treatment of spin-offs in the United States has yielded a large number of studies from that country, however recently research from outside of the US has begun to proliferate. The

data from Veld and Veld-Merkoulova (2008) highlights that undertaking spin-off activity almost always generates positive abnormal returns. The range of abnormal return from the studies in the Unites States yields a range of significant abnormal returns from 2.15% (Allen et al., 1995) to 5.56% (Rosenfeld, 1984). Results for the rest of the world are comparable; however it is apparent that fewer studies have been conducted on spin-offs outside of the United States. Afshar, et al., (1992) suggest that spin-offs and equity carve-outs are very rare in the United Kingdom and this may explain the lower number of studies conducted in the area. Using UK data, Schauten et al. (2001) find spin-offs yield a positive abnormal return of 2.13% The source of the wealth gains from spin-offs is from a reduction in the information asymmetry between the management and the spun-off firm, as analyst cannot correctly value firms that are part of a larger firm, therefore the market undervalues such firms, by spinning off a firm or assets, it will result in lower information asymmetry and higher valuation as the market should be able to value the spin-off more accurately as a publicly listed firm. Chemmanur and Yan (2004) show that, similar to the carve-out literature, a source of wealth gains are those spin-offs that are subsequently taken over, these firms experience both short and long-term announcement returns.

2.3.4. Tracking Stock

A tracking stock is a form of financial restructuring whereby a parent company creates a new stock for a business unit in which it retains full legal control (Billett and Mauer, 2000; He et al., 2009). The purpose of a tracking stock is for the business unit's shares to reflect the financial performance of the newly created business unit without losing the ability to use internal capital markets between different business segments (Billett and

Mauer, 2000).[6] Zuta (2002) attributes the ability of being able to link managerial compensation with the tracking stock performance as a benefit of using such form of divestment. Hass (1996) however finds that the use of tracking stock has a negative influence on the firm due to the agency problems that are created between managers that own stock in both firms.

Research by Logue et al. (1996), Billett and Lauer (2000), Zuta (2002), D'Souz and Jacob (2000), Elder and Westra (2000), Chemmanur and Paeglis (2001) and Harper and Madura (2002) find significant positive short term stock market reaction to the announcement of tracking stock issuance. Clayton and Qian (2004) find a significant positive abnormal response of 3.12% and 5.82% on the announcement day. Harper and Madura (2002) highlights that the announcement returns to the news of tracking stock issuance have not been fully explained in the existing research. They find support that announcement returns are related to the reduction in the agency problem. Managers within the firm are held to account for decisions that are made, as the individual units under a tracking stock report their financial performance separately to the remainder of the firm and compensation can be linked to the reported unit and its financial performance. Similarly, D'Souz and Jacob (2000) attribute the positive market reaction to better information advantages by separate reporting by the divested unit.

Similarly with equity carve-outs, the long-term reaction to tracking stock issuance has been negative (Chemmanur and Paeglis, 2001; Harper and Madura, 2002; Boone et al., 2003; Billett and Vijh, 2004 and Clayton and Qian, 2004). Clayton and Qian (2004) associate this with the research by Ritter (1991) and Loughran and Ritter (1995) who

[6] Assets and liabilities of the newly created business unit are still legally connected to the parent company.

attribute this due to firms taking advantage of irrational market prices for new equity issuance.

Few studies have so for investigated the phenomena of positive short term returns and negative long term returns for tracking stocks. However, one such study by He et al. (2009) investigates this and finds that the self-serving interests of managers of furthering their own interest is the primary cause of the negative long term returns. They observe that managers undertake carve outs in order to take advantage of additional compensation packages or to take advantage of market momentum for compensation that is connected with firm share price performance. In addition, the agency argument is further enhanced by Billett and Vijh (2004) who show that tracking stocks underperform by around 12% compared to alternative divestiture mechanisms such as spin-offs.

2.4. The Determinants of Divestitures and Stock Market Response

Early research on divestiture activity occurred in the 1980s (Haynes et al., 2000) and documented an increase in the volume and transaction size of activity taking place, with Brauer (2000) suggesting that the growing market for corporate control alongside growing criticisms of large conglomerate M&A activity are the two main drivers for the increase in volume and size of divestiture transactions.

This section of the chapter aims to explore the reasons for firms undertaking divestiture activity and to provide an overview of the existing literature as to what factors have been routinely examined as determinants of divestiture activity. The section aims to explore what external (industry) factors and internal (firm specific) factors motivate firms to undertake this restructuring activity. First, this section will examine industry specific determinants of divestitures, and then it will expand into firm specific determinants of divestitures in order to provide a key overview as to what external and internal factors motivate firms to undertake divestiture activity.

2.4.1. Industry Determinants of Divestiture Activity

In the takeover literature, Andrade et al. (2001) and Martynova and Renneboog (2005) document that M&A activity usually occurs in waves, observing that for firms undertaking such activity, there are common factors that influence the takeovers taking place. Mitchell and Mulherin (1996) find that these common factors suggest a link between industry shocks and the volume of M&A activity being undertaken. Industry shocks, deregulation and new financing innovations were found to impact significantly on the level of activity taking place. Mulherin and Boone (2000) find that half of M&A end up in divestiture in the 1990s. Mitchell and Mulherin (1996) document that alongside

mergers; there are common factors that influence divestitures occurring. Industry wide factors, such as changes in technology, deregulation, changes in demand, foreign competition, and energy price volatility were all external factors that have been observed to influence the likelihood of activity taking place. The following section will examine industrial concentration and competition, industry growth/performance and government influence and country specific elements of voluntary divestitures

2.4.1.1. Industrial Concentration and Competition

As part of the literature on broad industry shocks, industrial concentration features highly in the divestiture research. Researchers have sought to determine what the impact of the level of concentration and competition in an industry has on the likelihood of divestiture activity taking place.

Liebeskind et al. (1996) investigate changes in US industrial concentration during the 1980s to determine whether any changes observed had been influenced by restructuring activity. They examine the median changes US industry concentration for manufacturing and non-manufacturing firms. They find that there is a general increase in industrial concentration in their sample of 695 4-digit SIC industries and more specifically the manufacturing industries observed a higher level of concentration than others. Liebeskind et al. (1996) find that for the sub-sample of firms undertaking divestiture activity, there is a significantly negative association between asset sales and industry concentration. The study observes during the 1980s, large incumbent firms divested assets to smaller firms, resulting in a reduction in the level of industry concentration. They conclude that restructuring activity was not the cause of an increase in industry concentration and the findings go against the notion that the relaxed antitrust regime of

the 1980s and the market for corporate control had increased industry concentration (Adams and Brock, 1988; Blair, 1993).[7] Tan and Yuan (2003) observe that less concentrated industries (those with high levels of competition) are more likely to divest to help soften inter-firm competition. Similarly, Hopkins (1991) finds that firms in industries with low levels of concentration are associated with relatively more divestiture activity.

However, there are a number of researchers that find contrasting evidence. Singhal and Zhu (2011) observe that high levels of industry concentration is associated with a higher likelihood of firms filing for Chapter 11, therefore in order to avoid this, it is likely that with high levels of concentration, firms would be more likely to undertake restructuring in order to resolve financial distress. Chang and Singh (1999) observe that divestiture rates are high in industries where high concentration exists. Powell and Yawson (2005) present evidence that shows that high levels of industry concentration increase the likelihood of divestiture activity taking place, they highlight that when industries are highly concentrated, asset sales are most likely the only possibility left for restructuring, as anti-trust regulators are unlikely to encourage further concentration. The results are consistent with the findings in the merger literature by Andrade and Stafford (2004) who observe that industries with higher levels of concentration experience low levels of takeover activity.

Ilmakunnas and Topi (1999) in their study of the Finnish manufacturing industry, find that the level of divestiture activity is independent of the size of the industry. Hatfield et

[7] For example, Shleifer and Vishny (1992) argued that the rise in the market for corporate control in the 1980s due intensified competition, firms would divest non-core assets and focus on core business industries that they had clear competitive advantage.

al. (1996) also observe that divestiture activity was not a significant driver of change in aggregate industry specialization in their sample. So far, the existing literature has failed to develop a consensus in regards to the influence of industry concentration on the willingness to divest.

Foreign competition is also another external shock that is examined by a number of studies. The existing research highlights that foreign competition can affect the level of sales and profitability of a number of industries (Powell and Yawson, 2005) and as such, high levels of foreign competition is likely to therefore have an impact on the level of divestiture activity. However, the limited research to date in this area does not support the view that foreign competition has any impact on the likelihood of divestiture activity taking place. Powell and Yawson (2005) observe that foreign competition increases the likelihood of takeover activity, but the evidence does not point to this phenomenon applying to divestitures. Similarly, Mitchell and Mulherin (1996) finds that foreign competition does not have a significant impact on the levels of restructuring activity.

2.4.1.2. Industry Growth/Performance

Çolak and Whited (2007) observe that industry growth is a highly significant variable in the decision to restructure. Ilmakunnas and Topi (1999) also investigate the impact of industry growth as a determining factor for divestiture activity and they find that industry growth had a strong negative impact on the likelihood of undertaking a form of restructuring activity. These results suggest that at times of high industry growth, firms are found to be less likely to divest as they are enjoying the benefits of high growth such as increased sales, prosperity and poor rates of growth are masked by strong performance elsewhere in the business. However during times of low growth, firms are more likely to

undertake restructuring activity due to poor performance and this is likely to lead to a negative stock price response to the announcement of divestiture activity due to the fire sale prices at which the assets are sold at. Shleifer and Vishny (1992) highlight that these fire sale prices are generated by firms divesting assets at times when the natural buyers of the assets are also likely to be financial constrained, this results in a discounted price received for the divested asset. The empirical literature confirms this, with Ramey and Shapiro (2001) observing a negative stock price response when aerospace firms divest during poor periods of poor industry conditions, Acharya et al. (2007) examine creditor recoveries at defaulting firms and find industry conditions are a key determinant of the price received for assets that are divested and similarly Borisova et al. (2013) find similar results in their study of US/international divestiture activity. Yet, Powell and Yawson (2005) show that divestiture activity is equally like to occur in high and low growth industries but find that broad industry shocks decrease the likelihood of divestitures taking place.

However, on the other hand, Maksimovic and Phillips (2002) show that after periods of positive demand shocks, firms are more likely to divest business units or assets. Asquith et al. (1994) and Schlingemann et al. (2002) show that divestiture activity is more likely to occur in industries that have a liquid market for corporate assets. This is consistent with the results of Sembenelli and Vannoni (2003), who observe that larger multi-business firms who experience high industry growth will take advantage of such growth by divesting sub business units or assets to focus on core business operations. Kruse (2002) highlights that if firms avoid divesting assets during periods of industry distress, then there is likely to be a positive relationship between industry growth and the likelihood of

asset sales, their empirical result confirm this observing that the likelihood of asset sales is higher during periods of high industry growth rates.

Therefore the results show that there are mixed results on the influence of industry growth on the likelihood of firms undertaking divestment activity.

2.4.1.3. Government influence and country specific elements of voluntary divestitures

The role of the country and the government of that country can have a large bearing on the determinants of divestiture activity. Taxation policy by governments has been found to influence managerial behaviour when taking the decision to engage in corporate restructuring. Constantinidies (1984) and Mauer and Lewellen (1990) highlight the tax advantages available to firms who engage in particular forms of divestiture activity, they outline the tax-timing option that allows firms to separate capital loses (which can be realised straight away) and capital gains (which can be deferred to smooth earnings). Schipper and Smith (1983), Desai and Jain (1999), Hoskisson and Hitt (1990) report that tax changes are a significant driver of divestiture activity. Copeland et al. (1987) and Maydew et al. (1999) highlight that spin-offs in the United States are not subject to tax[8] therefore managers may use this as a mechanism to spur divestiture. Gertner et al. (2002) and Çolak and Whited (2007) highlight that a spin-off is almost always structured as a tax free transaction with no cash flow implications to the parent, spin-off, or shareholders. In particular, when spin-offs of Real Estate Investment Trusts in the US were ruled by the

[8] Section 355 of Internal Revenue Code, specifies firms are not subject to tax if the spin-off element (i) has 80% of outstanding shares owned in the business unit, (ii) the unit must have not been acquired in a taxable transaction in the last five years, (iii) subsidiary must have a stated business purposes (cannot be used for tax avoidance) and; (iv) the spin-off must be operated for at least five years by the parent company (either indirectly or directly). (Schipper and Smith, 1983; Maydew, et al., 1999: p.145)

Internal Revenue Service as being tax free, a number of large spin-offs occurred[9]. However, if the percentage of ownership is less than 80%, then minority business units that are spun-off are liable to be taxed at the rate of capital gains (Maydew et al., 1991).

In the European Union, Veld and Veld-Merkoulova (2009) state that spin-offs do not incur any taxation, as they are merely a re-arrangement of investments that the investor already owns. To date, the member nations of Europe still have yet to fully adopt the directive;[10] however the United Kingdom, Italy, Belgium, Sweden and the Netherlands do treat spin-offs as a tax free transaction. Veld and Veld-Merkoulova (2009) report that spin-offs that receive favourable tax treatment observe higher abnormal returns than those that do not.

However, interestingly, the results of Maydew et al. (1999) find that managers collectively appear not to take advantage of tax benefits of divestiture. They find that managers chasing earnings and cash flow benefits are willing to incur tax costs that are entirely avoidable. Furthermore, they observed that managers take advantage of the premium paid on sales as part of acquisitions, as they exceed the avoidable tax cost.

Tax policy is not the only government influence that may affect the determinants of divestiture activity. Changes in regulation also brought around an increase in the divestiture activity taking place. Shleifer and Vishny (1991, 2003) highlight that a large upswing in anti-trust policy led to a large increase in corporate restructuring activity, especially in the 1980s in the United States and Jensen (1993) attributes a large influence

[9] Goolsbee and Maydew (2002) speculated this would result in a loss of over USD$800million per year to the United States

[10] Such as France and Switzerland. Germany adopts a policy of only taxing spin-offs should more than 20% of shareholders transfer their shares within a period of five years. (Zaman, 1998; Veld and Veld-Merkoulova, 2009)

of restructuring in the 1980s to changes in technology and regulation. In the United Kingdom, Powell and Yawson (2005) observe that deregulation (such as that of the telecommunications and utilities sectors in the 1980s in the UK) increases the likelihood of divestiture activity taking place, they highlight that the observed increase in divestiture activity following deregulation is a by-product of firms removing assets and sections of the firm that are not core to the main activities of the newly privatised firms.

Additional country specific characteristics are likely to impact the level of activity taking place. For example, in the United Kingdom and the United States, there exists common structural themes, for example, both experienced significant stock market booms in the 1980s and the 1990s and both countries experienced similar shocks driven by regulation across telecommunication, utilities and financial industries. Rossi and Volpin (2004) show that both countries have a high degree of shareholder protection, as per La Porta et al. (2000), they argue that a more active market for corporate assets is an outcome of the strong corporate governance regime in both countries. They show that corporate restructuring activity in nations with better accounting standards and strong shareholder protection leads to higher premiums paid in the corporate restructuring transactions. Both the United States and United Kingdom share strong governance and risk characteristics such as rule of law, high shareholder protection, low levels of corruption and high levels of political stability (Kaufmann et al., 2007). Similarly, Jory et al. (2012) show that divestiture activity is more likely in nations with high economic and investment freedom, good regulatory quality, high levels of political stability, absence of violence, low levels of corruption and a favourable rating for rule of law.[11] However, there are a notable

[11] In the merger literature, Moeller and Schlingemann (2005) present the country characteristics for a number of countries around the world and show how they the legal, economic, regulatory and credit positions are relative to other nations. The results show that both the United Kingdom and the United States

differences between the United States and the United Kingdom. The United Kingdom has historically had less stringent anti-trust regulations than those in the United States and this has leads to a greater level of restructuring activity, Moeller and Schlingemann (2005) demonstrate this by highlighting that a greater level of takeover activity in the UK relative to that of the US. Similarly, the United Kingdom has a lower level of protectionism compared with that of the United States (Borisova and Cowan, 2014).[12] Furthermore, Short and Keasey (1999) show that institutional stock ownership in the United Kingdom is significantly higher than the United States, Powell and Yawson (2005) highlight that this may lead to higher level of divestiture activity, as institutional shareholders are generally more receptive to restructuring activity. Afshar et al. (1992) and Hillier et al. (2009) highlight that unlike the United States, where spin-offs and equity carve outs form a large fraction of the divestiture activity taking place, asset disposals (sell-offs) in the United Kingdom represent the predominant form of divestiture activity. Prior research in the United States highlight that the characteristics of that country leads takeover activity, product and labour markets play an important role in restructuring activities (Berger and Ofek, 1999; Denis and Kruse, 2000), however these results do not necessarily apply to the UK. Hillier et al. (2009) highlights that the higher cost of partial control and lack of disciplinary role played by corporate takeover activity means that the role that divestitures play in the United Kingdom is different to that of the United States (Short and Keasey, 1999; Franks et al. 2001).

rate highly and are very comparable across a large number of measures in the study. Both nations have in common: the use the English common law legal system, high levels of shareholder rights, a very high degree of takeover activity (with UK experiencing a greater number of deals relative to GNP), a high level of Economic Freedom as indicated by the World Bank's EFW measure, similarly high credit ratings and finally, designated 'high' on the World Bank development classification.

[12] Buy American Act, 1933, Surface Transportation Assistance Act "buy American" provision and the American Recovery and Reinvestment Act (2009) "buy American" provision to name a few of the most common legislative approaches to creating protectionism.

2.4.1.4. Conclusion

The influence of industry concentration, industry growth, government policies and characteristics of the divesting country have so far been examined in conjunction with whether these industry, macro and countrywide factors are determinants of divestiture activity. The existing evidence highlights that there is no consensus in the literature about the influence of the macro-environment setting on stimulating divestiture activity.

The evidence as outlined in the industry concentration and industry growth/performance sections is mixed, the evidence on industry concentration and competition shows that both high and low levels of industry concentration can lead to the likelihood of divestiture activity taking place. The evidence on foreign competition highlights that it is not a factor that influences the probability of divestiture activity taking place. Similarly, the existing literature outlining the role of the performance of an industry is mixed. Poor industry conditions can lead to fire sale discounts in the sale of an asset poorly performing industries, with a number of studies showing that firms prefer to divest in better industry conditions, however there is also some evidence that suggests that the likelihood of divesting during better industry conditions is low. Finally, Powell and Yawson (2005) show that divestiture activity is equally like to occur in high and low growth industries. There is some evidence that government policy can be a driver of divestiture activity, especially after deregulation and when making particular forms of restructuring tax free. The literature review highlighted a number of country specific elements that affect the likelihood of divestiture activity taking place, with elements such as anti-trust regulation, governance, rule of law and shareholder protection influencing divestiture activity. The large number of studies based in the United States have given researchers a wide array of evidence on the performance of divestitures across a number of contents, including

macro-factors that are specific to the United States. Later in this study, the key focus will be on the United Kingdom, whilst sharing a number of common factors such as strong governance and risk characteristics such as rule of law, high shareholder protection, low levels of corruption and high levels of political stability (Kaufmann et al., 2007), differences do exist as well, as previously outlined, the United Kingdom has less stringent anti-trust regulation, experiences greater level of corporate restructuring, has less protectionism, high levels of institutional ownership, high partial cost of control and a lower disciplinary role played by takeover activity; these will form the basis for examining divestitures in the United Kingdom.

The above theories refocus mainly on the relationship between the firm and with the external environment. They do not completely explain why similar firms (who experience similar economic/strategic environments) will take different approaches when undertaking divestiture activity, therefore the influence of firm specific drivers of divestiture will be examined next to examine the existing research on whether firm specific attributes are a driver of divestiture activity.

2.4.2. Firm specific determinants of divestitures

This section of the chapter examines the firm specific determinants for firms undertaking divestiture activity. Whilst the influence of industry and external factors are likely to determine whether a firm undertakes restructuring activity, there have been a large number of studies that have examined firm level factors that have been found to trigger divestitures. Throughout the literature, key themes have emerged in the divestiture research as to why firms themselves opt to divest assets. Schlingemann et al. (2002) outlines three prominent reasons for divestiture activity, firstly, the 'efficiency

explanation,' that is firms divest in order to reallocate resources to those who can use it most efficiency, secondly, the 'focusing explanation,' firms aim to become more efficient in their operations by reducing the degree of diversification, and thirdly, the 'financing explanation,' to minimise credit constraints facing the firm. Divestiture announcements are newsworthy events that contain informative news about the operations of a firm, as firms are likely to divest funding, operating or strategic objectives, this news is especially more significant when the divestiture activity is initiated by the firm itself. An extensive literature highlights that the wealth effect of asset sales as wealth generating activities (Lang et al., 1995; Lasfer et al. 1996; Alexandrou and Sudarsanam, 2001; Bates, 2005) and these announcement returns vary with the motivation cited for engaging divestiture activity (Lee and Lin, 2008). Therefore the following section examines a number of firm specific determinants and the corresponding wealth effects of different motivations for undertaking corporate restructuring via divestiture activity.

2.4.2.1. Firm Financial Performance and Financial Distress

Financial status of the seller is perhaps one of the key antecedents of divestiture activity. When firms and business units exhibit average or superior performance in their primary business they are less likely to worry about the financial performance of said unit. However, there exists a vast number of studies highlighting that when firms are suffering from poor financial performance, divestiture appears to be a mechanism that firms utilise in order to try and improve their financial condition (Montgomery and Thomas, 1988).

Poor performance is measured generally by accounting measures such as return on equity, leverage ratios or via market measures such as stock price performance. Gole and Hilger (2008) highlight that if a particular unit is underperforming in a business, then such

business unit is not a good candidate for future investment. Failure to invest in a particular business unit is likely to lead to a downward spiral of poor performance, lack of investment and subsequently continued poor performance in the future. Gole and Hilger (2008) point out that unless such unit is realigned with the core operations of the firm, then it is likely to continue wasting managerial and financial resources.

Such a downward spiral in performance can signal the need to alter the corporate portfolio of business assets (Hoskisson and Turk, 1990). The financing hypothesis states that firms experiencing higher levels of financial distress will realise larger gains from the divestiture process (Cooney et al., 2004). In order to deal with weak financial performance, firms may opt to undertake divestment activity to correct. Harrigan (1981) states that long term financial performance decline or extremely poor performance by a business unit may lead it to consider divestment as a means of adjustment.

Kaiser and Stouraitis (2001) outline three principal areas of wealth maximization in the financing hypothesis. (i) Divesting assets with poor operating performance will eliminate the destruction of parent firm performance. (Meyer, et al., 1992), (ii) As a method of raising cash, when other finance options are not available (Lang, et al., 1995) and (iii), as a method to help increase the probability of parent firm survival in times of financial distress, by reducing leverage for firms experiencing cash flow problems (Afshar, et al., 1995).

Firms who are distressed may be restricted in the ways in which they are able to raise cheap funding. Lang et al. (1994) argue that asset sales are a relatively quick financing mechanism where access to external financing capital is limited. The financing hypothesis allows firms to invest in profit maximizing projects, which might be foregone

due to poor access to external sources of funding. Dittmar and Shivdasani (2003) also support the financing hypothesis, observing an improvement in investment efficiency after undertaking divestitures. They observe when financial constraints are relaxed by the funds available from divestiture, this results in a more efficient investment policy.

Chen and Guo (2005) in their study into why firms choose to divest business units, find support for firms who sell-off assets to relax any credit constraints, such as high leverage ratios or low free cash flow levels. They observe prior to the announcement of divestiture activity, firms are observed to be suffering from signs of financial distress.

Alexander et al. (1984) find that divestitures by firms in financial distress tend to be proceeded by a period of poor market performance. Similarly, Jain (1985) finds that sellers appeared to be poor performers prior to divestiture. Before the sell-off activity, Jain (1985) finds a decline in share price that is statistically significant on average of -10.8% for the period t_{-360} to t_{-11}. They convey therefore that there is at least one action that is taken by managers to ensure profit maximization for shareholders. This is confirmed by Hillier et al. (2009), who observe that divestitures are preceded by prior poor performance but it is the actions of managers voluntarily divesting assets that leads to performance improvements. Asquith (1983) and Malatesta (1983) find similar results in acquisition studies.[13]

The event studies in this area highlight that the market positively responds to the announcement of divestiture activity by distressed firms, with the key focus across the studies on the abnormal returns attributable to divesting firm shareholders. Afshar et al.

[13] CARs of -14.1% between t_{-480} and t_{-20}, and unsuccessful targets earn -10.5% over the same period. Similarly, Malatesta (1983) reports that the acquired firms exhibited CARs of -8.5% over a period covering 24 months prior to the event to 4 months prior to the event.

(1992) observes distressed firms are associated with higher excess returns on announcement of an asset sale. They find an event day mean excess return of 2.05% for firms classed as financially distressed, versus 0.59% for those that are healthy. Similarly, Lasfer et al. (1996) observed abnormal returns of 2.12% to distressed firms, versus 0.49% for firms classified as non-distressed. Lee and Lin (2008) show that divesting assets has a positive impact on the abnormal returns firms experience due to an increase in the probability of survival for those firms suffering from distress, verses those firms than do not restructure in order to survive. Lee and Lin (2008) find in the short term a significantly positive market reaction to the divestiture announcement in their sample. Bates (2005) shows that there are higher abnormal returns experienced by sellers that are divesting in order to mitigate or reduce the costs of financial distress.

On the other hand, Miles and Rosenfeld (1983) and Sembenelli and Vannoni (2003) find that a large number of divestitures take place after a period of positive abnormal returns (Brauer, 2006). This is consistent with Alexander, et al. (1984) and Klein (1986) who find that firms who undertake divestment activity in periods where the parent firm is not under financial distress, generate greater wealth gains on a comparative basis. Additionally, Lee and Lin (2008) highlight that over the long term; financially distressed firms experience negative abnormal returns, in contrast to the short term positive abnormal returns.

Additional studies by Desai and Jain (1999) and Miles and Rosenfeld (1983) have found no relationship between prior divestiture financial distress and observed abnormal returns.

2.4.2.2. Debt reduction

Closely related to the previous section examining financial distress, a number of studies have examined the impact of high levels of leverage motivating firms to undertake divestiture. Hillier, et al. (2009) find that firms undertaking divestment activity generally exhibit higher level of leverage and lower levels of liquidity, they observe that the high debt ratios are experienced one year in advance to any asset sale.

Lasfer et al. (1996) highlight that the proceeds from the divestiture of assets can be used to service debt obligations, which in turn reduces the cost of financial distress. Similarly, Ofek (1993) show that firms with high levels of leverage respond more quickly to a decline in stock price performance by selling off assets to repay debt. Gadad and Thomas (2005) find in their cross-sectional analysis, that the reduction in leverage is the only significant factor leading to a corresponding increase in shareholder wealth. They attribute this to the benefits of increased liquidity via reductions in levels of debt.

Lang et al. (1994) also account for firms that report poor performance and/or a high level of leverage, are more likely to divest. In a recession, the frequency of divestiture activity is expected to rise steeply; Coyne and Wright (1982) find this occurrence in the United Kingdom in the early part of the 1980s.

Empirically, Brown et al. (1994) find lower returns when proceeds from asset sales are used to reduce leverage compared to those firms that retain the proceeds. They find, consistent with the results of previous studies such as Diamond (1993) that creditors heavily influence financially distressed firms and are likely to receive proceeds of the payout to suit their own interest. Brown et al. (1994) find a CAR of -1.63% for those firms that cite debt repayment as a purpose for divesting versus a gain of 1.87% for

retaining firms over the two day. Similarly Nguyen (2013) find CARs for firms repaying debt of 0.45% versus 0.07% for those firms that don't use proceeds to pay down debt.

Empirically, Kaiser and Stouraitis (2001) observe that divestitures that are undertaken to reduce leverage and remove loss making assets contribute to positive abnormal returns. For those firms that do not cite any motivations, such as desire to raise cash or as a method to reshuffle assets, the abnormal returns are insignificantly different from zero.

Bates (2005) observes greater statistically significant cumulative abnormal returns to those firms that announce a distribution of the proceeds to debt over retaining the proceeds. They find that shareholders react more favourably to payout to debt, over payout as equity or retaining the proceeds.[14] Bates (2005) attributes the gain not just to a reduction in managerial discretion but an improvement in financial slack and/or a possible reduction in cost associated with financial distress. Bates (2005) concludes that the impact of agency cost of debt plays a strong role in determining the capital structure of a firm.

Afshar et al. (1992) find a positive response to the announcement of lowering levels of leverage as a motivation for divestiture activity, attributing to the positive action by managers taking action to avoid the possibility of bankruptcy.

2.4.2.3. Liquidity

The liquidity of the market for corporate assets plays an important role in determining whether a firm engages in value maximizing divestiture activity.

[14] Bates (2005) finds that for firms that retain proceeds, a positive correlation exists between a firm's growth opportunities and post-sale capital investment, however this investment appears at rates above industry-average

Shleifer and Vishny (1992) derived a model based on firm liquidity and hypothesise that the extent of firm liquidity influences the price paid for a divested asset. If a highly distressed or leveraged firm has been forced to divest its assets, then the influence of other firms in the market is found to have a significant impact on the price paid for the asset being divested. They find that if other firms in the industry are distressed, then the divesting firm will be forced to divest assets outside their core industry, where buyers will not be willing to fund or pay the full economic value for the asset. As such, the financial condition of the industry in which the divesting firm belongs is likely to have an influence on whether firms undertake divestiture activity.

Industrial evidence from Pulvino (1998), who investigates the sale and purchase of used aircraft between airlines and leasing firms, finds that those firms suffering from financial distress are paid lower prices for their assets compared to those firms that are more highly liquid/less distressed. Consistent with the evidence of Shleifer and Vishny (1992), Pulvino (1998) finds that during industry recessions the price paid for the assets are even lower, as the aircraft seller is forced to sell to firms outside of the aviation industry. Kim (1998) finds similar results in the oil drilling industry, as well as Brown (2000) in real estate investment trusts and Kruse (2002) in general corporate assets.

Schlingemann et al. (2002) show that in markets that have experienced high levels of merger and acquisition activity, firms are more likely to sell corporate assets. They use the volume of merger and acquisition transactions in a market as a proxy to measure the level of liquidity. They observe that those firms that are more highly liquid are more likely to divest assets. Schlingemann, et al. (2002) control for segment financial performance and continue to observe that highly liquid assets are more likely to be

divested. This highlights the importance of liquidity to firm managers as a driver for divestiture activity.

Lang et al. (1995) hypothesise that firms undertake divestiture activity to obtain liquidity after a period of poor performance. Officer (2007) observes when analysing the impact of acquisitions of divested assets by non-listed firms, a discount of around 15-30% is observed on the sale price of the asset. They find that parent firms that are have less liquidity available will sell their asset at a significant discount. The study also highlights when liquidity is very tight, then the discount on the sold asset is significantly larger (Officer, 2007).

2.4.2.4. Focus and Poor Fit

Goold et al. (1994) and Campbell et al. (1995) put forward the view that the existence of a multi-business enterprise can be justified if each business unit adds value to the overall corporation and that the value generated is greater than the cost of bringing units together, no matter what line of business they operate in. Additionally, they also specify that the parent firm needs to be able to add greater value to a business unit than any other possible owner. Therefore, the authors indicate that if any of the above three conditions are not met, then a firm may opt to discard a business unit or asset due to the lack of "fit" with core operations in the parent firm. Milgrom and Roberts (1992) define a complementary business resource (otherwise known as a synergistic resource) as assets or activities that are complementary if the marginal return of an activity increases in the level of the other activity. Duhaime and Grant (1984) find that those businesses units that display a high level of engagement with other firm business units are less likely to be divested than those that do not. However, where no such augmentation exists, many studies have used the

term ‘negative synergies’ which suggests an absence of synergy and a possible drain on the operations of a particular firm (Hanson and Song, 2003) and may be sold off to focus on core assets (John and Ofek, 1995). However, it is important to note that a change at the helm of the firm is likely to motivate divestiture activity to take place, especially when there are units that are not core to the operations of a firm or have a poor fit into the organization. Shimizu and Hitt (2005) highlight that a change in the CEO or director of a firm is likely to bring fresh perspectives, ideas and increase the likelihood of strategic change taking place. A new CEO is more likely to overcome inertia that may have prevented past CEOs from divesting business units that had a poor fit, this is especially relevant when these refocusing activities may result in the admission of past mistakes (Berger and Ofek, 1999). A number of studies have found a change in CEO increases the likelihood of divestiture activity taking place. Weisbach (1995) finds that newly appointed CEOs are more willing to divest poorly performing assets than previous incumbents, Berger and Ofek (1999) and Denis and Shome (2005) find 22% of corporate refocusing programmes are preceded by a change in CEO,[15] Hillier et al. (2009) observes a significantly higher level of CEO turnover for those firms that undertake divestiture activity. Ravenscraft and Scherer (1991) also show that sell-off activity is more likely following a change in CEO, observing that units acquired in past conglomerate mergers, which are mostly in unrelated business segments, are more likely to be divested than original units.[16]

[15] Berger and Ofek (1999) finds that this compared to 7% in a sample of control firms that do not undertake divestiture activity. Berger and Ofek define a change in CEO if the CEO for a firm has changed in the 12 months prior to the announcement of divestiture activity, whereas Denis and Shome (2005) define CEO change over a 24 month period prior to the divestiture, this results in an annual rate of CEO change of 11% resulting in asset sale activity.

[16] Overall, the results are consistent with Boot’s (1992) argument than managerial inertia driven by the reluctance to admit to past mistakes leads to the observance of a higher likelihood of divestiture activity from a CEO change.

Refocusing entails a contraction in the scope of operations with a renewed concentration on the firm's existing core business (Markides, 1992). John and Ofek (1995) hypothesized that there is a positive association between the level of abnormal returns experienced and the relatedness of an asset that is being divested. The lower the level of business unit interdependency, the higher the likelihood of business divestiture occurring. John and Ofek (1995) argued that increased focus was a key antecedent of business divestiture for two principle reasons; (i) the disposal via divestiture of assets providing negative synergies to the parent business would allow a firm to benefit from the removal of the inefficient business unit or asset (i.e. allows a firm to refocus) and (ii), wealth is generated from the disposal of a business unit which may fit better with the new buyer, than the existing parent firm.

The advocates of this theory indicate that low level of business interdependency or low levels of complementary fit, are likely to result in managers of the corporation being unable to monitor and control all of the business units equally and effectively (Duhaime and Grant, 1984). Kaiser and Stouraitis (2001) find that such characteristics are likely to impact communication between business units and between managers and business units. Unrelated businesses are likely to require highly diverse understanding and ability of all their business areas which most managers may not possess (Johnson, 1996; Steiner, 1997; Byerly, et al., 2003).

Veld and Veld-Merkoulova (2009) split the current focus literature into two subsets;

(i) Divestiture announcements where it is carried out in order to narrow business scope or to go ‘back to basics’ (Hite and Owers, 1983; Johnson, et al., 1996).

(ii) Focus increasing spin-offs as those spin-offs that are in a different industry from the business unit that is divested (Daley et al., 1997) or use alternative measures such as a reduction the Herfindahl index to measure a decrease the number industry segments that a firm operates in.[17]

Maksimovic and Phillips (2002) find consistent results that show diversified conglomerates have a lower level of firm productivity than that of specialised, single business firms. Toms and Wright (2002) and Dittmar and Shivdasani (2003) show that divestitures are associated with a highly significant reduction in the diversification discount. The decision not to divest was seen as a process that reduced the comparative advantage of any firm, especially conglomerates with multiple operating activities (Markides, 1995).

Empirically the results are generally consistent, despite different methodological approaches. Chen and Guo (2005) find evidence to support the fit hypothesis. They find that highly diversified firms are more likely to divest business units when suffering from low operating efficiency. Comment and Jarrell (1995) find a positive relation between an increase in focus and share price returns. They put forward the view that firms failed to take advantage of any benefits of diversification and they document a trend in the 1980s of a move away from value reducing acquisition activity and a drive towards corporate focus. They document a positive share price reaction attributing these to the benefits of a reduction or removal in negative synergies.

[17] Herfindahl index is constructed by summing the square of the ratio of segment sales to total sales across all segments.

Studies by Daley et al. (1997) and Krishnaswami and Subramaniam (1999) also find that industrial focus increasing divestitures has a positive impact on share price returns. Kaiser and Stouratis (2001) find that focus increasing divestitures result in 1.6% mean abnormal announcement day return and insignificant mean abnormal returns for those firms that do not increase focus of 0.5%. Veld and Veld-Merkoulova (2009) also find significant abnormal returns of around 1.34% for spin-offs that report an improvement in industrial focus as a driver of divestment activity.

This evidence however is contrasted by Alexandrou and Sudarsanam (2001), who find a mean CAR of 0.53% for non-focusing sell-offs and 0.22% for focusing sell-offs. They find that the non-focusing sell-offs, in their sample of 1,800 sell-offs, appear to generate higher abnormal returns than the refocusing sell-offs. However, it has to be noted that the results were insignificant and the authors themselves urged caution in reporting the results. They attributed this to their own interpretation of the data provided in Acquisitions Monthly publication.

Desai and Jain (1999) and Vijh (1999) empirically demonstrate that the long run abnormal returns for focus increasing divestitures are much greater than those for non-focus increasing divestitures.

2.4.2.5. Firm Size and Relative Asset Size

The size of a firm has been hypothesised by several authors as an influencing factor in abnormal returns experienced (Hamilton and Chow, 1993; Duhaime and Grant, 1984). The hypothesis is based on the notion that the larger the size of the firm, the greater the economic influence of any restructuring activity that is undertaken, and hence the greater

impact on abnormal returns observed. Bergh (1997) finds in an early sample that the size[18] of any acquisition is negatively correlated with the likelihood of divestiture. Larger business units that are acquired are more likely to be divested in the future.

A direct positive influence of firm size in relation to industry counterparts is found by Sembenelli and Vannoni (2003) as an antecedent of divestiture. The authors hypothesise that the results may be a proxy for managerial ability, finding that firms that are managed more efficiently experience the ability to enter and exit growing or declining industries much quicker than smaller firms. This is contested by Chang (1996) who found that large firms undertake divestiture less often that smaller firms when they are faced with a similar negative demand shock.

Alternatively, Sembenelli and Vannoni (2003) propose an additional explanation of firm size being a driver of divestiture is due to their sample period, which was one where larger firms were commonly perceived to follow so-called 'core business strategies' in response to the desires of the financial markets in their observation period.

These results appear logical, as the financial benefit of divesting a large division, would be expected to benefit significantly greater benefits than the divestment of a smaller division. However, some authors believe it is not the absolute size of the firm, but the relative size of the to the divesting company's firm size.

Klein (1986) empirically analyse the size hypothesis and finds that the relative size of a sell-off to the firm market capitalization is found to be positive to the announcement day returns. They find that larger firms exhibit larger gains to shareholders with a significant

[18] Size is measured by the number of employees in this study

positive announcement return of 2.53% for voluntary divestitures between 10%-50% of total firm market capitalization and 8.09% for firms with >50% market capitalization. Relatively smaller divestitures[19] exhibit insignificant announcement returns of 0.54%

Afshar et al. (1992) find a direct significant positive relationship with the relative size of divestment and the level of abnormal return experienced. This is consistent with Haynes et al. (1997) who found in their UK study, a positive relationship between firm size and the propensity to divest. However, Cao et al. (2008) find this relationship only applies for European firms in their study.

In their test of the relative size hypothesis, Hearth and Zaima (1984) find a positive association between relative divestiture size and returns. Benou et al. (2008) find that the relative size of the divestment to the divestor has a significant positive impact of share price return for their sample of high-tech divestitures.

However, this evidence is contrasted by that of Shimizu and Hitt (2005) who both show that as a portion of overall firm size, relative smallness is a major characteristic of divested business units. Chang and Singh (1999) find that relative size of the divested asset is found to be insignificant in the divestiture decision making process.

2.4.2.6. Information Asymmetry and Agency Issues

Information asymmetry has also been suggested as a possible driver of divestiture activity and the event study returns experienced by divesting firms.

[19] Assets or business units that are divested that make up less than 10% of the overall firm market capitalization.

Nanda and Narayanan (1999) attempt to understand why firms with multiple segments may be prone to undervaluation. They show that the financial market will only be able to observe cash flows from the whole group or parent company, but unable to view individual business units or segments. In the absence of such information Nanda and Narayanan (1999) hypothesised that misvaluations will occur.

The presence of agency conflicts has been a strong driver of research in the finance literature. Many of the previous studies have focused on factors that have an economic underpinning; however there have been a number of publications that examine the decision to divest business units or assets based on the 'principal-agent problem.' Agency and control-based explanations of corporate control are based on the information asymmetry between shareholders (principal) and managers (agent).

Myers and Majluf (1984) argued that the market is at a disadvantage in assessing firm value compared to managers from inside the firm. Shareholders are unable to monitor and control every decision that is taken by those senior managers who are running the firm; therefore this information asymmetry leads them to rely on other proxies to determine whether managers are making profit maximizing decisions.[20] Based on work on the wealth transfer hypothesis (Galai and Masulis, 1976), any proceeds that are raised through corporate restructuring will be closely observed by the market as an indicator of agency conflict. By divesting a business unit or asset, it infers a reduction in the level of firm diversification and subsequently, there is a transfer of wealth from the debtholders of the firm to the equity holders of the firm.[21]

[20] Roll (1986) highlighted (in his paper on mergers and acquisitions) that managers have an overbearing presumption about their abilities; therefore relying on self-regulation may not be in the interest of shareholders.
[21] Due to the fewer assets that debtholders now have a claim on and the increase in variability of returns.

Jensen (1986) and his free cash flow hypothesis is one of the often cited papers in corporate finance. This paper postulates that free cash flow[22] available to managers may allow them to benefit from prestige and power in their roles. Excess cash flow that has not been repaid to shareholders may be wasted on less profitable investment projects; such as projects below the cost of capital, empire building, lavish offices for management use or simply not being used by placing the cash in the bank. Jensen (1986) suggests restricting manager's ability to squander free cash flow should reduce the incentive to invest in projects below cost of capital by returning cash to shareholders via dividends, repurchases or via debt repayments.

Jensen (1986) advocates debt as a 'control' mechanism for managers, forcing them to pay interest payments to service the debt (which is contractually binding) and more importantly the debt has an effective motivating force to make such organisations more efficient due to the high costs of financial distress.

Datta et al. (2003) find that the monitoring effect of debt is also an important source of value maximization for firm shareholders. When debtholders monitor the operations of the parent company, Datta et al. (2003) found that managers are less likely to misallocate finances and destroy value. They empirically found when a parent company divests asset(s); their stock returns are significant and positively associated with private monitoring by external debtholders. By creating firm policies that favour payout policy over retaining divestiture income, Mulherin and Boone (2000) concludes that such activity creates wealth by reducing the agency conflict. Ofek (1993) finds that highly leveraged firms are more likely to respond quickly to short-term financial distress. This

[22] Defined by Jensen (1986:p323) as "Free cash flow is cash flow in excess of that required to fund all projects that have positive net present values when discounted at the relevant cost of capital."

suggests that the discipline enforced by the debtholders acts as a driver for managerial wealth maximizing decision making.

A number of studies have examined how the method of payment used in M&A transactions can reveal the existence of informational asymmetries between the two parties in the transaction. The theoretical work by Myers and Majluf (1984) implies that where asymmetric information exists between two parties, issues of adverse selection arise relating to the decision to use equity as a means of payment. In their model, Myers and Majluf (1984) highlight that managers have a better understanding about firm value than those individuals outside of the firm, therefore using this private information, they have an incentive to issue equity, especially when this private information indicates that their firm's shares are overvalued. Research by Hansen (1987) and Travlos (1987) suggests that when a bidder undertakes merger activity with equity, it sends a negative signal to the market, as it suggests that the bidder is paying for the transaction with overvalued equity, therefore signalling private internal information to the market that it is a low quality (Berkovitch and Narayanan, 1990). The empirical evidence shows that bidding firms that make use of equity as a method of payment for a merger transactions experience lower stockholder returns relative to those buyers using cash (Franks et al., 1988; Servaes, 1991; Alexandridis et al, 2010). Cash as a method of payment by the bidder is therefore considered to signal bidder undervaluation and be an indicator of quality in a merger transaction. However, in the divestiture research, the findings contrast to the M&A literature. In a divestiture transaction, each party holds important, private information. A divestor has detailed knowledge about the intrinsic quality of the asset that is material to its value, this private information is not readily available to potential buyers and similarly, each potential buyer has private information about the value it can generate

by merging the divested asset with its existing operations. Slovin et al. (2005) find that, unlike in M&A, if a divestor has favourable information about the prospects of the divested asset (such as future synergies or other benefits with the buyer) then in contrast with the previously highlighted adverse selection problem, equity as a payment mechanism for the asset may be beneficial for both the buyer and the seller of the asset. Slovin et al. (2005) show that equity based payments of divested assets generate significantly greater increases in shareholder wealth than cash based asset sales. They show that equity based transactions signal good prospects both to the divestor and the buyer of the asset[23] with gains of 3% attributable to the divestors and 10% to the buyers. This compares with gains of 1.9% to divestors and no significant returns to buyers in cash based transactions. Hege et al. (2009) observe similar results when examining cash and equity based divestiture transactions and Cao and Madura (2011) similarly find that asymmetric information issues are lowered when equity is used as a payment method. They empirically show that the choice of equity is more likely to be utilised as a method of payment in a divestiture transaction when firms have greater growth prospects and when there is more competition amongst bidders for the divested assets. Therefore, the results challenge the widely held view that funding transactions with equity results that an adverse selection problems. Divestiture transactions funded with equity convey valuable positive private information about the relevant asset to the market over cash based transactions (Slovin et al., 2005).

Agency concerns also arise from the use of the proceeds by firm managers. Tehranian et al. (1987) and Clubb and Stouraitis (2002) hypothesise that the use of proceeds from

[23] The divestor gains from the resultant synergies/positive news with a future increase in share price and the buyer gains from a positive contribution to firm value.

divestiture activity can act as a proxy for the presence of agency costs. Tehranian et al. (1987) find that firm share price reaction is influenced heavily by those managers than minimise agency costs by pursuing firm value maximisation. Similarly, Lang et al. (1995) found that parent firms who use the proceeds from any form of divestment activity to pay back shareholders experience a significant and positive share price reaction due to the reduction in any possible agency conflict between firm shareholders and managers. Conversely, they observed that those firms that retain proceeds for expansion experience a significantly negative share price reaction as the market discounts the agency cost of managerial discretion from the value of the transaction. Further evidence from Kaiser and Stouraitis (2001) found that the presence of agency costs have a significant impact on divestitures. They observed that retaining the proceeds from any divestment, and using such proceeds for future expansion had a negative impact on share price response in the 1980s. However, interestingly, they find this effect disappeared during the early 1990s. Lee and Lin (2008) find evidence of a greater market reaction to those firms that opt to pay down debt (and reduce agency costs of managerial discretion) compared to those firms that opt to retain proceeds for future investment purposes.

Consistent with the agency costs argument, Bates (2005) shows that the asymmetric shareholder wealth reaction to those firms that retain the proceeds for investment and those that utilise the proceeds to pay down debt is concentrated in firms with high levels of excess investment activity, firms with high levels of debt and those with lower levels of growth opportunities. However, Bates (2005) argues that the previous studies examining information asymmetry fail to incorporate the full economic impact of the divestiture. Bates suggests that at the date of announcement, it is difficult to ascertain how the proceeds of the divestiture are going to be distributed, this is only known in the

subsequent period after divestiture activity takes place. Lee and Lin (2008) in their study on the use of proceeds observe that agency concerns dominate the market reaction to divestiture announcements. Those firms that retain the proceeds for future investment purposes experience significantly lower shareholder returns compared to those firms that intend to use the proceeds to retire debt. Lee and Lin (2008) highlight that the asymmetric response in the market reaction is attributable to the increasing agency costs of managerial discretion for those firms retaining the proceeds for future investment and a decrease in the agency costs of debt (and a subsequent reduction in the cost of financial distress) among debt reduction divestors.

2.5. Additional Event Study Gains Related to Divestiture Activity

2.5.1. Impact of transaction price disclosure

Prior divestiture research has revealed that the disclosure of the transaction price has a significant impact on shareholder wealth. This helps to alleviate the asymmetric information issue between shareholders and managers.

Generally, assets are sold at their true economic value; therefore the value of the transaction can allow the market to infer information about such asset. However, where the asset cannot be fully observed, such as a form of divestiture which yields no required public disclosure, such as a sell-off, then the actual true economic value of this asset cannot be known and the problems of asymmetric information cannot be mitigated. Without a transaction price, Benou et al. (2008) highlights that this could signal to buyers that the divested assets are not very valuable and hence asymmetric information issues arise. Where the asset or the business unit is accompanied with a transaction price, then this allows the market to observe a true value of the divested unit.

Klein (1986) finds positive and significant abnormal returns if the announcement of the sell-off is accompanied with the transaction price. For those firms who do not disclose the price of the transaction, they experience announcement returns that are not significantly different from zero. Firms that disclose the transaction price on the date on the announcement of the divestiture, experience a positive significant abnormal return of 2.47%, versus a 0.02% for those that do not disclose price at the announcement date.

Sicherman and Pettway (1992) similarly observe disclosure of the price of the asset leads to a greater abnormal return to the seller of the asset. For divestiture announcements with the price of the transaction disclosed, they observe an average excess return of 1.48%,

compared to 0.31% for non-disclosing firms. They conclude that disclosing the price of the transaction is a significant factor in reducing the asymmetric information issue between managers and shareholders. Where the transaction price of the unit is not disclosed, then this leads the uniformed buyer to rationally believe that the non-disclosure is due to unfavourable information being hidden from the buyer about the assets being sold or from the shareholders of the divesting firm.

2.5.2. Transaction deal completeness

Most studies in corporate restructuring focus on the actual announcement date of the divestiture. However, Hearth and Zaima (1986) advise that the announcement date is only one of two particularly important events during the actual process. The first of those is the announcement of intention to divest and the second is the announcement of the completion of the deal or abandonment of the deal.

Previous research has uncovered an influence on whether the divestiture transaction is complete or if the announcement is simply an intention to divest. Asymmetric information between firm managers and the market creates uncertainty as to whether the deal will go ahead or not. If managers announce the intention to engage in corporate restructuring via divestiture, then there is the possibility of the event being called off or a change in the terms.

Empirical studies find that the market responds more favourably to announcements that disclosure a completion of the divestiture deal compared to those sell-offs that do not (Hearth and Zaima, 1986; Klein, 1986; Afshar et al., 1992).

Examining this, Afshar et al. (1992) find a greater abnormal return of 1.45% at t_0 for those firms that indicate that the divestiture transaction is a completed deal. Those firm that

fail to disclose a completed deal, experience abnormal returns on the announcement day of only 0.22%. The results complement those of Hearth and Zaima (1992), who find that if the first announcement of a sell-off defines it to be a completed transaction, this reduces the uncertainty surrounding the transaction and leads to a more favourable market reaction.

However, research by Lasfer, et al. (1996) finds that the announcement of the deal completion has no significant impact on announcement returns for their sample of firms in the United Kingdom that announce deal completion and those that do not.

The disclosure of divestiture completion appears to have mixed evidence in the existing empirical studies. The influence of deal completion and the availability of data may have prevented more studies in the area being released.

2.5.3. Value to the acquiring firm

Whether an asset or business unit fits, or in the case of divesting parent firm doesn't fit, is a highly researched area in the literature as a determinant of divestiture activity. Additional literature has also examined the impact of the business unit being divested on the buying or acquiring firm.

Jain (1985) proposes that buyers of a divested business unit are similar in nature to merger activity. On average, in the merger and acquisitions literature, it has been found that acquiring firms do not gain (Goergen and Renneboog, 2004). Jain (1985) studies the impact of the divestiture announcement on both divestors (sellers) and buyers of the asset(s). They find significant excess returns to both buyers and sellers; however they observe that the announcement returns are greater for sellers. Hite et al. (1987) find announcement day returns of 1.66% for those firms divesting assets and 0.83% for

acquiring firms. John and Ofek (1995) find similar results in their study; they find greater announcement returns to the firms that are selling the business unit or asset, compared to a buying firm.

Zaima and Hearth (1985) find small wealth gains to buying firm shareholders, however the result was not found to be statistically significant; a result that was consistent with Sicherman and Pettway (1992) who observed positive but not statistically significant returns. Rosenfeld (1984) found statistically significant announcement returns in their study, however the results are somewhat weakened by the small sample of only thirty firms that had been used in the study.

2.5.4. Impact of Involuntary Divestment

Divestiture may occur voluntarily by a parent company or involuntarily via government regulators or agents. In the United States, Section 7 of the Clayton Act prevents the acquisition of a competing firm if the overall impact of the acquisition will result in reduced competition (Alexander et al., 1984). Similar rules exist in the United Kingdom via the Enterprise Act (2002) and European Commission Article 81 (anti-competitive agreements) and Article 82 (abuse of dominant position). As such, firms may be forced by government regulators to divest a particular business unit, in order to satisfy competition law or simply due to firm difficulty through liquidation or receivership (Menon, et al. 2004).

Early research in this area found that involuntary divestitures were associated with either significant negative abnormal returns (Boudreaux, 1975; Hite and Owers, 1983) or no significant abnormal returns (Ellert, 1976). This is in comparison with voluntary divestitures where Boudreaux (1975) and Hite and Owers (1983) find significant

abnormal returns on announcement of a divestment. The negative abnormal returns that are realised on involuntary divestitures may be in part due to the regulatory body's focus on market competition, rather than the wealth maximization that a firm may have as their primary business motivation. Indeed, Boudreaux (1975: pg. 619-620) states that "if the antitrust authorities have done their jobs at all well, they are probably forcing the divestment of profitable assets." Boudreaux (1975) finds that involuntary divestitures have negative abnormal returns three months before the anti-trust complaint but no negative abnormal returns on the day of the judgement. Similarly, Ellert (1976) find no abnormal returns, which may be attributable to the market acquiring leakages of a possible antitrust complaint.

2.6. Conclusion

This focus of this chapter is to provide an overview of the existing research on corporate divestitures.

Section 2.2. provided an overview of the corporate restructuring literature, highlighting that restructuring is a concept that allows firms to change the composition of their organisation in order to suit their own corporate strategy. Section 2.3. examined the main forms of divestiture formations: sell-offs, equity carve outs, spin-offs, tracking stocks and the empirical evidence relating to the wealth implications of these concepts. Section 2.4. then examined the determinants of divestiture activity and event study response to these determinants. Section 2.5. examined the additional event study gains related to divestiture activity.

