Motives, Default Risk and Valuation Errors in Corporate Takeovers

SOPHOCLEOUS, ELENI,DEMETRIOU

Motives, Default Risk and Valuation errors in Corporate Takeovers

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Submitted for the Degree of Doctoral of Philosophy in Accounting and Finance

Durham Business School

University of Durham

2013

Author's Declaration

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Eleni Sophocleous

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Abstract

Motivated by the plethora of theories in explaining the conflicting evidence on the acquiring firms' profitability after a merger, this thesis examines how market conditions affect the most prominent takeover motives and the acquirers' abnormal returns and analyse changes in acquiring firms' default risk around the announcement on four different types of diversification. In the takeover process, information asymmetry holds a very central role, along with other firm and deal variables which release new information in the market and alter investors' views. Further, market conditions around the announcements significantly affect not only the takeover activity but also investors' beliefs and optimism which will eventually drive the acquirers' stock prices.

We first investigate the main takeover motives by analysing the wealth creation of the acquiring, the target firm and their combined gains. Firms react to both internal and external conditions by restructuring their business and takeovers are the fastest strategy to do so. Consequently, we re-examine takeover motives by incorporating the potential influence of market conditions (i.e. market misvaluation and merger waves). The results indicate that value increasing acquisitions are driven by both synergy and hubris, while value decreasing acquisitions by managerialism, after controlling for the hostility of the deal and extreme market valuations. We then turn our attention to the diversification benefits of mergers; although recent evidence suggests that mergers increase default risk for the acquiring firms, we find that due to the less uncertainty around horizontal mergers, acquirers can actually enjoy the risk-reducing diversification benefits of this related type of merger. Finally, we investigate how firm, market and industry valuation errors affect acquires performance in the UK market, after we control for multiple deals, method of payment and target type. Results suggest that although firm and deal characteristics help investors to revalue the potentials of an acquisition, investors are more likely to base their views on the state of the market/industry or the value of the firm and this will in turn drive the acquiring firms' abnormal returns.

Acknowledgements

I would like to express my deepest appreciation to my supervisor Dr. Panayiotis Andreou for his guidance and support. Without his constant help this dissertation would not have been possible. I would also like to thank Professor Rob Dixon for his understanding and support throughout this research. I thank Professor Gioia Pescetto and Professor Emilios Galariotis for their supervisions and supports they offered towards parts of my PhD study. I would also like to thank Dr. Christodoulos Louca for his help and valuable suggestions. Special thanks to the doctoral office for their help as well as for the financial support granted through a PhD scholarship.

I would like to thank my fellow graduate student and office mate during my time at Durham, Dr. Evangelos Vagenas-Nanos for his friendship and support. A special thanks to my parents and my sister for their understanding. Above all, I would like to thank my husband Andreas for his love and constant encouragement and for keeping me focused on my goals over the years.

Eleni Sophocleous

Dedication

I dedicate my PhD thesis to my mother, Margarita.

All I am I owe to you.

TABLE OF CONTENTS

LIST OF TABLES

Chapter 1: Introduction

1.1 Research Motives and Contributions

Mergers and Acquisitions are among the most popular restructuring strategies for corporate firms as numbers show that every year merger deals increase in number and in value. In 2012 the aggregate deal value of global mergers has reached 2,243.8$ bn, which is on par with 2011 deal value (2,243.9$ bn), despite the US and Europe financial crisis. The largest announcement of 2012 was Abbot Laboratories spin off of AbbVie, worth 54.4$ bn. Eurozone deals were 5.4% less than 2011's, with a total deal value of 687$ bn and accounted for 13% of global mergers. The UK and Ireland accounted for the largest proportion of deals with a 21.7% market share. European mergers (outside the Eurozone) accounted for 17.8% of the global mergers and was the best performing year since 2008 in terms of total deal value which reached 566.5$ bn. Asia-Pacific 368.1$ bn worth of deals contributed 16.4% of the global activity in 2012 while emerging markets contributed 22.8% to global mergers with a total deal value of 511.9$ bn.[1]

[1] Statistics were obtained from the most recent survey on transactions announced between 1 January 2012 and 31 December 2012 of www.mergernarket.com

To put numbers in perspective, the '2012 Intelligence Heat Chart' above by MergerMarket, shows the predicted flow of mergers based on the information relating to firms rumoured or officially up for sale in each region with the black colour being the most active region. The production path of a firm, expanding in a new industry and/or geographical area, the improvement of productivity, efficiency and competitive positioning, the value creation for shareholders and improvement of manager's career are all possibilities than can be achieved with one single move, a merger with another firm; not surprising mergers have evolved into a global phenomenon which dominates the world economic scene.

In general, mergers should be attractive to the shareholders of the firms involved if they increase the value of their shares. Value creation may result from a number of factors such as economies of scale in production, distribution and management, a technology that can be best deployed by the surviving company, the acquisition of new channels of distribution, and cross-selling of each other's products. However, empirical evidence shows that merger synergies are difficult to attain and their size can be disappointing.[2] Empirical evidence on announcement returns reveals that target and acquirer firms' returns vary depending on the characteristics of the deal. Accordingly, although there is substantial evidence that target firm shareholders enjoy significantly positive announcement abnormal returns of about 30% irrespective of the takeover mode (i.e. friendly or hostile), acquirer firm shareholders generally gain either significant negative, zero or positive announcement- and post-acquisition returns.[3] Consequently, the literature on mergers has concentrated into other influences that induce a firm to engage in a merger.

Through mergers, firms expect to realize technological and marketing synergies by expanding in a new stage of production, a new industry and/or a new geographical area, to reduce costs, increase productivity and/or efficiency of corporate resources, and improve competitive positioning. Efficiency theory (Bradley et al., 1983), neoclassical theory (Gort, 1969; Harforf, 2005), hubris theory (Roll, 1986), managerial theory (Jensen, 1986) and

[2] See for example Moeller, Schlingemann and Stulz (2005), Savor and Lu (2009) and Fu and Officer (2013).

[3] For evidence on announcement and post-acquisition returns see Asquith (1983), Jensen and Ruback (1983), You, Caves, Smith and Henry (1986), Dennis and McConnel (1986), Jarell, Brickley and Netter (1988), Bradley, Desai and Kim (1988), Lang, Stulz and Walking (1989), Jarell and Poulsen (1989), Franks, Harris and Titman (1991), Agrawal, Jaffe and Mandelkar (1992), Bhagat and Hirshleifer (1996), Schwert (1996), Cotter, Shivdasani and Zenner (1997), Loughran and Vijh (1997), Rau and Vermaelen (1998), Ghosh and Lee (2000), Mulherin and Boone (2000), Akhigbe, Borde and Whyte (2000), Bruner (2002), Fuller, Netter and Stegemoller (2002), Billet, King and Mauer (2004), Fee and Thomas (2004), Moeller, Schlingemann and Stulz (2005), Savor and Lu (2009) and Fu and Officer (2013)

misvaluation theory (Shleifer and Vishny, 2003) are a few schools of thought that have extrapolate upon traditional theories seeking to explain merger activity.

One of the most distinct patterns in mergers is the cyclical pattern of the deal activity. In the history of mergers, US has led the way for the merger activity for well over 100 years, and more than 5 major merger waves have been recorded since the early 1900s. Although some characteristics seem to be consistent across the history of mergers, each wave has been distinctly different from the others in many ways. Merger waves are in general the result of a combination of market and legal factors that intrigue firms to engage into mergers.

The literature of finance has repeatedly discussed the correlation between merger activity and various market conditions. Assuming the firms react to both internal and external conditions, changes in the market can have an impact on the firm in such way that the firm is appealed to persuade a merger. In general the level of stock markets appears to be a very important factor in the takeover process. A booming market is often an indicator of the overall economy's state and a signal of firms' future profit potentials. The history of mergers shows that periods of intense takeover activity coincide with periods of high market valuation. The market momentum allows firms to raise finance easily through the issue of new equity, and offer these shares as the medium of exchange in mergers and consequently, the merger activity increases.

There are also considerable differences between levels of merger activity during industry specific shocks. Market and regulatory conditions facilitate industrial shocks at which firms are required to make major changes and restructure their activities. Mergers and acquisitions are one of the easiest and fastest corporate restructuring strategies. Mitchell and Mulherin (1996) shows that mergers waves tend to be caused by a combination of market, regulatory and technological shock which motivates firm to expand by taking over another firm, instead of growing internally. Harford (2005) shows that industry shock alone are not enough to trigger a merger wave and that industry shocks are not a necessary condition but an excuse for firms to mimic their counterparts and restructure.

It is widely acknowledged in the literature that the firm's true value and future growth potential significant affects takeover process and profitability. Several studies have shown that high growth firms outperform undervalued firms in the post acquisitions period (Rau and Vermaelen, 1998; and Sudarsanam and Mahate, 2003). However, low growth firm seem to

increase shareholders wealth around the announcement, perhaps because the market recognizes the acquiring firm's potential for subsequent wealth creation.

The first empirical study of this thesis, 'Chapter 2: The Impact of Market Conditions on the Motives for Mergers and Acquisitions' considers the relation between acquirer, target and total gains (Berkovitch and Narayanan, 1993, henceforth BN method) to distinguish among the three prominent merger motives in the US takeover market. Given the central role of market conditions in the takeover activity, we also investigate whether motives change in the present of market misvaluation or during different merger waves. Furthermore, we extent BN method to control for several variables which have been identified in the literature to significantly affect takeover process. Our results show that despite the hostile nature of tender offers, both tender and non-tender offers are driven by synergy. We argue that since the introduction of the Best Price Rule in the late 1980s the nature of tender offers is as friendly as mergers and therefore there are no differences between the two mode of mergers. We also find that value-increasing acquisitions are driven by both synergy and hubris, whereas value-decreasing by managerialism. According to investor sentiment hypothesis, during high (low) valuation periods markets optimism (pessimist) intensifies investors' positive (negative) expectations. Therefore an acquirer is more likely to be overconfident during periods of high market valuation than in neutral periods and this can explain the co-existence of synergy and hubris during high valuation periods and pure synergy in neutral valuation periods.

In the second empirical chapter, 'Chapter 3: Diversified Mergers and Default Risk' we examine whether mergers realize the benefits of different types of diversification in terms of default risk. The literature on mergers is not conclusive about the direction of acquiring firms' default risk after a merger. Although, one might expect that diversification would lead to lower levels of risk, recent empirical evidence (Furfine and Ronen, 2011) shows that mergers increase risk.[4] We analyse changes in default risk between the period before the announcement and after the completion, on four types of diversification; vertical, horizontal, mixed vertical/horizontal and conglomerate. Default risk is estimated using a dynamic logit model of accounting and market data, while the level of vertical integration is calculated using industry commodity flow information from the Use table of Benchmark input-output tables as in Fan and Goyal (2006). Our results show that the increase in default risk is mainly driven by public firms and firms with higher idiosyncratic risk and that horizontal mergers

[4] Hagendorff and Vallascas (2011) provide evidence on managers' risk choices from bank acquisitions.

once combined with other deal/firm characteristics can decrease default risk in the post acquisitions period. We conclude that information asymmetry regarding the nature of each diversification type may impact acquiring firms' default risk. Our results remain robust to various factors related to takeover process and performance.

Finally, recognizing that UK takeover market represents the more active part of Eurozone, the last empirical chapter of the thesis 'Chapter 4: The source of misvaluation and UK takeover profitability' investigated the source of misvaluation and the profitability of the UK acquirers. We examine how firm, market and industry valuation affect the acquiring firms performance around the announcement and in the long-run period, after we control for various factors which have been found to affect takeover performance. Our results show that valuation errors stemming from the firm, the market and or the industry are equally important in driving the acquiring firm's performance. We suggest that although deal and firm characteristics help investors to revalue the potentials of the acquisition, investor sentiment significantly affects investors in the presence of misvaluation and in turn drive the stock prices.

Our research contributes to corporate takeover literature and further enables our understanding regarding the true motives of acquisitions during merger waves, booming or depressed periods, the impact of different type of merger diversification on acquirer's default risk after the merger completion, and finally the equal important role of firm, market and industry valuations, as well as the deal and firm characteristics in shaping investors' opinion about the profitability of the merger.

Chapter 2: The Impact of Market Conditions on the Motives for Mergers and Acquisitions

2.1 Introduction

Intrigued by the worldwide increase in deal announcements during the last two decades, an increasing body of literature has concentrated in exploring takeover motives, process and the controversies surrounding takeover outcomes. Although traditional theories view takeovers as corporate restructuring activities which create value by improving efficiency and productivity, empirical evidence shows that the majority of takeovers fail to reach shareholders' expectations. Evidence on bidding firms wealth loss (see for example, Dodd, 1980; Bradley, Desai and Kim 1988; Franks et al., 1991; Andrade et al., 2001) highlight the need to further investigate the takeover motives. Among these research efforts, alternative building blocks of theories have created suggesting that acquiring firms are motivated by reasons other than value creation. Counter-arguments suggest that takeovers destroy value because are driven by managerial objectives. Among others, hubris and managerialism theories have been advanced in the literature. According to Roll (1986) managers are infected by hubris and thus overestimate their own abilities, mis-valued both the target firm and the prospects of the acquisitions and end up overpaying the target firm. Within similar lines, managerialism hypothesis suggest that managers who pursue their own personal objectives instead of aiming to maximize shareholders' wealth tend to overpay the target firm. For example, Shleifer and Vishny (1990) explain that managers will engage in acquisitions within the same line business or to secure their job position.

Nevertheless, despite that the most obvious motive for a merger is to improve a firm's financial performance, some acquisitions are contacted for reasons others than the best interest of shareholders. Such acquisitions are usually focused on the self-interest of managers. Understanding the key motives of a takeover makes it easier to evaluate the likely success or failure of the deal. The focus of this study is to investigate the primary motives for a sample of US Mergers and Acquisitions from 1980 to 2010 and distinguish between the three most important motives; synergy, managerialism and hubris.

One of the most distinct patters in mergers is the cyclical pattern of the deal activity. Thus far, six merger waves have been examined in the literature: 1900s, the 1920s, the 1960s, the

1980s, the 1990s and the 2000s.[5] The rise and fall of each wave can be traced on various reasons, such as technological shocks, agency problems, managerial hubris and market timing. For example the fourth merger wave, 1980s which marks the beginning of our sample period, emerged when the previous wave with the inefficient conglomerate acquisitions came to an end.

Behavioral theories suggest that merger waves are more likely to occur during periods of high market valuations. In addition, during high valuation periods certain deal characteristics have been found to be used more frequently. For example Shleifer and Vishny (2003) show that during the bull market of the 1990s, the main method of payment is equity, since overvalued acquirers take advantage of the so-called mispricing premium of their firms and the less overvalued targets. Recent literature provides supporting evidence on the link between takeover activity and market conditions, and finds that a number of deals result in value destruction projects (Moeller et al., 2005). Such deals suffered from agency problems and are more likely to be driven by managerialism rather than synergy. Jensen (2004) discusses the agency costs of overvalued firms that are likely to change the incentives of the managers and as he explains when a firm is overvalued 'it is not whether you are going to lose the game, but when you are going to lose it, and the costs are enormous'. When markets are flourishing, and a firm's stock is overvalued, the managers will have access to low cost-of-capital funds from their overvalued equity but also from the debt markets. Managers who hold equity-based compensation (such as options) have the incentive to invest using the firm's equity because they will increase their own wealth. Acquisitions with firms whose stock is less overvalued are an ideal investment opportunity. These managers are more likely to be driven by managerialism or hubris; eventually they will have to justify firm's overvaluation with high firm performance that will not be able to deliver.

Takeover motives are difficult to observe mainly due to existence of different managerial motives in any sample and also due to the noise created by that other factors affecting takeover process. In this chapter, we consider the relation between wealth gains for target and the acquirer, as well as the ones between the target and the total gains to distinguish among the three prominent merger and acquisition motive that dominate US takeover market during the period of 1980 to 2010. We investigate whether our results change across various market conditions such as merger waves, and market valuation periods (high, neutral and low). Such

[5] Alexanridis et al., (2012)

an investigation is essential since market conditions and different market periods influence investment decisions in different fashions [Shleifer and Vishny (2003); (Polk and Sapienza, 2004)].

Further, we extent Berkovitch and Narayanan (1993) methodology on takeover motives, henceforth BN method, from a simple regression analysis to a more dynamic form by controlling for other variables that might affect takeover process and see how these variables alter the relation between target, acquirer and total wealth gains. Schwert (1996) uses regression analysis to study the effects of pre-announcement stock price run-ups on the premiums in a merger sample. Although single regression analysis is inconclusive, multiple regression analysis combines the effects of different characteristics (i.e. pill, auction, success, news, tender offer, management buyout (MBO), cash, and equity). Gaspar, Massa and Matos (2005) investigate the relation between investor turnover and investment horizon and use multiple regression analysis to control for various characteristics that might be related with investor turnover except investment horizon.

Previous studies on takeover motives have concentrated on the hostile nature of acquisitions. For example Berkovitch and Narayanan (1993) investigate a sample of tender offers from 1963 to 1988 and find that overall synergy is the primary motive. Our analysis includes both forms of takeover, tender and non-tender offers announced between 1980 and 2010. Tender offer is a form of a hostile takeover. If a takeover is hostile that means that the manager of the target firm was not in favour of such takeover and usually in such an acquisition, the target's managerial team is replaced. The acquirer makes public his intentions to buy the target firm's shares at a specific price and period and usually includes a premium over the current market price to encourage the target firm to complete the deal as soon as possible. In such type of merger where the acquirer contacts the target firm's shareholders directly, the transaction is usually much faster than a merger, there are less regulatory delays, the information asymmetry between the two parties minimizes and the acquirer does not face any competition. Acquirers' main motives for a tender offer are to increase profitability, to enter a new market, a new industry, a new distribution channel or a customer group, and to achieve technological advances. Evidence on acquiring firms abnormal returns indicate that acquirers that make tender offers outperform all other acquisitions (Agrawal et al., 1992 and Loughran and Vijh, 1997). Given the synergetic differences on the hostile nature of acquisitions we investigate whether the motives differ in each group.

Overall, our results show that both tender and non-tender offers are driven by synergy, value-increasing acquisitions are driven by both synergy and hubris, whereas value-decreasing by managerialism.[6] The latter finding remains robust across high and low valuation periods, where during low valuation periods the primary motive is synergy for value-increasing acquisitions and managerialism for value-decreasing acquisition. Our results suggest that i. the hostile nature of the deal will not affect the primary merger motives and ii. the state of the market is an important driver of the takeover motives. Historically, a tender offer was viewed as a hostile takeover. However the introduction of the Best Price Rule (14d-10) in the late 1980s by the Securities and Exchange Commission (SEC) brought the end of hostile takeovers since the acquirer has to offer the same price to both blockholders and other investors. The adoption of state antitakeover laws in the late 1980s and revisions to the Best Price Rule in 2006 made tender offers as friendly as mergers (Bertrand and Mullainathan, 2003; and Offenberg and Pirinsky; 2012). Thus not surprising we find that the hostility nature of the deal will not affect the takeover motive. Bouwman et al (2009) show that market conditions affect corporate decisions and the acquisition performance. Further, according to investor sentiment hypothesis, during extreme valuation periods, markets optimism can intensify investors' positive expectations and vice versa. Thus a manager would be more optimistic in high valuation periods and therefore more likely to be infected by hubris or overconfidence than in a neutral valuation period. This explains why we find that value increasing acquisitions during neutral valuation periods are driven solely by synergy whereas these acquisitions are driven by both synergy and hubris during extreme valuation periods.

In addition, we identify significant differences during merger wave periods. We find that in general that value increasing acquisitions are driven by synergy and value decreasing acquisitions by hubris in the first two wave periods of our sample whereas during the last wave period that value increasing acquisitions are driven by hubris and value decreasing acquisitions by managerialism. The differences in motives within the merger waves might be relevant with the differences that have been documented as to the characteristics of each merger wave. For example, the 1980's wave is very large in terms of activity and the size of the target firms. Most of the acquisitions during this period were hostile, the medium of payment was cash (through leveraged takeovers) rather than stock and they were characterized by heavy use of leverage. The next wave period in the 1990's, was

[6] Our main results are in line with previous studies; Berkovitch and Narayanan, (1993), Seth, Song and Pettit, (2000) and Hodgkinson and Partington, (2008).

characterised by technological advances involves larger cross-border mergers, and high stock valuations that initiate the use of stock as a method of payment. The 2000s wave is characterized by large private equity players, high market valuations, large premiums, low interest rates and a financial crisis that started from the loan market and spread to the house market.

2.1.1 Motives for Takeovers

As the competition in the capital markets intensifies, firms have focused on increasing their market shares by engage into value enhancing projects to improve their efficiency and productivity. Mergers and Acquisitions are a popular corporate restructuring activity since they enable resources to move quickly and create benefits for the acquirer and the target firm. Traditional theories describe acquisitions as value-enhancing activities suggesting that are merely executed for synergistic reasons. However, counter-arguments suggest that acquisitions are motivated by reasons others than maximising shareholders' wealth. Empirical studies show that, overall, takeovers generate significant wealth for the combined entity. However, gains are not distributed evenly across the two firm that are involved in the transaction, but instead target shareholders enjoy large wealth gains, whereas shareholders of bidding firms suffer from wealth destruction (see for example, Dodd, 1980; Bradley, Desai and Kim, 1988; Franks et al., 1991; Andrade et al., 2001).

Several schools of thoughts have been developed in an attempt to rationalize the takeover controversy of motives and outcomes. The efficiency theory views takeovers as activities which generate cost-reducing synergies, and therefore improves the combined firm's operations 9Bradley et al., 1983 and 1988). The neoclassical theory suggest economical, technological and regulatory changes lead to industry re-organizations and asset re-allocation that firms utilize through mergers and acquisitions (Gort, 1969; Mitchell and Mulherin, 1996 and Harford, 2005). Synergistic acquisitions should generate value for the combined entity. The target firm usually receives an acquisition premium and the bidder firm realizes shareholders wealth by capturing synergies above the cost of the acquisition. Additionally, target gains should increase with any increase of total gains depending on the level of target firm bargaining power. For example, the more the competition among bidders, the higher the target gains would be. Managerialism and Hubris theory focus on a firm-specific level that was left un-explored by the traditional theories. By relaxing the assumption of rational

managers, both theories suggest that managerial motivations, rather than maximising shareholders' wealth, are the driving forces of takeover activity and this explains the bidding firm wealth destruction. (Roll, 1986; Morck et al., 1990; Jensen, 2005; and Song, 2007).

Hubris hypothesis by Roll (1986) provides an alternative explanation for the takeover activity, where managers are infected by hubris and excessive self-confidence. To explain the value destroying takeovers, Roll explains that target selection is based not on pure economic gains as neoclassical or efficiency theory suggest, but instead on managers personal factors. Managers infected by hubris, overestimate their abilities to value and restructure a firm and end up overpaying over-valued (or not) target firms. Hayward and Hambrick (1977) find that overconfident managers pay substantially higher premiums than rational managers. A more recent study by Malmendier and Tate (2005) use unexercised options that managers hold to measure confidence level, and find that overconfidence managers engage into more and less successful acquisitions. Moeller, Schlingemann and Stulz (2004) show that managers of larger firms pay higher premiums probably because they feel more capable to make a successful acquisition.

Within similar lines, managerialism hypothesis suggest takeovers are driven by managerial motives but according to this theory managers consciously pursue their own personal objectives at the cost of their shareholders (Seyhun, 1990). Shleifer and Vishny (1990) explain that managers will engage in acquisitions within the same line business to en-power their position in the firm or to secure their job position if they feel threaten or to extract higher salary/bonus. Amihud and Lev (1981) find that conglomerate acquisitions merely result from agency problems, since risk diversification does not benefit shareholders. Jensen (1986) suggests that sometimes if a firm's cash reservals are enough, managers would avoid pay out dividends to re-invest resources to projects such as acquisitions that can increase their private benefits. A recent study by PWC (2012) explains that the top challenges to realizing synergies are i. delays in implementing planned actions, ii. Integration costs/complexities were underestimated, iii. Potential synergies and cost savings were overestimated and iv. lack of accountability for particular actions. Some synergistic acquisitions mean headcount reduction, overhead reduction and increasing purchase power by entering into a new market, a new customer base or a new business line. Managers who feel that they will be replaced would search for other investment opportunities to pursue their own personal benefits.

2.1.2 BN (1993) Methodology

To distinguish between the three main motives for mergers and acquisitions we follow a methodology initiated by Berkovitch and Narayanan (1993) and later altered by Seth, Song and Pettit (2000). The first indication of the motive of the merger is the gains of i. the bidder firm, ii. the target firm and iii. the total gains. The second indication is i. the correlation between target gains and total gains and ii. target gains and acquirer gains. Table 2.1 summarizes this approach's basic predictions.

[Table 2.1]

Accordingly, target firms enjoy positive abnormal returns irrespective of the takeover motive, whereas bidder and total gains fluctuate from zero to positive or take negative value depending on the motivation. In a synergistic acquisition the combined value should be greater than the sum of bidder and target value. We expect total gains to be positive and bidder gains to be positive or zero depending on the competition level between bidders. In the event of a bidding contest, target firm's gains will increase with the level of bargaining power and will be extracted from total gains, thus we expect the correlation between the two to be positive. Correlation between target and acquirer gain can be either zero in the extreme scenario of high competition where acquirer gains would be zero or positive if the level of competition is lower, and acquirers realize positive gains.

In acquisitions driven by hubris, managers overpay target in value-decreasing projects. Since these acquisitions do not create any value, target gains are merely a transfer from bidder gains thus target and acquirer gains will be negatively correlated and target and total gains would be totally un-correlated. Bidder should experience negative gains, and total gains should be zero. In the event of bidder competition, these predictions should become stronger, with bidder gains becoming more negative target gains more positive and total gains to remain zero.

Acquisitions driven by managerialism would be overall value decreasing since are executed for reasons other than shareholder's wealth maximisation. Bidders would experience negative wealth gains but target would still enjoy positive returns. The greater the bargaining power of the target firm, the higher the target gains would be and the lower bidder and total gains are. Therefore, target gains would be negatively correlated with both total gains and acquirer gains.

All three motivations might be present in the entire sample and we might not be able to conclude which is the primary motive. Since each hypothesis has opposite effects, it is possible that they cancel each other out. To address this problem, total gains are divided into two sub-groups; positive total gains and negative total gains. The positive total gains group will contain value-increasing acquisitions and therefore managerialism hypothesis can be ruled out from this group of acquisitions. We expect that these acquisitions would be mainly driven by synergy. However in the positive total gain group, hubris might be present but in a weaker form. If both of these motivations are presented in the sample then target gains would be positive, bidder gains can be from negative to positive and total gains would be zero to positive depending which is the strongest motive. To clarify this, the correlation between target and acquiring firms gains is examined, within both acquisitions with positive and negative acquirer's gains. If synergy is the primary motive then target and acquirer correlation would be positive and there would be no difference in the correlation between the two within positive and negative acquirer gains' groups. If synergy and hubris co-exist, then target to acquirer correlation would be positive in the positive acquirer gains' group and negative in the negative acquirer gains' group.

The negative total gains group of acquisitions would contain value-decreasing deals thus synergy can be eliminated since is predicts positive total gains and we have to distinguish between hubris and managerialism. Target and acquirer gains correlation for these two hypotheses predict a negative relationship and thus we use target and total gain correlation which predicts no relationship in the event of hubris and negative relationship in the event of managerialism.

Relation between Target and Total Gain under BN (1993):

$$\text{Target Gain} = \alpha + \beta_1(\text{Total Gain}) \tag{2.1}$$

Relation between Target and Acquirer Gain under BN (1993) and Seth et al. (2000):

$$\text{Target Gain} = \alpha + \beta_1(\text{Acquirer Gain}) \tag{2.2}$$

$$\text{Target Gain} = \alpha + \beta_1(\text{Acquirer Gain}) + \beta_2(\text{Acquirer Gain} \times \text{Dummy}) \tag{2.3}$$

where Dummy = 0 if acquirer gain is positive
= 1 if acquirer gain is negative

2.1.2.1 Additional Proxies

Total gains are a well-accepted proxy for synergy. However, the differences between hubris and managerialism are sometimes difficult to pin point and therefore for robustness purposes we use additional proxies to distinguish between the latter two motives. We adopt Net buyer measure of Malmendier and Tate (2005) to capture hubris and G-Index to capture managerialism.

Under hubris hypothesis of Roll (1986), managers overestimate their own abilities (i.e. they are overconfident) and incorrectly assess the value of the target firms. According to Malmendier and Tate (2005), overconfident managers are the ones who fail to reduce their personal portfolio exposure to firm-specific risk as captured by the portion of their equity-based compensation or their stock holdings and their human capital investment in the firm. Net Buyer measure of overconfidence or hubris, takes the value of 1 if the manager of the acquiring firm does not reduce his stock holdings across a period of at least 6 years and zero otherwise. Malmendier and Tate (2005) and Heaton (2002) find evidence that overconfident managers overestimate the returns of the merger and overpay the target firms. Kaplan and Robinson (2003) show that bidders offer higher premiums when they are overconfidence but not in the presence of agency (managerialism) problems. Andreou et al., (2011) also uses Net buyer measure and investigates the role of managerial overconfidence in corporate

diversification and show that overconfident managers are more likely to manage diversified firms.

Under the managerialism hypothesis or private benefits hypothesis, mergers are driven by the manager's personal interests. These managers choose projects that will maximize their welfare at the expense of acquirer shareholders (Mitchell and Lehn, 1990; Berkovitch and Narayanan, 1993). These managers are more likely to invest on low-benefit or value-destroying mergers as long as they increase their personal interests (Servaes, 1991; Land, Stulz and Walking, 1989, 1991). The Government index or G-Index or GIM, is an index for US public firms related to shareholder rights and managerial entrenchment (Gompers, Ishii and Metrick, 2003). It shows 'the balance of power between shareholders and mangers' and therefore can be used to capture agency or managerialism problems. G-Index can take values from 1 to 19 and firms are categorised into 10 groups; Firm with a G-index $\geq$ 14 (Dictatorship Portfolio) have the 'weakest shareholder rights' or the 'highest management power', while firms with a G-index $\leq$ 5 have the 'strongest shareholder rights' or the 'lowest management power' (Democracy Portfolio).

2.1.3 Extended BN (1993) Methodology

We extent Berkovitch and Narayanan (1993) method by controlling for other variables that might affect the takeover process and see how they affect the correlation between target, acquirer and total wealth gains. It is highly possible that different variables might be correlated with the motives behind a takeover, other than market-related such as valuation and wave periods. Multivariate analysis helps us investigate the correlation between gains and one independent variable set. We identify deal-related factors that have been documented in the literature of mergers and acquisitions to affect acquisition process and investigate how these variables change the correlation analysis across out three main sub-samples; the entire sample, the tender offers sample and the non-tender acquisitions. Following Schwert (2000), and Officer (2003) we include certain deal characteristics in an attempt to disentangle the separate effects of these variables on takeover motives.

Relation between Target and Total Gain – Extended BN Approach

$$\text{Target Gain} = \alpha + \beta_0(\text{Total Gain}) + \sum_{k=1}^{9} a_k D_{ki} + \sum_{k=1}^{9} \beta_k D_{ki}(\text{Total Gain}) + \varepsilon_i \quad (2.4)$$

Relation between Target and Acquirer Gain – Extended BN Approach

$$\text{Target Gain} = \alpha + \beta_0(\text{Total Gain}) + \sum_{k=1}^{9} a_k D_{ki} + \sum_{k=1}^{9} \beta_k D_{ki}(\text{Acquirer Gain}) + \varepsilon_i \quad (2.5)$$

The intercept $\boldsymbol{\alpha}$ and the slope $\boldsymbol{\beta_0}$ change as the characteristics of the deal change; the dummy variables $\boldsymbol{D_{ki}}$ equal one if the k^{th} characteristic applies to case i and zero otherwise. For each portfolio we run two different regressions where the depended variable, Y is always Target Gain and independent variable, X is Total Gain in the first regression and Acquirer Gain in the second.

[Table 2.2]

Table 2.2 shows the descriptive statistics for the explanatory variables we use in the regressions analysis. Completion is a dummy variable indicating whether the acquisition has completed or not. Competing bids shows if multiple acquiring firms were interested for the target firm in the following six months, Hostility is a dummy variable that shows is the attitude of acquisition was unsolicited (0) or hostile (1), Toehold is a dummy variable that equals one if during the announcement, the acquirer owns more than 5% of the target or zero otherwise and Cash (stock) is a dummy variable that equals one if the acquirer firm offers 100% cash (stock) to the target firm.

Withdrawn mergers have been used as a signal about CEO quality (Jacobsen et al., 2013). Accordingly, when the manager withdraw its offer rather than raise the offer price, may perceived positively by the shareholders and the quality of the manager. Such managers are more likely to be motivated by synergy rather than managerialism or hubris. Competing bids, or an acquisition battle is when multiple acquirers bid for the same target. Evidence show that the winner of the contest is worse off after the merger completion (Pepall and Richards;

2000). We therefore expect that the acquirers of such acquisitions will not be motivated by synergy. In a toehold the acquirer usually buys less than 5% of the target firm's equity. The market usually perceives a toehold as a precursor to a hostile takeover. Cash and Stock variables count for the method of payment used in the transaction. As explained above, stock offerings are more likely to happen if the stock is overvalued (Shleifer and Vishny; 2003) and it is more likely that managers will be infected by hubris or managerialism rather than motivated by synergy.

2.1.4 The Importance of Misvaluation and Wave Period

This study contributes to corporate acquisition literature and further enables our understanding of the important role of market conditions on takeover motives and the wealth effects of takeovers. Empirical research has concentrated on the relation of misvaluation and wave periods and various characteristics of takeover process. Acquirer and acquiring firms' decisions are naturally associated with factors affecting firms' valuation and market conditions around the announcement period. For example, according to Shleifer and Vishny (2003) mis-valuation can serve as an important driving force for a takeover decision and suggest that stock acquisitions are usually driven by overvaluation. The idea is that rational managers can correctly value their firms but markets cannot, either due to information asymmetries or market inefficiencies. Manages can take advantage of mis-valuation by offering their overvalued stock as the primary mean of payment in a less overvalued target firm or targeting undervalued firms. However, stock payments are considered negative information signal and at the merger announcement the market will correct its mistake through stock price, generating loses for the bidder.

Bouwman et al., (2009) show that market conditions affect corporate decisions and acquisition performance. There are also a plethora of empirical evidence showing that market valuation affects the characteristics and the outcome of the merger. Rhodes-Kropf and Viswanathan (2004) theoretically modelled Shleifer and Vishny (2003) idea and show the significance of mis-valuation in the takeover process. Dong, Hirshleifer, Richardson and Teoh (2006) provide evidence that market mis-valuation affects takeover process. The authors find that bidder and target mis-valuation will affect takeover volume, and characteristics like the method of payment, the premium, the type of acquisition (i.e.hostile), the successful probability and the wealth gains. Ang and Cheng (2006) finds evidence of

overvaluation in stock payments but this should not be the rule. Rhodes-Kropf (2005) recognizes the importance of mis-valuation for takeover activity but suggest that a combination of factors drive this activity.

Motivated by the under-researched misvaluation assumptions and the potential effects on takeover motives, this study builds on BN method and examines the potential influence of misvaluation. According to investor sentiment hypothesis, during extreme valuation periods, market optimism can intensify investors' positive expectations and vice versa. Thus a manager would be more optimism in a high valuation period rather than a neutral valuation period. The state of the market would also affect the target firm views about the prospect of a merger. The differences in valuations will affect the views of acquiring firms' managers and this in turn should be reflected in the primary takeover motives.

One of the most distinct patters in mergers is the cyclical patter of the deal activity. In our analysis we search for differences in takeover motives during different periods based on the three waves that are presented in our merger sample. The first wave period of our sample is the 1980's divestiture wave. A lot of firms during this period were considered to be undervalued and thus were mainly financed with cash. We expect that during this wave the majority of acquisitions will be driven by synergy or hubris. Technological advances is the most significant feature of the next merger wave in 1990's. During this period, the acquisitions were quite large in size and the high market valuations motivated firms to use their overvalued stock to make acquisitions. Overvaluation tends to pressure firms to get rid of their over-valued stock and thus we expect to see fewer synergistic acquisitions and more value-destroying deals. The third wave period that we investigate in the merger wave started in 2000's and peaks around 2005. Around this period, markets become globalized, market valuations are considered to be high, and the average premiums paid to the target firms are also large. 2007 is the year that the loan, bank and house market crisis hits the US market, and spreads across all Europe who responded with a reduction of interest rates, tight credit criteria and with financial austerity in all aspects of the economy. This would be the start of the depressing period for the last wave. We expect different wave periods to be associated with different merger motives due to the different characteristics of each wave.

2.2 Data Description

2.2.1 Sample Description

The US Mergers and Acquisitions (M&A) sample is from Thompson One Banker database. A list of mergers, acquisitions and tender offers is selected announced between 1980 and 2010. The deals involve public US bidders and domestic or foreign public targets.[7] Neither the bidder nor the target is a government, healthcare, a utility, a bank, a real estate or a financial institution. Restrictions on deal value (deal value is the total value minus fees and expenses, paid by the bidder) and relative size (ratio of deal value to the bidder market value) do not influence our finding and thus are not applied.[8] Finally, we require information about all explanatory variables we use in our regression analysis to be available. This further reduces our sample. Our final sample size comprise of 3533 bid announcements.

To calculate bidder, target and total gains us follow Bradley, Desai and Kim (1988) and Bekovitch and Narayanan (1993) methodology. First, we calculate the cumulative abnormal returns (CAR) for a five-day window (-2, +2) around the announcement date for all firms. To estimate abnormal returns we use the market model with a minimum estimation length of 90 days and a maximum of 255 days. Then, target gain is computed by multiplying the target's CAR by the market value 11 days prior to the announcement, minus the value of the target shares held by the bidder. Bidder gain is calculated by multiplying bidder's CAR by the market value of the acquiring firm 11 days prior to the announcement. Total gain is the sum value of target and bidder gain. To examine the robustness of our findings we use different announcement windows (i.e. -1, +1) and perform our analysis using equally returns. Our results remain robust.[9]

2.2.2 Valuation and Wave Classification

We use Bouwman, Fuller and Nain (2009) P/E method to classify our sample into different valuation periods (i.e. high, neutral, low). This classification method requires correcting the monthly market P/E ratio of S&P 500 by removing the upward trend. We obtain the P/E data

[7] We also request that the bidder owns less than 10% prior to the deal and obtains more than 50% after the deal and find that our results remain robust (Fuller et al., 2002).
[8] To ensure that the findings are not sensitive to the relative size or the value of the deal, we perform the analysis excluding from the sample the 5% smaller relative size deals and deals that have deal value less than 5, 10 and 50 million dollars.
[9] Our results remain robust when using equally returns or market adjusted returns.

from Bob Shiller website[10] and detrend the P/E ratio 'by removing the best straight-line fit from the P/E of the month in question and the previous 60 months' as Bouwman, Fuller and Nain (2009). A high-valuation month is the one that i) its detrended P/E ratio is above its 60-month average and also ii) it belongs in the top-half of all the above-average months of our sample. A low-valuation month is the one that i) its detrended P/E ratio is below its 60-month average and ii) it falls into the bottom half of the below-average months of our sample. The rest months are classified as neutral-valuation months. Bouwman, Fuller and Nain (2009) shows that alternative classifications of valuation periods[11] do not alter the pattern of the results. Using P/E classification method, 816 announcements (23% of the overall sample) fall into high-valuation period, 951 (27%) into low-valuation period and 1766 (50%) in neutral-valuation period.

[Table 2.3]

Table 2.3 presents the descriptive statistics for target, bidder and total gains, and CARS to target and bidder for a five-day window (-2, +2) around the announcement date for the entire sample and all sub-samples that we anticipate to find differences in the driving motivations. Panel A shows the descriptive statistics for total gains, and CARs to target and bidder firms for the event period (-2,+2). Panel B and C shows the descriptive statistics of the tender offers and non-tender offers respectively. In each panel, we present total number of acquisitions (N), the ratio of acquisitions with positive to negative total gains, the mean, median, min and max values. For the entire sample, mean target gains are significantly positive ($83.44mil.) irrespective of the valuation or the wave period. This pattern remains in both tender and non-tender offers. There seem to be a substantial increase of the mean target gains in announcements during low-valuation periods, (i.e. $122.23mil. for the entire sample, $146.43mil. for tender offers, and $115.41mil. for non-tender offers) and also, during the latest wave period ($128.84mil. for the entire sample, $150.59mil. for tender offers, and $122.72mil. for non-tender offers). The average target CAR is 24.12% and remains positive in all portfolios. We observe a significance increase in the average target CAR during Tender offers and especially in the latest merger wave that the CAR almost doubles. Mean bidder gain is negative, -$93.39million and remains negative within all valuation and wave periods. However, it becomes more negative during high and low valuation periods for both tender

[10] www.irrational exuberance.com

[11] Market valuation methods: S&P Index Level, Quarterly P/E ratio, Equal P/E ratio, Standard Deviation P/E Ratio, Market M/B ratio (median M/B ratio of all publicly listed firms), Industry M/B ratio (median M/B ratio of all publicly listed firms in that industry)

and non-tender offers, and during the latest wave period. The severity of bidders' losses decreases within neutral valuation periods and during the first wave period (1980-1990). The differences in mean gains comparing the first and the latest wave period might be due to the increase in the size of firms and value of the deals during the latest wave period comparing with previous wave periods. Mean Bidder CAR is negative, -1.56% and remains negative except during tender offers which becomes small positive of 0.15% due to the positive CARs in neutral valuation periods (0.61%) and in the second merger wave (1.01%). Interestingly, mean total gains are only positive during low valuation periods within the entire sample, tender and non-tender offers and during the second wave period (1991-2000) for only tender offers. For the entire sample, 53% of deal announcements yield positive total gains, which suggest that the primary motive is synergy. This rate increases when the offer is tender (57%), and during low valuation periods (57%) and falls to 51% for non-tender offers and during high and neutral valuation periods (52 and 51%).

2.2.3 Results

2.2.3.1 Univariate Regression Analysis

Table 2.4, 2.5 and 2.6 present the results of the regression analysis of target gain to total and bidder gain, for the entire sample, and for the sub-sample of tender offers and non-tender-offers respectively. In Panel B and C of each table we show how the motivations alter during i) different valuation periods and ii) different merger waves. Previous studies on takeover motives may suffer from the confounding effects of merger related characteristics. We examine the potential influence of market conditions during high, neutral and low valuation periods and across the most significant merger waves on takeover motives, conditional on takeover characteristics.

[Table 2.4]

For the entire sample, the higher proportion of acquisitions with positive total gains, the negative bidder gains, positive target gains and negative total gain indicate that the main motivation is managerialism. In the positive total gains sub-sample, we find a positive and statistically significant relationship between target and acquirer gains ($\boldsymbol{\beta_1}$) and a negative and statistical significant relationship between target and acquirer gains ($\boldsymbol{\beta_1 + \beta_2}$) consistent with the co-existence of synergy and hubris hypothesis. For the negative total gains portfolio,

there is a negative relationship between target and acquirer gains as give by both hubris and managerialism hypotheses. Target and total gains correlation, indicate the existence of synergy for the entire sample and the positive total gains sub-sample due to the statistical significant positive coefficients. The sub-sample of Negative total gains indicates a negative relationship between the target and total gains and thus suggests that in this sub-sample managerialism is the driving motive.

For high and neutral valuation periods we observe an identical pattern as within the entire sample, except that neutral negative total gains sub-sample indicate the existence of hubris as the primary motive instead of managerialism. For low valuation period, the pattern differs. Although the gains to target gains remains positive, the total gains become positive instead of negative due to less severe negative bidder gains. Target and acquirer correlation is significantly negative and thus indicate hubris as the main motive. In the positive total gains sub-sample, we find evidence for the co-existence of synergy and hubris hypothesis, while for negative total gains sub-sample for hubris or managerialism. The correlation between target and total gains, show evidence of synergy overall and in the positive total gains sub-sample, where for negative total gains sub-sample, of managerialism.

For the three different valuation periods we observe a uniform pattern of mean gains and of the target and acquirer gains relationship. Overall, bidder gains are negative, target gains are positive and total gains are negative, which suggest that managerialism might be the primary motive. There is a negative relationship between target and acquirer gains which indicates that either hubris or managerialism is the main motive. When looking into target and total gains correlation, there is a difference in the first wave comparing to the two latest. The significantly positive coefficient of target/total gains correlation in the 1980-1990 wave indicate synergy as the primary motive overall but also within positive total gain sub-sample. In the last two waves, evidence suggest that overall and within positive total gain sub-sample, synergy is the primary motive but also managerialism is the motive within negative total gains sub-sample.

[Table 2.5]

Table 2.5 shows the relationship between target gains with total and acquirer gains for the sub-sample of tender offers. The higher proportion of acquisitions with positive total gains, the negative bidder gains, positive target gains and negative total gain indicate that the main

motivation is managerialism. Overall and in the negative total gains sub-sample, we find a negative and statistically significant relationship between target and acquirer gains suggesting that hubris or managerialism is the main driving motive, while the positive significant coefficient ($\boldsymbol{\beta_1}$) and the negative and statistical significant relationship between target and acquirer gains ($\boldsymbol{\beta_1 + \beta_2}$) in the positive total gains sub-sample suggest the co-existence of synergy and hubris hypothesis. Target and total gains correlation, indicate the existence of synergy for the entire sample and the positive total gains sub-sample and the existence of managerialism in the negative total gains sub-sample.

Overall, there is no relationship between target and acquirer gains in the high valuation period which indicates that synergy is the main motive. In the positive total gains sub-sample, synergy and hubris co-exist, whereas in the negative total gains managerialism is the primary motive. The positive coefficient between target and total gains confirm that overall synergy is the main motive. In the positive total gains sub-sample this relationship stays positive and thus support synergy hypothesis and in the negative total gains sub-sample becomes negative which confirms the managerialism hypothesis. In the neutral and low valuation period there is a negative relationship between target and acquirer gains which indicates either the existence of hubris or managerialism overall and in the negative total gains sub-group. Positive total gains sub-group coefficients indicates the co-existence of synergy and hubris. During neutral period, there is a positive and statistical significant relationship between target and total gains which suggest that overall and in the positive total gains sub-group, synergy is the primary motive, whereas there is no relationship in the negative total gains group which suggest hubris is the primary motive in this sample. During low period, there is no relationship between target and total gains and thus this evidence supports hubris hypothesis. In the positive total gains sub-group the relationship becomes positive and indicates synergy as the primary motive and in the negative total gains group it becomes negative and thus indicates managerialism as the main motive.

Looking into different merger waves in the tender offers, it seems that the motives of the first and third wave are identical. Overall, the relationship between target and acquirer gains is negative which suggest that hubris or managerialism is the main motive. In the positive total gain this relationship indicates that hubris and managerialism co-exist and that in the negative total gain sub-group hubris is the primary motive for the first wave, and managerialism for the third wave. The relationship between target and total gains is positive and statistical

significant in both waves and in the positive total gain sub-group which shows that synergy is the primary motive. In the negative total gains sub-group the relationship is negative in the third wave which indicates that the primary motive is managerialism. In the second wave period the correlation between target and acquirer gains is zero which indicates that synergy is the primary motive. In the positive total gains sub-group synergy and hubris co-exist, whereas in the negative total gains sub-group the relationship is negative and thus indicates that is either hubris or managerialism. Overall and in the positive total gains sub-group the relationship between target and total gains is positive which indicates that synergy is the primary motive and negative in the negative total gains sub-groups which indicate managerialism as the main motive.

[Table 2.6]

In table 2.6 we present the relation between target and total gain and target and acquirer gain in the non-tender sample. Overall and in the negative total gains sub-group there is a statistically significant negative relation between target and acquirer gains which suggest that hubris or managerialism is the main motive. In the positive total gains sub-group there is evidence of the co-existence of both synergy and hubris. The relation between target and total gains is positive overall and in the positive total gains sub-group which indicates that synergy is the primary motive. In the negative total gains subgroup the relation is negative and thus suggest that managerialism is the primary motive in this group. This pattern remains unchanged through all three valuation periods and all wave periods.

Overall, our results show that both tender and non-tender offers are driven by synergy, value-increasing acquisitions are driven by both synergy and hubris, whereas value-decreasing by managerialism. The latter finding remains robust across high and low valuation periods, where during low valuation periods the primary motive is synergy for value-increasing acquisitions and managerialism for value-decreasing acquisition. Our results suggest that i. the hostile nature of the deal will not affect the primary merger motives and ii. the state of the market is an important driver of the takeover motives. The adoption of state antitakeover laws in the late 1980s and revisions to the Best Price Rule in 2006 made tender offers as friendly as mergers and therefore we do not find any differences between the two samples with the respect the takeover motives. Further, according to investor sentiment hypothesis, during extreme valuation periods, markets optimism can intensify investors' positive expectations and vice versa. Thus a manager would be more optimism in high valuation periods and

therefore more likely to be infected by hubris or overconfidence than in a neutral valuation period.

2.2.3.2 Multivariate Regression Analysis - Deal Characteristics and Takeover Motives

We use multiple regression analysis to control for other deal-related factors that have been documented in the literature to affect acquisition process. Overall, synergy is the primary motivation but depending on the valuation period or the merger wave period that the takeover is taking place the primary motive changes. This is an extension of Berkovitch and Narayanan (1993) methodology on merger motives since we control for other variables that might affect the correlation of target gains with total and acquirer gains, other than market conditions. The dependent variable in our regressions is the Target gain. We estimate the following models:

Relation between Target and Total Gain – Extended BN Approach

$$\text{Target Gain} = \alpha + \beta_0(\text{Total Gain}) + \sum_{k=1}^{9} a_k D_{ki} + \sum_{k=1}^{9} \beta_k D_{ki}(\text{Total Gain}) + \varepsilon_i \qquad (2.6)$$

Relation between Target and Acquirer Gain – Extended BN Approach

$$\text{Target Gain} = \alpha + \beta_0(\text{Total Gain}) + \sum_{k=1}^{9} a_k D_{ki} + \sum_{k=1}^{9} \beta_k D_{ki}(\text{Acquirer Gain}) + \varepsilon_i \qquad (2.7)$$

The intercept $\boldsymbol{\alpha}$ and the slope $\boldsymbol{\beta_0}$ change as the characteristics of the deal change; the dummy variables $\boldsymbol{D_{ki}}$ equal one if the k^{th} characteristic applies to case i and zero otherwise. The characteristics of deals that are used in the regression are measured one year before the announcement for the target firm. For each portfolio we run two different regressions where the depended variable, Y is always Target Gain and independent variable, X is Total Gain in the first regression and Acquirer Gain in the second.

[Table 2.7]

Table 2.7 is a summary table of the multivariate analysis. We re-run Berkovitch and Narayanan (1993) correlation analysis but this time we take into consideration other deal characteristics that have been ignored in the univariate analysis in previous section. We find that some relations between target and total gains and target and acquirer gains change and we show which characteristics are important in each sub-sample. For each sub-sample (i.e. Entire sample, Tender Offers and Non-Tender Offers) we report the sign of $\boldsymbol{\beta_0}$ coefficient for the two regressions, i. Target-Total Gains, and ii. Target-Acquirer Gains. Panel A shows the signs for the entire sample of each sub-group, Panel B and C show the sign for each sub-group when divided into different valuation periods (i.e. HIGH, NEUTRAL, LOW) and into Wave Periods (1980-1990, 1991-2000, 2001-2010) respectively. Panel A shows that the zero correlation between target and acquirer indicate that synergy is the dominant motive in value increasing acquisitions (positive total gains group). This finding holds true for all three sub-samples, entire, tender and non-tender offers. For value decreasing acquisitions (negative total gains group) we show that in the entire sample and in the non-tender offers the correlation between target and total gains is negative and thus we conclude that are driven by managerialism. Univariate analysis was inconclusive as what is the primary motive of, value-decreasing tender offers. After controlling for takeover characteristics, evidence show that this type of acquisitions are driven by hubris.

There is strong evidence that in general value-decreasing acquisitions (negative total gains group) are driven by managerialism irrespective of the valuation period. This finding shows that managers who pursue their own private benefits will engage into value destroying acquisitions and ignore market conditions. Panel C. shows that value-increasing acquisitions are driven by synergy in the first and second wave, whereas hubris dominants these acquisitions in the third wave. The zero relationship between target and total gains within negative total gains group during the first and second wave indicate the existence of hubris, whereas during the last wave value destroying acquisitions are driven by managerialism.

Value increasing Tender offers are driven by synergy reasons during neutral valuation periods. Value decreasing Tender offers seem to be driven by managerialism during high-valuation periods, and hubris during neutral and low – valuation periods. Managers might feel overconfident by the market momentum during high valuation periods but alter their decisions during neutral and low valuation periods. Non-Tender Offers are driven by synergy during low valuation periods, and during the first wave period. Value-destroying non-tender

offers are driven either by managerialism or hubris, although managerialism seems to be the dominant motive. We find evidence of managerialism in high and low valuation periods and in the first and third wave periods.

[Table 2.8]

For robustness purposes we use additional proxies to capture synergy, hubris and managerialism. Total gains is a well-accepted proxy for synergy. We adopt Net buyer measure of Malmendier and Tate (2005) to capture hubris and G-Index to capture managerialism. Net Buyer measure of overconfidence or hubris, takes the value of 1 if the manager of the acquiring firm does not reduce his stock holdings across a period of at least 6 years and zero otherwise. The Government index or G-Index or GIM shows 'the balance of power between shareholders and mangers' and therefore can be used to capture agency or managerialism problems. G-Index can take values from 1 to 19 and firms are categorised into 10 groups; Firm with a G-index ≥ 14 (Dictatorship Portfolio) have the 'weakest shareholder rights' or the 'highest management power', while firms with a G-index ≤ 5 have the 'strongest shareholder rights' or the 'lowest management power' (Democracy Portfolio). For the purpose of our analysis we create a sample of firms with G-Index ≥ 14.

Table 2.8 is the summary of the same regression analysis (BN method) as in Table 2.7. Panel A shows the sign of each regression for the entire sample in tender and non-tender offers, similarly with Panel A of Table 2.7. Since total gains capture the synergetic acquisitions then in the POSITIVE TG sample then the primary motive should be synergy. The sign of the regression analysis of the Target to Acquirer is zero which confirms that the primary motive in this sample is synergy. In Panel B, there are only deals with Net Buyer measure equal to 1. This means that these acquirers are more likely to be overconfident and thus infected by hubris. We confirm based on the sign of the regression analysis that hubris is the primary motive within this sample. Lastly, Panel C contains only the deals with G-Index above 14, which means that these firms have agency problems. We find evidence that managerialism is the primary motive in this sample. Our results remain unchanged within tender and non-tender offers.

2.3 Conclusion

This chapter's research objective was motivated by the need to understand what drives acquiring firms' abnormal returns by considering the merger motives and the influence of market conditions on acquisition decisions and outcomes. We find that takeover motives are different in value increasing acquisitions compared to value decreasing projects after controlling for misvaluation effects and considering different wave periods.

Our analysis on the takeover motives includes all tender and non-tender offers announced between 1980 and 2010. Despite the hostile nature of tender offers, we show that both tender and non-tender offers are driven by synergy, value-increasing acquisitions are driven by both synergy and hubris, whereas value-decreasing by managerialism. We argue that since the introduction of the Best Price Rule in the late 1980s the nature of tender offers is as friendly as mergers and therefore there are no differences between the two mode of mergers with respect the primary motives. Bouwman et al., (2009) show that market conditions affect corporate decisions and acquisition performance. We examine the potential influence of misvaluation on merger motives by deconstructing it into three valuation periods (high, neutral and low) and search whether different wave periods are linked with different takeover motives. We find that during extreme (high and low) valuation periods and neutral periods, takeover motives differ. According to investor sentiment hypothesis, during high (low) valuation periods markets optimism (pessimist) intensifies investors' positive (negative) expectations. Therefore an acquirer is more likely to be overconfident during periods of high market valuation than in neutral periods and this can explain the co-existence of synergy and hubris during high valuation periods and pure synergy in neutral valuation periods. Finally, we find that motives change during different merger waves and argue that the source of the differences lie upon the different characteristics of each wave that affect takeover motives.

Table 2.1 Takeover Motives

Hypotheses	Bidder Gains	Target Gains	Total Gains	Target to Total Correlation	Target To Acquirer Correlation
Panel A. Entire Sample					
Synergy	Positive or Zero	Positive	Positive	Positive	Positive or Zero
Hubris	Negative	Positive	Zero	Zero	Negative
Managerialism	Negative	Positive	Negative	Negative	Negative
Panel B. Positive Total Gains					
Synergy	Positive	Positive	Positive	*	Positive -> No Hubris
Synergy and Hubris	Positive and Negative	Positive	Positive	*	Positive -> Synergy Negative -> Hubris
Panel C. Negative Total Gains					
Hubris	Negative	Positive		Zero	**
Managerialism	Negative	Positive		Negative	**

Summary of the Implications of Different Hypotheses regarding i. Bidder, Target and Total Gains and ii. the relation between Target Gain and Total and Acquirer Gains.

* Target and Total gain correlation for (i)synergy and (ii) synergy and hubris hypotheses, both predict positive correlation.

** Target and Acquirer gain correlation for (i) hubris and (ii) managerialism hypotheses, both predict negative correlation.

Table 2.2 Descriptive Statistics

	D_{ki}(Total Gain)		D_{ki}(Acquirer Gain)	
Variable	Mean	Std Dev	Mean	Std Dev
Completion	-19.451	483.168	-82.350	419.465
Hostility	-6.405	162.872	-8.157	114.728
Competing bids	-2.470	164.870	-8.016	126.579
Toehold	-22.068	195.146	-5.217	109.162
Cash	-7.321	345.551	-31.350	294.375
Stock	-16.360	267.055	-34.872	242.035
Obs = 3533				

This table presents the summary statistics of the explanatory variables we use in our multivariate analysis. Target gain is computed by multiplying the target's CAR (-2,+2) by the market value 11 days prior to the announcement, minus the value of the target shares held by the bidder. Bidder gain is calculated by multiplying bidder's CAR (-2,+2) by the market value of the acquiring firm 11 days prior to the announcement. Total gain is the sum value of target and bidder gain. Completion is a dummy variable indicating whether the acquisition has completed or not, Hostility shows is the attitude of acquisition was unsolicited or hostile, Competing bids shows if multiple acquiring firms were interested for the target firm in the following six months . Toehold is a dummy variable that equals one if the fraction of the target's common stock owned by the bidder is greater than 5% at the bid announcement date or zero otherwise and Cash (stock) is a dummy variable that equals one if the acquirer firm offers 100% cash (stock) to the target firm

Table 2.3 AR Descriptive Statistics

PANEL A: Entire Sample						
Sample	N	Positive/Negative	Mean	Median	Min	Max
ALL	3533	1878/1655				
Target Gains			83.44	18.16	- 131.25	675.67
Bidder Gains			- 93.39	- 4.51	- 1,505.38	668.84
Total Gains			- 25.06	2.92	- 1,509.15	1,097.85
Target CAR			24.12%	19.78%	- 120.57%	266.48%
Bidder CAR			- 1.56%	- 1.37%	- 110.06%	96.20%
High Valuation	816	430/386				
Target Gains			81.25	20.00	-131.25	675.67
Bidder Gains			- 130.98	- 5.62	- 1,505.38	668.84
Total Gains			-54.18	2.98	- 1,509.15	1,097.85
Target CAR			25.46%	20.71%	- 102.50%	266.48%
Bidder CAR			- 2.05%	- 1.42%	- 74.79%	77.57%
Neutral Valuation	1766	905/861				
Target Gains			63.56	11.75	- 131.25	675.67
Bidder Gains			- 65.00	- 2.83	- 1,505.38	668.84
Total Gains			- 29.77	0.71	- 1,509.15	1,097.85
Target CAR			22.20%	18.46%	- 120.57%	182.36%
Bidder CAR			- 1.24%	-1.17%	- 110.06%	96.20%
Low Valuation	951	543/408				
Target Gains			122.23	31.74	- 131.25	675.67
Bidder Gains			- 113.83	- 11.25	- 1,505.38	668.84
Total Gains			8.67	7.66	- 1,509.15	1,097.85
Target CAR			26.53%	21.73%	-55.07%	247.38%
Bidder CAR			-1.71%	-1.77%	-43.42%	48.39%

1980-1989	837	404/433				
Target Gains			32.78	4.62	-131.25	675.67
Bidder Gains			-24.83	- 1.16	- 1,505.38	668.84
Total Gains			-37.35	-0.86	- 1,509.15	1,097.85
Target CAR			20.24%	16.12%	-54.98%	117.58%
Bidder CAR			-0.63%	-0.90%	-40.90%	96.20%
1990-1999	1472	806/666				
Target Gains			74.48	16.03	- 131.25	675.67
Bidder Gains			-74.11	- 3.83	- 1,505.38	668.84
Total Gains			- 9.24	3.62	- 1,509.15	1,097.85
Target CAR			23.25%	19.64%	-102.50%	182.36%
Bidder CAR			-1.62%	-1.57%	-53.78%	48.39%
2000-2010	1224	668/556				
Target Gains			128.84	38.98	- 131.25	675.67
Bidder Gains			- 163.44	- 16.15	- 1,505.38	668.84
Total Gains			- 35.69	9.41	- 1,509.15	1,097.85
Target CAR			27.82%	22.45%	-120.57%	266.48%
Bidder CAR			-2.12%	-1.50%	-110.06%	89.39%
PANEL B. Tender Offers						
Sample	N	Positive/Negative	Mean	Median	Min	Max
TENDER	891	516/375				
Target Gains			90.17	28.33	-131.25	675.67
Bidder Gains			-74.81	-1.24	-1505.38	668.84
Total Gains			-13.99	12.49	-1509.15	1097.85
Target CAR			34.09%	29.53%	-114.33%	266.48%
Bidder CAR			0.15%	-0.28%	-43.42%	46.30%
High Valuation	197	115/82				
Target Gains			109.2	29.76	-131.25	675.67
Bidder Gains			-145.26	-6.05	-1505.38	668.84
Total Gains			-34.29	12.49	-1509.15	1097.85
Target CAR			38.90%	32.41%	-29.36%	266.48%
Bidder CAR			-0.36%	-0.84%	-31.21%	32.56%

Neutral Valuation	485	269/216				
Target Gains			58.19	18.7	-131.25	675.67
Bidder Gains			-34.02	0.06	-1505.38	-34.02
Total Gains			-25.83	8.06	-1509.15	1097.85
Target CAR			30.43%	26.92%	-114.33%	146.54%
Bidder CAR			0.61%	0.03%	-30.55%	46.30%
Low Valuation	209	132/77				
Target Gains			146.43	48.48	-131.25	675.67
Bidder Gains			-103.04	-1.42	-1505.38	668.84
Total Gains			32.63	24.61	-1509.15	1097.85
Target CAR			38.05%	31.30%	-27.57%	234.41%
Bidder CAR			-0.43%	-0.65%	-43.42%	33.65%
1980-1989	312	159/153				
Target Gains			43.34	12.42	-131.25	675.67
Bidder Gains			-17.52	-1.16	-1505.38	668.84
Total Gains			-55.06	0.43	-1509.15	1097.85
Target CAR			27.59%	25.18%	-38.76%	103.34%
Bidder CAR			-0.35%	-0.44%	-30.55%	29.75%
1990-1999	310	201/109				
Target Gains			84.87	33.46	-131.25	675.67
Bidder Gains			-39.47	3.69	-1505.38	668.84
Total Gains			46.44	24.27	-1509.15	1097.85
Target CAR			34.53%	31.00%	-47.75%	145.01%
Bidder CAR			1.01%	0.52%	-25.78%	46.30%
2000-2010	269	156/113				
Target Gains			150.59	54.12	-75.66	675.67
Bidder Gains			-181.98	-13.13	-1505.38	668.84
Total Gains			-36	20.68	-1509.15	1097.85
Target CAR			41.12%	32.61%	-114.33%	266.48%
Bidder CAR			-0.27%	-0.88%	-43.42%	33.65%

PANEL C. Non-Tender Offers						
Sample	N	Positive/Negative	Mean	Median	Min	Max
Non-Tender	2642	1362/1280				
Target Gains			81.17	13.93	-131.25	675.67
Bidder Gains			-99.65	-5.86	-1505.38	668.84
Total Gains			-28.8	1.16	-1509.15	1097.85
Target CAR			20.76%	16.88%	-120.57%	247.38%
Bidder CAR			-2.13%	-1.87%	-110.06%	96.20%
High Valuation	619	316/303				
Target Gains			72.35	15.46	-131.25	675.67
Bidder Gains			-126.44	-5.25	-1505.38	668.84
Total Gains			-60.52	1.2	-1509.15	1097.85
Target CAR			21.18%	17.42%	-102.50%	157.97%
Bidder CAR			-2.59%	-1.78%	-74.79%	77.57%
Neutral Valuation	1281	636/645				
Target Gains			65.59	9.37	-131.25	675.67
Bidder Gains			-76.73	-3.49	-1505.38	668.84
Total Gains			-31.27	-0.32	-1509.15	1097.85
Target CAR			19.09%	15.41%	-120.57%	182.36%
Bidder CAR			-1.94%	-1.66%	-110.06%	96.20%
Low Valuation	742	410/332				
Target Gains			115.41	25.93	-131.25	675.67
Bidder Gains			-116.87	-13.01	-1505.38	668.84
Total Gains			1.92	4.86	-1509.15	1097.85
Target CAR			23.29%	18.59%	-55.07%	247.38%
Bidder CAR			-2.07%	-2.37%	-35.06%	48.39%
1980-1989	525	245/280				
Target Gains			26.5	3.04	-131.25	675.67
Bidder Gains			-29.18	-1.16	-1505.38	668.84
Total Gains			-26.83	-1.14	-1509.15	1097.85
Target CAR			15.87%	11.95%	-54.98%	117.58%
Bidder CAR			-0.80%	-1.28%	-40.90%	96.20%

1990-1999	1162	605/557				
Target Gains			71.71	12.05	-131.25	675.67
Bidder Gains			-83.35	-5.85	-1505.38	668.84
Total Gains			-24.1	1.16	-1509.15	1097.85
Target CAR			20.24%	16.61%	-102.50%	182.36%
Bidder CAR			-2.32%	-2.42%	-53.78%	48.39%
2000-2010	955	512/443				
Target Gains			122.72	35.74	-131.25	675.67
Bidder Gains			-158.22	-16.65	-1505.38	668.84
Total Gains			-35.6	7.08	-1509.15	1097.85
Target CAR			24.07%	19.46%	-120.57%	247.38%
Bidder CAR			-2.64%	-1.78%	-110.06%	89.39%

This table presents the descriptive statistics for the depended and independent variables we use in our regression analysis for the entire sample (Panel A), tender offer (Panel B) and non-tender offers (Panel C). Each panel is further divided by high, neutral and low valuation period, and the three merger waves that are present in our sample (1980s, 1990s, and 2000s). CAR, the cumulative abnormal returns are calculated for a five-day window (-2, +2) around the announcement date for all firms. Target gain is computed by multiplying the target's CAR by the market value 11 days prior to the announcement, minus the value of the target shares held by the bidder. Bidder gain is calculated by multiplying bidder's CAR by the market value of the acquiring firm 11 days prior to the announcement. Total gain is the sum value of target and bidder gain.

Table 2.4 Entire Sample - Relation Between Target - Total Gains and Target - Acquirer Gains

This table shows the results of the univariate analysis; Target Gains are regressed against total gains and acquirer gains. Target gain is computed by multiplying the target's CAR(-2,+2) by the market value 11 days prior to the announcement, minus the value of the target shares held by the bidder. Bidder gain is calculated by multiplying bidder's CAR (-2,+2) by the market value of the acquiring firm 11 days prior to the announcement. Total gain is the sum value of target and bidder gain. The relation between Target and Total Gain is given by: $Target\ Gain = \alpha + \beta_1(Total\ Gain)$ and the relation between Target and Acquirer Gain is given by (i) $Target\ Gain = \alpha + \beta_1(Acquirer\ Gain)$ and (ii) $Target\ Gain = \alpha + \beta_1(Acquirer\ Gain) + \beta_2\ (Acquirer\ Gain * Dummy)$, where Dummy = 0 if acquirer gain is positive and Dummy=1 if acquirer gain is negative. The numbers below estimates α and β1 are t-statistics. R^2 is also reported. Panel A shows the regression results for the entire sample of Mergers and Acquisitions, Panel B and C shows the regression results for the sub-sample of different valuations periods (i.e. High, Neutral and Low valuation periods) and different Merger waves (i.e. 1980 – 1990, 1991-2000, 2001-2010) respectively.