Existing research on divestitures highlights that, on average, there is a positive stock price response to the announcement of divestiture activity (Klein, 1986; Lang et al. 1995; Krishnaswami and Subramaniam, 1999; Hillier et al. 2009). Abnormal returns are also found to vary depending on the motivation of the divestiture. Firm specific determinants of divestiture activity were examined from Section 2.5.6. onwards, alongside the respective abnormal returns that divestors experience when announcing their intention to divest assets.

However, it has been noted from examining the literature that there still remains many areas that have not been researched in the existing divestiture literature and those areas that have been under researched. Therefore, the literature review in this chapter has provided the basis for the empirical testing in chapters 4, 5 and 6 of this thesis.

Chapter 3: Data and Methodology

3.1. Introduction

The data and methodology chapter provides an overview of the sample construction, key data, variables and an overview of the main methodology that will be examined throughout this thesis.

The remainder of the chapter is structured as: Section 3.2. provides an overview of the sample construction. Section 3.3. defines the key variables used throughout the thesis. Section 3.4. provides some descriptive statistics relating to the sample. Section 3.5. outlines the motivation for undertaking divestiture. Finally, section 3.6 outlines a brief summary of the event study methodology.

3.2. Sample Construction

The original sample of divestiture transactions was obtained from Thomson Reuters' ONE Banker[24] using the mergers and acquisitions module.

To be included in the original sample, the following criteria had been placed on the data: the transaction had to be defined as a divestiture and must have been publicly announced via The London Stock Exchange's Regulatory News Service, the media, corporate statements or pricing wires. The dates of the announcements had to have been between 1st January 1988 and 31st December 2009. The sample parent company divesting the asset had to be a publicly listed firm[25] based in the United Kingdom and the divestiture had to be voluntary. [26]

The initial sample information contained the announcement date, effective date of the transaction, ultimate target parent (parent company) name, SEDOL code (Stock Exchange Daily Official List) and a synopsis of the information provided to the Regulatory News Service. Additionally, details relating to the asset or firm being divested and the buyer of the asset were also obtained in the form of a press release attached to most of the announcements.

[24] Thomson Reuters ONE Banker has since been renamed Thomson ONE during the period of writing the thesis.

[25] Privatisations of government enterprises are not included in the sample. At the initial sample construction phase, a restriction was placed on the sample that required the parent divestor to be listed on the FTSE All Share index and as a robustness check, a restriction was placed on the SIC classification to prevent government related SIC codes from being included (8888: Foreign governments; 9100-9990: Public administration).

[26] The purpose of this study was to examine the impact of voluntary divestiture activity only, therefore the following steps were taken in order to omit any involuntary or anti-trust driven activity from the sample. (i), Utility and financial firms represented by SICs 4900-4999 and 6000-6999, respectively were excluded from the sample and, (ii), a search in the deal synopsis was undertaken for keywords such as "anti-trust," "forced," "competition commission," "monopolies and merger commission," "office of fair trading," "government" and "regulatory." Any deal synopsis that highlighted in some way that the deal was anything other than voluntary was excluded from the sample.

The initial sample provided 16,684 announcements of divestiture activity; this was deemed a sufficiently large sample to use as a basis of divestiture evaluation. The initial sample was checked for accuracy by taking a random sample of 5% of the announcements. This check for accuracy was completed by utilizing Nexus UK's historical newspaper store. Each of the announcements had the event date checked and details of the parent and business unit or asset being divested evaluated for accuracy. No adjustments were needed from the sample of announcement dates checked. Strong (1992) highlights the accuracy of the reported announcement dates to be important due to the central focus that the announcement dates take in event studies in corporate finance. In order to evaluate the wealth effects of the divesting firms in the sample, the initial sample then had further constraints placed upon it:

(i) The firm had to be in the FTSE 100, FTSE 250 or the FTSE SmallCap Index, all of these make up the FTSE All Share index for the period of at least 180 days before the announcement date. The firms were confirmed as constituents of FTSE All Share via Datastream and LBS Risk Measurement Service. Firms which did not meet this requirement were removed.

(ii) Firms classified as financials and utilities were removed from the sample.[27] Firms with no industry classification were also removed from the sample.

(iii) In order to evaluate the abnormal returns from the announcement of the divestiture, there was the requirement of 160 trading days' worth of stock price observations to calculate parameter estimates for the estimation window in the event study. Those firms

[27] The level 6 DataStream codes are derived from Thomson Reuter's DataStream product. The comparable codes under the Standard industrial classification would be SIC 4900-4999 for utility firms and SIC 6000-6999 for financial firms.

that did not contain this were dropped and additionally firms with zero stock price observations around the 61 day event window were also dropped.[28]

The final sample of 10,718 announcements is the basis of the divestiture sample used throughout this thesis.

[28] 246 announcements contained no stock price observations around the event window of 61 days [-30,+30].

3.3. Variable definitions

This section of the chapter will outline the variables that are used across this thesis alongside the motivation for their use. Individual empirical chapters will outline the variables that are specific to those chapters. When using accounting data, careful consideration has to be provided to the period in which the event date occurs and the financial year ends. As with most event studies using accounting data, the applicable accounting information is taken from the financial year end before the divestiture announcement. In all cases t_0 is defined as the financial year end prior to the announcement date.

3.3.1. Firm Size

Firm size is controlled using the variable *FSIZE* = ln(*totalassets*), where the variable total assets is defined as Worldscope variable: WC02999. Firm size is a frequently used control variable in the divestiture and financial distress literature (Hovakimian and Titman, 2006; Archarya et al. 2007). Fitzpatrick and Ogden (2011) observe that firm size is the most powerful forecaster of failure and Powell and Yawson (2007) highlight that divestiture likelihood increases with firm size. FSIZE is expected to be negatively related to the level of observed abnormal returns, it is expected that divestiture activity is likely to have a greater impact on smaller firms. Therefore divesting assets is more likely to be beneficial to smaller firm and their shareholders than it would have on larger firms.

3.3.2. Growth Opportunities

Growth opportunities (*GOPP)* available to the firm are measured using the market-to-book ratio. The variable is defined as market value of equity (WC08001) to book value of equity (common shareholders' equity WC03501). This variable is controlled for to

assess the impact of divestiture without the effects of under- or over-valuation of the parent firm and in addition, Singhal and Zhu (2011) highlight that firms with higher levels of market-to-book have a higher likelihood of undertaking restructuring activity. It is expected that market-to-book is positively associated with abnormal returns. Firms with greater growth prospects for the future are likely to invest the proceeds of the divestment in value enhancing projects over those firms that have a lower market-to-book ratio.

3.3.3. Firm focus

Firm focus is examined via variable *REL*. REL is a dummy variable set equal to one if the divested unit is in the same industry as the parent company at the DS level 4 industry (equivalent to two digit SIC level). Studies by Berger and Ofek (1995), and Comment and Jarrel (1995) highlight that firms become more efficient when they increase their level of focus. Firms that increase their focus are more likely to do so in order to reduce the diversification discount problem but as this is not a key focus of this study, firm focus is controlled for. REL is expected to be negatively related to returns because unrelated divestitures reduce the expected diversification discount and are beneficial for the firm's shareholders.

3.3.4. Clustering of divestiture activity

Mulherin (1996) and Powell and Yawson (2005) find that restructuring activity, such as divestitures, cluster across time and industry. Therefore in order to control for clustering, where one or more divestitures takes place within the period of 180 days prior to the announcement date, the dummy *CLUS* was set equal to one if firm has had another divestiture in the sample within the previous 180 days, and zero otherwise. The aim of this variable is to control for those firms that announce multiple divestitures within the

estimation window used in the event study methodology (outlined in the forthcoming section 3.6.).

3.3.5. Liquidity

The liquidity position of the firm was measured by the variable *LIQ*. This is defined as cash and short term equivalents (WC02001) divided by current liabilities (WC03101), as in Gadad and Thomas (2004) and Purnanandam (2008). Shleifer and Vishny (1992) and Officer (2007) observe that firms that are forced to divest assets will do so at a price lower than their economic worth and will be forced to do this when parent divesting firms have poor levels of liquidity. Additionally, Charitou et al (2004) observe that liquidity ratios are good predictors of business failure and as such have been incorporated into this thesis. It is expected that liquidity is positively associated with higher abnormal returns; firms that are not constrained financially are likely to be able to extract the full economic value of the assets being divested.

3.3.6. Leverage variables

The existing divestiture and financial distress literature emphasises the role of divestitures in stemming financial distress by using the proceeds of the activity to pay down debt. Leverage ratios are defined following the general approach of Hovakimian and Titman (2006). The leverage ratio of the firm is defined using the variable *LEV* which is measured as total debt (WC03255) divided by total assets (WC02999).

Later in the thesis, the debt variables are then segmented further into short- and long-term debt, which is divided by total assets or market assets. Short-term debt (WC03051) is the portion of debt payable within one year and long-term debt (WC03251) is the total of all interest bearing financial obligations excluding short-term debt payable within one year.

Total assets are defined as previously. Market assets are defined as in Hovakimian (2006) as total assets (WC02999) plus market value of equity (WC08001) minus book value of equity (WC03501). It is expected that in general, the relationship between leverage and abnormal returns is likely to be negative. Firms with high levels of debt may be liquidity constrained and as such, divest assets at below their market value, leading to a negative share price response.

3.4. Sample description

[Insert Table 3.01 about here]

Table 3.01 and figure 3.A presents data on the distribution of divestitures over time in the sample. From the period of 1988 to 2009, a total of 10,718 announcements of divestiture activity were recorded. The number of divestitures taking place each year ranges from a low of 311 in 2009 to a high of 704 in 2000. The 10,718 announcements were made by 1,674 unique firms. 578 firms undertook a single divestment in the sample, whilst the top three divesting firms were BP PLC (a count of 270 over the sample period), Unilever PLC (207) and ICI (150).

Table 3.02 provides summary statistics for the key accounting variables used in this analysis. For the full sample the mean market capitalization is £7,983 million (median £834.8 million), which is comparable with the studies by Alexandrou and Sudarsanam (2001) and Club and Stouraitis (2002). The average value of divestiture activity was £79.18million (median: £8.33million).[29] These results are consistent with studies by Alexandrou and Sudarsanam (2001), Club and Stouraitis (2002) and Hillier et al. (2009), but are slightly lower than the results found by Ataullah et al. (2010).[30]

[Insert Table 3.02 about here]

The average market-to-book ratio for the sample is 2.642 (median of 1.528) it highlights that there are growth opportunities available to the average firm in the sample divesting

[29] The divestiture value was reported in USD, this was converted back to GBP at the spot rate on the day of the announcement. The value of the transaction is only available for 6,707 announcements; this represents 62.84% of the total transactions used in the sample.

[30] Ataullah et al. (2010) observed a mean (median) deal value of £132.3million (£61m) for a smaller sample of 233 studies, however in their study, they place a lower limit of £15million to be included in their sample, pushing both the mean and median value of the divestiture activity upwards.

assets and are comparable to Ataullah et al. (2010) and Bates (2005). The average liquidity ratio is 0.453 (median 0.213). The mean and median liquidity ratio in the sample is below 1, which is lower than that observed by Coakley et al. (2007),[31] this suggests that the firms in the sample may be constrained to pay current liabilities immediately and as such may be suffering from signs of financial distress, despite the good growth opportunities outlined previously.

Sample firms have a mean profitability ratio of 0.073 (median: 0.108)[32] and a leverage ratio of 0.282 (median: 0.237) at the fiscal period prior to the announcement date and the leverage ratio is comparable to that of Ataullah et al. (2010) and Bates (2005) but slightly lower than that reported by Coakley et al. (2007).

[Insert Table 3.03 about here]

The key variables presented in section 3.3 are used throughout this thesis and as such a correlation matrix is presented in table 3.03. Table 3.03 outlines the degree of correlation between the key component variables in the study. It is observed that, as expected, there is a high degree of correlation between *FSIZE* and *MarketCap* and, *CLUS* and *MarketCap*. It is expected that firms with greater market capitalisation will be more likely to have a higher level of total assets, and similarly, firms with large market capitalisation are more likely to engage in multiple divestiture activity over a those smaller firms. Similarly, for the remaining key variables that are statistically significant, there is a low degree of correlation amongst the variables in the study. Likewise, where there is some evidence that weak correlation exists, the direction of the correlation coefficient that is

[31] Coakley et al. (2007) only have 165 divestitures in their sample
[32] Profitability is measured using the ratio of earnings before interest, taxation, depreciation and amortization to total assets.

exhibited is expected; such as the negative relationship between *LEV* and *LIQ* or the positive relationship between *FSIZE* and *LEV*.

3.5. Motivations for divesting

As previously highlighted in chapter two, the motivation for undertaking divestiture activity can be numerous. Lang et al. (1995) highlight that the market reaction to the divestiture announcement is contingent on the intended use of the proceeds from the sale. A small sample (35.6%) of the divestiture announcements were examined in order to highlight the motivation for undertaking divestiture activity. These are presented in table 3.04. The table outline that focusing on core businesses or assets is the most commonly cited reason for undertaking divestiture activity representing 27% of the sample. A number of studies highlight that many firms opt to concentrate in core business functions in order to focus on fewer areas where firms have strengths and to reduce the diversification discount and past poor diversification choices (Denis et al., 1997; Lins and Servaes, 1999).

[Insert Table 3.04 about here]

The second most popular reason cited for undertaking divestiture activity is in order to use the proceeds to pay down debt (Bates, 2005; Lee and Lin, 2008). This is followed by 9.4% of the sample highlighting that firms undertake divestiture activity in order to strengthen their existing operations.

Due to the lack of coverage in Thomson ONE Banker, these motivations were not utilised as part of the study. However, the sample is reported here in spirit of providing an overview for the reasons cited for divesting for a subsample of firms in the sample.

3.6. Event study methodology

In order to evaluate the economic impact of the divestiture activity throughout this thesis, the standard event study methodology is utilised. The event study methodology by Ball and Brown (1968) and Fama et al. (1969) is employed to assess the market's reaction to the announcement of divestiture activity.

3.6.1. Event study definitions

A standard event study approach measures the abnormal returns (AR), average abnormal returns (AAR), cumulative abnormal returns (CAR) and cumulative average abnormal returns (CAAR) over specified windows around a particular event. These returns allow the economic and statistical significance of the announcement to be evaluated and assessed. MacKinlay (1997) finds that the use of an 'event window' allows the price effects of an event to be captured even if they do not fall directly on the announcement day (t_0). So whether news leaks in advance of the announcement date or it takes longer for the market to interpret the news, the approach of using an event window helps to capture the economic significance of said event. Fama (1991) highlights that short-run event studies represent "the cleanest evidence we have on efficiency."

3.6.2. Calculation of abnormal returns

In order to calculate the overall impact of the announcement, it is necessary to calculate the abnormal return.

Brown and Warner (1980), Strong (1992) and MacKinlay (1997) define abnormal return as; the ex-post return of the share price over a specified event window minus the 'normal' had the announcement not taken place:

$$AR_{it} = R_{it} - E(R_{mt}|X_t)$$

Where AR_{it} is the abnormal returns on a particular company stock i at time t, R_{it} is the actual return observed by the company and $E(R_{mt}|X_t)$ is defined as follows: The normal returns are defined by variable R_{mt} which is the return on the market portfolio (FTSE All Share) over a specified period t and X_t is the conditioning information for the normal return model.

MacKinlay (1997) finds that the market model signifies an enhancement over the constant mean model or the market adjusted model; observing that this enhancement is derived from being able to clearly deduce the portion of the return that is related to the variance in the market return. This is backed up by Strong (1992) and Armitage, who highlight that the choice of the model used within an event study is insignificant compared to the accuracy of the reported event dates.

In order to accurately evaluate the announcements in the sample for this study multiple event windows are computed for evaluation. The event windows are 61 days [-30,+30], 31 days [-15,+15], 11 days [-5,+5], 5 days [-2,+2], 3 days [-1,+1], 2 days [-1,0] and 1 day [0].

3.6.3. Market Model

The market model is a one factor model and is defined as:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

$$E(\varepsilon_{it} = 0) \quad var(\varepsilon_{it}) = \sigma_{\varepsilon_t}^2$$

Where, R_{it} is the return observed by the company at time *t*, R_{mt} is the return on the market portfolio (FTSE All Share) over a specified period t. ε_{it} is the zero mean disturbance variable and the variables: α_i, β_i and $\sigma_{\varepsilon_t}^2$ are the parameters of the market model.

The daily returns for each company were calculated using the return index (RI) from Thomson Reuter's DataStream database. The total return index measures the performance of a stock by assuming that all dividends are re-invested. The RI is defined as:

$$RI_t = RI_{t-1}\left(\frac{P_t + D_t}{P_{t-1}}\right)$$

Where P_t is the closing share price at time t, P_{t-1} is the closing share price on the prior trading day, D_t is the dividend paid on day t, and RI_{t-1} is the Return Index on the previous day.

The return index is then converted into daily returns by:

$$daily\ return_i = \frac{RI_t - RI_{t-1}}{RI_{t-1}}$$

In order to make sure of the market model, a number of assumptions have to be made; the market is efficient, the event window sufficiently captures the reaction to the news of the announcement, there is no other factors (such as additional news) that can impact the model around the same time as the announcement. Brown and Warner (1980, 1985) find that the market model is robust against many parametric influences such as non-synchronous trading, clustering, serial correlation and non-normality.

3.6.4. Market Index

The choice of the market index was selected as the FTSE All Share, as it represents 98% of UK market capitalization (FTSE Group, 2013) and all of the announcement firms are listed as a component of the FTSE All Share index. The returns on the FTSE All Share are calculated as:

$$FTSE\ All\ Share\ daily\ return_i = \frac{FTA_t - FTA_{t-1}}{FTA_{t-1}}$$

Where FTA is the absolute value of the FTSE All Share index at time t.

3.6.5. Estimation Period

The estimation period used in the sample was 160 trading days. The estimation period is calculated separately from the event window to remove the possibility of the divestiture announcement impacting the normal parameter estimations. The approach calculates the expected performance of the announcing firm during a normal trading period prior to the divestiture announcement taking place. MacKinlay (1997) and Binder (1998) argue that if the event window falls within the estimation window, then the estimation of the normal trading period would be biased by the divestiture announcement. The estimation window in this thesis is t_{-191} to t_{-31} – this window is sufficiently close to the event date to capture the 'normal' returns near to the event date without being influenced by the divestiture announcements. A number of studies have investigated the length of the estimation period and finds that the estimation window varies between 100-300 days (Armitage, 1995), the prominent studies by Brown and Warner (1985) and MacKinlay (1997) specify an estimation window of 240 and 250 trading days, respectively. However Armitage (1995) and Park (2004) observe that event study results are not sensitive to estimation

windows selected, as long as it is greater than 100 days, therefore in order to balance improved estimation accuracy and minimise potential external confounding news events from impacting the precision of the estimation, 160 trading days are used for the calculation of the estimation period.

3.6.6. Aggregation of Abnormal Returns

In order to evaluate the overall sample or a subset of the sample, the abnormal returns are aggregated to allow conclusions to be drawn from the event window. This aggregation is done through time and across securities. The cumulative abnormal return (CAR) used when there is the requirement to assess a multi period event-window (Binder, 1998). This is defined as:

$$CAR_i(t_1, t_2) = \sum_{t=1}^{t} AR_{it}$$

Where CAR(t_1, t_2) is the sum of the abnormal returns for the specified event window through time t.

MacKinlay (1997) observes that only observing a few firms in isolation are not very useful in aggregation. The abnormal returns are required to be aggregated across all firms in the full sample or sub-sample (such as economic distress or those firms that are not distressed) to create the average abnormal return (AAR). So the AAR is computed for each date from [-30,+30] as:

$$AAR_t = \frac{1}{n} \sum_{i=1}^{N} AR_{it}$$

Where n is the number of firms in the sample. The AARs are aggregated over the specified event windows to obtain the cumulative average abnormal returns (CAARs):

$$CAAR_i(t_1, t_2) = \sum_{t=1}^{t} AAR_{it}$$

Where CAAR(t_1, t_2) is the sum of the average abnormal returns for the specified event window through time t. The CAAR measures the average cumulative effects on a sample to the announcement of an activity.

3.6.7. Significance testing

In order to assess the statistical significance of the results, significance testing is undertaken to test the null hypothesis that the abnormal returns are found to be zero. Using the market model, the test statistic for evaluating the average abnormal return at time t is given as:

$$t - statistic: \frac{AAR_t}{\sigma(AAR_t)}$$

Where the standard deviation of abnormal return is defined as:

$$\sigma(AAR_t) = \sqrt{\frac{\sum_{t-n}^{t-m-1}(AAR_t - \overline{AAR_t})^2}{n - m - 1}}$$

$n - m - 1$ degrees of freedom assumes that the average abnormal returns (AARs) are independent and identically distributed (iid) and exhibit normality. In order to assess the impact of the divestiture announcements across firms in the sample and time, the CAAR is tested by:

$$t - statistic: \frac{CAAR}{\sigma(CAAR) * \sqrt{T}}$$

The standard deviation of cumulative abnormal return is defined as:

$$\sigma(CAAR_t) = \sqrt{\frac{1}{n} \sum_{i=1}^{n} T(\sigma^2 AR_i)}$$

Under the null hypothesis, the distribution of the t-statistic is asymptotically normal with zero mean variance.

3.6.8. Summary

On overview of the event study methodology has been provided, outlining the approach and choice of event study model taken. The next section will outline the key accounting variables used in this thesis, then the sample used in the study will be outlined then analysed.

3.7. Summary of data and methods chapter

This chapter has provided an outline of the event study methodology, key variables and the sample construction for the empirical work in chapters 4, 5 and 6 of this thesis.

Section 3.2. provided an overview of the sample construction. Section 3.3. Section 3.3. defined the key variables of *FSIZE*, *GOPP*, *REL*, *LIQ* and *LEV* used throughout the thesis. Section 3.4. provided some descriptive statistics in relation to the sample. Section 3.5. provided a quick overview and discussion for the motivations that firms cite when divesting assets. Section 3.6. outlined the event study approach that will be used as a basis to examine divestiture announcements by UK listed firms.

As previously highlighted, each empirical chapter will provide an overview of data specific to that chapter in their respective chapter data section.

Table 3.01 Number of divestiture announcements each year in the sample

The table presents summary statistics for a sample of divestitures by UK firms between 1st January 1988 and 31st December 2009. The sample consists of FTSE All Share Index firms that are classed as non-financial and non-utility firms in the United Kingdom.

Year	*Frequency*	*Fraction (%)*	*Cumulative %*
1988	323	3.01	3.01
1989	477	4.45	7.46
1990	491	4.58	12.05
1991	515	4.81	16.85
1992	489	4.56	21.41
1993	507	4.73	26.14
1994	491	4.58	30.72
1995	524	4.89	35.61
1996	564	5.26	40.88
1997	646	6.03	46.9
1998	672	6.27	53.17
1999	671	6.26	59.43
2000	704	6.57	66
2001	606	5.65	71.66
2002	461	4.3	75.96
2003	499	4.66	80.61
2004	371	3.46	84.07
2005	324	3.02	87.1
2006	341	3.18	90.28
2007	388	3.62	93.9
2008	343	3.2	97.1
2009	311	2.9	100
Total	**10,718**	**100**	

Table 3.02 Key accounting values and ratios

The tables below present descriptive statistics for the full sample of divestiture announcements. Variables are all measured at the financial year end prior to the announcement of divestiture activity. MarketCap is the GBP£ value of market capitalisation and is measured in millions. Average divestiture size is the GBP£ value of the divestiture and is measured in millions. FSIZE is the natural logarithm of total assets. CLUS is a dummy variable that takes the value of one if the same firm has another divestiture in the period up to 180 days after the announcement of an asset sale, and zero otherwise. GOPP is measured as market value of equity to book value of equity. REL is a dummy variable that takes the value of one if the asset being divested is in the same industry as the parent firm at the four digit DS industry classification. LIQ is cash and short term equivalents to current liabilities. PROFIT is measured as earnings before interest, taxation, depreciation and amortization to total assets. CASH is the ratio of cash and short term equivalents to total assets. LEV is calculated as total debt to total assets. STD_A is short term debt to total assets and LTD_A is long term debt to total assets. LEV_MA is total debt to market assets. The variable market assets is defined as total assets plus market value of equity minus book value of equity. STD_MA is gross short term debt to market assets and LTD_MA is gross long term debt to market assets.

Variable	*Mean*	*Median*	*Std Dev.*	*N*
MarketCap (£million)	7,983	834	20,400	9684
Average Divestiture Size (£millions)	79.185	8.333	370.1	6707
Total Assets (£millions)	7,333	903	14,200	9727
Relative divestiture size (to total assets)	0.1995	0.017939	4.581	6099
Relative divestiture size (to market assets)	0.0951	0.012982	1.334	6043
FSIZE	13.966	14.020	2.837	9766
CLUS	0.567	1.000	0.495	10,718
GOPP	2.642	1.528	7.968	9759
REL	0.376	0.000	0.484	9766
LIQ	0.453	0.213	0.985	8017
PROFIT	0.073	0.108	0.223	9410
CASH	0.923	0.061	33.451	9423
LEV	0.282	0.237	1.784	9440
STD_A	0.094	0.053	0.322	9766
LTD_A	0.178	0.131	1.727	9766
LEV_MA	0.201	0.173	0.150	9378
STD_MA	0.068	0.037	0.092	9676
LTD_MA	0.127	0.094	0.129	9676

Table 3.03 Correlation Matrix

This table presents a correlation matrix of the main variables used throughout this thesis. All variables are defined in Table 2. P-values for two-tailed tests of significance are reported in parenthesis. t-statistics in parenthesis: *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

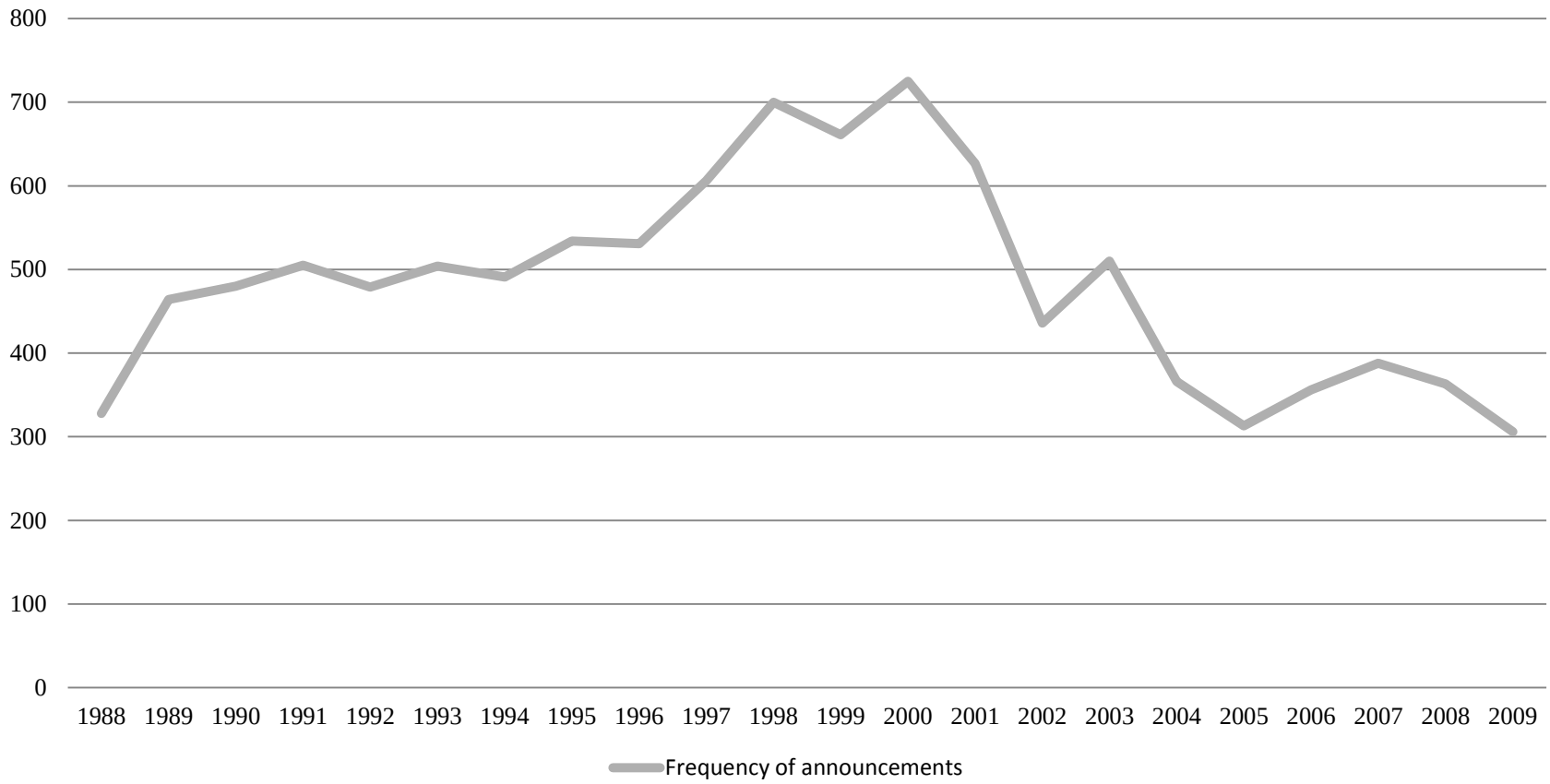
	FSIZE	GOPP	REL	CLUS	LIQ	LEV	MarketCap
FSIZE	1						
GOPP	-0.0686***	1					
	(0.000)						
REL	0.0265	0.0286**	1				
	(0.785)	(0.041)					
CLUS	0.4498***	-0.0334***	-0.0119***	1			
	(0.000)	(0.001)	(0.001)				
LIQ	-0.0928***	0.0454***	0.0364***	-0.0447***	1		
	(0.000)	(0.000)	(0.000)	(0.000)			
LEV	0.0886***	-0.0284*	0.0838***	0.0856***	-0.1228***	1	
	(0.000)	(0.0625)	(0.000)	(0.000)	(0.000)		
MarketCap	0.5537***	-0.0363***	0.017	0.2407***	-0.0652***	-0.0847***	1
	(0.000)	(0.000)	(0.250)	(0.000)	(0.000)	(0.001)	

Table 3.04 Motivations for divesting

The table presents the reason cited for divesting assets for 35.6% of the sample that provided their motivations for undertaking divestiture activity. The motivation was gathered from the Thomson ONE Banker database.

Reason cited	*Count*	*%*
Concentrate on core businesses/assets	1,027	27.0%
Proceeds used to pay down existing outstanding debt	637	16.8%
Strengthen operations	382	10.0%
Strengthen existing operations/expand presence in primary market	356	9.4%
Other	194	5.1%
General strategy to take advantage of sound investment opportunities	175	4.6%
Raise cash through disposal	169	4.4%
Expand presence in new/foreign markets	148	3.9%
General restructuring of business/operations	121	3.2%
Allow to offer new products and services	109	2.9%
Create synergies; eliminate duplicate services/operations	97	2.6%
Sell a loss making/bankrupt operation	79	2.1%
Acquire competitors technology/strategic assets	77	2.0%
Increase shareholder value	73	1.9%
Strengthen existing operations/expand presence in secondary markets	58	1.5%
Expand presence in new geographical regions	41	1.1%
Sale to comply with regulatory requirements	38	1.0%
Raise cash in conjunction with financing of concurrent acq./merger	12	0.3%
Increase shareholder value/dilute number of outstanding shares	6	0.2%
Change in legislation allows increased foreign ownership	1	0.0%
Dispose of surplus cash on hand	1	0.0%
Respond to other bid/tender offer	1	0.0%
TOTAL	**3,802**	**100%**

Figure 3.A Sample divestiture announcements per year



Chapter 4: Divestitures and Firm Life-Cycle

4.1. Introduction

So far, the empirical research on divestitures finds, on average, that asset sales are associated with significantly positive increases in shareholder wealth. The majority of these gains are attributable to an improved focus on the core business activities of the remaining assets (John and Ofek, 1995), debt reduction (Lang et al., 1995; Bates, 2005) and a reduction in the cost of financial distress (Lasfer et al., 1996). This chapter will examine the decision to divest in conjunction with the life-cycle theory as developed by Mueller (1972). Mueller's primary focus is on the agency problem within the firm, primarily, the question of whether managers undertake wealth maximizing activities by acting on behalf of shareholders, or whether they pursue personal objectives at the interest of shareholder wealth. The primary focus of this chapter is to examine how the stock market responds to divestiture announcement across a number of different life-cycle stages and whether agency concerns or other factors influence the levels of shareholder returns.

The research in the area of firm life-cycle is fragmented and is inconclusive in the number of actual life-cycle stages that are known to exist. Most research points to around four or five stages of firm life-cycle. Most of the existing literature in the field of firm life-cycle is conceptual in nature. However, this research expands on the early work by Pashley and Philippatos (1990, 1993) who try to examine divestiture activity and life-cycle for the first time. Motivated by a growing body of research utilising a cutting edge measure of firm life-cycle by De Angelo et al. (2006), this study undertakes an investigation in the wealth impact of firms that opt to divest assets or business units at different life-cycle

stages. This chapter aims to answer the question; is there a significant difference in the abnormal returns that are experienced by firms across different life-cycle stages?

Motivated by the framework provided by Mueller (1972), the chapter then investigates the impact of agency costs on divestiture activity. The wealth transfer hypothesis by Galai and Masulis (1976) stipulates that any proceeds that are raised through corporate restructuring activity will be closely observed by the market as an indicator of agency conflict. Those proceeds that are retained for investment purposes can be an indicator of agency costs, as any proceeds will increase the level of free cash flow and the ability for managers to undertake wealth destroying activities at shareholders' expense. The presence of agency costs have been shown by Kaiser and Stouraitis (2001) to have a significant impact on divestiture activity and Lee and Lin (2008) find that overall, agency concerns dominate the market reaction to divestiture announcements. The chapter investigates whether agency costs of managerial discretion influences the shareholder response to divestiture activity and whether these agency concerns are condition on life-cycle stage.

The key contributions that this chapter makes to the literature in corporate finance is, *(i)* it adds to the increasing body of literature utilizing the De Angelo et al. (2006) earned/contributed capital mix as a proxy for firm life-cycle,[33] *(ii)* methodological improvements made in this study to the De Angelo et al. (2006) approach enhance the measure to more accurately reflect life-cycle stage, and *(iii)* this is the first study of divestiture and firm life-cycle since the early work of Pashley and Philippatos (1990,

[33] Mergers and acquisitions (Owen and Yawson, 2010); Dividend policy (De Angelo et al., 2006); Seasoned equity offerings (De Angelo et al. 2010); Capital structure (Bulan and Yan, 2009); Cash holdings (Drobetz et al., 2015)

1993). Using the life-cycle theoretical framework as developed by Mueller (1972) to examine life cycle has allowed a cross-section of results to be developed, this is an improvement over the majority of existing divestiture research that focuses at a single point in time.

The key findings from the chapter show that divestiture activity is a wealth generating action undertaken by firm management, these results are consistent with existing literature in the field of divestitures (John and Ofek, 1995; Lang et al., 1995; Lasfer et al, 1996; Bates, 2005). Across the measures of life-cycle, later life-cycle periods experience higher abnormal returns, this is attributable to firms being rewarded for reconfiguring their operations back to an optimal size (by divesting unrelated assets) and a reduction in the agency costs of managerial discretion. Empirically the findings highlight that aligning managerial and shareholder interests is welcomed by firm shareholders. Finally, the study finds when examining those firms with negative retained earnings, these are observed to exhibit the highest announcement returns, suggesting costs of financial distress plays an important role in the level of returns experienced by firms undertaking divestiture activity.

The remainder of the chapter is structured as follows. 4.2. provides an overview of the literature and hypothesis development of firm life-cycle, its classification and existing life-cycle literature in corporate finance. Section 4.3. outlines the sample construction, variable definition and research method. Section 4.4. presents the results and 4.5. concludes.

4.2. Literature review and hypothesis development

Hanks (1990), highlights the value of an accurate life-cycle model to the managers of evolving and growing firms.

> *"[Knowledge of firm life-cycle] could provide a road map, identifying critical organizational transitions, as well as pitfalls the organization should seek to avoid as it grows in size and complexity. […] It could help management know when to "let go" of cherished past strategies or practices that will only hinder future growth."* [pg. 1]

Seminal work by Chandler (1962) hypothesised that modern corporations demonstrated a dynamism in which strategic decision making varies depending on the stage of the firm's life.

Subsequent research developed on this idea and started to develop specific models related to company life-cycles and the development process that an organization goes through. The studies sought to identify the dynamic firm characteristics that made up each section of firm life-cycle (Channon, 1973; Downs, 1967; Greiner, 1972; Quinn and Cameron, 1983; Rumelt, 1974).

These early papers spurred the creation of a large body of research (Quinn and Cameron, 1983; Miller and Friesen, 1984; Hanks et al, 1993) that links company life-cycle and organizational effectiveness in an attempt to answer and apply early theories on firm life-cycles.

These studies proposed a biological concept of organizations, one where they progressed through various stages in a life-cycle as they grow and develop. The biological allusion

is inferred from the life-like nature of organizations, they are born, they try to grow in different ways and in different forms and they eventually die. These stages are viewed as a hierarchical progression that involves a broad range of organizational strategies, activities and various structural perimeters (Quinn and Cameron, 1983). The pattern of development that occurs at one stage in an organization is not the same as the activities and structures present in another stage.

The early literature appeared to be conceptual, rather than empirical in nature, and hypothesised that changes which occur in firms follow a predictable pattern which can be characterised by stages of development (Miller and Friesen, 1984).

Early firm development was characterised as a four stage model containing; Birth, Growth, Maturity and Decline. Related to the early biological concept, the early literature presented a theoretical notion of the life-cycle as a deterministic evolutionary concept whereby an organization moves inevitably from one stage to the next over its life-cycle and is unable to reverse this sequence. However, this notion was questioned by researchers (Miller and Friesen, 1984; Tichy, 1980; Walton, 1980) who pointed out that organizations have a variety of transitional options available for them to progress or change to.

4.2.1. Firm life-cycle models

Understanding organizational life-cycle is of critical importance, as it facilitates firm managers to identify and observe changes that take place as the firm grows and develops. (Hanks et al., 1993; Beverland and Lockshin, 2001). Various models of firm life-cycle have been proposed by researchers, with most models displaying multi-life-cycle stages, varying from three to ten separate stages. Those models showing a greater number of

stages break down the general stages into specific development periods within the larger stages of other studies (Lester et al., 2003).

Hanks et al. (1993) state that firm life-cycle stage is a unique configuration of variables that are related to organization context and structure. In order to identify the life-cycle stage, this is done by clustering firms based on common configurations. Miller and Friesen (1984) structured their life-cycles around the four major gestalts, these included strategy, structure, decision-making style and organizational situation. Van de Ven (1992) emphasised that it is important to understand how the structures and activities of firms at various stages of the life-cycle process change over time.

In his extensive analysis of existing life-cycle models, Hanks (1990) concluded that organizations were theorised to move through five distinct stages. Start-up, expansion, consolidation, diversification and decline.

Early research by Greiner (1972) and Baird and Meshoulam (1988) presented strong theoretical support for a five stage model and the small number of empirical papers on life-cycle models subsequently found support for either five-stage or four-stage models (Miller and Friesen, 1984; Smith et al., 1985; Shani et al., 1988; Kazanjian, 1988; Hanks, 1990; Hanks et al., 1993; Lester et al., 2003).

Four stage models were criticised by Lester et al. (2003) as a few of the prominent studies in the area (such as Chandler, 1962 and Quinn and Cameron, 1983) did not include the decline stage, despite a number of studies finding support for this life-cycle stage (Lester and Parnell, 1999; Jawahar and McLaughlin, 2001). Miller and Friesen (1984) and Hanks et al. (1993) attribute the omission of the decline stage in some studies due to the unexpected nature of firms finding themselves in the decline stage and the lack of

predictability in comparison with the growth and expansion life-cycle stages. Miller and Friesen (1984) observed in their sample a number of large firms experiencing period of decline without going out of business and subsequently performed well.[34]

The next section outlines the characteristics of stages of firm life-cycle and the outline given by Miller and Friesen (1984) and highlights the identifiable differences in situation, strategy and structural characteristics between the five stages of firm life-cycle.

4.2.2. Inception (Initial growth)

This is the life-cycle stage characterised by new firms which attempt to capitalise on an idea for a new invention, a new marketing technique or a more efficient organizational structure of the firm (Mueller, 1972). The firms at this stage focus on day-to-day existence, by identifying an adequate number of customers to support the mere existence of the firm (Lester et al. 2003).

Ownership structure is dominated by the owner-manager, with the firms typically tend to be young and have simple and informal structures (Miller and Friesen, 1984). Decision making and information processing is likely to be low level, the organization is likely to display undifferentiated characteristics. At this stage, the firm is likely to have significant levels of innovation and a niche marketing strategy for attempting to take their idea, product or concept to the market. Mueller (1972) theorised that the profits at this stage accrue to those entrepreneurs, who in the face of uncertainty, are able to possess the information, intuition, courage or simply are just lucky to make the correct investment

[34] For example, Ford Motor Company and Macy's Department Stores Inc. in the United States.

decision. However, substantial risk taking is usually observed at this stage and the environment is very difficult or un-analysable (Daft and Weick, 1984).

The life-cycle stage is also known in the literature as; the birth stage (Lippitt and Schmidt, 1967), stage one (Scott, 1971), creativity stage (Greiner, 1972), entrepreneurial stage (Quinn and Cameron, 1983) and existence (Churchill and Lewis, 1983), amongst others.

4.2.3. Expansion (Rapid growth)

If the product, idea or concept is a good idea and is successful, then the firm will experience rapid expansion (Mueller, 1972). The firm at this stage will have experienced some initial product-market success and will have sought to establish distinctive competencies (Miller and Friesen, 1984). Rapid sales growth and the generation of revenue to ensure sufficient growth to stay competitive is a key characteristic at the expansion stage (Churchill and Lewis, 1983). Firms will attempt to amass resources to help them scale up their operations. Innovation will continue rapidly and will begin to broaden into closely related products/ideas. The markets served will appear more heterogeneous and some firms may find themselves competing with the more established firms, as the niche product strategy is possibly abandoned.

At this life-cycle stage, the firm will be typically medium sized, a little older and will have moved from an ownership structure that is owner-manager to having multiple shareholders. The company structure will have changed to establish some more formalisation (Quinn and Cameron, 1983) and some authority will be delegated to middle managers. Information processes and decision making models will now be enhanced greater than that observed in the inception stage (Lester et al., 2003).

The life-cycle stage is also known in the literature as; rapid growth stage (Down, 1967), Go-Go stage (Adizes, 1979), the second stage (Lyden, 1975) and survival stage (Lester et al., 2003).

4.2.4. Maturity Phase

As competition develops and other firms begin to take advantage of the profit opportunities and improve upon the ideas or concepts generated by the initial entrepreneur, the level of profit opportunities begin to slow and possibly decline in this life-cycle stage (Mueller, 1972). Levels of sales begin to stabilise and an increasing level of competition results in a gradual push towards an environment with multiple sales lines and business operations. The firms at this stage are large and have dispersed levels of ownership. However, formalisation and heavy firm bureaucracy are key organizational characteristics in this life-cycle stage (Quinn and Cameron, 1983). Individuals have to go through various levels of the organization's structure in order to achieve anything and policy making, procedures and tasks are now highly formalised (Miller and Friesen, 1984). Managers focus on strategy and planning, whilst daily operational decisions are usually delegated to middle management. Information processing and decision making is similar in nature to the expansion stage. However, the environment that they exist in is easily analysable (Daft and Weick, 1984).

In the maturity life-cycle stage, the level of innovation slows and is more conservative in nature. The firm may start to consolidate their product market strategy to focus on efficiently supplying their existing market(s) which are usually well-defined by this point.

The life-cycle stage is also known in the literature as; formalization and control stage (Quinn and Cameron, 1983), stage two (Scott, 1971), direction stage (Greiner, 1972) and maturity stage (Adizes, 1979).

4.2.5. Revival Phase

Firms at this stage will be altering the organization's structure in order to regenerate some of the high levels of growth experienced at earlier life-cycle stages. The firms are typically very large in this life-cycle and they face heavy competition from similar firms who are typically taking market share from the organization. Firms adopt expansion and diversification activity to cope with slower growth in sales. Organizations typically develop divisionalised structures for the first time to cope with the different nature of their heterogeneous markets and diversified products/ideas (Miller and Friesen, 1984). This high level of differentiation results in the organization developing sophisticated controls and a more formal focus on information processing and decision making. Firms move in to some unrelated markets in part due to the desire to achieve high levels of sales growth that was previously experienced in earlier life-cycle stages. Firms in the revival stage will focus on high levels of innovation and risk taking in order to return the firm to levels of growth experienced in earlier life-cycle stages. Successful firms will experience rapid growth in the revival phase.

The life-cycle stage is also known in the literature as; Elaboration of Structure stage (Quinn and Cameron, 1983), Stage 3 (Scott, 1971), coordination stage (Greiner, 1972), Revival phase (Miller and Friesen, 1984) and Renewal stage (Lester et al., 2003).

4.2.6. Decline Phase

The literature has taken a different approach in assessing the 'Decline stage' of the firm life-cycle. As previously discussed, some studies have failed to incorporate this stage into their analysis due to the difficulties in observing decline firm characteristics (Daft and Weick, 1984). The decline stage is one that is characterised by firms with a declining market size, a competitive environment and it is likely that the company is approaching stagnation as demand drops.

Firms in this life-cycle typically have low levels of innovation; this in turn leads to declining levels of demand, as antiquated products are no longer desirable to consumers, which require firms to cut prices to maintain levels of sales. Firms in this stage are caught in a vicious circle, as demand is also poor due to their less appealing product lines. Ignorance of product markets, lack of strategic planning and no clear-cut product-marketing strategy are all contributing factors cited by Miller and Friesen (1984) as to firms being characterised as being in the decline phase. Ownership is tightly focused and stakeholders may make conservative or risk adverse decisions in order to preserve resources, rather than to meet the needs of customers. Little information about customer needs and preferences are obtained in the decline phase and such firms in this stage are often characterised by poor communication between functions in the firm (Lester et al, 2003). Mintzberg (1984) highlights that the stage is often characterised by politics and power with high levels of bureaucracy.

Lester et al. (2003) find that control and decision making powers tend to return to a small number of people, as the power struggles have eroded the viability and success of the organization. If no opportunities arise, then at this stage the firm should start to pay out

a greater share of their profit as dividends before winding up the company. However, it should be noticed that Miller and Friesen (1984) observed a number of firms in their sample in the Decline life-cycle stage that did not go out of business and managed to turn the fortunes of the firm around (For example, Ford Motor Company, Macy's Department Stores Inc., Volkswagenwerk and Yellow Freight).

The decline stage (Miller and Friesen, 1979) is also known as Deceleration stage (Downs, 1967), Fourth stage of Lyden (1975) and Kimberly (1979) and the Prime Organization stage (Adizes, 1979).

4.2.7. Sequencing of the five life-cycle stages

Miller and Frisen (1984) in their seminal longitudinal study of corporate life-cycle tested this deterministic move from one stage to another to ascertain whether this was an accurate notion. They observed that whilst the pattern is roughly borne out, it only represents a rough central tendency rather than a clear cut evolutionary process. In their sample of 36 corporations over 20 years, they observed that 23% of firms in a 'revival' stage end up moving 'back' a life-cycle stage to 'maturity.' Indeed, there are also examples found of firms jumping back two stages, i.e. from 'decline' to 'maturity'.

Miller and Friesen (1984) suggest that the conceptual literature oversimplifies the evolution of firm life-cycle, as firms fail to follow the deterministic sequence inferred by biological progression, especially those firms that exist over longer periods of time. They observed that each phase of firm life-cycle is in many ways unique, especially their situational, strategic, structural and decision making variables. They observed that each stage was internally coherent and very different from one and other, as they found that they are by no means connected to each other by any form of determinable sequence

(Hanks et al., 1993). Firms may take a large number of transitional paths (i.e. maturity phase followed by growth). These results of Miller and Friesen (1984) are supported by the empirical work that has been undertaken (Tichy et al, 1980; Walton, 1980). However, the literature fails to derive an agreement for the time spent in each life-cycle stage (Quinn and Cameron, 1983).

4.2.8. Criticisms

A potential weakness highlighted by Lester et al., (2003) is that a five stage model fails to capture the various sub-stages that smaller firms move in and out of. Scott and Bruce (1987) and Churchill and Lewis (1983) present a models which detail sub-stages for smaller firms. Some studies such as that by Mintzberg (1984) have criticised the latent oversimplication which is inherent in classifying firms into a restricted number of life-cycle stages and the operational definitions that are used to differentiate between the various like cycle stages (Olsen and Terpstra, 1992). However, the life-cycle theory has been used extensively in management research over a wide variety of organizational perspectives. These include the impact of firm life-cycle on; the relation between corporate control and product innovation (Liao, 2006), management accounting systems (Moores and Yuen, 2001), performance appraisal (Chen and Guo, 2004), organizational power (Mintzberg, 1984), organizational effectiveness (Quinn and Cameron, 1983), strategic human resource (Milliman et al., 1991), incentive reward systems (Chen and Hsieh, 2005) and the stock market response (Anthony and Ramesh, 1992). In addition, there has been a research focus for several decades on the life-cycle of industries (Miles et al., 1993; Grimm and Smith, 1997; Lester et al. 2003).

4.2.9. Summary

Life-cycle stages are viewed as a hierarchical progression that involves a broad range of organizational strategies, activities and various structural perimeters (Quinn and Cameron, 1983). The pattern of development that occurs at one stage in an organization is not the same as the activities and structures present in another stage.

Why is life-cycle important? Whetten (1987) identified the following key elements; it serves as a diagnostic tool that allows other firms to sense awareness of an organization's current business position, it allows appropriate goals to be set and relevant life-cycle factors to be monitored to ensure the running success of a firm and for firm survival, and it allows firms to understand of the clusters of problems one is likely to encounter at different stages of organizational development. In new stages of firm development, past strategies, behaviours and concepts used may not be appropriate to in other life-cycle stages. They may be inappropriate, ineffective or possible even fatal to the organization (Kazanjian and Drazin, 1989).

4.2.10. Empirical studies

The discussion so far has focused on the management literature, emphasising a high influence of firm characteristics such as situation, strategy and structural influences to help distinguish between the five stages of firm life-cycle (Miller and Friesen, 1984). However, there have been a small number of studies that have examined the impact of firm life-cycle and the 'value-relevance' of changes in key financial information. These studies have sought to quantify firm life-cycle and the characteristics that firms exhibit during different life-cycle stages using the life-cycle theory developed by Mueller (1972).

'Value-relevance' in the literature is used to refer to the empirical relation between accounting information and contemporaneous changes in firm value, which is usually proxied by changes in the level of stock returns (Easton, 2001; Holthausen and Watts, 2001; Jenkins et al., 2004). As previously discussed, it is expected that strategic focus and therefore accounting performance measurements will vary across different life-cycle stages (Rappaport, 1981).

Prior literature has acknowledged the impact of corporate life-cycle on the value-relevance of reporting data. The classic paper in this area was derived by Anthony and Ramesh (1992) investigating the association between accounting performance measures and stock prices, deriving a market-based approach to examine stock market reactions to the level of capital expenditure (CAPEX) and sales growth and whether they are functions of life-cycle stage. The study uses firm age as a variable to minimise the effect of a possible correlation with risk measures derived from the other financial variables, as intuitively, growth firms are likely to be younger with new products/ideas. Anthony and Ramesh (1992) classify firms into various life-cycle stages using a univariate and

multivariate ranking procedure based on four classification variables; *(i)* annual dividend as a percentage of income, *(ii)* percentage sales growth, *(iii)* capital expenditure as a percentage of total firm value and *(iv)*, the age of the firm. Growth stage firms are expected to have low dividend payout, high sales growth, high capital expenditure and be a young age, conversely, stagnant firms are likely to have high dividend payout ratios, low sales growth, low capital expenditure and have had been around for a long time. In their descriptors of life-cycle stages, dividend payout and age are positively correlated and sales growth and CAPEX are both negatively correlated with firm age. Testing their hypotheses by using a multivariate ranking procedure, Anthony and Ramesh (1992) regress CARs on differenced earnings, CAPEX and sales growth variables and find evidence that the stock market reaction to accounting performance measures is a function of life-cycle stage. They specifically show a monotonic decrease of the value relevance of sales and CAPEX growth in life-cycle stage.

Using the same life-cycle classification approach as Anthony and Ramesh (1992), Black (1998) observed a monotonic increase in the value relevance of firm earnings and cash-flows in various life-cycle stages. The results of the study suggest that earnings are more useful than cash-flows in the later mature/decline life-cycle stages, consequently in earlier growth life-cycle stages, cash flows are more relevant than earnings. Still using the classification approach of Anthony and Ramesh (1992), Jenkins et al. (2004) investigates the value relevance of key accounting components of earnings change (including changes in sales and changes in levels of profitability) across different life-cycle stages of the firm. They observed when firms are in the growth life-cycle stage, changes in the level of sales are more highly valued than changes in profitability. In the mature stage, the emphasis falls on profitability over changes in the level of sales. Consequently change in

profitability is the most valued in the decline stages of the firm life-cycle. Martinez (2003) finds support for a non-linear relationship between accounting variables and stock-returns, observing that the relevance of earnings is conditional on firm size, level of debt and life-cycle of the firm. Kousenidis (2005) however, fails to find significant evidence of the information content of earnings data between life-cycle stages. Xu (2007) explores how the life-cycle stage affects the expected rate of return, especially in relation to whether life-stage stages have implications for stock market responses to common risk factors (Book-to-market, beta, size and leverage). The main focus of the study is to determine whether pricing of risk factors is conditional on life-cycle stage. They observe that the risk is priced differently across life-cycle stages.

Empirical evidence on the relation between firm maturity/life-cycle and dividends was found by De Angelo et al. (2006). They examine the firm behaviour and their propensity to pay dividends and whether it is related to its stage of firm life-cycle. In order to determine life-cycle stage, the authors use a proxy of retained earnings to equity (RE/TE) and in addition, as a check, retained earnings to total assets (RE/TA). De Angelo et al. (2006) argue that these ratios of retained earnings in a firm's capital structure are a logical proxy for firm life-cycle stage, as it measures the extent to which the organization is reliant on external capital to fund day to day operations or whether the firm is self-financing. Grabowski and Mueller (1975) argue that self-financing firms are likely to have a high RE/TE (RE/TA) ratio, as they are likely to be older and more mature with ample cumulative profit streams. De Angelo et al. (2006) argue that this earned/contributed capital mix is a better measure of firm life-cycle as it represents earnings which can be used for investment and their approach has been adopted by a

number of studies to classify firm life-cycle stages (De Angelo et al., 2006; Bulan and Yan, 2009; De Angelo et al. 2010; Owen and Yawson, 2010; Drobetz et al., 2015).