PANEL A. Entire Sample

		Target and Total Gain			Target and Acquirer Gain			
Sample	N	α	β_1	R^2	α	β_1	β_2	R^2
ALL	3533	85.49***	0.08***	0.1	76.29***	-0.08***		0.030
		28.61	14.12		24.74	-11.1		
Positive Total Gains	1878	32.82***	0.34***	0.4	119.66***	-0.01		0.000
		7.72	34.81		25.06	-0.43		
					65.24***	0.26***	-1.07***	0.280
					14.45	14.73	-27.14	
Negative Total Gains	1655	8.31*	-0.10***	0.1	-18.84***	-0.20***		0.360
		1.82	-13.53		-4.99	-4.99		

PANEL B. VALUATION PERIODS

		Target and Total Gain			Target and Acquirer Gain			
Sample	N	α	β_1	R^2	α	β_1	β_2	R^2
HIGH	816	84.53***	0.05***	0	71.90***	-0.08***		0.040
		13.97	4.35		11.62	-5.99		
Positive Total Gains	430	22.84***	0.35***	0.4	110.54***	-0.03		0.002
		2.82	18.22		11.59	-0.9		
					66.05***	0.21***	-0.95***	0.230
					7.13	5.4	-11.27	
Negative Total Gains	386	6.69	-0.12***	0.2	-11.41	-0.17***		0.320
		0.73	-8.68		-1.38	-13.29		
NEUTRAL	1766	66.68***	0.12***	0.1	59.29***	-0.06***		0.020
		17.48	14.52		14.66	-5.96		
Positive Total Gains	905	28.76***	0.35***	0.4	105.45***	0.02		0.001
		5.17	25.23		16.32	0.76		
					63.46***	0.26***	-1.00***	0.240
					10.33	9.82	-17	
Negative Total Gains	861	2.34	-0.05	0	-25.83***	-0.19***		0.320
		0.41	-4.84		-5.72	-20.22		
LOW	951	121.65***	0.06***	0	112.32***	-0.09***		0.040
		18.49	4.92		16.8	-6.58		
Positive Total Gains	543	49.28***	0.33***	0.3	151.49***	-0.03		0.002
		5.14	16.38		15.3	-1.03		
					68.09	0.29	-1.22	0.360
					7.3	9.27	-17.2	
Negative Total Gains	408	27.14***	-0.16***	0.2	-7.3	-0.23***		0.400
		2.58	-9.78		-0.79	-16.52		

PANEL C.WAVE PERIODS

		Target and Total Gain			Target and Acquirer Gain			
Sample	N	α	β_1	R^2	α	β_1	β_2	R^2
1980 - 1989	837	40.95***	0.22***	0.310	30.23***	-0.10***		0.020
		9.71	19.16		6.02	-4.22		
Positive Total Gains	404	7.72	0.53***	0.650	86.30***	-0.06		0.003
		1.35	27.22		9.95	-1.1		
					60.06***	0.25***	-0.90***	0.150
					6.98	4.21	-8.39	
Negative Total Gains	433	-3.32	0.06***	0.050	-39.50***	-0.28***		0.380
		-0.62	4.48		-9.72	-16.09		
1990 - 1999	1472	75.46***	0.11***	0.090	71.47***	-0.04***		0.009
		17.63	11.99		15.76	-3.74		
Positive Total Gains	806	30.34***	0.34***	0.380	105.01***	0.03		0.002
		4.86	22.31		14.77	1.23		
					52.12***	0.29***	-1.26***	0.330
					8.11	11.27	-19.71	
Negative Total Gains	666	12.93**	-0.07***	0.050	-10.43*	-0.15***		0.260
		2.03	-5.98		-1.88	-15.13		
2000 - 2010	1224	130.01***	0.03***	0.010	115.57***	-0.08***		0.050
		22.26	3.47		19.41	-7.93		
Positive Total Gains	668	52.38***	0.30***	0.310	161.19***	-0.06**		0.008
		5.94	17.28		18.4	-2.26		
					87.58***	0.22***	-0.96***	0.280
					9.92	7.67	-15.71	
Negative Total Gains	556	26.11***	-0.15***	0.190	-7.62	-0.20***		0.350
		2.59	-11.25		-0.82	-17.26		

Table 2.5 Tender Offers - Relation Between Target - Total Gains and Target - Acquirer Gains

This table shows the results of the univariate analysis; Target Gains are regressed against total gains and acquirer gains. Target gain is computed by multiplying the target's CAR(-2,+2) by the market value 11 days prior to the announcement, minus the value of the target shares held by the bidder. Bidder gain is calculated by multiplying bidder's CAR (-2,+2) by the market value of the acquiring firm 11 days prior to the announcement. Total gain is the sum value of target and bidder gain. The relation between Target and Total Gain is given by: $Target\ Gain = \alpha + \beta_1(Total\ Gain)$ and the relation between Target and Acquirer Gain is given by (i) $Target\ Gain = \alpha + \beta_1(Acquirer\ Gain)$ and (ii) $Target\ Gain = \alpha + \beta_1(Acquirer\ Gain) + \beta_2\ (Acquirer\ Gain * Dummy)$, where Dummy = 0 if acquirer gain is positive and Dummy=1 if acquirer gain is negative. The numbers below estimates α and β1 are t-statistics. R^2 is also reported. Panel A shows the regression results for the tender offers, Panel B and C shows the regression results for the sub-sample of different valuations periods (i.e. High, Neutral and Low valuation periods) and different Merger waves (i.e. 1980 – 1990, 1991-2000, 2001-2010) respectively.

PANEL A. Tender Offers

		Target and Total Gain			Target and Acquirer Gain			
Sample	N	α	β_1	R^2	α	β_1	β_2	R^2
ALL	891	91.55***	0.10***	0.09	86.02***	-0.06***		0.02
		15.32	9.28		13.69	-4.05		
Positive Total Gains	516	33.65***	0.33***	0.39	119.06***	0.05		0.00
		4.06	18.26		12.62	1.37		
					69.09***	0.24***	-1.28***	0.24
					7.56	7.56	-12.68	
Negative Total Gains	375	11.47	-0.07***	0.06	-26.54***	-0.20***		0.38
		1.07	-4.69		-3.25	-15.18		

PANEL B. VALUATION PERIODS								
		Target and Total Gain			Target and Acquirer Gain			
Sample	N	α	β_1	R^2	α	β_1	β_2	R^2
HIGH	197	112.57***	0.10***	0.09	103.71***	-0.04		0.01
		8.58	4.31		7.3	-1.38		
Positive Total Gains	115	20.98	0.42***	0.55	131.95***	0.04		0.00
		1.27	11.79		6.08	0.43		
					71.43***	0.33***	-1.17***	0.26
					3.37	3.94	-6.22	
Negative Total Gains	82	15.61	-0.12***	0.19	-6.61	-0.16***		0.35
		0.78	-4.26		-0.37	-6.52		
NEUTRAL	485	61.83***	0.14***	0.19	56.89***	-0.04*		0.01
		8.92	10.79		7.37	-1.82		
Positive Total Gains	269	35.00***	0.31***	0.36	116.60***	-0.04		0.00
		3.23	12.24		9.72	-0.93		
					74.52***	0.14***	-1.23***	0.22
					6.38	3.01	-8.67	
Negative Total Gains	216	-9.36	0	-	-41.92***	-0.16***		0.29
		-0.87	-0.06		-5.16	-9.36		
LOW	209	145.82***	0.02	0.00	139.38***	-0.07***		0.04
		10.33	0.83		9.89	-2.79		
Positive Total Gains	132	44.21**	0.28***	0.32	110.63***	0.17***		0.06
		2.35	7.85		5.53	2.78		
					45.44**	0.34***	-1.81***	0.32
					2.35	6.03	-7.14	
Negative Total Gains	77	81.91***	-0.15***	0.16	26.62	-0.22***		0.36
		2.73	-3.73		0.94	-6.43		

PANEL C.WAVE PERIODS								
		Target and Total Gain			Target and Acquirer Gain			
Sample	N	α	β_1	R^2	α	β_1	β_2	R^2
1980 - 1989	312	55.69***	0.22***	0.34	42.06***	-0.07*		0.01
		6.81	12.6		4.22	-1.63		
Positive Total Gains	159	18.33*	0.52***	0.63	114.66***	0		-
		1.66	16.41		7.17	-0.05		
					79.69***	0.28**	-1.13***	0.16
					4.96	2.92	-5.42	
Negative Total Gains	153	-13.74	0.06***	0.05	-56.9	-0.3		0.37
		-1.23	2.69		-7.12	-9.62		
1990 - 1999	310	80.46***	0.10***	0.09	84.05***	-0.02		0.00
		8.81	5.65		8.77	-0.97		
Positive Total Gains	201	37.63**	0.25***	0.30	102.40***	0.04		0.00
		2.93	2.93		7.35	0.78		
					45.29***	0.23***	-1.75***	0.37
					3.69	5.43	-10.81	
Negative Total Gains	109	21.41	-0.06**	0.04	-3.88	-0.13***		0.22
		1.24	-2.13		-0.26	-5.55		
2000 - 2010	269	151.88***	0.04*	0.01	141.45***	-0.05**		0.02
		12.36	1.98		11.1	-2.52		
Positive Total Gains	156	37.71**	0.32***	0.37	148.59***	0.05		0.01
		2.05	9.54		7.45	0.84		
					81.60***	0.26***	-1.14***	0.23
					4.02	4.29	-6.65	
Negative Total Gains	113	67.01**	-0.12***	0.14	19.82	-0.18***		0.29
		2.77	-4.23		0.84	-6.73		

Table 2.6 NonTender Offers - Relation between Target - Total Gains and Target - Acquirer Gains

This table shows the results of the univariate analysis; Target Gains are regressed against total gains and acquirer gains. Target gain is computed by multiplying the target's CAR (-2,+2) by the market value 11 days prior to the announcement, minus the value of the target shares held by the bidder. Bidder gain is calculated by multiplying bidder's CAR (-2,+2) by the market value of the acquiring firm 11 days prior to the announcement. Total gain is the sum value of target and bidder gain. The relation between Target and Total Gain is given by: $Target\ Gain = \alpha + \beta_1(Total\ Gain)$ and the relation between Target and Acquirer Gain is given by (i) $Target\ Gain = \alpha + \beta_1(Acquirer\ Gain)$ and (ii) $Target\ Gain = \alpha + \beta_1(Acquirer\ Gain) + \beta_2\ (Acquirer\ Gain * Dummy)$, where Dummy = 0 if acquirer gain is positive and Dummy=1 if acquirer gain is negative. The numbers below estimates α and β1 are t-statistics. R^2 is also reported. Panel A shows the regression results for non-Tender Offers, Panel B and C shows the regression results for the sub-sample of different valuations periods (i.e. High, Neutral and Low valuation periods) and different Merger waves (i.e. 1980 – 1990, 1991-2000, 2001-2010) respectively.

PANEL A. Non-Tender Offers

		Target and Total Gain			Target and Acquirer Gain			
Sample	N	α	β_1	R^2	α	β_1	β_2	R^2
ALL	2642	83.31***	0.08***	0.04	72.71***	-0.09***		0.04
		24.16	10.77		20.57	-10.62		
Positive Total Gains	1362	32.34***	0.35***	0.40	119.35***	-0.03		0.00
		6.53	29.66		21.56	-1.39		
					62.83***	0.27***	-1.05***	0.30
					12.12	12.93	-24.22	
Negative Total Gains	1280	7.31	-0.12***	0.12	-16.70***	-0.20***		0.35
		1.46	-13.12		-3.92	-26.35		

PANEL B. VALUATION PERIODS								
		Target and Total Gain			Target and Acquirer Gain			
Sample	N	α	β_1	R^2	α	β_1	β_2	R^2
HIGH	619	74.33***	0.03***	0.01	61.70***	-0.08***		0.06
		11.12	2.61		9.18	-6.07		
Positive Total Gains	316	24.57***	0.31***	0.38	102.58***	-0.06(*)		0.01
		2.7	13.93		10.01	-1.52		
					63.80***	0.16***	-0.86***	0.23
					6.42	3.76	-9.44	
Negative Total Gains	303	5.06	-0.12***	0.15	-12.04	-0.16***		0.30
		0.49	-7.22		-1.29	-11.23		
NEUTRAL	1281	68.72***	0.10***	0.07	59.97***	-0.07***		0.03
		15.03	10		12.59	-6.04		
Positive Total Gains	636	26.00***	0.37***	0.44	101.36***	0.04		0.00
		4.03	22.35		13.23	1.47		
					56.96***	0.32***	-1.00***	0.28
					7.98	10.16	-15.47	
Negative Total Gains	645	4.31	-0.08***	0.06	-20.76	-0.2		0.34
		0.66	-6.45		-3.88	-18.23		
LOW	742	115.27***	0.07***	0.04	104.36***	-0.10***		0.05
		15.56	5.24		13.75	-6.06		
Positive Total Gains	410	50.34***	0.35***	0.34	159.09***	-0.09**		0.02
		4.52	14.51		14.03	-2.48		
					71.90***	0.29***	-1.17***	0.37
					6.7	7.39	-15.2	
Negative Total Gains	332	17.19*	-0.16***	0.19	-12.65	-0.22***		0.40
		1.58	-8.8		-1.32	-14.85		

PANEL C.WAVE PERIODS								
		Target and Total Gain			Target and Acquirer Gain			
Sample	N	α	β1	R2	α	β1	β2	R2
1980 - 1989	525	32.25***	0.21***	0.27	22.75***	-0.13***		0.04
		6.97	14.06		4.24	-4.67		
Positive Total Gains	245	1.61	0.53***	0.65	68.24***	-0.11*		0.01
		0.26	21.45		7.05	-1.81		
					47.17***	0.21**	-0.75***	0.15
					4.91	2.73	-6.26	
Negative Total Gains	280	1.01	0.05**	0.03	-29.60***	-0.26***		
		0.18	2.89		-6.7	-13.16		
1990 - 1999	1162	74.34***	0.11***	0.09	67.71***	-0.05***		0.01
		15.31	10.54		13.14	-3.82		
Positive Total Gains	605	26.86***	0.38***	0.43	105.78***	0.03		0.00
		3.81	21.11		12.78	0.99		
					51.74***	0.32***	-1.23***	0.33
					6.94	10.33	-17.32	
Negative Total Gains	557	11.39*	-0.07***	0.05	-11.83*	-0.16***		0.27
		1.66	-5.57		-1.98	-14.13		
2000 - 2010	955	123.84***	0.03**	0.01	108.17***	-0.09***		0.06
		18.68	2.87		16.1	-7.72		
Positive Total Gains	512	56.56***	0.29***	0.29	163.11***	-0.09**		0.02
		5.62	14.45		16.78	-3.12		
					88.85***	0.21***	-0.93***	0.29
					9.07	6.3	-14.09	
Negative Total Gains	443	17.85*	-0.16***	0.19	-12.64	-0.21***		0.36
		1.61	-10.24		-1.26	-15.65		

Table 2.7 Summary of the Main Results from the Multivariate Analysis

	ENTIRE SAMPLE		TENDER OFFERS		NON-TENDER OFFERS	
	Target to Total	Target to Acquirer	Target to Total	Target to Acquirer	Target to Total	Target to Acquirer
PANEL A. ENTIRE SAMPLE						
ALL	Positive	Negative	Positive	Zero	Positive	Negative
Positive TG		Zero		Zero		Zero
Negative TG	Negative		Zero		Negative	
PANEL B. VALUATION PERIODS						
HIGH	Zero	Negative	Zero	Negative	Zero	Negative
Positive TG		Zero		Negative		Zero
Negative TG	Negative		Negative		Negative	
NEUTRAL	Positive	Zero	Positive	Negative	Positive	Zero
Positive TG		Zero		Positive		Zero
Negative TG	Negative		Zero		Zero	
LOW	Zero	Zero	Zero	Zero	Zero	Zero
Positive TG		Zero		Zero		Positive
Negative TG	Negative		Zero		Negative	
PANEL C. WAVE PERIODS						
1983-1989	Positive	Positive	Positive	Positive	Zero	Zero
Positive TG		Positive		Positive		Positive
Negative TG	Zero		Zero		Negative	
1993-1999	Positive	Zero	Zero	Zero	Positive	Zero
Positive TG		Zero		Zero		Zero
Negative TG	Zero		Zero		Negative	
2003-2007	Zero	Negative	Zero	Zero	Zero	Negative
Positive TG		Negative		Zero		Negative
Negative TG	Negative		Zero		Negative	

This table is the summary of the multivariate analysis. We extent Berkovitch and Narayanan (1993) methodology on merger motives to control for other variables that might affect the correlation of target gains with total and acquirer gains, other than market conditions. We run two different regressions for a. the entire sample, b. tender offers and c. non-tender offers. Panel A, shows the sign of each regression for all mergers and acquisitions of the three samples, Panel B and C shows the sign of each regression for the three samples, for different valuation periods and different merger waves respectively. The depended variable, Y is always Target Gain and independent variable, X is Total Gain in the first regression and Acquirer Gain in the second. We estimate the following models as follow:

Relation between Target and Total Gain

$$\text{Target Gain} = \alpha + \beta_0(\text{Total Gain}) + \sum_{k=1}^{9} a_k D_{ki} + \sum_{k=1}^{9} \beta_k D_{ki}(\text{Total Gain}) + \varepsilon_i$$

Relation between Target and Acquirer Gain

$$\text{Target Gain} = \alpha + \beta_0(\text{Total Gain}) + \sum_{k=1}^{9} a_k D_{ki} + \sum_{k=1}^{9} \beta_k D_{ki}(\text{Acquirer Gain}) + \varepsilon_i .$$

The intercept $\boldsymbol{\alpha}$ and the slope $\boldsymbol{\beta_0}$ change as the characteristics of the deal change; the dummy variables $\boldsymbol{D_{ki}}$ equal one if the kth characteristic applies to case i and zero otherwise. The characteristics of deals that are used in the regression are measured for the target firm and are calculated over the fiscal year prior to the acquisition. Completion is a dummy variable indicating whether the acquisition has completed or not, Hostility shows is the attitude of acquisition was unsolicited or hostile, Competing bids shows if multiple acquiring firms were interested for the target firm in the following six months (see Officer (2003)), Toehold is a dummy variable that equals one if the fraction of the target's common stock owned by the bidder is greater than 5% at the bid announcement date or zero otherwise (see Officer (2003)), Cash (stock) is a dummy variable that equals one if the acquirer firm offers 100% cash (stock) to the target firm and intra-industry is a dummy variable that shows whether acquiring and target firm belong in the same Fama and French (1997) 49-industry classification.

Note: TG stands for Total Gains

Table 2.8 Summary of the Main Results from the Multivariate Analysis of Additional Proxies

	ENTIRE SAMPLE		TENDER OFFERS		NON-TENDER OFFERS	
	Target to Total	Target to Acquirer	Target to Total	Target to Acquirer	Target to Total	Target to Acquirer
PANEL A. ENTIRE SAMPLE						
ALL	Positive	Negative	Positive	Zero	Positive	Negative
Positive TG		Zero		Zero		Zero
Negative TG	Negative		Zero		Negative	
PANEL B. NET BUYER = 1						
ALL	Positive	Positive	Positive	Zero	Positive	Zero
Positive TG		Negative		Negative		Negative
Negative TG	Zero		Zero		Zero	
PANEL C. G-INDEX ≥ 14						
ALL	Zero	Negative	Zero	Negative	Zero	Negative
Positive TG		Zero		Zero		Zero
Negative TG	Negative		Negative		Negative	

This table is the summary of the multivariate analysis. We extent Berkovitch and Narayanan (1993) methodology on merger motives to control for other variables that might affect the correlation of target gains with total and acquirer gains, other than market conditions. We run two different regressions for a. the entire sample, b. tender offers and c. non-tender offers. Panel A, shows the sign of each regression for all mergers and acquisitions of the three samples, Panel B and C shows the sign of each regression for the three sample for only acquisitions with a Net Buyer Measure =1 and G- Index ≥ 14, respectively. Net buyer measure (Malmendier and Tate; 2005) classify the managers of a firm as overconfident is they do not reduce their portfolio exposure to firm-specific risk as captured by the number of stocks they held every year. Panel B contains only the firms that the managers are overconfident and therefore are more likely to be infected by hubris. G- Index or Government Index shows 'the balance of power between shareholders and mangers' (Gompers, Ishii and Metrick, 2003) and therefore can be used to capture agency or managerialism problems. G-Index can take values from 1 to 19 and firms are categorised into 10 groups; Firm with a G-index ≥ 14 (Dictatorship Portfolio) have the 'weakest shareholder rights' or the 'highest management power', while firms with a G-index ≤ 5 have the 'strongest shareholder rights' or the 'lowest management power' (Democracy Portfolio). Panel C contains only the firms that belong in the Dictatorship Portfolio.

Chapter 3: Diversified Mergers and Default Risk

3.1 Introduction

The implications of corporate diversification and issues related to diversification have been widely explored. A number of influences that induce a firm to integrate (Carleton, Harris and Stewart, 1980; McDougall and Round, 1984; Reed and Luffman, 1986; Ramanujam and Varadarajan, 1989; Penas and Unal, 2004; Grafiken and Hankins, 2011) and the effects of diversification on firms' organizational structure and economic performance (Rumelt, 1977; Amihud and Lev; 1981; Allen and Hamilton, 1985; Lubatkin, 1987; Kim, Hwang and Burgers, 1993; Mansi and Reeb, 2002; Kedia, Ravid and Pons, 2009) have been also extensively investigated. It has been shown that firms diversify for both proactive and defensive reasons (see for example Reed and Luffman, 1986), to realize technological and marketing synergies (Abell, 1980; Booz, Allen and Hamilton, 1985), to obtain vertical economies (Stewart, Harris and Carleton, 1984) and to reduce firm's default risk (Amihud and Lev, 1981; Montgomery and Singh, 1984; Kim, Hwang and Burgers, 1993; Penas and Unal, 2004) by spreading activities across global market areas that will provide to the firm operational flexibilities and profit possibilities.

In the literature of corporate finance, diversification is known as a risk management tool due to the operational hedging that can be accomplished via diversified mergers (Amihud and Lev, 1981; Hirshleifer, 1988; Penas and Unal, 2004; Grafinkel and Hankins. 2011). A recent study by Furfine and Rosen (2011) shows that mergers increase default risk in the long term (i.e. 6 months after the completion of the deal), despite the common belief that mergers decrease default risk through the diversification effect. Mansi and Reeb (2002) study the risk effects and its impact on firm value in conglomerate acquisitions. They find that 'excess value is decreasing in diversification and that the diversification discount is most pronounced in firms with higher than average debt levels'. Anderson and Reeb (2003) find that family firms experience less diversification and use similar levels of debt as nonfamily firms. The latest findings suggest that default risk changes through diversified mergers deserve the interest of new empirical studies. It remains yet unclear which mergers increase default risk and how different types of diversification affect a firm's default risk in the post-acquisition period.

This study adds to our understanding of diversification through mergers and acquisitions by studying default risk variation in different types of corporate diversification. Empirical studies have reported conflicting evidence on the direction of default risk after a merger in which several important questions remain unanswered. Realizing the diversification benefits of a merger greatly depend upon the manager of the acquiring firm and how capable is to complete the deal. An unrelated merger might be riskier than a related one, due to the uncertainty of entering in a new market/industry, the difficulty to correctly value the target firm and the information asymmetry in terms of integrating with the target firm. Our research builds on previous evidence that default risk changes through a diversified merger by exploring the changes of default risk on related and unrelated diversification strategies. In this study we seek to address the following questions; Do certain types of mergers (vertical, horizontal, mixed vertical/horizontal, conglomerate) involve different levels of default risk? Is this potential default risk variation across diversification types related to other firm and deal's characteristics? Do other elements such as market conditions affect default risk and diversification type? To answer these questions we study default risk changes for the acquiring firms' prior to the acquisition announcement and post-acquisition completion, within four different types of diversification; vertical, horizontal, mixed vertical/horizontal (i.e. related diversification strategies) and conglomerate (i.e. unrelated diversification).

The literature on corporate diversifications and factors related to diversification is dating back to 1970s. Diversification has gained much academic attention after the first empirical evidence uncovered differences in performance between related and unrelated diversified firms. Rumelt (1974, 1977) found that related diversified firms outperform unrelated firms because of the skill advantage they have when entering related areas. Other studies have explored the underlying reasons regarding the difference in performance between related and unrelated diversified firms. Bettis and Hall (1982) for example propose two alternative explanations; high performing related diversified firms select firms from high profit industries and/or these firms are able to develop and pursue strategies in their constituent businesses and thus are more efficient in developing and pursuing appropriate diversification strategies. Miles (1982) showed that the general environment, the industry's competitive environment and firms' specific characteristics and performance affect diversification decisions.

Other papers have linked diversification with firm and deal characteristics. MacDonald (1985) studied the inter-industry diversification and showed that large firms are more likely to diversify into similar industries in terms of advertising intensity and R&D intensity. Lecraw (1984) showed that industry and firm characteristics influence diversification strategy in unrelated acquisitions (conglomerate acquisitions). Levitt (1975) find that vertical firms prefer related diversification to grow in size and expand in related industries. Montgomery and Singh (1984) showed that unrelated mergers have higher systematic risk as captured by beta and compared to other diversification categories. Kim, Bettins and Mahajan (1985) find that certain diversification can reduce risk and increase returns.

Through diversification a firm can increase returns by spreading its activities into various markets (regional or industrial) and thus reduce corporate risk (Hamel and Prahalad, 1985; Kim and Mauborgne, 1988). Lewellen (1971) argued that conglomerate mergers can sustain higher levels of debt because diversification reduces earnings variability. Mansi and Reeb (2002) study the risk effects on conglomerate acquisitions and showed that higher leverage firms enjoy higher diversification discount. Furfine and Rosen (2011) find that managerial motives outweigh asset diversification benefits and increase default risk for the acquiring firm. Since the significant increase, in numbers and value, of mergers and acquisitions during the last decades and the latest findings that risk reduction is not among the diversification benefits of a merger, the literature on corporate risk variation through diversification deserves further research.

The success of every diversification, related or unrelated, depends mainly upon the efficiency of the management team in transferring resources between the two firms and how well integrated the two firms become. The spreading of activities across new markets (business or geographic) or stages of production will also expose firms to additional costs (such as the transferring of resources between the two firms, the new group of customers that the merged firm has to attract, or/and the mis-management of a larger firm), increase risk levels and thus decrease profitability. The question to diversify will always be a calculated risk; however the profitability of the merger and realizing the diversification benefits in terms of risk are greatly depended upon the manager of the acquiring firm and how capable is to complete the deal. Persuading an unrelated merger might be riskier than a related one, due to the uncertainty of entering a new market/industry and the information asymmetry in terms of integrating with a firm in an unfamiliar market/industry. The acquirer is more likely to overlook critical factors

and overpay the target firm and experience monitoring problems once the merger is completed. Information asymmetry concept dates back to Akerlof, (1970) in his article 'The market for Lemons'. Akerlof's model assumes that due to information asymmetry the buyer cannot tell the bad-quality products. We therefore argue that the acquirer has more difficulties to communicate and to verify the benefits of an unrelated acquisition and it creates a risk of adverse selection. On the other hand when the acquirer makes a related acquisition, he is familiar with the nature of the business, the industry and the production process of the target and therefore the choice of a firm that will be both profitable and decrease default risk, is easier. Since horizontal diversification is the merger of two firms that belong in the same industry and in the same stage of production, then information asymmetry between the acquirer and the target minimizes which in turn should reduce default risk for the acquiring firm to the minimum. To explore this hypothesis we need a measure of information asymmetry.

Idiosyncratic stock volatility has been linked with issues such as portfolio diversification, active portfolio management, future earnings, option valuation and information asymmetry. Chen et al. (2001) show that level of information quality affects stock volatility and that higher information asymmetry increases stock volatility. Pastor and Veronesi (2003) explore the relation between information asymmetry and stock volatility when investors are aware about the uncertainty in the potential profitability of the firm and show that higher uncertainty induces high return volatility. Miffre (2011) finds a positive relation between high idiosyncratic stock volatility and poorly diversified firms. We therefore expect that the type of diversification which involves the higher uncertainty due to information asymmetry will increase volatility and the acquirer firm's default risk. It is more likely that unrelated diversification will have higher uncertainty than related diversification. Following Furfine and Rosen (2011) we measure idiosyncratic stock volatility, as 'the standard deviation of the idiosyncratic component of the acquirer's stock return, estimated by taking the square root of the variance of the residuals form a market model estimated over the six month period ending at the end of the month prior to the merger announcement.'

To assess the impact of default risk on different type of diversification, we need to quantify the credit worthiness of each firm. For the purpose of our study we adopt a recent econometric model which predicts corporate risk using both accounting and market data developed by Campbell, Hilsher and Szilagyi (2008). There is a large related literature on the

prediction of corporate risk which varies in the choice of variables and the methodology used. Beaver (1966), Altman (1968), Ohlson (1980) and Zmijewski (1984) uses a static model to estimate the probability to default, that includes only accounting data. Kaplan and Urwitz (1979) Blume, Lim and MacKinlay (1998) and Molina (2005) use accounting variables to predict credit ratings. However, static models involve biases and overestimations of the impact of the explanatory variables since they do not take into account the time-series evolution of the accounting variables, as noted by Shumway (2001).

Alternative models to the static models of Beaver (1966), Altman (1968), Ohlson (1980) and Zmijewski (1984) to estimate the probability of default, are the dynamic panel models of Shumway (2001), Chava and Jarrow (2004) and Campbell, Hilsher and Szilagyi (2008). The latter study developed a logit specification of a dynamic panel model which considers a wide range of market and accounting explanatory variables to predict a firm's default risk. This is a common practise used not only by academic studies but also by large financial institutions that choose to build their own probability of default models, collect historical fundamental data from financial statements, and identify firms which defaulted to estimate a logistic regression model. The traditional measure of credit quality is a rating, similar to the ones produced by S&P, Moody's or Fitch. For example, Furfine and Rosen (2011) use the Expected Default Frequency (EDF) developed by MoodysKMV (KMV) which is an estimate of the probability that a firm defaults in the next year. Campbell et al. (2008) model, offers a significantly improved alternative way to estimate default risk in various horizons. Since their model outperform Moody's KMV model in periods less than one year, we choose to adopt this model for the purpose of our analysis which spans from one month before the announcement to six months after the completion. For periods more than a year, the predictability power of both models is comparable.

The second obstacle to our study is the diversification categorization of our sample of mergers and acquisitions for the period of 1980 to 2008. Several measures have been employed in the literature that capture the degree of vertical integration. The dominating methods are the value-added approach used by Adelman (1955)[12], Rumelt (1974) total product percentage approach and the input-output matrix method proposed by Maddigan (1981). Adelman (1955) calculates the ratio of value added over sales. Despite the simplicity in calculating this ratio it has a major drawback; it is influenced by both the type of

[12] See also Gort, (1962), Nelson (1959), Laffer (1969), and Wilder (1977)

integration and the firm's profitability. Rumelt (1974) measures vertical integration as a percentage of total product. The problem with this measure is that it captures both vertical and horizontal integration, and also it requires to breakdown total value of production by product line, information which is not always available.

Maddigan (1981) exploits the interactions of the Leontief (1951) input-output model and developed a static linear model of vertical integration index using the national input-output tables and information on the firms' industries. Vertical index is treated not as a single processing chain, but as an interaction which is reflected by a two-dimensional matrix of the two firms. The main problem with this method is the possible vertical linkages that exist between companies and which are difficult to identify with the input – output tables. For example a merger between a petroleum – refining firm (SIC 29)[13] and a petroleum exploration firm (SIC 13) is consider as a diversifying merger despite that based on the industry definition this is also a vertical merger. Fan and Lang (2000) and Fan and Goyal (2006) address the issue and provide a more sophisticated method to distinguish between vertical and horizontal mergers. They use industry commodity flows information in the Use table of Benchmark input-output tables to capture vertical integration. We follow Fan and Goyal (2006) method to classify mergers by the type of diversification as horizontal, vertical, mixed horizontal/vertical and conglomerate.

We find that not all mergers increase default risk of the acquiring firm; horizontal diversification when combined with other characteristics can diversify default risk. We also find that larger acquirers increase risk less than smaller ones. The increase in default risk surrounding mergers is driven by public firms, firms with higher idiosyncratic risk, and deals announced and completed during the second merger wave. Our results remain robust after controlling for other factors related to acquisition process and performance.

[13] SIC stands for Standard Industrial Classification which is a system for classifying industries by a four-digit code.

3.2 Literature Review

3.2.1 Mergers and Default Risk

There is a strong connection between periods of high market uncertainty and thus elevated risk levels, and merger activity. The most recent example is the US credit crisis of 2008 that dramatically affected the number of mergers and acquisitions which decreased in value by more than 50% in the year 2009 compared with 2007. More than ever, firms will now strategically position themselves in risk-reducing projects, such as diversified mergers. There was a common presumption in the literature of corporate finance that certain types of mergers (i.e. conglomerate mergers) decrease risk. Amihud and Lev (1981) showed that conglomerate mergers can reduce risks through the diversification effect. More recently, Furfine and Rosen (2011) show that mergers increase default risk due to aggressive managerial actions that increase risk at a level which outweighs the risk-reducing benefits of diversification.

A number of studies have discussed the potential economic benefits and motivations of diversified mergers. Early papers (Carleton, Harris and Stewart, 1980; McDougall and Round, 1984; Reed and Luffman, 1986; and Salter and Weinhold, 1979) suggest that a number of influences may be at work that induce a firm to diversify. One of the first papers, Levy and Sarnat (1970) explains that mergers might reduce risk through the diversification effect, but will also destroy value for shareholders. This finding was later confirmed by Amihud and Lev (1981) who also suggest that managers engage in conglomerate mergers to reduce their unemployment risk. Geneen (1984), and Little (1984) study the rationale and effectiveness of conglomerate acquisitions, while other studies explored other motives/relationships behind diversification. For example, Lecraw (1984) finds that the industry and firm characteristics of a firm influence its diversification strategy. Risk variation has been also empirically studied with respect other types of diversification; Williamson (1971) and Carlton (1979) discuss how vertical integration may reduce risk during periods of uncertainty and Levitt (1975) finds that vertical firms evolve into related-diversified firms (they grow in size and expand in related industrial sectors). Some other studies have explored wealth creation and other benefits or drawbacks in related versus unrelated mergers. Lubatkin (1987) finds that conglomerate acquisitions outperform related acquisitions in terms of stock market's valuation while Bettis and Hall (1982) and Bettis and Mahajan (1985)

studied risk-return trade-off of diversified firms and find that certain diversification postured can reduce risk and increase returns.

More recent studies present a reverse pattern regarding risk variation through the diversification effect of mergers. Ghosh and Jain (2000) and Morellec and Zhdanov (2008) find that the default risk of the bidding firm increases due to changes in financial leverage. Furfine and Rosen (2011) study the impact of mergers on default risk and find that on average, mergers increase default risk due to managerial risk-increasing motivations with respect to the structure of compensation which outweigh the diversification effects. They find greater risk increases at firms where the CEOs have large option-based compensation, where the recent equity performance is low and where idiosyncratic volatility is high. Shareholder can benefit from risk-increases but at the same time the previous proposition points into large "agency issues" due to private benefits of the managers.

Other studies have explored issues related to distress acquisitions; Hotchkiss and Mooradian (1998) find that distress acquisitions are in related industries and bidders are related with the targets. They also show that this type of acquisitions result in positive abnormal returns and improve operating performance. Clark and Ofek (1994) find that distressed firms are more likely to engage in related acquisitions and will not be hostile. Carapeto et al (2009) confirm that distress acquisitions result in positive AR for both the bidder and the target. Bruland and De Maeseneire (2011) studies the relationship of stock equity volatility of the acquirer firm and default risk for mergers that the target firm is distressed and find that growth bidders, low-risk bidders, acquirers who offer high premiums and acquisitions during or close to booming markets increase bidder post-acquisition default risk. They attribute this effect on acquirer's performance and risk before the acquisitions and to the high market valuations..

This paper focuses on risk variation over different types of integration. Although the literature on mergers and acquisitions has extensively studied diversification effects on mergers, yet no study to our knowledge has ever compared acquirer firm's default risk variation prior to the announcement and after the merger completion by the type of diversification. Diversification has been linked to the spread of risk through the firm's expansion in different stages of production, in new products (related or unrelated with the firm's main business line), and in other industries or geographic areas (Hamel and Prahalad, 1985; Kim and Mauborgne, 1988; Clark and Ofek, 1994). It has been also viewed as a solution against the alternative of bankruptcy (Carapeto et al., 2009), or to access sources of

financing, debt and equity beyond its reach due to acquirer's small size (Lewellen, 1971; Shleifer and Vishny, 1992). There are also tax advantages associated with diversified mergers condition upon the future operating gains which can be increased through cost and resources reduction (Lewellen, 1971). Nevertheless, irrespective to the abovementioned motives behind diversification, one of the main benefits is the reduction of default risk, or at least this was the expectation until recently.

3.2.2 Diversified Mergers

Diversification through mergers is a corporate restructuring strategy which creates value by improving efficiency and productivity. There are different types of diversification and each type serves specific corporate targets. Diversification strategies can be classified into related and unrelated; a related diversification is a merger of two firms with common core skills and an unrelated is the one where the firms involved belong in different industries or geographic areas. Unrelated diversification is also called external or conglomerate diversification. There is a common presumption that unrelated diversification will reduce risk due to the expansion in a different country or in another product range and thus it can improve the profitability of the acquiring firm. However, it is unlikely that such mergers will create value for either the bidder or the target firm (Rumelt, 1974, 1977; Bettis and Hall, 1982)

Diversification strategies can also be classified by the direction of the diversification. Vertical integration (or related) is the merger of two firms that belong in different stages of the same production path. There are three types of vertical integration, backward and forward integration and balanced. A firm that expands backward on the production line (upstream) is backward intergraded, while a firm that expands forward on the production line (downstream) is forward integrated. A balanced vertical integration is both upstream and downstream merger. Vertical integration can help companies reduce costs, increase productivity/efficiency of corporate resources through operating synergies, improve competitive positioning accruing from increased size of business and receive additional profits by decreasing transportation expenses, average costs and reducing turnaround time in the long-run. However, the merged firm needs to be fully efficient with respect their distribution systems, production facilities or research operations to receive the additional profits. On the other hand, concentrating on one product might result into smaller earnings if demand for the product falls, or a substitute product displaces the product in the marketplace

and the entire organization may suffer. Market conditions are also important drivers of the success of a vertical merger. Fan and Goyal (2006) finds that on vertical mergers result in positive gains due to imperfect competition. Kedia et al., (2011) extent Fan and Goyal (2006) sample which spans until 1996, and show that vertical mergers yield positive wealth effects until 1998. This effect reverses after 1998 and up to 2002 in line with Moeller et al., (2005). Williamson (1971) and Carlton (1979) discuss how vertical integration, in specific, may reduce risk during periods of uncertainty.

Horizontal integration is the most common form of related corporate expansion and it is the merger of two firms that belong in the same industry or in the same stage of production. Essentially, the ultimate purpose of the bidding firm which initiated the merger is to increase its share of the market for a particular product or service. The success of a merger may depend not only of how integrated the joining firms become, but also on how well suited the managers to handle the growth of the firm. Eckbo (1983, 1985) was one of the first studies that investigate horizontal mergers and the wealth effect creation. McGuckin, Warren-Boulton and Waldstein (1988), Salinger and Schumann (1988), Fee and Thomas (2004), Shahrur (2005) and Gugler and Sieber (2007), among others, investigate horizontal mergers and the underlying reasons for any wealth effect changes through this type of mergers. In general, horizontal or related mergers lead to operational synergies due to cost reduction, as well as financial synergies. Hotchkiss and Mooradian (1998) find that distress acquisitions are in related industries and bidders are related with the targets. They also show that this type of acquisitions result in positive abnormal returns and improve operating performance. Clark and Ofek (1994) find that takeovers that involve distressed firms would belong in the same industry and will not be hostile. Carapeto et al (2009) confirm that distress acquisitions result in positive AR for both the bidder and the target.

Mixed vertical – horizontal mergers occurs when a firms diversifies both vertically and horizontally. It is unclear how this type of diversification would affect acquirer firms in terms of risk due to the simultaneously vertical and horizontal effects that they will receive. The success of every diversification would greatly depend upon the efficiency of the management team in transferring resources between the two firms and how well integrated the two firms become. In sum, the direction of the diversification would essentially modify firm's business objectives so as to better satisfy the desired performance of the firm. However, the spreading of activities across new markets (business or geographic) or stages of production will also

expose firms to additional costs (such as the transferring of resources between the two firms, the new group of customers that the merged firm has to attract, or/and the mis-management of a larger firm), increase risk levels and thus decrease profitability. The question to diversify will always be a calculated risk. Unrelated diversification is probably riskier than related diversification since the acquirer will enter an unfamiliar industry. Due to the uncertainty and the information asymmetry (Akerlof; 1970) it is possible that the acquirer will overlook critical factors and overpay the target firm. Finally, once the merger is completed the acquirer will most likely have trouble monitoring the new acquisition's performance.

3.2.3 Default Risk Explanatory Variables

This paper seeks to shed light on risk variation in diversified mergers in the post-acquisition period. We compare default risk levels prior to the acquisition announcement and after the acquisition completion, in four different types of diversification (vertical, horizontal, mixed vertical/horizontal, conglomerate) and search how default risk is related with three groups of explanatory variables; the first set of variables is target related. We look at target's ownership status, target's country, target's industry and the size of the target in relation with the acquirer's size. The second group of variables include information regarding the method of payment used, acquirer's debt level and acquirer's size. The next group of variables are related with the profitability of the merger and the managerial compensation. Finally, we also see how default risk varies in the three most important merger waves of our sample; 1980s, 1990s and 2000s.

3.2.3.1 Merger Waves

The history of mergers and acquisitions is divided into six periods based on the merger activity and the market conditions. For example, from 1897-1904 was the first wave, also known as the horizontal wave. Then from 1916-1929 was a vertical merger, followed by a conglomerate merger until 1969 and a hostile wave in the 1980's. The 1990's wave was overpopulated by cross-border merger and the last known wave in the 2000's involved private equities and LBOs.

The 1960's conglomerate wave increase the size of the firms, which instead of becoming more efficient they were under-performing and lead to the next merger wave of 1980's which is the beginning of our sample period. According to the literature, the period of 1980 - 1989

is known as a divestiture merger wave.[14] During that period, a lot of firms were large and highly inefficient being in fact sub-products of the 1960's conglomerate wave. Most of the firms were under-performing due to industry shocks they experienced and were also considered as undervalued. This wave initiated a large increase in loans and thus increased debt levels, which spurred a high default rate among firms. Finally, banks stopped this lending frenzy, thus ended the wave. The 1980's wave is very large in terms of activity and the size of the target firms. Most of the acquisitions during this period were hostile, the medium of payment was cash (through leveraged takeovers) rather than stock and they were characterized by heavy use of leverage.[15] Ghosh and Jain, 2000 shows that when a firm increase its leverage through a merger, its default risk also increases. Also the larger the target firm is, the bigger its impact on the acquirer. We therefore expect that during the first merger wave that most firms were high-leveraged and targets were very large is size, default risk levels will be elevated.

The next wave period in the 1990's, was characterised by technological advances involves larger cross-border mergers, and high stock valuations that initiate the use of stock as a method of payment. Shleifer and Vishny (2003) argue that managers prefer to engage into mergers and pay with stock when their stock is overvalued. Such acquisitions benefit the shareholders of the acquiring firms. However, there are no predictions in the literature for the direction of the risk in overvalued acquisitions. Furthermore, cross-border acquisitions can take the direction of the risk both ways; buying a foreign target, the acquirer enters a new market with cheaper sources of production, gains greater bargaining power and diversify its country's and/or market's risk. However, there is more uncertainty and information asymmetry involved by entering a new country. Due to the conflicting theories, we have no prior expectation regarding the level of default risk of the acquiring firms during this wave.

Finally, the last wave period is the beginning of global markets as we know it today. This wave is characterized by large private equity players, high market valuations, large premiums, low interest rates and a financial crisis that started from the loan market and spread to the house market. In 2007 the crisis hits a peak in the US market and around banks are forced to follow a stingiest credit which sinks the market into a depressing period. Due to the elevated market risk during this period, we expect that default risk levels of the acquiring firms will also be elevated.

[14] See for example Holmstrom and Kaplan (2001)
[15] See for example Bhagat, Shleifer and Vishny (1990) and Kaplan (1997)

3.2.3.2 Target-related Characteristics

The first set of explanatory variables is target-related characteristics. We investigate how default risk changes in the four types of diversification by the target's status (i.e. public, private and subsidiary), the target's country (i.e. foreign and domestic target's), the target's industry (i.e. same or different industry) and finally the size of the target in relation with the acquirer's size (relative size).

Target type is an important factor of the acquisition success in terms of wealth creation. Several studies report positive abnormal returns for private and subsidiary acquisitions and zero or negative for public acquisitions (Bradley, Desai and Kim, 1988; Jarrell and Poulsen, 1989; Lang, Stulz and Walking, 1989; Servaes, 1991; Berkovitch and Narayanan, 1993; Mulherin and Boone, 2000). The primary characteristic of a public firm is the dispersed ownership of the target entity. More specific, in a public merger there will be no identifiable party to stand behind the obligations of the target after closing. The deal happens between the managerial teams of the two firms involved and it is subject to shareholder approval. This creates a level of uncertainty. In a private merger, the deal is typically negotiated directly with the shareholders of the target and thus such acquisitions are more profitable and less risky. We therefore expect that non-public acquisitions will involve smaller increases of default risk.

The literature on cross-border acquisitions (CBA) concentrated on the performance differences when acquiring a foreign target compared with a domestic target. Datta and Puia (1995) shows that CB acquirers experience negative abnormal returns and attribute this to the high costs that such acquisitions has, the cultural differences, and the integration problems that the managerial team faces. Moeller and Schlingermann (2004) find that US bidders experience lower performance in cross-border acquisitions compared with the domestic ones. Goergen and Renneboog (2004) find that acquisitions of domestic firms result in negative insignificant abnormal returns, while cross-border acquisitions result in significant positive returns. Conn et al., (2005) uncover significant wealth differences between domestic and cross-border acquisitions after controlling for target status and the method of payment. Cross border acquisitions do not increase wealth (Doukas and Travlos, 1988) but acquirers who choose to expose themselves internationally by taking over a foreign target in the absent of information asymmetry, they can take advantage from (1) the gains from diversification, (2) the synergies, (3) the strategic planning, (4) the access to research and development, (5) the

access to cheaper sources of production, (6) the incomplete markets and information asymmetries, (7) diversify specific country's and/or market's risk , and finally (8) the greater bargaining power. We expect that if the acquiring firm is well prepared and aware of risks and possibilities of the new market which is entering, it can decrease risk in the post-acquisition period.

Relative size is the ratio of the deal's value to the market value of the acquirer. The smaller the target compared to acquirer the less likely the merger will have an impact on the acquirer's firm (Asquith et al., 1983). Similarly, we expect that the smaller relative size deals would involve smaller increases of risk.

3.2.3.3 Method of Payment, Acquirer's Leverage and Size

The method of payment in an acquisition affects the asset volatility of the firm as well as the market reaction around the announcement and the success of the merger (Travlos, 1987). There are three main methods of payments; cash, stock and a combination of cash and stock, known as mixed payments. Usually, an acquirer will offer stock if he thinks that his stock is overvalued (Shleifer and Vishny, 2003). Evidence on wealth creation by the method of payment offered in a merger suggest that equity acquisitions are perceived negatively by the market and that shareholders of the acquiring firm experience negative abnormal returns, while shareholders in cash acquisitions experience small positive or zero abnormal returns (Asquith et al., 1990; and Eckbo, Giammarino, Heinkel; 1990). Method of payment is one of the strongest drivers of the success and the profitability of the acquisition. However, we have no prior expectation for the direction of the risk by the method of payment.

Furfine and Rosen (2011) find that there is a positive relationship between the leverage level and default risk. We also include leverage as an explanatory variable and explore how diversification strategies are affected if the acquirer increases its leverage level.

Acquirer size also affects takeover process in terms of wealth creation but also in terms of the change in risk. Vassalou and Xing (2005) for example, show that smaller high default risk firms (value stocks) yield higher returns compared with bigger firms (growth stocks). We expect that the larger the acquirer is, the more diversified he will be and therefore its risk will be less affected by the acquisitions.

3.2.3.4 Merger Profitability and Managerial Compensation

The ultimate goal of any healthy firm should be to maximize shareholder's wealth by taking profitable project. We therefore investigate how risk levels change before and after the acquisition in different types of diversification. Rumelt, (1974), (1977), Montgomery (1979) and Bettis (1981) show that different type of diversification strategies yield different wealth gains. More specific they find that related mergers outperform unrelated mergers. High risk projects are usually high return projects. We therefore expect that profitable acquisitions will also be risk-enhancing projects and visa versa.

Furfine and Rosen (2011) include OPTIONS as a managerial compensation measure and an explanatory variable of the risk-increasing mergers. They argue that greater option compensation will be correlated with risk-increasing projects. We want to test their finding and see how it changes when we split the sample by the type of diversification.

The remainder of this paper presents our data, explains risk measure, vertical integration methodology, the explanatory variables we incorporate in univariate and multivariate analysis and presents our empirical results. Overall our research provides a new perspective in the default risk associated with the different diversification strategies. We find a strong relationship between idiosyncratic stock volatility and default risk increase. Idiosyncratic stock volatility is an indicator of information asymmetry; horizontal acquisitions involve less information asymmetry than other diversification strategies due to the familiar nature of the industry and thus reduce default risk for the acquiring firm after the merger completion.

3.3 Data and Methodology

3.3.1 Sample Description

The US Mergers and Acquisitions (M&A) sample is from Thompson One Banker database. We choose all the mergers and acquisitions which are selected announced and completed between 1980 and 2008. The deals involve public US bidders and domestic or foreign targets. Neither the bidder nor the target is a government, a healthcare, a utility, a bank, a real estate or a financial institution. To ensure that a merger has a significant impact on acquirer's firm default risk, we examine only those where the acquirer owns less than 10% prior to the deal and obtains more than 50% after the deal, similar with other studies (see for example Fuller et

al., 2002). We apply the minimum restrictions on deal value (deal value is the total value minus fees and expenses paid by the bidder > 5%) and relative size (ratio of deal value to the bidder market value > 5 million dollars) in order to eliminate the deals that have little or no influence on the bidder's firm default risk.[16] After these restrictions are applied our sample is reduced to 8046 completed mergers.

We also require that within the selected period of our analysis (1980-2008): i. accounting and market data are available from COMPUSTAT and CRSP, respectively, so we can calculate acquiring firm's default risk 1 and 6 months prior the announcement, and 6 months after the completion of the merger and ii. commodity flow data are available for the selected deals from the U.S. input-output (IO) tables so we can construct the IO-based measures to measure the vertical integration of the deals as Fan and Lang (2000). The final sample comprise of 8046 completed mergers. We then calculate the acquiring firm's default risk between 6-months prior the announcement and 6-months after the completion, and between 1-month prior the announcement and 6-months after the completion[17] and we end up with 2203 completed mergers and acquisitions.

Finally, we construct the explanatory variables[18] used by Furfine and Rosen (2011) to explore the relationships between the acquirer default risk and: i. the target default risk, ii. the managerial compensation, iii. asymmetric information, and iv. stock valuation. To do so, we require stock market information from CRSP, balance sheet changes from COMPUSTAT and executive compensation data from Execucomp. Due to the number of information we require from CRSP and COMPUSTAT to construct the variables, and Execucomp data unavailability, our final sample comprise of 1382 observations.

3.3.2 Estimating Default Risk

We estimate default risk 6 months (and 1 month) before the announcement and 6 months after the merger completion, using Campbell, Hilscher and Szilagyi (2008) dynamic panel

[16] To ensure that the findings are not sensitive to the relative size or the value of the deal, we perform the analysis excluding from the sample the 5% and 10% smaller relative size deals and deals that have deal value less than 5, 10 and 50 million dollars. We find that further restrictions do not influence our findings and thus are not applied.

[17] Our analysis is contacted for both period of default risk; since our findings are not influenced by this period we report only the results for the default risk calculated between 1-month prior the announcement and 6-months after the completion similar to Furfine and Rosen (2011).

[18] You can find detailed explanations of the explanatory variables we construct as given in the Rosen and Furfine (2011) paper at section 3.3.3.

logit model of distress. To measure the probability of default, the authors extent previous work of Shumway (2001) and Chava and Jarrow (2004) by considering a wide range of explanatory monthly accounting and daily market variables from COMPUSTAT and CRSP.[19] They also examine the model's predictability into various horizons. The proposed model is significantly improved in terms of explanatory power and compared with previous work of Shumway (2001) and thus we adopt this model for the purposes of our analysis.

The logistic distribution probability of bankruptcy during the next period is given by:

$$P_{(t-1)}\,(Y_{it}\ = 1) = \frac{1}{1 + \exp(-\alpha - \beta_{x_{i,t-1}})}$$

where Y_{it} is an indicator that equals one if the firm goes bankrupt in month t, and $x_{i,t-1}$ is a vector of all explanatory variables at the end of the previous month. The higher $\alpha + \beta_{x_{i,t-1}}$ is the higher the probability of bankruptcy. We obtained the values for the Y_{it} indicator from BankruptcyData.com database.[20]

Then we construct the explanatory variables of the model for each firm, using quarterly accounting data from COMPUSTAT and monthly and daily equity market data from CRSP.

The variables are defined as follows:

$$i.\ NIMTAAVG_{t-1,t-12}\ = \frac{1-\varphi^3}{1-\varphi^{12}}\ (NIMTA_{t-1,t-3} + \cdots + \varphi^9\, NIMTA_{t-10,t-12}\ )$$

where $\varphi = 2^{-\frac{1}{3}}$

$$ii.\ NIMTA_{i,t} = \frac{Net\ Income_{i,t}}{Total\ assets\ (adjusted)_{i,t}}$$

$$Total\ assets\ (adjusted)_{i,t} = Total\ Assets_{i,t} + 0.1(Market\ Equity_{i,t} - Book\ Equity_{i,t})$$

$$iii.\ EXRETAVG_{t-1,t-12}\ = \frac{1-\varphi}{1-\varphi^{12}}\ (EXRET_{t-1} + \cdots + \varphi^{11}\, EXRET_{t-12}\ )$$

where $EXRET_{i,t}\ = \log\big(1 + R_{i,t}\ \big) - \log(1 + R_{S\&P500,t}\ )$

[19] Campbell et al., (2008) find that a measure to distance to default based on Moody's KMV model adds little explanatory power to their model.
[20] We would like to thank Neofytos Lambertides for providing this data.

$$iv.\ \ TLMTA_{i,t} = \frac{Total\ Liabilities_{i,t}}{Firm\ Market\ Equity_{i,t} + Total\ Liabilities_{i,t}}$$

$$v.\ SIGMA_{i,t-1,t-3} = (252 * \frac{1}{N-1} \sum_{k\in\{t-1,t-2,t-3\}} r_{i,k}^2)^{\frac{1}{2}}$$

$$vi.\ CASHMTA_{i,t} = \frac{Cash\ and\ Short\ Term\ Investments_{i,t}}{Firm\ Market\ Equity_{i,t} + Total\ Liabilities_{i,t}}$$

$$Relative\ Size = \log(\frac{Firm's\ market\ capitalization}{S\&P500\ market\ capitalization})$$

$$vii.\ MB = Firm's\ market - to - book\ value\ ratio$$

$$viii.\ Price = \log(Price\ per\ share)$$

All eight variables in the Campbell et al., (2008) bankruptcy model enter significantly and with the expected signs at the period 1980 to 1998, which is the closest period to Campbell's bankruptcy model 2 (1963 – 1998), pp. 2910.

To estimate acquiring firm's default risk one month and six months before the announcement and six months after the completion of the merger, we first estimate default risk for each firm for each month. We annualized the monthly probability for each firm similar to MoodysKMV Expected Default Frequency (EDF). In order to limit the influence of outliers with extremely low or high default risk values we winsorize the monthly default risk probabilities at the 1st and 99th percentiles of their polled distributions. We basically replace any observation below the 1st percentile with the 1st percentile, and any observation above the 99th percentile with the 99th percentile.[21] Finally, we construct the difference of acquirer's default risk between six months after the merger completion (DF_{c+6}) and one month prior to the merger announcement date ($DF_{\alpha-1}$): $\Delta DF_{16} = DF_{c+6} - DF_{\alpha-1}$

where c is the month in which the merger is completed and a is the announcement month of the merger.[22]

[21] Our results are robust to other winsorization windows (5th / 95th percentiles and 1st /99th percentiles) as well as to no winsorization.

[22] We also estimate the change of default risk between six months before the announcement and six months after the merger completion and our results remain qualitatively the same.

Since our measure of default risk includes market and accounting data, the six month period after the completion of the merger ensures that all the necessary information of the merger will be reflected in the accounting data.

3.3.3 Explanatory Variables

Following Furfine and Rosen (2011) we estimate the following variables as are described in their study:

Target Public: is a dummy variable that takes the value 1 if and only if the target is publicly traded and 0 otherwise

Target Sub: is a dummy variable that takes the value 1 if and only if the target is a subsidiary and 0 otherwise

Vol: is the standard deviation of the idiosyncratic component of the acquirer's stock return, estimated by taking the square root of the variance of the residuals from a market model estimated over the six month period ending at the end of the month prior to the merger announcement

Run up net mkt: is the buy-and-hold return of a company's stock in the 12 months ending at the end of the month prior to the merger announcement in excess of the return of the CRSP value – weighted index over the same period.

Mkt-to-book: is the ratio of acquirer's market value of equity to the book value of equity as of the last quarterly balance sheet prior to the month of the merger announcement.

Stock: is an indicator variable that takes the value 1 if and only if the acquisition is financed at least partially with stock.

Diff ind: is an indicator variable that takes the value 1 if and only if the target and the acquirer are in different industries.

Ratio: is the ratio of the deal's value to the market value of the acquirer

Mkt val: is the natural log of the market value of the acquiring firm at the end of the month prior to the merger announcement.

Car: is the cumulative abnormal return abnormal return for the acquiring firm's stock from the day prior to the merger announcement through the day after the announcement.

Car resid: is the estimated residual from the regression of CAR on RETURN INTERIM, defined as the buy-and-hold return for an acquirer's stock between the end of the month prior to the merger announcement and at the end of the month six months after the merger is effective

Dist from desired risk: is defined as the residual from a regression of acquirer default risk on balance sheet determinants of target risk level . Following Usyal (2011), target risk model regresses observed default risk on acquirer market-to-book, EBITA/SALES, ASSETS, R&D/SALES ratio, an R&D dummy, and PPE (property, plant, and equipment expenditures).

Market-to-book: is Market Value (liabilities [Item LT] minus balance sheet deferred taxes and investment tax credit [Item TXDITC] plus Preferred Stock (Preferred Stock is equal to liquidating value [Item PSTKL] if available, else redemption value [Item PSTKRV] if available, else carrying value [Item PSTK]) plus Market Equity [Item CSHO x Item PRCC_F]) over Total Assets [Item AT].

Sales: the natural logarithm of net sales [Item SALE]

Assets: Total Assets [Item AT]

Ratio of R&D/Sale: is defined as R&D expenses [Item XRD] over Sales [Item SALE].

R&D dummy - R&D Dummy is a dummy variable that takes a value of one if COMPUSTAT reports R&D expense [Item XRD] as missing, and of zero otherwise.

PPE – property, plant, and equipment expenditures [Item PPENT]

Ind cf vol diff: is the risk in the acquirer's industry minus the risk in the target firm's industry, where industry risk is the standard deviation of the ratio of annual total cash flow to total assets in an industry in the five years prior to the merger announcement. Industry definitions are obtained from SDC, which separates firms into six broad industry groups. Cash flow measure is operating cash flows from COMPUSTAT, which are sales minus the sum of cost of goods sold, selling and administrative expense, and the change in working

capital. Cash flows and assets are then aggregated by the six SDC industry groups and we then take the standard deviation over a 5-year period.

Execucomp sample: is a dummy variable that takes the value 1 if and only if the acquirer is in the Execucomp data for the year prior to the merger announcement.

Options: is defined as the fraction of the acquiring CEO's compensation that is derived from executive stock options if EXECUCOMP SAMPLE equals 1 and is zero otherwise.

We extend Furfine and Rosen (2011) analysis by incorporating: i. the three most important merger waves during our sample period (1980s, 1990s and 2000s), ii. the four types of diversification (i.e. vertical, horizontal, mixed and conglomerate), and iii. cross border mergers identification variable.

Diversification type: Horizontal is a dummy variable that takes the value 1 if and only if the acquirer diversifies horizontally, while Mixed and Conglomerate are defined analogously for the acquirers who diversify both vertically and horizontally (mixed) and for the acquirers who make an unrelated acquisitions (conglomerate) respectively.

Wave1, Wave2 and Wave3 is an indicator variable that takes the value 1 if and only if the acquisitions was announced and completed during the first merger wave (1980-1989), during the second (1990-1999) and during the third (2000-2008) respectively.

CBA is an indicator that takes the value 1 if and only if the target firm is not a US firm and 0 is the target firm is a US firm.

3.3.4 Measuring Vertical Integration

To classify the mergers and acquisitions into the four main types of integration we follow a methodology applied by Fan and Goyal (2006), Acemoglu et al. (2009) and Kedia et al. (2011). To calculate the vertical integration coefficient for each acquisition we have to use the industry commodity flow information in the 'UseTable' of Benchmark Input-Output Accounts for the U.S. Economy which are available by the Bureau of Economic Analysis. Using the dollar amount of input transfer between industries, given by the IO data,[23] we

[23] Maddigan (1981), Caves and Bradburd (1988), and Davis and Morris (1995) used IO data to measure vertical integration. McGuckin et al. (1991) used IO data to classify the relationship between merging firms into vertical, horizontal or conglomerate.

construct vertical relatedness index between industries. The 'UseTable' is a matrix which contains the value of commodity flows between each pair of roughly 500 private-sector, intermediate IO (Input-Output) industries. The tables are updated every five years and are available from 1982 until 2002. There are 3 different types of files depending on the I-O code; the sector level (2 digit I-O code), the summary level (4 digit I-O code) and the detailed level (6 digit I-O code). We choose to use the detailed level IO code for the purpose of our analysis as it provides all the necessary details of each industry and thus it reduces the possibility of making any mistakes when matching vertical coefficients with the merger sample by industry. We estimate the relatedness coefficients for the years 1982, 1987, 1992, 1997 and 2002.

Each table reports for each pair of industries, *i* and *j*, the dollar value of *i*'s output required to produce industry *j*'s total output, denoted as *aij*. In addition, for the matrix format tables, the total industry *j*'s output and the total industry *i*'s output were computed by adding the column and row sums of the data on the "UseTable" respectively for *j* and *i* industry. Pivot tables have been used in order to calculate the total industry *j*'s output and the total industry *i*'s output for the non-matrix format tables. The *aij* value is divided by the dollar value of industry *j*'s total output to get *vij*, representing the dollar value of industry *i*'s output required to produce 1 dollar's worth of industry *j*'s output.

Conversely, we divide *aji* by the dollar value of industry i's total output to get *vji*, representing the dollar value of industry *j* 's output required to produce 1 dollar's worth of industry *i*'s output:

$$vij = \frac{aij}{total\ j´s\ output}$$

$$vji = \frac{aij}{total\ i´s\ output}$$

We then take the average of the two input requirement coefficients to obtain the vertical relatedness coefficient of industries *i* and *j*[24]:

$$Vij = \frac{1}{2}\,(vij + vji)$$

To match the merger sample with the vertical coefficients we have to convert the acquirer and the target Standard Industry Classification (SIC) codes into the industry codes (IO) used in the U.S. input-output tables. We obtain the tables needed to convert the Standard Industry Classification (SIC) codes and the industry codes (IO) used in the U.S. input-output tables for the years 1982, 1987 and 1992 from Joseph Fan's analysis. The above tables are not available for the years 1997 and 2002 and thus we use a table which shows the relationship between the industry codes (IO) and the North American Industry Classification System (NAICS). We convert the NAICS codes to SIC codes using the tables which are published by the United States Census Bureau.[25] We deleted all codes where we could not match the IO codes with a representative NAICS code or SIC codes. Finally, we used Fan's conversion table to match any unmatched IO codes.[26] Our vertically related coefficients have been matched with Joseph Fan's coefficients.

We then classified our sample of mergers and acquisitions as vertically related if the corresponding vertical coefficient was larger than a certain cutoff. For robustness, we consider three alternative cutoffs: 1%, 5% and 10%.[27] Kedia et al. (2011) used three alternative classifications; Fama and French (1988) industry classifications, four-digit CRSP SIC codes and two-digit SIC codes to test the strength and robustness of their results. They find that the four-digit SIC classification to be more precise and a 1% cutoff. We follow Kedia et al. (2011) four-digit SIC classification and a 1% cutoff. Our merger sample is significantly reduced, due to data availability when calculating default risk. Given this

[24] Following Fan and Goyal, (2006), Acemoglu et al., (2009) and Kedia et al., (2011), we take the average of the two input requirement coefficients to avoid any bias of our analysis in the event where the industries are selling in both directions.
[25] http://www.census.gov/eos/www/naics/concordances/concordances.html
[26] The inter industry relatedness measures for IO Tables of 1982, 1987 and 1992 are available from the webpage at Joseph P.H. Fan webpage under Relatedness Project.
[27] These cut-off points are similar to Fan and Goyal (2006)

reduction we do not use the strictest definition of vertical relatedness (10% cut-off) which further reduces our sample.[28]

To classify mergers by the type of integration we take into consideration: i. the four-digit CRSP SIC code[29] and ii. the vertical relation coefficient. If the acquirer and the target firm have the same four-digit CRSP SIC code then the merger is horizontal. However it can also be vertical so we have to look at the vertical coefficient to distinguish pure horizontals (we refer to these mergers as horizontal) and mixed vertical/horizontal. Vertical mergers (1) are those that are classified as vertically related as captured by the vertical coefficient, and the acquirer and the target firm belong in a different industry (i.e. they have different SIC codes). Horizontal mergers (2) are the ones which belong in the same industry based on the four-digit CRSP SIC code that are not vertically related. If they are vertical but they belong in the same industry (same SIC code), then they are classified as mix horizontal and vertical (3). Finally, if we cannot classify a merger as vertical or horizontal, then it is classified as a conglomerate merger (4).

3.3.5 Descriptive Statistics

Table 3.1 displays the summary statistics on acquirer and public target firms' default risk. We estimate default risk for both the target and the bidder firms, six months before the announcement ($DF_{\alpha-6}$), one month before the announcement ($DF_{\alpha-1}$), and six months after the completion of the merger (DF_{c+6}). We then calculate the change of default risk between these periods for the target and the bidder firms. $\Delta DF_{66}$is the difference of default risk between six months before the announcement and six months after the completion and ΔDF_{16} is the difference of default risk between one month before the announcement and six months after the completion ($\Delta DF_{16} = DF_{c+6} - DF_{\alpha-1}$).

We find that, on average, mergers lead to an increase in default risk for the acquiring firm. The mean increase between one month or six months prior to the announcement and six months after the completion of the merger is about the same (~ 0.014) across all mergers in our sample. To gain perspective of this risk increase after the merger completion, consider that the mean level of default risk six (one) months before the announcement is 0.018 (0.017)

[28] For robustness purposes we run our analysis using 5% and 10% cut-offs and it does not affect our main findings.
[29] Kedia et al. (2011) concludes that the four-digit SIC classification is more precise than the two-digit SIC or Fama and French (1988) industry classification.

and 0.031 after the merger completion. The increase of default risk between the two periods is almost a 82% increase. Acquirer's default risk one month before the announcement is 0.001 at its lowest value and 0.404 at its highest, and takes values from 0.001 to 1.174, six months after the completion. Initially we had 337 public target firms in our sample with available default risk data before the announcement. After we have calculated the post-acquisition default risk we ended up with 86 public target firms with a 0.047 mean level of default risk six months before the announcement and 0.056 one month before the announcement. Default risk for the target increases to 0.135 six months after the completion of the deal, which is around an 241% increase. Evidently, the level of increase of default risk for the target firms exceeds the corresponding increase for the acquiring firms and although, it would have been interesting to explore the target sample, we have decided to focus our analysis on the acquiring firms mainly due to the limited sample of the target firms.

[Table 3.1]

In this study we concentrate on the importance role of diversification types on default risk changes. Diversification is a form of growth strategy to increase performance through the expansion of a firm's operations into a new market, product, services or stages of production. Although asset pricing literature has established a strong relationship between profitability and default risk[30], often, other diversification benefits outperform wealth creation. One of the most important factors which affect the overall market risk, and in turn acquisition decisions and process (i.e. merger characteristics and deal numbers) are the market conditions at the time of the announcement. To investigate default risk changes by the type of diversification and the market conditions, we report at table 3.2 the summary statistics for default risk by the type of diversification and the aggregate default risk changes over the three most important merger waves of our sample period, 1980's, 1990's and 2000's. We also display acquiring firm's default risk one month before the announcement ($BDF_{\alpha-1}$), six months after the completion (BDF_{c+6}), the risk change between the two periods ($B\Delta DF_{16}$) and the % risk change ($\%B\Delta DF_{16}$) in table 3.3, by the type of diversification during the three merger waves.

From Table 3.2, Panel A, we can see that mixed vertical/horizontal and conglomerate mergers are the two most popular types of diversification for the entire sample period. Default risk increases by 86% across mixed mergers and 81% across conglomerate ones.[31]

[30] See for example Merton, 1973; Chan and Chen, 1991; Fama and French, 1996
[31] All of our results are statistical significant at 1%.

Pure horizontal acquisitions seem to be the less popular type of diversification, despite the fact that they increase default risk the least by 53% overall. Vertical mergers increase default risk the most compared with all the other types of diversification by 124%. Panel B shows default risk changes within the three major merger waves in our sample period. We can clearly see that the number of deals increase in each decade and that although during the first wave the average default risk prior to the announcement is the highest (0.022), it is during the second wave that default risk increases the most by 103%. During the third merger wave, default risk increases the least by 76%.

[Table 3.2]

When we look at default risk changes more closely in each merger wave (see Table 3.3), we find that there are certain diversification types in each wave that either maximise or minimise risk. During the first wave, the lowest mean value of default risk one month before the announcement is 0.006 in the horizontal deals. However, horizontal diversification increases default risk levels the most compared within and across all waves, at a surprising percentage of 442%. Vertical deals involve the lowest level of default risk change during this wave (22%). Although all of our variables are winsorized, the results in this portfolio might be driven by some observation due to the small number of observations; there are only 19 vertical acquisitions and 15 horizontal deals. The most popular type of diversification is conglomeration during this period probably following the trend of the previous wave and the common belief that conglomerate acquisitions reduce risk exposure. However, the larger a firm becomes as a result of the acquisitions the more the performance of the entire firm can suffer. This type of diversification increase default risk by 70%.

During the second wave period, the lowest average default risk prior to the acquisition announcement (0.012) in vertical deals, which also increase default risk the least by 48% as in the first wave period. Vertical integration has been linked to risk reduction in many studies (see for example Arrow; 1975, Williamson; 1975, and Carlton 1978). Accordingly, during periods of uncertainty firms diversification on specialized and known business areas can increase performance and efficiency of their resources by cutting costs and expenses and improve their competitive positioning by increasing in size. Vertical integration can increase profitability and thus decrease default risk (Rumelt, 1974, 1977). More recent papers support that vertical deals are profitable but do not make any predictions about default risk and vertical diversification. Fan and Goyal (2006) for example, find that on vertical yield positive

abnormal returns due to imperfect competition. Kedia et al., (2011) extent Fan and Goyal (2006) sample and show that vertical mergers yield positive wealth effects until 1998. This effect reverses after 1998 and up to 2002 in line with Moeller et al., (2005). We also find that mixed vertical/horizontal increase default risk levels the most by 164%. Horizontal deals default risk prior to the announcement is 0.013 and it is increased by 71% during the six months period after the merger is completed. Conglomerate acquisitions also increase default risk by about the same percentage as horizontal deals, 76% and remain the most popular diversification type. A conglomerate merger is a merger between two unrelated firms. This kind of merger will create larger firms. The larger the firm, the larger its market share, synergy, cross selling and the smaller its risk exposure.