Using the life-cycle classification approach of De Angelo et al. (2006), Brockman and Unlu (2011) find similar results in an international setting. Their research highlights that young firms are more likely to have many investment opportunities and be short on cash, therefore have a strong motivation to retain cash to avoid flotation and underpricing costs of raising new financial capital. Conversely, older firms tend to have fewer investment opportunities but have larger retained earnings (cash), these types of firms have a stronger desire and incentive to pay out this excess cash to investors to avoid the agency costs that are connected to free-cash flow. Brockman and Unlu (2011) highlight that the life-cycle theory indicates that firms adjust their dividend payout policies over firm life-cycles due to the alternating tradeoffs between declining information costs and subsequent rising agency costs. They examine the relation between retained earnings and dividend policy, finding that dividend-paying firms increase their levels of retained earnings decile rank before paying out and those firms that do not, were found to decrease their retained earnings decile rank. The results are consistent with a life-cycle theory of dividends and they find an increasing relationship between the retained earnings decile and the propensity to pay dividends and additionally the propensity to pay dividends increases significantly with retained earnings – even after controlling for size, sales growth, assets, total equity and cash holdings. In other words, their findings strongly supporting life-cycle theory.

Owen and Yawson (2010) use the earned/contributed capital mix of De Angelo et al. (2006) as a proxy for firm life-cycle in their study into the impact of corporate life-cycle on takeover activity. They observed significant results between the stage of company

life-cycle and the likelihood of firm undertaking merger activity, those firms with a high level of retained earnings in their capital structure (such as very mature firms) were more likely to undertake acquisition activity. They also observed that bidders with lower levels of retained earnings in their capital structure experienced a more positive market reaction on the announcement of a takeover deal than later life-cycle stage firms.

4.2.11. Divestiture and life-cycle

The majority of studies that empirically examine the wealth impact of voluntary divestiture in finance literature have found positive abnormal returns on the announcement date. See Chapter 2 for a full literature review on the determinants and associated announcement returns. Therefore the first hypothesis to be investigated is:

> $H_{0\text{-}1}$: There are insignificant abnormal returns on the announcement of divestiture activity.
>
> $H_{1\text{-}1}$: The announcement of divestiture activity yields significant positive abnormal returns to the parent firm.

It is expected for the sample of UK firms, for the announcement of divestiture activity to yield significant abnormal returns to the firm undertaking the divestiture transaction. The existing divestiture research reveals that divestiture activity is generally wealth maximizing for shareholders (Lang et al., 1995; Bates, 2005; Lee and Lin, 2008; Hillier et al. 2009) with levels of announcement returns varying depending on the motivation for the transactions.

One of these motivations that has been examined in the literature is the focusing hypothesis. It is expected that firms will undertake divestiture activity in order to focus

their business operations by divesting assets that are not core to a firm's main business activities. Studies by Comment and Jarrell (1995), Daley et al., (1997) and Krishnaswami and Subramaniam (1999) generally they all observe positive relation between an increase in firm focus and share price returns when undertaking divestiture activity. Therefore it is hypothesized that:

> $H_{0\text{-}2}$: There is an insignificant difference between related and unrelated divestitures.
>
> $H_{1\text{-}2}$: There is a significant difference between related and unrelated divestitures.

It is anticipated that those firms that undertake divestiture activity in the United Kingdom will partially do so in order to enhance their focus, by narrowing the scope of their business operations. The announcement returns are expected to be significantly positive for those firms that announce focus increasing divestiture activity, as these are expected to be driven by increases in operating performance (John and Ofek, 1995) and a reduction inefficiencies from operating across multiple lines of business activity (Rajan et al., 2000).

Next, the previous life-cycle literature will be examined in conjunction with research that has taken an empirical studies focus in nature.

Mueller (1972) highlights that a firm has a relatively well defined life-cycle and proposes a formal theory of firm life-cycle. The main focus by Mueller is that changes in life-cycle stages can be characterised by the agency problem within a firm, young firms have a large number of possible investment opportunities available to them but are not sufficiently profitable to be able to meet the financing needs to pursue these opportunities. Divestiture activity offers these firms in earlier life-cycle stages an attractive and available source of

funds as they face high barriers to obtaining external financing. As firms grow, their investment opportunities diminish, profitability lowers and growth begins to falter, at this stage firms generate more cash than they have available investment opportunities and agency concerns of managerial discretion begin to dominate. Pashley and Philippatos (1990) hypothesized that once firms reach an optimal size further growth and development would result in dis-economies of scale and would eventually lower the value of the firm. As previously discussed, a firm may opt to use various forms of divestiture to help to remove assets or businesses that are no longer fit for inclusion within the existing firm framework (Hanks, 1990). Divesting at different life-cycle stages would signal different motivations for undertaking such activity. For example, divesting non-core assets for strategic reasons versus being forced to divest assets to starve off the threat of financial distress.

Pashley and Philippatos (1990) examine the life-cycle framework and find it useful for observing differences in the motivations for voluntary divestiture. They examine firm life-cycle using a cluster analysis and a factor analysis to identify the life-cycle stage that each of the 145 firms in their sample belong to. Pashley and Philippatos (1990) use firm financial characteristics of liquidity, sales, market power, dividend policy, operating profitability and financial leverage to identify the life-cycle stage of each firm. They observe that the majority of firms who alter their portfolio are larger firms which are sufficient in size in order to undertake divestment activity, these later stage life-cycle firms are classified as late expansion, maturity and decline stage firms.

Firms in late expansion are expected to divest units to reduce leverage and to increase liquidity. Later maturity and early decline stage firms are hypothesised to derive improved profitability from divesting units or assets in the firm that are poorly

performing. Firms in the decline stage may use asset sales to maintain dividends and to improve liquidity. In their results, firstly, they observed that relative to their control groupings; late expansion/early maturity stage firms seek and somewhat obtain reductions in observed levels of debt. Secondly, late maturity/early decline stage divesting firms experience improved profitability and thirdly, decline stage firms obtain improved liquidity from the divestiture transaction. In addition, Pashley and Philippatos (1990) observed an increase in profitability after divestiture for the regenerating maturity group.

In a later paper, Pashley and Philippatos (1993) examine stock price performance surrounding the announcement of divestiture and whether it is dependent on life-cycle stage using a mean adjusted returns model. Using the work of Montgomery et al. (1984), Pashley and Philippatos highlight that differences in divestiture motivations (whether they are strategic divestitures, divestitures of unrelated business operations, divestitures of poorly performing assets or divestitures for leverage and liquidity purposes, amongst others) exist and that the differences in the motivation for divesting should yield a different stock market reaction. Richardson and Gordon (1980), Rappaport (1981), Anthony and Ramesh (1992) and De Angelo et al. (2006) show that different accounting performance measures vary across life-cycle stages. Park and Chen (2006) find that investors process accounting information differently, depending on the stage of firm life-cycle a firm finds itself in. Extending this, Pashley and Philippatos (1993) suggest that these divesting motivations and firm characteristics will vary and be conditional on life-cycle stage, therefore it is expected that the announcement of divestiture activity will lead to differing responses based on the life-cycle stage.

They however find that no life-cycle group generates significant abnormal returns over the observation period when compared to a matched control group. They find some

evidence that voluntarily divesting US firms experienced small positive but insignificant CARs but overall they conclude, that contrary to the previous studies on firm divestiture, that in their sample of 105 firms the evidence is weak in suggesting that significant abnormal returns will be experienced by firm shareholders by divesting at one life-cycle stage over another. To date, this is the only study which has specifically examined the impact of firm life-cycle on the performance of stock market returns, therefore this will be the source of the next testable hypothesis. Bates (2005) shows that there is a differing market reaction to the announcement of divestiture activity depending on the characteristics of the firm divesting. Those firms with higher leverage, lower growth opportunities and those that have undertaken excess investment, experience significantly higher market reaction, therefore bringing these findings together with the existing research on firm life-cycle, it is hypothesised that the market will most likely respond differently to the life-cycle stage due to the difference in the motivation to divest and the associated characteristics that each firm has at different life-cycle stages. Therefore, the third hypothesis to be investigated:

$H_{0\text{-}3}$: The level of abnormal return is not conditional on firm life-cycle stage.

$H_{1\text{-}3}$: The announcement returns are conditional and vary according to life-cycle stage.

By building on the early work of Pashley and Philippatos (1990, 1993) using UK data, increasing the sample size, adapting a five stage life-cycle model that is now consistent in the newer life-cycle literature and a more robust approach to measuring firm life-cycle stage, it is expected that the results will show that characteristics and motivation for undertaking divestiture activity will alter conditional on the stage a firm finds itself in its

life-cycle. Therefore it is expected that firms at the earlier stages of their life-cycles are more likely to be motivated to undertake divestiture activity in order to free up liquidity or to take a strategic approach and remove loss making units. Whereas firms later in their life-cycle may wish to divest assets to pay down debt, return cash to shareholders or to focus operations. Brockman and Unlu (2011) highlight that older firms have fewer investment opportunities, therefore it is likely that firms at the earlier life-cycle stage will exhibit higher abnormal returns than those that are more mature, however the lack of investment opportunities does not necessarily indicate the expected market response, as Bates (2005) shows that mature firms with high levels of leverage experiences a greater market reaction than those firms that retain proceeds for re-investment opportunities. Owen and Yawson (2010) find that life-cycle has a negative impact on the stockholder returns generated at the announcement of M&A activity and show that younger firms experience a greater market reaction[35] than those older firms in their sample. However, they highlight that the economic significance of the finding is cast in doubt due to a low coefficient observed in the life-cycle variable. Pashley and Philippatos (1993) show that no life-cycle stage generates significantly positive stockholder returns over another when divestiture activity is announced. Therefore, with such a contrasting evidence, no particular life-cycle stage is hypothesized to experience significantly higher announcement returns over another, only that those announcement returns are conditional on life-cycle stage.

Next, the agency costs of managerial discretion will be introduced in order to link divestiture activity and firm life-cycle stage by a unified theoretical framework.

[35] The response is negative across all life-cycle stages, but Owen and Yawson (2010) observe that the response is less negative for those younger firms.

In the divestiture literature, there have been a number of studies that have examined the influence of information asymmetry and agency costs (an overview is presented in the earlier section 2.4.2.6.). Jensen (1986) highlights that excess free cash flow may be used by managers to grow their firms beyond an optimal size as larger firms bring associated benefits of prestige and power. As a firm grows, these ever increasing levels of free cash flow may lead to inefficient expenditures which exist only to bring further benefits to the firm management. Jensen (1986) advocates the use of debt as a control mechanism, forcing managers to make interest payment to service the debt, minimizing excess free cash flow and additionally, the use of debt has a monitoring role as debtholders perform an effective monitoring role to ensure that managers are not likely to destroy firm value.

Firms that divest assets will receive proceeds from the asset sale and therefore it is of interest to monitor what a firm does with the proceeds from the sale. Based on the wealth transfer hypothesis by Galai and Masulis (1976), any proceeds that are raised through corporate restructuring activity will be closely observed by the market as an indicator of agency conflict, proceeds that are retained for investment purposes can be an indicator of agency costs, as any proceeds will increase the level of free cash flow available to firm managers to use for their own projects. This is in contrast to proceeds that are repaid to shareholders or proceeds that are used to pay down debt, this is an action which minimizes accumulating further free cash flow, and therefore it is analogous to a reduction in agency cost of managerial discretion, as the proceeds are not used for managerial satisfaction.

In the divestiture literature, Bates (2005) highlights that firms with high debt ratios benefit more when these proceeds are used towards debt repayments which can alleviate agency concerns. Datta et al. (2003) confirms that divestiture activity returns are positively associated with private monitoring by firm debtholders and Clubb and Stouraitis (2002)

show that those firms that reduce the agency costs of managerial discretion experience a significantly positive market reaction versus a negative market reaction for those firms that increase managerial discretion. For those divesting firms that act to minimize agency costs have been shown to experience a significantly positive market reaction compared with those firms that retain the proceeds for internal investment purposes (Lang et al. 1995).

The presence of agency costs have been shown by Kaiser and Stouraitis (2001) to have a significant impact on divestiture activity and Lee and Lin (2008) find that overall, agency concerns dominate the market reaction to divestiture announcements.[36] Bates (2005) finds that the stockholder returns differ to divesting firms conditional on their levels of investment activity, debt and growth levels; these are all factors that vary across the life-cycle of a firm (Hanks et al., 1993; Pashley and Philippatos, 1990, 1993; Martinez, 2003; Xu et al., 2007). Therefore, it is hypothesized that the agency costs of managerial discretion are likely to differ across firm life-cycle stages. Hypothesis number four that will be tested is the following:

> $H_{0\text{-}4}$: There are no abnormal returns attributable to the level of agency costs of managerial discretion.
>
> $H_{1\text{-}4a}$: The level of abnormal return is conditional on the level of agency costs of managerial discretion within the firm.
>
> $H_{1\text{-}4b}$: The level of abnormal return is conditional on the level of agency costs of managerial discretion and these vary across life-cycle stages.

[36] In the merger literature, Owen and Yawson (2010) have shown that announcement returns and likelihood of activity are conditional on firm life-cycle stage.

It is expected that divestiture activity that leads to a reduction in the agency cost of managerial discretion will lead to a significantly positive stock market response on the announcement of divestiture activity. Additionally, it is anticipated that as a firm grows, the mid-to-latter stages of its life-cycle will be dominated by agency concerns. Brockman and Unlu (2011) highlight that young firms are more likely to have many investment opportunities and be short on cash, therefore agency concerns of managerial discretion are likely to be very low at this stage, however, older firms tend to have fewer investment opportunities but have larger retained earnings/cash, these types of firms have a stronger incentive for managers to have a high level of discretion and thus agency costs due to the relatively high levels of free cash flow in the later stages of firm life-cycle. It is expected that at the later stages where agency concerns dominate, any action to reduce the levels of managerial discretion will lead to positive stock holder returns on the announcement.

This literature and hypotheses form the basis of the empirical examination in this chapter. The next section highlights the data used in this chapter and this is then followed by the presentation and discussion of the main body of the empirical analysis of divestiture and firm life-cycle.

4.3 Data

The following section will focus on the data and approaches taken in this chapter of the thesis. The content includes the variable definitions used in this chapter and information on how various life-cycle categorizations were derived. An outline of the sample construction, event study methodology and multivariate approach is available in the data and methodology chapter 3.

Details of the event study methodology and sample construction is available in chapter 3 of this thesis. This chapter starts with the full sample of non-financial and utility announcements in order to evaluate the impact of firm life-cycle stage on the announcement returns of firms undertaking divestiture activity as outlined in chapter 3.

The key variables used in this study are presented in table 4.01.

[Insert Table 4.01 about here]

4.3.1. Life-cycle variables:

The proxy for measuring life-cycle stage that has been adopted for this research is that based on the work by De Angelo et al. (2006). They argue that firm life-cycle stage is a function of the amount of its earned equity (retained earnings) relative to total common equity (RE/TE hereon) and retained earnings to total assets (RE/TA hereon). This proxy measures the proportion of firm retained earnings in a firm's capital mix as a proxy for firm life-cycle, as it measures the extent to which the firm relies on internal self-finance or external capital (Owen and Yawson, 2010). The estimation of an individual firm's stage in its life-cycle is the RE/TE and RE/TA measurement which is measured at the fiscal year end prior to the divestiture announcement. Where there is ambiguity, the

announcement was removed from the sample (for example, no fiscal year end date listed in Worldscope database). The accounting variables were derived yearly for each company listed at their respective financial year ends for the period -5 years to +5 years relative to the divestiture announcement that takes place in year 0.

The Wordscope database was used to obtain accounting information for the determination of firm life-cycle. These proxy variables of retained earnings (WC03495), total assets (WC02999) and total equity (WC03501) were obtained on a yearly basis. If retained earnings are positive for a particular firm, then this represents the accumulated stock of internally generated funds. If this value is negative, then this could indicate that a company has been suffering from cumulative losses or has paid out more than it has earned. Total assets represent the sum of current and long-term assets and total equity in this study is represented by common equity, which represents common shareholders' investment in the company but exclude accumulated unpaid preferred dividends. In conjunction with the research by De Angelo et al. (2006) and Golbe and Nyman (2013) those firms with negative common equity were removed from the sample. The motivation for this is to prevent the introduction of measurement bias by firms with negative common equity and negative retained earnings having their life-cycle stage overstated as both negative variables would result in a positive RE/TE ratio, incorrectly specifying that they are later in their life-cycle stage. Similarly, for those firms with positive RE values and negative common equity, a negative book value of common shareholders' equity may arise following significant corporate finance activity, such as re-leveraging or for those firms in severe distress, these events are problematic in that they unduly affect the interpretation of the firm. Therefore, in order to avoid the potential pitfalls of misclassification, these firms are removed from the sample, consistent with most

empirical research in accounting and finance (Fama and French, 1992; Griffin and Lemmon, 2002). Consistent with De Angelo et al. (2006) and Owen and Yawson (2010), this study observed 371 negative TE observations, which represented 3.6% of the sample. 1,249 observations were dropped where no RE variables are reported from WorldScope. The earned/contributed capital mix of retained earnings to total equity (RE/TE) and retained earnings to total assets (RE/TA) proxies are measured at the fiscal year end prior[37] to the announcement of the divestiture. Where the RE/TE and RE/TA proxy measurement was unavailable at t_0 (the fiscal year end prior to the divestiture announcement), then those firms were removed from the sample. 8,593 observations remained in the final sample.

4.3.2. Life-cycle stages

In order to classify firms into component life-cycle stages, multiple approaches were used in order to classify firms using the De Angelo et al. (2006) earned/contributed capital mix as a proxy for firm life-cycle.

To begin, the study investigated the general classification approach similar to that of Owen and Yawson (2010). In their study, they examine corporate life-cycle and merger and acquisition activity based their segmentation of life-cycle stages into quartiles amongst the sample. Once quartiled, firms as were classified generally as young (quartile 1), mature (quartiles 2 and 3) and old (quartile 4). In order to generate quartiled life-cycle stages, the variables of RE, TE and TA are taken to create the earned/contributed capital mix (RE/TE and RE/TA, respectively) at period t_0 for each announcement. The RE/TE

[37] Following prior research by De Angelo et al, (2006), Owen and Yawson (2010) and Brockman and Unlu (2011) the fiscal year ends were measured via Worldscope code WC05350 and a check of the length of fiscal year to be between 350-380 days via WC05351 was also completed as a robustness check.

and RE/TA ratios are generated for each announcement at the fiscal year prior to the acquisition announcement and are ordered in ascending order. This classification approach utilised by Owen and Yawson (2010) however comes with some limitations, namely the life-cycle classification is derived completely within the sample of those firms undertaking merger and acquisition activity. This has the potential to result in a high level of misclassifications. For example, if one particular life-cycle stage firm is more likely to undertake merger and acquisition activity, then the complete life-cycle will be measured within this sample, rather than within the complete life-cycle stage.

Therefore, in order to overcome bias of using a quartiled sample purely based on the sample's RE/TE and RE/TA proxy, the life-cycle classification is determined by incorporating the RE/TE and RE/TA variables of the global population of listed dead and alive firms in the United Kingdom into the segmentation process which the firms in the sample are measured against to classify life-cycle stage. This approach allows the sample to be classified using all publicly listed firms in the United Kingdom as a proxy for the complete life-cycle that firms experience. By incorporating all publicly listed firms in each year from 1988-2009, this minimises the selection bias that would be inherent when focusing only on the divesting firms in the sample. Divesting firms are less likely to be at firms at the earliest stage of their life-cycle, so by taking this approach it minimises the likelihood of misclassification of mature firms of belonging to earlier life-cycle stages, yet keeps to the spirit of De Angelo et al. (2006) and Owen and Yawson (2010) classification approaches.

The data is taken from 1988 to 2009 and is re-assessed in each year. The inclusion of both alive and dead companies creates a framework to assess what life-cycle stage a firm is in based on the full earned/contributed capital observations for the global sample of all

UK firms to measure against. The first determination in the study uses a five stage approach of life-cycle classification. It is done so by quartiling RE/TE and RE/TA variables against the global sample of firms by removing negative RE/TE and RE/TA variables respectively and reporting separately these as life-cycle stage zero, as in De Angelo et al. (2006) and Brockman and Unlu (2011).

The approach incorporates five life-cycle stages as observed in the theoretical life-cycle literature as the core number of life-cycle stages found in existing life-cycle research (Hanks, 1990; Lester et al., 2003) by classifying firms as belonging to either stage 0, 1, 2, 3 or 4. Appendix 4.A presents a random sample of thirteen firms to highlight their associated life cycle classification using this framework.

4.3.3. Measures of Relatedness

As highlighted in the previous chapter, there have been a large number of studies that have examined the 'fit' of the divested unit to the core operations of the parent firm. Divestiture is typically a corporate finance transaction that involves the sale of assets that do not match the core operations of a firm (Kaplan and Weisback, 1992; Maksimovic and Phillips, 2001). John and Ofek (1995) hypothesize that there is a positive relation between the level of abnormal returns experienced on divestiture announcements and the unrelatedness of an asset that is being divested. Therefore, the lower the level of business unit interdependency, the higher the abnormal returns. Whilst there have been a number of studies that have been undertaken in this area using different methodological and empirical approaches, generally they all observe positive relation between an increase in focus and share price returns (Comment and Jarrell, 1995; Daley et al., 1997; Veld and Veld-Merkoulova, 2009), although Alexandrou and Sudarsanam (2001), who find a mean CAR of 0.53% for non-focusing sell-offs and 0.22% for focusing sell-offs. They find that the non-focusing sell-offs, in their sample of 1,800 sell-offs, appear to generate higher abnormal returns than the refocusing sell-offs.

This chapter uses the same approach as Berger and Ofek (1995) classifying firms by SIC codes, reporting firms at the two digit SIC level. A divestiture is defined as related if those assets or business units being divested have a SIC code that matches the parent firm to the two digit level and is coded as one as a dummy variable. If the assets are not classified at the same two digit SIC code, then they are classified as unrelated and coded as zero. Due to the good availability of the SIC data, the relatedness at the three and four digit SIC level are also reported.

4.3.4. Agency Costs

Jensen (1986) the separation of control and ownership between managers and shareholders is a primary source of conflicting perspectives between the two parties. The management in a firm generally experience a high level of autonomy and are able to make decisions and undertake activities that maximize their own welfare and are not in the interest of firm shareholders (Jensen and Meckling, 1976; Morck et al., 1988). Watts and Zimmerman (1986) highlight that these activities can take the form of empire building, desire for an easier life by avoiding higher risk projects, excessive investment in personal projects or delaying restructuring activities, amongst others.

It is expected that the level of agency costs of managerial discretion to vary across firm life-cycle, as firms are expected to have higher levels of retained earnings and free cash flow at later stages of firm life-cycle. It is anticipated that agency costs are high at these life-cycle stages as managers have higher levels of personal discretion due to the availability of free cash flow. The earlier stages of the life-cycle are expected to yield low levels of free cash flow.

In addition to free cash flow as a measure for agency costs, a measure of the extent and quality of investment opportunities available to a firm is used as a proxy to measure agency costs. Smith and Watts (1992) and Fenn and Liang (2001) highlight that firms with the highest agency costs have fewer growth opportunities, similarly, those with lower agency costs have higher growth opportunities. The intuition is that at the earlier stages of a firm's life-cycle, growth opportunities are likely to be high and managers are less likely to waste precious resources that hinder the growth and development of the organization. At later stages of the firm life-cycle, growth opportunities dry up,

suggesting that firms are likely to have high levels of free cash flow, and in an efficient market, should return these funds to existing shareholders via dividends. Smith and Watts (1992), Opler and Titman (1993), Fenn and Liang (2001) and Bates (2005) use the market-to-book ratio to proxy the extent and quality of investment opportunities and therefore, agency costs of managerial discretion. Following on from these studies, this chapter uses the market-to-book ratio as a proxy for investment opportunities and agency costs of managerial discretion. Specifically, this chapter uses a definition which focuses on market to book ratios that are less than one. In an efficient market, the lower market-to-book ratio reflects under-priced equity values relative to the book value of assets. If a firm has a market to book ratio less than one, this implies that on average, the firm's managers are not utilizing existing assets effectively and as such the market for assets is less than the accounting value for assets and consequently this may infer high agency costs (Fenn and Liang, 2001). The agency variables investigated are low market to book (*MBOOK_LOW*) which is defined as a dummy variable that is equal to one if a firm has a market-to-book ratio that is less than the median DS level 6 industry market-to-book ratio for the same industry in that year, otherwise zero.

Secondly, an alternative measure of agency costs is investigated via a high free cash flow approach. Fenn and Liang (2001) highlight that firms with low market to book ratios do not necessarily represent those with poor return on assets or severe free cash flow issues. Low market to book ratios may be representative of the industry a firm is operating in (for example, non-capital intensive industries) or it may include those firms that have a poor level of historical earnings and firms that have few growth opportunities available to them.

Therefore to overcome this, and consistent with Opler and Titman (1993), by using a measure which uses book market to book and free cash flow, this two factor approach should highlight firms more accurately that are suffering from high agency costs. Traditional agency theories of free cash flow highlight that firm managers may misuse free cash flow (or the proceeds from divestitures) on manager specific projects (Lang et al. 1995) that benefit their own existence rather than the motives of shareholders. Therefore, high free cash flow (*HIGH_FCF*) is coded one if firms that have a market to book ratio that is less than the global median[38] of all firms in that year and net operating cash flows[39] that are greater than the global median in the same year, otherwise zero. The *HIGH_FCF* is examined to ascertain whether high levels of free cash flow drive the announcement returns that divesting firms experience.

Finally, a measure that incorporates both agency variables above are brought together to create the variable *AGENCY*. *AGENCY* is a variable that incorporates both of the previous agency measures. It is a dummy variable equal to one if a firm is divesting assets where the market-to-book ratio is less than one or where firms have high free cash flow, otherwise zero.

Therefore these agency costs are examined in conjunction with firm life-cycle to ascertain whether these agency costs drive the abnormal returns for divesting firms and more importantly, whether the interaction between these agency cost variables with abnormal returns are conditional on firm life-cycle stage.

[38] The global median represents all publicly listed non-financial firms on the FTSE All Share index in the year in which divestiture activity takes place in the United Kingdom. The median values are re-assessed and recalculated each year.

[39] Net operating cash flow is defined as the ratio of EBITDA to (Market Cap + book value of debt) for all publicly listed firms in the FTSE All Share in the same year as the divestment.

The final sample consists of 8,593 announcements will be used to examine the hypotheses outlined in the following section.

4.4. Empirical Results

This section of the research outlines the empirical results that have been observed based on the data described in the previous data section. An outline and discussion of the event study will be provided, moving onto a discussion on the focus of this research chapter, the firm life-cycle. Furthermore, an interpretation the relatedness of divesting assets will be provided in conjunction with the results on firm life-cycle.

4.4.1. Wealth effects (full sample)

Table 4.02 reports the full sample of 8,593 divestiture announcements for the period of 1998-2009 in this research. For the full sample, the results are significant for the three event windows that are reported in this research for both the mean and the median values.

[Insert Table 4.02 about here]

The AR on the announcement day across the entire sample is 0.635% (mean) and 0.076% (median). The mean CAR over the five day event window [-2,+2] is observed as 1.018% (mean) and 0.266% (median). Similar results were observed for the shorter three day event window [-1,+1], where the CAR for the period was measured at 0.924% (mean) and 0.225% (median). These results support $H_{1\text{-}1}$ that the announcement of divestiture activity yields significantly positive abnormal returns to the parent firm. This positive market reaction suggests that the announcement of the divestment signals positive news to the market. John and Ofek (1995) show that the announcement of divestiture activity is seen as a positive indicator to investors, as they perceive this would reduce the diversification discount problem that overly diversified firms suffer. Additionally, Dittmar and Shivdasani (2003) find that by eliminating negative synergies through divesting, this creates value for the firm.

4.4.2. Relatedness

An increase in corporate focus is frequently cited by managers as a driver of divestment activity with prior studies reporting significant and positive CARs for divestiture announcements relating to an increase in focus. Table 4.03 presents the event study returns segmented by those firms that are divesting assets related to their core business and those firms that are divesting assets that are unrelated to their core operations. Panel A defines related and unrelated at the two digit SIC level, Panel B at the three digit SIC level and Panel C at the four digit SIC level.

[Insert Table 4.03 about here]

At the two digit SIC level, in panel A, the reported average CAR over the three day event window [-1,+1] firms divesting assets related to their core business is 0.893% and expanding this to the five day [-2,+2] event window, the reported average CAR is 1.039%. For the firms who opt to divest unrelated assets or business units, these represent nearly 62% of the overall sample. The average CAR over [-1,+1] event window is 0.866% and the [-2,+2] event window was observed as 0.982% However, the difference between the two samples is generally insignificant.

The narrowing definition of a 'related' assets or business unit causes a fall in the percentage of announcements that are classified under this heading. At the two digit level, this accounts for 38% of firms, this falls to 24% at the three digit level and 20% of firms at the four digit level.

Similar results were observed over the three and four digit SIC approach to classifying relatedness. Across all of the measures, it is generally observed that there is an

insignificant difference between firms divesting assets that are related to their core business operations and those divesting assets outside of the core business operations.

Three results were observed to be significant, at the two digit SIC, firms that divest unrelated assets experience a significantly higher level of median abnormal returns compared to those that are divesting related assets on the announcement day t_0. Therefore for this measure, then we can reject $H_{0\text{-}2}$ and accept $H_{1\text{-}2.}$ These results support the findings of Comment and Jarrell, (1995), Daley et al. (1997) and; Krishnaswami and Subramaniam (1999).

Over the five day event window in panel B and C, there is a significant mean difference at the 5% level between firms divesting related assets versus unrelated assets. Firms that divest related assets outside the core business area experienced around half of a percent lower abnormal returns than those divesting assets at the same three digit SIC. Therefore, again over the five day event window, we can reject $H_{0\text{-}2}$ and accept $H_{1\text{-}2.}$

These results contrast with the earlier findings in panel A, however, the results are consistent with the UK study by Alexandrou and Sudarsanam (2001). They find a mean CAR of 0.53% for those related assets that are sold off and 0.22% for unrelated assets that are sold. Although similarities exist through the empirical results, it may be hypothesised that the drivers of abnormal returns in the study may be the result of additional factors outside the relatedness of the divested asset. Research by Hoskisson and Johnson (1992) and Hoskisson et al. (1993) point out, that even firms that undergo multiple divestitures with the aim of increasing their corporate focus, they still continue to remain highly diversified and as such divesting related assets may not alter the composition of the firm or firms may be motivated to divest for other reasons.

4.4.3. Agency costs

The agency costs of managerial discretion are likely to be a factor that changes throughout the life-cycle of a firm. Younger firms exhibit lower levels of free cash flow and retained earnings and as such, managerial discretion is limited as a by-product of this as resources are scarce to engage in empire building or undertaking investment activity that is not wealth maximizing for firm investors. However, before this is investigated later in the multivariate section of this chapter, the univariate event study returns for the one, three and five day event window are reported in table 4.04 for the complete sample.

[Insert Table 4.04 about here]

Panel A segments the sample by those firms that have high or low agency cost of managerial discretion by the book-to-market ratio measure. The book-to-market variable is measured against the DS level 6 industry average book-to-market ratio in the year of the announcement. Those firms that have a market-to-book ratio lower than the DS level 6 industry average at the financial year end prior to the divestiture announcement date are classified as experiencing high agency costs (Opler and Titman, 1993; Fenn and Liang, 2001; Bates, 2005). This suggests that, on average, the firm's managers are failing to utilize existing assets effectively, inferring high agency costs of managerial discretion. Conversely, a market-to-book ratio of greater than the industry average in the year of the announcement, is classified as suffering from low agency costs, inferring low agency costs of managerial discretion. Over the three day event window [-1,+1] divesting firms experience significant CARs of 1.093% versus 0.442% for those firms with high market-to-book ratios. The difference between the samples is significant to the 1% level. Higher abnormal returns are attributable to those firms with high agency costs, that is the firms

with lower market to book ratios relative to the other firms in the industry. This result suggests that the market responds positively to those firms that are divesting assets when undervalued when experiencing high agency costs. These results highlight that firms that experience high levels of managerial discretion (as measured by the low market-to-book ratio) experience significantly higher abnormal returns when divesting assets over the three and five day event windows.

Panel B examines free cash flow as a proxy for agency costs. The agency costs of managerial discretion is limited by firms that have lower levels of free cash flow and they grow when firms have high available free cash flow. Using a measure of free cash flow adopted by Fenn and Liang (2001), those firms with high free cash flow experienced CARs of 1.006% and those with low free cash flow, experienced CARs of 0.725%, whilst both of the individual results are significant, the difference between the two samples was observed to be insignificant over the three day event window. It is only over the five day event period when there is a significant difference between at the two samples at the 10% level. Over the five day event window, the results are consistent with panel A. Those firms that have a high degree of managerial discretion experience significantly higher abnormal returns on the announcement of divestiture activity.

Finally, panel C brings together the results from panel A and panel B, and highlights whether agency costs of managerial discretion is defined by either of the two measures. The results show that again that there are significantly higher abnormal returns attributable to those firms with the greatest agency costs over those that have fewer agency costs issues. The difference between those firms with high agency costs and those with low agency costs is observed to be statistically significant across all three event windows examined. In other words, managers that are afforded more discretion in

utilizing the resources in the running the firm, experience significantly higher event study returns when divesting assets. We are therefore able to accept hypothesis $H_{1\text{-}4}$, abnormal returns on the announcement of divestiture activity is conditional on the agency costs of managerial discretion within a firm. The results are inconsistent with traditional agency theories of free cash flow, Lang et al. (1995) put forward the view that if a firm lacks specific constraints on how to use proceeds from an asset sale, then the financing benefits from the sale is likely to be offset by the agency costs of managerial discretion. Without low levels of free cash flow, investors may not trust managers to use the proceeds from divestiture activity efficiently in value maximizing activities such as the repayment of debt. However, the results appear to provide support for the view that the market positively reacts to a manager having higher levels of discretion. Those firms are likely to have a high level of free cash flow that is generated from operations that are thriving in its current business operations. The high levels of free cash flow are likely to be an indicator that such firms are better performers and have less need for the cash provided by divesting assets to keep their business afloat, in fact, it suggests that the cash proceeds from divestiture activity are used for strategic investment purposes and to enable growth opportunities (Opler et al., 1999) to further enhance future business operations (for example, expansion and R&D) rather than to prop the business up in times when its ability to generate cash from operations is low. Similarly, the low market to book ratio suggests that the firm's future prospects are good and that earnings are likely to grow due to future investment opportunities made possible by the high levels of free cash flow or the proceeds from the divestiture activity.

4.4.4. Firm Life-Cycle

So far, the empirical results have focused on the announcement returns attributable to the full sample and segments of the full sample based on relatedness and agency elements. This section focuses on the examination of firm life-cycle, by providing a short overview of the RE/TE and RE/TA measures alongside an analysis of the univariate event study returns for the sample in this chapter.

4.4.4.1. Descriptive Statistics

Table 4.05 (panel A) presents an outline of the life-cycle proxies (RE/TE and RE/TA) that are used for calculating a firm's life-cycle stage. The life-cycle proxy of retained earnings scaled by total equity measure (RE/TE) has a negative mean value of -0.194 and a positive median value of 0.468 at the prior fiscal period to the announcement date. Similar results are found in the fiscal period after the announcement, where RE/TE has a negative mean value of -0.129 and a positive median value of 0.48. These results are consistent with that found by De Angelo et al. (2006) and Brockman and Unlu (2011) who both observe a high number of firms with negative retained earnings during the 1990s.

[Insert Table 4.05 about here]

However the measure of retained earnings scaled by total assets (RE/TA) has a positive mean value at the fiscal period prior to the announcement of 0.036 and a median value of 0.112, this then falls in both cases to -0.356 (mean) and 0.105 (median) in the year after the announcement. Panel B presents an overview of the age of the firms in each life-cycle stage, providing an insight into the general effectiveness of the RE/TE and RE/TA measures of firm life-cycle used in this chapter.

The median measurements across all life-cycle groupings show a general increase in firm age as life-cycle stage progresses and this is mostly reflected in the result for the mean ages as well across the sample. However, using firm age as a proxy to indicate firm life-cycle stage has its limitations, in that firms of the same age can be at very different stages of their life-cycle, therefore in order to overcome this limitation firm age is only reported as a descriptive statistic and is not incorporated into any formal testing within the chapter.

4.4.4.2. Results

As previously highlighted this research examines the differences in the wealth gains or losses to shareholders of firms that announce that they are undertaking divestiture at various stages of the firm life-cycle, this section examines firm life-cycle in conjunction with the wealth effect of divesting assets.

Table 4.06 (panel A) reports the abnormal and cumulative abnormal returns generated for shareholders of the divesting firm around the announcement of the divestiture transaction for the event window of 5 days [-2,+2] and three days [-1,+1] split into four life-cycle groups. The RE/TE and RE/TA ratios are generated for each announcement at the fiscal year prior to the acquisition announcement and are ordered in ascending order. The discussion of the results will focus on RE/TE measures, and RE/TA measures will act as a robustness check.

[Insert Table 4.06 about here]

Life-cycle stage 1 is observed to be insignificant across the event windows reported in both the RE/TE. Only 3.01% of the sample remains in this stage and the process of extracting those firms with negative retained earnings out of this life-cycle stage has led to a relatively smaller sample of firms observed in life-cycle stage 1.

In life-cycle stage 2 the mean AR reported is 0.306% and the median 0.062%, both these results are significant. Consequently, expanding the event window to the three and five day event windows also produces significant abnormal returns.

Life-cycle stage 3 similarly shows a positive AR and CARs over all of the event windows that are significant at the 1% level.

Life-cycle stage 4 contains the largest percentage of the full sample, with 30.42% of firms in this category. The reported mean AR on the day of the announcement of divestiture activity is significant at 0.424% and the results for [-1,+1] and [-2,+2] were both significant at the 1% level. In the median results for the same life-cycle stage, the reported abnormal returns were lower at 0.043% (significant at the 10% level), with the CAR over the three day event window observed as 0.195% and over the five day event window as 0.348%, both of these results are significant at the 1% level.

The extracted and created life-cycle stage 0 contains perhaps the most interesting results of all the life-cycle stages. As in De Angelo et al. (2006) and Brockman and Unlu (2011), those firms that exhibit negative retained earnings at the fiscal year prior to the announcement of a divestiture are classified in this stage of life-cycle.

The abnormal return in this life-cycle stage is higher than any of the other four categories. AR on the day of the divestiture announcement is 1.328% (mean) and 0.210% (median). The mean CAR over the three day event window [-1,+1] is measured at 2.217% and over the five day event window [-2,+2] is 2.393%. Similarly, the median CAR for the three

day event window is 0.483% and 0.515% for the five day event window. All the results in life-cycle stage 0 are significant to the 1% level. [40]

As observed previously by Fisman and Love (2003), firms that exhibit negative retained earnings, do so because a firm may have paid out more than it has earned (cumulatively) or it implies that they have been loss making. In this case, in the fiscal period prior to the announcement of a divestment the firm has a published a negative retained earnings value in their public accounts. Examining the descriptive statistics for life-cycle stage 0 in table 4.07, those firms in this life-cycle classification suffer from high operating expenses or high levels of leverage that leads to reduced profitability. For example, gross profit margin is lower in the negative RE group (28.2%) versus 32.4% in the year after the divestment. Likewise the operating profit margin is significantly lower at -50.2% vs 10.6% in the positive RE sample. The net margin is negative at -75.1% (mean) or -1.5% (median) compared to 6.4% (mean) or 5.9% (median).

[Insert Table 4.07 about here]

With such a motivation behind the reason for divesting it suggests that firms in this stage of the life-cycle are using divestitures as a method of increasing liquidity and paying down debt in response to poor financial performance. (Duhaime and Grant, 1984; Hamilton and Chow, 1993; and Schlingemann et al., 2000)

The previous table highlighted that the results are being driven by those firms that exhibit negative RE/TE and RE/TA ratios. Next, the table 4.06 (panel B) examines firm life-cycle as before, but in order to ascertain whether those firms with in life-cycle stage 0

[40] The results using the RE/TA measure of firm life-cycle are fairly similar over each of the measured life-cycle stages, however there is a slight change in the distribution of firms.

were driving the results, the table reports event study abnormal returns by removing negative RE/TE and RE/TA firms from both the global proxy of UK listed firms and the sample of firms.

The purpose of this approach is to examine whether the negative RE/TE and RE/TE samples have an overbearing influence by exhibiting negative retained earnings. Such results which may depart from the life-cycle ideas generated by De Angelo et al. (2006), as those firms with negative retained earnings may simply be older firms that are suffering from cumulative losses or are continuing to pay out dividends which cannot be met by net income that is retained by the firm. Therefore in order to reduce the possibility of misclassification, negative retained earnings are removed.

This resulted in a loss of 1,668 firms, representing 19.4% of the complete sample.

The univariate event study returns highlighted in table 4.06 (panel B) paint a similar picture to panel A, in that the earliest life-cycle stage, stage 1 is observed to have insignificant CARs over the three and five day event window. The results are observed to be significant on the event day (t_0), where the mean abnormal return is reported as 0.242%.

Across life-cycle stage 2, 3 and 4, the results are found to be significantly positive across the one, three and five day event windows. Over the three day event window, the highest mean and median abnormal returns are found to be in life-cycle stage 3, suggesting that those firms at the mid to late stages of their life-cycle appear to generate abnormal returns that are greater than those at other life-cycle stages.

4.4.5. Interpretation of univariate results

The event study results allow is to reject $H_{0\text{-}3}$ and accept $H_{1\text{-}3}$, the levels of abnormal return vary conditional on life-cycle stage. It is found that it is the youngest firms, that are expected to be going through the expansion and rapid growth phrase exhibit the highest and most statistically significant abnormal returns on announcement of an asset sale if those firms with negative retained earnings are included (those in table 4.06 panel A). Using a cleaner measure without negative retained earnings, life-cycle 3 (the late maturity and revival stage) is observed to have the highest level of event study returns across each event window.

Clearly, the univariate results have identified life-cycle stage 0 firms experience higher abnormal returns than any of the other life-cycle stages that drive these results. The findings attached to life-cycle stage 0 allow us to posit that these firms with negative retained earnings are firms facing financial constraints experience higher abnormal returns than those firms that are otherwise considered healthy.

Reported negative retained earnings can be an indicator of a long-term series of losses that have been reported by the firm. This infers that at this early stage, these firms are more likely to undertake divestiture activity as a way to reduce their levels of borrowing (Lang et al., 1995) or to mitigate issues of financial distress. This supports the view of Officer (2007) who shows that those firms divesting assets have on average lower cash balances and cash flow than size- and industry-matched control firms.

At life-cycle stages 1-2 (expansion and maturity stages), weaker abnormal returns are experienced over the announcement date. The “maturity” phase in the study is where the level of profit opportunities begins to slow for a firm and possibly decline in this life-

cycle stage (Mueller, 1972). Divestiture activity at this stage may also be used to eliminate any negative synergies that are identified; as maturing firms seek to efficiently focus on their core units, so may do this by divesting and reducing the diversification discount (Dittmar and Shivdasani, 2003) however in this study, it appears that at the early stages of firm life-cycle, there are insignificant returns attributable to those firms with positive levels of retained earnings.

Life-cycle stage 3 is identified as the "late maturity and revival" phases under the classification by Miller and Friesen (1984) and in this stage firms in this stage begin to consolidate their operations, as levels of sales begin to stabilise and the business moves their focus onto core units of operation following revival and renewed effort by the firm to revitalise their business operations. The results in this life-cycle stage were significantly positive and support this view across the two panels A and B. The abnormal returns are the greatest in life-cycle stage 3 than any of the other positive life-cycle stages. This suggests that these firms are being rewards for removing firms that are not central to the core operations of a firm and focusing on continuing profitability at this later stage of the firm life-cycle is positively viewed by shareholders.

Finally, life-cycle stage 4 is identified as the "decline" stage in the life-cycle literature. Firms in this life-cycle typically have low levels of innovation; this in turn leads to declining levels of demand, as antiquated products are no longer desirable to consumers. Few investment opportunities exist as ignorance of product markets and lack of strategic planning are contributing factors cited by Miller and Friesen (1984) as to firms being characterised as being in the decline phase. Firms still experience positive abnormal returns on the announcement of a divestiture in this stage, as poor financial performance as suggested by Duhaime and Grant (1984), Sudersanam (1995), and Schlingemann et al.

(2000) is a motivating factor for firms to continue paying dividends or to maintain existing operations for as long as possible. The univariate results reflected this in panel B, the abnormal returns were still significantly positive, but they were the lowest across all life-cycle stages examined in that panel. Maintaining liquidity levels may be a factor that leads the assets to be sold to help slow down the decline in relevance and status of the company.

4.4.6. Multivariate Analysis

The previous section of this chapter focused on analysing the univariate event study results that examined the abnormal returns for firms undertaking divestiture activity. The univariate analysis focused on the event study returns for firms categorized in different life-cycle stages, with each life-cycle stage exhibiting different abnormal returns.

The following section examines the cross-sectional determinants of these abnormal returns by conducting multivariate analysis on the results. The multivariate analysis will be undertaken using cross sectional regression to examine the factors that impact the observed event study returns experienced by the parent company that is undertaking divestiture activity. The cross sectional regression allows us to simultaneously control for factors that influence the event study abnormal returns for firms that are divesting assets, such as life-cycle stage, firm specific characteristics and accounting related variables together.

Consistent with Owen and Yawson (2010) on their study on examining corporate life-cycle and M&A activity, this study will focus the multivariate analysis on the quartile functions derived assuming five stages of firm life-cycle and four stages of firm life-cycle. The decision to focus on the quartile follows the existing theoretical research in the life-

cycle area that supports five or four life-cycle stages (Greiner, 1972; Miller and Friesen, 1984; Hanks, 1990; Lester et al. 2003) and follows on from the approach taken by Owen and Yawson (2010).

The results in tables 4.08 and 4.09 present the results of the cross-sectional regression of the five stage life-cycle using the life-cycle classification approach of RE/TE and RE/TA respectively. Tables 4.10 and 4.11 present the results of the four stage life-cycle model (with negative retained earnings firms removed, as in the univariate section) defined by RE/TE and RE/TA respectively.

The dependent variable in these tables is the cumulative abnormal return over the three-day event window and the baseline of the models is specified by the following equation:

$$CAR_{[-1,+1]} = \alpha + \beta_1 FSIZE + \beta_2 GOPP + \beta_3 CLUS + \beta_4 REL + \varepsilon \qquad \text{[Equ. 4.1]}$$

Model 1 of table 4.08 and table 4.09 examines the impact of the RE/TE and RE/TA as proxies on the event study CARs.

These life-cycle proxies used in this multivariate section of the study are examined to ascertain whether there is any relationship between the proxies and the CARs experienced by those divesting assets. In table 4.08 and 4.09 using the five stage life-cycle, supporting the results found by Owen and Yawson (2010), the findings for both RE/TE and RE/TA variables show that firm life-cycle is significantly negatively related to the level of abnormal returns experienced by the parent firm at the 1% level.

These results suggest that those firms that are classed as younger or are at the earlier stages of their life-cycle experience higher abnormal returns when divesting compared to

those that are in the later stages of their existence. These results are consistent with the evidence observed in the univariate section of the chapter on the five stage life-cycle.

Tables 4.10 and 4.11 report RE/TE and RE/TA variables over the four stage life-cycle, where those firms with negative retained earnings have been removed from the sample. In this scenario, the RE/TE variable in table 4.10 and the RE/TA variable in table 4.11 become insignificant. It appears that the results are not robust when limiting the sample to those firms with positive retained earnings.

This result suggests that the negative relationship between RE/TE and RE/TA variables are mostly driven by those firms with negative retained earnings in the sample and this effect disappears when these firms are removed from the sample.

Model 2 investigates whether any particular life-cycle stage drives the returns for those firms divesting assets.

[Insert Table 4.08 about here]

In table 4.08 these life-cycle stages are classified using the five stage life-cycle approach defined by RE/TE, where life-cycle 0 as the omitted category[41] and the remaining four life-cycle stages are categorized as Q1 to Q4 using the RE/TE proxy. The life-cycle stages were classified using a dichotomous variable where the life-cycle stage takes on the value of 1 if a particular firm is classified as belonging in that life-cycle stage. Similarly, as a robustness check table 4.09 highlights the firms classified using the RE/TA approach.

[41] The omitted variable provides the reference category against which the other life-cycle stages are assessed against.

Somewhat consistent with the previous finding in model 1, each of the life-cycle stages are observed to exhibit negative coefficients. The results are found to be significantly different in life-cycle stage 2 at the 1% level, and at the 10% level for stage 1 and 4.

[Insert Table 4.09 about here]

As a robustness check, table 4.09 presents the results for the five stage life-cycle approach defined by RETA with the same respect Q1 to Q4 life-cycle stages. Similar results were observed whereby the coefficients of each life-cycle stage were found to be negative. Using the RE/TA proxy yields a highly significant result for each life-cycle stage.[42]

[Insert Table 4.10 about here]

As a check, table 4.10 examines each life-cycle stage, with the firms exhibiting negative retained earnings to be removed from the sample.

A marked difference is observed in the results. By removing the firms with negative retained earnings from the sample, only life-cycle 3 is significantly positive against the earliest life-cycle stage in table 4.10.[43] These results are consistent with the earlier univariate result and suggest that the earlier highly significant results are driven by those firms with negative retained earnings.

[Insert Table 4.11 about here]

[42] As a further robustness check, Appendix 4.B presents the results of table 4.08/09 controlling for the price paid for the divested asset. This amount paid for the asset is otherwise known as the 'deal size.' Lang et al. (1995) and Lasfer et al. (1996) find that announcement period abnormal returns for firms undertaking divestiture activity increase with the divestiture deal size (DSIZE), however the limited reporting by Thomson ONE of the price paid for each divestiture, especially in the earlier period of the sample, this has prevented the inclusion throughout this thesis as a core control variable. The results show that the variable DSIZE is significantly positive across all models, confirming the positive relation between the price paid for the divested asset(s) and announcement returns. When controlling for DSIZE, the previous findings in table 4.08 and 4.09 hold.

[43] The results are not found to be robust against the RETA measure in table 4.11.

Next model 3 investigates the impact of free cash flow on the observed event study returns for divesting firms. Free cash flow is selected for two reasons, firstly it is a good proxy for agency costs, firms with higher levels of free cash flow are likely to display higher levels of managerial discretion versus firms with low levels of free cash flow, where managerial discretion is minimized. Secondly, the variable is investigated as, although firm free cash flow was not used as a measure of firm life-cycle in this chapter, there are a number of studies that have examined firm free cash flow and used this as a proxy for firm life-cycle. Dickinson (2011) argues that cash flows outperform basic alternative measures of firm life-cycle such as profitability, age and size and similarly, Black (1998) found an increase in the value relevance of free cash flow to firm life-cycle. Therefore to assess the relationship that free cash flow has with event study returns, it is adopted and measured in model 3.

The results of model 3 show that there is no significant impact of free cash flow levels in explaining abnormal returns by the divesting firm's parent when assessed with the full sample of divesting firms. This result applies across both the five and four stage firm life-cycles adopted in this chapter and are similar to the findings in the earlier univariate section. These results are to be expected due to the unpredictable nature of excess cash flow, whilst it is expected that firms in their later life may have free cash flow, some firms may opt to disburse this to shareholders and others may opt to keep it for future investment opportunities or day to day financing of operations. When a firm undertakes business operations such as new equity offerings or issues new debt, there may be an

inflow of cash into the business that may cause interpretation difficulties if cash levels are used to explain firm life-cycle.[44]

Additionally, the level of free cash flow appears to have no relationship in this context, suggesting that for firms that divest assets or business units, the level of free cash is not a significant factor in explaining abnormal returns.

Next, model 4 examines the impact of capital expenditure (CAPEX) on the divestor abnormal returns. Anthony and Ramesh (1992) in their study on firm life-cycle document that CAPEX is negatively correlated with firm age. The results indicate that the level of CAPEX is negatively related to the level abnormal returns experienced by divesting firm. These results are significant across both the five stage and four stage life-cycle definitions.

These results show that the market places a lower value on firms that divest assets that have a higher level of capital expenditure over a lower one. It appears that firms who undertake divestiture activity after a period of high capital expenditure receive a cautious response from shareholders. Such activity might reflect that investors may be wary of managers that have invested significant capital in projects that are quickly reversed by undertaking divestiture activity.

[44] However it should be noted that free cash flow (FCF) is significantly negatively associated with announcement return CARs when incorporating the deal size (DSIZE) into the sub sample of divestiture announcements that are reported with a price paid for the assets. As previously highlighted, this variable is only reported for a subset of the full sample, however nonetheless, it highlights that firms experiencing the highest level of abnormal returns are those with lower levels of free cash flow. These are likely to be firms at the earlier stages of their life cycle and these results support the previous findings in this regards. An additional interpretation to this finding is that the market positively responds to low agency costs (as proxied by level of free cash flow) and as such to firms that have high levels of agency costs are associated with significantly negative abnormal returns. Further analysis of these findings are presented later in this section.

Finally, driven by the Jenkins et al. (2004) who use profitability and find it a significant variable in assessing firm life-cycle, it has been adopted in model 5 of table 4.08-4.11. Hillier et al. (2009) observed that one of the most significant factors in the decision to undertake divestiture activity is poor operating returns. Profitability is measured as EBITDA to total assets, which is a measure of return on assets. Firms that suffer from poor profitability are more likely to undertake divestiture activity as a means of mitigating financial distress, improving cash flow or focusing business operations in core areas.

The results show that after controlling for firm size, growth opportunities, clustering, same industry and divestiture activity, profitability is an insignificant factor in explaining abnormal returns by divesting firms for across a five stage life-cycle approach. The lack of significance in the result may point to the findings of Bergh (1997) and Haynes et al. (2002) who highlight that profitability is a difficult measure to capture in a cross sectional context due to the variation in the way that firms react to poor profitability (some may do quickly, others may respond after a period) and as such, firm specific decisions can influence profitability and as such as difficult to deal with in cross sectional analysis.

However, profitability in tables 4.10 and 4.11 is observed to be positive and significant when the firms with negative retained earnings are excluded from the sample. For those firms that are not suffering from financial distress, it appears that the results contrast with that of Hillier et al. (2009). Firms with higher levels of profitability, appear to experience higher abnormal returns when divesting assets. One suggestion for this result is that it appears that firms that are not financially constrained are able to extract the full value of the asset being divested. Additionally, it could be suggested that the market has a higher degree of confidence in profitable firms that divest assets as a strategic option available

to them over those firms that are forced to divest due to poor returns on their existing assets.

The earlier univariate results suggest that there is a mixed picture when it comes to the influence of agency costs within a firm. Firms with low levels of market to book experience higher event study returns than higher market to book ratios. Similarly, the univariate results show that firms that are classified as suffering from the characteristics of high agency costs experience significantly higher abnormal returns compared to those firms that are suffering from low agency costs.

However, when examining free cash flow, there is no significant difference observed between high free cash flow firms and low free cash flow and the level of free cash flow does not appear to be a significant factor in explaining the event study abnormal returns for divesting firms. Additionally, those firms that have lower levels of retained earnings and those making smaller levels of capital investment in the year prior to the divestment, all achieve significantly higher abnormal returns than those that do not.

Therefore in this case, the results highlight a mixed picture in regards to the influence of agency elements on abnormal returns. To investigate this further, tables 4.12 and 4.13 try to investigate the interaction between these variables and the respective five and four stage life-cycle stages as utilized throughout this chapter.

Table 4.12 investigates the impact of these agency factors using the life-cycle structure that contains five stages against the omitted category of life-cycle stage 0 (or those firms with negative retained earnings). [45]

[45] The RE/TE approach is used to define life-cycle stage. The RE/TA approach was utilized and found no significant differences in the results to the RE/TE approach.

[Insert Table 4.12 about here]

The previous univariate results (table 4.04, panel A) highlight that firms with a low market-to-book ratio, experience significantly higher abnormal returns on the announcement of divestiture activity compared to those with a high market-to-book. This result could be interpreted as the market is providing a positive signal to the firm for divesting assets when the firm's future prospects are good. These positive prospects are likely to lead to future growth due to future investment opportunities made possible by the proceeds from the divestiture activity. By undertaking divestiture activity, firms may be divesting less profitable assets or business units that are a drain on company finances and reinvesting the proceeds in more profitable projects.

Therefore to take this further, model 1 investigates the interaction between firms with low market to book ratios and firm life-cycle in order to test whether the level of abnormal returns are associated between the two. The result shows that once incorporating the interaction between life-cycle stage and low market-to-book, then no life-cycle stages appear to be significant in explaining the abnormal returns to those divesting firms. However, the variable MBOOK_LOW is observed to be significant, these results back the earlier univariate findings that is there is a positive association between stockholder returns and for those firms that divest with high agency costs.

Model 2 highlights the interaction between high free cash flow and firm life-cycle stage. Similar to the univariate element reported previously, the interaction between this variable and the various firm life-cycle stages are found to be insignificant. There appears

to be no consistent or statistically significant response to firms with high free cash flow conditional on life-cycle stage.

In order to investigate the impact of high agency costs, following Fenn and Liang (2001), the variable AGENCY is used in model 3. In the univariate testing, the agency cost variable is positively and significantly related to the level of abnormal returns experienced by divesting firms. The variable AGENCY is found to be significantly positive at the 5% level in the multivariate testing, these results highlight again that there is a strong positive association between high agency costs and firms announcing divestiture activity. The interaction between AGENCY and firm life-cycle stages reveals results that are not statistically significant and are therefore not robust to the earlier univariate results.

So far investigating the impact of agency costs has shown the results are robust to the findings in the earlier univariate section of the study. Additionally, the results show that the abnormal returns experienced by divesting firms appear not to be conditional on the life-cycle stages of each firm when investigated with factors surrounding agency costs.

Finally, the level of capital expenditure that was investigated earlier is re-introduced to assess the impact of capital expenditure being conditional on life-cycle stage. The failure to observe any life-cycle stage impact of the previous agency cost variables on firm CARs and life-cycle stages, has led to the testing of this variable to ascertain whether the returns observed during different life-cycle periods are driven by levels of CAPEX.

As previously highlighted, CAPEX was observed to be negatively related to the abnormal returns for the full sample of divesting firms. Therefore, in order to investigate the final angle to the agency cost hypothesis, the CAPEX variable was introduced in conjunction with a test of the interaction variables of firm life-cycle stage. Earlier, it was observed

that that the market rewards divesting firms with higher abnormal returns for those firms that undertake lower levels of capital expenditure. It could be argued that when a firm is suffering from financial distress, wanting to refocus their operations or poor performance, then undertaking capital expenditure may not be an ideal action for a manager/CEO to undertake. Firms appear to gain higher abnormal returns when capital expenditure is low, versus lower abnormal returns when capital expenditure is high. This this was attributable to investors being wary of managers that have invested significant capital in projects that are quickly reversed by undertaking divestiture activity and as such, the market places a lower value on firms that divest assets that have a higher level of capital expenditure.

Model 4 tests the interaction between the cumulative abnormal returns experienced by the divesting firm and the level of capital expenditure conditional on the various life-cycle stages. The result shows that there is a distinct split between early and late life-cycle stage firms. Earlier life-cycle stages (1 and 2) show a positive relation between CAPEX and observed CARs and those at the later stages (3 and 4) show a negative relation. It is expected that when firms are have negative or low levels of retained earnings, they are likely to be at the earlier stages of firm life-cycle and they are also likely to be suffering from financial constraints, therefore any major capital expenditure activity is likely to be done for growth purposes. At the earlier stages of firm life-cycle, agency cost concerns are likely to be minimal.

However, when firms reach their later stages, then agency costs concerns appear to dominate. When examining the interaction between CAPEX and life-cycle stages 3 and 4, these coefficients are negative at the 1% level. This result tells us that once firms reach maturity, then agency concerns appear to cause investors unease, so to the extent that

firms that engage in high levels of CAPEX prior to divestiture experience significantly lower abnormal returns.

Next, the results are examined to ascertain whether they are robust when removing the sample of firms with negative retained earnings.

[Insert Table 4.13 about here]

Table 4.13 reports the life-cycle classification approach using the four stage life-cycle categorization as defined using RE/TE (without the negative retained earnings sample). The reference category in this model is the earliest life-cycle group, which is the quartile with the lowest retained earnings.

The prior univariate result highlighted that after extracting firms with negative retained earnings, life-cycle stage 3 experienced higher abnormal returns compared to the other life-cycle stages, additionally model 2 in table 4.10 highlighted that there is a significantly positive response from life-cycle 3 for the sample of firms with positive retained earnings.

Across all of the components investigated in table 4.13, the results in life-cycle 3 are clearly highlighted as a significant factor across in the multivariate regression.

Model 1 highlights that, similar to the findings over the five stage life-cycle measure, over the four stages, the interaction results suggest that there is no significant life-cycle stage that drives the results. However, once more the low market-to-book variable is observed to be significantly positive at the 10% level over the four stage life-cycle model. Suggesting these results are robust to the earlier univariate and multivariate findings.

Model 2 then examines high free cash flow and the interaction between this variable and event study returns. Life-cycle stage 3 and the high free cash flow is observed to be

significant in this model. The results show that the market responds more positively to those firms that have low free cash flow, or in other words, when managerial discretion is limited. Firms with high free cash flow still experience positive abnormal returns, but less so than those with lower levels of free cash flow. At stage 3, firms start to slow down and are typically very large by this stage, usually operating in multiple product areas as a by-product of firm diversification, therefore it appears that shareholders view high free cash flow at this stage of the life-cycle as a mechanism to worsen the principal-agent problem (Jensen, 1986), therefore by limiting the availability of free cash flow, the firm limits managerial discretion and wastage on non-wealth maximizing activities.

Next, model 3 examines the *AGENCY* variable and the interaction with the four stage firm life-cycle stage. No variables are observed to be significant over the four stage life-cycle model.

Finally, the interaction between CAPEX and the four stage firm life-cycle is examined and again life-cycle stage 3 is found to be highly significant. At the late maturity and revival stages of a firm's life-cycle, firms will try to regenerate some of the past successes by undertaking investment in new business areas or ideas. However, as previously highlighted, where firms undertake a high level of CAPEX which is subsequently followed by divestiture activity, the market appears to treat this with caution and firms subsequently receive a lower gain on the announcement, especially at later life-cycle stages.

4.5. Conclusion

This study sought to examine whether differences in abnormal returns exist at various life-cycle stages when a firm announces that it is undertaking divestiture activity. The motivation for this study was to use a new approach to measure firm life-cycle that had yet to be used in divestiture research and to work on the foundations of the research by Pashley and Philippatos (1990, 1993) who examined the stock price performance surrounding the announcement of divestiture and whether it is dependent on life-cycle stage. Their results found that voluntary divesting US firms experienced small positive but insignificant CARs. They concluded that contrary to previous studies on divestiture, in their sample of 105 firms, the evidence is weak in suggesting that significant abnormal returns will be experienced by firm shareholders. Much of the existing literature has categorised life-cycle stages by particular characteristics and traits, however this is the first study to use a quantifiable approach to help explore the earned/contributed capital mix (RE/TE and RE/TA) as a means of identifying firm life-cycle stage in conjunction with an event study to examine whether there are any particular influences of life-cycle stage on firm returns of divesting firms.

However the research undertaken in this study tries to ask the question: is there a significant difference in the abnormal returns that are experienced in each life-cycle stage? Do differences in firm life-cycle stage lead to differences in the observed announcement returns?

To an extent, the answer is most certainly yes.

This study examined a sample of 8,593 divestment announcements over the period of 1988-2009 in the United Kingdom. The different life-cycle stages exhibit varying levels

of abnormal returns, even if most of these reactions are positive, it is the extent to which they differ that is of interest. The initial sample results are significant and positive with a mean AR of 0.635% on the day that the divestment is announced. Over the three day event window [-1,+1] the average CAR is observed as 0.924% and over the five day event window 1.018%. These results are significant at the 1% level.

The study then examined whether the extent of the relatedness level of divested assets had an impact on the observed announcement returns. The results show that firms who divest assets that are related to their core business operations observed an insignificant difference over the three day event window [-1,+1], but over the five day event window, higher abnormal returns were attributable to those that divest related assets over unrelated assets, a result consistent with Alexandrou and Sudarsanam (2001).

Finally, the study examined firm life-cycle and did so using the De Angelo et al. (2006) approach of categorizing life-cycle stage via the earned/contributed capital mix. The focus of the research was to work on the earlier research by Pashley and Philippatos (1990, 1993) and determine whether another approach to measuring firm life-cycle would yield any improvements to the observed research in the field.

Using the quartiling approach similar to that of Owen and Yawson (2010). Life-cycle classification approaches were created that were consistent with the number of stages that Miller and Friesen (1984) suggest in their early life-cycle research. Upon segmenting the life-cycle stages by the earned/contributed capital mix, it was the youngest firms that had negative retained earnings that exhibited the largest gains using the event study methodology. These firms displayed elements of financial distress or poor operating performance. The results were positive and highly significant for the younger firms;

abnormal returns of 1.328% were observed on the event day when the divestiture was announced, which rose to 2.217% for the CAR on the three day event window and 2.393% CAR for the five day event window. The largest gain outside of the firms that exhibited negative retained earnings belonged to those firms in the 'late maturity and revival' phase Stage 3, experiencing ARs 0.671% on the event day and 0.809% for the three day event window CARs.

Similarly, when the firms with negative retained earnings were removed from the sample, life-cycle stage 3 continued to display the highest level of abnormal returns. The higher abnormal returns experienced at this stage can be attributable to firms beginning to consolidate their operations and a renewed focus on revitalising their operations. Firms in the late maturity stages are large and are usually burdened with slow growth and loss making activities, therefore divesting assets at this life-cycle stage is positively viewed by firm shareholders in part due to the cash proceeds from the sale being used to reinvest in future growth opportunities.

The cross-sectional determinants of the abnormal returns were examined by undertaking multivariate analysis. Using cross sectional regression allowed for an examination of the factors that helped influence the abnormal returns for firms undertaking divestiture activity. The multivariate analysis showed that life-cycle stage was significant and negatively related to the level of abnormal returns experienced by the divestor. These results supported the earlier univariate analysis that highlighted firms at the earlier stages of their life-cycles experienced higher abnormal returns than later life-cycle stages.

An additional view that arose with using this particular proxy is that it presented an agency argument due to the negative relationship observed between level of retained

earnings and abnormal returns. Those firms with low levels of retained earnings are limiting managerial discretion and as such limiting their scope to invest in non-wealth maximizing activities. This alignment in objectives was positively viewed by firm shareholders.

However, the negative relationship between CARs and the life-cycle proxies was not robust after removing those firms with negative retained earnings.

The cross sectional results observed that a major driver of divestor abnormal returns are firms with a low market-to-book ratios. Following Smith and Watts (1992) and Bates (2005) who use market-to-book as a proxy for agency costs, low market-to-book ratios are generally indicators that the firm is undervalued and currently earning poor return from their current given set of assets. For those firms divesting assets, the positive interpretation from the market is that higher abnormal returns are welcomed by investors in order for firms to focus on potential future prospects and growth by removing poorly performing assets from the business.

However, the evidence in this chapter in support of limiting managerial discretion was mixed.

Levels of capital expenditure are found to be negatively related to abnormal returns across the full sample, but once splitting the results into respective life-cycle stages, earlier life-cycle stage firms experienced a positive relationship with CAPEX compared to later life-cycle stage firms, where a negative relationship was observed. These results suggest that agency costs concerns appear to be prevalent at the later stages of firm life-cycle, but not at earlier stages, where capital expenditure is encouraged for growth purposes.

Finally, free cash flow was observed to be an insignificant factor in explaining the level of abnormal returns across the whole sample. Free cash flow only became significant when interacting with life-cycle stage 3, where it was observed that that limiting managerial discretion by having lower levels of free cash flow was positively viewed by firm investors.

Therefore the results in this chapter appear to show, although the life-cycle variable RE/TE and RE/TA are significant and are a good proxy for life-cycle classification; the event study returns vary significantly depending on whether those firms with negative retained earnings are included in the sample. However, it should be noted that across many of the measures investigates, that life cycle stage 3, those in the late maturity and revival phases, appear to consistently show the highest event study abnormal returns for those firms announcing divestiture activity.

One the key findings that has arisen out of this chapter is the impact of negative retained earnings and low levels of market-to-book and the impact that these have on divestiture returns. The result from the firms in the sample with negative retained earnings suggests that there are characteristics of financial distress or poor operating performance. Additionally, there is some evidence that at later stages of firm life-cycle, agency cost concerns drive the announcement returns. Therefore, the next stage of this thesis will now move on to examine the impact of poor financial health on the impact on divestitures.

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Table 4.01 Financial and life-cycle variable definitions

This table reports the key financial and life-cycle variables used throughout this chapter. The variable name, variable reference, definitions and Worldscope codes used throughout this chapter are presented below. Variables not defined in this table are defined in their respective tables.

Variable name	*Variable reference*	*Definition*	*Worldscope*
Firm Size	*FSIZE*	A measure of firm size as defined by *ln(totalassets)*	ln[WC02999]
Growth Opportunities	*GOPP*	A measure of growth opportunities as proxied by the market to book (measured as the market value of equity to book value of equity).	Datastream: MTB
Cluster	*CLUS*	Dummy variable that is equal to one if the firm has been involved in another divestiture 180 days prior to the announcement.	-
Same industry divestiture	*REL*	Dummy variable that is equal to one if the divested unit is in the same industry as the parent company at the two digit SIC level.	-
Capital Expenditure	*CAPEX*	A measure of capital expenditure and is measured using the ratio of capital expenditure to total assets	[WC04601] / [WC02999]
Free cash flow	*FCF*	A measure of free cash flow and is measured as the ratio of (Net operating cash flow from operations - CAPEX) to total assets	([WC18198] - [WC04601]) / [WC02999]
Profitability	*PROFIT*	A measure of profitability and is measured using the ratio of EBITDA (earnings before interest, taxation, depreciation and amortization) to total assets.	[WC18198] / [WC02999]
Low Market to Book	*MBOOK_LOW*	Dummy variable that is equal to one if the market-to-book ratio is less than the median DS level 6 industry market-to-book ratio for the same industry in that year.	-
High Free cash flow	*HIGH_FCF*	Dummy variable that is equal to one if firm has below median market-to-book ratios and above median net operating cash flows against where;	-
	- Global Market-to-book	Global market-to-book computes the median market-to-book of publicly listed firms in the FTSE All Share in the same year as the divestment.	Datastream: MTB
	- Global cash flow from operating activities	Global operating cash flow is defined as the ratio of EBITDA to (Market Cap + book value of debt) for all publicly listed firms in the FTSE All Share in the same year as the divestment.	[WC18198] / ([WC08001] + [WC03255])
Agency	*AGENCY*	Dummy variable that is equal to one if either the variable MBOOK_LOW or HIGH_FCF is equal to one, otherwise zero.	-
Retained Earnings	*RE*	Retained earnings	[WC03495]
Total Equity	*TE*	Total equity	[WC03501]
Total Assets	*TA*	Total assets	[WC02999]
RE/TE	*RETE*	The ratio of retained earnings to total equity	[WC03495] / [WC03501]
RE/TA	*RETA*	The ratio of retained earnings to total assets	[WC03495] / [WC02999]

Table 4.02 Event study returns (full sample)

This table reports abnormal stock price returns on the announcement of divestiture activity for a sample of 8,593 announcements by UK firms for the period of 1988-2009. This result excludes financial, utilities and those firms that were not categorised by at least a primary Standard Industrial Classification code. The announcement of divestiture activity is day 0 [t0], as derived from Thomson Reuters ONE Banker database. Daily equity data is obtained from Thomson Reuters Datastream. Abnormal returns are calculated using the market model - with daily return on the sample firm's stock minus the market return of the FTSE All Share Index. The table reports the average abnormal return on the announcement date (to) and the cumulative average abnormal returns for a five [-2,+2] and three day [-1,+1] event window.
*** and ** denote statistical significance at the 1% and 5% level, respectively.

		Mean		**Median**	
		Return	t-stat	Return	z
AR	[t0]	**0.635%*** **	9.98	**0.076%*** **	5.63
CAR	[-2,+2]	**1.018%*** **	9.45	**0.266%*** **	6.17
CAR	[-1,+1]	**0.924%*** **	9.95	**0.225%*** **	6.72

Table 4.03 Event study returns (by relatedness)

This table reports abnormal stock price returns on the announcement of divestiture activity for a sample of 8,593 announcements by UK firms for the period of 1988-2009. This result excludes financial, utilities and those firms that were not categorised by at least a primary Standard Industrial Classification code. Related assets are defined as those business units that are being divested with a SIC code that matches the parent (to the two, three and four digit level), otherwise the divestiture is unrelated. The announcement of divestiture activity is day 0 [t_0], as derived from Thomson Reuters ONE Banker database. Daily equity data is obtained from Thomson Reuters Datastream. Abnormal returns are calculated using the market model - with daily return on the sample firm's stock minus the market return of the FTSE All Share Index. 'Freq.' represents the count of observations for each respective category.

		Divesting related assets/business units				Divesting unrelated assets/business units				*Difference*			
Panel A – Two digit SIC													
		Mean		**Median**		**Mean**		**Median**		Mean		Median	
		Return	t-stat	Return	z	Return	t-stat	Return	z	Return	t-stat	Return	z
AR	[t0]	**0.033%**	0.554	**-0.020%**	-1.397	**0.141%**	3.221	**-0.017%**	1.002	0.108%	1.496	0.003%*	1.842
CAR	[-2,+2]	**1.039%*****	5.117	**0.233%*****	4.632	**0.958%*****	7.830	**0.279%**	7.997	-0.081%	-0.364	0.046%	1.066
CAR	[-1,+1]	**0.893%*****	5.996	**0.192%*****	5.358	**0.767%*****	7.667	**0.210%**	7.757	-0.125%	-0.725	0.018%	0.362
			Freq	3,229	38.06%		**Freq**	5254	61.94%				
Panel B – Three digit SIC													
		Mean		**Median**		**Mean**		**Median**		Mean		Median	
		Return	t-stat	Return	z	Return	t-stat	Return	z	Return	t-stat	Return	z
AR	[t0]	**0.062%**	0.803	**-0.024%**	-0.157	**0.112%*****	2.853	**0.009%**	-0.02	0.050%	0.607	0.033%	0.264
CAR	[-2,+2]	**1.412%*****	5.121	**0.377%*****	4.971	**0.851%*****	7.604	**0.240%*****	7.656	-0.560%**	-2.227	-0.138%	-0.874
CAR	[-1,+1]	**1.011%*****	5.185	**0.181%*****	4.589	**0.752%*****	8.214	**0.208%*****	8.211	-0.260%	-1.329	0.027%	0.213
			Freq	2,076	24.47%		**Freq**	6,407	75.53%				
Panel C – Four digit SIC													
		Mean		**Median**		**Mean**		**Median**		Mean		Median	
		Return	t-stat	Return	z	Return	t-stat	Return	z	Return	t-stat	Return	z
AR	[t0]	**0.060%**	0.695	**-0.003%**	-0.822	**0.109%*****	2.868	**-0.022%**	0.335	0.049%	0.558	-0.019%	-1.061
CAR	[-2,+2]	**1.483%*****	4.581	**0.302%*****	4.208	**0.865%*****	7.985	**0.253%*****	8.123	-0.618%**	-2.288	-0.049%	-0.435
CAR	[-1,+1]	**1.007%*****	4.5344	**0.082%*****	3.353	**0.767%*****	8.6109	**0.224%*****	8.884	-0.240%	-1.143	0.143%	0.729
			Freq	1,698	20.02%		**Freq**	6785	79.98%				

Table 4.04 Event study returns (by agency proxies)

This table reports abnormal stock price returns on the announcement of divestiture activity for a sample of 8,593 announcements by UK firms for the period of 1988-2009. The results exclude financial, utilities and those firms that were not categorised by at least a primary Standard Industrial Classification code. The announcement of divestiture activity is day 0 [t0], as derived from Thomson ONE Banker database. Daily equity data is obtained from Datastream. Abnormal returns are calculated using the market model. Low market to book is a dummy variable that is equal to 1 if market-to-book ratio is less than the median DS level 6 industry market-to-book ratio for the same industry in that year, otherwise zero; High market to book is a dummy variable that is equal to 1 if market-to-book ratio is greater than the median DS level 6 industry market-to-book ratio for the same industry in that year, otherwise zero. High free cash flow is a dummy variable that is equal to 1 and is defined as firms that have a market to book ratio that is less than the global median of all firms in that year and net operating cash flows greater than the global median in the same year at t0. Low free cash flow are those firms in the sample that have a market to book ratio greater than the global median and net operating cash flows that are below the global median at t0; Agency proxy is a dummy that is equal to 1 if a firm has low market to book ratio (as previously defined) or high free cash flow, otherwise zero. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

Panel A		**Low market to book** (N= 4,865)			**High market to book** (N= 3,728)			*Difference*	
Market to book									
		t		*t stat*	*t*		*t stat*		*t stat*
	AAR	[t0]	0.191%***	3.681	[t0]	-0.024%	-0.540	0.215%***	3.025
	CAAR	[-2,+2]	1.356%***	9.168	[-2,+2]	0.494%***	3.144	0.862%***	3.946
	CAAR	[-1,+1]	1.093%***	9.979	[-1,+1]	0.442%***	3.387	0.650%***	3.311

Panel B		**High free cash flow** (N= 2,779)			**Low free cash flow** (N= 5,814)			*Difference*	
Free cash flow									
		t		*t stat*	*t*		*t stat*		*t stat*
	AAR	[t0]	0.126%**	2.129	[t0]	0.087%**	2.166	0.039%	0.551
	CAAR	[-2,+2]	1.274%***	9.626	[-2,+2]	0.853%***	9.480	0.420%*	1.900
	CAAR	[-1,+1]	1.006%***	9.813	[-1,+1]	0.725%***	10.397	0.281%	1.584

Panel C		**Agency proxy = 1** (N= 5,119)			**Agency proxy = 0** (N= 3,474)			*Difference*	
Agency									
		t		*t stat*	*t*		*t stat*		*t stat*
	AAR	[t0]	0.190%***	3.804	[t0]	-0.038%	-0.847	0.229%***	3.185
	CAAR	[-2,+2]	1.340%***	9.388	[-2,+2]	0.454%***	2.756	0.886%***	4.008
	CAAR	[-1,+1]	1.087%***	10.229	[-1,+1]	0.402%***	2.945	0.685%***	3.991

Table 4.05 Life-cycle descriptive statistics

The table reports the mean and median values of the full sample of life-cycle variables RE/TE and RE/TA. RE/TE is the ratio of retained earnings to total equity. RE/TA is defined as the ratio of retained earnings to total assets. t_0 is the financial year prior to the announcement of the divestiture activity and t_{-5} and t_{+5} is five years prior to and after t_0, respectively. Panel A reports the RE/TE and RE/TA measures from t_{-5} to t_{+5} and panel B reports the firm age at the date of the divestiture announcement. The firm age is taken as the difference between the company foundation date in Worldscope and the date of the divestiture announcement. The definition of the five and four stage life-cycle approach is available in section 4.3.2 of this chapter.

Panel A

	Period (t)	-5	-4	-3	-2	-1	**0**	1	2	3	4	5
RE/TE	mean	0.307	0.263	0.311	0.236	0.167	**-0.194**	-0.129	-0.795	-1.470	-0.202	0.393
	median	0.395	0.420	0.450	0.460	0.462	**0.468**	0.480	0.485	0.495	0.495	0.512
	n	7,565	7,872	8,062	8,258	8,398	**8,593**	8,342	7,693	6,957	6,517	5,913
RE/TA	mean	0.002	-0.012	-0.046	-0.002	0.058	**0.036**	-0.355	-0.407	-0.773	-1.829	-2.173
	median	0.074	0.085	0.094	0.101	0.109	**0.112**	0.105	0.110	0.108	0.106	0.104
	n	7,565	7,878	8,068	8,263	8,399	**8,593**	8,342	7,693	6,957	6,517	5,913

Panel B

Firm age by five stage life-cycle (years)

	Life-cycle stage	0	1	2	3	4
RE/TE	Mean	41	38	43	49	50
	Median	28	30	33	40	44
	n	*1,600*	*209*	*1,608*	*2,257*	*2,499*
RE/TA	Mean	41	39	39	46	51
	Median	28	27	31	46	47
	n	*1,600*	*419*	*2,480*	*2,275*	*1,399*

Firm age by four stage life-cycle (years)

	Life-cycle stage	1	2	3	4
RE/TE	Mean	39	47	50	51
	Median	31	40	42	46
	n	*1,326*	*1,428*	*1,959*	*1,860*
RE/TA	Mean	37	54	57	45
	Median	27	39	43	46
	n	*2,393*	*1,686*	*1,604*	*890*

Table 4.06 - Panel A: Event study returns (by life-cycle stage – five stage categorization)

This table reports abnormal stock price returns on the announcement of divestiture activity for a sample of 8,593 announcements by UK firms for the period of 1988-2009. The results excludes financial, utilities and those firms that were not categorised by at least a primary Standard Industrial Classification code. The firm life-cycle stage is derived using the five stage approach of life-cycle categorization. The announcement of divestiture activity is day 0 [t_0], as derived from Thomson ONE Banker database. Daily equity data is obtained from Datastream. Abnormal returns are calculated using the market model. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

RETE

	Life Cycle Stage 0			
	Mean	t	Median	z
AAR (0)	**1.328%*** **	[5.31]	**0.210%*** **	[7.33]
CAR [-2,+2]	**2.393%*** **	[5.78]	**0.515%*** **	[4.86]
CAR[-1,+1]	**2.217%*** **	[5.96]	**0.483%*** **	[6.13]
		Freq	1,668	(19.41%)

	Life Cycle Stage 1				Life Cycle Stage 2				Life Cycle Stage 3				Life Cycle Stage 4			
	Mean	t	Median	z	Mean	t	Median	z	Mean	t	Median	z	Mean	t	Median	z
AAR (0)	**0.101%**	[0.34]	**0.001%**	[0.02]	**0.306%** **	[2.54]	**0.062%** **	[2.56]	**0.671%*** **	[7.82]	**0.059%*** **	[3.21]	**0.424%*** **	5.86	**0.043%***	[1.93]
CAR [-2,+2]	**-0.168%**	[0.36]	**0.094%**	[0.43]	**0.458%** **	[2.3]	**0.149%**	[1.52]	**0.817%*** **	[5.65]	**0.180%** **	[2.55]	**0.800%*** **	5.74	**0.348%*** **	[4.08]
CAR[-1,+1]	**-0.054%**	[0.14]	**-0.024%**	[0.14]	**0.359%** **	[2.2]	**0.126%** **	[1.98]	**0.809%*** **	[7.1]	**0.172%*** **	[2.79]	**0.664%*** **	5.82	**0.195%*** **	[3.46]
		Freq	259	(3.01%)			1,686	(19.62%)			2,366	(27.53%)			2,614	(30.42%)

RETA

	Life Cycle Stage 0			
	Mean	t	Median	z
AAR (0)	**1.328%*** **	[5.31]	**0.210%*** **	[7.33]
CAR [-2,+2]	**2.393%*** **	[5.78]	**0.515%*** **	[4.86]
CAR[-1,+1]	**2.217%*** **	[5.96]	**0.483%*** **	[6.13]
		Freq	1,668	[19.36%]

	Life Cycle Stage 1				Life Cycle Stage 2				Life Cycle Stage 3				Life Cycle Stage 4			
	Mean	t	Median	z	Mean	t	Median	z	Mean	t	Median	z	Mean	t	Median	z
AAR (0)	**-0.039%**	[0.22]	**-0.005%**	0.13	**0.366%*** **	[4.29]	**0.057%*** **	[2.27]	**0.537%*** **	[6.24]	**0.051%*** **	[3.15]	**0.710%*** **	[6.47]	**0.070%** **	[2.33]
CAR [-2,+2]	**-0.287%**	[0.99]	**-0.051%**	0.32	**0.466%*** **	[3.07]	**0.093%**	[1.22]	**0.876%*** **	[5.91]	**0.257%*** **	[3.41]	**1.106%*** **	[5.83]	**0.470%*** **	[3.98]
CAR[-1,+1]	**-0.196%**	[0.84]	**-0.122%**	0.99	**0.417%*** **	[3.46]	**0.117%***	[1.9]	**0.744%*** **	[6.36]	**0.207%*** **	[4.07]	**1.026%*** **	[6.13]	**0.254%*** **	[2.89]
		Freq	487	(5.65%)			2,622	(30.44%)			2,381	(27.64%)			1,435	(16.66%)

Table 4.06- Panel B: Event study returns (by life-cycle stage – four stage categorization)

This table reports abnormal stock price returns on the announcement of divestiture activity for a sample of 8,593 announcements by UK firms for the period of 1988-2009. The results exclude financial, utilities and those firms that were not categorised by at least a primary Standard Industrial Classification code. The firm life-cycle stage is derived using the four stage approach of life-cycle categorization. The announcement of divestiture activity is day 0 [t_0], as derived from Thomson ONE Banker database. Daily equity data is obtained from Datastream. Abnormal returns are calculated using the market model. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

RETE

	Life Cycle Stage 1				Life Cycle Stage 2				Life Cycle Stage 3				Life Cycle Stage 4			
	Mean	t	Median	z	Mean	t	Median	z	Mean	t	Median	z	Mean	t	Median	z
AAR (0)	**0.242%****	[1.96]	**0.061%****	[2.31]	**0.600%*****	[4.69]	**0.054%***	[1.93]	**0.633%*****	[6.43]	**0.044%****	[2.13]	**0.353%*****	[5.52]	**0.052%****	[2.14]
CAR [-2,+2]	**0.337%**	[1.49]	**0.166%**	[1.62]	**0.728%*****	[3.87]	**0.119%**	[1.19]	**1.011%*****	[5.69]	**0.194%****	[2.42]	**0.563%*****	[4.45]	**0.348%*****	[3.98]
CAR[-1,+1]	**0.276%**	[1.51]	**0.116%**	[1.57]	**0.751%*****	[4.66]	**0.145%****	[1.89]	**0.861%*****	[6.08]	**0.196%*****	[3.33]	**0.485%*****	[4.86]	**0.167%*****	[2.68]
	Freq		1,408 (20.33%)				1,511 (21.82%)				2,062 (29.78%)				1,944 (28.07%)	

RETA

	Life Cycle Stage 1				Life Cycle Stage 2				Life Cycle Stage 3				Life Cycle Stage 4			
	Mean	t	Median	z	Mean	t	Median	z	Mean	t	Median	z	Mean	t	Median	z
AAR (0)	**0.291%*****	[3.41]	**0.049%****	[2.06]	**0.540%*****	[4.75]	**0.041%***	[1.76]	**0.599%*****	[6.72]	**0.058%****	[2.54]	**0.576%*****	[4.48]	**0.060%**	[1.47]
CAR [-2,+2]	**0.321%****	[2.05]	**0.117%**	[1.39]	**0.837%*****	[4.45]	**0.074%**	[0.82]	**0.797%*****	[5.70]	**0.265%*****	[3.41]	**1.202%*****	[4.87]	**0.634%*****	[4.04]
CAR[-1,+1]	**0.286%****	[2.37]	**0.083%**	[1.52]	**0.713%****	[4.69]	**0.198%*****	[3.32]	**0.780%*****	[6.59]	**0.196%*****	[3.25]	**1.014%*****	[4.55]	**0.269%****	[2.34]
	Freq		2,541 (36.69%)				1,777 (25.66%)				1,688 (24.38%)				919 (13.27%)	

Table 4.07 Profitability ratios (Gross profit, operating profit and net margin) of negative retained earnings sample versus positive retained earnings

This table below presents profitability ratios for the five stage life-cycle approach. The table splits those firms with negative retained earnings and those with positive retained earnings. Profitability ratios (%) of life-cycle stages. Life-cycle stage 0 are all the firms that exhibit negative RE/TE and life-cycle 1, 2, 3 and 4 are the life-cycle stages with positive RE/TE ratios. Gross profit margin is measured as (net sales - cost of goods sold) / Net sales; Operating margin is measured as operating profit / net sales and net profit margin is measured as net income / net sales.

		Life-cycle stage 0 / Negative retained earnings				Life-cycle stages 1, 2, 3 and 4 combined / Positive retained earnings			
Profitability (%)			**Before divesting**	After divesting			**Before divesting**	After divesting	
	t	-1	**0**	+1	+2	-1	**0**	+1	+2
Gross profit margin	mean	18.7	**28.2**	27.2	23.8	32.9	**32.4**	31.2	32
	median	27.2	**27.9**	28.8	28.5	28.6	**28.4**	28.5	28.3
Operating profit margin	mean	-98	**-50.2**	-36.2	-54.1	11.8	**10.6**	7.3	5.1
	median	4.8	**3.9**	4.6	5.8	10.9	**10.4**	10	10
Net margin	mean	-90.1	**-75.1**	-71.6	18.9	9.4	**6.4**	14.4	4.8
	median	0.8	**-1.5**	1.3	2.2	6.5	**5.9**	5.6	5.4

Table 4.08 Regressions of event study CARs by life-cycle measures (using the five stage categorization approach), FCF, CAPEX and PROFIT

This table reports the multivariate regressions of the event study cumulative abnormal returns for firms undertaking divestiture activity in the sample. The definition of variables FSIZE, GOPP, CLUS, REL, RETE, FCF, CAPEX and PROFIT are available in table 4.01. The definition of the five stage life-cycle approach is available in section 4.3.2 of this chapter. t-statistics in brackets: *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

	(1)	(2)	(3)	(4)	(5)
FSIZE	-0.00182***	-0.00222***	-0.00248***	-0.00280***	-0.00226***
	[-4.39]	[-5.35]	[-6.11]	[-7.36]	[-5.85]
GOPP	-0.000590***	-0.000589***	-0.000592***	-0.000579***	-0.000634***
	[-4.56]	[-4.55]	[-4.49]	[-4.47]	[-4.95]
CLUS	0.000823	0.00117	0.00138	0.00203	-0.000208
	[0.38]	[0.53]	[0.61]	[0.93]	[-0.10]
REL	0.000503	0.000225	0.000684	0.00133	0.00153
	[0.26]	[0.11]	[0.34]	[0.68]	[0.78]
RETE	-0.00519***				
	[-3.29]				
FCF			-0.00883		
			[-0.84]		
CAPEX				-0.120***	
				[-4.76]	
PROFIT					-0.00179
					[-0.39]
Life-cycle stage 1		-0.0101*			
		[-1.74]			
Life-cycle stage 2		-0.0109***			
		[-3.43]			
Life-cycle stage 3		-0.0045			
		[-1.48]			
Life-cycle stage 4		-0.00579*			
		[-1.82]			
intercept	0.0363***	0.0462***	0.0445***	0.0539***	0.0416***
	[6.58]	[8.61]	[8.16]	[9.71]	[7.98]
N	6381	6381	6085	6364	6109
R-sq	0.011	0.011	0.01	0.013	0.011
adj. R-sq	0.01	0.01	0.009	0.013	0.01
F	14.28***	9.20***	10.08***	16.62***	13.12***

Table 4.09 Regressions of event study CARs by life-cycle measures (using the five stage categorization approach), FCF, CAPEX and PROFIT

This table reports the multivariate regressions of the event study cumulative abnormal returns for firms undertaking divestiture activity in the sample. The definition of variables FSIZE, GOPP, CLUS, REL, RETA, FCF, CAPEX and PROFIT are available in table 4.01. The definition of the five stage life-cycle approach is available in section 4.3.2 of this chapter. t-statistics in brackets: *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

	(1)	(2)	(3)	(4)	(5)
FSIZE	-0.00218***	-0.00201***	-0.00248***	-0.00280***	-0.00226***
	[-5.68]	[-4.99]	[-6.11]	[-7.36]	[-5.85]
GOPP	-0.000575***	-0.000583***	-0.000592***	-0.000579***	-0.000634***
	[-4.45]	[-4.50]	[-4.49]	[-4.47]	[-4.95]
CLUS	0.00115	0.00102	0.00138	0.00203	-0.000208
	[0.53]	[0.47]	[0.61]	[0.93]	[-0.10]
REL	0.000673	0.000452	0.000684	0.00133	0.00153
	[0.34]	[0.23]	[0.34]	[0.68]	[0.78]
RETA	-0.0129***				
	[-2.63]				
FCF			-0.00883		
			[-0.84]		
CAPEX				-0.120***	
				[-4.76]	
PROFIT					-0.00179
					[-0.39]
Life-cycle stage 1		-0.0122***			
		[-2.63]			
Life-cycle stage 2		-0.00635**			
		[-2.06]			
Life-cycle stage 3		-0.00790***			
		[-2.64]			
Life-cycle stage 4		-0.00616*			
		[-1.83]			
intercept	0.0412***	0.0436***	0.0445***	0.0539***	0.0416***
	[7.95]	[8.37]	[8.16]	[9.71]	[7.98]
N	6381	6381	6085	6364	6109
R-sq	0.01	0.011	0.01	0.013	0.01
adj. R-sq	0.01	0.01	0.009	0.013	0.01
F	13.48***	8.764***	10.08***	16.62***	13.12***

Table 4.10 Regressions of event study CARs by life-cycle measures (using the four stage categorization approach), FCF, CAPEX and PROFIT

This table reports the multivariate regressions of the event study cumulative abnormal returns for firms undertaking divestiture activity in the sample. The definition of variables FSIZE, GOPP, CLUS, REL, RETE, FCF, CAPEX and PROFIT are available in table 4.01. The definition of the four stage life-cycle approach is available in section 4.3.2 of this chapter. t-statistics in brackets: *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**
FSIZE	-0.00156***	-0.00149***	-0.00146***	-0.00161***	-0.00140***
	[-4.11]	[-3.99]	[-3.59]	[-4.43]	[-3.78]
GOPP	-0.000212	-0.000213	-0.000231	-0.000211	-0.000177
	[-1.17]	[-1.18]	[-1.20]	[-1.19]	[-0.98]
CLUS	0.000137	0.000236	0.00135	0.000350	-0.0000141
	[0.07]	[0.12]	[0.58]	[0.18]	[-0.01]
REL	0.00269	0.00281	0.00355*	0.00307*	0.00265
	[1.52]	[1.58]	[1.70]	[1.73]	[1.44]
RETE	0.0046				
	[1.35]				
FCF			0.00357		
			[0.25]		
CAPEX				-0.0417**	
				[-2.51]	
PROFIT					0.0138**
					[2.36]
Life-cycle stage 2		0.00288			
		[1.10]			
Life-cycle stage 3		0.00627**			
		[2.50]			
Life-cycle stage 4		0.00181			
		[0.70]			
intercept	0.0259***	0.0244***	0.0270***	0.0313***	0.0248***
	[5.10]	[4.62]	[4.62]	[5.74]	[4.72]
N	5233	5233	5173	5223	4984
R-sq	0.005	0.005	0.005	0.005	0.005
adj. R-sq	0.004	0.004	0.003	0.004	0.004
F	4.630***	4.097***	3.560***	5.601***	5.138***

Table 4.11 Regressions of event study CARs by life-cycle measures (using the four stage categorization approach), FCF, CAPEX and PROFIT

This table reports the multivariate regressions of the event study cumulative abnormal returns for firms undertaking divestiture activity in the sample. The definition of variables FSIZE, GOPP, CLUS, REL, RETE, FCF, CAPEX and PROFIT are available in table 4.01. The definition of the four stage life-cycle approach is available in section 4.3.2 of this chapter. t-statistics in brackets: *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**
FSIZE	-0.00136***	-0.00139***	-0.00146***	-0.00161***	-0.00140***
	[-3.75]	[-3.77]	[-3.59]	[-4.43]	[-3.78]
GOPP	-0.000199	-0.000193	-0.000231	-0.000211	-0.000177
	[-1.11]	[-1.08]	[-1.20]	[-1.19]	[-0.98]
CLUS	0.000506	0.000107	0.00135	0.000350	-0.0000141
	[0.03]	[0.05]	[0.58]	[0.18]	[-0.01]
REL	0.00272	0.00281	0.00355*	0.00307*	0.00265
	[1.53]	[1.58]	[1.70]	[1.73]	[1.44]
RETA	0.00339				
	[0.52]				
FCF			0.00357		
			[0.25]		
CAPEX				-0.0417**	
				[-2.51]	
PROFIT					0.0138**
					[2.36]
Life-cycle stage 2		0.000182			
		[0.08]			
Life-cycle stage 3		-0.000833			
		[-0.37]			
Life-cycle stage 4		0.00181			
		[0.12]			
intercept	0.0248***	0.0260***	0.0270***	0.0313***	0.0248***
	[4.55]	[4.62]	[4.62]	[5.74]	[4.72]
N	5233	5233	5173	5223	4984
R-sq	0.004	0.004	0.005	0.005	0.005
adj. R-sq	0.003	0.003	0.003	0.004	0.004
F	4.630***	3.080***	3.560***	5.601***	5.138***

Table 4.12 Regressions of event study CARs by life-cycle stage and the interaction with agency proxies

This table reports the multivariate regressions of the event study cumulative abnormal returns for firms undertaking divestiture activity in the sample. The definition of variables FSIZE, GOPP, CLUS, MBOOK_LOW, HIGH_FCF, AGENCY and CAPEX are available in table 4.01. The definition of the five stage life-cycle approach is available in section 4.3.2 of this chapter. MBOOK_LOW/HIGH_FCF/AGENCY/CAPEX*Life-cycle stage 1/2/3/4 represents the interaction between the agency variables and the life-cycle stages. t-statistics in brackets: *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

	1	**2**	**3**	**4**
FSIZE	-0.00227***	-0.0022***	-0.00226***	-0.0025***
	[-5.42]	[-5.30]	[-5.40]	[-5.88]
GOPP	-0.00042***	-0.00055***	-0.00042***	-0.00057***
	[-3.01]	[-4.17]	[-3.04]	[-4.44]
CLUS	0.00117	0.00123	0.00118	0.00205
	[0.54]	[0.56]	[0.54]	[0.93]
REL	0.00019	0.000186	0.000199	0.000558
	[0.10]	[0.09]	[0.10]	[0.28]
Life-cycle stage 1	-0.00583	-0.00901	-0.0062	-0.0271***
	[-0.58]	[-1.31]	[-0.58]	[-2.94]
Life-cycle stage 2	-0.00984**	-0.00975**	-0.00822*	-0.0253***
	[-2.04]	[-2.56]	[-1.66]	[-5.07]
Life-cycle stage 3	-0.00121	-0.00558	-0.00244	-0.0137***
	[-0.28]	[-1.57]	[-0.56]	[-2.86]
Life-cycle stage 4	-0.00242	-0.005	-0.00324	-0.0165***
	[-0.56]	[-1.38]	[-0.73]	[-3.37]
MBOOK_LOW	0.0118**			
	[2.51]			
MBOOK_LOW Life-cycle stage 1*	-0.0087			
	[-0.70]			
MBOOK_LOW Life-cycle stage 2*	-0.00373			
	[-0.58]			
MBOOK_LOW Life-cycle stage 3*	-0.00659			
	[-1.12]			
MBOOK_LOW Life-cycle stage 4*	-0.00641			
	[-1.11]			
HIGH_FCF		0.00384		
		[0.68]		
HIGH_FCF Life-cycle stage 1*		-0.00468		
		[-0.36]		
HIGH_FCF Life-cycle stage 2*		-0.00447		
		[-0.63]		
HIGH_FCF Life-cycle stage 3*		0.00124		
		[0.19]		
HIGH_FCF Life-cycle stage 4*		-0.00376		
		[-0.56]		
AGENCY			0.0110**	
			[2.33]	
AGENCY Life-cycle stage 1*			-0.00792	
			[-0.62]	
AGENCY Life-cycle stage 2*			-0.00606	
			[-0.94]	
AGENCY Life-cycle stage 3*			-0.00442	
			[-0.75]	
AGENCY Life-cycle stage 4*			-0.00494	
			[-0.86]	
CAPEX				-0.325***
				[-5.68]
CAPEX Life-cycle stage 1*				0.367**
				[2.34]
CAPEX Life-cycle stage 2*				0.319***
				[3.90]
CAPEX Life-cycle stage 3*				-0.213***
				[-2.85]
CAPEX Life-cycle stage 4*				-0.248***
				[-3.41]
intercept	0.0401***	0.0450***	0.0403***	0.0648***
	[6.67]	[8.12]	[6.65]	[10.75]
N	6381	6085	6381	6364
R-sq	0.013	0.012	0.013	0.018
adj. R-sq	0.011	0.01	0.011	0.016
F	6.671***	5.840***	6. 571***	9.100***

Table 4.13 Regressions of event study CARs by life-cycle stage and the interaction with agency proxies

This table reports the multivariate regressions of the event study cumulative abnormal returns for firms undertaking divestiture activity in the sample. The definition of variables FSIZE, GOPP, CLUS, MBOOK_LOW, HIGH_FCF, AGENCY and CAPEX are available in table 4.01. The definition of the four stage life-cycle approach is available in section 4.3.2 of this chapter. MBOOK_LOW/HIGH_FCF/AGENCY/CAPEX*Life-cycle stage 2/3/4 represents the interaction between the agency variables and the life-cycle stages. t-statistics in brackets: *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

	1	**2**	**3**	**4**
FSIZE	-0.00252***	-0.00143***	-0.00250***	-0.00191***
	[-6.15]	[-3.80]	[-6.11]	[-4.89]
GOPP	-0.000121	-0.000130	-0.000132	-0.000212
	[-0.07]	[-0.71]	[-0.72]	[-0.72]
CLUS	0.00134	0.000236	0.00135	0.000857
	[0.62]	[0.12]	[0.61]	[0.43]
REL	0.000811	0.00274	0.000828	0.00326*
	[0.41]	[1.54]	[0.42]	[1.84]
Life-cycle stage 2	-0.00133	-0.000488	-0.00118	0.00339
	[-0.30]	[-0.14]	[-0.26]	[0.80]
Life-cycle stage 3	0.00129	0.00287	-0.000637	0.0160***
	[0.33]	[0.91]	[-0.16]	[4.07]
Life-cycle stage 4	0.00151	0.000522	0.000294	0.00462
	[0.37]	[0.16]	[0.07]	[1.12]
MBOOK_LOW	0.00687*			
	[1.72]			
MBOOK_LOW Life-cycle stage 2*	-0.00101			
	[-0.18]			
MBOOK_LOW Life-cycle stage 3*	0.00308			
	[0.60]			
MBOOK_LOW Life-cycle stage 4*	-0.00434			
	[-0.84]			
HIGH_FCF		-0.00262		
		[-0.67]		
HIGH_FCF Life-cycle stage 2*		0.00777		
		[1.46]		
HIGH_FCF Life-cycle stage 3*		0.00985*		
		[1.91]		
HIGH_FCF Life-cycle stage 4*		0.00297		
		[0.57]		
AGENCY			0.00541	
			[1.56]	
AGENCY Life-cycle stage 2*			-0.0013	
			[-0.23]	
AGENCY Life-cycle stage 3*			0.00601	
			[1.17]	
AGENCY Life-cycle stage 4*			-0.0023	
			[-0.44]	
CAPEX				0.0128
				[0.25]
CAPEX Life-cycle stage 2*				-0.00397
				[-0.06]
CAPEX Life-cycle stage 3*				-0.196***
				[-3.00]
CAPEX Life-cycle stage 4*				-0.0419
				[-0.64]
intercept	0.0400***	0.0244***	0.0405***	0.0292***
	[7.04]	[4.43]	[7.09]	[4.87]
N	5233	5173	5233	5233
R-sq	0.012	0.01	0.012	0.015
adj. R-sq	0.011	0.009	0.010	0.014
F	4.193***	3.234***	3.169***	4.442***

Appendix 4.A Sample life-cycle classification

This table represents a sample of 13 announcements, a listing of the divesting parent firm and the subsequent categorisation using the De Angelo et al. (2006) approaches.

		Five stage life-cycle		**Four stage life-cycle**	
id	Firm	RE/TE	RE/TA	RE/TE	RE/TA
1	Tesco PLC	3	3	2	2
45	Aviva PLC	3	2	3	1
85	BP PLC	4	4	4	3
3331	Serco Group PLC	3	2	2	1
3356	J Sainsbury PLC	3	3	3	3
4001	Minorplanet Systems PLC	2	2	1	1
4242	British American Tobacco PLC	4	3	4	3
4671	AMEC PLC	2	2	1	1
4909	Kingfisher PLC	3	3	3	2
4998	Pillar Property PLC	2	2	1	1
5039	National Grid Group PLC	4	4	4	3
5393	Imperial Metal Industries PLC	3	3	3	2
5437	Vodafone Group PLC	3	4	3	4

Appendix 4.B: Regressions of event study CARs by divestiture size, life-cycle stage and FCF, CAPEX and PROFIT

This table reports the multivariate regressions of the event study cumulative abnormal returns for firms undertaking divestiture activity in the sample. The definition of variables FSIZE, GOPP, CLUS, RETE, RETA, FCF, CAPEX and PROFIT are available in table 4.01. DSIZE is defined as the price received for the divested assets divided by the book value of total assets at the financial year-end prior to the divestiture announcement. The five stage life-cycle approach is available in section 4.3.2. of this chapter. . t-statistics in brackets: *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
FSIZE	-0.0018***	-0.0023***	-0.0022***	-0.0020***	-0.0022***	-0.0029***	-0.0025***
	[-3.15]	[-4.02]	[-4.06]	[-3.59]	[-3.64]	[-5.46]	[-4.74]
GOPP	-0.000252	-0.00025	-0.00024	-0.00024	-0.000297*	-0.000275*	-0.000287*
	[-1.53]	[-1.53]	[-1.46]	[-1.48]	[-1.69]	[-1.67]	[-1.78]
CLUS	0.004	0.00451	0.00435	0.0043	0.00560*	0.00533*	0.00288
	[1.42]	[1.61]	[1.55]	[1.53]	[1.73]	[1.90]	[1.06]
REL	-0.000975	-0.00116	-0.0008	-0.00114	5.62E-05	-0.0002	0.000239
	[-0.38]	[-0.45]	[-0.31]	[-0.44]	[0.02]	[-0.08]	[0.09]
DSIZE	0.0371***	0.0372***	0.0368***	0.0375***	0.0379***	0.0386***	0.0395***
	[6.74]	[6.75]	[6.68]	[6.82]	[6.41]	[7.00]	[7.18]
RETE	-0.007***						
	[-3.27]						
RETE LC stage 1		-0.00957					
		[-1.31]					
RETE LC stage 2		-0.0112***					
		[-2.85]					
RETE LC stage 3		-0.00878**					
		[-2.28]					
RETE LC stage 4		-0.00476					
		[-1.16]					
RETA			-0.0190***				
			[-3.01]				
RETA LC stage 1				-0.0133**			
				[-2.18]			
RETA LC stage 2				-0.00792**			
				[-2.06]			
RETA LC stage 3				-0.00846**			
				[-2.21]			
RETA LC stage 4				-0.00970**			
				[-2.24]			
FCF					-0.0245**		
					[-1.96]		
CAPEX						-0.0741***	
						[-3.98]	
PROFIT							0.00902
							[1.61]
Intercept	0.0337***	0.0458***	0.0393***	0.0423***	0.0376***	0.0510***	0.0414***
	[4.43]	[6.13]	[5.41]	[5.78]	[4.49]	[6.81]	[5.79]
N	3909	3909	3909	3909	3217	3895	3753
R-sq	0.029	0.029	0.028	0.028	0.028	0.032	0.028
adj. R-sq	0.027	0.026	0.027	0.026	0.026	0.03	0.026
F	19.31***	12.78***	19.03***	12.54***	15.36***	21.22***	17.68***

Chapter 5: Divestitures and Firm Distress

5.1. Introduction

In the results of the previous chapter, it was observed that significant abnormal returns are experienced by divesting firms that exhibited negative levels of retained earnings. De Angelo et al. (2006) argue that firms with negative retained earnings are early stage life cycle firms. However, whilst this proxy is a measure of life cycle stage, high levels of negative retained earnings are also driven by firms recording losses over one or more periods prior to divestiture activity, therefore observing negative retained earnings can also imply that a firm is suffering from financial distress. Early empirical research by Fitzpatrick (1932) highlighted that negative retained profit to equity ratio was one of the best indicators of potential future bankruptcy. Therefore in order to investigate this further, an analysis of financial distress and divestiture activity takes the focus for empirical investigation in this chapter. The key motivating factor for this investigation is the finding in Chapter 4 that shows firms with negative retained earnings are observed to experience higher announcement date abnormal returns, relative to those firms with positive retained earnings. It is expected that the financing theory of asset sales will prevail, that is, those firms that are suffering from financial distress, use divestiture activity in order to generate proceeds in order to mitigate the costs of financial distress. It is hypothesised that those firms suffering from high levels of financial distress will benefit the most from undertaking divestiture activity and therefore the expected shareholder announcement returns will be greater for highly distressed firms.