Mixed vertical/horizontal type is the most popular type of diversification during the third merger wave, 2000 -2008. This type of deals increase default risk by 43% and they are the second less risky type. The first is horizontal diversification which increase risk by only 11%. Vertical deals involve the highest levels of default risk prior to the announcement (0.021) and they also increase risk the most by 180%. Conglomerate deals also increase risk a lot, by 100% although the mean level of default risk is the lowest before the announcement (0.012).

On average, we find that conglomerate acquisitions are the most popular type of diversification during the first two periods and mixed during the last one. Default risk – wise, we find mixed evidence; for example horizontal deals are the riskier in the first period but the safer strategy during the last period. More comprehensive analysis follows to uncover the relationships between diversification strategies and default risk changes.

[Table 3.3]

Table 3.4 presents the mean value of idiosyncratic stock volatility for the number of firms that engage in vertical, horizontal, mixed vertical/horizontal and conglomerate acquisitions. As explained in the previous section, we expect that related diversification should involve less uncertainty and thus smaller levels of stock volatility. We find that horizontal diversification involves the lowest levels of idiosyncratic stock volatility and thus we expect that this type of diversification would involve lower default risk for the acquiring firm.

[Table 3.4]

3.3.6 Results – Risk Variation and Vertical Integration

In general the 'law of diversification' says that the more you diversify the lower your risk and the higher your return. However, the most recent empirical study on mergers and default risk, Furfine and Rosen (2011) finds that mergers are on average risk increasing activities for the acquiring firms. They attribute their finding mainly on managerial motivations which outweigh the risk-reducing benefits of asset diversification. We investigate how each type of diversification (vertical, horizontal, mixed vertical/horizontal and conglomerate) affects default risk for the acquiring firms' prior to the acquisition announcement and post-acquisition completion. Then we test whether Furfine and Rosen (2011)'s explanatory variables are robust across our analysis. We also seek to link certain merger characteristics with specific types of diversification and in turn the change of default risk. To the extent that specific firm/deal characteristics and diversification have been found to affect acquisitions process and success, we aim to uncover which factors dominate default risk increase. We split our sample by target type, method of payment, the size of the deal and acquirer's leverage. We also look how stock past performance, industry risk and managerial compensation affects acquirer's default risk levels. Table 3.5 presents the summary statistics for the explanatory variable we incorporate in our analysis and tables 3.6 to 3.8 report the results of this analysis. Finally tables 3.9 and 3.10 present the multivariate analysis of this study.

So far we find that mergers are generally risk increasing, irrespective of the diversification strategy. We also find that certain strategies seem to be more or less popular in each merger wave. Each strategy involves different levels of risk prior and post-acquisition in each wave and thus there is evidence that there is a relationship between the market conditions at the time of the announcement and the diversification strategy the acquirer chooses. Default risk change between the announcement period and the acquisition completion period can vary from 11% to 442% depending on the type of diversification period that the acquirer chooses and the period that the merger is announced. To further explore how acquirer's default risk changes after a merger, we examine the default risk change between the announcement period and the completion period within different portfolios in tables 3.6 -3.8. The choice of the explanatory variables we use in our analysis is guided by the literature of corporate finance and previous closely related studies such as Rosen and Furfine (2011). Summary statistics for default risk and the independent variables are presented in Table 3.5. All

variables are winsorised at the $5^{th}/95^{th}$ level to control for outliers and our results are robust at the $1^{st}/99^{th}$ level winsorization.

[Table 3.5]

The first set of explanatory variables in the univariate analysis (Table 3.6) is related with the target firm. The target's ownership status, the target's country, industry, and the size of the target in relation with the acquirer's size are all factors that have been found to affect acquisition process. The literature on merger diversification and the ownership status of the target prior to the merger is quite limited. Faccio and Masulis (2005) and Conn, Cosh, Guest and Hughes (2005) find that non-public acquisitions create value for the acquiring firm. Also the level of information asymmetry and the transparency regarding the market value of public and private firms differs and thus we expect that the level of risk will also be different between the two types of targets. We include dummy variables to control for the target type; TARGET_PUBLIC, TARGET_PRIVATE and TARGET_SUB which take the value 1 if the target is public, private or a subsidiary respectively. Next, we want to see how default risk changes depending of the target's country of origin; CBA – cross border acquisitions dummy takes the value of 0 if the target is domestic firm and 1 if it is a foreign firm. Although the type of diversification accounts for the industry that the target and the acquirer firms are, as in previous studies, we also include a broader definition that shows whether the target and the acquirer belong in a different industry. To account for size we use the variable RATIO which is the ratio of the deal's value to the market value of the acquirer.

The second set of explanatory variables (Table 3.7), include information regarding the method of payment used, acquirer's debt level, and acquirer's size. We account for the method of payment used in the acquisition; STOCK, CASH, MIX are dummy variables that takes the value 1 if and only if the acquisitions is financed with equity, cash or a combination of cash and equity. Leverage changes are closely associated with the firm's default risk. Acquirers tend to increase leverage through a merger and thus increase default risk (Ghosh and Jain, 2000; Morellec and Zhdanov, 2008). We therefore measure the leverage change over the same period that we measure default risk change. LEV is a variable that takes the value of 1 if the leverage of the deal is above the median value. Acquirer size also affects takeover process in terms of wealth creation but also in terms of the change in risk (see for example Vassalou and Xing, 2005). The larger the firm is the more likely it will be diversified and therefore the acquisitions will not affect it risk mutch. We incorporate

acquirer's size using MKT_VAL, the natural log of the acquirer's market value at the end of the month prior to the merger announcement.

The last group of variables (Table 3.8) are related with the profitability of the merger and the managerial compensation. The ultimate goal of any healthy firm should be to maximize shareholder's wealth by taking profitable project. We therefore investigate how risk levels change before and after the acquisition in different types of diversification. Rumelt, (1974), (1977), Montgomery (1979) and Bettis (1981) show that different type of diversification strategies yield different wealth gains. More specific they find that related mergers outperform unrelated mergers. We estimate CAR, the cumulative abnormal return for the acquiring firm's stock, between two days before the announcement and two days after the announcement and split our sample into value-add deals with positive abnormal returns and value-destroy deals with zero or negative abnormal returns. We also account for the acquiring firm's stock performance as captured by the MKT-TO-BOOK which is the ratio of the acquirer's market value of equity to the book value of equity as of the last quarterly balance sheet prior to the month of the merger announcement. Finally, we include firm's stock idiosyncratic volatility as a measure of information asymmetry between management and shareholders; VOL is defined as the standard deviation of the idiosyncratic component of the acquirer's stock return, estimated by taking the square root of the residuals from a market model estimated over the six month period ending at the end of the month prior to the merger announcement. Managers of high-volatility firms might undertake riskier projects since shareholders can not sufficiently monitor their actions. We expect that volatility should be positively related with default risk.

The literature on mergers and acquisitions finds significant differences on acquisitions (especially on the profitability of the merger) depending on the type of firm being acquired. Several studies report that public acquisitions result in negative abnormal returns or break-even around the acquisition's announcement day.[32] On the other hand, the vast majority of studies report significant positive abnormal returns for private[33] and subsidiary[34] acquisitions.

[32] See for example Jensen and Ruback (1983), Ascquith (1983), Jarrell and Poulsen (1987a), Bradley, Desai, and Kim (1988), Jarrell, Brickley and Netter (1988), Jarrell and Poulsen (1989), Asquith, Bruner, and Mullins (1990), Servaes (1991), Kaplan and Weisbach (1992), Hansen and Lott (1996), Chang (1998), Mulherin and Boone (2000), Schwert (2000), Ang and Kohers (2001), and Fuller, Netter, and Stegemoller (2002).

[33] See for example: Chang (1998), Ang and Kohers (2001), Fuller, Netter, and Stegemoller (2002).
For evidence from other countries (Australia) see for example: Da Silva Rosa, Limmack, Supriadi, and Woodliff (2001).

[34] For evidence see Fuller et al (2002), Faccio and Masulis (2005), Antoniou et al (2007).

Private targets are usually smaller in size, family-owned firms which are less likely to affect the acquirer. On the other hand, acquisitions which involve public targets are more uncertain about the outcome of the deal due to the fact that the merger is negotiated with the managers but it is subject to the approval of the shareholders. We therefore expect that the more the uncertainty of the target firm (i.e. public mergers) the greater the increase of risk. The first empirical evidence from Table 3.6 - Panel A suggest that although public acquisition involve the lowest levels of default risk before the announcement, they increase default risk the most (by 0.019 ~127%), whereas private and subsidiary acquisitions which involve higher levels of default risk before the announcement increase default risk much less, 90% and 49% respectively. Looking at public acquisition group by the diversification type, we find that vertical public acquisitions have the lowest levels of default risk increase (21%) and mixed vertical/horizontal the greatest increase (165%). In the private acquisition sample, the previous patter reverses; vertical private mergers increase risk the most by 206% and mixed the least by 42%. The average default risk increase in private acquisitions is 90%. Vertical acquisitions remain the most risky type of diversification when the target is a subsidiary firm with a 79% increase. However, horizontal deals involve the lowest levels of default risk and actually increase risk at -8%. Subsidiary deals increase risk the least by 49% compared with the other two target types.

The acquisition process is very complex with many dimensions influencing its outcome and the risk change. Adding another dimension on diversification such as the target status shows that default risk changes are not affected solely by the type of diversification but also by other characteristics which interact with the diversification type. The primary characteristic of a public firm is the dispersed ownership of the target entity. More specific, in a public merger there will be no identifiable party to stand behind the obligations of the target after closing. The deal happens between the managerial teams of the two firms involved and it is subject to shareholder approval. This creates a level of uncertainty. In a private merger, the deal is typically negotiated directly with the shareholders of the target and thus such acquisitions are more profitable and less risky (remember the average increase in private and subsidiary mergers is only 90% and 49%, whereas in public mergers is 127%).

A horizontal merger is the merger of two firms from the same business or market. Such type of diversification benefits the firms due to economies of scale. A horizontal merger will normally increase the total market share of the combined entity due to the combination of

facilities, technologies, and operations, the reduction of competition and other costs and the increase of the working capital. In general, this type of diversification should not increase default risk compared with other types of diversification since the acquirer increases its share value but remains in a familiar environment business line. We do confirm this prediction and we even find that subsidiary horizontal acquisitions decrease risk at -8%. A vertical merger is the merger of two firms from different stages of the same industry or operation. Usually, there is a pre-existence buyer-seller or supply chain relationship before the merger between the two firms. Such acquisitions benefit both firms from a reduced inventory and a more efficient allocation working capital. Private and public firms are different in terms of information availability and quality and this influence the acquirer's choice of target as well as the diversification strategy and thus we can see that a vertical public merger decreases risk whereas a private vertical merger maximized default risk, 21% and 206% respectively. Conglomerate mergers are when two firms that operate in different or unrelated business lines merge to benefit from expanding into new markets and different business, create a diverse portfolio of products that reduce its default risk. We find that conglomerate acquisitions do not maximise default risk irrespective of the target type.

Firms engage in cross – border acquisitions (CBA) to take advantage of the diversification premium, access new research and development, cheaper sources of production, diversify specific country's and/or market's risk, information asymmetries and gain greater bargaining power. All else equal a foreign target should decrease default risk more than a domestic target due to the diversification benefits. We find in panel B – Table 3.6 that foreign acquisitions increase default risk less than domestic acquisitions (79% compared with 88% in domestic targets). We also find that horizontal foreign acquisitions decrease default risk at -19%. We argue that due to the information asymmetry in terms of business restructuring of the target firm after the announcement is completed, all other types of diversification result in higher default risk levels than horizontal acquisitions where the acquirer is familiar with the nature of the business. At a more theoretical level this hypothesis can be better explained with the information economics which views information asymmetry as significant obstacle that exists in markets and which creates constrains in the selection of the right targets (Akerlof, 1970). Capron and Shen (2007) empirically find that acquirers are more likely to engage in a private and related acquisition or a private acquisition in a similar industry or in an industry that the acquirer feels that is experienced in. Given that horizontal acquisitions is a form of related acquisition where the target and the acquirer belong in the same business and in the

same stage of production, the acquirer holds the knowledge and the experience to make a successful and a profitable acquisition that will eventually decrease default risk.

Relative size is the ratio of the deal's value to the market value of the acquirer. The larger the acquirer, the smaller this ratio and the less likely the merger with have an impact on the acquirer's default risk. We therefore expect smaller default risk increases in the portfolio with smaller deals. We confirm that acquisitions with relative size below median increase default risk less than acquisitions with relative size above median (39% and 171% respectively - see Table 3.6, Panel C). We also find that the choice of diversification can further decrease or increase default risk in both groups. Horizontal deals decrease default risk at -14% which is the largest decrease we have found so far.

[Table 3.6]

At table 3.7, Panel A presents default risk changes by the method of payment. We find that stock acquisitions increase default risk the least by 67% as expected, and cash the most by 102%. The type of strategy chosen can further reduce default risk in both portfolios. For example, default risk change is reduced to 11% in horizontal cash deals and in 49% in horizontal stock deals. In the event of mixed payment, vertical integration which is a related type of diversification has the lowest levels of risk-increase (11%). Panel B, displays two portfolios based on the acquiring firm's leverage level as captured by the equity-to-asset ratio. We expect that default risk should increase as the use of debt increase in a firm's capital structure. We confirm our expectations and find that default risk increase at 109% in the portfolio with deals that have leverage above median whereas low leverage firms experience only a 12% increase in default risk. The choice of horizontal diversification by low leverage firms decreases default risk by -43%.

Acquirer size also affects takeover process in terms of wealth creation but also in terms of the change in risk (see for example Vassalou and Xing, 2005). The larger the firm is, the more diversified it will be and consequently its risk will be affected less by the acquisition. Thus we expect that acquisitions with market value above median to result in smaller levels of risk-increase. Panel C in table 3.7, displays risk changes by acquirer's market value. We have split the sample into two sub-samples; acquisitions that have MV above median and acquisitions that have MV below median. We confirm that larger acquirers' default risk increase by 42% compared with smaller acquirers who have an increase of risk by 115%. We also find that the

choice of diversification will further reduce risk-increase; for larger acquirers who choose a mixed vertical/horizontal default risk will increase by 21%. In the sample of acquisitions with smaller MV acquirers', horizontal mergers increase default risk the least by 59% and vertical the most by 133%.

[Table 3.7]

In table 3.8, default risk changes are investigated in profitable and non-profitable mergers and based on and acquirer's recent stock performance. In panel A we split our sample based on the cumulative abnormal returns five-days around the announcement. We find that value-destroying acquisitions compensate acquirers with lower levels of risk-increase, 42%, compared with a 105% increase for acquisitions which yield zero or positive AR. Looking at the different diversification strategies in each sample, we find that horizontal acquisitions increase risk the least (by 30%) in the non-profitable acquisitions. We also account for the acquiring firm's stock performance using MKT-TO-BOOK which is the ratio of the acquirer's market value of equity to the book value of equity as of the last quarterly balance sheet prior to the month of the merger announcement. Rau and Vermaelen (1998) and more recently Jovanovic and Rousseau (2002) find that market to book ratio can be used to measure growth opportunities and has been found as an important driving factor of acquisition process. We find that acquisitions by firms with undervalued stock increase risk by 104%, compared with overvalued ones which increase risk by only 55%. Our results are consistent with Rosen and Furfine (2011). We also find that the choice of diversification strategy significantly reduced default risk levels. For example, in the group of undervalued acquirers, horizontal acquisitions increase risk by 55% whereas in the group of overvalued acquirers, horizontal and mixed vertical/horizontal increase risk by 47% and 31% respectively. Finally we use idiosyncratic stock volatility (VOL) to account for the information asymmetry. VOL is the standard deviation of the idiosyncratic component of the acquirer's stock return. Managers of high-volatility firms might signal that these managers undertake riskier projects or do not have the knowledge well integrate with the target firm. We expect that volatility should be positively related with default risk. We confirm our expectation since the group of firms with volatility above median increase default risk by 96% whereas lower volatility group increase default risk by 84%.

[Table 3.8]

In tables 3.6 to 3.8 we have presented evidence on which type of diversification increase acquiring firm's default risk the least and how diversification interacts with target characteristics, method of payment and leverage information, acquirer's size, merger profitability and idiosyncratic stock volatility, and in turn affect default risk. In the next part of this study, we contact a multivariate analysis of the risk-increasing determinants in a regression framework. We run a standard regression model where the dependent variable is the change of risk one month before the announcement, and six months after the completion. To understand better how well our explanatory variables contribute to the risk change, we first run a correlation matrix in order to avoid multicollinearity.[35] Table 3.9 and 3.10, presents our regression results.

We first, replicate the regression analysis of Furfine and Rosen (2011) and match the sign and significance of the coefficients on all explanatory variables. Then, we include several other variables that might influence the change in acquiring firms' default risk. We include two dummy variables, TARGET_PUBLIC and TARGET_SUB, to control for the public and subsidiary targets. Since private targets behave the same as subsidiary targets, in the regressions we omit the private target category. The primary characteristic of a public firm is the dispersed ownership of the target entity. Due to the nature of public acquisitions there is more uncertainty involved in such deal. Although private targets are considered riskier than public targets, in a private merger, the deal is negotiated directly with the shareholders of the target and thus the information asymmetry of the two parties can reduced and achieve an agreement which will be profitable for both parties. Univariate analysis shows that public acquisitions increase risk more than private or subsidiary acquisitions. We find the coefficient on TARGET_PUBLIC positive and significant and the coefficient on TARGET_SUB negative but insignificant, as predicted (see regression 1, Table 3.9).

[Table 3.9]

VOL captures the idiosyncratic volatility of the acquiring firm's stock and it is a managerial compensation measure; higher stock volatility means not only higher returns for managers who hold options on firm's stock but can also increase default risk. Moeller et al., 2007 explains that high idiosyncratic volatility in a firm's stock can be a sign of information

[35] We find two collinear pairs, MTBV with MV and Industry Dummy with Conglomerate acquisitions. We run our regressions with all variables and with only one of each pair. Our results remain robust.

asymmetry between the managers and the shareholders that might undertake risk increasing projects to increase their returns. We therefore expect a positive relationship between idiosyncratic volatility and default risk. We confirm this sign which is also statistical significant at 1%.

Two measures are used to capture the firms' stock performance; RUNUP_NET_MKT and MKT_TO_BOOK. RUNUP_NET_MKT is the buy-and-hold return of the firm 12 months before the month of the announcement. MKT_TO_BOOK is the ratio of the market value of equity to the book value, over the last quarter end before the announcement. Both variables are used to capture over valued or under valued stocks. Overvaluation has been linked with risk-increasing project (Rau and Vermaelen; 1998 and Jovanovic and Rousseau; 2002). We find a positive and statistical significant coefficient on the RUNUP_NET_MKT as expected while the coefficient of MKT_TO_BOOK is insignificant; MKT_TO_BOOK is correlated with MRK_VAL so we omit this variable in the next regressions to avoid multicollinearity.

We also include dummy variables, to account for the method of payment. STOCK, is an indicator that takes the value 1 if and only if the acquisition is financed with stocks, 0 otherwise. MIX CASH/STOCK is an indicator that takes the value 1 if and only if the acquisition is financed with both stock and cash. Method of payment has been linked with the market reaction but also with the success of a merger. Travlos (1987) discuss how the valuation of a firm's stock will affect the reaction of the market and the success and profitability of the merger. We expect that overvalued stock will be correlated with greater risk after the merger is completed since the market perceives overvalued stock as a negative signal and makes a correction on the firm's stock value. Further, stock acquisitions do not increase firm's leverage levels and thus should not increase risk. On the other hand cash acquisitions are more likely to be debt increasing projects, and therefore can increase risk (Amihud and Lev; 1981). We find a negative sign for stock acquisitions, consisting with our univariate analysis, although statistical insignificant.

DIFF_IND is an indicator variable that takes the value 1 if and only if the target and the acquirer are in different industries. Acquiring a firm in a different industry offers diversification benefits that might decrease default risk. We find a negative coefficient on DIFF_IND, although statistical insignificant. This implies that if the firms involved in the acquisition belong in a different industry, default risk decreases. Although the exposure of a

firm in a new business/market might increase risk due to the unknown nature of the merger, it can also decrease risk due to the diversification benefits.

We also include relative size, RATIO, as an explanatory variable of default risk. Relative size is the ratio of the deal value to the bidder market value. The size of the target relative to the acquirer can affect the market reaction to a deal announcement (Asquith et al., 1983). The bigger this ratio is, thus the larger the target firm the bigger the impact of the particular acquisition on the acquirer and the greater the market reaction. We therefore expect and find a positive statistical significant relationship between relative size and default risk. We confirm the direction of this variable. MRK_VAL is the natural log of the market value of the acquiring firm at the end of the month prior to the merger announcement. The larger the acquirer the more likely it will carefully choose profitable projects that will diversify its risk. We find a negative and statistical significant coefficient of MRK_VAL supporting the view that default risk increases less for larger acquirers.

CAR_RESID is the estimated residual from the regression of CAR on RETURN INTERIM, defined as the buy-and-hold return for an acquirer's stock between the end of the month prior to the merger announcement and at the end of the month six months after the merger is effective. Furfine and Rosen (2011) use this variable instead of CAR as it excludes the part of abnormal return that is affected by the announcement and isolates the component at the exact period we measure default risk. We find a positive but statistical insignificant coefficient for CAR_RESID which means that this variable cannot help in explaining default risk changes.

IND_CF_VOL_DIFF is the risk in the acquirer's industry minus the risk in the target firm's industry, where industry risk is the standard deviation of the ratio of annual total cash flow to total assets in an industry in the five years prior to the merger announcement. This variable captures the difference of the acquiring firm's cash flow volatility and the target's industry. We find a negative sign, although statistical insignificant that shows that if the target's industry is riskier than the acquirer's, then acquirer's risk will increase after the acquisition. Finally, DIST_FROM_DESIRED_RISK is defined as the residual from a regression of acquirer default risk on balance sheet determinants of target risk level. We follow Usyal's (2011) capital structure model to estimate the firm's target default risk. We find a positive and statistical significant value which means that mergers are used as mechanisms to increase their leverage.

Following Furfine and Rosen (2011) we run a second regression and include data on the acquiring firm's manager options to investigate whether executive compensation impacts default risk. High risk projects can increase not only a firm's default risk but also the value of the executive stock options and therefore we expect a positive sign. EXECUCOMP is a dummy variable that takes the value 1 if and only if the acquirer is in the Execucomp data for the year prior to the merger announcement. OPTIONS is defined as the fraction of the acquiring CEO's compensation that is derived from executive stock options if EXECUCOMP equals 1 and is zero otherwise. We match the direction of both variables, but both coefficient are statistically insignificant. The problem with these variables lies on the Execucomp which does not provide these information about all firms in our sample. However, these two additional variables, improve the significant level of almost all coefficients on the abovementioned variables and we decide to keep them in our analysis.

In regression 4 to 6 in Table 3.9, we introduce variables on firm's diversification strategy (i.e. vertical, horizontal, mixed and conglomerate). We include these data to investigate whether diversification type significantly affects the level of default risk after an announcement. In general the 'law of diversification' says that the more you diversify the lower your risk and the higher your return. However, this law might not apply to mergers and acquisitions. Firms do not treat the acquired business as investors treat stocks. The more a firm diversifies in an unrelated industry the greater the possibility is to increase its default risk and to destroy value. Related acquisitions seem to return greater profit for the acquirer, whereas unrelated seem to destroy value. In the literature of corporate finance, there is a common presumption that despite the risky nature of conglomerate acquisitions (unrelated) and value destruction for the acquirer firm,[36] they reduce risk through the expansion of a firm's activities in a different country or in another product range. An unrelated acquisition is the expansion in a completely new area to widen the acquirer's firm field of operations. However, the lack of knowledge, skills and expertise by the managerial team[37] or a hubris infected manager who overestimates his abilities to handle such an acquisitions, can destroy value and increase risk in both unrelated and related acquisitions. Unrelated acquisitions or related acquisition (excluding horizontals) need heavy investment in human and technical resources to be successful in terms of risk and also profit. Related acquisitions seem to outperform the unrelated in terms of value creation, since the managerial team can simply transfer the skills,

[36] See for example Rumelt, (1974, 1977) and Bettis and Hall, (1982)
[37] See Berger and Ofek (1995) and Lang and Stulz (1994)

the technological experience, and the marketing plan in a closely related industry. In terms of default risk levels, we expect that such and acquisitions are 'safer' than the unrelated acquisitions. Based on information economic theory (Akerlof, 1970), we argue that due to the information asymmetry in terms of business restructuring of the target firm that belong either in a different industry or in a different market or in a different stage of production, default risk might be greater than in acquisitions where the target and the bidder belong in the same industry and production stage (i.e. horizontal acquisitions). Empirical evidence suggest that acquirers are more likely to make private related acquisitions or choose a firm in an industry where the acquirer feels that has the experience to grow (Capron and Shen; 2007).

HORIZONTAL is a dummy variable that takes the value 1 if and only if the acquirer diversifies horizontally, while MIXED and CONGLOMERATE are defined analogously for the acquirers who diversify both vertically and horizontally (mixed) and for the acquirers who make an unrelated acquisitions (conglomerate) respectively. We omit VERTICAL diversification since our results remain unchanged with the addition of this variable. We find a negative and statistical significant coefficient for the HORIZONTAL variable, while the coefficient for MIXED and CONGLOMERATE variables are not different from zero. In regressions 5 we exclude DIFF_IND variable which is correlated with diversification variables and in regression 6 we exclude MKT_TO_BOOK which is found correlated with market value (MRK_VAL). Our result remains robust in both regressions and the coefficient of HORIZONTAL variable remains negative and statistical significant.

Table 3.10 presents additional evidence on default risk change by incorporating cross-border acquisitions (regression 1), the leverage level (regression 2) and merger waves (regression 3). The coefficients of the previously mentioned variables are essentially unchanged when incorporating CBA and leverage which suggest that these variables are not the only factors driving the change in acquirer default risk. Regression 3 is essentially regression 2 of table 3.9 with the addition of merger waves. WAVE1 is an indicator variable that takes the value 1 if and only if the acquisitions was announced and completed during the first merger wave (1980-1989), and WAVE 2 is an indicator variable that takes the value 1 if and only if the acquisitions was announced and completed during the second wave period (1990-1999). From univariate analysis we find that default risk increases were greater during the second merger wave. We confirm this finding since we find a positive and statistical significant coefficient for WAVE2, and a negative sign for WAVE1. Then we want to see how

diversification variables and merger wave improve our model's prediction (regression 4) and whether our results remain robust if we exclude DIFF_IND variable (regression 5) and MKT_TO_BOOK (regression 6). The sign of the coefficients and the statistical significance of all variables remain in regressions 4, 5, and 6.[38]

[Table 3.10]

To sum up, the regression analysis in this section confirms our findings in the univariate analysis. The increase in default risk between the period before the announcement and after the completion is driven by public firms and firms with higher idiosyncratic risk. More importantly, we find that larger acquirer and acquirers who choose a horizontal mergers, diversify default risk. The second wave, i.e. 1990 – 1999, is the more risk-increasing period in our sample. These results remain robust after controlling for other factors related to acquisition process and performance.

[38] We also incorporate interactions in our regression analysis between the diversification types and i.merger waves, and ii. method of payment. The coefficient for the horizontal variable remains significant, but not for the interaction variables.

3.4 Conclusion

We examine the impact of default risk on different types of diversification. Although existing research shows that default risk changes after a merger, the evidence is not conclusive as to the direction of the change. It has been also theorised that certain types of diversification lead to lower levels of default risk for the combined entity. We analyse changes in default risk, in the pre- and post- acquisition period, on four different types of merger integration; vertical, horizontal, mixed horizontal/vertical and conglomerate. We use the sample of US takeovers announced during the period 1980-2008. Default risk is estimated using accounting and market variables through a dynamic logit model. We find that not all mergers increase default risk of the acquiring firm; horizontal diversification when combined with other characteristics can diversify default risk. We also find that larger acquirers increase risk less than smaller ones. The increase in default risk surrounding mergers is driven by public firms, firms with higher idiosyncratic risk, and deals announced and completed during the second merger wave. Our results remain robust after controlling for other factors related to acquisition process and performance.

We argue that the source of the differences we find in default risk within different portfolios is associated with the information asymmetries regarding the nature of each diversification strategy. Akerlof (1970) introduces information asymmetry into the market mechanism and explains that 'lemons'[39] which is a defective product will be bought if the buyer knows less about a product than what he should know for the quality of the product. Similarly, in our study there is less information asymmetry in a related merger and especially in horizontal mergers where the acquirer is buying a firm which is exactly identical with the acquiring firm and thus the manager has the knowledge how to manage the combined entity. Therefore a horizontal merger makes the most of the risk-reducing diversification benefit.

Our argument finds support on papers concentrating on stock volatility; according to Chen et al., (2001) poor information quality induces high stock volatility and Miffre (2011) finds a positive relation between high idiosyncratic stock volatility and poorly diversified firms. Horizontal diversification involves the lower levels of idiosyncratic stock volatility, thus less uncertainty and decrease default risk levels after the merger is completed.

[39] In Akerlof's (1970) paper, a lemon is an American slang term for a car that is found to be defective only after it has been bought

Table 3.1 Summary Statistics of Acquirer and Target Firms' Default Risk.

Variable	obs	Min	Mean	Median	Max	Std Dev
$BDF_{\alpha-6}$	1376	0.001	0.018	0.006	0.376	0.040
$BDF_{\alpha-1}$	1382	0.001	0.017	0.006	0.404	0.041
BDF_{c+6}	1382	0.001	0.031	0.007	1.174	0.106
$B\Delta DF_{66}$	1376	-0.358	0.014	0.000	1.151	0.096
$B\Delta DF_{16}$	1382	-0.303	0.015	0.001	1.168	0.088
$TDF_{\alpha-6}$	337	0.001	0.047	0.011	0.641	0.114
$TDF_{\alpha-1}$	318	0.001	0.056	0.010	1.000	0.151
TDF_{c+6}	86	0.001	0.135	0.010	4.936	0.625
$T\Delta DF_{66}$	86	-0.613	0.095	0.001	4.294	0.556
$T\Delta DF_{16}$	86	-0.082	0.087	0.001	3.936	0.476

The table displays the summary statistics on acquirer and target firms' default risk for the sample 1382 deals announced and completed from January 1980 to December 2008. $BDF_{\alpha-6}$, $BDF_{\alpha-1}$, BDF_{c+6} is the acquiring firm's default risk 6-months and 1 month prior the acquisition and 6 months after the completion of the acquisition respectively. $B\Delta DF_{66}$ and $B\Delta DF_{16}$ is the change in the acquiring firm's DF 6-months prior the announcement to 6-months after the completion and 1-month prior the announcement to 6-months after the completion of the merger. The same variables are reported for the public target firms. $TDF_{\alpha-6}$, $TDF_{\alpha-1}$, TDF_{c+6} is the target firm's default risk 6-months and 1 month prior the acquisition and 6 months after the completion of the acquisition respectively. $T\Delta DF_{66}$ and $T\Delta DF_{16}$ is the change in the acquiring firm's DF 6-months prior the announcement to 6-months after the completion and 1-month prior the announcement to 6-months after the completion of the merger.

Table 3.2 Default Risk Descriptive Statistics by the Diversification Type and Merger Waves

Panel A. DF by diversification type											
Diversification	Obs	$BDF_{\alpha-1}$			BDF_{c+6}			$B\Delta DF_{16}$			
		mean	median	Std.dev.	mean	median	Std.dev.	mean	median	Std.dev.	% change
Vertical	227	0.017	0.006	0.045	0.039	0.008	0.147	0.021	0.001	0.120	124
Horizontal	166	0.013	0.005	0.037	0.020	0.007	0.040	0.007	0.001	0.044	53
Mixed	574	0.018	0.006	0.046	0.034	0.007	0.117	0.016	0.000	0.098	86
Conglomerate	415	0.015	0.006	0.032	0.027	0.007	0.078	0.012	0.001	0.062	81
Panel B. DF by merger waves											
1980 – 1989	201	0.022	0.008	0.048	0.042	0.011	0.106	0.020	0.001	0.080	94
1990 – 1999	450	0.015	0.006	0.038	0.031	0.008	0.107	0.016	0.001	0.094	103
2000 - 2008	731	0.016	0.005	0.041	0.028	0.006	0.105	0.012	0.000	0.087	76

This table displays the number of deals by the type of diversification, and the three merger waves in our sample period. Merger wave 1 spans from 1980 to 1989, the next one from 1990 to 1999 and the most recent from 2000 to 2008. We use the target and the acquirer four-digit SIC from CRSP as the basis for classification. Transactions are classified as horizontal if the acquiring and the target firm are in the same industry. Mixed transactions are the ones that are classified both as vertical and horizontal. Vertical transactions are the ones that are classified as pure vertical but not horizontal and the remaining are classified as conglomerate. The required cut-off for the vertical integration coefficient is 1%. $BDF_{\alpha-1}$ is the acquiring firm's mean default risk one month before the announcement. BDF_{c+6} is the acquiring firm's mean default risk six months after the merger completion. The change of the risk between the two periods is captured $B\Delta DF_{16}$, where $\Delta DF_{16} = DF_{c+6} - DF_{\alpha-1}$ and $\%B\Delta DF_{16}$ is the percentage change between the two periods, where $\%\Delta DF_{16} = \frac{DF_{c+6}}{DF_{\alpha-1}} - 1$.

Table 3.3 Default Risk Changes During the Merger Waves by Type of Diversification

	Diversification Type			
Default Risk	Vertical	Horizontal	Mixed	Conglomerate
Panel A: Period 1980-1989				
$BDF_{\alpha-1}$	0.023	0.006	0.028	0.020
BDF_{c+6}	0.028	0.033	0.063	0.034
$B\Delta DF_{16}$	0.005	0.027	0.035	0.014
$\%B\Delta DF_{16}$	22	442	125	70
obs	19	15	61	106
Panel B: Period 1990-1999				
$BDF_{\alpha-1}$	0.012	0.013	0.022	0.014
BDF_{c+6}	0.017	0.022	0.057	0.024
$B\Delta DF_{16}$	0.006	0.009	0.036	0.010
$\%B\Delta DF_{16}$	48	71	164	76
obs	97	72	118	163
Panel C: Period 2000-2008				
$BDF_{\alpha-1}$	0.021	0.015	0.016	0.012
BDF_{c+6}	0.059	0.017	0.023	0.024
$B\Delta DF_{16}$	0.038	0.002	0.007	0.012
$\%B\Delta DF_{16}$	180	11	43	100
obs	111	79	395	146

This table displays the acquiring firms' default risk changes by the type of diversification during the three merger waves, (i.e. 1980s, 1990s and 2000s) of our sample. $BDF_{\alpha-1}$ is the acquiring firm's mean default risk one month before the announcement. BDF_{c+6} is the acquiring firm's mean default risk six months after the merger completion. The change of the risk between the two periods is captured $B\Delta DF_{16}$, where $\Delta DF_{16} = DF_{c+6} - DF_{\alpha-1}$ and $\%B\Delta DF_{16}$ is the percentage change between the two periods, where $\%\Delta DF_{16} = \frac{DF_{c+6}}{DF_{\alpha-1}} - 1$.