The existing empirical research on divestitures finds, on average, that asset sales are associated with significantly positive increases in shareholder wealth. The majority of these gains are attributable to an improved focus on the core business activities of the remaining assets (John and Ofek, 1995), debt reduction (Lang et al. 1995; Bates, 2005) and a reduction in the cost of financial distress (Lasfer et al., 1996). This chapter will examine the role of financial distress, especially how the stock market responds to the announcement of divestiture activity for those firms that are considered be to distressed or non-distressed.

This chapter provides an overview of financial distress modelling, including that of accounting-based interest coverage measures (Asquith et al. 1994; Ahn et al. 2006; Acharya et al. 2007), net income measures (John et al. 1992; Bhagat et al. 2005; Ang and Mauck, 2011) and measures generated via multiple discriminant analysis (MDA) (Altman, 1968; Taffler 1983). It then expands on the classification of financial distress by examining the use of financial distress modelling in the divestiture literature. Hite et al. (1978), Chen and Guo (2005) and Denis and Shome (2005) highlight that poorly performing firms divest assets in order to improve operating efficiency.

The main theoretical framework that will be investigated in this chapter is the financing theory of asset sales. Asset sales allow a firm to obtain access to financing that can be difficult to source from other sources, especially during periods when firms are suffering from internal financial problems (Asquith et al., 1994; Lang et al., 1995). Divestiture activity can allow a firm to reduce the direct/indirect cost of financial distress/bankruptcy if the proceeds from the sale are used to reduce the probability of bankruptcy, financial distress or to pay down debt. Any divestiture activity that reduces the cost of financial distress/bankruptcy is expected to lead to wealth gains by

the divesting firm shareholders. The support for the financing explanation for divestiture activity is mixed. Some studies show that a positive stock market response to divestiture announcements that reduce the expected costs of financial distress (Asquith et al., 1994; Lang et al. 1995) and find contrasting evidence (Brown et al., 1994; Alexandrou and Sudarsanam, 2001). Therefore, this chapter will bring together the themes of divestiture, financial distress and the interaction between distress configurations. The key issues that are examined in the chapter are: *(i)* What classification approaches are used to determine whether a firm is distressed or non-distressed? *(ii)* How do firms that are classified as distressed, across a number of financial distress measures, respond to the announcement of divestiture activity? *(iii)* Extending the analysis beyond the traditional financial distress measures, what role does the short-term liquidity and *(iv)* leverage position provide on the market reaction to the divestiture announcements? *(v)* How does the interaction between the measures of firm distress and liquidity/leverage position impact the observed market reaction to the announcements?

This chapter examines these issues via an event study analysis of the stock market price reaction to asset divestiture announcement of 10,718 sales by non-financial UK firms from 1988-2009. Firm distress is measured using the Taffler (1983) UK z-score approach, a measure of interest coverage and a measure of net income. These varying measures of financial distress capture between 15.4% and 22.9% of the sample as 'distressed.'

The empirical results show that consistent with the prior literature in the area, divestiture activity as a whole is a wealth generating activity for firms to engage in. Over a three day event window, parent firms that divestiture assets experience

abnormal returns of 0.681%, a result similar in magnitude to Sicherman and Pettway (1992) and Borisova et al. (2013). The study then divides the sample into distressed and non-distressed subgroups and finds higher stock market gains on the announcement of divestiture activity by financially distressed firms, these results are consistent across the three measures of financial distress classification utilized. The positive reaction supports financing theories of divestiture for the selling firm, as these firms can use the proceeds from the sale to provide financing that may have been otherwise difficult to obtain. This study suggests that the market interprets the sale of assets as a mechanism to reducing and mitigating the costs of financial distress (Asquith et al. 1994; Lang et al., 1995). The subsequent sections then examine cross-sectional determinants of abnormal returns. Liquidity and leverage are found to be a significant factor in explaining abnormal returns experienced by divesting firms, it is observed that firms with a strong bargaining positions are able to extract better prices from the sale. For those firms with high levels of debt overhang or low liquidity, they appear to suffer a poor bargaining position and subsequently experience fire sale discounts on the sale of assets. Finally, the study brings the major three components of the multivariate analysis together, leverage, liquidity and financial distress to examine the interaction between these variables via a cross-sectional analysis. The key finding is that the financial position is an important factor when divesting. Divesting parent firms that have lower levels of leverage and higher levels of liquidity are more likely to be in a better financial position and therefore better able to negotiate a better price for the divested asset or business unit compared to being in a weakened financial position.

The remainder of the chapter is structured as follows. 5.2. provides an overview of the literature on firm distress, the motivation and hypothesis development. Section 5.3. outlines the sample construction, variable definitions and research method. Section 5.4. presents the results and 5.5. concludes.

5.2. Literature Review

The recessionary periods of the mid-1970s, early 1980s, 1990s and late 2000s resulted in an increase in firms suffering from financial distress. Firms that were once profitable and admired experienced changes in performance and found themselves suffering from the encumbrance of excessive debt, declining sales, increasing costs and increasingly changing macroeconomic conditions.

The stability, or instability, of firms is of interest to firm stakeholders, such as investors, governments and customers. When firms are not successful, there is a desire to understand how they react and adapt to a poor business environment. The economic cost and impact of business failure, in some cases, can be extremely high.

5.2.1. What is financial distress?

In the finance literature, there are a number of terms attached to the concept of financial distress. Wruck (1990) defines financial distress as a situation where cashflow is insufficient to cover current obligations, Ross et al. (2006) define financial distress when firms declare bankruptcy, and Pastena and Ruland (1986) indicate that a variety of circumstances can be used to describe the term: *(i)* the firm is unable to pay debts when they come due, *(ii)* the market value of assets is less than its total liabilities, and *(iii)* the firm continues trading under court protection.

Part *(i)* above has been the focus of much of the early financial distress literature, as classification under this definition is relatively simple. Part *(ii)* contains a number of challenges to use as a definition of financial distress. With no consistent accounting standards in use across the world, the accounting number can vary by locale, thereby

the situation arises where firms can be classified as distressed in one jurisdiction and not distressed in another.

Part *iii)* varies internationally in the extent of court protection, from countries that have strong creditor protection to countries that have weak creditor protection. Davydenko and Franks (2008) in their study of defaults in the UK, France and Germany highlight that the UK's bankruptcy code is creditor friendly and in most circumstances, a secured creditor can sell the company and its assets without heeding the interest of other claimants and their actions cannot be challenged in court unless fraudulent or negligent.

5.2.2. Financial Distress Modelling

Keasey and Watson (1991) highlight that it is not the choice of model that is important when undertaking financial distress analysis, but the resulting successful classification or mis-classification of financial distress.

Developing models to predict financial distress is of both academic interest and business interest. A number of approaches and models have been used in the prediction financial distress, from qualitative analysis, single univariate models, multivariate analysis, conditional probability analysis, risk index models, time-series analysis and dynamic models, amongst others (Altman and Hotchkiss, 2006).

Outside the literature on distress prediction, financial distress modelling has also be used in conjunction with studies in changes in market share (Opler and Titman, 1994), asset sales (Shleifer and Vishny, 1992; Sudarsanam and Lai, 2001), fire sales (Eckbo and Thorburn, 2008), work effort of directors (Chou and Yin, 2010), and capital structure (Wald, 1999; Graham, 2000; Molina, 2005).

A large volume of research over the past few decades focused on addressing approaches to measure financial distress. Advances in research methodology and approaches has led to an increase in the number of empirically focused publications that seek to determine (i) how firms facing financial distress can be identified, (ii) the likelihood of firms facing financial distress/bankruptcy and (iii) the impact of financial distress has on firm characteristics and outcomes. The early classical prediction models involve classifying firms as failing or non-failing. The most popular approaches have been multiple discriminate analysis (MDA), followed by conditional probability analysis (Altman and Saunders, 1998).

Early papers in this area were published by Fitzpatrick (1932) and Beaver (1967). As part of a series of articles in The Certified Public Accountant, Fitzpatrick presented an early approach attempting to create an indicator of financial distress using accounting ratios. Using a simple matched pair approach to study nineteen pairs of firms with similar characteristics where one firm had failed and the other a survivor, Fitzpatrick was able to provide the first interpretation of the characteristics of failed/financially distress firms. Fitzpatrick found the best bankruptcy indicator was the ratio of retained profit/equity and total equity/total liabilities.[46]

The main pioneering research in the financial literature belongs to Beaver (1966). His research was the first to apply simple statistical t-tests to the matched pair sample in order to test the overall importance of individual accounting variables. Beaver (1968) then developed a univariate model using a number of financial ratios that had been

[46] In the previous chapter of this thesis, it was observed that firms divesting assets with the greatest stock market response had negative retained profit to equity ratios, motivating the investigation in this chapter.

selected using a dichotomous classification test. In univariate analysis, the prediction of failure is undertaken by finding an optimal cut-off point for each measure and this in turn is used to classify firms based on this measure (Balcaen and Ooghe, 2006).

The ratios used in his analysis included non-liquid asset ratios and liquid asset ratios. In his analysis using 79 bankrupt firms and 79 matched healthy firms, Beaver observed that non-liquid asset measures predict firm failure better than liquid asset measures, and in addition found that failed firms have lower inventory balances. Beaver finds that distressed firms have lower financial ratios than non-distressed firms and the ratios worsen as the risk of financial default increases.

5.2.3. Accounting measures of financial distress

The prediction of financial distress in the early studies focused around using ratio analysis as a mechanism to predict or highlight financial distress. Using indicators of profitability, liquidity and leverage, these accounting ratios of financial distress were adopted early in the financial distress literature and are still used today to assess levels of financial distress. Interest coverage ratios and net income based ratios of financial distressed are the main accounting measures that are still used in the financial literature today (Acharya et al., 2007; Bhagat et al., 2005; Ang and Mauck, 2011).

5.2.3.1. Interest coverage

A number of studies have utilised interest coverage on debt as an approach to determine whether a firm is facing financial distress. The interest coverage ratio is a ratio that measures whether a firm is able to service debt interest payments by income received in the same financial period. It is usually measured by:

$$= \frac{operating\ income}{Interest\ Expense} \qquad \text{[Equ. 5.01]}$$

Andrade and Kaplan (1998) define financial distress as occurring when a firm has EBITDA less than interest expense. Studies by Hoshi et al. (1991), Ahn, et al. (2006), Acharya et al. (2007) and Ahn and Choi (2009), use the interest coverage ratio to define financial distress. Kruse (2002) uses a modified version of interest coverage ratio but eliminates firms in his sample with interest coverage less than zero[47] and again defines a firm as distressed if the ratio of EBITDA to interest expense is less than one. Asquith et al. (1994) and Hovakimian and Titman (2006) determine that financial distress is likely when in a given year, the firm's EBITDA is less than 80% of its interest expense in one year, or alternatively, when the interest coverage ratio is less than one over two consecutive years.

5.2.3.2. Negative Net income

A firm that exhibits negative net income is considered to be financially distressed, as the firm has been unable to meet expenditure from current income.

John et al. (1992) considered one period of negative net income as an indicator of financial distress. Bhagat et al. (2005) define financial distress as i) one period of negative net income and ii) two periods of negative net income. Ang and Mauck (2011) in their analysis of fire sale acquisitions use a similar definition to Bhagat et al. (2005). They observe that results are similar across the two measurement approaches,

[47] Kruse (2002) highlights that they remove firms if EBITDA is negative or interest expense is very small as negative variables may bias the classification of a firm as distressed or healthy.

therefore opt to use one period of negative net income as it is the least costly in terms of observations lost due to missing or unavailable data.

De Angelo and De Angelo (1990) use a period of three years of negative net income as a proxy for financial distress and term this a protracted period of financial distress. De Angelo and De Angelo highlight that the benefit of this is that it allows financially distressed firms to be identified without classifying firms that are insolvent, as financially distressed. [48]

5.2.4. Altman's MDA approach

The first formal multivariate analysis of financial distress prediction was undertaken by Altman (1968). Altman undertook a linear multiple discriminant analysis approach (MDA) to identify the possibility of a firm becoming distressed.

MDA is used to locate a linear combination of features to classify firms as failing or non-failing. MDA constructs a boundary line between variables, so if it falls to one side of the line, it is likely to be classified as financially healthy, whereas if it falls to the other side, then it may be classed as failing/bankrupt. The boundary line is known as the discriminant function.

The discriminant function is defined as:

$$D_i = d_0 + d_1 X_{i2} + d_1 X_{i2} + \cdots + d_n X_{in} \quad \text{[Eq. 5.02]}$$

where D_i is the discriminant score for firm i; $X_{ij}$is the value of attribute X_j (with j = 1,…., n) for firm i; d_0 is the intercept and, d_j is the linear discriminant coefficient for

[48] Kahl (2002) finds that the median time spent in a financially distressed state is around 35 months (which is almost three years), similar to the three year period used in De Angelo and De Angelo (1990).

attribute j. Several firm attributes are combined into one single MDA, D_i. Where D_i has a score between $-\infty$ and $+\infty$ to give an indication of the financial health of a firm.

There are a number of assumptions in using MDA. The dataset of firms is assumed to be dichotomous, that is, that the dataset feeding the MDA analysis can be divided into two categories; failure and non-failure. It is assumed that none of the data overlaps and there is the assumption of normally distributed independent variables and equal covariance matrices across the failing and non-failing firms (Balcaen and Ooghe, 2006).

Using MDA, Altman originally developed a financial distress prediction model by using 33 manufacturing firms that filed for bankruptcy and 33 financially healthy firms in the same sector. All firms in the sample had assets greater than US$1million.

The z-score approach is measured by combining financial ratios and the weightings of the ratios as determined by MDA as follows:

$$Z = 0.012\left(\frac{current\ assets - current\ liabilities}{total\ assets}\right) + 0.014\left(\frac{retained\ earnings}{total\ assets}\right) + 0.033\left(\frac{EBIT}{total\ assets}\right) + 0.006\left(\frac{market\ value\ of\ equity}{book\ value\ of\ liabilities}\right) + 0.999\left(\frac{sales}{total\ assets}\right)$$

[Equ. 5.03]

Where $(current\ assets - current\ liabilities/total\ assets)$ is a liquidity measure scaled by the size of the firm, $(retained\ earnings/total\ assets)$ is a measure of earnings power and profitability, $(EBIT/total\ assets)$ is a measure of operating

efficiency, $(market\ value\ of\ equity/book\ value\ of\ total\ liabilities)$ is a measure of leverage and $(sales/total\ assets)$ is a measure of asset turnover.

Based on the MDA, Altman defined firms with a z-score of less than 1.81 as financially distressed or viewed as a potential failure (Agarwal and Taffler, 2007). Those with a z-score greater than 2.99 are defined as safe or non-distressed. Those firms with a z-score between 1.81 and 2.99 are in the grey zone where it is not clear whether financial distress is impending or not. Altman (2000) highlights that in his analysis due to historical computing and software limitations; no intercept was specified in the regression hence the cut-off point in the Altman model is not zero.

Altman (1968) found that his model accurately led to the prediction of 97% of bankruptcies one year prior to firms filing for chapter 7 and 72% two years prior. In his 2000 publication, he revealed subsequent analysis resulted in an accuracy of between 82% and 94% based on three new samples.[49] However, Altman (2000) notes an increase in the Type II classification errors over time.[50]

Altman has adjusted the z-score model in order to classify a wider range of firms (manufacturers, non-manufacturing, industrials and emerging market credits, and private firms).

[49] 86 distressed firms from 1969-1975; 110 bankrupt firms from 1976-1995 and 120 bankrupt firms from 1997-1999.

[50] Using this approach, two types of possible mis-classifications may occur: Type I error where a failing firm is misclassified as a non-failing firm and Type II, where a non-failing firm is incorrectly classified as a failing firm. Altman (2000) reveals 15-20% of all firms over time have a Type II misclassification and 10% of large firms are misclassified.

The multivariate approach that Altman had taken in 1968 nearly 45 years ago has widely adopted in the United States and around the world (Altman and Narayanan, 1997).

5.2.5. Issues with accounting based measures in models

Hillegeist et al. (2004), Gharghori et al. (2006) and Agarwal and Taffler (2008) outline some of the criticisms that accounting based measures face. Accounting information is historical and present past performance of a firm and may not be suitably informative in predicting the future financial distress. Accounting statements are only produced at set periods throughout the year. Therefore a single observation on an annual basis does not allow a firm's risk of bankruptcy basis to be assessed more than once in a single year. The conservative nature of accounting standards has resulting implications for the valuations provided in accounting statements. The true market values of assets may be under reported and therefore may lead to distortions in accounting based ratios. Accounting information can easily be subject to manipulation by managers. Hillegeist et al. (2004) cites that as accounting statements are prepared on a going-concern basis, therefore by their very definition and design are of limited use when predicting financial distress and bankruptcy. Accounting based financial distress models are developed through empirical and econometric analysis (matching past patterns of firms that have been financially distressed), such that the models are not based on theory. Gharghori et al. (2006) states that market-based models, such as that of the Merton option based model, are able to overcome this limitation as the models are grounded by finance theory. Financial ratios vary across industries, therefore accounting based models derived from one particular industry are specific for their sample and lack cross industry generalisation (Franzen et al., 2007). The cause of

financial distress or bankruptcy may not be observable fully in the firm financial statements.

One of the major assumptions made when using accounting variables as a means of financial distress prediction is that all relevant distress indicators are reflected in the annual accounts. However, not all information related to financial distress is reflected in the financial statements (Balcaen and Ooghe, 2006). Zavgren (1985) argues that any econometric approach that uses only financial information will not be able to predict with certainty the future failure or non-failure of a firm, as additional non-accounting factors cannot be captured when utilising only financial variables.

Shumway (2001) is critical of prior bankruptcy models in the finance literature for failing to incorporate all available firm year observations, hence leading to bias and incorrectly specified coefficients of the variables related to bankruptcy. Shumway shows that hazard models are better specified, as they take into account all available observations and finds such models outperform Altman (1968) and Zmijewski (1984) in a number of tests.

Ohlson (1980) highlights that the choice of different accounting variables would unlikely make any major difference in the classification of financially and non-financially distressed firms in his likelihood function, however he does state that non-accounting information such as volatility or equity prices could be useful due to their information content.

Finally, when estimating financial distress using accounting based models due care has to be taken in the classification of such approaches. Using an accounting approach derives a bankruptcy score that is based on the characteristics of the original sample

of firms that declared bankruptcy. So in the case of using Taffler (1984), the score given is the likelihood of financial distress based on the characteristics of 39 failed and 56 healthy industrial firms for the period 1978-1981. This is frequently ignored in the literature where accounting approaches such as z-scores and o-scores are said somewhat incorrectly to *predict* financial distress rather than to classify firms as financially distressed based on a historical characteristics of a sample of distressed/bankrupt firms.

5.2.6. Financial Distress models and their use in the United Kingdom

So far, the multiple discriminate analysis modelling has been the dominant technique that have been used in the UK.

The popularity of the early MDA studies in the United States had a direct impact on the United Kingdom. A number of MDA models were developed during the 1970s and 1980s, however despite statistical advances that have occurred in the area of corporate failure; MDA still remains a popular and widely used tool for this technique in the UK (Charitou et al. 2004).

The first study recorded UK to use MDA to create a UK based z-score model was conducted by Lis (1972). Lis used a four variable function in a similar style to Altman's z-score.

$$Z = 0.063\left(\frac{working\ capital}{total\ assets}\right) + 0.092\left(\frac{EBIT}{total\ assets}\right) + 0.057\left(\frac{retained\ earnings}{total\ assets}\right) + 0.0014\left(\frac{net\ worth}{total\ debt}\right)$$ [51]

[51] Where 'net worth' is defined as total assets – shareholders' funds.

[Equ. 5.04]

The cut off in the Lis model is 0.037; firms below this cut-off point were classified as financially distressed whilst those above, were deemed not to be financially distressed. Taffler (1983) highlights that out of a sample of 30 failure firms, the model suffered from a single type I error and five type II errors.

This was the first of a long line of classic financial distress models using accounting ratios to be published in the United Kingdom. These include studies by Taffler (1974), Tisshaw (1976), Taffler (1977), Bank of England (1979), Mason and Harris (1979), DataStream (1980), Betts and Belhoul (1982, 1983), El Hennaway and Morris (1983). Components of these models are summarized in Appendix 5.A.

Taffler (1977) developed a z-score model similar in nature to that of Altman (1968) using a sample of failed firms on the London Stock Exchange (LSE) between 1968 and 1976 and 46 randomly selected solvent industrial firms.[52] Using MDA, Taffler created a z-score model for analysing the financial health of firms listed on the LSE using financial ratios that were determined by factor analysis.[53] The coefficients of the Taffler model were proprietary for a number of years, however have since been published by Taffler (Agarwal and Taffler, 2007).

The Taffler (1983) z-score model of ratio definition and coefficients takes the following form:

[52] It has been commonplace to use this model across non-financial firms listed on the LSE in the UK, indeed, Agarwal and Taffler (2007) disclose this and have also used the model in this manner. Taffler updated and creates a model for analysing retail firms in Taffler (1984).
[53] The factor analysis was undertaken to ensure there was no collinearity between ratios and to group ratios into functions (Taffler, 1983).

$$Z = 3.20 + 12.18X_1 + 2.50X_2 - 10.68X_3 + 0.029X_4$$

[Equ. 5.05]

Where:

$X_1 = {Profit\ before\ tax}/{Current\ liabilities}$ (53%)[54]

$X_2 = {Current\ assets}/{Total\ liabilities}$ (13%)

$X_3 = {Current\ liabilities}/{Total\ assets}$ (18%)

X_4 = No Credit Interval = (16%)

$$(Quick\ assets - Current\ liabilities) \Big/ \frac{Sales - PBT - Depreciation}{365}$$

X_1 measures profitability, X_2 working capital position, X_3financial risk, and X_4 liquidity. Unlike Altman, Taffler was able to use the cut-off point of zero, therefore using this model, a z-score that is positive (>0) is above the solvency threshold and is unlikely to fail within the next year. Should a firm have a negative z-score (<0), this indicates that the firm is measured as having a financial profile of firms that have failed in the past, therefore the probability of failure is high. The greater the negative z-score, the higher the likelihood of failure. Unlike Altman's models, there is no grey area in the Taffler approach.

[54] The percentages given in parenthesis after each ratio show the Mosteller-Wallace contributions of each individual ratio to the overall power of the model (Agarawal and Taffler, 2007).

Taffler's (1984) linear discriminant model remains one of the most popularly used in UK academic research. Studies by Afshar et al. (1992), Lasfer et al. (1996), Alexandrou and Sudarsanam (2001) and Lee and Lin (2008) use the z-score approach to classify financially distressed and non-financially distressed firms.

Agarwal and Taffler (2007) evaluate the performance of the UK based z-score model and find that it has the ability to predict distress risk for UK firms.[55] Agarwal and Taffler (2008) compare the Taffler z-score with market based models used by Hillegesist et al. (2004) and Bharath and Shumway (2008), and find that both z-score and market based models predict financial distress risk, each providing unique information about financial distress and firm failure.

Agarwal and Taffler (2007) evaluate the performance of the original Taffler z-score model and conclude that the z-score model continues to have the ability to predict distress risk in the United Kingdom for UK based firms.

Conditional probability modelling approaches have been less popular in the UK. Research by Peel et al. (1986) is cited as being one of the first to apply a logit based model of financial distress in the UK, followed by the work of Keasey and Watson (1987), who used the same approach to classify small firm failure. Multi-period logit analysis came from Peel and Peel (1988) and Keasey et al. (1990) who used this technique to determine whether it was possible to accurately predict between financially distressed or non-financially distressed firms for a number of years before the event. Keasey et al. (1990) highlighted that when expanding the horizon of

[55] Agarwal and Taffler (2007) note an increasing number of firms at risk of financial distress from 1997 onwards.

analysis over more than one year results in difficulties in examining the patterns of failing firms.

More recently Agarwal and Taffler (2008) compare the Taffler z-score approach with that of Merton model used in Hillegeist et al. (2004) and the naïve market model used in Bharath and Shumway (2008). They observe that in terms of predictive accuracy, there is little difference between market-based and accounting models and conclude that neither the market- or accounting-based model is a sufficient statistic for predicting failure, however each model carries unique information about firm failure.

They conclude that although accounting models lack theoretical grounding, the accounting models have three things in their favour: (i) corporate failure is not usually a sudden event, therefore firm decline may be captured via several periods of published accounting statements, (ii) the double entry system allows any manipulation of accounting policies to have a minimal impact on so called window-dressing, and (iii) loan covenants are based around accounting numbers and this information is more likely to be reflected in accounting based models of financial distress.

5.2.7. Summary

This chapter presents a summary of the techniques that have arisen from the desire for academics and businesses to create a way to examine a firm's financial health.

Using multiple discriminant analysis, the z-score approach of Altman (1968) has been the dominant accounting based approach taken in the distress and business failure prediction literature.

In the United States, the use of MDA has decreased (Dimitras et al., 1996) to make way for models that required less demanding statistical techniques based on logit and probit analysis, these approaches create conditional probability models that consist of a combination of variables that best distinguish between failed and non-failing firms. Researchers such as Ohlson (1980) and Zmijewski (1984) pioneered the use of these alternative financial approaches.

More recently, with the number of highlighted issues with using accounting data, a number of market-based financial distress models have been proposed. Using market based variables has provided a more theoretically attractive approach and is a mechanism to capture information that is not contained within the accounting variables. Grice and Dugan (2001) highlight that even though accounting models such as Zmijewski (1984) and Ohlson (1980) have determined that financial ratios are good predictors of financial distress, they highlight that the financial models fail to incorporate all forms of information that may lead to financial distress. Non-financial events that precipitate bankruptcy are not considered (i.e. union issues, weather, lawsuits etc.). Market based approaches aimed to overcome the limitations of using accounting based information and were found to have meaningful advantages by having a higher predictive ability of financial distress/firm failure in out-of-sample testing.

The next section will examine the extant literature that has arisen in the field of divestitures in conjunction with financial distress. Furthermore, an overview into the approach used and the event study reactions to firms divesting assets or business units will be provided.

5.2.8. Financial Distress and Divestitures

The decision to divest assets can be motivated by a wide array of various factors such as strategic fit, strategic focus, macroeconomic factors, industry elements, competition, technological change, regulatory changes or financial motives.[56]

Firms may be motivated to divest assets by their financial position, rather than strategic or any other basis. The poor financial position is a common focus in the existing divestiture literature – poor operating performance, capital constraints, high leverage and the cost of financial distress have so far gathered researchers' attention in the divestiture field. Chen and Guo (2005) provide evidence that poorly performing firms divest assets to improve their operating efficiency.

Poor operating performance and high levels or financial leverage can result in the restricted availability of financing to firms. Lang et al. (1995) find another motivation for divesting assets is the ability to raise funds cheaply that is otherwise not available on the capital markets. They highlight that availability of retained earnings may not be sufficient to fund future investment opportunities, therefore firms requiring capital for investment or liquidity purposes may be forced to sell assets. The financing hypothesis by Lang et al. (1995) implies that parent firms are likely to divest assets that are draining to the parent or that are likely to maximize value on sale. They observe that the average stock price reaction to the announcement of an asset sale is higher when the proceeds are used to pay down debt than keeping the proceeds of the sale in the firm.

[56] A full literature review of divestiture motivations can be found in chapter two of this thesis.

Although financial distress has varying definitions throughout most of the academic literature, there exists a common framework for analyzing its impact on asset divestitures. Many firms opt to divest to alleviate the constraints of debt obligations (Lang et al., 1995; Andrade and Kaplan, 1998). Hite et al. (1987) document that asset sales promote efficiency by allocating resources in a firm to their most needed state; either for future investment purposes or to limit the scope of financial distress. They show that gains can be captured by the seller and the buyer of an asset through the efficiency gains that the divestiture transaction allows to take place.

Ofek (1993) observes that financial distress can be mitigated through asset divestitures, as the cash inflow from the sale of business units or assets can be used to meet debt obligations.[57] Ofek finds that firms that suffer from poor stock price performance and have high levels of debt, are more likely to sell their assets. Firms suffering from financial distress frequently divest assets as part of the restructuring process to allow managers to focus on the business segments where a comparative advantage exists (Asquith et al., 1991; Sudarsanam and Lai, 2001). Gilson et al. (1990) reports that creditors often force borrower firms suffering from high levels of debt to divest assets as a condition of an agreed restructuring and Clayton and Reisel (2013) empirically demonstrate that asset sales create value when highly levered firms use the proceeds to retire debt.

5.2.9. Event study returns

A number of studies have investigated whether there is any relationship between event study returns and financial performance between firms that are identified as financially

[57] This excludes spin-offs as these do not generate any income from the sale of an asset.

distressed and those that are not. These studies have yielded a mix of classification methodologies that have been utilised to ascertain whether a firm is considered to be distressed or healthy. The existing empirical research on divestiture activity finds consistent evidence that there are significantly positive mean returns on the announcement of such a sale (Mulherin and Boone, 2000; Bates, 2005; Lee and Lin, 2008; Hillier et al., 2009).

Incorporating distress, Afshar et al. (1992) observe that firms with lower z-scores are associated with higher excess returns on announcement of an asset sale. They find an event day mean excess return of 2.05% for firms classed as financially distressed, versus 0.59% for those that are healthy. The positive market reaction is attributable to firms paying down their levels of debt versus retaining the proceeds. Similarly Nguyen (2013) find CARs for firms repaying debt of 0.45% versus 0.07% for those firms that don't use proceeds to pay down debt. Bates (2005) and Clayton and Reisel (2013) show that there are higher abnormal returns experienced by sellers that distribute the proceeds to debt repayment over retaining the proceeds. Bates finds that shareholders react more favourably to the payout to debt attributing the impact on the reduction in the costs associated with financial distress.

Lasfer et al. (1996) find higher abnormal returns for distressed firms relative to healthy firms; distressed firms exhibited statistically significant abnormal returns of 2.12% and healthy firms 0.49% for divestments and the difference between the abnormal returns in the distress subsample and the non-distress subsample is significant in their study. Both studies measure distress using Taffler's (1984) z-score measure. Similarly, Hillier et al. (2009) find that firms suffering from poor financial health respond positively to divestitures that are undertaken in order to improve the performance of

the firm. Using the Taffler UK z-score approach, Lee and Lin (2008) show that divesting assets has a positive impact on the abnormal returns firms experience due to an increase in the probability of survival for those firms suffering from distress, verses those firms than do not restructure in order to survive.[58] Lee and Lin (2008) find a positive market reaction to the divestiture announcement in their sample in the short term.

However, the evidence is not consistent across the financial distress and divestiture literature. Lee and Lin (2008) expand their study to evaluate the performance of financially distressed firms that divest assets in the long-run (up to five years following a divestiture). They observe that over the long-run, firms exhibit negative abnormal returns on the announcement of divestiture activity. Lee and Lin note however, that these returns are irrespective of the motivation, financial distress or otherwise, as there is no reliable performance difference between those firms divesting to service debt and those who are retaining proceeds for investment purposes. Brown et al. (1994) find abnormal returns of -1.63% for those firms that cite debt repayment versus a gain of 1.87% for those firms that retain the proceeds for their main motivation for divesting. Brown et al. (1994) find that asset sales used to repay debt are more likely to be more beneficial to creditors than shareholders, as it is unlikely that the sales would occur in the absence of the pressure from creditors. These authors highlight that existing studies did not incorporate shareholder wealth as the key focus – especially when using asset sales to pay down debt. Alexandrou and Sudarsanam (2001) find that financially distressed firms experience a mean CAR of -0.26% versus 0.57% for non-distressed firms, attributing it, not to an improvement in financial health, but the strength of the

[58] Similar results were found by Kaiser and Stouraitis (2001) in their case study of Thorn-EMI

seller being able to extract higher value from the sale compared to financially weak sellers.

The existing literature provides an overview of the existing financial distress modelling and literature investigating the relationship between financial distress and the divestiture activity, however the lack of consensus on the impact of financial distress on the wealth of the shareholder of a firm, the following hypotheses are developed:

> $H_{0\text{-}1}$: There is are insignificant abnormal returns to those firms announcing divestiture activity whilst classified as financially distressed.
>
> $H_{1\text{-}1a}$: There is are significantly positive abnormal returns to those firms announcing divestiture activity whilst classified as financially distressed across one or two of the firm financial distress measures.
>
> $H_{1\text{-}1b}$: There is are significantly positive abnormal returns to those firms announcing divestiture activity whilst classified as financially distressed across all three measures of the firm financial distress.

It is generally anticipated, as in Lasfer et al. (1996) and Clayton and Reisel (2013), that the financing theory of asset sales prevails and it is expected that financially distressed firms experience higher stock market returns on the announcement, which is driven by the decline in the costs of financial distress. The competing alternative hypotheses will capture if the three firm financial distress measures are inconsistent or consistent at capturing the extent of financial distress.

With further multivariate examination, it is expected that the costs of financial distress are connected with the levels of abnormal returns experienced by the divesting firms, therefore the study will aim to examine what are the drivers of the costs of financial distress and whether they impact the observed announcement returns. It is expected that levels of liquidity play an important role in the divestiture decision. Charitou et al (2004) observe that liquidity is an important indicator and predictor of firm failure. Shleifer and Vishny (1992) show that firm illiquidity is a source of discount in the sale price of divested assets, firms that have low levels of liquidity are forced to divest assets at below their full economic value, at so called "fire sale" prices, due to their weakened bargaining position. On the other hand, Åstebro and Winter (2012) highlight that liquidity does not have a significant effect on firm survival probability and Ang and Mauck (2011) highlight that although there appears to be a popular notion of fire sale discounts due to firm distress and illiquidity, their findings do not support this. Therefore with these competing views in mind, the hypotheses being tested are:

$H_{0\text{-}2}$: There is an insignificant response to the firm liquidity position on the announcement returns of the divesting firms.

$H_{1\text{-}2a}$: There is a significant positive relationship between the liquidity position and the announcement returns of the divesting firms.

$H_{1\text{-}2b}$: There is a significant negative relationship between the liquidity position and the announcement returns of the divesting firms.

The expectation here is that there would be a significant reaction to the news of divestiture activity that is conditional on the levels of liquidity, however the competing

findings of existing studies on firm liquidity leave the driver of the reaction and the respective sign of the reaction unpredicted.

The resolution of financial distress can be undertaken by a reduction in the level of firm leverage by using the proceeds of the asset sale. Ofek (1993) shows that leverage increases the likelihood of poorly performing firms undertaking restructuring activity. Research by Bates (2005) and Clayton and Reisel (2013) observe higher abnormal returns for those firms that undertake divestiture activity that use the proceeds to retire debt. Clayton and Reisel argue that the higher positive reaction is attributable to sellers mitigating or reducing the costs of financial distress and the agency costs of debt. However, not all the existing evidence points this way, for example, Brown et al. (1994) find lower reactions to those firms that cite debt reduction and Lasfer et al. (1996) find higher abnormal returns to those firms with higher levels of leverage. Therefore:

> $H_{0\text{-}3}$: There is an insignificant response to the firm leverage position on the announcement returns of divesting firms.
>
> $H_{1\text{-}3}$: There is a significant positive response to the firm leverage position on the announcement returns of divesting firms.

It is hypothesised that leverage will therefore have a significant impact on the announcement returns, however the competing findings of the existing research leave the reaction unpredicted.

The main theoretical framework utilised in Chapter 5 is based around the direct and indirect costs of bankruptcy. Lasfer et al. (1996) outline that divestiture activity allows firms to avoid both the direct and indirect financial distress costs of bankruptcy. Direct

costs cover, amongst other things, administrative and legal expenses directly related to being bankrupt, and the indirect costs of bankruptcy, which is more substantial, covers all the other costs that are related to the firm's bankruptcy position. For example, these might include foregoing wealth maximizing investment opportunities due to the time and resources spent trying to resolve bankruptcy and finding that stakeholders such as customers, suppliers and lenders may be unwilling to exposure themselves to the added risks of transacting with a bankrupt firm (Gilson et al., 1990).

A number of studies have used this theoretical framework to develop the financing hypothesis of asset sales. The financing hypothesis of asset sales propose that divestitures represent an opportunity for firms to obtain access to financing that can be difficult to obtain from alternative sources, especially during periods of financial distress. Under this theory, Lang et al. (1995) highlights that firms divest assets when the activity represents a lower cost source of financing than what is available on the debt and equity markets and/or the cash flow from the sale represents a higher net present value than retaining the assets. Denis and Shome (2005) show a higher incidence of asset divestments for firms experiencing poor operating performance and higher leverage.

Divestiture activity represents a mechanism to reduce the direct and indirect costs of bankruptcy if the proceeds from the sale are used to reduce the probability of bankruptcy. Divestiture activity that reduces the cost of bankruptcy is therefore expected to lead to wealth gains from divesting firm shareholders (Asquith et al., 1994; Lang et al., 1995). Afshar et al. (1992) and Lasfer et al. (1996) find higher gains for divestment announcements by financially distressed UK firms.

The theoretical framework differs from earlier studies in the area such as Hite et al. (1987) who propose an efficient deployment hypothesis of assets sales. Hite et al. argue that divestiture activity promotes efficiency as firms will reallocate their assets to better uses and the divestor is able to capture some of the gains from the sale via the proceeds received. However, the theoretical framework adopted this this study makes allowances for managerial discretion, highlighting that management may be unlikely to divest assets for efficiency reasons alone, they opt to do so when the cost of financial distress increases.

5.2.10. Conclusions

The literature review of this chapter has focused on the measurement and calculation of firm distress and a review of the existing literature in the area.

So far the event study returns on firms that have been classified as financially distressed have varied; Jain (1985), Afshar et al (1992), Bates (2005) and Lee and Lin (2008), observe a positive market reaction to the announcement of divestiture for financially distressed firms. Much of the research attributes the gains to resolving the financial distress issue and paying down debt (Bates, 2005; Clayton and Reisel, 2013).

However, the observed event study returns have varied based on the market's perception as to whether the alleviation of debt obligations is a source of gains for a financially distressed firm. Some studies have found lower abnormal returns that are attributable to financially distressed firms compared to healthy firms. Studies by Brown et al. (1994), and Alexandrou and Sudarsanam (2001) observe similar results, that distressed firms experience anomalously lower average returns compared to those not suffering from financial distress.

The aims of this study are to examine a set of divestitures from the United Kingdom and to examine the market response to the announcement of divesting business unit(s) or asset(s) for firms that are financially distressed and healthy. To date, there have been only a few studies that have dominated this area of finance research. Therefore, this study will seek to examine what are the principle factors that drive firms to undertake divestments and what are the outcomes of doing so.

The next section will outline the data set used in the analysis and the methodology used.

5.3. Data and Methodology

This section provides of the data used in the analysis of financial distress and asset divestitures. An overview of the methodological approach used in the analysis of the sample and thereafter an expanded section defining the variables used in this section of the thesis will be provided. Then an overview of the descriptive statistics relevant for this section of the thesis will be outlined.

Details of the event study methodology and sample construction is available in the data and methodology chapter. This section contains 10,718 non-financial and utility announcements in order to evaluate the impact of financial distress on the announcement returns of divestiture announcements. These announcements were derived from Thomson Reuters ONE Banker database. The chapter starts by examining the univariate abnormal returns to those firms divesting assets split into subsamples of distressed and non-distressed firms. Then the differences between the two samples are examined.

In order to examine the factors that causes the before mentioned abnormal returns, multivariate analysis is undertaken to examine the relationship between the cumulative abnormal returns (CARs) for the announcement period.

The general model used in the study is

$$CAR_{(t-1,t+1)} = \propto +FSIZE + CLUS + GOPP + REL + LIQ + LEV + DISTRESS$$

[Equ. 5.06]

The dependent variable used was the three day event window CARs, regressed against accounting variables and financial distress variables as defined in the next section.

5.3.1. Variable definitions

Earlier theoretical and empirical work in the financial distress literature proposes a multitude of variables that can explain a firm's decision to divest assets using a distressed or non-distressed period. The control variables listed below are motivated by these studies.

Details of the event study methodology and sample construction is available in chapter 3 of this thesis. This chapter uses the full sample of 10,718 non-financial and utility announcements in order to evaluate the impact of firm financial distress on the announcement returns of firms undertaking divestiture activity.

These three measures of firm distress, alongside the key variables used in the tables in this chapter are presented in table 5.01.

5.3.2. Financial distress variables used in the study

The first financial measure of distressed is INTCOV. Interest coverage is measured as the ratio of EBITDA (worldscope WC18198) to interest expense (worldscope WC 01251) at the financial year end prior to the announcement of divestiture. A firm is classified as distressed if the ratio is either less than 0.8 in the year prior to the announcement or less than 1 for two consecutive years prior to the announcement. This approach is adopted by Asquith et al. (1994) and Hovakimian and Titman (2004). Asquith et al. (1994) outlines that this definition restricts attention to firms that are suffering from a serious period of financial distress[59]. If the interest coverage

[59] Asquith et al. (1994) argue that an interest coverage ratio between 0.8 – 1.0 does not correctly identify firms suffering from a serious of sustained bout of financial distress, as firms within this range have sufficient liquid funds in order to meet any interest payments. They classify anything lower than 0.8 to be serious financial difficulty.

conditions are met and the firm is classified as distressed, then a dummy variable is set equal to one, otherwise if the firm is deemed financially healthy, then the dummy is set equal to zero.

Secondly, an accounting approach using a net income based measure was used as a proxy for financial distress. Following De Angelo and De Angelo (1990), a firm is classed as financially distressed if net income before extraordinary items/preferred dividends (worldscope WC01551) is negative at the financial year end prior to the announcement of divestiture activity. Where this condition applies, then the firm is classified as distressed via a dummy variable which is equal to one, otherwise if these conditions do not apply, then the dummy variable is set equal to zero.

Finally, the Taffler (1983) z-score model of ratio definition and coefficients takes the following form (as previously highlighted in equation 5.05]:

$$Z = 3.20 + 12.18X_1 + 2.50X_2 - 10.68X_3 + 0.029X_4$$

Where the definitions of the Taffler model were adopted for this study are as follows[60]:

$$X_1 = {Earnings\ before\ interest\ and\ tax - interest\ expense\ on\ debt}/{Current\ liabilities}$$

$$X_2 = {Current\ assets}/{total\ liabilities}$$

$$X_3 = {Current\ liabilities}/{Total\ assets}$$

[60] The respective worldscope codes are defined as $X_1 = {(WC18191-WC01251)}/{WC03101}$, $X_2 = {WC02201}/{WC03351}$, $X_3 = {WC03101}/{WC02999}$, $X_4 = {WC02001}/{((WC01001-WC01251-WC01148)/365)}$.

X_4 = No Credit Interval[61] =

$$((cash\ and\ short\ term\ eqiv) \Big/ \frac{Sales - EBIT - interest\ expense\ on\ debt - Depreciation}{365}$$

Using this Taffler z-score model, a z-score >0 is above the solvency threshold and the firm is unlikely to fail within the next year. Should a firm have a z-score <0, this indicates that the firm is measured as having a financial profile of firms that have failed in the past, therefore the probability of failure is high. The intuition here, is that the greater the negative z-score, the higher the likelihood of firm failure, according to the Taffler model. Financial distress is classed by a dummy variable that is equal to one if z-score is less than zero, otherwise if it is considered to be non-distressed; the dummy variable is set to zero.

A full variable definition table is provided in table 5.01.

[Insert Table 5.01 about here]

5.3.3. Endogeneity and heterogeneity

Roberts and Whited (2012) highlight that endogeneity is an important issue that confronts empirical studies in corporate finance. Endogeneity refers to correlation between independent variables and the error terms in OLS regression and where issues of endogeneity arise, these can lead to challenges in the interpretation of regression outputs. These biased and inconsistent parameter estimates can be a result of three factors: omitted variables, simultaneity and selection bias. Çolak and Whited (2007)

[61] Another definition of quick assets = current assets – inventories (WC02201 – WC02101) was also used in the study, with similar results found – therefore, they are not reported.

put forward the view that endogeneity is an issue in divestiture studies as the activity of divestiture is not undertaken from a random selection from a population of diversified firms. Therefore the firms that end up undertaking divestiture activity are those firms that should sell assets as they will have the best result from doing so (by generating a positive stock price response). Studies in the area generally lack a negative response, as those firms that are opt not to divest assets are likely to be using alternative means of raising finance, rather than undertaking an asset sale. The firms that opt to divest will exhibit different characteristics from those firms that do not undertake such activity (Çolak and Whited, 2007). Çolak and Whited (2007) show that after controlling for endogeneity in divestiture, the implication for research in the area is that refocusing firms have a higher level of Tobin's q, as such, they exhibit better investment opportunities than control firms and secondly, compared to non-divesting control firms, divested segments are observed to be smaller than controls. Both investment opportunities and size are controlled for in this study by the variables GOPP and FSIZE. Similarly, unobserved heterogeneity presents a fundamental challenge to finance researchers undertaking empirical research, as asset prices and corporate policies depend on a number of factors that are unobservable (Gormley and Matsa, 2014). A number of recent studies have tried to address unobservable heterogeneity (Bertrand et al., 2004; Petersen, 2009; Erickson and Whited, 2012), however, an earlier study by Gilson et al. (1990) highlights that unobservable heterogeneity affects those firms undertaking restructuring activity. Firms that have complex capital structures with numerous complex creditor claims in times of distress experience unobservable heterogeneity. Gilson et al. (1990) show that complex financing structures of the firm, such as differences in seniority rights and creditor

claims lower the likelihood of firms succeeding in successfully carrying out restructuring activity. These differences are borne by disputes over agreements whether restructuring is equitable to creditors, however the notion of equity/fairness to creditors is difficult to measure, yet it is a significant factor in the success of restructuring activity. Bringing these findings into this chapter, the implication is that the measures of financial distress used can only capture financial distress as defined by the model, however it does not take into account unobservable or omitted variables, such as the seniority of the creditors, the ownership structures, legal liabilities or any other claims that are likely to be treated differently across firms under a restructuring deal that are not observable to the researcher. Similarly, the causal relationship between the announcement returns and distress may not controlled for fully if there is some unobservable factor that is significantly different between firms suffering from financial distress and those firms that are financially healthy (such as creditor claims, legal factors, social factors or political factors). This study minimizes concerns of unobservable heterogeneity by basing the empirical variables used in the study on the main accounting and deal characteristics used in the prior financial distress literature.

5.4. Empirical Results

5.4.1. Full sample characteristics

The sample consists of divestiture announcements derived from the Thomson Reuters ONE Banker database using the merger and acquisitions module for the period 1988-2009. The sample had the condition placed upon it that the parent firm of the business unit or asset that was being divested had to be publicly listed in the United Kingdom on the FTSE All Share Index. Those firms that were classified as financial firms and regulated utility firms were excluded due to the impact of regulation on the fundamental characteristics, structure and financing policies.

Chapter 3 of this thesis provides an overview of the descriptive statistics relating to the full sample, these are reported in table 3.02.

5.4.2. Financial distress measures

Table 5.02 highlights the classification background for the three measures of firm distress that is used in this chapter.

[Insert Table 5.02 about here]

Panel A highlights the number of firms in the sample that are classified as distressed or non-distressed using the three measures. Using the Taffler z-score approach (TAFF), 1,648 divestiture announcements were undertaken by firms that were classified as financially distressed, this compares to 9,070 announcements that were undertaken by non-distressed firms. Similarly using the interest coverage classification approach (INTCOV), 2,062 announcements were considered to be undertaken by financially distressed firms, versus 8,656 by healthy firms. The

negative net income based approach (NNI) of financial distress classification yielded 2,452 of the sample divesting assets when distressed and 8,266 announcements were made by non-distressed firms. Overall, using the three classification measures distressed firms accounts for 15.4%, 19.2% and 22.9% of the sample respectively. The TAFF approach appears to offer a more refined measure of financial distress and as such the intricacy of the model results in fewer firms being classified as financially distressed. This suggests the more refined measure of financial distress is less prone to type I errors, however it should be noted that the classification of distress across the lowest and the highest classification approaches represents a range of 7.5% of the full sample.

The correlation matrix presented in Panel B highlights the relationship between the three different measures of financial distress. The TAFF and INTCOV measure have a correlation coefficient of 0.656, which is the highest in the sample. The correlation between INTCOV and NNI had a correlation coefficient of 0.409 and the lowest level of correlation between the variable sets in the sample was between TAFF and NNI, which had a correlation coefficient of 0.336.

Panel C highlights the number of firms in the sample that are classified consecutively across three, two or just a single measure of distress. Combing all three measures of distress, there are 3,537 announcements in the sample that are classified as distressed in at least one of the three measures used, this represents 33.0% of the full sample.

Specifically examining the distressed sample, 811 announcements were classified as distressed across all three measures (representing 22.9% of the distressed sample),

1,003 (28.4%) were classified as distressed across two of the three measures and the remaining 1,723 (48.7%) were classified as distressed in one of the three measures.

5.4.3. Event study

In this section of the research, the results of the event study approach are reported. The sample is split into subsamples, those firms that are classed as financially distressed and those firms that are classified as non-distressed. This study reports multiple event windows, from a five day event window [-2,+2] to a single day event window [t_0], however the main focus of this thesis will be the three day event window [-1,+1].

[Insert Table 5.03 about here]

Table 5.03 (panel A) presents an overview of the AAR at [t_0] and CAARs for the respective event windows. For the full sample, on the announcement day, the mean abnormal returns are 0.139%. Similarly, the mean CAARs for the three day event window [-1,+1] are 0.861% and are significant and positive. These significantly positive results suggest that on the announcement day, the release of the divestiture news conveys news to the market that is interpreted in a positive way. These results are consistent with results of Lang et al. (1995), Lasfer et al. (1996), Bates (2005), Benou et al. (2008), Cao et al. (2008) and Hillier et al. (2009) and the previous chapter.

Whilst the motivation to undertake divestiture varies by firm, over all of the event windows reported for the whole sample in the previous chapter, it is observed that undertaking divestiture activity is a value enhancing transaction for the selling firm's shareholders. The results highlight that investors respond favourably to the decision to divest assets results in positive abnormal returns that are significantly different from zero.

5.4.3.1. Event study returns: Distressed versus non-distressed

This section examines the abnormal returns of the subsamples of distressed and non-distressed firms and the differences between the two. Lasfer et al. (1996) highlight that one of the main benefits of undertaking divestiture activity is the resolution of financial distress and as such there will be a higher abnormal return to the selling firm that is distressed relative to a selling firm that is financially healthy. Table 5.03 (panel B) outlines event study results for the subsample of distressed and non-distressed firms. Across all three measures of firm financial distress higher abnormal returns are experienced by distressed firms over non-distressed firms and in several cases the differences are statistically significant.

Using the Taffler z-score measure of financial distress, the results show that over the three day event window firms in the distressed subsample experience CAARs of 1.112% and are significant at the 1% level. These results contrast with those firms that are deemed as non-distressed, which experience CAAR of 0.745%. The difference between the subsample CAARs are reported as 0.367% and this is significant at the 10% level.

Over the three day event window [-1,+1], the CAARs using the interest coverage (*INTCOV*) is 1.041 % for the distressed subsample and 0.754% for the non-distressed subsample, both results are found to be significant individually. However, the difference between the samples is found to be insignificant. Using the *INTCOV* approach, the difference is only observed to be significant over the two day event window [-1,0]. Where the CAAR is 0.445% for the distressed subsample and 0.163% for the non-distressed subsample, again both results are found to be significant

individually. The difference in CAARs between the two samples is 0.282% which is significant at the 5% level.

Finally, using the net income based approach (*NNI*) of distress classification, the subsample of distressed firms experiences CAARs of 1.051% for the three day event window and the healthy firms in the sample experience CAARs of 0.738%. The difference in CAARs between the two subsamples is 0.313% and the difference is significant at the 10% level for the [-1,+1] event window. The difference was also measured as 0.269% over the [-1,0] event window, which is significant at the 5% level.

Across all three measure of financial distress, it is observed that those firms that are classed as distressed experience higher positive abnormal returns compared to the subsample of healthy firms that are not financially distressed. These findings are consistent with that of Lasfer et al. (1996), who attributed that the reduction in the financial distress costs as the source of these gains. These results are consistent with the studies of Afshar et al. (1992), Lasfer et al. (1996), Bates (2005) and Lee and Lin (2008) who all observe higher announcement returns for those firms who are classified as financially distressed when divesting assets. The studies attribute the financing theory of asset sales to the favourable view by investors of starving off the threat of financial distress. The results seem to contrast with Shleifer and Vishny (1992), Brown et al. (1994), Alexandrou and Sudarsanam (2001) and Ang and Mauck (2011) who put forward the view that financially distressed firms are in a weakened bargaining position and unable to negotiate a the full economic worth of the asset being sold, therefore distressed firms in a near bankrupt state are forced to accept lower valuations for the asset being sold. The results also allow us to accept the hypothesis $H_{1\text{-}1a}$ that there are significant positive abnormal returns attributable to those distressed

firms that undertake divestiture activity for the three day event window for *TAFF* and *NNI* based measures of financial distress. Whilst the *INTCOV* approach yields a positive result for the distressed sub-sample, H_{0-1} cannot be rejected (and therefore H_{0-1b} cannot be accepted) for the measure over the three day event window, as the differences between the distressed and healthy sample is found only to be significantly different over the two day event window [-1,0] and not over the three day event window.

5.4.3.2. Liquidity

Table 5.04 examines the univariate abnormal returns of the subsamples of these firms that have high levels of liquidity versus those firms with low levels of liquidity, and the differences between the two. High liquidity firms are where LIQ is above the sample median and low liquidity firms are those with LIQ below the sample median. Charitou et al (2004) observe that liquidity is an important indicator and predictor of firm financial distress.

[Insert Table 5.04 about here]

The univariate results show that firms that have low levels of liquidity experience lower abnormal returns in comparison to those firms that have higher levels of liquidity at time of divestment. Over the [-1,+1] event window, firms with low liquidity experience statistically significant CAARs of 0.658% at the 1% level versus those firms with higher levels of liquidity that experience higher CAARs of 0.989% over the same three day event window, which is significant at the 1% level. The difference between the two samples 0.331% is significant at the 5% level. The results hold over the three- and five-day event windows.

Evidence of Shleifer and Vishny's (1992) view that firm illiquidity is a source of a discount in asset sales is reflected in the observed results. Those firms that have low levels of liquidity experience lower abnormal returns than those that are in a better liquidity position. It appears that divesting parent firms that are not in a weakened bargaining position at the time of a sale are able to extract higher abnormal returns relative to those that are distressed. These results allow us to accept hypothesis $H_{1\text{-}2b}$ that there is a significant positive relationship between liquidity and the announcement. These univariate results suggest that those firms that are able to divest with high levels of liquidity appear not to suffer from issues of short term liquidity issues that motivate many divestiture sales and appear to be divesting assets for other, perhaps more strategic reasons (Montgomery et al., 1984; Lang et al., 1995).

5.4.3.3. Leverage

Table 5.04 also examines univariate event study returns for firms that have high and low levels of leverage. High leverage is classified as such if the level of leverage is above the median leverage at the time of divestiture. Similarly, if the firm has a level of leverage that is below the median leverage, then they are classified as 'low leverage.'

Over the [-1,+1] event window, firms with high levels of leverage experience CAARs of 0.804% and those with low leverage experience CAARs of 0.945%, both of these results individually are significant to the 1% level. Over the [-2,+2] event window those firms with high levels of leverage experience CAARs of 1.017% and those firms that have low levels of leverage have CAARs of 1.097%, both these results are significant at the 1% level. Even though the results are significant individually, the

difference between the sample with low levels of leverage and high levels of leverage is found not to be statistically significant, therefore we cannot reject hypothesis H_{0-3} as there is no significant difference between abnormal returns experienced by those firms categorized as having levels of high leverage versus low levels of leverage. Firm leverage levels appear to have little impact on the univariate returns that are attributable to firms that undertake divestiture activity.

5.4.4. Multivariate analysis

The previous section of the thesis focused on analysing the univariate event study results that examined the abnormal returns for firms engaging in divestiture activity. The abnormal returns for distressed and non-distressed firms across the three measures of financial distress were examined, alongside firm liquidity and leverage.

The following section builds on this by introducing multivariate analysis to examine the cross sectional determinants of these abnormal returns. To do this, multiple regression analysis was conducted in order to evaluate the impact of financial distress and the observed event study returns experienced by parent firms undertaking divestiture over the three day event window [-1,+1].

The cross-sectional regression allows us to simultaneously control for factors that influence the observed abnormal returns for firms that are divesting assets; these factors consist of financial distress variables, firm specific characteristics such as size and growth opportunities, deal characteristics such as clustering and relatedness and accounting based characteristics.

Table 5.05 presents the results of the first cross-sectional regression. In these models, the dependent variable is the cumulative abnormal return over the three day event

window. The control variables FSIZE, CLUS, GOPP and REL are used throughout this study. Firm size was found to be significantly negative across all models, the remaining variables were observed to be mostly insignificant across all models.

[Insert Table 5.05 about here]

Model 1 highlights that liquidity is a significant factor in explaining abnormal returns experienced by those divesting firms. After controlling for firm size, growth opportunities and divestiture clustering, the variable was found to be significant at the 1% level, suggesting that CARs are increasing with firm liquidity. This result implies that firms appear not to be constrained by short term financing and the market is positively viewing high levels of liquidity. Those divesting firms that find themselves with a strong liquidity position avoid the problem of a fire sale discount. These results support the view that liquidity is important and that firms may divest assets as a mechanism to create an alternative source of funding for short term liquidity purposes (Lang et al., 1995).[62] The results contrast with the findings of Montgomery et al. (1984) who find divestitures for liquidity purposes yield insignificant results and Ang and Mauck (2011) who find no evidence of fire sales.

Model 2 examines the impact of leverage on divestor abnormal returns and finds a statistically significant result at the 5% level whereby the level of debt is negatively related to the CARs experienced by divesting firms. This suggests that those firms with lower levels of leverage are able to escape from financial distress relative to those that are burdened by higher debt obligations. These leverage results compliment the

[62] Lang et al. (1995) observe that divestitures typically follow a period of poor performance and on average, those firms announcing divestiture activity for liquidity improving reasons are associated with a positive stock price reaction and Montgomery et al. (1984) find that divestitures for liquidity purposes result in CARs that are not significant.

liquidity results obtained in Model 1 and the earlier findings in the univariate analysis of a sellers' discount when those firms that are divesting assets are in a weakened bargaining position. However, these results contrast with Lang et al. (1995), Afshar et al. (1992), Clubb and Stouraitis (2002) and Clayton and Reisel (2013) who use debt reduction as a proxy for financial distress. Bates (2005) highlights that these results are not an indicator of where the disbursement of proceeds from the asset sale goes, but the gains are attributable to a reduction in the level of the agency costs of debt.

Models 3 to 5 incorporate the various measures of financial distress that have been used in this study; interest coverage, net income and z-score respectively. Interest coverage is found to be significant at the 10% level and the Taffler z-score and net income measure is significant at the 5% level. The positive coefficient between all three variables suggests that the market response to divestment announcements is greater for financially distressed firms and that the market responds favourably to those firms that divest in order to mitigate the cost of financial distress. These results support the findings of the earlier univariate analysis. The magnitude of the response is smallest for the INTCOV measure of financial distress and greatest for the TAFF measure, suggesting that the more refined measure of financial distress may reflect the true resultant economic response to those firms that are taking action in order to mitigate costs of financial distress by divesting assets.

Research by Lang et al. (1995) and Lasfer et al. (1996) find a positive relationship between the value of the divested asset and the event study returns. However, until now, the study has omitted deal size (DSIZE) as a control variable due to the limited reporting of this variable from Thomson ONE. The findings of Lang et al. (1995) and Lasfer et al. (1996) create grounds to extend the analysis in of models 1 – 5 in table

5.05 to include the variable DSIZE for a smaller sub-sample. It is expected that the relationship between DSIZE and the observed announcement returns is positive.

[Insert Table 5.06 about here]

Table 5.06 extends this analysis and the variable DSIZE is found to be highly significant at the 1% level and positive across all five models, these results are consistent with the earlier findings of Lang et al. (1995) and Lasfer et al. (1996) that shareholder returns increase with the price paid for the divested asset. The analysis is extended to examine the interaction between the size of the divestiture and each of the key independent variables in models 1 – 5.

The results show for model 1 that for firms with a high level of liquidity, the price paid for the asset matters less than those firms that are liquidity constrained. The interaction between LEV and DSIZE is negative, suggesting that high levels of leverage and larger value divestiture transactions are associated with lower shareholder announcement returns. For model 2, the interaction between LEV and DSIZE is found to be significantly negative at the 1% level, suggesting that for firms with higher levels of leverage, the higher price paid for the assets results is a much greater shareholder wealth losses. This result suggests that shareholders view such large asset sales to pay off debt not to be in their own interests, but more so in bondholders' interests. In light of the inclusion of DSIZE, model 3 main effects and interaction variables are observed to be insignificant. Model 4, using the NNI approach to measuring firm financial distress, the interaction between firm distress and the DSIZE is significantly negative at the 5% level. The result shows that conditional on firm distress conditions, larger values paid for divestiture assets are associated with larger stockholder wealth losses.

These results suggest that the market places a lower value on the sale proceeds, evidenced by lower abnormal returns experienced by divesting firms. However, interestingly this result differs depending on the measurement of firm distress, using the TAFF approach (model 5), the interaction between DSIZE and firm distress is significantly positive at the 10% level, suggesting that conditional on firm distress, larger divestments are associated with greater stockholder gains. These results suggest for those firms that are captured as financially distressed using the TAFF measure, the resolution of financial distress appears to generate a positive market response at the announcement, suggesting that the amount paid for the sale may help in the resolution of financial distress, more so than smaller size divestments. It should be noted that caution should be given to these results due to the smaller sub-sample used in this analysis.

Finally, models 6 to 9 in Table 5.05 investigate the components of the Taffler z-score model to better assess the characteristics driving the results found in the event study section.[63] Profitability (*taff_x1)* is found to be statistically significant at the 1% level, observing that higher CARs are experienced by firms that report lower levels of profitability at the financial year prior to the divestiture announcement. Working capital position (*taff_x2)* is positive and statistically significant at the 1% level. It could be said that the firms with higher working capital have sufficient current assets to cover current liabilities, and as such are in a stronger financial position after the

[63] The Taffler z-score model picks up varying financial distress characteristics, such as: Taff_x1 represents variable X_1 in the Taffler z-score approach which measures profitability, Taff_x2 represents variable X_2 which measures working capital position, Taff_x3 represents variable X_3 measuring financial risk, and Taff_x4 represents variable X_4which measures the no credit interval. Investigating the components of the Taffler z-score approach allows us to deeper examine the elements which are driving the financial distress measure and the event study CAARs.

asset sale than a firm that has a lower level of working capital. These results support the previous liquidity findings in model 1. However, there is little research that has examined working capital in conjunction with divestiture activity. Financial risk (*taff_x3*) is a current liabilities based measure as part of the Taffler z-score. The results are statistically significant at the 5% level and are found to be negatively related to the divesting firms CARs in model 8. Finally, the no credit interval component (*taff_x4*) is found to be insignificant in explaining abnormal returns in the divestiture sample utilised in this chapter.

Those firms that are financially distressed exhibit statistically significant announcement returns that are positive. The financial distress variables are all found to be positive and statistically significant in the cross-sectional regressions explaining the market reaction to the divestment announcement. This suggests that the divesting parent firm experiences higher abnormal returns when they are categorized as financially distressed.

However, further investigation is required to examine the results of model 1 for liquidity and model 2 for leverage. Table 5.07 examines the leverage variable further by segmenting the debt into total, short- and long-term debt to assets and into the same ratios with market rather than book leverage as an explanatory variable. Using book leverage, short-term, long-term and total debt are found to be negative and significant for the total debt and long-term debt at the 5% level.

[Insert Table 5.07 about here]

The short term debt (variable *STD_A*) was found to be insignificant. These results provide event that short term debt obligations appear not to be a factor impacting the

abnormal returns experienced when firms announce divestiture activity. These results then re-examined using the market assets variable utilized by Baker and Wurgler (2002) and Hovakimian (2006) in models 4 to 6. Similarly, the results show a negative relationship between the book value of total debt to market assets and similarly a significant negative relationship between the ratio of long-term debt to market assets at the 5% level. Again, short term debt to market assets is found to be insignificant.

These results suggest that the negative relation between leverage and abnormal returns is driven not by short-term debt constraints but long-term debt. Although not impacted by short-term debt constraints, the observed negative relationship between long-term debt and abnormal returns highlights possible investor concerns about firm long term survival. Shleifer and Vishny (1992) and Kruse (2002) highlight that distressed firms with long term debt suffer from being unable to raise required funds in capital markets due to long-term debt overhang. In addition, Gertner and Scarfstein (1991) and Acharya et al. (2007) highlight that high long-term leverage may be associated with a higher level of dispersed debt ownership. Therefore this would require greater co-ordination and negotiation, which they state could hinder recovery from financial distress.

5.4.5. Liquidity, leverage and financial distress

Tables 5.08 and 5.09 examine in a multivariate setting whether the interaction of financial distress and liquidity or financial distress and leverage impacts abnormal returns experienced by divesting firms.

The categorization used in tables 5.08 and 5.09 takes the form of 'low' and 'high.' 'Low' is a dummy variable that takes the value of 1 if the firm divesting assets has a

ratio that is lower than the median for the full sample of firms. The variable in this case is either liquidity or leverage. Likewise, if the respective ratios are above the median, they are categorized as 'high.' Distress is defined as previously.

Firstly, an examination of the relation between leverage and liquidity is examined via categorical predictors.

[Insert Table 5.08 about here]

In Table 5.08, model 1 provides an overview of the combination of high/low leverage to high/low liquidity. After controlling for firm size, divestiture clustering and growth opportunities, the variable *highlev_lowliq* is significantly negative at the 1% level. Similarly to the previous results and Shleifer and Vishny (1992), those sellers that have a poor bargaining position due to the constraints of high levels of leverage and low levels of liquidity experience a negative stock market response when announcing divestiture activity.

Model 2 examines the interaction between firms identified as financially distressed using the z-score measure of financial distress and liquidity. Model 3 is similar to model 2 except the distress measure is the interest coverage dummy. In model 4 financial distress is measured using the negative net income based approach of financial distress classification.

Across models 2 to 4 consistent results are found; firms that are not financially distressed and have low levels of liquidity have significantly lower CARs on the announcement of divestiture activity. So in the absence of liquidity or financial distress, the market places a lower value on the divestiture activity. Firms with high levels of liquidity experience higher abnormal returns within the sample and these

multivariate results reinforce the view that the market positively responds to divestiture activity and asset sales for firms that have a strong bargaining position. The suggestion here is that firms who are not formally designated as financially distressed also suffer from having a weak bargaining position when they have low levels of liquidity. The finding here suggests that the market responds negatively to those firms that are not able to extract the full economic value of the asset even when they are not formally classified as suffering from financial distress.

These results hint at the view that the market responds positively to those firms that are able to avoid the problem of a buyer's market; that is, they have sufficient liquidity in order to avoid being in a weakened bargaining position at the time of negotiating the value of the assets being divested. These results suggest that firms are not forced to offer assets at a discount and as such can realize the full market value for the assets or business unit being sold. Shleifer and Vishny (1992) suggest that illiquidity is the main source of fire sale discounts and Pulvino (1998) highlight that fire sale discounts are due to the weakened position of the asset divestor.

Similarly Table 5.09 focuses on the interaction of leverage and financial distress. Model 1 examines the interaction between firms identified as financially distressed using the z-score measure of financial distress and the low/high levels of leverage. Model 2 examines the interaction between firms identified as distressed and low/high levels of leverage using the interest coverage measure of financial distress. Model 3 follows on by using the net income based measure of financial distress.

[Insert Table 5.09 about here]

In models 1 and 2, firms that are classified as non-distressed and had high levels of leverage experienced significantly lower abnormal returns. This suggests that the market reacts more positively to those firms that have lower levels of leverage and are not distressed. Model 3 observes a positive association between CAARs and those firms that are distressed and have low leverage. Again the market reacts more positively to lower levels of leverage, however in this model; there is a significant positive association for those firms that are distressed. These results suggest that the constraints placed upon a firm with higher levels of leverage may not be mitigated through the proceeds made available from divesting assets and as such, firms may not necessarily see the benefits of debt reduction from undertaking divestiture activity when those firms have high levels of leverage (whether they are distressed or not).

These results suggest that CAARs are driven by the financial position of the selling firm. In the previous section on liquidity, it is argued that liquid firms that are able to avoid divesting assets at a discount, experience higher abnormal returns when these firms are classified as financially distressed. Similarly for leverage, those firms that have lower levels of leverage are in a better position financially to negotiate the full value or a better price for any asset or business unit being sold. Being in a better financial position allows firms to maximize the asset/unit value and therefore maximize firm and shareholder value.

Where firms are not in a strong position to extract the full value of the divested asset (such as having low liquidity or high levels of leverage), the results have indicated that the parent firm's abnormal returns are significantly lower on the announcement by around 0.5% for those firms with low levels of liquid and 0.2% for those firms that have high levels of leverage.

5.5. Summary and Conclusions

The main aim of this study was to examine the impact of divestitures in conjunction with firm financial distress. Firstly, the study shows that divestiture activity is wealth creating for the parent firm divesting assets. Over the three day event window, firms experience abnormal returns of 0.861%. The positive reaction supports theories of divestiture based on operating efficiency for the selling firm, by reducing the expected costs of financial distress (Asquith et al. 1994; Lang et al., 1995). This study suggests that the market interprets the sale of assets or business units as a mechanism to reducing and mitigating the costs of financial distress and the magnitude of the positive response is consistent with the findings of Sicherman and Pettway (1992) and Borisova et al. (2013).

Whilst the motivation to undertake divestiture activity varies by firm, the study then examined the event study returns in conjunction with measures of financial distress. The literature review outlined a number of approaches taken so far to measure firm financial distress and from this, Taffler's z-score, an interest coverage based measure and a net income based measure of financial distress were adopted in this study. Afshar et al. (1992) and Lasfer et al. (1996) find higher gains on the announcement of divestiture activity by financially distressed UK firms. The financial distress variables are found to be significant drivers of the abnormal returns, as all three measurements of financial distress used in this study are found to be positively and significantly related to abnormal returns on announcement. Consistent with a number of earlier studies, it was observed that firms who undertake divestiture activity when distressed obtain more favourable announcements compared to those that are not distressed (Lasfer et al., 1996; Coakley et al., 2007; Ang and Mauck, 2011). The findings suggest

that financial distress is a significant factor in explaining the stock market returns to firms divesting assets.

The results from the multivariate analysis highlight the cross-sectional determinants of abnormal returns. Liquidity is found to be a significant factor in explaining abnormal returns experienced by divesting firms. The positive coefficient highlights the higher the level of liquidity, the higher the abnormal returns experienced. The market positively evaluates high liquidity when evaluating the divestiture decision, as higher levels of liquidity allow firms to avoid the fire sale problem where financially constrained sellers are forced to sell their assets or business units at a price below their true economic value, due to their weak bargaining position.

Similarly the multivariate results show that the level of debt is negatively related to the cumulative abnormal returns experienced by parent firms divesting assets. When examined further it is observed that these results are driven by long-term debt, suggesting that investors are concerned about the prospects of firms with large debt overhang when evaluating the divestment decision (Kruse, 2002).

Finally, the study brings the major three components of the multivariate analysis together, leverage, liquidity and financial distress to examine the interaction between these variables via a cross-sectional analysis. The results show that investors appear to place a higher value on divestitures by sellers with high levels of liquidity and/or when firms are financially distressed, suggesting that firms are not financially constrained in the short term, but the gains are given by divesting firms being able to avoid the problems of a buyers' market and extract the full economic value of the assets sold. The key finding from the multivariate analysis is that the financial position

of the seller is likely to influence the abnormal returns experienced. Divesting parent firms who have lower levels of leverage and higher levels of liquidity are more likely to be in a better financial position and therefore better able to negotiate a better price for the divested asset or business unit compared to being in a weakened financial position.

Table 5.01 Financial and distress definitions

This table reports the key financial and distress variables used throughout this chapter. The variable name, variable references, definitions and Worldscope codes used throughout this chapter are presented for the financial definitions. The three forms of distress measured in this chapter are presented, including the variable name and definition. Variables not defined in this table are defined in their respective tables.

Variable name	*Variable reference*	*Definition*	*Worldscope*
Firm Size	*FSIZE*	=ln(total assets)	=ln(WC02999)
Growth Opportunities	*GOPP*	Market to book (measured as the market value of equity to book value of equity)	WC08001/WC03501
Same industry divestiture	*REL*	Dummy variable that is equal to one if the divested unit is in the same industry as the parent company at the two digit SIC level	N/A
Cluster	*CLUS*	Dummy variable that is equal to one if the firm has been involved in another divestiture 180 days prior to the announcement	N/A
Liquidity	*LIQ*	A measure of liquidity that is computed as cash and short term equivalents to current liabilities	WC02001 / WC03101
Leverage	*LEV*	A measure of leverage calculated as total debt to total assets	WC03255 / WC02999
	Debt_A	Total debt to total assets	(as above)
	STD_A	Short term debt to total assets	WC03051 / TA
	LTD_A	Long term debt to total assets	WC03251 / TA
	Debt_MA	Total debt to market assets 'Market assets' is defined as: total assets + market value of equity – book value of equity	WC03255 / (WC02999 + WC08001 - WC03501)
	STD_MA	Short term debt to market assets	WC03051 / MA
	LTD_MA	Long term debt to market assets	WC03251 / MA
Distress Measures	*TAFF*	Taffler z-score whereby, firms are classified as distressed if they have a z-score less than zero. Firms that have a z-score greater than zero are classified as non-distressed	N/A
	INTCOV	Interest coverage distress measure. Interest coverage is measured using (= EBITDA / interest expense). If the interest coverage ratio at the financial year end prior to the announcement of divestiture is either is < 0.8 or < 1 for two consecutive years prior to the announcement, then the firm is classified as distressed	N/A
	NNI	A distress measure based on negative net income. Where net income is negative at the financial year end prior to the announcement of divestiture activity, then a firm is classified as financially distressed	N/A

Table 5.02: Descriptive statistics of each measure of financial distress

The table reports the number of firms that have been classified as non-distressed or distressed for the sample of 10,718 non-financial and non-utility firms for the period 1988-2009. The distress measures are defined as: *TAFF* which is the Taffler z-score whereby, firms are classified as distressed if they have a z-score less than zero. Firms that have a z-score greater than zero are classified as non-distressed. *INTCOV* is the interest coverage variable. Interest coverage is measured using (= EBITDA / interest expense). If the interest coverage ratio at the financial year end prior to the announcement of divestiture is either is < 0.8 or < 1 for two consecutive years prior to the announcement, then the firm is classified as distressed. *NNI* is a distress measure based on negative net income. Where net income is negative at the financial year end prior to the announcement of divestiture activity, then a firm is classified as financially distressed. t-statistics in parenthesis: *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

Panel A: Financial distress by measure

	TAFF		*INTCOV*		*NNI*	
Count of sample	N	%	N	%	N	%
Non-distressed (0)	9,070	84.6%	8,656	80.8%	8,266	77.1%
Distressed (1)	1,648	15.4%	2,062	19.2%	2,452	22.9%
Total	10,718	*100%*	10,718	*100%*	10,718	*100%*

Panel B: Correlation matrix

	TAFF	INTCOV	NNI
TAFF	1		
INTCOV	0.6555*** (0.000)	1	
NNI	0.3356*** (0.000)	0.4093*** (0.000)	1

Panel C: Count of distress measures

	Count	Fraction of distressed	Fraction of total sample
No distress classification across any measure	**7,181**	-	**67.0%**
Classified as distressed	**3,537**	-	**33.0%**
using one measure	1,723	48.7%	16.1%
using two measures	1,003	28.4%	9.4%
using three measures	811	22.9%	7.6%

Table 5.03: Event study returns (by firm distress measure)

The table below presents the abnormal returns surrounding the divestiture announcement for the full sample of 10,718 firms for the period 1988-2009 in Panel A. Panel B provides the abnormal return for the full sample (excluding financial and utility firms) segmented by distress measure type. The distress measures are defined as: TAFF which is the Taffler z-score whereby, firms are classified as distressed if they have a z-score less than zero. Firms that have a z-score greater than zero are classified as non-distressed. INTCOV is the interest coverage variable. Interest coverage is measured using (= EBITDA / interest expense). If the interest coverage ratio at the financial year end prior to the announcement of divestiture is either is < 0.8 or < 1 for two consecutive years prior to the announcement, then the firm is classified as distressed. NNI is a distress measure based on negative net income. Where net income is negative at the financial year end prior to the announcement of divestiture activity, then a firm is classified as financially distressed. t-statistics in brackets: *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

Panel A:

Event window	[-1,+1]	[0]
mean	**0.861%*** **	**0.139%*** **
t stat	[15.044]	[4.209]
median	0.255%	0.007%
N	10,718	10,718

Panel B:

TAFF	Distressed N = 1,648		Non-distressed N = 9,070		*Difference*	
t	CAAR	t stat	CAAR	t stat	CAAR	t-stat
[-2,+2]	1.153%***	[7.704]	0.990%***	[12.877]	0.163%	[0.635]
[-1,+1]	1.112%***	[9.593]	0.745%***	[12.522]	0.367%*	[1.652]
[-1,0]	0.321%***	[3.387]	0.199%***	[4.097]	0.122%	[0.880]
[0]	0.07%	[1.056]	0.141%***	[4.089]	-0.071%	[-0.740]

INTCOV	Distressed N = 2,062		Non-distressed N = 8,656		*Difference*	
t	CAAR	t stat	CAAR	t stat	CAAR	t-stat
[-2,+2]	1.065%***	[7.278]	1.008%***	[13.344]	0.057%	[0.239]
[-1,+1]	1.041%***	[9.181]	0.754%***	[12.883]	0.287%	[1.410]
[-1,0]	0.445%***	[4.808]	0.163%***	[3.411]	0.282%**	[2.147]
[0]	0.159%**	[2.428]	0.119%***	[3.529]	0.04%	[0.466]

NNI	Distressed N = 2,452		Non-distressed N = 8,266		*Difference*	
t	CAAR	t stat	CAAR	t stat	CAAR	t-stat
[-2,+2]	1.188%***	[8.442]	0.967%***	[12.862]	0.221%	[0.995]
[-1,+1]	1.051%***	[9.641]	0.738%***	[12.683]	0.313%*	[1.676]
[-1,0]	0.426%***	[4.788]	0.157%***	[3.300]	0.269%**	[2.338]
[0]	0.235%***	[3.726]	0.093%***	[2.782]	0.141%*	[1.924]

Table 5.04 – Event study returns and liquidity/leverage

The table below presents the abnormal returns surrounding the divestiture announcement for the full sample of 10,718 firms for the period 1988-2009 split into sub-samples of high/low liquidity and high/low leverage. The difference in abnormal returns between the two subsamples are reported, alongside the test statistic of the difference. Liquidity is measured as cash and short term equivalents to current liabilities. High liquidity is defined as those firms that have a level of liquidity higher than the median level of liquidity within the sample. Similarly, low liquidity is defined as firms that have a level of liquidity that is below the sample median. Leverage is measured as total debt to total assets. A firm is classified as having high leverage if the level of leverage is above the median leverage at the time of divestiture. Similarly, if the firm has a level of leverage that is below the median leverage, then they are classified as 'low leverage.' t-statistics in brackets: *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

Liquidity

	High liquidity N = 5,928		Low liquidity N = 4,790		*Difference*	
t	CAAR	t stat	CAAR	t stat	CAAR	t stat
[-2,+2]	1.183%***	[14.749]	0.831%***	[7.658]	0.352%**	[2.027]
[-1,+1]	0.989%***	[15.920]	0.658%***	[7.822]	0.331%**	[2.361]
[-1,0]	0.217%***	[4.281]	0.229%***	[3.335]	-0.012%	[-0.146]
[0]	0.111%***	[3.103]	0.147%***	[3.030]	-0.036%	[-0.640]

Leverage

	High leverage N = 5,919		Low leverage N = 4,799		*Difference*	
t	CAAR	t stat	CAAR	t stat	CAAR	t stat
[-2,+2]	1.017%***	[10.274]	1.097%***	[15.286]	-0.08%	[-0.464]
[-1,+1]	0.804%***	[10.484]	0.945%***	[16.993]	-0.141%	[-1.033]
[-1,0]	0.246%***	[3.934]	0.190%***	[4.191]	0.056%	[0.691]
[0]	0.117%***	[2.631]	0.135%***	[4.207]	-0.018%	[-0.331]

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Table 5.05 – Multivariate Event study

This table reports the multivariate regressions of the event study cumulative abnormal returns for firms undertaking divestiture activity in the sample. The core accounting variables and firm distress variables in this table are defined in table 5.01. The additional variables used in this table are defined as: The components of the Taffler ratio; taff_x1 is 12.18(profit before tax / current liabilities) - a measure of profitability; taff_x2 is 2.5(current assets / total liabilities) - a measure of working capital position; taff_x3 is -10.68(current liabilities / total assets) - a measure of financial risk; taff_x4 is (0.029*no credit interval) and is a measure of no credit interval. All variables are computed at t_0 which is defined as the financial year end prior to the announcement of divestiture activity t-statistics in brackets: *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
FSIZE	-0.00182***	-0.00275***	-0.00231***	-0.00232***	-0.00231***	-0.00218***	-0.00218***	-0.00248***	-0.00231***
	[-4.76]	[-8.11]	[-6.28]	[-6.29]	[-6.27]	[-5.78]	[-5.83]	[-6.64]	[-6.24]
CLUS	0.000905	0.00284*	0.00115	0.00114	0.00115	0.000704	0.00103	0.000121	0.000379
	[0.49]	[1.73]	[0.63]	[0.62]	[0.63]	[0.38]	[0.56]	[0.66]	[0.42]
GOPP	-0.00013	-0.000103	-0.000126	-0.000125	-0.000126	-0.000134	-0.000128	-0.000122	-0.000108
	[-1.32]	[-1.17]	[1.32]	[-1.32]	[-1.33]	[-1.41]	[-1.35]	[-1.29]	[-1.13]
REL	-0.000678	-0.000693	-0.00038	-0.000377	-0.000381	-0.00009	0.000078	-0.0000719	-0.000398
	[-0.41]	[0.47]	[-0.23]	[-0.23]	[-0.23]	[-0.05]	[0.05]	[-0.04]	[-0.24]
LIQ	0.00638***								
	[7.28]								
LEV		-0.00845**							
		[-1.97]							
INTCOV			0.000958*						
			[1.69]						
NNI				0.00162**					
				[2.13]					
TAFF					0.00266**				
					[2.13]				
taff_x1						-0.00117***			
						[-3.41]			
taff_x2							0.00118***		
							[2.85]		
taff_x3								-0.00542***	
								[-2.86]	
taff_x4									-8.8E-07
									[-0.94]
Intercept	0.0303***	0.0464***	0.0390***	0.0354***	0.0388***	0.0379***	0.0366***	0.0438***	0.0386***
	[6.07]	[10.44]	[8.23]	[6.62]	[8.18]	[7.85]	[7.52]	[8.79]	[9.03]
N	9499	9389	9719	9719	9719	9719	9719	9719	9719
R-sq	0.01	0.008	0.005	0.005	0.005	0.006	0.006	0.006	0.005
adj. R-sq	0.01	0.008	0.004	0.004	0.004	0.006	0.005	0.005	0.004
F	19.62***	15.38***	9.296***	9.394***	9.537***	11.75***	10.95***	10.97***	9.478***

Table 5.06 – Multivariate Event study: Regression of CARs against deal size & distress

This table reports the multivariate regressions of the event study cumulative abnormal returns for firms undertaking divestiture activity in the sample. The core accounting variables and firm distress variables in this table are defined in table 5.01. The additional variables used in this table are defined as: DSIZE; the price received for the divested asset divided by book value of total assets. *LIQ/LEV/INTCOV/NNI/TAFF*DSIZE* is the interaction between DSIZE and the respective variables. All variables are computed at t_0 which is defined as the financial year end prior to the announcement of divestiture activity t-statistics in brackets: *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

	(1)	(2)	(3)	(4)	(5)
FSIZE	-0.00192***	-0.0024***	-0.0024***	-0.0024***	-0.00209***
	[-3.93]	[-5.24]	[-4.98]	[-5.03]	[-3.90]
CLUS	0.00242	0.00488**	0.0028	0.00282	0.00178
	[1.11]	[2.38]	[1.30]	[1.32]	[0.74]
GOPP	-0.000229**	-0.00018	-0.00024**	-0.00025**	-0.00035***
	[-1.96]	[-1.61]	[-2.14]	[-2.19]	[-2.82]
REL	-0.000998	-0.00008	0.000364	0.00280	-0.00118
	[-0.50]	[-0.04]	[0.18]	[0.20]	[-0.53]
LIQ	0.00801***				
	[6.60]				
LEV		-0.00812			
		[-1.38]			
INTCOV			-0.00041		
			[-0.16]		
NNI				0.00171	
				[0.69]	
TAFF					-0.00143
					[-0.49]
DSIZE	0.0172***	0.0447***	0.0176***	0.0206***	0.0184***
	[3.51]	[7.66]	[3.89]	[4.57]	[3.45]
*LIQ*DSIZE*	-0.00420***				
	[-2.78]				
*LEV*DSIZE*		-0.0523***			
		[-3.56]			
*INTCOV*DSIZE*			-0.00898		
			[-1.04]		
*NNI*DSIZE*				-0.0215**	
				[-2.49]	
*TAFF*DSIZE*					0.0181*
					[1.68]
Intercept	0.0309***	0.0402***	0.0394***	0.0392***	0.0366***
	[4.85]	[6.69]	[6.44]	[6.42]	[5.32]
N	6101	6101	6101	6101	6101
R-sq	0.018	0.022	0.01	0.012	0.013
adj. R-sq	0.016	0.021	0.009	0.011	0.012
F	15.15***	18.61***	9.093***	9.79***	9.344***

Table 5.07 – Multivariate - Gross total, short- and long term debt to assets

This table reports the multivariate regressions of the event study cumulative abnormal returns for firms undertaking divestiture activity in the sample. The core accounting variables and firm distress variables in this table are defined in table 5.01. The additional variables used in this table are defined as; LEV is gross total debt to total assets; STD_A is gross short-term debt to total assets; LTD_A is gross long-term debt to total assets. LEV_MA is gross total debt to market assets; STD_MA is gross short-term debt to market assets; LTD_MA is gross long-term debt to market assets. The variable 'Market assets' is defined as the total assets + market value of equity – book value of equity. t-statistics in brackets: *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

	(1)	(2)	(3)	(4)	(5)	(6)
FSIZE	-0.00275***	-0.00219***	-0.00219***	-0.00238***	-0.00203***	-0.00201***
	[-8.11]	[-6.88]	[-6.90]	[-8.47]	[-6.50]	[-6.44]
CLUS	0.00284*	0.000601	0.000572	0.00164	-0.0000842	-0.0000238
	[1.73]	[0.33]	[0.32]	[1.05]	[-0.05]	[-0.01]
GOPP	-0.000103	-0.0000992	-0.0001	-0.000141	-0.000106	-0.000122
	[-1.17]	[-0.99]	[-1.00]	[-1.55]	[-1.08]	[-1.23]
REL	-0.000693	-0.000178	-0.000189	-0.000252	-0.000236	-0.00000762
	[0.47]	[-0.11]	[-0.11]	[-0.18]	[-0.15]	[-0.00]
LEV	-0.00845**					
	[-1.97]					
STD_A		-0.00168				
		[-0.68]				
LTD_A			-0.00103**			
			[-2.23]			
LEV_MA				-0.00964**		
				[-2.08]		
STD_MA					0.00533	
					[0.62]	
LTD_MA						-0.0120**
						[-1.98]
Intercept	0.0464***	0.0387***	0.0387***	0.0428***	0.0363***	0.0378***
	[10.44]	[9.04]	[9.11]	[10.92]	[8.57]	[8.94]
N	9389	9719	9719	9323	9635	9635
R-sq	0.008	0.006	0.006	0.009	0.005	0.006
adj. R-Sq	0.008	0.005	0.006	0.008	0.005	0.005
F	15.38***	9.456***	9.494***	15.79***	9.684***	9.842***

Table 5.08 – Multivariate - Financial distress and liquidity

This table reports the multivariate regressions of the event study cumulative abnormal returns for firms undertaking divestiture activity in the sample. The core accounting variables and firm distress variables in this table are defined in table 5.01. The additional variables used in this table are defined as. lowlev_highliq is a dummy variable that is equal to 1 if the firm is below the median level of leverage in the sample and the same firm is also above the median level of liquidity in the sample, otherwise 0. highlev_lowliq is a dummy variable that is equal to 1 if the firm is above the median level of leverage in the sample and the same firm is also below the median level of liquidity in the sample, otherwise 0. lowlev_lowliq is a dummy variable that is equal to 1 if the firm is below the median level of leverage in the sample and the same firm is alow below the median level of liquidity in the sample, otherwise 0. zdistress_highliq is a dummy variable that is equal to 1 if the firm has been classified as distressed using the Taffler z-score approach (z>0) and the firm has a level of liquidity that is above the median in the sample, otherwise coded as 0. zdistress_lowliq is a dummy variable that is equal to 1 if the firm has been classified as distressed using the Taffler z-score approach (z>0) and the firm has a level of liquidity that is below the median in the sample, otherwise coded as 0. znondistress_lowliq is a dummy variable that is equal to 1 if the firm has been classified as non-distressed using the Taffler z-score approach (z<0) and the firm has a level of liquidity that is below the median in the sample, otherwise coded as 0. icdistress_highliq is a dummy variable that is equal to 1 if the firm has been classified as distressed using the interest coverage approach (If the interest coverage ratio at the financial year end prior to the announcement of divestiture is either is < 0.8 or < 1 for two consecutive years prior to the announcement, then the firm is classified as distressed) and the firm has a level of liquidity that is above the median in the sample, otherwise coded as 0. icdistress_lowliq is a dummy variable that is equal to 1 if the firm has been classified as distressed using the interest coverage approach and the firm has a level of liquidity that is below the median in the sample, otherwise coded as 0. znondistress_lowliq is a dummy variable that is equal to 1 if the firm has been classified as non-distressed using the interest coverage approach and the firm has a level of liquidity that is below the median in the sample, otherwise coded as 0. nnidistress_highliq is a dummy variable that is equal to 1 if the firm has been classified as distressed using the net income approach to classifying financial distress (Firms are classified using this approach if the net income at the financial year end prior to the announcement is negative) and the firm has a level of liquidity that is above the median in the sample, otherwise coded as 0. nnidistress_lowliq is a dummy variable that is equal to 1 if the firm has been classified as distressed using the net income approach to classifying financial distress and the firm has a level of liquidity that is below the median in the sample, otherwise coded as 0. nninondistress_lowliq is a dummy variable that is equal to 1 if the firm has been classified as non-distressed using the net income approach to classifying financial distress and the firm has a level of liquidity that is below the median in the sample, otherwise coded as 0. t-statistics in brackets: *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

	(1)	(2)	(3)	(4)
FSIZE	-0.00228***	-0.00229***	-0.00229***	-0.00230***
	[-6.19]	[-7.17]	[-7.17]	[-7.19]
CLUS	0.00111	0.000689	0.000678	0.000623
	[0.61]	[0.38]	[0.38]	[0.35]
GOPP	-0.000132	-0.000107	-0.000109	-0.000105
	[-1.39]	[-1.07]	[-1.08]	[-1.05]
REL	0.000469	-0.000209	-0.000208	-0.000183
	[0.28]	[-0.13]	[-0.13]	[-0.11]
lowlev_highliq	0.00221			
	[0.98]			
highlev_lowliq	-0.00457***			
	[-2.41]			
lowlev_lowliq	-0.00152			
	[-0.65]			
zdistress_highliq		0.000462		
		[0.15]		
zdistress_lowliq		-0.0000318		
		[-0.01]		
znondistress_lowliq		-0.00501***		
		[-2.86]		
icdistress_highliq			-0.00172	
			[0.59]	
icdistress_lowliq			-0.0016	
			[0.56]	
icnondistress_lowliq			-0.00535***	
			[-2.98]	
nnidistress_highliq				-0.00181
				[0.66]
nnidistress_lowliq				-0.000728
				[0.27]
nninondistress_lowliq				-0.0059***
				[-3.21]
Intercept	0.0397***	0.0410***	0.0416***	0.0417***
	[8.01]	[8.54]	[8.62]	[8.65]
N	9719	9719	9719	9719
R-sq	0.006	0.006	0.006	0.006
adj. R-sq	0.005	0.005	0.005	0.006
F	8.005***	7.984***	7.911***	8.205***

Table 5.09 – Multivariate - Financial distress and leverage

This table reports the multivariate regressions of the event study cumulative abnormal returns for firms undertaking divestiture activity in the sample. The core accounting variables and firm distress variables in this table are defined in table 5.01. The additional variables used in this table are defined as: lowlev_highliq is a dummy variable that is equal to 1 if the firm is below the median level of leverage in the sample and the same firm is also above the median level of liquidity in the sample, otherwise 0. highlev_lowliq is a dummy variable that is equal to 1 if the firm is above the median level of leverage in the sample and the same firm is also below the median level of liquidity in the sample, otherwise 0. lowlev_lowliq is a dummy variable that is equal to 1 if the firm is below the median level of leverage in the sample and the same firm is alow below the median level of liquidity in the sample, otherwise 0; zdistress_lowlev is a dummy variable that is equal to 1 if the firm has been classified as distressed using the Taffler z-score approach (z>0) and the firm has a level of leverage that is below the median in the sample, otherwise coded as 0; znondistress_highlev is a dummy variable that is equal to 1 if the firm has been classified as non-distressed using the Taffler z-score approach (z<0) and the firm has a level of leverage that is above the median in the sample, otherwise coded as 0; icdistress_highlev is a dummy variable that is equal to 1 if the firm has been classified as distressed using the interest coverage approach (If the interest coverage ratio at the financial year end prior to the announcement of divestiture is either is < 0.8 or < 1 for two consecutive years prior to the announcement, then the firm is classified as distressed) and the firm has a level of leverage that is above the median in the sample, otherwise coded as 0. icdistress_lowlev is a dummy variable that is equal to 1 if the firm has been classified as distressed using the interest coverage approach and the firm has a level of leverage that is below the median in the sample, otherwise coded as 0. znondistress_highlev is a dummy variable that is equal to 1 if the firm has been classified as non-distressed using the interest coverage approach and the firm has a level of leverage that is above the median in the sample, otherwise coded as 0; nnidistress_highlev is a dummy variable that is equal to 1 if the firm has been classified as distressed using the net income approach to classifying financial distress (Firms are classified using this approach if the net income at the financial year end prior to the announcement is negative) and the firm has a level of leverage that is above the median in the sample, otherwise coded as 0. nnidistress_lowlev is a dummy variable that is equal to 1 if the firm has been classified as distressed using the net income approach to classifying financial distress and the firm has a level of leverage that is below the median in the sample, otherwise coded as 0. nninondistress_highlev is a dummy variable that is equal to 1 if the firm has been classified as non-distressed using the net income approach to classifying financial distress and the firm has a level of leverage that is below the median in the sample, otherwise coded as 0. t-statistics in brackets: *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

	(1)	(2)	(3)
FSIZE	-0.0023***	-0.0023***	-0.0023***
	[-6.24]	[-6.24]	[-6.24]
CLUS	0.00125	0.00126	0.00123
	[0.68]	[0.69]	[0.67]
GOPP	-0.000124	-0.000124	-0.000124
	[-1.30]	[-1.31]	[-1.31]
REL	0.000569	0.00056	0.000607
	[0.34]	[0.34]	[0.37]
zdistress_highlev	-0.00207		
	[-0.66]		
zdistress_lowlev	0.00564		
	[1.49]		
znondistress_highlev	-0.00196**		
	[-2.11]		
icdistress_highlev		-0.00234	
		[-0.81]	
icdistress_lowlev		0.00185	
		[0.63]	
icnondistress_highlev		-0.00252**	
		[-2.36]	
nnidistress_highlev			-0.00268
			[-0.99]
nnidistress_lowlev			0.00453*
			[1.83]
nninondistress_highlev			-0.00156
			[-1.85]
Intercept	0.0395***	0.0400***	0.0393***
	[8.23]	[8.33]	[8.18]
N	9719	9719	9719
R-sq	0.005	0.005	0.005
adj. R-sq	0.005	0.004	0.005
F	7.491***	7.103***	7.459***

Appendix 5.A: Main features of representative UK failure prediction studies

Researcher(s) and Year of publication	Techniques used	Period studied	Matching by	YPTF	Estimation Sample (F/NF)
Lis (1972, cited in Taffler, 1982)	MDA	1964-1972	Year, Industry, Asset size	1	30/30
Taffler (1974, cited in Taffler, 1982)	MDA	1968-1973	No	4	23/61
Taffler (1977, cited in Taffler, 1983)	MDA	1969-1976	Industry, Asset size	1	46/46
Taffler (1984)	MDA	1978-1981	No	1	39/56
El Hennawy and Morris (1983)	MDA	1960-1968 / 1969-1971	No	5	22/22
Keasey and Watson (1987)	MDA	1974-1980	Year, Industry	3	25/30
Peel et al. (1986)	Logit	1971-1984	No	1	34/44
Keasey and Watson (1987)	Logit	1970-1983	Year	3	73/73
Peel and Peel (1988)	Logit, Multilogit	1978-1982	No	3	35/44
Keasey et al. (1990)	Logit, Multilogit	1976-1984	Year, Industry, Net assets	5	40/40
Keasey and McGuinness (1990)	Logit	1976-1984	Year, Industry, Net assets	5	43/43
Piesse and Wood (1992)	MDA	1973-1986	Year, Industry (motor components)	5	No model development
Morris (1997)	Univariate, Logit, NNs	1973-1983	Year, Industry	5,10,5	111/111, 75/75, 61/61
Wilson et al. (1995)	NNs, Logit	1972-1979	Year	1	40/32* /40
Lennox (1999)	MDA, Probit, Logit	1987-1994	No	4	Varies w. fiscal year

Key

* Distressed acquired firms

MDA = Multiple Discriminant analysis; NNs = Neural networks; F = Failed; NF = Non-failed; YPTF = Years examined prior to failure

Chapter 6: Divestitures and Economic-, Industry- and Firm-Distress

6.1. Introduction and motivations for research

So far, the empirical research on divestitures finds, on average, that asset sales are associated with significantly positive increases in shareholder wealth. The majority of these gains are attributable to an improved focus on the core business activities of the remaining assets (John and Ofek, 1995), debt reduction (Lang et al., 1995; Bates, 2005) and a reduction in the cost of financial distress (Lasfer et al., 1996). This chapter will examine two contrasting theories to evaluate how the stock market responds to divestiture activity during periods of economic-, industry- and firm-distress.

The first of those theories focuses on firm financing, that is, the financial distress resolution hypothesis. Existing research shows that a positive stock market response to divestiture announcements that reduce the expected costs of financial distress (Asquith et al., 1994; Lang et al. 1995). The reduction in the cost of financial distress is derived from asset sales representing a lower cost source of available finance than alternative methods of financing and the act of divesting assets represents a greater net present value to the business than retaining them.

The second competing theory is based around the work of Shleifer and Vishny (1992), who put forward the view that during periods of financial distress assets are likely to be sold off at below their full economic value. Given distress conditions, industry bidders for the assets are less likely to be in a position in order to pay the full economic worth of the assets, therefore the scope for them being acquired by non-industry users at a lower value is high. These non-industry bidders are unlikely to pay the full economic value of the asset. This fire sale hypothesis suggests firms suffering from

distress are forced to sell assets at below their full economic worth in order to ensure a successful sale (Shleifer and Vishny, 1992; Diamond and Rajan, 2011).

The previous chapter in this thesis examined the topic of divestitures and firm financial distress and one of the observations from the research highlighted that the number of divestitures taking place over the period from 1988 to 2009 fluctuated. It was observed that there had been a steady increase in the number of divestitures leading up to the period of 2000 and subsequently a decline in the number of divestitures taking place from the same date.

The external business environment is one which can have an influence on the amount of corporate financing activity that a firm undertakes. In the M&A literature, it is well known that merger and acquisition activity falls and rises with economic cycles (Andrade et al. 2001; Martynova and Renneboog, 2008) and divestiture activity is similarly influenced by macroeconomic factors. Research on economic distress is very much underdeveloped in the divestiture literature and it was suggested by Kahl (2002) that future research would benefit from investigating the extent that firm restructuring and economic distress are linked.

Therefore this chapter of the thesis beings together the themes of external market conditions, availability of buyers and the financial condition of the divesting firm to assess these factors via stock market returns to the announcement of divestiture activity. The key issues that are to be examined in this chapter are; *(i)* how do poor macroeconomic conditions influence the observed stock price response to divestiture announcements, *(ii)* how does financial distress for firms influence the observed announcement returns to the divestiture news, *(iii)* how do industry distress periods

and potential fire sale discount conditions affect the observed returns, and *(iv)* how does the interaction between all of these financial distress conditions (economic-, industry- and firm-distress) affect the observed stock market response to the announcements?

This chapter examines these issues via an event study analysis of the stock market price reaction to asset divestiture announcement of 10,718 sales by non-financial UK firms from 1988-2009. As previous highlighted the period covers two recessions, a stock market crash by technology companies around 2000/2001 and a global financial crisis in 2008, and a significant level of variation in firm and industry distress levels. Such a large sample will allow the impact of specific distress conditions to be isolated and measured via the stock price response to the divestiture announcement.

The results show that during periods of industry distress, divesting firms experience a significantly negative stock price response on the announcement of an asset sale. These findings support that of Shleifer and Vishny (1992) who put forward the argument that under industry distress conditions, assets are likely to be sold at fire sale prices in order to encourage distressed industry buyers to bid for the assets or to encourage non-industry buyers to bid for them. There is some evidence found in support of the financial distress resolution theory, especially for those firms divesting during periods of economic and firm distress. However, industry distress conditions dominate in the results when examining the interaction between all three forms of distress and the stock market response. In isolation and with economic distress, industry distress is found to produce a negative stock price reaction. Firm distress is observed to mitigate the negative stock market response for industry distressed sellers, however this leads to abnormal returns that are insignificantly different from zero.

Overall, the results show that fire sale conditions prevail during periods of industry distress, but the financing benefits at the firm level can offset the fire sale discount.

The remainder of the chapter is structured as follows. 6.2. provides an overview of the literature on economic-, industry- and firm-distress and chapter hypothesis development. Section 6.3. outlines the sample construction, variable definition and research method. Section 6.4. presents the results and 6.5. concludes.

6.2. Literature Review and hypothesis development

6.2.1. Economic Distress

Neoclassical economics defines that economic cycles are driven by changes in the level of business conditions. These conditions are reliant on changes to GDP, levels of unemployment, profitability of firms, the number of bankruptcies, and the general price level of goods and services. Additional factors such as the amount of government spending, level of money supply and the direct impact of political decision making can influence the state of the economy.

During good periods, the economy grows, unemployment is low, firms are profitable and there generally is an increase in levels of GDP. However, fluctuations in the performance of the economy mean that there can be changes in the macroeconomic environment that can lead to decreases in the level of GDP. When this decline occurs, then the economy in the country is at risk of entering a recession. A recession is a period of economic distress, which refers to a general contraction in the total amount of economic activity taking place within an economy. The exact definition of a recession varies from country to country with most definitions centring on a contraction in GDP. For example, in the United Kingdom, the Office for National Statistics (O.N.S.) define a recession to be two successive quarters where negative economic growth. A similar definition is adopted by all member states of the European Union. In the United States, the National Bureau of Economic Research (N.B.E.R.) does not use the same definition adopted by EU member states, but defines a recession as a significant decline in economic activity that is spread across the economy. In their definition, they require that a recession lasts for more than a few months, that there is

an impact on the real GDP, real income, unemployment, levels of industrial production and wholesale firm retail sales.

In the United Kingdom, as previously highlighted, the preferred definition of a recession is "two or more consecutive quarters of contraction in national GDP." For the purposes of this study covering the periods of 1988-2009; there are two periods which impact the data, the 1990 recession lasting five quarters and the 2008 recession lasting six quarters.

The majority of the existing studies in the divestiture research fail to integrate economic distress into their analysis. However, as previously highlighted macroeconomic conditions have been observed to impact the levels of corporate financing activity taking place (Alexandrou and Sudarsanam, 2001).

In periods of economic growth, the level of optimism increases as investors have at their disposal a greater number of investment opportunities and the growth prospects for those and existing investments are favourable. Therefore if any divestiture activity takes place during this period, then the parent firms who are divesting assets will not have any shortage of investment opportunities from the proceeds of the sale. This contrasts sharply with times of economic decline, there is a reduction in investment opportunities, growth prospects and confidence.

John et al. (1992) highlight that the most common reason given by firms for a performance decline within a company is due to poor economic conditions, such as a recession. Similarly, Kruse (2002) finds that external causes such as recessions and periods of economic decline were cited by firms for the reductions in firm financial performance. Fitzpatrick and Ogden (2011) find in their study investigating the

impact of economic distress on firm failure, that the impact of the macroeconomic conditions are fairly small on their full sample, however they document a significant effect of economic distress conditions on those firms that exhibit high levels of leverage. Fitzpatrick and Ogden (2011) adopt the NBER definition of a recession in their study.

In the merger literature, Becketti (1986) examine the relationship between the volume of merger activity and aggregate changes in business cycle, it is observed that about one third of M&A activity can be attributed to changes in the macroeconomic environment[64]. Bouwman et al. (2009) examine the market conditions in merger quality, and classify periods as high-, neutral- or low-valuation markets and where they lie consistent with its long-term trend. The measure based on a de-trended monthly price-to-earnings ratio of the S&P 500 in the United States, classifies each month as above or below the detrended monthly P/E five year average, the top half of those above the trendline are classified as high-valuation periods and the bottom half of those firms below the trendline are classified as low-valuation periods. The remaining periods (which amounts to half of the dataset) are classified as neutral-valuation periods.

Bouwman et al. observe that in the short run, the announcement of high-valuation acquisitions results in a CAR of -0.04% and low-valuation acquisitions a CAR of -1.31%. In the short-run, the market appears to treat high-valuation deals more favourably in periods of optimism than those mergers announced in low-valuation

[64] Within the third of the merger activity that Becketti (1986) attributes to changes in the macroeconomic environment, the study observes that changes in the real rate of interest significantly affects M&A activity and highlights a dependence on acquirers using debt finance these deals.

periods. These results back those of Rosen (2006) who observe higher short-run returns to acquirers during periods of over-optimism by investors. However, over the long-term Bouwman et al. (2009) observe (using two year BHAR) high-valuation acquisitions experience returns of -11.32% versus -3.28 from acquisitions in low-valuation periods[65]. The study suggests that for low-valuation acquisitions, those during recessionary periods are fundamentally different in nature from high-valuation acquisitions.

During recessionary periods, firm failure and recovery rates are sensitive to wider macroeconomic conditions (Altman et al., 2001). Singhal and Zhu (2011) find the distribution of firm bankruptcy peaks around recessionary periods and Franks and Sussman (2005) observe recovery rates by financially distressed firms in the UK are sensitive to GDP growth.

In the divestiture literature Campello et al. (2010) point out that during periods of economic distress, such as the financial crisis in 2008, divestiture activity by constrained firms is used to maintain operations and meet the liquidity needs of firms. Alexandrou and Sudarsanam (2001) show that during periods of economic distress[66] firms that divest assets experience significantly higher abnormal returns than they would do so in times of economic growth. Interestingly, Alexandrou and Sudarsanam (2001) also observed that the number of divestitures taking place increases during a recession and falls when the economy is performing well. This suggests twofold that firms engage in divestiture activity in order to either i) remove the threat of financial

[65] Bouwman et al. (2009) show that the high market acquirers underperform relative to low market acquirers in the long run is attributable to managerial hubris and herding. Those firms that move later during merger waves perform more poorly than those at earlier stages.
[66] Alexandrou and Sudarsanam (2001) define recessionary periods as from the second quarter of 1990 to the second quarter of 1992.

distress or ii) to maximize the return on the asset(s) being divested by divesting during recessions due to the higher abnormal returns experienced during that period. These results suggest that divestiture activity predominantly occurs around periods of economic distress, rather than during boom periods in the economy.