Table 3.4 Idiosyncratic Stock Volatility by Type of Diversification

	Diversification Type			
	Vertical	Horizontal	Mixed	Conglomerate
VOL	0.029	0.024	0.030	0.025
p-value	<.0001	<.0001	<.0001	<.0001
obs	227	166	574	415

This table displays the acquiring firms' idiosyncratic stock volatility by the type of diversification. VOL is the standard deviation of the idiosyncratic component of the acquirer's stock return, estimated by taking the square root of the residuals from a market model estimated over the six month period ending at the end of the month prior to the merger announcement.

Table 3.5 Summary Statistics of Default Risk's Explanatory Variables

Variable	Mean	Std. Dev.
$BDF_{\alpha-1}$	0.017	0.041
$B\Delta DF_{16}$	0.015	0.088
$\%B\Delta DF_{16}$	164.803	843.348
TARGET_PUBLIC	0.318	0.466
TARGET_PRIVATE	0.404	0.491
TARGET_SUB	0.277	0.448
OPTIONS	0.116	0.275
VOL	0.028	0.016
RUNUP_NET_MKT	-0.003	0.358
MKT_TO_BOOK	2.044	0.872
STOCK	0.247	0.432
CASH	0.557	0.497
MIX	0.415	0.493
DIFF_IND	0.249	0.433
RATIO	0.251	0.676
MRK_VAL	7.102	1.766
CAR	0.008	0.086
CAR_RESID	0.000	0.085
IND_CF_VOL_DIFF	0.000	0.014
DIST_FROM_DESIRED_RISK	0.001	0.040
LEV	-103.134	324.537
CBA	0.155	0.000
Obs =1382		

This table displays the summary statistics for the risk explanatory variables. $BDF_{\alpha-1}$ is the acquiring firm's mean default risk one month before the announcement. $B\Delta DF_{16}$ is the acquiring firm's mean default risk six months after the merger completion. TARGET_PUBLIC, _SUB, and _PRIVATE are dummy variables that take the value of 1 if and only if the target firm are public, subsidiary and private firms respectively and 0 otherwise. OPTIONS is defined as the segment of the acquiring CEO's compensation as derived from executive stock options. VOL is the standard deviation of the idiosyncratic component of the acquirer's stock return, estimated by taking the square root of the residuals from a market model estimated over the six month period ending at the end of the month prior to the merger announcement. RUNUP_NET_MKT is the buy-and-hold return of a firm's stock in the 12 months ending at the end of the month prior to the merger announcement in excess of the return of the CRSP value-weighted index over the same period. MKT-TO-BOOK is the ration of the acquirer's market value of equity to the book value of equity as of the last quarterly balance sheet prior to the month of the merger announcement. STOCK, CASH, MIX are dummy variables that takes the value 1 if and only if the acquisitions is financed with equity, cash or cash and equity respectively. DIFF_IND is an indicator that takes the value 1 if and only if the target and the acquirer belong in a different industry. RATIO is the ratio of the deal's value to the market value of the acquirer. MKT_VAL is the natural log of the acquirer's market value at the end of the month prior to the merger announcement. CAR is the cumulative abnormal return for the acquiring firm's stock, between two days before the announcement and two days after the announcement. Car resid: is the estimated residual from the regression of CAR on RETURN INTERIM, defined as the buy-and-hold return for an acquirer's stock between the end of the month prior to the merger announcement and at the end of the month six months after the merger is effective. IND_CF_VOL_DIFF is the risk in the acquirer's industry minus the risk in the target firm's industry, where industry risk is the standard deviation of annual cash flows in the five years prior to the merger announcement. Dist from desired risk: is defined as the residual from a regression of acquirer default risk on balance sheet determinants of target risk level. LEV is a dummy variable that takes the value 1 if the acquiring firm's leverage value is above the median value. CBA is an indicator that takes the value 1 if and only if the target firm is not a US firm.

Table 3.6 Diversification, Risk and Target Related Characteristics

	Vertical	obs	$BDF_{\alpha-1}$	p-val	BDF_{c+6}	p-val	$B\Delta DF_{16}$	p-val	$\%B\Delta DF_{16}$
Panel A. Type of Target									
Public	1	66	0.015	<.0001	0.018	<.0001	0.003	0.456	21
	2	76	0.011	<.0001	0.021	<.0001	0.009	0.056	84
	3	185	0.018	<.0001	0.048	0.000	0.030	0.003	165
	4	113	0.014	<.0001	0.032	0.000	0.018	0.022	132
	ALL	440	0.015	<.0001	0.035	<.0001	0.019	<.0001	127
Private	1	91	0.020	0.001	0.061	0.008	0.041	0.032	206
	2	46	0.007	<.0001	0.019	0.003	0.012	0.051	166
	3	271	0.017	<.0001	0.025	<.0001	0.007	0.033	42
	4	151	0.014	<.0001	0.025	<.0001	0.011	0.011	83
	ALL	559	0.016	<.0001	0.030	<.0001	0.014	0.000	90
Subsidiary	1	70	0.016	0.008	0.029	0.009	0.013	0.051	79
	2	44	0.024	0.027	0.022	0.000	-0.002	0.099	-8
	3	118	0.022	<.0001	0.035	0.001	0.013	0.187	61
	4	151	0.017	<.0001	0.025	0.000	0.008	0.047	47
	ALL	383	0.019	<.0001	0.028	<.0001	0.009	0.013	49
Panel B. CBA									
Domestic	1	188	0.019	<.0001	0.043	0.000	0.024	0.014	126
	2	138	0.012	<.0001	0.021	<.0001	0.009	0.007	75
	3	489	0.019	<.0001	0.036	<.0001	0.017	0.000	89
	4	353	0.015	<.0001	0.026	<.0001	0.011	0.000	73
	ALL	1168	0.017	<.0001	0.032	<.0001	0.015	<.0001	88
Foreign	1	39	0.008	<.0001	0.018	0.011	0.011	0.112	138
	2	28	0.021	0.138	0.017	0.005	-0.004	0.021	-19
	3	85	0.015	0.004	0.025	0.008	0.009	0.243	60
	4	62	0.013	<.0001	0.032	0.020	0.019	0.130	146
	ALL	214	0.014	<.0001	0.025	<.0001	0.011	0.040	79
Panel C. RELATIVE SIZE									
Below median	1	173	0.015	<.0001	0.031	0.003	0.016	0.038	110
	2	109	0.015	0.001	0.013	<.0001	-0.002	0.078	-14
	3	453	0.015	<.0001	0.018	<.0001	0.003	0.091	23
	4	308	0.011	<.0001	0.016	<.0001	0.005	0.015	43
	ALL	1043	0.014	<.0001	0.019	<.0001	0.005	0.002	39
Above median	1	54	0.026	0.003	0.064	0.014	0.038	0.098	149
	2	57	0.010	<.0001	0.035	<.0001	0.025	0.002	251
	3	121	0.032	<.0001	0.094	<.0001	0.062	0.001	196
	4	107	0.025	<.0001	0.057	<.0001	0.032	0.002	129
	ALL	339	0.025	<.0001	0.067	<.0001	0.043	<.0001	171

Summary mean statistics for the sample of firms with acquisitions from January 1980 to December 2008. $BDF_{\alpha-1}$, BDF_{c+6} is the acquiring firm's default risk 1 month prior the acquisition announcement and 6 months after the completion of the acquisition. $B\Delta DF_{16}$ is the change in the acquiring firm's DF 1-month prior the announcement to 6-months after the completion of the merger and % $B\Delta DF_{16}$ is the percentage change in default risk. Acquirer's default risk and change to default

risk are reported within the four levels four levels of vertical integration; 1= vertical, 2=horizontal, 3=mix and 4=conglomerate mergers. Panel A displays the results broken down by target type, i.e. public, private and subsidiary targets. Panel B, by cross border acquisitions, i.e. 0 = Domestic and 1= Foreign, and Panel C by the relative size of the target to acquirer firm as captured by the ratio of the deal value to the acquirer's market value.

Table 3.7 Diversification, Risk, Method of Payment, Acquirer's Debt level and Size

	Vertical	obs	$BDF_{\alpha-1}$	p-val	BDF_{c+6}	p-val	$B\Delta DF_{16}$	p-val	$\%B\Delta DF_{16}$
Panel A. Method of Payment									
Cash	1	122	0.012	0.002	0.028	0.012	0.016	0.052	128
	2	105	0.015	0.001	0.020	<.0001	0.005	0.297	33
	3	322	0.012	<.0001	0.029	<.0001	0.017	0.002	138
	4	221	0.013	<.0001	0.024	<.0001	0.011	0.007	84
	ALL	770	0.013	<.0001	0.026	<.0001	0.013	<.0001	102
Stock	1	65	0.028	0.000	0.072	0.008	0.044	0.062	156
	2	38	0.010	<.0001	0.016	0.004	0.005	0.254	49
	3	136	0.027	<.0001	0.036	<.0001	0.008	0.244	30
	4	103	0.014	<.0001	0.022	<.0001	0.008	0.056	56
	ALL	342	0.022	<.0001	0.036	<.0001	0.015	0.007	67
Mix	1	40	0.014	<.0001	0.016	<.0001	0.002	0.602	11
	2	23	0.012	<.0001	0.032	0.008	0.021	0.067	178
	3	116	0.026	0.000	0.048	0.001	0.023	0.051	88
	4	91	0.019	<.0001	0.038	0.002	0.018	0.032	95
	ALL	270	0.021	<.0001	0.039	<.0001	0.018	0.002	87
Panel B. Leverage Level									
Below median	1	52	0.010	<.0001	0.024	0.007	0.014	0.093	136
	2	31	0.025	0.056	0.014	0.000	-0.011	0.066	-43
	3	129	0.020	<.0001	0.014	<.0001	-0.006	0.058	-28
	4	87	0.014	<.0001	0.025	0.000	0.011	0.072	74
	ALL	299	0.017	<.0001	0.019	<.0001	0.002	0.463	12
Above median	1	175	0.019	<.0001	0.043	0.001	0.024	0.020	122
	2	135	0.011	<.0001	0.022	<.0001	0.011	0.002	105
	3	445	0.018	<.0001	0.040	<.0001	0.022	<.0001	121
	4	328	0.015	<.0001	0.027	<.0001	0.012	0.001	82
	ALL	1083	0.016	<.0001	0.034	<.0001	0.018	<.0001	109
Panel C. ACQUIRER MV									
Below median	1	115	0.024	<.0001	0.056	0.003	0.032	0.033	133
	2	84	0.016	0.004	0.026	<.0001	0.009	0.132	59
	3	293	0.021	<.0001	0.049	<.0001	0.028	0.000	131
	4	215	0.019	<.0001	0.036	<.0001	0.018	0.001	96
	ALL	707	0.020	<.0001	0.044	<.0001	0.023	<.0001	115
Above median	1	112	0.010	<.0001	0.021	0.000	0.010	0.049	102
	2	82	0.011	<.0001	0.015	<.0001	0.005	0.101	44
	3	281	0.016	<.0001	0.019	<.0001	0.003	0.202	21
	4	200	0.011	<.0001	0.016	<.0001	0.006	0.048	52
	ALL	675	0.013	<.0001	0.018	<.0001	0.005	0.001	42

Summary mean statistics for the sample of firms with acquisitions from January 1980 to December 2008. $BDF_{\alpha-1}$, BDF_{c+6} is the acquiring firm's default risk 1 month prior the acquisition announcement and 6 months after the completion of the acquisition. $B\Delta DF_{16}$ is the change in the acquiring firm's DF 1-month prior the announcement to 6-months after the completion of the merger and % $B\Delta DF_{16}$ is the percentage change in default risk. Acquirer's default risk and change to default

risk are reported within the four levels four levels of vertical integration; 1= vertical, 2=horizontal, 3=mix and 4=conglomerate mergers. Panel A displays the results broken down by the method of payment, i.e. cash, stock and mixed cash/stock payment. Panel B show results by the acquirer's leverage level as captured by the debt level. Leverage is estimated by taking the difference of the equity-to-asset ratio between the period six months after the merger completion and one month before the merger announcement. Finally in Panel D results are divided by the size of the acquirer as measured by the market value (MV), i.e. above and below median MV.

Table 3.8 Diversification, Risk, Acquirer's stock performance, MTBV and Managerial compensation

	Vertical	obs	$BDF_{\alpha-1}$	p-val	BDF_{c+6}	p-val	$B\Delta DF_{16}$	p-val	$B\Delta DF_{16}$
Panel A. ACQUIRER AR(-2,+2)									
CAR<0	1	106	0.016	0.000	0.028	0.017	0.012	0.145	76
	2	76	0.017	0.007	0.022	<.0001	0.005	0.365	30
	3	287	0.021	<.0001	0.034	<.0001	0.012	0.019	58
	4	178	0.016	<.0001	0.035	<.0001	0.019	0.004	118
	ALL	647	0.018	<.0001	0.032	<.0001	0.013	<.0001	72
CAR>0	1	121	0.018	<.0001	0.048	0.002	0.030	0.026	160
	2	90	0.011	<.0001	0.019	<.0001	0.009	0.043	83
	3	287	0.016	<.0001	0.035	<.0001	0.019	0.003	123
	4	237	0.014	<.0001	0.021	<.0001	0.007	0.002	49
	ALL	735	0.015	<.0001	0.031	<.0001	0.016	<.0001	105
Panel B. MARKET-TO-BOOK									
Below median	1	127	0.019	0.000	0.044	0.003	0.025	0.035	131
	2	101	0.018	0.000	0.027	<.0001	0.010	0.077	55
	3	295	0.022	<.0001	0.049	<.0001	0.026	0.000	120
	4	292	0.017	<.0001	0.031	<.0001	0.015	0.000	88
	ALL	815	0.019	<.0001	0.039	<.0001	0.020	<.0001	104
Above median	1	100	0.015	<.0001	0.032	0.012	0.017	0.105	112
	2	65	0.007	<.0001	0.010	0.001	0.003	0.255	47
	3	279	0.015	<.0001	0.019	<.0001	0.005	0.139	31
	4	123	0.011	<.0001	0.016	0.001	0.006	0.168	55
	ALL	567	0.013	<.0001	0.020	<.0001	0.007	0.008	53
Panel C. VOL									
Below median	1	97	0.031	<.0001	0.072	0.0016	0.042	0.0253	136
	2	45	0.027	0.0084	0.025	<.0001	-0.003	0.7471	-9
	3	265	0.031	<.0001	0.055	<.0001	0.023	0.0023	73
	4	128	0.028	<.0001	0.055	<.0001	0.027	0.003	99
	ALL	535	0.030	<.0001	0.055	<.0001	0.025	<.0001	84
Above median	1	130	0.007	<.0001	0.014	<.0001	0.006	0.0059	86
	2	121	0.008	<.0001	0.019	<.0001	0.011	0.0046	131
	3	309	0.007	<.0001	0.017	<.0001	0.010	0.0203	132
	4	287	0.009	<.0001	0.014	<.0001	0.005	0.0013	56
	ALL	847	0.008	<.0001	0.016	<.0001	0.008	<.0001	96

Summary mean statistics for the sample of firms with acquisitions from January 1980 to December 2008. $BDF_{\alpha-1}$, BDF_{c+6} is the acquiring firm's default risk 1 month prior the acquisition announcement and 6 months after the completion of the acquisition. $B\Delta DF_{16}$ is the change in the acquiring firm's DF 1-month prior the announcement to 6-months after the completion of the merger and % $B\Delta DF_{16}$ is the percentage change in default risk. Acquirer's default risk and change to default risk are reported within the four levels four levels of vertical integration; 1= vertical, 2=horizontal, 3=mix and 4=conglomerate mergers. Panel A displays the results broken down by acquirer's abnormal returns in a five-days window around the announcement date, i.e. CAR>=0 for deals with positive abnormal returns and CAR<0 for deals with negative abnormal return, and Panel B by

acquirer's stock profitability as captured MARKET-TO-BOOK value. MARKET-TO-BOOK is the ratio of acquirer's market value of equity to the book value of equity as of the last quarterly balance sheet prior to the month of the merger announcement. Panel C presents results by VOL the standard deviation of the idiosyncratic component of the acquirer's stock return, estimated by taking the square root of the variance of the residuals from a market model estimated over the six month period ending at the end of the month prior to the merger announcement.

Table 3.9 Regression Analysis on the Determinants of the Change in Risk – Diversification

	Dependent variable = $B\Delta DF_{16}$					
	1	2	3	4	5	6
Intercept	0.050***	0.050***	0.049***	0.061***	0.058***	0.057***
	(0.0006)	(0.0007)	(0.0007)	(0.0001)	(0.0003)	(0.0003)
TARGET_PUBLIC	0.010*	0.010*	0.010*	0.011*	0.011*	0.011*
	(0.0819)	(0.0812)	(0.0832)	(0.0572)	(0.0612)	(0.0444)
TARGET_SUB	-0.007	-0.007	-0.007	-0.007	-0.007	-0.006
	(0.2639)	(0.2462)	(0.2643)	(0.2339)	(0.2354)	(0.2853)
VOL	0.430**	0.428**	0.431**	0.422**	0.413**	0.354*
	(0.0271)	(0.0281)	(0.0271)	(0.0318)	(0.0356)	(0.0572)
RUNUP_NET_MKT	0.008	0.008	0.008	0.008	0.008	0.009
	(0.2168)	(0.2299)	(0.2172)	(0.2583)	(0.2511)	(0.1687)
MKT_TO_BOOK	-0.003	-0.003	-0.003	-0.003	-0.003	
	(0.3142)	(0.3136)	(0.3186)	(0.3491)	(0.350)	
STOCK	-0.008	-0.009	-0.008	-0.009	-0.009	-0.009
	(0.2002)	(0.1747)	(0.2055)	(0.1711)	(0.1584)	(0.1353)
MIX CASH/STOCK	-0.003	-0.004	-0.003	-0.004	-0.004	-0.004
	(0.6031)	(0.5545)	(0.6037)	(0.5722)	(0.5192)	(0.5364)
DIFF_IND	-0.007	-0.007	-0.007	-0.013		
	(0.2068)	(0.2009)	(0.2094)	(0.069)		
RATIO	0.002	0.002	0.002	0.002	0.002	0.002
	(0.6815)	(0.6797)	(0.682)	(0.6711)	(0.6416)	(0.5996)
MRK_VAL	-0.005**	-0.005**	-0.005**	-0.005**	-0.006**	-0.006***
	(0.0014)	(0.0029)	(0.002)	(0.0016)	(0.0013)	(0.0001)
CAR_RESID	0.042	0.041	0.042	0.043	0.042	0.043
	(0.1295)	(0.1336)	(0.1291)	(0.1161)	(0.1255)	(0.1192)
DIST_FROM_DESIRED_RISK	0.322***	0.321***	0.322***	0.327***	0.322***	0.329***
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
IND_CF_VOL_DIFF	-0.041	-0.042	-0.041	-0.039	-0.045	-0.037
	(0.7994)	(0.7945)	(0.7987)	(0.8117)	(0.7804)	(0.8186)
EXECUCOMP		-0.006				
		(0.3902)				
OPTIONS		0.005	-0.001	0.000	-0.001	-0.002
		(0.6398)	(0.9362)	(0.9958)	(0.8712)	(0.8208)
HORIZONTAL				-0.020**	-0.016*	-0.016*
				(0.0287)	(0.0699)	(0.0697)
MIXED				-0.012	-0.008	-0.008
				(0.0907)	(0.2319)	(0.2206)
CONGLOMERATE				-0.005	-0.010	-0.009
				(0.5355)	(0.1708)	(0.1889)
Observations	1382	1382	1382	1382	1382	1382
R-squared	0.070	0.070	0.070	0.073	0.071	0.070

Regressions on the determinants of the change in risk in the four type of integration; vertical, horizontal, mix, and conglomerate. The dependent variable $\boldsymbol{B\Delta DF_{16}}$ is the change in the acquiring firm's default risk from the end of the month prior to the merger announcement to the end of the month six months after the completion of the merger. TARGET_PUBLIC: is a dummy variable that takes the value 1 if and only if the target is publicly traded and 0 otherwise. TARGET_SUB: is a dummy variable that takes the value 1 if and only if the target is a subsidiary and 0 otherwise. VOL: is the standard deviation of the idiosyncratic component of the acquirer's stock return, estimated by taking the square root of the variance of the residuals from a market model estimated over the six month period ending at the end of the month prior to the merger announcement. RUNUP_NET_MKT: is the buy-and-hold return of a company's stock in the 12 months ending at the end of the month prior to the merger announcement in excess of the return of the CRSP value – weighted index over the same period. MKT_TO_BOOK: is the ratio of acquirer's market value of equity to the book value of equity as of the last quarterly balance sheet prior to the month of the merger announcement. STOCK: is an indicator variable that takes the value 1 if and only if the acquisition is financed at least partially with stock. DIFF_IND: is an indicator variable that takes the value 1 if and only if the target and the acquirer are in different industries. RATIO: is the ratio of the deal's value to the market value of the acquirer. MRK_VAL: is the natural log of the market value of the acquiring firm at the end of the month prior to the merger announcement. CAR_RESID: is the estimated residual from the regression of CAR on RETURN INTERIM, defined as the buy-and-hold return for an acquirer's stock between the end of the month prior to the merger announcement and at the end of the month six months after the merger is effective. DIST_FROM_DESIRED_RISK: is defined as the residual from a regression of acquirer default risk on balance sheet determinants of target risk level.S IND_CF_VOL_DIFF: is the risk in the acquirer's industry minus the risk in the target firm's industry, where industry risk is the standard deviation of the ratio of annual total cash flow to total assets in an industry in the five years prior to the merger announcement. EXECUCOMP: is a dummy variable that takes the value 1 if and only if the acquirer is in the Execucomp data for the year prior to the merger announcement. OPTIONS: is defined as the fraction of the acquiring CEO's compensation that is derived from executive stock options if EXECUCOMP equals 1 and is zero otherwise. HORIZONTAL: is a dummy variable that takes the value 1 if and only if the acquirer diversifies horizontally, while MIXED and CONGLOMERATE are defined analogously for the acquirers who diversify both vertically and horizontally (mixed) and for the acquirers who make an unrelated acquisitions (conglomerate) respectively1%, 5% and 10% significance levels are reported with ***, ** and * respectively. P-values are in parentheses below each coefficient.

Table 3.10 Regression Analysis on the Determinants of the Change in Risk - Merger Waves, Diversification and Other Determinants

	Dependent variable = $B\Delta DF_{16}$					
	1	2	3	4	5	6
Intercept	0.058***	0.055***	0.044***	0.055***	0.053***	0.052***
	(0.0003)	(0.0007)	(0.0036)	(0.0007)	(0.001)	(0.0012)
TARGET_PUBLIC	0.011**	0.011**	0.009	0.010*	0.010*	0.010*
	(0.0494)	(0.0449)	(0.1193)	(0.0871)	(0.0865)	(0.0733)
TARGET_SUB	-0.006	-0.007	-0.007	-0.008	-0.008	-0.007
	(0.2889)	(0.2659)	(0.2145)	(0.1921)	(0.1961)	(0.2262)
VOL	0.353*	0.351*	0.491**	0.478**	0.462**	0.422**
	(0.0578)	(0.0593)	(0.0142)	(0.0176)	(0.0217)	(0.0297)
RUNUP_NET_MKT	0.009	0.008	0.009	0.008	0.008	0.009
	(0.1611)	(0.2148)	(0.2107)	(0.2499)	(0.2483)	(0.1763)
MKT_TO_BOOK			-0.003	-0.002	-0.003	
			(0.4444)	(0.4712)	(0.4502)	
STOCK	-0.010	-0.009	-0.009	-0.009	-0.009	-0.010
	(0.1287)	(0.1483)	(0.1742)	(0.1471)	(0.1404)	(0.1194)
MIX CASH/STOCK	-0.004	-0.004	-0.005	-0.005	-0.005	-0.005
	(0.5206)	(0.5452)	(0.4639)	(0.438)	(0.4289)	(0.414)
DIFF_IND			-0.008	-0.013*		
			(0.1658)	(0.071)		
RATIO	0.002	0.002	0.002	0.002	0.002	0.002
	(0.6052)	(0.5834)	(0.6285)	(0.6206)	(0.5963)	(0.5592)
MRK_VAL	-0.006***	-0.006***	-0.005***	-0.005***	-0.005***	-0.006***
	(0.0001)	(0.0008)	(0.0033)	(0.0025)	(0.002)	(0.0003)
CAR_RESID	0.042	0.044*	0.044*	0.046*	0.045*	0.045*
	(0.1222)	(0.100)	(0.1002)	(0.0959)	(0.1003)	(0.0992)
DIST_FROM_DESIRED_RISK	0.329***	0.334***	0.313***	0.317***	0.314***	0.319***
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
IND_CF_VOL_DIFF	-0.040	-0.033	-0.048	-0.045	-0.051	-0.045
	(0.8066)	(0.8396)	(0.7683)	(0.7827)	(0.7522)	(0.7805)
OPTIONS	-0.002	-0.001	0.001	0.001	0.000	-0.001
	(0.8359)	(0.9299)	(0.9385)	(0.8841)	(0.9702)	(0.9431)
CBA	-0.002					
	(0.7351)					
LEV		0.000				
		(0.3628)				
HORIZONTAL	-0.016*	-0.017*		-0.019**	-0.016*	-0.016*
	(0.0702)	(0.0596)		(0.0319)	(0.0758)	(0.0764)
MIXED	-0.008	-0.009		-0.012*	-0.008	-0.008
	(0.2188)	(0.2057)		(0.092)	(0.2355)	(0.2251)
CONGLOMERATE	-0.009	-0.010		-0.006	-0.011	-0.011
	(0.1871)	(0.1777)		(0.4432)	(0.1338)	(0.1408)
WAVE1			-0.027	-0.026	-0.029	-0.028

			(0.1618)	(0.1866)	(0.1398)	(0.148)
WAVE2			0.034*	0.032*	0.034*	0.034*
			(0.069)	(0.0826)	(0.0696)	(0.0649)
Observations	1382	1382	1382	1382	1382	1382
R-squared	0.07	0.071	0.071	0.076	0.073	0.073

Regressions on the determinants of the change in risk in the four type of integration; vertical, horizontal, mix, and conglomerate. The dependent variable $\boldsymbol{B\Delta DF_{16}}$ is the change in the acquiring firm's default risk from the end of the month prior to the merger announcement to the end of the month six months after the completion of the merger. TARGET_PUBLIC: is a dummy variable that takes the value 1 if and only if the target is publicly traded and 0 otherwise. TARGET_SUB: is a dummy variable that takes the value 1 if and only if the target is a subsidiary and 0 otherwise. VOL: is the standard deviation of the idiosyncratic component of the acquirer's stock return, estimated by taking the square root of the variance of the residuals from a market model estimated over the six month period ending at the end of the month prior to the merger announcement. RUNUP_NET_MKT: is the buy-and-hold return of a company's stock in the 12 months ending at the end of the month prior to the merger announcement in excess of the return of the CRSP value – weighted index over the same period. MKT_TO_BOOK: is the ratio of acquirer's market value of equity to the book value of equity as of the last quarterly balance sheet prior to the month of the merger announcement. STOCK: is an indicator variable that takes the value 1 if and only if the acquisition is financed at least partially with stock. DIFF_IND: is an indicator variable that takes the value 1 if and only if the target and the acquirer are in different industries. RATIO: is the ratio of the deal's value to the market value of the acquirer. MRK_VAL: is the natural log of the market value of the acquiring firm at the end of the month prior to the merger announcement. CAR_RESID: is the estimated residual from the regression of CAR on RETURN INTERIM, defined as the buy-and-hold return for an acquirer's stock between the end of the month prior to the merger announcement and at the end of the month six months after the merger is effective. DIST_FROM_DESIRED_RISK: is defined as the residual from a regression of acquirer default risk on balance sheet determinants of target risk level.S IND_CF_VOL_DIFF: is the risk in the acquirer's industry minus the risk in the target firm's industry, where industry risk is the standard deviation of the ratio of annual total cash flow to total assets in an industry in the five years prior to the merger announcement. EXECUCOMP: is a dummy variable that takes the value 1 if and only if the acquirer is in the Execucomp data for the year prior to the merger announcement. OPTIONS: is defined as the fraction of the acquiring CEO's compensation that is derived from executive stock options if EXECUCOMP equals 1 and is zero otherwise. HORIZONTAL: is a dummy variable that takes the value 1 if and only if the acquirer diversifies horizontally, while MIXED and CONGLOMERATE are defined analogously for the acquirers who diversify both vertically and horizontally (mixed) and for the acquirers who make an unrelated acquisitions (conglomerate) respectively. WAVE1 and WAVE 2 is an indicator variable that takes the value 1 if and only if the acquisitions was announced and completed during the first merger wave (1980-1989), and the second (1990-1999) respectively. CBA is an indicator that takes the value 1 if and only if the target firm is not a US firm. Leverage is estimated by taking the difference of the equity-to-asset ratio between the period six months after the merger completion and one month before the merger announcement. 1%, 5% and 10% significance levels are reported with ***, ** and * respectively. P-values are in parentheses below each coefficient.

Chapter 4: Valuation Errors and the UK Takeover Profitability

4.1 Introduction

Empirical studies on mergers and acquisitions report substantial gains for the combined entity (i.e. Dodd 1980; Franks et al., 1991; Andrade et al., 2001). Target firms enjoy the majority of wealth created through the merger, whereas shareholders of the acquiring firms suffer from wealth loss or at best, they break even (for UK evidence on takeover gains please see Sudarsanam et al., 1996; and Higson and Elliott, 1998). Despite the value destruction for the acquiring firms, mergers remain a very popular restructuring strategy for the firms as evidence shows that every year, deals increase in numbers and in value. However, the corporate finance literature remains inconclusive on what drives mergers and the reasons behind acquirer firm returns' variation.

This paper contributes to the literature of corporate finance by providing new supporting evidence on the misvaluation theory of mergers from the UK market. We study how firm, market, or industry valuation errors affect the acquiring firms' returns both in the short run and in the long run and after controlling for multiple deals, the method of payment, the target's firm status, the relative size, the acquirer's size and for cross-border acquisitions. We find that, during high market/industry valuation periods mergers increase returns for the acquiring firms and although returns are reversed in the long-run, these mergers are less value destroying compared with mergers during low market/industry valuation periods. We also show that undervalued firms, high relative size deals, multiple and cash acquisitions are more profitable in both short and long run period, while undervalued firms, public and stock acquisitions decrease acquirers' value.

There are a plethora of theories investigating a number of influences that induce a firm to engage in a merger (i.e. economies of scale, economic disturbance theory and agency costs of free cash flows). Through mergers, firms expect to realize technological and marketing synergies by expanding in a new stage of production, a new industry and/or a new geographical area (diversification), to redeploy excess corporate cash or avoid double taxation of dividends to shareholders, to reduce costs, increase productivity and/or efficiency of corporate resources, and improve competitive positioning. Efficiency theory (Bradley et al., 1983), neoclassical theory (Gort, 1969; Harforf, 2005), hubris theory (Roll, 1986) and

managerial theory (Jensen, 1986) are a few schools of thought that have extrapolate upon traditional theories and suggest alternative motives in explaining takeover activity, such as assets misvaluation or valuation errors, mismanagement or 'hubris'. Whilst each theory offers significant insights in understanding and explaining mergers, none of the predictions of each theory are a necessary condition in a merger. In reality most mergers are a result of a number of different motivations and cannot be attributed solely to one incentive.

Having said that, we cannot ignore the periodically patterns in takeover activity and we have to recognize the link between the state of the market/industry and the activity of mergers. Nelson (1959) initiated the misvaluation theory of merger; he discusses that mergers are 'highly concentrated in time, that they cluster during periods of high stock market valuation and that during these periods stock is more likely to be used as a method of payment.' However, Nelson's theory assumes that several industries experience shocks at the same time to explain aggregate merger waves which is not always the condition. Gort, (1969) argues that takeover activity intensifies during periods of 'dramatic economic changes'. He also assumes that due to information asymmetry shareholders have in general differing options about the true value of an equity.

The emergence of the market timing theory of mergers has intensified the debate on what is driving acquisitions (Stein, 1988,1989,1996; Morck et al., 1990; Shleifer and Vishny, 1990; Baker and Wurgler 2000, 2002, 2006; Baker et al., 2003; Jenter, 2002; and Polk and Sapienza, 2004). Behavioural finance and market timing theory sees investment projects as a result of the mispricing in the markets. Shleifer and Vishny, (2003) offers a theoretical model of this behavioral approach in mergers; the model recognize that investors can misvalue the firms especially during a booming or a depressed market but the managers of the firms (assuming that they are rational) should be aware of the market imperfections and at the same time should be able to value their firms correctly. If this is the case, then managers will try to take advantage of stock market inefficiency and engage in stock acquisitions in high market valuation periods. Empirical evidence confirm that periods of intense (low) takeover activity, coincide with periods of high (low) market valuations and also show that there is a positive correlation between high (low) market valuation periods and the use of stock (cash) as a takeover currency (see for example Maksimovic and Phillips 2001; Jovanovic and Rousseau, 2002; and Ang and Cheng, 2006).

A comprehensive study by Rhodes-Kropf and Viswanathan, (2005) decomposed valuation into three main sources; the market, the industry and the firm. Any deviations from fundamentals should motivate firms to persuade a merger. Dong et al., (2006) shows that firms' market valuations significantly affect the method of payment, the premium, and the returns of the merger. Ang and Cheng (2006) provide evidence that stock acquisitions are correlated with possible firms' misvaluation supporting Shleifer and Vishny (2003) theoretical model on misvaluation. Antoniou, Guo and Petmezas (2008) show that the momentum on UK acquirers returns during high market valuation periods are driven by investor sentiment. Finally, Petmezas (2009) finds that UK acquirers outperform their counterparts when they engage in mergers in booming markets and after controlling for the target type and method of payment.

Behavioral theories have concentrated not only on the market and the firm valuations but also on the acquiring firms' managers and whether their beliefs affect the acquiring firm's performance. Roll (1986) with the famous 'hubris hypothesis' is one of the first papers which recognize the importance of managers' beliefs on influencing the acquisition decisions and returns. Hubris-infected managers over-estimate their abilities to create value in a merger, and overestimate the potential synergies. Malmendier and Tate (2008) find that firms with non-overconfident managers will perform better in an acquisition than acquirers with overconfident managers. Croci, Petmezas and Vagenas-Nanos (2010) find that firms with non-overconfident managers gain more than those with overconfident managers during high valuation periods. These results find support on anecdotal evidence which suggest that firms take advantage of misvaluation ex-post mistakes to correct their value.[40]

In this study we control for the overconfidence of the acquiring firms' managers by differentiating our sample in multiple and single acquirers. Doukas and Petmezas (2007) use the frequency that each acquirer makes acquisitions as a measure of overconfidence. The authors argue that managerial overconfidence results from self-attribution bias and that although overconfident managers are more capable than their peers, they tend to overestimate the potential synergy of a merger deal or underestimate the riskiness of the project. It is more likely that an overconfident manager would make multiple acquisitions in a short period than a non-overconfident manager. Studies on the performance of multiple acquirers show that

[40] For example, in 2000 American Online (AOL) completed its $164bn acquisition of Time Warner using its then hyper-inflated stocks. In the following year, when the market corrected the error, Time Warner experienced a mega-loss of $99bn.

although there is not much difference between multiple and single acquirers (or overconfident and non-overconfident), the performance of multiple acquirer declines with each subsequent acquisitions.[41] Fuller et al., (2002) finds that multiple acquirers' performance varies by the target type, the relative size and the method of payment. By including a measure that captures the acquirers' overconfident we would like to see how the acquiring firms' performance during high or low valuation periods will change. We find that undervalued acquirers outperform overvalued acquirers irrespective of the manager's overconfidence (or whether the acquirer makes multiple announcements) while both multiple and single acquirers gain much more when making acquisitions in high market or industry valuation periods. Multivariate analysis confirms these results and also shows that method of payment, target status, relative size and valuation errors stemming either the firm, the market or the industry significantly affect acquiring firm's performance.

Consistent with previous studies, our results suggest that information asymmetry and investors' sentiment may play an important role in explaining the acquiring firms' returns. Antoniou, Guo and Petmezas (2008) shows that the performance of UK acquirers during high market valuation periods, is driven by investors' sentiment. We argue that since investors value firms based on the availability of relevant information (information asymmetry), during booming markets optimism can intensify investors' positive expectations (investor sentiment hypothesis). A merger announcement releases information to the market and helps investors to adjust their views on the firms' value. Deal and firm characteristics of the merger also work as a signaling tool in the market (Myers and Majluf, 1984). For example an acquirer offering his stock as the method of payment, is usually perceived as a signal that the acquirer is overvalued or a cash acquisitions is viewed positively by investors (Schlingemann, 2004; Martynova and Renneboog, 2007). At the same time, investors' expectations can be elevated during periods of extreme market/industry valuations and drive up or down the stock market price around the announcement. Finally, the high takeover activity during booming markets can be explained by the information asymmetry hypothesis. Information is in general more transparent and accessible at a market level. Thus during periods of high market valuations, the target firms might overestimate market misvaluation and due to investor sentiment, expect higher returns during these periods. Consequently, the likelihood of the target firms accepting a merger offer should be higher than during a low market valuation period and therefore takeover activity increases analogously with market/industry valuation.

[41] See for example Conn et al., (2004)

4.2 Literature Review

4.2.1 Value Creation and Mergers

Much of the focus in the literature of corporate finance has been on whether mergers are profitable, and if so for whom. In general Mergers and Acquisitions should be attractive to the acquiring and the target firms' shareholders only if they maximise the value of their share. Value creation in mergers may result from a number of reasons such as distribution and management, economies of scale in production, new technological knowledge, new distribution channels and cross-selling of each other's products. Empirical evidence shows that merger synergies are difficult to attain and their size can be disappointing.[42] The announcement returns of the target and the acquirer vary depending upon various firm- and transaction characteristics. There is substantial evidence that target firm shareholders enjoy significantly positive announcement abnormal returns of about 30% irrespective of the takeover mode (i.e. friendly or hostile), while the acquirer firm shareholders generally gain either significant negative, zero or positive announcement- and post- acquisition returns.[43]

Existing studies propose various reasons in explaining the variation in bidder and target firms' announcement returns. Cotter, Shivdasani and Zenner, (1997) finds that the abnormal returns to target firm shareholders for successful tender offers have rose 22% during the 1960s and more than 50% in the early due to the high premiums the acquiring firms offer. Other contributing factors to the increase in target's returns include the improvement of takeover defences, the regulations and deregulations, and the good financial performance of the target (or the anticipation).[44] For the same reasons, returns on shareholders of the acquiring firms have slightly declined over time. Moeller, Schlingemann and Stulz (2005) document that although acquirers experience positive returns during the 1990s, especially during 1990-1997, gains were offset by the losses during the later period, 1998-2001.

[42] See for example Jensen and Ruback (1983) and Sirower (1997).
[43] For evidence on announcement and post acquisition returns see Asquith (1983), Jensen and Ruback (1983), You, Caves, Smith and Henry (1986), Dennis and McConnell (1986), Jarell, Brickley and Netter (1988), Bradley, Desai and Kim (1988), Lang, Stulz and Walking (1989), Jarell and Poulsen (1989), Franks, Harris and Titman (1991), Agrawal, Jaffe and Mandelker (1992), Bhagat and Hirshleifer (1996), Schwert (1996), Cotter, Shivdasani and Zenner (1997), Loughran and Vijh (1997), Rau and Vermaelen (1998), Ghosh and Lee (2000), Mulherin and Boone (2000), Akhigbe, Borde and Whyte (2000), Bruner (2002), Fuller, Netter and Stegemoller (2002), Billet, King and Mauer (2004), and Fee and Thomas (2004).
[44] Ghosh and Lee, 2000

Studies on the post-merger performance provide conflicting evidence about the long-term impact of mergers on the acquiring firms' returns. Although some find that mergers increase shareholders wealth, others find that the majority of the acquirers underperform their industry peers.[45] Sample and time period selections, firm and deal specific factors, (i.e. the overpayment of growth target firms, sale of stocks around merger announcement dates, the method of payment), the methodology used or factors that are not related to the merger have been employed to explain the variation in the post-merger findings.[46] Most likely, the longer the period after the completion of the merger, the higher the likelihood that other factors which are not related to the merger will affect the abnormal returns of the acquirer.

4.2.2 Timing of Mergers

Another distinct feature of the takeover market is the cyclic move of the deals and the trends of each period, known as merger waves. High merger activity is usually followed by periods of lower merger activity. The US market for example has over a 100-year history in merger waves, the UK activity started around the 1960s, while the EU merger history is fairly new and only started around 1980s. The UK merger market is considered the leader in terms of takeover activity within the EU as it accounts for about 31% of all EU Deals.[47] Since 1984, the EU merger waves are paralleling those in the US market. Therefore, UK merger activity is an ideal and attractive testing sample of the European market.

The UK market experienced two small merger waves in the 1890s and the 1920s. Then due to the 1940's War, UK market sank into a major depression which lasted until late 1950s. In the 1960s, the deal value of the UK takeovers reaches £1.95bn, and rose even higher to £2.5bn in 1973. The 1980's wave has an astonishing deal value of £27bn and an the average deal value is 10 times more compared with the previous waves (£20.4m comparing to £2m) and twice the total value of acquisitions. In terms of wave characteristics, the 1960s wave was overpopulated by horizontal acquisitions due to a new industrial policy (IRC) that was adopted to help strengthen UK firm and make them more competitive. The trend of horizontal mergers continues during the next wave that peaked in 1972 but on a smaller scale.

[45] See for example, Barber and Lyon (1997), Fama (1998), and Lyon, Barber and Tsai (1999).
[46] For a review of key findings on factors affecting long-term M&A performance, see for example Anslinger and Copeland (1996), Loughran and Vijh (1997), Sirower (1997), Lajoux (1998), Agrawal and Jaffe (1992), Linn and Switzer (2001), Frick and Torres (2002), and Heron and Lie (2002).
[47] Thompson Financial SDC database ranks Germany as the second country in terms of merger deals with 16% of all EU deals, France third with 14%, Netherlands forth with 7% and Italy fifth with 6%.

Conglomerate mergers are increasing in numbers in this wave. The 1980s merger wave occurred during a booming market period and the market crash in 1987. During the 1990s, new sectors in the UK were being privatized and deregulation of the telecom industry led to a new wave. In 2000s the deal value of UK mergers reached £107bn and for the first time the value of acquisitions taken by foreign firms exceeds domestic ones. This is also the time of the one of the worst financial crises. The bursting US house bubble in 2006 initiated the beginning of a great depression which is characterized by extreme credit control worldwide, decrease in international trade which damaged investors' confidence that had an impact on global stock markets. The EU and UK had responded to this crisis with strictness measures in all aspects of the economy and increase taxes.

Until recently, there was no unified theory of mergers or at least a theoretical model explaining takeover waves or the timing of waves and the returns of the deals. A notable exception is a study by Gort (1969), which argues that, 'at certain times, shareholders have differing options as to the true value of a share because of imperfections in the information available and how it is assessed. These differences in valuation can lead to takeover transactions and become greater at times of dramatic economic change.' Only recently, the literature on mergers and acquisitions has provided a theoretical base and empirical evidence to support the link between market conditions and takeover activity. Shleifer and Vishny, (2003) explain that there is a strong connection between aggregate takeover activity, the quality and the outcome of the deals (in terms of profit) and mis-valuation or valuation errors. More specific the authors discuss how the stock market can misvalue the acquirers, the target firms, and the combined entity. Assuming that managers are rational, then mergers can be used as a form of arbitrage by the acquirers to correctly value their firms by taking advantage of stock market inefficiency. Rhodes-Kropf and Viswanathan, (2005) decomposed valuation errors into three main sources; the market, the industry and the firm. Potential value deviations from either source works as a motivation for the firms to engage in a merger and to take advantage of investors' (false) expectations and beliefs regarding the true value or the potential of the firms, especially during periods of flourishing or depressing stock markets. The misvaluation theory recognizes the link between the cyclic nature of takeovers activity and the valuations of the market, the industry and the firms at the time of the announcement.

Sporadic empirical evidence appears to be consistent with several implication of the misvaluation theory of mergers. For example Andrade et al. (2001) and Jovanovic and

Rousseau (2002), find that merger activity increases when the market is booming, and also show that the prevalence of stock acquisitions is greater during these periods. Systematic evidence of higher levels of merger activity in bull markets is also found by Verter (2002). The author also shows these acquisitions are more likely to use stock and to result into low market returns, suggesting that these firms are overvalued. Further, Titman, Wei and Xie (2004) and Polk and Sapienza (2004) find that high investment is more likely to result into lower stock returns in the cross section, and Lamont (2000) shows a similar pattern for planned investment in the time series. Finally Ang and Cheng (2006) provide evidence that stock acquisitions are correlated with possible firms' misvaluations supporting Shleifer and Vishny (2003) theory, while Dong et al., (2006) show that there is a relationship between the firms market valuation, transaction characteristics, and firms' abnormal returns variation in the us mergers.

4.2.3 Other Explanatory Variables

Several transaction and acquirer specific characteristics are also reported in the literature of mergers as major determinants of acquisition process and performance. For example the target's firm ownership status has been found to affect the acquiring firms' abnormal returns. Ang and Kohers (2001) find that public acquisitions yield lower abnormal returns than private acquisitions. Fuller et al., (2002) show private acquisitions result in 2.08% abnormal returns, while a public target generates -1% for the bidder during the period of 1990 to 2000. Further Moeller et al., (2004) confirms that private acquisitions are profitable deals for the acquirer, and public acquisitions destroy value. Similar results are documented for the UK and European merger markets by Conn et al., (2005), Draper and Paudyal (2006) and Faccio et al., (2006). Graebner and Eisenhardt (2004) suggest that performance differences between these two types of acquisitions might be caused by differences in managers' motivation and bargaining power. Barney (1986, 1988) and Reuer and Ragozzino (2006) suggest that the level of private information drives acquisition performance. This is the most prominent explanations for the growth differential between private and public acquisitions; information on public firms is more widely available, whereas private targets typically do not disclose all relevant information. Furthermore, market is constantly pricing public firms, while private firms are less visible and transparent and therefore more risky and more difficult to value (Deeds, Decarolis and Coombs, 1999; and Becchetti and Trovato, 2002). Since the

information about a public firm is available, potential bidders may compete and therefore overpay such targets (Draper and Paudyal, 2006).

A growing amount of research has examined the role of method of payment in the acquisitions process. Hansen (1987) and Fishman (1989) suggest that acquirers will offer stock in an acquisition when there is high information asymmetry about target's value. Further, Myers and Majluf (1984) suggest that, given the information asymmetry arising from superior managers' internal information, managers think that their overvalued equity is the best method of payment. Conversely, investors might recognize the adverse selection problem, re-value their initial beliefs based on the new information about the method of payment and drive equity prices down. Therefore stock public acquisitions are result in value destroying projects for the acquirer.[48] The method of payment also affects acquirers' performance in domestic and cross-border acquisitions. Accordingly, Conn et al. (2005) shows that cash acquirers buying domestic public targets outperform their peers buying foreign public targets; this pattern reverses when the acquirers offer non-cash[49] payments. When the target is a private firm, domestic acquisitions outperform foreign acquisitions when the method of payment is cash or non-cash. In addition, acquirers engaging in cross-border acquisitions of public firms using non-cash methods do not experience losses, whilst private firms' domestic deals generate higher abnormal returns than for cross-border deals. These results reflect that target origin is highly relevant in addition to method of payment in the determination of abnormal returns.

Furthermore, the relative size of the target to bidding firm and the bidder's size are both significant factors in the acquisitions process (Asquith et al. (1983), Jensen and Ruback (1983), Jarrell and Poulsen (1989), Kang (1993) and Fuller et al. (2002)). The larger the size of the target firm the more severe the generated abnormal returns as a result of the changes in structure for the acquiring firm as a result of the acquisition. More specific, Jensen and Ruback (1983) finds that the acquiring firms' abnormal returns increase with the size of the target relative to the size of the acquirer. In addition, Loderer and Martin (1990) find that larger firms tend to overpay targets and this will reduce their share price performance. Finally, single acquirers have been found to enjoy higher abnormal returns than multiple

[48] See for example: Travlos (1987), Wansley, Lane and Yang (1987), Amihud, Lev and Travlos (1990), Servaes (1991), Brown and Ryngaert (1991), Martin (1996), Ghosh and Ruland (1998), Draper and Paudyal (1999, 2006), and Fuller, Netter, Stegemoller (2002), Conn et al. (2005).
[49] Non-cash offers include stock offers, stock and cash offers, and other offers.

acquirers (Ismail, 2008 and Doukas and Petmezas, 2007). Fuller et al., (2002) defines multiple acquirers as 'the firms that make five or more acquisitions within a 3-year period'. Doukas and Petmezas (2007) argue that such acquirers are infected by overconfidence who choose projects that decrease shareholders' value compared with rational managers who make better choices and thus increase shareholders' wealth.

This paper contributes to the literature of mergers and acquisitions by building on the existing literature of takeovers which incorporates the misvaluation theory in explaining the returns of the mergers. We investigate how acquiring firm's returns varies in the UK takeover market across over- and under- valuation errors stemming either from the firm, the market and the industry. We control for several deal and firm characteristics such as multiple deals, the method of payment, the target status, the relative size, the acquirer's market value and cross border acquisitions and see whether our results change.

4.3 Data and Methodology

4.3.1 Sample Description

The UK Mergers and Acquisitions (M&A) sample is from Thompson One Banker database. 54,895 deals are announced and completed between 1986 and 2006. We include successful offers which are announced and completed between 1986 and 2006. The acquirer is a UK company listed in the London Stock Exchange (LSE). The target firm is a public or private firm, domestic or foreign firm. The vast majority of UK takeovers involve private targets. The method of payment is 100% cash or equity or a combination of cash and equity. The price, return data, P/E ratio of the acquiring firms, market P/E ratio and industry P/E ratio must be available from the DataStream database. The value of the transaction is £1 million or more to avoid results being driven by extremely low value transactions. The market value of the acquirer a month prior to the bid announcement is at least £1 million or more. To ensure that a merger has a significant impact on acquirer's firm default risk, we examine only those where the acquirer owns less than 10% prior to the deal and obtains more than 50% after the deal, similar with other studies (see for example Fuller et al., 2002). Neither the bidder nor the target is a government, a healthcare, a utility, a bank, a real estate or a financial institution. After these restrictions, our final sample comprise of 3622 completed UK mergers and acquisitions.

4.3.2 Valuation Techniques

This study investigates, acquiring firm's returns in the short and long run subject to firm, market and industry valuation. We also see how multiple deals, the target firm's ownership status and the method of payment affect profitability. We use market-based valuation techniques to estimate the firm, market and industry valuation.

In an efficient capital market, the best estimation of a firm's value is given by its current share price multiplied by the number of shares in issue. In reality stock market valuations do not always reflect the fair value of the firms and thus various techniques have been developed in order to capture any value divergence from its fundamental. Several approaches[50] have been used in the literature to estimate a firm's valuation, with the most popular ones being Cash flows valuation[51] and Relative valuation.[52]

Market-based valuation methods or relative valuation models, assume that a firm's market value can be found using an indicator of value for comparable firms, comparable transactions, or comparable industry averages. The principle here is that capital markets are consistently price firms, and a common market based pricing mechanism for all firms should reflect their true value. Such indicators can be the firm's earnings, cash flow, sales or book value. The most common ratios multiply those statement numbers. The most common models that are used in practice are the price-earnings ratio (P/E), the price-to-book ratio (P/B) or its reciprocal market-to-book ratio (M/B), the price-to-sales ratio (P/S), the ratio of price-to-cash flows from operations (P/CFO) and market-to-net worth (Tobin's Q). Most of these pricing techniques rely upon some benchmark valuation from either the market as a whole or for a reference firm or industry. Market-based valuation methods are popular for three reasons; first, the simplicity of these methods in calculations, relatively cash flow valuation techniques which require much more assumptions and information about the firm. Second, relative valuation is easier to explain than DCF methods and third, market-based methods will most likely reflect the current market conditions.

[50] Damodaran, 2001; Copland, Koller and Murrin, 2002; and Levy, 2006

[51] Examples of Cash flow valuation is FCFF (free cash flow to the firm) which reflects cash from operating and investing activities, or FCFE (free cash flow equity valuation) which includes cash from operating, investing and financing activities.

[52] Other approaches to valuation of a firm are asset valuation (where a summary of the assets less the liabilities of the firm are valued on some agree basis) and contingent valuation (where the firm is valued in terms of the present value of the expected cash flows plus some premium for any future growth options.

Accordigly, Chan, Hamao and Lakonishok (1991) document that M/B explains mean stock returns by conjectures that is a proxy for risk or mispriced stocks. Similarly, Fama and French (1992) argued that firm size and market-to-book value better explain the variation in average stock returns. More specifically, they posit that the market-to-book ratio is a proxy for 'unobservable common risk factors' and empirically find that this ratio has a significant relationship with realised returns. An alternative explanation for the predictive power of financial ratios and more specific for market-to-book ratio, that it is consistent with Fama and French (1992), is provided by Lakonishok, Shleifer and Vishny (1994) who argue that 'financial ratios are capable of predicting share returns, because they capture the systematic errors of investor expectation of future returns and the inefficiency of stock market'.

We use the ratio of market price to book value (or the price-to-book ratio or the market-to-book ratio) to compare the market value of a firm's equity to its book value. This ratio assumes that there is a consistent relationship between market value and the net book value of the firm. Several studies use the market-to-book ratio as a predictor of the cross-sectional stock returns and as an indicator of misvaluation on a firm specific level (e.g., Chen and Jindra, 2001, Ang and Cheng, 2006, Daniel and Titman, 2006 and Dong et al., 2006). P/B ratios and its reciprocal M/B ratios are obtained directly from Datastream database (data-type PB).

P/B ratio is calculated as follow:

$$\left(\frac{P}{B}\right)_{it} = \left[\frac{CurrentSharePrice}{CurrentBookValuePerShare^{[1]}}\right]$$

[1] Where current book value can be calculated as under:

$$BV_{it} = \left[\frac{LatestBookValue^{[2]}}{TotalSharesOutstanding(allclasses)atBalanceSheetDate^{[2]}}\right]$$

[2] The current book value is the latest book value shown on the balance sheet before the announcement and total shares outstanding are as of latest balance sheet date before the announcement, adjusted for capital changes found in company interim and annual reports or local stock exchange documents.

The general idea to capture any mispricing of an equity is to first calculate the firm's ratio and then identify an appropriate benchmark to compare the firm's ratio. Following Chen and Jindra, (2001) and Ang and Cheng (2006), the misvaluation of stock *i* at time *t* is calculated as follow using the appropriate industrial sector's P/B ratio for each firm in our sample in the month prior to the announcement:

$$MV_{it} = \frac{\left(\frac{P}{B}\right)_{it} - \left(\frac{P}{B}\right)_{jt}}{(P)_{it}}$$

Where:

$\left(\frac{P}{B}\right)_{it}$ is the price-to-book ratio of stock i at t

$\left(\frac{P}{B}\right)_{jt}$ is the median price-to-book ratio of industry j to which i belongs at t.

Accordingly, 'differences among industries, due to varying growth opportunities and risks, are accounted for through industries medians. For each firm, we use the stock price and the number of shares outstanding at *t* to derive its market value. The book value is the most recent value of common equity before *t*. For any event firm, we compute the price-to-book ratios of all firms in its industry. The Fama and French (1997) 48-industry classification is first used, and we require that there be at least 5 companies in the industry to derive the median, if this is not satisfied, the Fama and French 38-industry classification is used'. The sample is ranked based on the P/B ratio in three equally weighted sub-groups as high, neutral, and low valued announcements.

We use the FTSE ALL share P/E ratio to control for the aggregate stock market performance and monthly P/E of the 10-industries as classified by Fama and French (1993)[53] to control for industry valuation. The price to earnings ratio (P/E) compares the current price with earnings. The price shows the market's anticipation as given by the future sales or earnings whereas the denominator is current earnings. So the P/E ratio shows the forecasted future sales/earnings in

[53] Fama and French (1993) 10 industries include Oil&Gas, Industrial, Financials, Health Care, Consumer Services, Consumer Goods, Materials, Technology, Telecom and Utility and are identified according to ICBN Industry Classification.

relation with the current earnings. If market participants anticipate higher future earnings than current earnings, the P/E ratio will increase and if they expect lower future earnings than current earnings, the P/E ratio will decrease. As with any relative valuation method, the historical P/E ratios, or the average P/E ratio of the industrial sector can be used as benchmarks. P/E ratios are obtained directly from the Datastream Database (data-type PE) and are derived by dividing the total market value by the total earnings (earnings-weighted average of the P/E of the constituents).

Accordingly, P/E ratio is calculated as follows: $\left(\frac{P}{E}\right)_{it} = \frac{\sum_{1}^{n}\left(P_t \times N_t\right)}{\sum_{1}^{n}\left(E_t \times N_t\right)}$

where:

$\left(\frac{P}{E}\right)_{it}$ is the price-to- earnings ratio of stock i at day t

P_t is the unadjusted share price i on day t

N_t is the number of shares i in issue on day t

E_t is the earnings per share i on day t[54]

n is the number of constituents in index

We define each calendar month as high- or low- valuation month based on the Value-weighted market index P/E ratio (TOTMKUK) of FTSE ALL SHARE. To do so, we first detrend the market P/E ratio by removing the best straight line fit from the actual P/E ratio of the month in question and the five preceding years. We define high (low) market valuation periods as the top (bottom) third of all detrended P/E and the rest as neutral valuation periods. Analogously, the same method is used to define each period as high-, neutral- and low- based on industry valuation but using the Value-weighted industry P/E ratio of the 10 industries as identified by Fama and French.[55]

[54] Note that negative earnings per share are treated as zero.

[55] Market and Industry valuation periods are also classified as high, neutral and low following Bouwman et al., (2009) classification. Each month is classified into a high- (low-) valuation if its detrended P/E is above (below)

4.3.3 Acquisitions Returns

To investigate how firm, market and industry valuations are related to the returns of the acquisitions around the announcement but also the long-run returns of the acquisition, we calculate the announcement-period returns and the long-run returns for 12 and 36 months after the merger is completed.. Event studies were introduced by Fama et al. (1969) aiming to produce evidence on how stock prices respond to information, in our case 'date of acquisition announcement'. Empirical work on mergers has focus on various windows around the event date and different event study methodologies but most studies report approximately similar abnormal returns.[56] This is mainly due to the use of daily data that seem to adjust rapidly within a day around the new information (i.e. acquisition announcement).

We follow calculate cumulative abnormal returns (CARs) for a five-day window around the acquisition announcement [-2, +2] using the market adjusted returns. Fuller et al. (2002) reports that the 5-day window around the event is wide enough to capture the first stock price reaction when this new information enters the market.

After selecting our sample through SDC, stocks daily price data (RI)[57] for the sample period were collected, using the SDC's SEDOL through DataStream. We first calculate the daily return for each company as shown in equation (1):

$$R_{i,t} = \frac{\left(RI_{i,t} - RI_{i,t-1}\right)}{RI_{i,t-1}} \tag{1}$$

We define $R_{i,t}$ as the return for acquiring firm's security *i* at day *t* and it is given by the percentage change of the price between time *t* and the previous one (*t*-1). In the same way we calculate the daily benchmark return, $R_{m,t}$ for the FTSE all share market index for the sample period we are interested in. We use the modified market adjusted model to capture the announcement period abnormal return of the bidding firm's security *i*.

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the past five-year average. The sample is ranked based on the detrended P/E ratio and each month which is greater than the past-five year average is classified as a high-valuation period, whereas each month that is below its past average as a low-valuation period. Our results are robust against Bouwman et al., (2009) classification.

[56] Bradley, Desai and Kim, 1988; Jarrell and Pulsen, 1989; Lang, Stulz and Walking, 1989; Servaes, 1991; Berkovitch and Narayanan, 1993; Mulherin and Boone, 2000

[57] This not only accounts for any capital changes during out testing period but also incorporates any dividends paid by firms throughout this period.

Accordingly, for every firm's security *i*, the abnormal return $AR_{i,t}$ at day *t* is calculated using the following formula:

$$AR_{i,t} = R_{i,t} - R_{m,t} \tag{2}$$

Following Fuller et al.'s (2002) simple event study methodology, we calculate the cumulative abnormal returns (CARs) for the five-day period [-2, +2] around the announcement day (day 0) of each takeover. CARs are calculated by summing the daily abnormal returns over the examined window as shown in equation (3):

$$CAR_{i,T} = \sum_{t-2}^{t+2} AR_{i,t} \tag{3}$$

where *T* is the examined five-day period [-2, +2].

Alternative models can be used to calculate the abnormal returns, such as the market adjusted return method. According to Brown and Warner (1980), weighting the market return by the firm's beta in event studies, does not add any significant improvement to the estimation of the abnormal returns.

Long-run analysis is performed for 12 and 36 months after the acquisition announcement. We calculate one and three year holding period excess returns after controlling for risk factors as they have been identified by Fama and French (1996). The calendar-time portfolio excess returns are estimated with calendar time portfolio regression (CTPR) as shown in equation (4):

$$\left(R_{p,t} - R_{f,t}\right) = a_p + \beta_p \left(R_{m,t} - R_{f,t}\right) + s_p SMB_t + h_p HML_t + \varepsilon_t \tag{4}$$

Where a_p measures the monthly average risk adjusted excess returns after controlling for the three risk factors. The dependent variable $\left(R_{p,t} - R_{f,t}\right)$ is the monthly excess return of the calendar-time portfolio of bidders over the risk free rate; $\left(R_{m,t} - R_{f,t}\right)$ is the excess return of the market portfolio; SMB stands for small minus big and is the excess return of a portfolio

of small firms over a portfolio of large firms and finally HML stands for high minus low and is the excess return of a portfolio of value firms over glamour firms. SMB and HML are estimated following Fama and French (1996) methodology.

4.3.4 Descriptive Statistics

Table 4.1 displays the summary statistics for the entire sample of the 3622 mergers and acquisitions. The mean and median values of the deal value, the bidder market value and the relative size of the offer are reported yearly. Deal value is the total value of the merger minus fees and expenses paid by the bidder, market value is the market value of the acquiring firm at the end of the month prior to the merger announcement and relative size is the ratio of deal value to the bidder market value. The average deal value ranges from 22.69 million to 181.33 million UK pounds, with a total sample mean of about 68.94 millions. There are some noticeable mean fluctuations with regards deal value and size around the peaks of 1990's and 2000's merger waves. Also bidders seem to be much larger than the targets firms.

[Table 4.1]

Table 4.2 presents the yearly acquisition activity in numbers and as a percentage, of our sample by the type of the deal (i.e. multiple and single), the target status (i.e. private and public firms), the method of payment (i.e. cash, stock and mix), the market that the target firm belongs to (domestic versus foreign) and the acquirer and target firm industry (intra stands for the deals where the bidder and the target belong in the same industry and inter stands for the deals where the bidder and the target belong in a different industry). Multiple acquirers are defined as the acquirers who make at least five completed acquisitions within a three year period (see Fuller et al., 2002). We try a "more refined definition" of multiple acquisitions that basically not only focuses on the acquirer but also on the amount of acquisitions within a specified time frame. Accordingly, multiple deals are defined as the deals which are completed within a 3 year period by the same bidder. All other acquisitions from this bidder are defined as single acquisitions.[58] We find that 6% of our sample is multiple deals and 94% is single deals. There is an increase in multiple deals around 1986, 1993, and 2000 which is the peak of the 1980s wave, the beginning of the 1990s and 2000s wave. We also see that the takeover market experienced a boom in the late 1980s, then a

[58] We match the sample size of multiple acquirers with previous UK studies, such as Doukas and Petmezas (2007) and Antoniou et al., (2007).

second boom between 1996 and 2001, and a smaller peak in 2005. Our sample is thus representative of the transactions occurring within the UK takeover market of 1980s, 1990s, and 2000s waves. Acquisitions of private targets represent the 85% of the overall activity, whereas public acquisitions only the 15%. The most popular method of payment is mix payments (51%), although there are periods where either cash or equity outweighs mix payments. In general, stock payments are considered as a sign of acquirer's overvaluation and have been closely linked with high market valuation (see for example Petmezas, 2009 and Antoniou et al., 2008). 68% of our targets are domestic firms, and 48% belong in the same industry as the acquirer firm.

[Table 4.2]

Table 4.3 presents the mean and median valuation values by firm, market and industry valuation of the entire sample of acquisitions (Panel A). The overall sample has mean valuation of 0.49*** under firm-specific, -0.18*** under market valuation, and 0.21 under industry valuation. This pattern remains through all our panels (i.e. multiple deals, method of payment and target status), although there are some significant increases or decreases in specific sub-groups. For example mean firm valuation in the multiple deals increases to 0.67. Panel B shows the mean valuations of multiple and single deals. We find that firm and industry valuations are positive and significant higher than those of single deals, whereas under market valuation both types of deals have negative mean valuations. Panel C shows the mean valuations by method of payment. We find that stock acquirers have higher mean valuation values than cash acquirers. This is in line with Shleifer and Vishny, (2003) who explains that cash deals will be associated with undervaluation. Finally, Panel D shows the mean valuations by target status. The results here show that public acquisitions are in general less overvalued than private acquisitions under market and industry valuation. When the market or the industry are undervalued then acquirers might be less infected by hubris and thus choose to make public acquisitions that are more transparent in terms of information. However, when the acquirer is overvalued then is more likely to be infected by overconfidence or hubris (Petmezas, 2009) and thus persuade private acquisitions despite the fact that private targets are more difficult to value than public targets.

[Table 4.3]

4.3.5 Results – Returns In The Presence Of Misvaluation

The main aim of this project is to examine the performance of UK bidding firms both around the announcement and during the post-acquisitions period based on the possible misvaluation effects of the firm, the market and the industry and by controlling for the type of deals (i.e. multiple versus single), the method of payment and the target type. The methodology that we use to capture the source of misvaluation assigns each month in the sample period as high, neutral and low, according to the P/B ratio for possible firm misvaluation, the detrended market P/E ratio for market misvaluation and the detrended industry P/E ratio for industry misvaluation.

A limited number of studies have investigated the performance of bidders by looking at the source of misvaluation. In this study we seek to examine acquirer's performance under the presence of misvaluation as captured by market, industry and film and how other determinants that have been identified in the literature of mergers to affect acquisition process, affect acquirer's performance. Along this framework, this section presents the five-day cumulative abnormal returns (CARs) to all bidders by firm valuation as captured by P/B ratio one month before the announcement (Table 4.4), market valuation as capture by the detrended FTSE ALL SHARE P/E ratio one month before the announcement (Table 4.5) and industry valuation as captured by the detrended P/E industry ratio one month before the announcement (Table 4.6). We also report the differentials in CAR between low and high valuation portfolios in each panel.

4.3.5.1 Acquiring Firms Announcement Returns

Table 4.4 presents the five-day cumulative abnormal returns (CARs) for acquisitions classified by acquirers' P/B ratio into high, neutral low valuation periods and by multiple deals, method of payment and target type. Abnormal return differentials between high and low portfolios are also reported in each panel. Panel A presents the CARs for the entire sample and then the sample is further sub-grouped by multiple deals (Panel B), method of payment (Panel C) and target status (Panel D). Panel E report abnormal returns differentials by several portfolio combinations to uncover any significant patterns. We find that on average the acquiring firms' gains are positive and statistically significant (1.07%). As we move along the three portfolios, the gains of the portfolio with the undervalued firms are 1.70%, statistical significant at 1%, and the gains of the overvalued acquirers are positive,

0.28% and statistical significant. The differential between high and low portfolio is -1.42% and statistical significant at 1%, indicating that when not taking into consideration any other performance determinants, undervalued acquirers outperform their overvalued counterparts.[59] Acquirers who engage into multiple deals, offer cash or mix cash/equity[60] and choose private firms[61] enjoy on average higher abnormal returns than their counterparts. Both single and multiple deals by undervalued acquirers are more profitable than single or multiple overvalued acquirers (see Panel B). Panel C shows that undervalued acquirers earn significantly more than overvalued acquirers irrespective of the method of payment. [62] However, undervalued stock acquirers earn the most (2.80%) compared with undervalued acquirers who offer cash or a combination of cash and stock. On the other hand, overvalued acquirers who offer cash or stock loose, -0.04% and -0.65% respectively. Finally, Panel D shows that private acquisitions outperform public acquisitions by 2.50%. Undervalued acquirers earn 2.08%, whereas overvalued acquirers earn 0.73%, both statistically significant at 1%. Public acquisitions on the other hand, destroy value from -0.45% when the acquirer is undervalued to -1.78% when it's overvalued.

[Table 4.4]

Overall, these findings indicate that acquirers enjoy significantly higher positive abnormal returns (or lower negative) within lower valuation periods. This pattern holds true irrespective to multiple deals, the method of payment and target status. Although firm valuation seems to amplify the patterns of the gains that have already established in the literature of mergers and acquisitions (i.e. undervalued cash acquirers gain more than overvalued cash acquirers), valuation alone is not enough in explaining acquirers' returns but the combination of valuation with other acquisition characteristics can help us explaining these patterns. Draper and Paudyal (2006) explain that an acquisition announcement reduce the information asymmetry surrounding bidding firms. Investors re-optimize their views about the acquirer once learning the newly released information. The direction of this

[59] Sudarsanam and Mahate (2003) also finds similar results for a smaller UK sample.
[60] For studies that report positive abnormal returns in the event of cash and mixed/other payments see for example: Asquith, Bruner and Mullins (1990), Eckbo, Giammarino and Heinkel (1990), Travlos (1987), Fuller et al (2002) and Conn et al (2005).
[61] Studies that have reported positive abnormal returns in private and subsidiary acquisitions see for example: Da Silva Rosa et al (2004), Ang and Kohers (2001), Fuller et al (2002), Draper and Paudyal (2006), Faccio and Masulis (2005) and Conn et al. (2005).
[62] For studies that posit that acquiring firms experience positive abnormal returns when the acquisitions is financed with cash rather than stock see for example: Asquith, Bruner and Mullins (1990), Eckbo, Giammarino and Heinkel (1990), Travlos (1987), Fuller et al. (2002) and Conn et al. (2005)

revaluation depends upon the investors' views on the real potential of the acquiring firm and the positive or negative signal of the acquisitions announcement. For example a cash acquisition or a private acquisition is in generally perceived by investors as a positive signal. New information regarding the value of the acquiring firm, help investors to revalue the acquisition quality and in the event that the acquirer is viewed as undervalued drive up its share price.