In the merger literature by Jovanovic and Rousseau (2004), Rhodes-Kropf and Viswanathan (2004), and Goel and Thakor (2005), who find that on average, the best deal for acquiring firms are around recessionary periods when the market is depressed, during this period firms are likely to be divesting assets when alternative sources of financing is too costly (Lang et al., 1995). Bouwman et al. (2009) and Ang and Mauck (2011) suggest that the conditions of depressed markets are better for managers who undertake merger activity as managers are likely to be motivated by profitable synergies from careful and cautious analysis, rather than driven by managerial hubris and overvaluation that may prevail in times of high economic growth.

Back in the divestiture literature, Alexandrou and Sudarsanam (2001) observe CARs of 0.61% for firms divesting assets during a recession versus CARs of 0.2% outside of the recessionary period. The difference is found to be significant. In their study, they attribute the gains to a positive response from investors for tackling the issues related to having assets that contribute to negative synergies within the firm. They argue that the poor performance of these assets may be masked in boom periods, but in recessionary periods firms cannot afford to do so in a recession. Therefore, Alexandrou and Sudarsanam (2001) highlight that divesting assets during a recessionary period may evoke a much greater response from firm shareholders due to the pressures firms face by poor economic conditions.

Additionally, Alexandrou and Sudarsanam (2001) also observe that financially stronger sellers[67] experience larger gains than those firms that are distressed. They conclude that the gains attributable to divestiture activity depend twofold on the financial condition of the firm divesting and the economic position of the external macroeconomic environment. Borisova et al. (2013) in their US study of cross-border divestiture activity use the NBER definition of a recession, however they do not find any significant differences between divesting in recessionary periods and non-recessionary periods for their sample of cross-border divestitures.

It is important to examine the impact of the macroeconomic environment on divestiture activity, to date, few studies, beyond Alexandrou and Sudarsanam (2001) and Borisova et al. (2013) have investigated the impact of a poor economy on the divestiture activity. Their findings were mixed, therefore this study will aim to bring clarity and build on the earlier work in the area.

It is expected that in periods of economic distress, firms divest assets in order to starve off the threat of financial distress. Ang and Mauck (2011) find higher premiums in merger transactions in times of distress and Bouwman et al. (2009) observe higher abnormal returns are experienced by firms undertaking M&A activity in low-valuation periods in the economy. However Fitzpatrick and Ogden (2011) observe that the economic environment has little influence on firm distress. Therefore, the first hypothesis to be investigated is:

[67] Measured using Tobin's Q, where q values greater than one indicate a financially strong seller; conversely, a q value less than one indicates a financially weak seller.

$H_{0\text{-}1}$: There are insignificant abnormal returns to those firms announcing divestiture activity in a period of economic distress.

$H_{1\text{-}1}$: There are significant abnormal returns to those firms announcing divestiture activity in a period of economic distress.

It is expected that a positive stock price response would prevail during periods of economic distress, as in Alexandrou and Sudarsanam (2001), suggesting a positive stockholder reaction to the resolution of financial distress. A negative price response would suggest a poor macroeconomic environment would lead to suggest that conditions of economic distress would result in assets selling for less than their economic worth.

6.2.2. Industry Distress

So far, the external factors affecting firms that divest assets has focused on a macroeconomic view that overall economy-wide distress is likely to impact the performance observed from selling assets. The performance of the overall economy has been shown to impact the volume of divestiture activity taking place in each year and the price paid for the assets in those periods.

Maksimovic and Phillips (1998) and Ilmakunnas and Topi (1999) show that the conditions in an industry are important in explaining conditions such as asset reallocation or reorganization. The industry conditions are observed by them to be more important in explaining asset sale decisions than bankruptcy for firms in Chapter 11 in the United States. Kruse (2002) examined the reasons given by firms for poor performance and it was observed that 98% of firms stated in the financial press that external factors were instrumental in explaining the performance decline of firms. A

number of studies have examined an external factor that is more closely aligned with the firm – the firm's industry. The impact in the fortunes of an industry can have wide ranging implications on the operations of the firms that belong to a particular industry. For example, in times of intense competition within a particular industry, prices may be reduced and margins tight in order to compete effectively for customers. In times where there are few players in an industry, it may offer the incumbent firms to engaging in monopolistic pricing.

The seminal piece of research in examining industry distress was undertaken by Shleifer and Vishny (1992). Distress refers to the fact that the economic assets of the industry are worth less than when an industry is not distressed. Shleifer and Vishny (1992) argue that firms that are distressed are likely to be selling assets at a time when those firms that could be potential acquirers of the sale of assets are likely to be distressed as well. Therefore the first argument that they put forward is that firms that reside in the same industry do not have the economic power to purchase the assets of the distressed firms, resulting in depressed prices being offered for the assets being divested. In addition to this idea, they argue that the depressed prices of the assets for sale in the industry can be explained using the industry-equilibrium notion, or the more commonly known notion of a 'fire sale.'

A fire sale refers to the notion that firms sell off or divest assets at values lower than their economic worth. During periods of industry distress, the sale of an asset is conducted at a discounted price. The price is discounted as similar firms in the industry are also distressed and the divestment is forced as firms are required to sell assets to meet any liabilities that fall due (Shleifer and Vishny, 2011).

Shleifer and Vishny (1992) argue that during times of industry distress, the value and economic worth of assets fall. Lang and Stulz (1992) find that firms in bankruptcy may convey negative information about the conditions of the industry which they find themselves in. Acharya et al. (2007) argue that this fall in the economic worth could have been a determinant in firm distress occurring for a firm. However, the key point that Shleifer and Vishny (1992) argue is that the liquidation values of the available assets can fall below their economic worth in times of industry distress. This discount is attributable to distressed firms in the industry being unable to offer full economic value of the divested assets' worth, as they are not in an economic position to do so.

Shleifer and Vishny (1992) highlight that firms with more specialized and specific assets to one particular industry are more likely to be impacted by the fire sales than those that have more generic assets. Ramey and Shapiro (2001) look at the aerospace industry in the U.S. They observe that firms that have more specialized equipment receive a lower value for the sales of the assets versus the estimated economic worth. Additionally, the indirect costs of bankruptcy lead to a higher discount for those firms from outside the industry that acquire assets, versus when there is an internal buyer.

Acharya et al. (2007) find that for firms divesting assets due to distress, the valuation of the assets will vary depending on the financial position and the buyer of the assets. They highlight that if the assets are generic, the value that buyers place on the asset are likely to be the same. However, if the assets are specific to a particular industry, then buyers from the same industry are more likely to place a higher value on the assets than those outside. When the industry is distressed, internal industry firms are unlikely to be able to offer the best value for the assets, therefore a lower price has to be accepted. In their study on creditor defaults and their recoveries, they observe that

industry conditions at the time of default are economically important determinants of creditor recoveries. During periods of industry distress, there is an observed fall in the level of recoveries due to the financial constraints of the firms in the industry.

Investigating divestitures by firms in the U.S., Schlingemann et al. (2002) observe that firms are more likely to divest assets in industries that have a more liquid market for corporate assets – i.e. markets that are not suffering from industry distress. Asquith et al. (1994) find that divestments are important mechanisms to avoid the threat of bankruptcy and as such finds that the industry conditions which firms find themselves in, impact the level of divestments taking place.

A number of studies have investigated the notion of a fire sale and its prevalence in the area of real and financial assets. One of the earliest pieces of research was conducted by Pulvino (1998), who examines whether fire sales occur in his examination of the airline industry. It was shown that firms that are financially constrained experienced lower prices for aircraft versus those rivals that are not constrained. Additionally, it was found that bankrupt airlines received lower prices for their aircraft versus non-bankrupt firms. Pulvino (1998) observed, similarly to Shleifer and Vishny (1992) and Acharya et al. (2007), that financially distressed firms are more likely to divest assets to better financed external firms but as such, suffer from fire sale discounts when doing so of around 10-20%. Significantly, he finds that the results are stronger when the overall airline industry was distressed. Outside of the airline industry, Campbell et al. (2011) examined real estate sales in the United States. They found that in situations where homes were sold under foreclosure, they sold at lower prices than other homes that were not foreclosed by a magnitude of 28%

Benmelech and Bergman (2008, 2009, 2011) examine the airline industry in the United States and the implication of contractual obligations and fire sales. In Benmelech and Bergman (2008) they highlight that aircraft are often leased from financial institutions and as such, the aircraft industry is a good environment to analyse the impact of financial distress. Under U.S. bankruptcy codes, debtors are usually protected from repossessions and liquidations under automatic stay provisions, however during bankruptcy lessors do not have the same level of protection, therefore should firms default on their payments, then the lessee will likely repossess the asset. They find that when airlines are suffering from financial distress, they try and successfully manage to renegotiate existing financial contractual obligations downward. The renegotiation only occurs when firms are financially distressed and liquidity value of the assets is poor. This poor liquidity occurs when firms in the industry are suffering from financial distress and as such, the lessee is unable to lease the planes to competitors due to the strong creditability of the threats of failure made by the firms suffering from financial distress. These results highlight that the lessee is aware of the financial burden of fire sales and as such, will restructure existing contracts to avoid them.

Interestingly Benmelech and Bergman (2011) show that in the airline industry there is a contagion effect, where bankrupt firms impose negative externalities on those non-distressed firms in the same industry raising the cost of capital to those firms that have similar aircraft. This pushes up the cost of debt finance throughout the industry. They observe that in times of industry distress, the impact is further magnified, as when the industry is distressed, there are further increases in cost of capital due to the lack of liquidity from other firms in the industry to buy the assets.

Kim (1998) looks at the drilling industry in the U.S. and specifically examines the asset liquidity. Using a measure of asset liquidity measured by trading volume and the depth of the buyers' market, she finds that during periods of industry distress, the level of activity of asset sales drops compared with periods where the industry is not distressed. Managers opt to form a 'pecking order' of asset sales, preferring to sell liquid assets before illiquid assets. Kim (1998) observes that managers limit themselves to selling illiquid assets especially during periods of industry distress, as it conveys negative information to investors about the prospects of the firm.

Coval and Stafford (2007) study fire sale discounts caused by capital withdrawals in the mutual fund industry. They observe that funds that are distressed are forced to sell at prices below their fundamental values. This forced trading is found to be costly for the selling fund. Distressed funds create opportunities for outsiders that are not liquidity constrained and as such are observed to buy the funds at prices below their fundamental value leading to significant positive abnormal returns of over 10% on the transaction.

Acharya et al. (2007) examine the impact of industry distress on creditor recoveries. The main focus of the study is to examine whether the economic condition of the industry that firms belong to impacts on the ability of creditors to recover during periods of downturns. In their study using defaulted securities from 1982-1999, they observe that industry conditions contribute in determining the rate of recovery. They observe that during periods of industry distress, firms suffer from two perspectives, they suffer from the decline in the economic value of the existing assets and secondly, from the impact of lower levels of industry liquidity which is imposed by the financial constraints that the peer firms in the industry face.

Kruse (2002) finds that firms are more likely to undertake divestiture activity if the industry's growth rate is higher. This buyer's market improves the probability of a transaction taking place for firms that are not financially distressed. Kruse finds that when firms are not distressed, the divesting parent company receives full value for those assets sold. However, when firms are suffering from financial distress, they are significantly less likely to undertake divestiture activity unless the industry itself is found to be healthy.

However, in the context of M&A transactions, Ang and Mauck (2011) find that there are no fire sale bargains. They attribute their findings to a behavioural issue rather than one that is observable via changes in the examining stock return data. Ang and Mauck highlight that the evidence of any gains can only be attributable to the perceived gain which firms might receive should they use 52 week high for a stock as a mechanism to measure the relative return of the asset. They argue that the fire sale discount is in the mind of acquirers of assets, as no evidence is found in the abnormal returns that are examined in the study.

Eckbo and Thorburn (2008) find mixed evidence in their research on the automatic bankruptcy auctions that take place in Sweden. They observe that fire sale discounts do exist when the industry is distressed and a bankruptcy auction results in a piecemeal auction of assets. However for firms that are still trading as a going-concern, the auction of such assets are not impacted by industry conditions that lack liquidity. Eckbo and Thorburn attribute the lack of fire sale discounts in going concern sales due to the liquid market for assets of such businesses, they find multiple buyers help push the value of the assets up to the full economic value of the asset. The lack of liquidity

experienced during piecemeal auctions are found to lower prices and the debt recovery rates, this yields a situation where fire sale prices prevail.

Borisova et al. (2013)[68] highlight that industry wide distress would deplete the number of potential buyers that would be willing to purchase the asset(s) being divested and as such an examination of event study returns of a large heterogeneous sample on the divestiture announcement serves as a good indicator of the value received from the transaction. Such analysis avoids the difficulties in estimating the intrinsic value of the divested assets across a large sample of announcements where the value of the asset is not always reported. In their study of divestiture activity, they observe higher announcement returns to firms divesting assets into non-distressed foreign industries versus divesting assets to their own market. Constrained firms divesting to US market experience CARs of 1.46% over a three day event window, compared to non-constrained cross-border transactions that experience CARs of 6.77% over the same period. Borisova et al. propose that overseas buyers that are not constrained allow the divestor to avoid selling the assets at discounted fire-sale prices when the domestic industry is distressed.

Shleifer and Vishny (1992) argued that firms that are in an industry that is distressed face two major issues, firstly lack of purchasing power by similar firms in the industry and secondly, the lack of bargaining power by the seller of the asset are likely to lower

[68] Borisova et al. (2013) examine cross-border divestiture activity, therefore their measure of the performance of an industry is firstly measured at the national level by measuring the median return on assets for each two-digit SIC industry per country in the financial year before the divestiture announcement. They use a binary = 1 if the acquiring industry performance is greater than the target industry performance for each divestiture transaction, otherwise 0. Additionally, Borisova et al. use industry level return data, AAA US corporate bonds and University of Michigan Index of Consumer Sentiment in their measure of industry performance.

the price that the asset is sold for. Therefore the hypothesis that will be investigated is:

$H_{0\text{-}2}$: There are insignificant abnormal returns to those firms announcing divestiture activity during periods of industry distress.

$H_{1\text{-}2}$: There are significant negative abnormal returns to those firms announcing divestiture activity during periods of industry distress.

The hypothesis H_1 appears to be the reverse of H_2. This is due to two main reasons. Firms are more likely to buy and sell assets that are specific to their industry and therefore the impact of economic distress is likely to be less than that of industry distress. Secondly, the results of Alexandrou and Sudarsanam (2001) observed higher announcement returns for those firms undertaking asset sales in periods of economic distress. It would be expected that a negative stock price response is experienced when divestiture activity is announced. The negative response would suggest that the assets are being sold at a fire-sale price (that is, less than their full economic worth) when the industry a firm is operating in is suffering from distress. Any positive stock price response would suggest that the firm has a strong bargaining position or is divesting generic (or non-specific) assets, and as such is not subject to the influence of poor industry conditions.

6.2.3. Firm Distress

This section builds on the earlier development of the literature on economic and industry distress, examining the impact of a form of distress that is specific to an individual firm. The concept of firm financial distress has a number of definitions that are used in the literature, Wruck (1990) defines firm financial distress as a situation where cashflow is insufficient to cover current obligations, Pastena and Ruland (1986) declares that the concept can be defined in a multitude of ways; *(i)* the firm is unable to pay debts when they come due, *(ii)* the market value of assets is less than the firm's total liabilities, and *(iii)*, the firm continues to trade under court protection. Ross et al. (2006) limits the definition to those firms that have declared bankruptcy.

As highlighted, there is a wide scope in the interpretation of firm financial distress, however Campbell et al. (2008) summarises the varying definitions used in the literature to classify firms suffering from financial distress, as firms that fail or are nearly failing to meet their financial obligations.

There are a number of approaches that have been used in the prediction/measurement of firm financial distress, Altman and Hotchkiss (2006) summarise the existing approaches taken as consisting of qualitative analysis, univariate modelling, multivariate modelling, conditional probability analysis, risk index models, time series analysis and dynamic models, amongst others. These approaches to financial distress measurement/prediction have been used across a wide array of studies, including: changes in market sale (Opler and Titman, 1994), asset sales (Shleifer and Vishny, 1992; Sudarsanam and Lai, 2001), fire sales (Eckbo and Thorburn, 2008), work effort

of directors (Chou and Yin, 2010) and capital structure (Wald, 1990; Graham, 2000; Molina, 2005).

The pioneering research in the financial literature was developed by Beaver (1966, 1968) who applied statistical testing in order to test the overall importance of individual accounting variables and, who developed a predictor of firm failure by finding an optimal cut-off point for each measure in order to classify whether firms were likely to fail. Beaver observed that distressed firms consistently have poorer financial ratios[69] than non-distressed firms, and the ratios worsen as the risk of firm distress/default increases.

The early studies in this area then led to the development of a multitude of research where ratio analysis formed the basis of the identification and prediction measures of financial distress. An overview of these are available in section 5.2.2. of this thesis.

Whilst a large volume of research has addressed the differing approaches to measuring firm financial distress, accounting based measures of financial distress have been, and still remain popular in the finance literature (Acharya et al., 2007; Bhagat et al., 2005; Ang and Mauck, 2011).

Some of the more recent studies in financial distress have focused on three key accounting measures of financial distress. These include *(i)* multiple discriminant analysis (MDA), *(ii)* interest coverage ratios, and *(iii)*, net income measures.

[69] Beaver (1968) used non-liquid asset and liquid asset ratios in the study and observed that non-liquid asset measures are a better predictor of firm failure than liquid asset measures.

These measures are developed in depth in the previous chapter[70], however a summary of them appears below.

The first multivariate analysis of financial distress prediction was undertaken and developed by Altman (1968) using linear multiple discriminant analysis (MDA) to identify the likelihood of a firm becoming distressed. In this type of analysis, the MDA constructs a boundary line between the accounting variables that are examined and firms are classified as failing, non-failing or in a grey zone as measured by a 'z-score'. Using a model made up of accounting measures of liquidity, profitability, operating efficiency, leverage and asset turnover[71], the model classifies firms as failing, which meant that they had similar characteristics to those firms that had failed in Altman's sample of 33 bankrupt and 33 non-bankrupt firms, or, as non-failing. If the z-score lay in the grey area, then it was uncertain whether the firm in question would be clarified as failing or non-failing. Altman (2000) observed that his model resulted in an accuracy of between 82-94% in accurately predicting distressed firms.

In the United Kingdom there were a number of MDA based measures of financial distress, the most prominent being that of Taffler (1983, 1984) who developed a z-score model for UK based firms. The components of the Taffler MDA model differ from that of Altman, incorporating measures of profitability, working capital position, financial risk and liquidity[72]. Similarly, Taffler's MDA model includes a failing and

[70] See section 5.2.3.1. to 5.2.7.

[71] $Z = 0.012\left(\frac{current\ assets - current\ liabilities}{total\ assets}\right) + 0.014\left(\frac{retained\ earnings}{total\ assets}\right) + 0.033\left(\frac{EBIT}{total\ assets}\right) + 0.006\left(\frac{market\ value\ of\ equity}{book\ value\ of\ liabilities}\right) + 0.999\left(\frac{sales}{total\ assets}\right)$ [Equ. 5.03]

[72] See section 5.2.6. in the previous chapter.

non-failing classification for firms (but not a grey area). The cut-off point in Taffler's z-score is zero, therefore firms with a z-score that is positive are above the solvency threshold and are unlikely to fail within the next year, firms with a negative z-score are more likely to fail in the next year. The greater the z-score, the higher likelihood of failure/non-failure. Agarwal and Taffler (2007) show that the Taffler z-score model continues to have the ability to predict firm distress risk for UK based firms. The Taffler z-score approach remains popular and is still used in UK academic research (Afshar et al., 1992; Lasfer et al., 1996; Alexandrou and Sudarsanam, 2001; Lee and Lin, 2008).

Another standard measure of firm distress is via a firm's interest coverage ratio. Interest coverage measures the interest chargeable on firm debt as a measure of firm financial distress. It measures whether a firm is able to service debt interest payments by the income that is received in the same financial period. Studies by Hoshi et al. (1991), Ahn, et al. (1996), Acharya et al. (2007), Ahn and Choi (2009) and Borisova et al. (2013) use the interest coverage ratio to define financial distress. Andrade and Kaplan (1998) define firm financial distress occurring if operating income (EBITDA) to interest expense is less than 1. Alternatively, Asquith et al. (1994) and, Hovakimian and Titman (2006) define firm financial distress if the interest coverage ratio is less than 80% of the interest expense in one year, or less than 1 over two consecutive years.

Thirdly, the net income measure remains a prominent accounting based measure of firm financial distress. If a firm exhibits negative net income, it is unable to meet expenditure from current income and is therefore considered to be financially distressed. A number of studies utilise the net income measure of firm financial distress with varying periods used throughout the research from one year of negative

net income (John et al., 1992; Bhagat et al., 2005; Ang and Mauck, 2011), two years of negative net income (Bhagat et al., 2005; Ang and Mauck, 2005; Borisova et al., 2013); and three years of negative net income (De Angelo and De Angelo, 1990). Studies by Bhagat et al. (2005) and Ang and Mauck (2011) examine the competing windows of negative net income measurement and observe similar result across various periods, therefore suggest that using a single period of negative net income measurement to highlight firm financial distress is the least costly in terms of observations lost due to missing or unavailable data.

Beyond the measurement choice of firm financial distress, the relationship between firm distress and the resulting actions by firms is of interest to researchers. Particularly where firm financial distress is likely to lead to restructuring activity in order for firms address potential costs of financial distress. By divesting assets, firms seek to transform their financial position by alleviating debt constraints, providing liquidity or promoting efficiency by allocating resources to where it is needed most (Hite et al., 1987). Asset sales can help the firm obtain the required resources as they may fail to obtain excess to external financing when the firm is suffering from financial problems (Lang et al., 1995). Ofek (1993) highlights that the process of divesting assets can help reduce both the direct and indirect cost of bankruptcy if the proceeds from the sale are used to mitigate from financial distress.

If the proceeds from the divestiture activity are used to pay down debt and alleviate the costs of financial distress, then it would generally be expected that the existing firm shareholders are likely to positively respond to such activity. However, the empirical evidence is mixed. Afshar et al. (1992) and Lasfer et al. (1996) observe higher abnormal returns to those firms divesting assets when financially distressed. Similarly,

Bates (2005) observes higher abnormal returns by divesting firms that are divesting in order to mitigate or reduce the costs of financial distress. Lee and Lin (2008) document a positive impact to shareholder returns when firms suffering from financial distress divest assets, versus those firms that do not restructure in order to survive. Clayton and Reisel (2013) demonstrate divesting to use the proceeds to retire debt in highly leveraged firms supports a financial distress resolution view of asset sales. Conversely, Brown et al. (1994) find lower abnormal returns to those financially distressed firms that use their proceeds to retire debt. Alexandrou and Sudarsanam (2001) find lower abnormal returns to distressed firms divesting assets, they attribute this to healthy, non-distressed firms having a stronger bargaining power when divesting assets and are therefore in a stronger position to negotiate full price for the assets. Borisova et al. (2013) highlight that it is important to examine the seller's financial state, as they find in their study that it is the financial condition of constrained firms selling assets in need of liquidity that drive the announcement returns.

The third hypothesis brings in the financial distress concept as outlined in the previous chapter in this thesis and it is hypothesized that firms that are suffering from firm financial distress are likely to gain a more favourable market reaction on the announcement of the divestiture activity. The intuition here is that firms are able to raise finance that would otherwise be difficult to obtain by selling assets. Afshar et al. (1992) and Lasfer et al. (1996), Bates (2005) and Clayton and Reisel (2013) find higher gains for divesting firms that are suffering from financial distress. Some of the evidence does not support the suggestion of financial distress resolution driving the observed announcement returns. Brown et al. (1994) observe a negative response to firms using proceeds to retire debt and Alexandrou and Sudarsanam (2001) observe a

higher stock price response to healthier firms, attributing this to the strong bargaining power of firms that are not suffering from financial distress. Therefore, the third hypothesis that will be investigated is:

> $H_{0\text{-}3}$: There are insignificant abnormal returns to those firms announcing divestiture activity whilst exhibiting firm financial distress.
>
> $H_{1\text{-}3}$: There are significantly positive abnormal returns to those firms announcing divestiture activity whilst exhibiting firm financial distress.

It is expected that the resolution of the costs of financial distress will lead to greater returns driven by the decline in firm financial distress costs (Afshar et al., 1992; Lasfer et al., 1996). A positive stock price response would suggest that the (partial) resolution of financial distress prevails on the announcement of divestiture activity. For example, the firm is able to retire debt or reduce any of the other constraints a firm may find itself in when suffering from financial distress. Any negative response to the announcement would suggest that the asset sale does not play a beneficial role in the resolution of firm financial distress.

The fourth and fifth hypotheses are based around the accounting position of the three configurations of (industry-, economic- and firm-) distress. Liquidity and leverage are examined in conjunction with the three forms of distress to ascertain whether the announcement returns to the three forms of distress were conditional on the accounting position of each firm.

Two competing theories run throughout the literature on distress so far, that is the resolution of financial distress versus the impact of fire-sale decisions on industry- (and potentially economic-) distress. Firms can sell assets for less than the full value

under fire sale conditions, however it could be stated that even if this is the case, then the benefits from a reduction in cost of financial distress may outweigh the loss from the assets sold at fire sale prices. There are a number of studies that look at the competing influence of each form of distress, Maksimovic and Phillips (1998) find that industry conditions are more important than firm specific conditions in explaining asset sales and plant closures of bankrupt firms in the US. Kruse (2002) suggest that divestiture activity is more likely where the industry is strong and firms divesting are non-distressed. Pulvino (1998) document fire sale prices in the aircraft leasing industry and Eckbo and Thorburn (2008) in bankruptcy auctions. Yet, Ang and Mauck (2011) observe higher merger premiums during recessionary periods. With a number of competing views, the relative importance of the form of distressed will impact the stock price response to the divestiture announcement. Generally, if the financing hypothesis dominates then the anticipated stock price response to the announcement would be positive versus a negative response if the fire sale explanation dominates.

Therefore the following hypotheses are prosed:

$H_{0\text{-}4}$: Stock price response is insignificant for divestiture announcements made by firms experiencing overlapping distress conditions.

$H_{1\text{-}4a}$: Stock price response is significantly higher for divestiture announcements made by firms experiencing overlapping distress conditions.

$H_{1\text{-}4b}$: Stock price response is significantly lower for divestiture announcements made by firms experiencing overlapping distress conditions.

As highlighted in the previous chapter, it is hypothesized that the liquidity position has an important influence on the observed abnormal returns. Pulvino (1998) shows for transaction values in commercial aircraft sales, firms that face short-term financing constraints achieve less than the full economic worth of an asset sale. Firms in a stronger liquidity position are hypothesised to be able to extract the full economic value of the assets being divested, therefore it is expected that there is a strong positive relationship between announcement returns and liquidity. Firstly liquidity is examined and it is hypothesised that:

$H_{0\text{-}5}$: There is an insignificant impact of the firm liquidity position on the announcement returns of the divesting firms.

$H_{1\text{-}5}$: There is a significantly positive impact of the firm liquidity position on the announcement returns of the divesting firms.

Similarly, leverage is investigated and it is hypothesised:

$H_{0\text{-}6}$: There is an insignificant impact of the firm leverage position on the announcement returns of the divesting firms.

$H_{1\text{-}6a}$: There is a significantly negative impact of the firm leverage position on the announcement returns of the divesting firms.

$H_{1\text{-}6b}$: There is a significantly positive impact of the firm leverage position on the announcement returns of the divesting firms.

It is anticipated that and leverage position of the divesting firm will impact on the observed announcement returns. Firms with high levels of leverage are likely to be divesting in order to reduce debt, however, the existing research is mixed, Bates (2005) and Clayton and Reisel (2013) observe higher abnormal returns for those firms that undertake divestiture activity to lower level of indebtedness. Yet, Brown et al. (1994) and Lasfer et al. (1996) show a negative relationship between the level of leverage and abnormal returns, therefore two competing hypotheses will be tested.

6.2.4. Conclusion

The literature review of this chapter has focused on the measurement and determination of economic, industry and firm distress and a review of the existing finance literature in the area. The existing literature has motivated the corresponding hypothesis development in the chatper.

The literature examining the impact of the macroeconomic environment on shareholder performance and divestitures highlighted that Alexandrou and Sudarsanam (2001) document higher abnormal returns during a recessionary period compared to firms announcing during non-recessionary periods. Alexandrou and Sudarsanam (2001) observe CARs of 0.61% for firms divesting assets during a recession versus CARs of 0.2% outside of the recessionary period. The difference is found to be significant. Borisova et al. (2013) find no significant different between divestiture activity in recessions versus non-recessionary periods. In the merger literature, Ang and Mauck (2001) document higher premiums for merger transactions

and Bauwman et al. (2009) document significantly lower CARs in the low-valuation periods in their study.

The condition of the industry in which a seller divests assets is found to influence the abnormal returns experienced by divestors. Distressed firms are forced to sell assets at a time when the natural buyers of the assets are likely to be financially constrained, such that the divesting firms receive a discounted price on the assets due to the lack of buyers available to purchase the asset at the full economic value (Shleifer and Vishny, 1992, 2011). Asquith et al. (1994) and Schlingemann et al. (2002) show that divestiture activity is more likely to occur in industries with a liquid market for assets and Kruse (2002) documents that firms divesting during industry periods that are good receive the full value of the asset, whereas divestiture activity during periods of industry distress leads to firms being significantly less likely to undertake such activity due to the depressed prices received for the assets. Industrial evidence from Pulvino (1998), who investigates the sale and purchase of used aircraft between airlines and leasing firms, finds that those firms suffering from financial distress are paid lower prices for their assets compared to those firms that are more highly liquid/less distressed. Consistent with the evidence of Shleifer and Vishny (1992), Pulvino (1998) finds that during industry recessions the price paid for the assets are even lower, as the aircraft seller is forced to sell to firms outside of the aviation industry. It is expected that the influence of fire sales, where the firms that are under pressure from credits to sell assets at a value that is somewhat or significantly below the full economic value of the asset, will be influenced by the state of the industry in which the assets are being sold. In periods of industry distress, firms will be forced to either refuse to sell an

asset or accept bids that are below the full economic worth, leading to a negative stock price response to the announcement of divestiture activity during this period.

The event study returns experienced by financially distressed firms have varied. Afshar et al. (1992), Lasfer et al. (1996) and Bates (2005) all document a positive market reaction when firms suffering from financial distress announce divestiture activity. Conversely, Brown et al. (1994), Alexandrou and Sudarsanam (2001) and Clayton and Reisel (2013) all document lower returns to financially distressed firms announcing divestiture activity.

Building on from the previous chapter, the aims of this chapter are to examine a set of divestitures from the United Kingdom and to examine the market response to the announcement of divesting firms and the relationship between firm, industry and economic distress conditions. However, to date, very little research has examined the interaction between the three forms of distress. For example, if firms divest their assets at fire sale prices, but the benefits of the sale help to mitigate against the cost of financial distress, what should the resultant response from the market be? Would these results differ depending on the state of the macroeconomic environment?

This chapter will extend the focus of the previous chapter by considering the overlap of firm, industry and economic distress conditions that are expected to give rise to competing financing benefits and fire sale losses from the announcement of divestiture activity. The proposal here is that the determinants of financial distress, external market conditions and the availability of potential buyers for the assets being divested are key determinants of the market response to divestiture activity.

These hypotheses are the basis of the empirical examination in this chapter. The next section highlights the data and methodology taken in order to investigate these hypotheses; this is then followed by the presentation and discussion empirical findings.

6.3. Data

In this section of the chapter, an overview will be provided of the data and methodology used in the examination of the previously highlighted hypotheses.

Details of the event study methodology and sample construction is available in chapter 3 of this thesis. This chapter uses the full sample of 10,718 non-financial and utility announcements in order to evaluate the impact of economic and industry distress on the announcement returns of firms undertaking divestiture activity.

6.3.1. Identifying economic distress

For the economic measures, the UK definition of a recession used by HM Treasury has been used in this thesis. It is defined as two or more consecutive quarters of contraction in national GDP. If the event happened whilst in a recession, it was classified as taking place in a period of economic distress. When no recession is taking place, these firms are classified as divesting assets in a period of non-economic distress. Economic distress is represented by the variable *ECON_DISTRESS* in this chapter.

In the sample period from 1988-2009, two periods were classified as economic distress occurring. Period one consists of five quarters, starting at the beginning of Q3 in 1990 and up to, and including, Q3 of 1991. Period two of economic distress consisted of six quarters, starting in Q2 of 2008 and up to, and including, Q3 of 2009.

Few studies use economic distress in their analysis, but the literature that exists in this area, such as that of Ang and Mauck (2011) defines economic distress in a similar way.

Other approaches include using the change in industrial production as a proxy for recessionary periods (Maksimovic and Phillips, 2002).

6.3.2. Identifying industry distress

In order to identify whether a particular industry is defined as distressed, each firm in the sample is classified as belonging to a particular industry via level 6 DataStream Industry classification code. The level 6 classification groups firms based on the source of its revenue or majority of revenue. A breakdown of the full industry classifications can be seen in table 6.02.

To accurately classify whether an industry is distressed, a global list of all publicly listed UK firms were obtained from Thomson Reuters DataStream for the period of 1985–2009. Using a definition similar to Acharya et al. (2007), an industry is defined as distressed if the median stock return for the industry is less than -30%. Gilson et al. (1990) and Opler and Titman (1994) also take this approach.

In addition, a sales based measure is incorporated where in order for an industry to be classified as a distressed it also has to have negative median sales growth in financial year prior to the divestiture, in addition to median stock returns of less than -30%. This stipulation on the dataset helps to remove industries that may be suffering a large fall in their median firm stock price that may be attributable to non-distress factors. The combination of stock market performance measures and book measure of industry

performance is observed to be a robust approach in classifying an industry as distressed, rather than just capturing expectations of future profitability.[73]

The classification of industry distress was run from the period of 1985-2009 using the divestiture sample against the global list of UK listed firms as outlined previously. Those announcements made by firms in the DS level 6 industries that met the classification of industry distress were classified as such and firms that didn't meet these criteria were classified as industry non-distressed.[74] Where there were less than five observations a year for a particular industry, these were removed from the global sample. Industry distress is represented by the variable *IND_DISTRESS*.

6.3.3. Identifying firm distress

The accounting approach using a net income based measure was used as a proxy for financial distress. John et al., (1992), Bhagat et al. (2005) and Ang and Mauck (2011) have all used net income based measures of financial distress.

A firm is classed as financially distressed if net income before extraordinary items/preferred dividends is negative at the financial year end prior to the announcement of divestiture activity. Firm distress is represented by the variable *FIRM_DISTRESS*.

[73] Acharya et al. (2007) observed that it reflects the proximity of firms in the industry to financial constraints and found the effect of combining the two measures to be 40% stronger, than simply using stock market returns alone.

[74] An alternative approach of measuring industry shocks utilised by Mitchell and Mulherin (1996) in the merger and acquisitions literature and Denis and Shome (2005) and Powell and Yawson (2005) in the divestiture literature was also examined. This approach measures industry sales shock as: =(industry five-year sales growth – mean industry five-year sales growth). However poor data availability and concerns of over-classifying too many firms as distressed led to using the mixed market and accounting approach of Acharya et al. (2007).

These three measures of economic, industry and firm distress, alongside the key variables used in the tables in this chapter are presented in table 6.01.

[Insert Table 6.01 about here]

6.4. Results

In order to provide an examination of the proposed hypotheses set out in the previous section, a general overview of the full sample is provided. The focus of this chapter is on industry and economic distress, alongside firm distress, and to understand the relationship and the interaction between the three unique types of distress that event study returns.

[Insert Table 6.02 about here]

Table 6.02 presents a breakdown of the industry classification at the DS level 6 categorisation and the number and fraction of firms in each industry within the sample. The highest concentration of firms undertaking divestiture activity is found in 'Food Products' (7.43%), 'Business Support Services' (5.93%) and 'Industrial Machinery' (5.49%). The industries with the smallest number of divestitures in the sample are 'Footwear,' 'Soft Drinks,' 'Alternative Fuels,' and 'Renewable Energy Equipment;' each measuring only two instances (or 0.02% each) of divestiture activity within the sample.[75]

The table also outlines the year in which industries are classified as distressed in this study. It is notable that a number of the distressed industries cluster in time. There is clustering of industry distress in the telecommunications and technology sectors around the years 2000-2002 following the crash of the dot-com bubble. Similarly, clustering of industry distress occurred around the basic resources, home construction, mining and industrial sectors in following the banking crisis that prevailed.

[75] In the sample, no divestiture activity is measured in industries classified as 'Pipelines,' 'Aluminium,' 'Railroads' or 'Tires.'

Economic distress, industry distress and firm distress are brought together and are represented in table 6.03, which outlines the descriptive statistics and the interaction between the distress types as investigated in this chapter.

[Insert Table 6.03 about here]

The sample used in this chapter is from the period of 1988-2009. This covered the recessionary periods in the United Kingdom starting from the 3rd quarter of 1990 until the end of the 3rd quarter in 1991 and the period from the start of the 2nd quarter in 2008 until the end of the 2nd quarter in 2009. In total, 1,077 non-financial/utility divestitures took place in these two periods of economic distress. In the earlier recessionary, 645 divestitures were announced and 432 divestitures in the latter of the recessionary period. The number of firms divesting assets during a period classified as economically distressed represents 10.05% of the total sample, this is in contrast to only 3.78% of the periods studied being classified as periods of economic distress.[76]

The proportion of the sample that divest in periods of industry distress is much smaller. 346 announcements in the sample divest during periods of industry distress, representing 3.2% of the full sample. Finally, the divestiture announcements that are undertaken by those firms that are classified as being financially distressed represent 22.9% of the sample.

A greater proportion of announcements are made by firms suffering from firm financial distress, than economic distress or industry distress. The correlation matrix

[76] 10 of the 264 months in the study are classified as economically distressed.

in panel B of the table highlights that there is a low level of correlation between all three distress variables, with a low correlation coefficient for all three variables.

Panel C highlights further descriptive statistics of the distress measures and the interaction between the three forms of distressed as measured in this chapter. 3,378 (31.5%) of the full sample exhibit at least one form of distress. The majority (86%) of the distressed sub-sample is concentrated by those firms divesting with only one distress classification, 13.4% are categorised as two forms of distress and 0.7% (or 23 announcements) are classified as distressed using all three measures. A further breakdown of distress configurations show that outside those firms classified as suffering from a single form of distress, the most popular combination appears to be divesting whilst suffering firm and economic distress (316), followed by industry and firm distress (97), then economic and industry distress (38).

Table 6.04 provides a brief outline of the key descriptive statistics of the key accounting variables used in this chapter. The table also reports the Mann–Whitney–Wilcoxon to test the differences between the median figures for distressed and non-distressed in the sample.[77] The findings from this table highlight a number of important points about the characteristics of those firms divesting under each distress measure utilised in this chapter.

[Insert Table 6.04 about here]

Firstly, those firms that divest during periods of economic distress have significantly greater levels leverage than those firms divesting during periods of non-economic

[77] The median test of differences between the accounting variables of distressed and non-distressed firms in the sample is conducted in order to overcome the issues of non-normal distributions in the accounting data used in the sample.

distress. Likewise, the descriptive statistics for firms divesting during recessionary periods show that they appear to have significantly lower levels of growth opportunities, liquidity and profitability compared to those firms that divest outside of recessionary periods. This suggests that as a group, firms divesting during economic distress appear to be less well-off over a number of measures compared to their non-economic distressed counterparts.

Next the descriptive statistics for those firms that are divesting during periods of industry distress are examined and they highlight that firms divesting in this condition appear to be exhibit significantly lower levels of profitability compared to non-industry distressed firms. The results then show that firms divesting during industry distress appear to have marginally higher levels of liquidity on average and both short- and long-term leverage is found to be significantly lower. The results here suggest that on average, it appears that the sharp decline in profitability appears to be spurring firms into divesting assets, rather than any immediate liquidity concern.

Finally, the firms suffering from firm financial distress appear to have a significantly lower level of profitability across both the mean and median measures, firms suffering from firm financial distress have a lower level of growth opportunities and lower levels of liquidity. These results suggest that these firms are divesting in order to improve their financial position across a number of measures.

6.4.1. Event study returns

In this section of the research, the results of the event study approach are reported. The full event study from $[t_{-30},t_{+30}]$ to $[t_0]$ is reported for reference in table 6.05 and the discussion of the full results is available in the previous chapter.

[Insert Table 6.05 about here]

Table 6.06 presents an overview of the AAR at $[t_0]$ and CAARs for the respective event windows used in the study. The table presents the impact of economic and industry environment, alongside firm-distress on the event study returns.

[Insert Table 6.06 about here]

Firstly, the economic environment is examined via *ECON_DISTRESS*. This section examines the abnormal returns for subsamples of the firms that divest assets during times of economic distress and non-economic distress. In all of the event windows considered, from $[t_{-30},t_{+30}]$ to $[t_{-1},t_0]$, it is observed that firms divesting assets during periods of economic distress experience significantly positive abnormal returns. This is in contrast to those firms divesting assets during periods of non-economic distress, whereby these firms experience lower abnormal returns, but are still positive. Over the three day event window $[t_{-1},t_{+1}]$ those firms divesting during the economic distress classification period experience a CAAR of 1.078% and those in the non-economically distressed period experience CAARs of 0.837%, both of these results are significant at the 1% level. Those firms divesting during a period of non-economic distress experience on average a CAAR of 0.241% lower than a firm divesting assets in a period of economic distress. However, it must be noted that the differences over the three day event window were not observed to be statistically significant and it is

therefore it is difficult to support the findings of Alexandrou and Sudersanam (2001). The findings do however support the study by Ang and Mauck (2011), who find no evidence of superior returns during periods of economic distress for firms undertaking M&A activity in their study. Therefore H_{0-1} cannot be rejected.

The abnormal returns for subsamples of the firms that divest assets during periods of industry distress and non-industry distress are examined next. Table 6.06 presents an overview of the AAR at $[t_0]$ and CAARs for the respective event windows used in the study and the impact of industry distress on the on the abnormal returns experienced by divesting parent firms is highlighted.

The empirical evidence shows that when firms are part of industries that that are suffering from distress, the reaction by investors to the announcement of the divestment of assets is negative. This is in contrast to when firms divest assets at points when their industry is not defined as being distressed; these firms experience positive returns on the announcement of divestiture activity. Those firms that are divesting assets during times on non-industry distress experience positive and significant abnormal returns. Over the three day event window $[t_{-1},t_{+1}]$ the non-distressed firms in the sample experience CAARs of 0.912% which are significant at the 1% level. Similarly, the five day event window is also significant at the 1%, where it was observed that the CAARs for this period is 1.062%.

However, the important aspect of analysis is to examine the differences in the results experienced by those in the sample that are divesting assets during periods of industry distress versus those firms that are divesting assets when their industries are not classified as being distressed. The difference in CAARs from those firms divesting

assets whilst their industry is distressed and those that do so when their industry is not, is 1.567%, which is significant at the 5% level. These results allow H_{0-2} to be rejected and the alternative hypothesis H_{1-2} to be accepted.

During periods of industry distress, the economic worth of the assets sold declines compared with divesting assets in non-distressed periods. Consistent with the view of Shleifer and Vishny (1992) and Acharya et al (2007) the empirical results reflect this notion. Firms divesting assets in periods of industry distress experience negative CAARs over all of the event windows in the study. This suggests that the market disciplines firms for divesting assets during this period as firms are forced to sell off assets at lower values than their economic worth. The existing research points to lack of industry liquidity (Shleifer and Vishny, 1992; Pulvino, 1998) and fire sales (Acharya et al., 2007) as a possible explanation for these negative CAARs that are experienced by divestors. Asquith et al. (1994) find that asset sales are an important way to avoid firm financial distress and as such can be limited during periods of poor industry conditions. When firms are divesting assets in periods of non-industry distress, then they are able to maximize the value that the asset is sold for, as they are not constrained by the economic state of the industry that they belong to (Kruse, 2002).

With such a significant difference in the observed announcement returns between the two samples, this suggests that industry conditions are an important determinant in the value of divesting assets. Should firms undertake divestiture activity in periods of industry distress, they may end up finding themselves divesting in a market with low levels of liquidity, where acquirers offer lower valuations for the assets being divested or being forced to lower the sale price to find a buyer. When a firm is suffering from a combination of firm distress and industry distress, the lack of flexibility that these

distressed firms have, forces them to accept a lower price for the asset than it would otherwise have been able to accept when in a stronger position (Pulvino, 1998; Kim, 1998; Schlingemann et al., 2002).

6.4.2. Interaction between firm-, industry- and economic-distress

This section of the chapter further explores the source of the event study returns highlighted in the previous event section where firms are simply classified if they are suffering from financial distress or are divesting during periods of industry or economic distress. This section aims to further clarify the source of the observed event study returns by studying the univariate interaction between the three types of distress. Firms that are classified as suffering from financial distress at the time of the announcement may opt to divest assets during a recession. In the previous section, this would have incorporated this announcement within the firm distress category and also within the economic distress category. This section aims to further enhance our understanding of distress in conjunction with the announcement returns in order to identify the source of the returns by segmenting firms based on their distress classifications.

Table 6.07 highlights the univariate interaction between the three distress types over the three day event window $[t_{-1},t_{+1}]$. Economic, industry and firm distress are represented by panel A, B and C respectively. As highlighted in each of the panels, the categorisation of distressed firms that exhibits the highest and statistically significant abnormal return are those firms that divest when suffering from all three forms of distress - the CARs for those firms were observed to be 3.12%. The lowest abnormal return is attributable to those firms that were not distressed, but divesting

during periods of economic and industry distress, these firms averaged CARs of -1.771%, it appears that shareholders react negatively to the announcement of a financially strong firm undertaking divestiture activity during periods where both the wider economy and the local industry are distressed. However, it must be noted that these results were not found to be statistically significant. Investors react most negatively to divestment announcements by firms during periods of industry distress by firms that not suffering from firm distress and not suffering from economic distress where a CAR of -1.727% is observed.

[Insert Table 6.07 about here]

As previously highlighted in the event study section, industry distress is shown to be a significant cause of negative abnormal returns to divesting shareholders. Panel B highlights that firms who are suffering from industry distress but not economic or firm distress are observed to experience a significant difference in CARs of 2.657% when divesting in periods of non-industry distress versus doing so in periods of industry distress. Likewise, in panel C, those firms that were suffering from industry distress but not economic distress at the time of the divestiture announcement, experienced a statistically significant difference in the returns of -2.692% if they opted to divest during a period of time when the firm was not distressed, versus doing so when it was distressed.

The market appears to negatively view divestitures during industry distress; however this reaction changes if the firm is suffering from financial distress. When a divestor is suffering from firm financial distress, there is a high likelihood is that divestiture activity is being undertaken in order to starve off the threat of bankruptcy and as such,

investor reaction to the announcement is found to be 2.692% higher and the difference between the two categorises are significant. Therefore, only for this scenario are we able to reject $H_{0\text{-}3}$ and accept $H_{1\text{-}3}$; that the level of abnormal returns is related to the financial position of the firm when undertaking divestiture activity within a distressed industry. The recovery from financial distress appears to be viewed more positively by the market than the lower priced paid for assets during times of industry distress, it is a tradeoff that is in favour of firm recovery.

These results highlight confirmation that divesting during periods of industry distress is viewed negatively by firm shareholders, with the view that divesting during this period is not an optimal strategic operating decision by a parent firm's board, as they are divesting at values below the full economic worth of the asset. However, the exception to this rule is that if firms are financially distressed, then the act of divesting assets is treated positively by investors, as it is likely to be deemed a more pressing matter than the issue of lower valuations that plague divesting during periods of industry distress.

6.4.3. Multivariate Analysis

The previous section of this chapter focuses on analysing the univariate event study results that examined the abnormal returns for firms undertaking divestiture activity in the United Kingdom. The section focuses on evaluating the abnormal returns for those firms that opt to divest assets in varying states of industry and macro-economic conditions. This evaluation also incorporates firm distress, as examined in the previous chapter of this thesis, in order to build up a complete understanding of the impact of distress on the observed abnormal returns.

The subsequent section builds on the univariate analysis by introducing multivariate analysis in order to examine the cross sectional determinants of these abnormal returns. As in the previous chapters, multiple regression analysis is undertaken in order to evaluate the impact of firm-, industry- and economic-distress by parent firms undertaking divestiture over the three day event window $[t_{-1},t_{+1}]$.

Using cross sectional regression allows us to simultaneously control for factors that influence the observed abnormal returns in the event study for those firms that opt to divest assets. These factors consist of financial distress variables, industry distress variables, economic distress variables, firm-specific characteristics, deal characteristics and accounting based characteristics.

Table 6.08 presents the results of the first cross-sectional regression. In this model, the dependent variable is the cumulative abnormal returns experienced by divesting firms over the three day event window. Distress is defined as economic distress in model 1, industry distress in model 2 and firm distress in model 3.

[Insert Table 6.08 about here]

In all of the multivariate testing in this chapter, it is observed for divesting parent firms, the variable FSIZE is significantly negative across all of the models examined. The negative relationship between abnormal returns and firm size suggests that divesting assets by larger firms is viewed less favourably by investors compared to divestiture activity by smaller firms. Smaller firms may be divesting assets that are worth a greater proportion of the parent firm's total value, and as such represent more significant news compared to a larger firm divesting assets. These results are consistent with the findings of Clubb and Stouraitis (2002) and Bates (2005) who argue

that agency costs are higher in firms that are larger in size and as such, the divested units may not sold at their true value; due to inertia or inefficiencies in their operations and, secondly, the disbursement of proceeds from the sale of the asset in larger firms may be inefficiently allocated to self-interested managers who may not invest the proceeds with shareholder maximisation as their key focus.

Models 1 to 3 in table 6.08 support the results previously found in the univariate event study section.

It is observed that firms that divest assets during periods of economic distress experience higher abnormal returns than those that divest outside of this period. The result is significantly positive at the 10% level. This result suggests that the market reacts positively to those firms that are divesting assets during recessionary periods and that they are doing so in order to position themselves away from the threat of financial distress. Kruse (2002) found that external causes such as recessions and periods of economic decline were cited by firms for the reductions in firm financial performance; therefore firms appear to be using divestiture activity as a means to mitigate the threat of financial distress. These results are supported by Alexandrou and Sudarsanam (2001).[78] Fitzpatrick and Ogden (2011) found that the influence of macroeconomic conditions can be small and this therefore has motivated the study of the influence of a macro condition that is likely to affect the operations of a business more than the general state of the overall economy; the condition of the industry in which a firm finds itself in.

[78] Alexandrou and Sudarsanam (2001) additionally suggest that firms are aware of the positive reaction by investors during periods of economic distress and as such, may bring forward any planned divestiture activity in order to take advantage of the positive market reaction.

Model 2 introduces the impact of industry distress on the abnormal returns experienced by divesting parent firms. The results from the multivariate analysis in model 2 support the findings of the prior univariate analysis. Firms that undertake divestiture activity in times of industry distress experience significantly negative abnormal returns on the announcement of such activity. These results are significant at the 1% level. It appears that the market punishes firms for divesting assets or business units when the industry conditions are not favourable. Previously, it was highlighted that it was not the most optimal time for parent firms to divest assets during periods of industry distress and these results support that notion. It is anticipated that those firms divesting during periods of industry distress have no choice but to do so in order to raise funds for business operations. Therefore the market for the divested assets becomes a buyers' market, in which the buyer has the upper hand in negotiating the sale price for the assets (Kruse, 2002).

Finally, in table 6.08, model 3 incorporates firm financial distress. Supporting the results of the univariate analysis in this chapter and consistent with the results of the previous chapter in this thesis, the multivariate results observed a positive relationship between firm distress and abnormal returns. These results were found to be significant at the 5% level. These results are consistent with the studies of Afshar et al. (1992), Lasfer et al. (1996), Bates (2005) and Lee and Lin (2008) who observe higher announcement returns for those firms who are classified as financially distressed when divesting assets. The market attributes the act of divesting assets by firms suffering from financial distress favourably due to starving off the threat of financial distress.

6.4.4. Distress configurations

As previously highlighted, the relationship between the three forms of distress in this chapter are examined from a multivariate perspective. Firms were sectioned into various configurations of firm, economic and industry-distress. The distress configurations were examined in order to ascertain whether the drivers of abnormal returns are conditional on the overlap between firm, economic and industry distress. The earlier summary statistics (Table 6.04, panel C) highlights that a significant portion of industry distress divestiture activity overlap with firm distress and economic conditions. This section aims to explore whether specific types of distress are potentially were masked behind the broad categorisations that had been used in the previous tables. A particular type of distress can be isolated in order to examine the specific distress type on the stock market response to the announcement. The distress configuration is represented by the standard variable *fd_x_ed_x_id_x* representing the three types of distress used in this chapter (firm distress [*fd*], economic distress [*ed*] and industry distress [*id*]. *x* is replaced by y or n to represent if a divesting firm is suffering from that form of distress.[79] The combinations of distress configurations are grouped together and shown on table 6.09.

[Insert Table 6.09 about here]

Given the positive market reaction to divestiture activity under firm financial distress and economic distress conditions, the previous findings for industry may understate the severity of the negative market reaction to divestiture under industry distress

[79] For example, variable *fd_y_ed_n_id_y* represents an announcement by a firm that is suffering from firm distress and industry distress but not economic distress.

conditions. It is observed that there are three significant configurations of distress that influence the abnormal returns experienced by shareholders. These are observed in models 2, 4 and 7. Model 2 represents firms that are suffering from firm distress and economic distress but not industry distress. The variable *fd_y_ed_y_id_n* is statistically significant at the 5% and is found to have a positive association with levels of abnormal returns. Therefore those firms that are found to be suffering from financial distress that divests assets during recessionary periods experience 1.04% higher abnormal returns compared to the remainder of firms in the sample. These results suggest that the source of gains are attributable to the resolution of financial distress, consistent with Afshar et al. (1992), Lasfer et al. (1996) and Bates (2005).

Model 4 represents firms that are suffering from economic and industry distress, but not firm distress. The variable *fd_n_ed_y_id_y* is statistically significant at the 5% and is found to have a negative association with abnormal returns. These firms experience a negative CAR of 3.20% over the three day event window in comparison to the remainder of firms in the sample.

Finally, model 7 represents those firms suffering from only industry distress, but not firm or economic distress. These results are statistically significant at the 1% level and are found to have a negative association with abnormal returns and confirm the earlier finding in Table 6.08. Those firms suffering from only from industry distress experience negative abnormal returns of around 2.9% less than the remaining firms in the sample.

Model 9 introduces all forms of distress measured against those in the sample of firms that are not suffering from any form of distress. The results are mostly consistent with

those in models 1 – 8 (except that variable *fd_y_ed_y_id_n* is no longer observed to be significant).

Overall, the findings show that firms that are suffering from firm financial distress during periods of economic distress are rewarded with higher abnormal returns when announcing divestiture activity. These results support the findings of Alexandrou and Sudarsanam (2001) and the financial distress resolution appears to be the driver of abnormal returns during these conditions. These result provide limited support to $H_{1\text{-}4a}$. Shareholders of the parent firm appear to signal approval that the action, or rather the attempt, to reduce or to eliminate firm distress via divestiture is in the interest of the firm and this is especially possible in periods where firms are not constrained by fire sale conditions in industry distress periods.

However, it should be noted that the financial resolution benefit of divestitures appears to only occur via this overlap of firm and economic distress conditions, not in isolation with firm distress or economic distress. Overall, in isolation, only industry distress is found to be significant. The results show that in contrast to the earlier findings, there is no evidence of higher returns for divesting by firms experiencing firm or economic distress in isolation. These results allow us to reject hypothesis $H_{0\text{-}4}$ and $H_{1\text{-}4a}$, and accept $H_{1\text{-}4b}$. Negative stock price response suggests that industry distress and the associated fire sale conditions are the most consistent determinant of divestiture returns in this chapter. These findings support the theoretical framework of Shleifer and Vishny (1992).

As previously highlighted, those firms opting to divest during periods of industry distress are punished by investors due to the fire sale conditions of having to sell the

asset at a lower price than the full economic value of the asset. However interestingly, what these multivariate results show over the univariate results, is that the only scenario that supports the financial distress resolution in the multivariate analysis is when distressed firms divesting assets during periods of economic distress. Firm and economic distress conditions in isolation are not associated with higher returns for divestiture transaction announcements, casting doubt in the financial distress resolution benefit of divestitures.

6.4.5. Deal size

The descriptive statistics in table 6.04 highlight that the deal size is higher for those firms divesting during times of industry distress versus those firms divesting in non-industry distressed periods. It is notable that deal size is consistent across economic and firm distress measures. Until now, the deal size variable has been omitted as a control due to the limited reporting of this variable from Thomson ONE. Lang et al. 1995) and Lasfer et al. (1996) find higher event study returns to those firms divesting higher value assets, therefore to control for deal size, table 6.10 extends the analysis with the control DSIZE. It is expected that there is a positive association between the divestiture deal size and the announcement returns to shareholders and consistent with the previous fire sale related findings, it is expected that the losses experienced will increase by the size of the divested asset.

[Insert Table 6.10 about here]

DSIZE is found to be significantly positive across all of the three forms of distress. The size of the deal is positively associated with the announcement return CARs at the 1% level. These results are consistent with the earlier findings of Lang et al. (1995)

and Lasfer et al. (1996), shareholder announcement returns increase with the price paid for the divested asset. The interaction between the size of the divestiture and form of distress shows that there is a significantly negative association between DSIZE that is conditional on industry conditions. These results show that the resulting fire sale price given for divesting in periods of industry distress highlights that larger divestiture activity (by asset sale price) is associated with larger shareholder losses at the time of the divestiture announcement. Similarly the interaction between divestiture size and firm distress is significantly negative at the 5% level, highlighting that when firms suffering from financial distress divest assets, the market places a lower value on the sale proceeds and this is reflected in the lower announcement returns surrounding the divestiture announcement.

The inclusion of the DSIZE variable results in the interaction effect between economic distress is observed to be insignificant.

6.4.6. Distress and the interaction with liquidity and leverage

Table 6.11 extends the analysis to consider the role of short-term liquidity and leverage on the market reaction to divestiture announcements. This section will resume the use of variables *LIQ* and *LEV* that have been investigated in chapter 5 to assess the interaction between these variables and the three forms of distress. Pulvino (1998) puts forward the notion that liquidity captures the short-term constraints associated with fire sale (industry distress) conditions, therefore the role of liquidity will be examined to investigate the interaction with the firm, economic and industry distress.

[Insert Table 6.11 about here]

Liquidity is investigated in the multivariate analysis, and as found in the previous chapter, is observed to be significantly positively correlated with abnormal returns in models 1, 3, and 5. Outside of distress conditions, liquidity is positive and highly significant. These results suggest that firms suffering from a weak short-term financing position experience a lower price for their divestiture activity and as such the market responds by discounting the value placed on the disposal of assets, these results are consistent with that of Pulvino (1998) and Sheifer and Vishny (2011), sellers that face short-term financing constraints experience less than the economic worth of the asset(s) divested.

Overall, the results allow $H_{0\text{-}5}$ to be rejected and for $H_{1\text{-}5}$ to be accepted; the event study abnormal returns are related to levels of liquidity. Model 3 highlights the impact of industry distress and liquidity on the observed abnormal returns for those firms divesting assets. The positive association continues to be observed for firms divesting assets outside of periods of industry distress, however the interaction effect shows that if a firm divests during a period of industry distress, even with a strong liquidity position, there is a statistically significant negative association between CARs and LIQ. Those firms with low liquidity, who are facing short-term financing constraints appear to benefit most from resolution of financial distress view of divestitures. However, overall the market appears to view divestiture as a poor choice during industry distress even when divesting firms have a strong liquidity position, due to the fire sale conditions.

The interaction between economic distress and liquidity is found to be significant and positive. This suggests that during recessionary periods, those that have a strong bargaining position are able to benefit to a greater extent during the negotiation of the

divestiture activity, and are not forced to sell at below their economic worth (Alexandrou and Sudarsanam, 2001). This result, however, is found to be conditional on financial health at the firm level. In model 5, the result suggests that for firms that are suffering from firm distress and have low levels of liquidity, these firms experience significantly higher stock market returns on the announcement of the news suggesting that the resolution of financial distress and subsequent improved liquidity position is valued positively by the market.

The relationship between CARs, firm leverage and distress is investigated in models 2, 4 and 6 in table 6.11. Pulvino (1998) argues that leverage is associated with long-term debt overhang and Ofek (1993) shows that high levels of leverage increases the likelihood of asset restructuring activity by poorly performing firms. Lasfer et al. (1996) show that the stock market response to firms increases with leverage for those firms that are financially distressed. Therefore, this section examines the impact of leverage on the stock market response to the divestiture announcement by the three forms of distress.

Across all of the three models, leverage is found to be negatively associated with abnormal returns over the three day event window. The results show that firms that exhibit higher levels of leverage experience significantly negative abnormal returns on the announcement of a divestiture. These results allow the rejection of $H_{0\text{-}6}$ and $H_{1\text{-}6b}$ and acceptance of $H_{1\text{-}6a}$ and are consistent with the evidence from Brown et al. (1994) and Lasfer et al. (1996). The interaction effects highlight that those firms with high levels of leverage that divest assets in periods of industry distress experience significantly lower abnormal returns than firms that do not divest in periods of industry distress. These results support the fire sale theory of asset sales suggesting that those

firms with high levels of leverage lack a good bargaining position in order to negotiate the best possible price for the asset.

These results suggest that low leverage firms benefit to a greater extent when divesting assets. It could be noted that at lower levels of leverage, the resolution of firm financial distress is more achievable than those firms with higher levels of leverage and at high levels of leverage, firms are susceptible to fire sale discounts on divested assets due to their poor bargaining position (Brown et al., 1994). The interaction effect between leverage and economic distress is not found to be significant.

Overall, it appears that similar to the findings in the previous chapter, there is a strong association with negative returns for firms that exhibit high levels of leverage and these returns are even more pronounced (lower) for firms that divest when they are suffering from financial distress or industry distress. In both scenarios, it appears that the market is aware that during these periods firms are unable to fully extract the full economic value of the assets being divested and it appears that the failure to resolve firm financial distress leads to a negative stock price response by the market on the announcement.

6.5. Conclusion

This chapter examined the stock price response to the announcement of divestiture activity with distress conditions on a large sample of UK firms between the period of 1988 and 2009. The three distress conditions that were examined were focused around distress that is specific to the individual firm (firm distress), the industry that a firm operates in (industry distress) and the wider macroeconomic environment (economic distress). The period of analysis covers a large variation in firm, industry and economic distress.

The key issues that were examined in this chapter are; *(i)* how do poor macroeconomic conditions influence the observed stock price response to divestiture announcements, *(ii)* how does financial distress for firms influence the observed announcement returns to the divestiture news, *(iii)* how do industry distress periods and potential fire sale discount conditions affect the observed returns, and *(iv)* how does the interaction between all of these financial distress conditions (economic-, industry- and firm-distress) affect the observed stock market response to the announcements?

Firstly, the study examined the impact that the state of the economy has on the observed announcement date returns for divesting firms. 10% of the sample was observed to announce divestiture activity during periods of industry distress, despite only representing 3.78% of the time period studied in this chapter. Firms that divested during periods of economic distress experience abnormal returns of 1.078%. For those firms divesting in periods of non-economic distress, lower abnormal returns of 0.837% had been observed over the same event window. However, the difference between the two samples is insignificant.

The business environment that firms were operating continued to be examined via undertaking analysis into the impact of the condition of the industry in which firms belonged to. Splitting the sample into those firms that divested during periods of industry and non-industry distress yielded interesting results.

The announcement returns observed over the three day window for industry distressed firms is -0.655%. Those firms that are not classified as belonging to an industry suffering from distress experienced abnormal returns of 0.912%, over the same event window and the difference between the two groups is statistically significant. These results show that the concerns of assets being sold for less than their full economic worth, as suggested by Shleifer and Vishny (1992), have a strong impact on the abnormal returns observed by the parent firm.

The univariate interaction between economic, industry and firm distress was then examined in order to test the differences between the distress configurations of each divesting firms. The results showed that there was a highly significant difference between non-industry distress and industry distress once all of the other forms of distress are filtered from the sample. This cleaner measure of the difference between non-industry distress and industry distress backed up the previous results found in the earlier event study section. The interaction also highlighted the impact of firm distress and industry distress. It was observed that during periods of industry distress, there was found to be a significant difference between those firms suffering from firm distress and non-firm distress. When a divestor is suffering from firm financial distress, the likelihood is that divestiture activity is being undertaken in order to starve off the threat of bankruptcy and as such, investor reaction to the announcement is found to be 2.692% higher than those that were not firm distressed during periods of

industry distress. The results from the multivariate analysis highlight the cross-sectional determinants of abnormal returns. The three measures of distress examined in the study were found to be significant drivers of abnormal returns. Backing up the previous univariate results, economic distress and firm distress coefficients were found to be positively associated with announcement returns and industry distress was found to be negatively associated.

However, when examining the impact of specific forms of distress and the interaction between economic-, firm- and industry-distress, it is found that industry distress dominates those firms that are also suffering from an overlap of economic and/or firm distress. The stock price response to divestiture activity during periods of industry distress in isolation yields a significantly negative response, likewise during periods of industry and economic distress, also yields an even greater negative response. These results provide support to the fire sale theory of asset sales by Shleifer and Vishny (1992). During periods of industry distress and when the firm divesting is experiencing distress, leads to a stock market response that is insignificantly different from zero. These results yields some support to the resolution of financial distress theory, suggesting that the benefit to the firm of mitigating any consequential action from being in a state of distress offsets the fire sale losses during periods of industry distress.

Additionally, the initial results find a higher response to firms divesting during periods of economic distress, however the examination of the overlap and individual distress conditions in isolation found that the evidence is partially driven by the overlap between these conditions. In isolation, economic and firm distress are found to elicit an insignificant response to the announcement of divestiture activity.

Finally, the study examined the interaction between firm distress and levels of liquidity and leverage, as leverage and liquidity were observed to be significant drivers of the stock market returns during divestiture activity. Outside of the distress conditions it is observed that firms suffering from short-term financing constraints experience a lower stock price response on the announcement of an asset sale, consistent with the fire sale explanation of asset sales.

The multivariate interaction continues to highlight a significantly negative response to divestiture announcements made during periods of industry distress, even for those with a strong liquidity position.

The results also show that during periods of economic distress, there was a positive association between stock market returns and the announcement, suggesting those with a strong bargaining position can extract more of the full economic value out of the asset during the sale. For those firms divesting with low levels of liquidity, it was observed that divesting during periods of firm distress led to significantly positive abnormal returns. The economic distress and firm distress results lend some support to a financial distress resolution explanation of divestiture activity.

The interaction between announcement returns and leverage is significantly negative for firms suffering from firm distress and industry distress. Firms with high levels of leverage experience significantly negative abnormal returns when they are suffering from firm distress, this suggests that they suffer from fire sale discounts on the price of their assets due to their poor bargaining position. In periods of industry distress, this result is amplified further, firms with higher levels of leverage experience even

greater negative abnormal returns at the announcement. These results also lend support to the fire sale theory of asset sales (Shleifer and Vishny, 1992).

Table 6.01 Financial and distress variable definitions

This table reports the key financial and distress variables used throughout this chapter. Panel A presents the variable name, variable references, definitions and Worldscope codes used throughout this chapter. Panel B highlights the three forms of distress measured in this chapter, the respective variable reference and definition. Variables not defined in this table are defined in their respective tables.

Panel A: Financial measures

Variable name	*Variable reference*	*Definition*	*Worldscope*
Firm Size	*FSIZE*	=ln(total assets).	ln(WC02999)
Growth Opportunities	*GOPP*	Market to book (measured as the market value of equity to book value of equity).	WC08001/WC03501
Same industry divestiture	*REL*	Dummy variable that is equal to one if the divested unit is in the same industry as the parent company at the two digit SIC level.	N/A
Cluster	*CLUS*	Dummy variable that is equal to one if the firm has been involved in another divestiture 180 days prior to the announcement.	N/A
Liquidity	*LIQ*	A measure of liquidity that is computed as cash and short term equivalents to current liabilities.	WC02001 / WC03101
Profitability	*PROFIT*	A measure of profitability and is measured using the ratio of EBITDA (earnings before interest, taxation, depreciation and amortization) to total assets.	WC18198 / WC02999
Leverage	*LEV*	A measure of leverage calculated as total debt to total assets	WC03255 / WC02999

Panel B: Distress measures:

Economic Distress	*ECON_DISTRESS*	Economic distress is measured using the UK approach of defining a recession: Two or more consecutive quarters of contraction in national Gross Domestic Product (GDP).
Industry Distress	*IND_DISTRESS*	Industry distress is defined as an industry (defined at the level 6 DataStream Industry classification) that has experienced negative median sales in financial year prior to the divestiture AND median stock returns in the industry of less than -30%.
Firm Distress	*FIRM_DISTRESS*	Distress measure based on negative net income. Where net income is negative at the financial year end prior to the announcement of divestiture activity, then a firm is classified as financially distressed.

Table 6.02 Datastream level 6 industry classification and years of industry distress

This table reports the Datastream level 6 industry classification approach used throughout this chapter. The full list of industries are presented below (excluding financial, utilities and non-classified firms). The table also presents the industry code and the mnemonic for each respective industry. The count refers to the number of observations each industry contains in the sample of UK divestiture announcements for the period 1988-2009 and the fraction of firms this represents. The year(s) of observed industry distress is defined by *IND_DISTRESS* outlined in table 6.01.

	DS level 6 industry name	*Industry code*	*Mnemonic*	*Count*	*Fraction of sample*	*Year(s) of observed industry distress*
Oil and Gas	Exploration & Production	050	OILEP	152	1.42%	1998
	Integrated Oil & Gas	097	OILIN	395	3.69%	-
	Oil Equipment & Services	051	OILSV	71	0.66%	2002
	Pipelines	052	PIPEL	0	0.00%	-
	Renewable Energy Equipment	074	RENEE	2	0.02%	-
	Alternative Fuels	083	ALTFL	2	0.02%	-
Basic Materials	Commodity Chemicals	092	CHEMS	95	0.89%	-
	Specialty Chemicals	033	CHMSP	462	4.32%	-
	Forestry	038	FORST	3	0.03%	-
	Paper	082	PAPER	21	0.20%	-
	Aluminium	093	ALUMN	0	0.00%	-
	Nonferrous Metals	054	NOFMS	6	0.06%	-
	Iron & Steel	056	STEEL	48	0.45%	2008
	Coal	049	COALM	14	0.13%	-
	Diamonds & Gemstones	089	DIAMD	4	0.04%	2008
	General Mining	122	MINES	320	2.99%	1990
	Gold Mining	119	GOLDS	28	0.26%	2001
	Platinum & Precious Metals	078	PLTNM	55	0.51%	2008
Industrials	Building Materials & Fixtures	030	BMATS	469	4.38%	-
	Heavy Construction	039	HVYCN	138	1.29%	-
	Aerospace	098	AEROS	113	1.06%	-
	Defence	044	DEFEN	89	0.83%	-
	Containers & Packaging	070	CONPK	113	1.06%	2008
	Diversified Industrials	101	DIVIN	187	1.75%	-
	Electrical Components & Equipment	037	ELEQP	165	1.54%	2001
	Electronic Equipment	057	ELETR	183	1.71%	-
	Commercial Vehicles & Trucks	117	COMMV	21	0.20%	-
	Industrial Machinery	043	IMACH	588	5.49%	2008
	Delivery Services	040	DELSV	9	0.08%	-
	Marine Transportation	099	MARIN	47	0.44%	-
	Railroads	081	RAILS	0	0.00%	-
	Transportation Services	064	TRNSV	171	1.60%	-
	Trucking	131	TRUCK	38	0.35%	-
	Business Support Services	086	BUSUP	635	5.93%	-
	Business Training & Employment Agencies	134	BUSTE	100	0.93%	2001, 2002
	Financial Administration	046	FINAD	54	0.50%	-
	Industrial Suppliers	032	INSUP	92	0.86%	2008
	Waste & Disposal Services	047	WASTE	30	0.28%	2008
Consumer Goods	Automobiles	065	AUTOS	3	0.03%	1990
	Auto Parts	063	AUPRT	123	1.15%	2002
	Tires	053	TYRES	0	0.00%	-
	Brewers	067	BREWS	54	0.50%	-

	DS level 6 industry name	*Industry code*	*Mnemonic*	*Count*	*Fraction of sample*	*Year(s) of observed industry distress*
	Distillers & Vintners	068	DISTV	140	1.31%	-
	Soft Drinks	114	SOFTD	2	0.02%	-
	Farming & Fishing	035	FMFSH	24	0.22%	-
	Food Products	071	FDPRD	795	7.43%	-
	Durable Household Products	059	DURHP	43	0.40%	1998
	Nondurable Household Products	062	NDRHP	64	0.60%	-
	Furnishings	060	FURNS	71	0.66%	-
	Home Construction	036	HOMES	113	1.06%	1990, 2008
	Consumer Electronics	075	CNELE	47	0.44%	-
	Recreational Products	155	RECPR	11	0.10%	-
	Toys	061	TOYSG	6	0.06%	-
	Clothing & Accessories	069	CLTHG	203	1.90%	2008
	Footwear	153	FOOTW	2	0.02%	-
	Personal Products	048	PRSNL	16	0.15%	-
	Tobacco	079	TOBAC	92	0.86%	-
Health Care	Health Care Providers	045	HCPRO	26	0.24%	-
	Medical Equipment	132	MEDEQ	105	0.98%	2002, 2008
	Medical Supplies	103	MEDSP	19	0.18%	2001, 2007
	Biotechnology	157	BIOTC	76	0.71%	1998, 2002, 2008
	Pharmaceuticals	095	PHRMC	187	1.75%	-
Consumer Services	Drug Retailers	120	DGRET	46	0.43%	-
	Food Retailers & Wholesalers	088	FDRET	120	1.12%	-
	Apparel Retailers	066	APRET	133	1.24%	2008
	Broadline Retailers	087	BDRET	59	0.55%	-
	Home Improvement Retailers	085	HIMPR	52	0.49%	-
	Specialized Consumer Services	156	SPCSV	10	0.09%	2001
	Specialty Retailers	090	SPRET	371	3.47%	-
	Broadcasting & Entertainment	115	BRDEN	273	2.55%	2001, 2002
	Media Agencies	041	MEDAG	202	1.89%	2001
	Publishing	084	PUBLS	439	4.10%	2008
	Airlines	129	AIRLN	56	0.52%	-
	Gambling	100	GAMNG	121	1.13%	2006
	Hotels	080	HOTEL	227	2.12%	-
	Recreational Services	055	RECSV	191	1.78%	1992
	Restaurants & Bars	072	RESTS	256	2.39%	-
	Travel & Tourism	094	TRAVL	84	0.78%	-
Telecom	Fixed Line Telecommunications	142	TELFL	145	1.35%	2000, 2002
	Mobile Telecommunications	143	TELMB	86	0.80%	2001, 2002
Technology	Computer Services	150	CMPSV	185	1.73%	2000, 2002, 2008
	Internet	151	INTNT	31	0.29%	-
	Software	058	SOFTW	332	3.10%	2000, 2002
	Computer Hardware	034	COMPH	20	0.19%	2001
	Electronic Office Equipment	105	OFFEQ	13	0.12%	-
	Semiconductors	130	SEMIC	10	0.09%	-
	Telecommunications Equipment	126	TELEQ	101	0.94%	2001, 2002

Table 6.03 Descriptive statistics of Firm-, Industry-, and Economic-distress

The table reports the number of firms that have been classified as non-distressed or distressed for the sample of 10,718 non-financial and non-utility firms for the period 1988-2009. The distress measures are: *ECON_DISTRESS*, *IND_DISTRESS* and *FIRM_DISTRESS*, these variables defined in table 6.01. t-statistics in parenthesis: *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

Panel A: Financial distress by measure

	FIRM_DISTRESS	*ECON_DISTRESS*	*IND_DISTRESS*
Count of sample	N *(%)*	N *(%)*	N *(%)*
Non-distressed (0)	8,266 *(77.1%)*	9,641 *(90.0%)*	10,372 *(96.8%)*
Distressed (1)	2,452 *(22.9%)*	1,077 *(10.0%)*	346 *(3.2%)*
Total	10,718 *(100%)*	10,718 *(100%)*	10,718 *(100%)*

Panel B: Correlation matrix

	FIRM_DISTRESS	*ECON_DISTRESS*	*IND_DISTRESS*
FIRM_DISTRESS	1		
ECON_DISTRESS	0.0431*** (0.000)	1	
IND_DISTRESS	0.0427*** (0.000)	0.041*** (0.000)	1

Panel C: Count of distress measures

	Count	*Fraction of distressed*	*Fraction of total sample*
No distress classification across any measure	**7,340**	-	**68.50%**
Classified as distressed	**3,378**	-	**31.50%**
using one measure	2,904	86.00%	27.10%
using two measures	451	13.40%	4.20%
using three measures	23	0.70%	0.20%
Distress configurations			
economic distress only	700	20.7%	
economic and industry distress only	38	1.1%	
industry distress only	188	5.6%	
industry and firm distress only	97	2.9%	
firm distress only	2,016	59.7%	
firm and economic distress only	316	9.4%	
economic, industry and firm distress	23	0.7%	
	3,378	100.0%	

Table 6.04 Descriptive statistics of key accounting variables and ratios by distress type

The table below presents descriptive accounting statistics and ratios for full sample as categorised based on economic-, industry- and firm-distress. The definition of each type of distress is available in table 6.01. N is the number of observations in each type of distress. The differences between the means are reported and the differences in median are tested using the Mann–Whitney–Wilcoxon test. The table represents descriptive accounting variables taken from accounting statements for each of the firms in the sample for the period between 1988-2009. The sample consists of non-financial and non-utility firms in the United Kingdom. All variables are all measured at the financial year end prior to the announcement of divestiture activity and the key variables are defined in 6.01, in addition. DSIZE represents the average divestiture size is the GBP£ value of the divestiture and is measured in millions to total assets. STD_A represents the ratio of short term leverage to total assets and LTD_A represents the ratio of long term leverage to total assets. t-statistics: *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

	Economic				**Industry**				**Firm**			
	Distress N = 1,077		Non-distress N = 9,641		Distress N = 346		Non-distress N = 10,372		Distress N = 2,452		Non-distress N = 8,266	
	mean	median	mean	median	mean	median	mean	median	mean	median	mean	median
FSIZE	13.518	13.915	13.506	13.695	12.906	12.96	13.527	13.743	13.591	13.868	13.483	13.687
	t = -0.141 z = -0.354				t = 4.352*** z = 4.125***				t = -1.814* z = -1.875*			
DSIZE	0.107	0.02	0.097	0.021	0.183	0.037	0.095	0.021	0.100	0.020	0.097	0.021
	t = -0.777 z = 0.338				t = -4.639*** z = -3.532***				t = -0.278 z = 1.317			
GOPP	2.251	1.531	2.896	1.694	5.84	1.703	2.731	1.662	2.728	1.546	2.861	1.698
	t = 2.249** z = 3.014***				t = -6.335*** z = 0.140				t = 0.642 z = 4.932***			
LIQ	0.421	0.191	0.448	0.021	0.762	0.228	0.435	0.212	0.448	0.206	0.445	0.217
	t = 0.834 z = 3.944***				t = -5.730*** z = -3.068***				t = -0.130 z = 1.874*			
PROFIT	0.071	0.114	0.081	0.217	-0.09	0.038	0.085	0.122	0.062	0.117	0.085	0.122
	t = 1.261 z = 4.278***				t = 12.761*** z = 11.042***				t = 4.007*** z = 3.507***			
LEV	0.283	0.264	0.252	0.122	0.298	0.233	0.254	0.234	0.260	0.235	0.254	0.233
	t = -5.312*** z = -7.036***				t = -4.321*** z = -1.130				t = -1.559 z = -1.874*			
STD_A	0.108	0.059	0.093	0.533	0.124	0.032	0.093	0.054	0.102	0.053	0.092	0.053
	t = -1.217 z = -3.555***				t = -1.415 z = 4.257***				t = -1.065 z = 0.226			
LTD_A	0.169	0.162	0.16	0.135	0.171	0.099	0.161	0.139	0.164	0.140	0.160	0.137
	t = -1.860* z = -3.019***				t = -1.151 z = 2.842***				t = -1.119 z = -1.525			

Table 6.05 Event study (full sample)

The table below presents the abnormal returns surrounding the divestiture announcement for the full sample of 10,718 non-financial and utility firms for the period 1988-2009 listed on the FTSE All Share index. The event study was undertaken using the event study methodology outlined in chapter three of this thesis. t-statistics in brackets: *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

Event window	[-30,+30]	[-15,+15]	[-5,+5]	[-2,+2]	[-1,+1]	[-1,+0]	[0]
mean	**2.483%*** **	**1.765%*** **	**1.246%*** **	**1.016%*** **	**0.861%*** **	**0.258%*** **	**0.139%*** **
t	[9.618]	[9.589]	[11.367]	[13.742]	[15.044]	[5.521]	[4.209]
median	1.064%	0.761%	0.399%	0.329%	0.255%	0.012%	0.007%
sd	30.4%	21.3%	13.6%	10.2%	8.5%	5.0%	3.5%
min	-235.8%	-186.7%	-121.6%	-120.7%	-87.2%	-73.6%	-66.6%
max	374.8%	321.3%	246.6%	258.8%	269.2%	119.8%	118.2%
N	10,718	10,718	10,718	10,718	10,718	10,718	10,718

Table 6.06 Event study returns (by distress measure)

The table below presents the abnormal returns surrounding the divestiture announcement for the full sample of 10,718 firms for the period 1988-2009 combined with the distress measures used in this study. The difference in abnormal returns between distressed and non-distressed sub-samples are also reported. The abnormal return for the full sample (excluding financial and utility firms) segmented by distress measure type. The distress measures are*: ECON_DISTRESS, IND_DISTRESS and FIRM_DISTRESS*, these variables defined in table 6.01. t-statistics in brackets: *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level. The count N is reported in braces {}.

		Event window:	[-30,+30]	[-15,+15]	[-5,+5]	[-2,+2]	[-1,+1]	[-1,0]	[0]
Economic distress	**Distressed** {1,077}	**CAAR**	**6.089%*** **	**3.015%*** **	**2.077%*** **	**1.717%*** **	**1.078%*** **	**0.416%** **	**0.223%***
		t	[5.763]	[4.002]	[4.629]	[5.675]	[4.601]	[2.173]	[1.651]
	Non-distressed {9,641}	**CAAR**	**2.080%*** **	**1.625%*** **	**1.153%*** **	**0.937%*** **	**0.837%*** **	**0.240%*** **	**0.130%*** **
		t	[8.372]	[9.174]	[10.931]	[13.177]	[15.191]	[5.345]	[4.077]
	Difference	**Difference in CAAR**	-4.009%***	-1.390%	-0.924%	-0.779%*	-0.241%	-0.175%	-0.094%
		t	[-2.820]	[-1.434]	[-1.478]	[-1.739]	[-0.686]	[-0.786]	[-0.672]
Industry distress	**Distressed** {346}	**CAAR**	**-2.440%**	**-2.448%***	**-0.540%**	**-0.368%**	**-0.655%***	**-0.109%**	**-0.165%**
		t	[-1.368]	[-1.925]	[-0.713]	[-0.720]	[-1.655]	[-0.338]	[-0.720]
	Non-distressed{10,372}	**CAAR**	**2.647%*** **	**1.905%*** **	**1.306%*** **	**1.062%*** **	**0.912%*** **	**0.270%*** **	**0.149%*** **
		t	[10.188]	[10.285]	[11.833]	[14.273]	[15.824]	[5.746]	[4.486]
	Difference	**Difference in CAAR**	5.087%**	4.353%**	1.846%*	1.430%*	1.567%**	0.379%	0.314%
		t	[2.070]	[2.496]	[1.871]	[1.945]	[2.401]	[0.948]	[1.344]
Firm Distress	**Distressed** {2,452}	**CAAR**	**2.353%*** **	**1.814%*** **	**1.517%*** **	**1.188%*** **	**1.051%*** **	**0.426%*** **	**0.235%*** **
		t	[4.786]	[5.175]	[7.267]	[8.442]	[9.641]	[4.788]	[3.726]
	Non-distressed {8,266}	**CAAR**	**2.267%*** **	**1.584%*** **	**1.157%*** **	**0.967%*** **	**0.738%*** **	**0.157%*** **	**0.093%*** **
		t	[8.635]	[8.465]	[10.379]	[12.862]	[12.683]	[3.300]	[2.782]
	Difference	**Difference in CAAR**	-0.09%	-0.23%	-0.36%	-0.22%	-0.31%	-0.269%*	-0.14%
		t	[0.092]	[-0.387]	[-0.566]	[0.099]	[-1.004]	[-1.668]	[-0.242]

Table 6.07 Event study (interaction between measures of distress)

The table below presents the abnormal returns surrounding the divestiture announcement for the full sample of 10,718 firms for the period 1988-2009 over [-1,+1] event window combined with the distress measures used in this study. The abnormal return for the full sample (excluding financial and utility firms) segmented by distress measure type. The distress measures are: ECON_DISTRESS, IND_DISTRESS and FIRM_DISTRESS, these variables defined in table 6.01., ** at the 5% level and * at the 10% level and count of observations in braces {*x*}

Panel A

		Firm and Industry Distress	Firm Distress / Non Industry Distress	Non Firm Distress / Industry Distress	Non Firm Distress / Non Industry Distress
Economic	Distress	**3.120%****	**1.571%*****	**-1.771%**	**0.943%*****
	[t] {count}	[2.538] {23}	[3.968] {316}	[-1.386] {38}	[3.287] {700}
	Non-distress	**0.965%**	**0.729%*****	**-1.727%*****	**0.931%*****
	t	[1.230] {97}	[6.521] {2016}	[-3.571] {188}	[15.107] {7340}
Difference	**Difference in CAAR**	-2.155%	-0.841%	0.044%	-0.013%
	t	[-0.913]	[-1.126]	[0.014]	[-0.033]

Panel B

		Firm and Economic Distress	Firm Distress / Non Economic Distress	Non Firm Distress / Economic Distress	Non Firm Distress / Non Economic Distress
Industry	Distress	**3.120%****	**0.965%**	**-1.771%**	**-1.727%*****
	t	[2.538] {23}	[1.230] {97}	[-1.386] {38}	[-3.571] {188}
	Non-distress	**1.571%*****	**0.729%*****	**0.943%*****	**0.931%*****
	t	[3.968] {316}	[6.521] {2016}	[3.287] {700}	[15.107] {7340}
Difference	**Difference in CAAR**	-1.550%	-0.236%	2.714%	2.657%***
	t	[-0.661]	[-0.295]	[0.909]	[2.929]

Panel C

		Industry and Economic Distress	Industry Distress / Non Economic Distress	Non Industry Distress / Economic Distress	Non Industry Distress / Non Economic Distress
Firm	Distress	**3.120%****	**0.965%**	**1.571%*****	**0.729%*****
	t	[2.538] {23}	[1.230] {97}	[3.968] {316}	[6.521] {2016}
	Non-distress	**-1.771%**	**-1.727%*****	**0.943%*****	**0.931%*****
	t	[-1.386] {38}	[-3.571] {188}	[3.287] {700}	[15.107] {7340}
Difference	**Difference in CAAR**	-4.891%	-2.692%**	-0.627%	0.201%
	t	[-1.319]	[-2.258]	[-0.769]	[1.001]

Table 6.08 Regressions of firm CARs by distress type

This table reports the multivariate regressions of the event study cumulative abnormal returns for firms undertaking divestiture activity in the sample. All accounting variables and distress variables in this table are defined in table 6.01. t-statistics in brackets: *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

	(1)	(2)	(3)
FSIZE	-0.00222***	-0.00227***	-0.00232***
	[-6.10]	[-6.24]	[-6.29]
CLUS	0.000955	0.00102	0.00114
	[0.52]	[0.56]	[0.62]
GOPP	-0.000118	-0.000102	-0.000125
	[-1.24]	[-1.07]	[-1.32]
REL	0.000231	0.000409	0.000377
	[0.14]	[0.25]	[0.23]
ECON_DISTRESS	0.00480*		
	[1.79]		
IND_DISTRESS		-0.0159***	
		[-3.45]	
FIRM_DISTRESS			0.0016**
			[2.13]
intercept	0.0377***	0.0392***	0.0354***
	[8.03]	[8.36]	[6.62]
N	9719	9719	9719
R-sq	0.005	0.006	0.005
adj. Rsq	0.004	0.005	0.004
F	9.455***	11.20***	9.39***

Table 6.09 Regressions of firm CARs by distress configurations

This table reports the multivariate regressions of the event study cumulative abnormal returns for firms undertaking divestiture activity in the sample. All accounting variables and distress variables in this table are defined in table 6.01. The additional variables used in this table are defined as follows: fd_y_ed_y_id_y is a dummy variable equal to 1 if a firm is suffering from firm distress (FIRM_DISTRESS) and divesting at a time of economic distress (ECON_DISTRESS) and industry distress (IND_DISTRESS) during the announcement of divestiture activity, otherwise 0; fd_y_ed_y_id_n is a dummy variable equal to 1 if a firm is suffering from firm distress and divesting during a period of economic distress at the time of divestiture announcement, otherwise 0; fd_y_ed_n_id_y is a dummy variable equal to 1 if a firm is suffering from firm distress and divesting during a period of industry distress at the time of the divestiture announcement, otherwise 0. fd_n_ed_y_id_y is a dummy variable equal to 1 if a firm divests during a period of economic distress and industry distress at the time of the divestiture announcement, otherwise 0; fd_y_ed_n_id_n is a dummy variable equal to 1 if a firm divests when suffering firm distress at the announcement of divestiture activity, otherwise 0; fd_n_ed_y_id_n is a dummy variable equal to 1 if a firm divests during a period of economic distress, otherwise 0; fd_n_ed_n_id_y is a dummy variable equal to 1 if a firm divests during a period of industry distress, otherwise 0; fd_n_ed_n_id_n is a dummy variable equal to 1 if a firm isn't suffering from any form of distress (firm/industry/economic distress) at the time of the divestiture announcement, otherwise 0. t-statistics in brackets: *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
FSIZE	-0.0022***	-0.0022***	-0.0022***	-0.0022***	-0.0022***	-0.0022***	-0.0022***	-0.0022***	-0.00227***
	[-6.08]	[-6.14]	[-6.08]	[-6.12]	[-6.09]	[-6.09]	[-6.23]	[-6.10]	[-6.23]
CLUS	0.00099	0.000994	0.000945	0.000925	0.00096	0.000935	0.0011	0.000963	0.00111
	[0.54]	[0.54]	[0.52]	[0.51]	[0.53]	[0.51]	[0.60]	[0.53]	[0.61]
GOPP	-0.00012	-0.00012	-0.00012	-0.00012	-0.00012	-0.00012	-9.20E-05	-0.00012	-0.000089
	[-1.27]	[-1.27]	[-1.30]	[-1.28]	[-1.29]	[-1.26]	[-0.96]	[-1.28]	[-0.93]
REL	0.000351	0.00022	0.000369	0.00044	0.000365	0.000332	0.000345	0.000382	0.000208
	[0.21]	[0.13]	[0.22]	[0.27]	[0.22]	[0.20]	[0.21]	[0.23]	[0.13]
fd_y_ed_y_id_y	0.0211								0.0209
	[1.24]								[1.23]
fd_y_ed_y_id_n		0.0104**							-0.011
		[2.17]							[-0.63]
fd_y_ed_n_id_y			0.00782						-0.0135
			[0.90]						[-0.71]
fd_n_ed_y_id_y				-0.0320**					-0.0530**
				[-2.38]					[-2.45]
fd_y_ed_n_id_n					-0.00084				-0.0218
					[-0.41]				[-1.28]
fd_n_ed_y_id_n						0.00338			-0.0179
						[1.04]			[-1.04]
fd_n_ed_n_id_y							-0.029***		-0.0496***
							[-4.66]		[-2.75]
fd_n_ed_n_id_n								0.000521	
								[0.30]	
intercept	0.0379***	0.0380***	0.0379***	0.0383***	0.0382***	0.0379***	0.0391***	0.0377***	0.0388***
	[8.10]	[8.12]	[8.10]	[8.19]	[8.15]	[8.08]	[8.35]	[7.80]	[8.24]
N	9719	9719	9719	9719	9719	9719	9719	9719	9719
R-sq	0.005	0.005	0.005	0.005	0.005	0.005	0.007	0.005	0.008
adj. R-sq	0.004	0.004	0.004	0.005	0.004	0.004	0.006	0.004	0.007
F	9.12***	9.752***	8.971***	9.943***	8.843***	9.027***	13.16***	8.828***	7.203***

Table 6.10 Regressions of firm CARs against deal size and financial distress measurements

This table reports the multivariate regressions of the event study cumulative abnormal returns for firms undertaking divestiture activity in the sample. All accounting variables and distress variables in this table are defined in table 6.01. t-statistics in brackets: *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

	(1)	(2)	(3)
FSIZE	-0.0021***	-0.0024***	-0.0024***
	[-3.87]	[-5.02]	[-5.03]
CLUS	0.0017	0.0029	0.0028
	[0.72]	[1.35]	[1.32]
GOPP	-0.0003***	-0.0002**	-0.0002**
	[-2.78]	[-2.02]	[-2.19]
REL	-0.0011	0.0003	0.0028
	[-0.51]	[0.15]	[0.20]
ECON_DISTRESS	0.0121***		
	[2.89]		
IND_DISTRESS		-0.0017	
		[-0.28]	
FIRM_DISTRESS			0.0017
			[0.69]
DSIZE	0.0244***	0.0188***	0.0206***
	[5.01]	[4.54]	[4.57]
*DSIZE*ECON_DISTRESS*	-0.0302***		
	[-1.61]		
*DSIZE*IND_DISTRESS*		-0.0350***	
		[-2.72]	
*DSIZE*FIRM_DISTRESS*			-0.0215**
			[-2.49]
intercept	0.0351***	0.0395***	0.0392***
	[5.01]	[6.46]	[6.42]
N	6101	6101	6101
R-sq	0.016	0.013	0.012
adj. Rsq	0.015	0.012	0.011
F	10.20***	10.24***	9.79***

Table 6.11 Regressions of event study CARs by distress type and interaction with liquidity and leverage

This table reports the multivariate regressions of the event study cumulative abnormal returns for firms undertaking divestiture activity in the sample. All accounting variables and distress variables in this table are defined in table 6.01. ECON/IND/FIRM_DISTRES*LIQ/LEV represents the interaction effect between the economic/industry/firm distress variable and the LIQ or LEV variables. t-statistics in brackets: *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

	(1)	(2)	(3)	(4)	(5)	(6)
FSIZE	-0.00175*** [-4.63]	-0.00271*** [-8.03]	-0.00181*** [-4.78]	-0.00275*** [-8.16]	-0.00183*** [-4.79]	-0.00277*** [-8.15]
CLUS	0.000904 [0.49]	0.00276* [1.69]	0.00093 [0.50]	0.00285* [1.74]	0.00084 [0.45]	0.00286* [0.87]
GOPP	-0.00012 [-1.20]	-0.0001 [-1.11]	-0.00011 [-1.10]	-0.0001 [-1.08]	-0.00012 [-1.25]	-0.00012 [-1.22]
REL	-0.00094 [-0.56]	0.000608 [0.41]	-0.0007 [-0.42]	0.000595 [0.40]	-0.000646 [-0.39]	0.00069 [0.47]
ECON_DISTRESS	0.0027 [0.92]	0.000161 [0.03]				
IND_DISTRESS			-0.0123** [-2.30]	-0.00122 [-0.18]		
FIRM_DISTRESS					0.00528** [2.47]	0.0093*** [2.95]
LIQ	0.00571*** [6.10]		0.00723*** [7.96]		0.00855*** [8.51]	
LEV		-0.0106** [-2.34]		-0.00565 [-1.27]		-0.00274 [-0.56]
*ECON_DISTRESS *LIQ*	0.00543** [2.13]					
*ECON_DISTRESS *LEV*		0.0163 [1.12]				
*IND_DISTRESS *LIQ*			-0.00892*** [-2.75]			
*IND_DISTRESS *LEV*				-0.0371** [-2.13]		
*FIRM_DISTRESS *LIQ*					-0.0087*** [-4.41]	
*FIRM_DISTRESS *LEV*						-0.0256** [-2.51]
intercept	0.0293*** [5.91]	0.0460*** [10.35]	0.0303*** [6.13]	0.0461*** [10.39]	0.02915*** [5.83]	0.04462*** [9.93]
N	9499	9389	9499	9389	9499	9389
R-sq	0.011	0.009	0.012	0.009	0.012	0.009
adj. R-sq	0.01	0.008	0.012	0.009	0.011	0.008
F	14.93***	11.58***	17.13***	12.66***	16.90***	12.24***

Chapter 7: Conclusion and Discussion

7.1. Introduction

This thesis has examined corporate divestitures in conjunction with life cycle theories and financial distress theories. The thesis begins by providing an overview of the existing corporate restructuring literature, including restructuring types, and the motivations for undertaking divestiture. After the literature review, chapter 3 provides an overview of the main data and definitions that were used throughout this thesis. Chapters 4, 5 and 6 were the key contributions to this study in that they were the empirical chapters that investigated the impact of firm life cycle, and firm-, industry- and economic distress on the event study returns of those firms announcing their intention to divest assets.

The remainder of this chapter is as follows; Section 7.2. provides a summary of the main empirical findings from chapters 4, 5 and 6. Section 7.3. provides an overview of the limitations of the study and finally, section 7.4 provides a summary and an overview of future research suggestions.

7.2. Summary of Main Research Findings

This section provides a short overview of the main research findings of the empirical chapters 4, 5 and 6 of this thesis.

7.2.1. Firm divestitures and life cycle: What role does firm life cycle play in the observed abnormal returns to UK firm shareholders?

The motivation for examining firm life cycle was to build on the early research of Pashley and Philippatos (1990, 1993) who examined stock price performance surrounding the announcement of divestiture activity and whether the abnormal returns were conditional on life cycle stage.

Chapter 4 focused on an examination of firm life cycle based around the earned/contributed capital mix (RE/TE and RE/TA) measures of life-cycle as developed by De Angelo et al. (2006). Using this approach, the research updates the divestiture and life cycle concepts developed by Pashley and Philippatos (1990, 1993). Additionally the chapter investigates the cross-sectional determinants and seeks to determine whether agency costs concerns vary across firm life cycle.

The findings of the chapter indicate that the level of abnormal returns are conditional on life cycle stage, with most of the divestiture gains being attributed to younger firms and maturing firms. However, interestingly when firms with negative retained earnings are removed from the sample, it is those firms in life cycle 3, the late maturity and revival firms, appear exhibit the highest level of abnormal returns. These results suggest that gains to older firms are attributable to reconfigurations in the structure of a firm in order to reverse the concerns of slow growth by divesting assets. It is expected that the proceeds

from the sale are used to either reinvest proceeds to revitalize the business or to return these proceeds to shareholders.

The chapter then investigates agency costs as a possible explanation for the observed event study returns. The findings were mixed. Traditional measures of managerial discretion proxied via free cash flow, were found to be insignificant across the sample (except in life cycle stage 3), firms with low market-to-book ratios (high investment opportunities) were observed to exhibit significantly higher abnormal returns than those with lower investment opportunities. It was observed that agency concerns dominated firms at the end of their life-cycle but not at the start of their life-cycle, where excess spending on capital expenditure was negatively viewed by firm shareholders later in life.

The chapter examined related versus unrelated divestitures and found those firms that divested assets in the same industry as themselves experienced higher abnormal returns than divested assets outside of the core industry. The cross sectional results highlighted that the drivers were not simply life cycle stage, but found to be related to the financial state of the seller. Firms with poor financial positions were found to exhibit greater wealth gains for the shareholders of the divesting firm. These findings led to the focus of the subsequent chapters of the thesis.

7.2.2. Firm divestitures and financial distress: What role does the financial condition of the divestor have on the abnormal returns of UK firms?

Existing research highlights that firms may undertake divestiture activity in order to mitigate the costs of financial distress. Lasfer et al. (1996) and Lee and Lin (2008) highlight that in the UK, one of the main benefits from undertaking divestiture activity is the due to the possible resolution of financial distress.

Chapter 5 examines the relation between abnormal returns on announcement of divesting assets and firm financial distress. The chapter surveys a wide array of financial distress measures and incorporates three measures of financial distress; Taffler's z-score, an interest coverage based measure and a net income based measure. The main focus of the chapter is to investigate whether the financial condition of the seller impacts the level of abnormal returns experienced by shareholders.

The results from the chapter find, across all three measures, that financially distressed divestors experience significantly greater abnormal returns than those firms that are not financially distressed. These findings suggest that the market interprets the sale of assets as a mechanism in reducing or mitigating the costs of financial distress. The cross sectional results show that leverage is negatively correlated with abnormal returns, which is driven by long-term debt. Finally, the chapter highlights that liquidity is found to be a significant factor in explaining abnormal returns. It is observed that firms with better liquidity positions are able to extract the full economic value of the assets divested and avoided having to undertake fire sales. A strong financial position by the seller of the assets is found to be viewed positively by divesting firm shareholders.

7.2.3. Firm, economic and industry distress: What role does the business environment (firm's industry and the macroeconomic environment) have on the observed abnormal returns of UK firms?

The external business environment has been highlighted in previous research as affecting the levels of corporate financing activity taking place (Alexandrou and Sudarsanam, 2001). John et al. (1992) highlight that the most common reason given for a performance decline within a company is due to poor economic conditions. Kruse (2002) finds that

external causes such as recessions and periods of economic decline are cited by firms for the reductions in firm financial performance. Research by Shleifer and Vishny (1992) argues that the conditions of the industry that firms operate in will impact the returns experienced on selling an asset. Therefore, bringing together economic-, industry- and firm distress distress alongside divestiture, this chapter investigated the wealth impact of the business environment on the assets being divested.

The main finding from this chapter is in relation to the investigation into industry distress. It is observed that industry distress is a highly significant factor influencing shareholder wealth. During periods of industry distress, the lack of buying power by firms in the same industry results in assets being divested at fire sale values. Divesting assets in periods of industry distress was found to significantly lower shareholder wealth. Using industry distress as a measure of bargaining position, firms in a strong bargaining position experienced higher abnormal returns for shareholders on announcing the news; however this bargaining strength is wiped out when a firm divests during periods of industry distress. Even with high levels of liquidity, divesting firms suffer when they divest assets in periods of industry distress.

Additionally, this chapter also observed that there is a greater loss suffered by firms with high leverage that opt to undertake divestiture activity in times of industry distress. The poor bargaining position that these divestors find themselves in due to industry distress is further compounded by the high level of leverage. Likewise, when firms are financially distressed, their bargaining position is limited and this is further limited in times of high levels of leverage.

7.3. Limitations & Selection Bias

Throughout this thesis a number of limitations have been highlighted, however this section briefly covers some of the main aspects of these limitations and their implications for this thesis.

7.3.1. Market model

Key assumptions are made in regards to using the Market Model. It is assumed that the market is efficient, the event is unanticipated and there are no confounding factors that can impact the model. In an imperfect world, confounding events such as market over reaction to the divestiture announcement, insider-trading or other factors that the model cannot anticipate and account for. Brown and Warner (1980, 1985) highlight that the market model is robust against many parametric influences such as clustering, serial correlation, non-normality and non-synchronous trading. A number of trips were taken in order to control for clustering in divestiture activity, the *CLUS* variable is adopted throughout the multivariate testing in the chapter in order to control for overlapping announcement dates.

7.3.2. Informationally efficient markets

A key assumption of using an event study is a perfectly competitive market, however information availability may have an impact on the observed stock returns. Stock prices may not reflect all of the available information on the date of an announcement, this could be in part due to lack of available data, clarity about particular announcements, confounding effects due to macroeconomic factors (For example, good or bad news in particular industries) or information being released at busy or quiet periods. Therefore, in order to control for this, the three day event window [-1,+1] is adopted as a core focus in

this study to help capture informational leakages a day prior or day after the announcement.

7.3.3. Thin trading

This research has included publicly listed firms in the United Kingdom that all vary in their size and as such each will experience varying levels of trading volume. Trading volume and volatility have been found to highly correlate in empirical studies that examine the relationship between trading volume and volatility. Karpoff (1987) finds a strong positive correlation between trading volume and the price volatility and absolute returns. There are a number of views as to why this occurs but the majority of the research in this area examines the flow of news to the market.[80] Harris and Raviv (1993) highlight that trading volumes are proxies for capturing investors' expectations and investment outlooks. Board and Sutcliffe (1990) find a positive relationship between volatility and volume on the FTSE 100 index. FTSE 100 listed firms may have higher trading volumes than those listed in the Alternative Investment Market (AIM). The monitoring effect by intuitional investors and the coverage provided by mainstream media are likely to impact the volume of trading on this exchange. Thinly traded firms may provide anomalous evidence when conducting event studies as those smaller firms with fewer trades may appear to have large and significant responses to the divestiture announcements. Such conditions would lead to biases in the examination of abnormal returns. Some researchers have simply removed thinly traded stocks (Cohen et al., 1983) to prevent inducing biases into research, whilst others have sought to correct for thin trading (Scholes and Williams,

[80] It is beyond the scope of this research, but the competing hypotheses in this area are the 'mixture of distributions hypothesis' (Clark, 1973) and the 'sequential information arrival hypotheses; which more information can be found in Floros and Vougas (2007)

1977; Atchison et al., 1987; Bowie, 1994). Strong (1992) reports that there generally is no improvement to the power specification of studies when trying to correct. Brown and Warner (1985) and Jain (1985) find similar results. More recently, friction modelling as a means of measuring expected returns in thin trading environments (Anderson, 2009). For this study thin trading was not examined as the focus on FTSE All Share firms capture those firms which have the largest market capitalisation and therefore reduces concerns over thin trading for those divesting firms in the sample.

7.3.4. Life cycle sample

In order to categorise firms using the life-cycle framework, it does rely on them being publically listed on the stock market in the United Kingdom. Such inclusion immediately creates a bias in the study, as the full life-cycle of firms cannot be observed, as there is no way to assess those younger firms or those firms that opt not to become a public entity using the research methodology in this study. Such a drawback exists in all finance research that uses publicly derived financial data, however by basing the sample on those firms based on the FTSE All Share, it captures a significant portion (98%) of the UK market capitalisation of listed companies and provides the broadest scope of firms to measure against.

7.4. Future Research Suggestions and Concluding Remarks

7.4.1. Future research suggestions

This thesis focuses on divestitures and the relation to firm life-cycle, firm-, industry- and economic-distress. Even though a large scope of the three empirical topics have broadened our understanding of divestitures, there still remains a number of topics where future research would improve our knowledge in this topic.

Firstly, the major finding from the first chapter is that it is hypothesised that financial distress elements are evident in earlier life cycle-stages, where these firms with negative retained earnings display signs of financial distress, which is mostly driven by investigating a small number of accounting ratios. It would be advantageous to investigate formally the link between distress and life-cycle stages as suggested in chapter 4 and 5 of this thesis. There would be merit in examining more formally, using the three measures of distress in chapter 5, whether it is indeed distressed firms that are the predominant constituent of the negative retained earnings sample or whether there are other factors at play. It would also be interesting to introduce the type of analysis undertaken in the chapter 6, to ascertain the relationship between life-cycle stage, financial distress and the associated link between industry and economic distress.

Secondly, the motivations for divestiture should be investigated as a future priority for research in this area. The research in this thesis was unable to incorporate them due to the lack of data available for the sample period from 1988-2009. Whilst a number of proxies can be used to determine managerial decision making, the reasons cited for divestiture would be beneficial in truly undertaking the announcement reaction to the news by firm managers. Whilst a number of firms may appear to be financially distressed, those firms

may be undertaking divestiture in order to exploit future investment prospects, which are not picked up using distress variables.

Thirdly, the research on industry distress provides a promising outlook for future study. With a relatively small sample in this chapter that are defined as divesting during periods of industry distress, it would be interesting to expand the sample to include international divestitures. Expanding the sample to cover countries with larger datasets, such as the United States, would help to understand further the motivations and characteristics of those firms specifically divesting during periods of industry distress.

Fourthly, linked to the idea investigated during chapter 6, further research on the macroeconomic environment would help further the research profile in this area. This chapter has investigated firms divesting during times of various forms of distress; however there has been little divestiture research that has examined specifically the gains during positive periods and during divestiture waves. It would be interesting to incorporate divestiture volume in order to ascertain whether the market to divestiture activity impacts of the announcement returns of those firms selling assets.

7.4.2 Concluding remarks

The research on divestitures is sometimes overshadowed by the vast array of existing research on mergers and acquisitions. Whilst this thesis does not bring the existing divestiture research up to that level, it does add some knowledge (however big) in the ever growing research area that examines asset sales by publicly listed firms. Divestitures provide a good corporate restructuring approach for firms to address changes in strategy, innovation and a mechanism to deal with negative shocks related to firm performance or the state of the overall economy

The findings derived in this thesis suggest that the area of divestiture research, alongside the topics proposed for future research, make this an attractive area to continue exploring in my future research career.

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