Having examined the effects of firm valuation on the returns of the acquisition for the acquiring firm, results from testing market valuation on acquirer's gains are reported in Table 4.5. The overall sample shows that acquirers enjoy positive abnormal returns of 1.07% statistically significant at 1%, while the sample partitioned by high/low valuation periods yields significant gains for high-valuation acquirers (1.82%) suggesting that acquirers bidding within high market valuation periods enjoy significant positive returns comparing with the ones in low market valuation periods (HML 1.50%). The same pattern holds when we divide the sample by multiple deals, method of payment and target status. Differentials in mean abnormal return of high versus low market valuation period, show that acquirers who engage in acquisitions during high valuation periods outperform those who engage in deals in low valuation periods, irrespective of the deal type, the payment method and the target status. More specific, single and multiple deals in overvalued periods result in 1.82% and 1.83% respectively, while their counterparts in undervalued periods result in 0.31% and 0.25%. Acquirers who offer cash, stock or mix during overvalued periods enjoy 1.71%, 2.24% and 1.77% respectively, while gains span from 0.09% and 0.90% in cash and mix acquisitions to -1.17% in stock acquisitions. The sub-analysis by target status shows that bidders buying public targets generate significant losses (-1.05%) whereas acquirers buying private targets have significant gains of about 1.46%. The gains from private acquisitions range from 0.94% when the market is undervalued to 2.13% when the market is overvalued, while the gains from public acquisitions are significantly negative (-2.84%) in undervalued periods, and positive at overvalued periods, while not statistical significant. Our empirical results are consistent with previous UK studies,[63]and comparable with US studies who suggest that stock market reacts more favourably on announcement made during overvalued periods than those announced during undervalued periods.[64] During flourishing periods, investors' optimism or sentiment can intensify the positive expectations from i.e. a private

[63] See for example Petmezas (2009)
[64] Tebouri (2005) and Bouwman et al., (2009).

acquisition and thus drive up the stock market price around the announcement. Even in the event of stock acquisitions that one would expect negative abnormal returns around the announcement, in a high market valuation synergies are overestimated, and acquirers' announcement returns increase to positive and statistical significant.

[Table 4.5]

Finally, in the last table of our univariate analysis, (Table 4.6) bidder's announcement abnormal returns are reported by industry valuation as captured by the detrended P/E ratio. If industry P/E ratio captures the valuation errors of the market by at an industry-specific level, then we expect that the returns of the acquiring firms will be similar to those of Table 4.5 and market valuation. We do in fact confirm this expectation, and find in general that acquisitions announced during high valuation periods result in significantly positive abnormal returns, irrespective of the multiple type, method of payment and target type. Stock and public acquisitions during low valuation period result in negative abnormal returns as during low market valuation periods in the previous table.

[Table 4.6]

4.3.5.2 Acquiring Firms Post Acquisition Returns

So far we have examined the acquiring firms' performance during a short-run window around the announcement. We show that acquisitions announced during high market or industry valuation periods are perceived more positively by optimism investors than the acquisitions announced during low valuation periods, and this has an effect on bidders' gains which are positive and highly significant. We also find that undervalued acquirers enjoy higher abnormal returns than overvalued acquirers, in line with information asymmetry hypothesis. We now turn our attention towards the returns of the acquisitions in the post-acquisition period.

Accordingly, market timing appears to have a significant impact on long-term stock performance. Research has shown that overvalued acquirers have low subsequent returns. Rau and Vermaelen (1998) examine the relationship between firm-level valuation and long-run firm performance of acquiring shareholders under extrapolation hypothesis. However, empirical research lacks evidence exploring both firm valuation errors and market/industry ones within the same period. More specific we expect to see acquirers buying during high

valuation markets to enjoy higher announcement returns but lower long-run abnormal returns than those buying during low-valuation markets. Empirical findings based on univariate and cross-sectional short-run analysis confirms that valuation errors during acquisitions announcement significantly affect acquirers' announcement abnormal returns. Using the calendar-time approach (CTPR) market adjusted returns and calendar-time regression intercept and alphas are used to measure the excess returns and empirically investigate acquirer's long-run performance. The Fama and French (1996) three factor model is used for this purpose.

[Table 4.7]

[Table 4.8]

Table 4.7 and 4.8 report the results for the entire sample, for multiple deals, different methods of payment and target status across all three valuation sources (i.e industry, market and firm) for 12-months and 36-months after the announcement, respectively. We find that acquisitions announced during high market and industry valuation periods result in higher announcement returns, and in lower negative post-acquisition returns. In addition, undervalued acquirers suffer smaller losses compared with overvalued acquirers. Clearly, the long-run analysis in this study's framework suggests that valuation status around the merger announcement shape acquirer's gains both in the short but also in the long run period.

4.3.5.3 Multivariate Analysis

The results from univariate analysis focus on the impact of different valuation sources on bidder's announcement and post-acquisition returns and acquisition's characteristics. As in this framework the effects of multiple factors cannot be observed, announcement period 5-day returns are regressed against a set of explanatory variables that are likely to affect acquirers' gains as shown below:

$$CAR_{i,t} = \alpha + \sum_{i=1}^{N} X_i + \varepsilon_i$$

Where the intercept, α measures the excess return to bidders after accounting for the effects of all explanatory variables, while the vector of explanatory variables, X_i includes variables that are most likely to explain bidders' cumulative abnormal returns, $CAR_{i,t}$. PRIVATE is an

indicator variable that takes the value 1 if and only if the target is a private firm. CASH is a dummy variable that takes the value of 1 if the acquisition is financed with cash only, and STOCK is a dummy variable that takes the value of 1 if the acquisition is financed with stock only. LRATIO is the log value of the ratio of the deal's value to the market value of the acquirer. LMV is the log value of the acquirer's market value. CBA is a dummy variable that equals 1 if the target is a foreign firm. HOSTILE is a dummy variable that equals 1 if the deal is hostile and 0 otherwise. MULTIPLE is a dummy variable that equals 1 if the deal was announced by an acquirer who also announced at least 5 deals within 3 years. LOW_FIRM_VALUATION and HIGH_FIRM_VALUATION is a dummy variable that equals 1 if the deals was announced during a low firm valuation period, or a high firm valuation period, respectively as captured by the P/B ratio. LOW_MARKET_VALUATION, HIGH_MARKET_VALUATION, LOW_IND_VALUATION, and HIGH_IND_VALUATION variables are defined analogously using the detrended market and industry P/E ratio.

[Table 4.9]

Table 4.9 presents the results from the multivariate analysis. We first run a regression analysis including the factors we have used in the univariate analysis and several other important determinants. Then we include firm valuation, market valuation and industry valuation and then all three valuation sources. Target type is an important factor in the acquisitions process. Empirical studies have shown the acquiring firms' returns around the announcement vary by the target type (Servaes, 1991 and Mulherin and Boone, 2000). Private targets are considered riskier than public targets due to the information asymmetry that exists between the two parts. In general is more difficult to value a private firm than a public firm and thus the acquirer might mis-valued the target, offer a higher premium that will decrease his returns. We find the coefficient on PRIVATE negative and significant (see regression 1, Table 4.9). We also include dummy variables, CASH and STOCK, to account for the method of payment. Method of payment is related to the market reaction and the success of mergers. Travlos (1987) argue that firm's stock valuation impacts the reaction of the market and the success and returns of the merger. Usually acquirers offer stock if they believe that their stock is overvalued (Shleifer and Vishny; 2003). The market recognizes this and reacts negatively to stock acquisitions. Cash acquisitions are found to perform better than stock acquisitions in terms of short run abnormal returns (Asquith et al., 1990). Consistent

with the literature predictions, we find a negative sign for stock acquisitions and positive for cash acquisitions, although statistical insignificant. The size of the target relative to the acquirer can affect the market reaction to a deal announcement (Asquith et al., 1983). The bigger this ratio is, thus the larger the target firm the bigger the impact of the particular acquisition on the acquirer and the greater the market reaction. We therefore expect and find a positive statistical significant relationship between relative size and announcement returns. We confirm the direction of this variable. Market value and cross border variables remain insignificant through all of our regression. Finally, MULTIPLE is a dummy variable that equals 1 if the deal was announced by an acquirer who also announced at least 5 deals within 3 years. This measure shows acquirers who make more frequent announcements and they are more likely to be overconfident (Doukas and Petmezas, 2007). Univariate analysis shows that multiple deals outperform single deals and we confirm this result in the multivariate framework. If we change the definition of multiple acquirers as those that make 3 (or 5) acquisitions within a 3-year period and single as those that make only 1 acquisition within a 3-year period then our results for acquirers' profitability are consisted with previous UK studies (see for example Doukas and Petmezas; 2007).

In regression 2, we introduce the firm valuation variable and find that overvalued acquirers enjoy significantly less abnormal returns than undervalued firms. In general, undervalued acquirers have been found to outperform overvalued acquirers (Rau and Vermaelen; 1998 and Sudarsanam and Mahate; 2003). Sudarsanam and Mahate, (2003) explain that an overvalued acquirer is more likely to offer his stock than cash and as explained above, stock acquisitions have a negative market reaction whereas investors anticipate high growth of undervalued acquirers and react positively. In regression 3 and 4, we include market and industry valuation variables, and as expected we find that acquisitions announced during overvalued markets or overvalued industries increase abnormal returns. Our results are statistical significant.

Our findingss find support on both information asymmetry hypothesis and investor sentiment. We argue that since investors value firms based on the availability of relevant information (information asymmetry), during booming markets optimism can intensify investors' positive expectations (investor sentiment hypothesis) and drive up the stock market price around the announcement. Similarly, if an industry is perceived as overvalued, investors' synergy-estimation will be also more prominent and this will be reflected on acquirer's stock return

around the announcement. Finally, in the last regression we include all three valuation sources and we find that the increase in acquiring firms' abnormal returns around the announcement is driven by target status, relative size, and multiple deals. More importantly, we show that firm, market and industry valuations significantly affect the acquirers' short-run gains.

4.4 Conclusion

There is an extensive literature exploring the motives of takeovers and the returns of acquiring firms. Several theories have been motivated by findings suggesting that mergers destroy value for the acquiring firms' shareholders. We explore acquiring firms' returns by assessing firm, market and industry valuations around the announcement and after we control for several firm and deal characteristics that affect takeover process and performance. Our key finding is that factors like the target type, the method of payment or multiple deals work as signalling tools in the merger process and that firm, market and industry valuations around the announcement are associated with the acquiring firms' performance, enhance investors beliefs about the potential value of the mergers and consequently drive the stock market.

We provide direct empirical evidence from the UK takeover market that valuation status during the acquisition announcement is an important motive for firms to make acquisitions. Acquirer's gains are positively related with high market/industry valuation periods and negatively with acquiring firm's valuation.[65] Our results remain robust after controlling for the multiple deals, method of payment, target status, relative size, acquirer's size and cross border acquisitions. Our findings can be interpreted as consistent with the information asymmetry hypothesis and investor's sentiment. Accordingly, investors evaluate acquiring firms and the potential synergies of the merger based on the available information. Market and industry information are more transparent and accessible and during high market/industry valuation periods, investors allocate more weight to industry or market misvaluation than the firm's true value. In turn, investors' beliefs about merger profitability become more (or less) biased in a booming market (or in a depressed market). This over- or under- estimation of the merger potential value is the driving factor of the acquiring firms' announcement abnormal returns. Transaction and firm characteristics work as signalling tools for the investors. In the presence of information asymmetry the release of new information about the merger, such as the method of payment, entice investors to reappraise the target and bidder's value and the potential of the merger. For example, cash payments are in general perceived positively by the investors and thus an announcement of a cash acquisition in a high market valuation period can drive acquirer's stock price up. The correlation of high market/industry valuation and high takeover gains can be rationalizes with investor sentiment (Brown and Cliff, 2005), while our results for higher gains of undervalued acquirers are consistent with previous

[65] Our results are in line with previous UK studies such as Petmezas (2009) and Antoniou, Guo and Petmezas (2008)

studies like Sudarsanam and Mahate (2003) and Rau and Vermaelen (1998). Investor sentiment, the information contents of the transaction, and the sources of mis-valuation, form the framework of our analysis and explain the acquiring firms' merger performance.

Table 4.1 Descriptive Statistics

		DEAL VALUE (£MIL)		SIZE (£MIL)		RELATIVE SIZE	
YEAR	N	mean	median	mean	median	mean	median
1986	16	78.34	70.22	506.38	313.25	0.32	0.11
1987	55	95.35	21.00	839.53	345.31	0.30	0.11
1988	126	63.13	5.92	443.29	106.71	0.21	0.07
1989	152	54.91	7.13	411.73	107.69	0.18	0.07
1990	98	31.76	4.50	242.16	87.67	0.18	0.06
1991	79	51.33	5.77	448.77	94.26	0.23	0.10
1992	72	22.69	3.38	306.04	93.61	0.21	0.05
1993	103	25.69	6.00	521.75	97.21	0.29	0.07
1994	166	31.19	6.01	454.24	84.07	0.35	0.06
1995	184	35.00	5.37	469.92	103.45	0.21	0.05
1996	231	52.73	5.07	315.65	107.78	0.26	0.06
1997	260	34.31	4.51	416.00	89.36	0.21	0.07
1998	280	148.14	6.18	769.27	124.99	0.21	0.06
1999	302	181.33	8.87	795.34	147.78	0.34	0.10
2000	308	92.25	9.96	1431.21	181.80	0.22	0.07
2001	215	25.65	8.15	1029.38	98.49	0.28	0.09
2002	184	85.83	6.45	1326.36	91.10	0.43	0.08
2003	130	54.74	5.75	1485.03	88.96	0.45	0.07
2004	162	24.36	4.99	995.01	71.82	0.29	0.08
2005	259	49.36	7.70	1210.27	81.60	0.95	0.10
2006	240	53.81	7.36	1728.65	90.77	0.90	0.10
TOTAL	3622	68.94	6.69	854.49	107.77	0.36	0.07

This table presents the yearly mean and median values of deals for the sample of 3622 M&As announced by UK listed firms in the LSE, for the period of 1986 to 2006. Targets are private, public or subsidiary firms with a deal value above 1 million UK pounds, operating in either domestic or foreign markets. The deal value (£million) is the total value that the acquirer pays, excluding fees and expenses. Size is the acquirer's market capitalization at the time of the merger announcement. Relative size is the ratio of the deal value over the market value of the acquiring firm one month prior to the announcement.

Table 4.2 Yearly Acquisitions Activity

		DEALS		TARGET STATUS		MODE OF PAYMENT			MARKET		INDUSTRY	
YEAR	N	MULTIPLE	SINGLE	PRIVATE	PUBLIC	CASH	STOCK	MIX	DOM	CBA	INTRA	INTER
1986	16(0.44)	1(7)	15(93)	10(63)	6(38)	10(63)	5(31)	1(6)	11(69)	5(31)	8(50)	8(50)
1987	55(1.52)	1(2)	54(98)	29(53)	26(47)	24(44)	19(35)	12(22)	39(71)	16(29)	20(36)	35(64)
1988	126(3.48)	4(3)	122(97)	88(70)	38(30)	63(50)	16(13)	47(37)	80(63)	46(37)	51(40)	75(60)
1989	152(4.20)	1(1)	151(99)	117(77)	35(23)	60(40)	27(18)	65(43)	102(67)	50(33)	56(37)	96(63)
1990	98(2.71)	1(1)	97(99)	81(83)	17(17)	50(51)	12(12)	36(37)	59(60)	39(40)	36(37)	62(63)
1991	79(2.18)	2(3)	77(97)	58(73)	21(27)	21(27)	24(30)	34(43)	61(77)	18(23)	31(39)	48(61)
1992	72(1.99)	5(7)	67(93)	64(89)	8(11)	23(32)	18(25)	31(43)	48(67)	24(33)	25(35)	47(65)
1993	103(2.84)	10(10)	93(90)	91(88)	12(12)	34(33)	22(21)	47(46)	68(66)	35(34)	41(40)	62(60)
1994	166(4.58)	9(6)	157(94)	144(87)	22(13)	65(39)	25(15)	76(46)	120(72)	46(28)	72(43)	94(57)
1995	184(5.08)	13(7)	171(93)	159(86)	25(14)	57(31)	26(14)	101(55)	128(70)	56(30)	69(38)	115(63)
1996	231(6.38)	19(8)	212(92)	200(87)	31(13)	79(34)	30(13)	122(53)	153(66)	78(34)	101(44)	130(56)
1997	260(7.18)	19(7)	241(93)	223(86)	37(14)	95(37)	30(12)	135(52)	173(67)	87(33)	117(45)	143(55)
1998	280(7.73)	22(8)	258(92)	241(86)	39(14)	104(37)	37(13)	139(50)	185(66)	95(34)	137(49)	143(51)
1999	302(8.34)	19(6)	283(94)	228(75)	74(25)	111(37)	43(14)	148(49)	200(66)	102(34)	158(52)	144(48)
2000	308(8.50)	27(9)	281(91)	259(84)	49(16)	74(24)	53(17)	181(59)	204(66)	104(34)	168(55)	140(45)
2001	215(5.94)	12(6)	203(94)	186(87)	29(13)	50(23)	37(17)	128(60)	137(64)	78(36)	120(56)	95(44)
2002	184(5.08)	12(7)	172(93)	168(91)	16(9)	67(36)	23(13)	94(51)	137(74)	47(26)	94(51)	90(49)
2003	130(3.59)	6(5)	124(95)	111(85)	19(15)	54(42)	23(18)	53(41)	90(69)	40(31)	80(62)	50(38)
2004	162(4.47)	9(6)	153(94)	152(94)	10(6)	54(33)	12(7)	96(59)	120(74)	42(26)	85(52)	77(48)
2005	259(7.15)	7(3)	252(97)	236(91)	23(9)	88(34)	27(10)	144(56)	179(69)	80(31)	141(54)	118(46)
2006	240(6.63)	0	240(100)	219(90)	24(10)	73(30)	19(8)	148(62)	155(65)	85(35)	134(56)	106(44)
TOTAL	3622	199(6)	3423(94)	3061(85)	561(15)	1256(35)	528(15)	1838(51)	2449(68)	1173(32)	1744(48)	1878(52)

This table presents the yearly numbers of deals for the sample of 3622 M&As announced by UK listed firms in the LSE, for the period of 1986 to 2006. Next to each number, the yearly percentage is reported in the parenthesis. Multiple deals, are the deals announced by an acquirer who acquired five or more targets

within a 3-year period. Targets firms are either publicly traded or private. The method of payment is cash, stock or a combination of cash and equity. The target is either a UK firm (domestic) or foreign (CBA=cross border acquisition). Finally, each deal is classified as diversifying (inter-industry) when the acquirer takes over a target with a different two-digit SIC industry code or non-diversifying (intra-industry) is the target and the acquirer are operating in the same industry sector.

Table 4.3 Valuation Statistics by Multiple Deals, Method of Payment and Target Status

Valuation Source		FIRM		MARKET		INDUSTRY	
	N	mean	median	mean	median	mean	median
Panel A. Mean valuations of the overall sample							
ALL	3622	0.49***	-0.14***	-0.18***	-0.45***	0.21	0.20
Panel B. Mean valuations by multiple deals							
SINGLE	3423	0.48**	-0.16**	-0.18***	0.45***	0.18	0.20
MULTIPLE	199	0.67**	0.12**	-0.24	0.34	0.76	0.00
Panel C. Mean valuations by method of payment							
CASH	1256	0.29	-0.13	-0.11*	0.46*	0.12	0.06
STOCK	528	0.64***	-0.09***	-0.13	0.36	0.69	0.43
MIX	1838	0.59**	-0.16**	-0.25***	0.46***	0.14	0.23
Panel D. Mean valuations by target status							
PRIVATE	3061	0.55***	-0.15***	-0.20***	0.46***	0.15	0.20
PUBLIC	561	0.19	-0.08	-0.11	0.39	0.57	0.14
Panel E. Differences in mean valuations							
SINGLE - MULTIPLE		-0.18		0.06		-0.58	
CASH - STOCK		-0.35		0.01		-0.58	
PRIVATE - PUBLIC		0.36		-0.09		-0.43***	

This table reports the mean and median valuation values of the 3622 deals in our sample, at a firm, market and industry level. The price-to-book (P/B) method is used to estimate firm's valuation, the market P/E ratio (i.e. FTSE ALL SHARE P/E ratio) to estimate the market valuation and the industry P/E ratio to estimate the industry valuation one month prior to the merger announcement. Panel A. reports the mean valuations for the entire sample, Panel B, C and D reports the mean valuations by multiple deals, the method of payment, and the target status respectively. Multiple deals are the deals announced by an acquirer who acquired five or more targets within a 3-year period. Targets firms are either publicly traded or private. The method of payment is cash, stock or a combination of cash and equity. In panel E we report the mean difference in valuations by the deal multiple status, the method of payment and the target status. A t-test is used to examine whether the mean valuation is significantly different from zero.

Table 4.4 Acquirer's Mean AR by Firm Valuation, Multiple Deals, Method of Payment and Target Status

Valuation Source		FIRM				
		ALL	LOW	NEUTRAL	HIGH	HML
Panel A. Acquirer's mean abnormal returns by firm valuation periods						
ALL	mean	1.07%***	1.70%***	1.23%***	0.28%*	-1.42%***
	N	3622	1207	1208	1207	-
Panel B. Acquirer's mean abnormal returns by multiple deals						
SINGLE	mean	1.04%***	1.64%***	1.21***	0.25%	1.39%***
	N	3423	1168	1141	1114	-
MULTIPLE	mean	1.51%***	3.54%**	1.52%**	0.66%	2.89%***
	N	199	39	67	93	-
Panel C. Mean valuations by method of payment						
CASH	mean	0.83%***	1.58%***	0.92%***	-0.04%	-1.62%***
	N	1256	406	453	397	-
STOCK	mean	0.59%	2.80%***	-0.29%	-0.65%	-3.46%***
	N	528	174	148	206	-
MIX	mean	1.37%***	1.47%***	1.83%***	0.81%***	-0.66%*
	N	1838	627	607	604	-
Panel D. Mean valuations by target status						
PRIVATE	mean	1.46%***	2.08%***	1.54%***	0.73%***	-1.35%***
	N	3061	1026	1043	992	-
PUBLIC	mean	-1.05%***	-0.45%	-0.75%	-1.78%***	-1.34%*
	N	561	181	165	215	-
Panel E. Differences in acquirer's mean abnormal returns						
ALL MULTIPLE – ALL SINGLE		0.40%**				
LOW MULTIPLE – HIGH SINGLE		3.33%***				
HIGH MULTIPLE – LOW SINGLE		-0.98%				
ALL CASH – ALL STOCK		0.24%				
LOW CASH - LOW STOCK		-1.20%				
HIGH CASH - HIGH STOCK		-0.61%				
LOW CASH – HIGH STOCK		2.23%***				
HIGH CASH – LOW STOCK		-2.82%***				
ALL PRIVATE - ALL PUBLIC		2.50%***				
LOW PRIVATE - LOW PUBLIC		2.52%***				
HIGH PRIVATE - HIGH PUBLIC		2.51%***				
LOW PRIVATE – HIGH PUBLIC		3.86%***				
HIGH PRIVATE – LOW PUBLIC		1.17%**				

This table reports the acquirer's mean abnormal returns 5 days around the announcement [-2,+2] for the 3622 deals in our sample by the firm valuation periods (i.e. low, medium and high) and also by multiple deals, the method of payment, and the target status. The price-to-book (P/B) ratio one month before the announcement is used to estimate firm's valuation. To classify a month as high- (low-) valuation period, the P/B ratio of that month should belong to the top third of all P/B above (below) the past five-year average. All remaining months are classified as neutral-valuation periods. Panel B, C and D reports the mean abnormal returns by multiple deals, the method of payment, and the target

status respectively. Multiple deals are the deals announced by an acquirer who acquired five or more targets within a 3-year period. Targets firms are either publicly traded or private. The method of payment is cash, stock or a combination of cash and equity. In panel E we report the mean difference in abnormal returns by the deal multiple status, the method of payment and the target status. A t-test is used to examine whether the mean abnormal return is significantly different from zero.

Table 4.5 Acquirer's Mean AR by Market Valuation, Multiple Deals, Method of Payment and Target Status

Valuation Source		MARKET				
		ALL	LOW	NEUTRAL	HIGH	HML
Panel A. Acquirer's mean abnormal returns by firm valuation periods						
ALL	mean	1.07%***	0.31%	1.14%***	1.82%***	1.50%***
	N	3622	1227	1276	1119	-
Panel B. Acquirer's mean abnormal returns by multiple deals						
SINGLE	mean	1.04%***	0.31%	1.07%***	1.82%***	1.50%***
	N	3423	1158	1210	1055	-
MULTIPLE	mean	1.51%***	0.25%	2.53%***	1.83%***	1.60%*
	N	199	69	66	64	-
Panel C. Mean valuations by method of payment						
CASH	mean	0.83%***	0.09%	0.72%**	1.71%***	1.60%***
	N	1256	413	437	406	-
STOCK	mean	0.59%	-1.17%	0.85%	2.24%***	3.40%***
	N	528	188	167	173	-
MIX	mean	1.37%***	0.90%***	1.49%***	1.77%***	0.90%*
	N	1838	626	672	540	-
Panel D. Mean valuations by target status						
PRIVATE	mean	1.46%***	0.94%***	1.38%***	2.13%***	1.20%***
	N	3061	1023	1117	921	-
PUBLIC	mean	-1.05%***	-2.84%***	-0.51%	0.37%	3.20%***
	N	561	204	159	198	-
Panel E. Differences in acquirer's mean abnormal returns						
LOW MULTIPLE – HIGH SINGLE		-1.60%				
HIGH MULTIPLE – LOW SINGLE		1.50%				
ALL CASH – ALL STOCK		0.24%				
LOW CASH - LOW STOCK		1.26%**				
HIGH CASH - HIGH STOCK		-0.50%				
LOW CASH – HIGH STOCK		-2.20%***				
HIGH CASH – LOW STOCK		2.88%***				
ALL PRIVATE - ALL PUBLIC		2.50%***				
LOW PRIVATE - LOW PUBLIC		3.78%***				
HIGH PRIVATE - HIGH PUBLIC		1.76%***				
LOW PRIVATE – HIGH PUBLIC		0.56%				
HIGH PRIVATE – LOW PUBLIC		4.98%***				

This table reports the acquirer's mean abnormal returns 5 days around the announcement [-2,+2] for the 3622 deals in our sample by the market valuation periods (i.e. low, medium and high) and also by multiple deals, the method of payment, and the target status. The market P/E ratio (i.e. FTSE ALL SHARE P/E ratio) is used to estimate the market valuation one month prior to the merger announcement. Panel B, C and D reports the mean abnormal returns by multiple deals, the method of payment, and the target status respectively. Multiple deals are the deals announced by an acquirer who acquired five or more targets within a 3-year period. Targets firms are either publicly traded or private. The method of payment is cash, stock or a combination of cash and equity. In panel E we

report the mean difference in abnormal returns by the deal multiple status, the method of payment and the target status. A t-test is used to examine whether the mean abnormal return is significantly different from zero.

Table 4.6 Acquirer's Mean AR by Industry Valuation, Multiple Deals, Method of Payment and Target Status

Valuation Source		MARKET				
		ALL	LOW	NEUTRAL	HIGH	HML
Panel A. Acquirer's mean abnormal returns by firm valuation periods						
ALL	mean	1.07%***	0.55%***	0.95%***	1.75%***	1.20%***
	N	3622	1256	1186	1180	-
Panel B. Acquirer's mean abnormal returns by multiple deals						
SINGLE	mean	1.04%***	0.51%**	0.95%***	1.70***	1.20%***
	N	3423	1185	1118	1120	-
MULTIPLE	mean	1.51%***	1.17%**	0.90%	2.62%**	1.40%
	N	199	71	68	60	-
Panel C. Mean valuations by method of payment						
CASH	mean	0.83%***	0.20%	0.91%***	1.45%***	1.20%***
	N	1256	449	409	398	-
STOCK	mean	0.59%	-0.32%	0.48%	1.53%	1.90%
	N	528	170	175	183	-
MIX	mean	1.37%***	1.02%***	1.11%***	2.01%***	1.00%**
	N	1838	637	602	599	-
Panel D. Mean valuations by target status						
PRIVATE	mean	1.45%***	1.04%***	1.39%***	1.90%***	0.90%**
	N	3061	1069	992	1000	-
PUBLIC	mean	-1.05%***	-2.24%***	-1.36%***	0.54%	2.80%***
	N	561	187	194	180	-

Panel E. Differences in acquirer's mean abnormal returns	
LOW MULTIPLE – HIGH SINGLE	-0.50%
HIGH MULTIPLE – LOW SINGLE	2.10%**
ALL CASH – ALL STOCK	0.24%
LOW CASH - LOW STOCK	0.53%
HIGH CASH - HIGH STOCK	-0.08%
LOW CASH – HIGH STOCK	1.30%*
HIGH CASH – LOW STOCK	1.77%**
ALL PRIVATE - ALL PUBLIC	2.50%***
LOW PRIVATE - LOW PUBLIC	3.28%***
HIGH PRIVATE - HIGH PUBLIC	1.43%**
LOW PRIVATE – HIGH PUBLIC	0.50%
HIGH PRIVATE – LOW PUBLIC	4.21%***

This table reports the acquirer's mean abnormal returns 5 days around the announcement [-2,+2] for the 3622 deals in our sample by the market valuation periods (i.e. low, medium and high) and also by multiple deals, the method of payment, and the target status. The the industry P/E ratio is used to estimate the market valuation one month prior to the merger announcement. Panel B, C and D reports the mean abnormal returns by multiple deals, the method of payment, and the target status respectively. Multiple deals are the deals announced by an acquirer who acquired five or more targets within a 3-year period. Targets firms are either publicly traded or private. The method of payment is cash, stock or a combination of cash and equity. In panel E we report the mean difference in abnormal

returns by the deal multiple status, the method of payment and the target status. A t-test is used to examine whether the mean abnormal return is significantly different from zero.

Table 4.7 Acquirers 12 Months Long-Term Performance

VALUATION			FIRM				MARKET				INDUSTRY			
		ALL	LOW	NEUTRAL	HIGH	HML	LOW	NEUTRAL	HIGH	HML	LOW	NEUTRAL	HIGH	HML
Panel A. ALL	mean	-0.12***	-0.08***	-0.11***	-0.16***	-0.08***	-0.14***	-0.14***	-0.06***	0.08***	-0.12***	-0.11***	-0.12***	0.00
	N	3622	1207	1208	1207		1227	1276	119	-	1256	1186	1180	-
Panel B. Multiple deals														
SINGLE	mean	-0.13***	-0.09***	-0.12***	-0.18***	-0.08***	-0.15***	-15***	-0.08***	0.07***	-0.14***	-0.11***	-0.14***	0.00
	N	3423	1168	1141	1114	-	1158	1210	1055	-	1185	1118	1120	-
MULTIPLE	mean	0.09**	0.33**	0.02	0.03	-0.30***	-0.03	0.09*	0.22**	0.25**	0.20***	-0.04	0.10	-0.10
	N	199	39	67	93	-	69	66	64	-	71	68	60	-
Panel C. Method of Payment														
CASH	mean	-0.09***	-0.04*	-0.10***	-0.14***	-0.10***	-0.11***	-0.10***	-0.06**	0.05*	-0.10***	-0.13***	-0.13***	-0.04
	N	1256	406	453	397	-	413	437	406		449	409	409	
STOCK	mean	-0.019***	-0.12**	-0.20***	-0.23***	-0.12**	-0.20***	-0.27***	-0.09*	0.11*	-0.23***	-0.08*	-0.08*	0.15
	N	528	174	148	206	-	188	167	173		170	175	175	
MIX	mean	-0.11***	-0.09***	-0.10***	-0.15***	-0.05*	-0.15***	-0.13***	-0.05**	0.09***	-0.11***	-0.10***	-0.10***	-0.01
	N	1838	627	607	604	-	626	672	540		637	602	602	
Panel D. Target Status														
PRIVATE	mean	-0.11***	-0.08***	-0.11***	-0.16***	-0.08***	-0.14***	-0.14***	-0.05**	0.10***	-0.12***	-0.12***	-0.12***	0/00
	N	3061	1026	1043	992		1023	1117	921		1069	992	1000	
PUBLIC	mean	-0.14***	-0.10***	-0.14***	-0.16***	-0.06	-0.15***	-0.13***	-0.13***	0.02	-0.15***	-0.10***	-0.16***	-0.01
	N	561	181	165	215		204	159	198		187	194	180	

Excess returns are estimated using calendar time regressions for each portfolio for 1 year post-event holding periods. This table presents all acquisitions for 12-months after the deal announcement according to the source of valuation (i.e firm, market and industry). We then present long-run returns based on multiple deals (Panel B), the method of payment (i.e. cash, stock, mix) in Panel C, and target status (i.e. private and public) in Panel D. Each portfolio is rebalanced each month to include firms that just announced a deal. The monthly abnormal returns are measured by intercepts as shown below:

$$\left(R_{p,t} - R_{f,t}\right) = a_p + \beta_p \left(R_{m,t} - R_{f,t}\right) + s_p SMB_t + h_p HML_t + \varepsilon_t$$

where $R_{p,t}$ is the calendar time portfolio return, $R_{f,t}$ is the return on one month T-bill during month t; SMB stands for small minus big and is the excess return of a portfolio of small firms over a portfolio of large firms and finally HML stands for high minus low and is the excess return of a portfolio of value firms over glamour firms. SMB and HML are estimated following Fama and French (1996) methodology.

a_p measures the monthly average risk adjusted excess returns after controlling for the three risk factors. The dependent variable $\left(R_{p,t} - R_{f,t}\right)$ is the monthly excess return of the calendar-time portfolio of bidders over the risk free rate; $\left(R_{m,t} - R_{f,t}\right)$ is the excess return of the market portfoli; A t-test is used to examine whether the monthly abnormal returns are significantly different from zero.

Table 4.8 Acquirers 36 Months Long-Term Performance

VALUATION		FIRM					MARKET				INDUSTRY			
		ALL	LOW	NEUTRAL	HIGH	HML	LOW	NEUTRAL	HIGH	HML	LOW	NEUTRAL	HIGH	HML
Panel A. ALL	mean	-0.41***	-0.31***	-0.43***	-0.47***	-0.16***	-0.45***	-0.47***	-0.29***	0.16***	-0.49***	-0.39***	-0.33***	0.17***
	N	3622	1207	1208	1207	-	1227	1276	1119	-	1256	1186	1180	-
Panel B. Multiple deals														
SINGLE	mean	-0.42***	-0.34***	-0.43***	-0.50***	0.18***	-0.46***	-0.48***	-0.30***	0.16***	-0.52***	-0.39***	-0.34***	0.18***
	N	3423	1168	1141	1114	-	1158	1210	1055	-	1185	1118	1120	-
MULTIPLE	mean	-0.17**	0.07	-0.40***	-0.10	-0.17	-0.20*	-0.24**	-0.06	0.14	-0.12	-0.31***	-0.07	0.05
	N	199	39	67	93	-	69	66	64	-	71	68	60	-
Panel C. Method of Payment														
CASH	mean	-0.31***	-022***	-0.32***	-0.41***	-0.19***	-0.39***	-0.37***	-0.18***	0.21***	-041***	-0.35***	-0.17***	0.25***
	N	1256	406	452	397	-	413	437	406		449	409	398	
STOCK	mean	-0.53***	-0.41***	-0.55***	-0.62***	0.20**	-0.54***	-0.67***	-0.39***	0.14*	-0.59***	-0.49***	-0.53***	0.06
	N	528	174	148	206	-	188	167	173		170	175	183	
MIX	mean	-0.43***	-0.35***	-0.48***	-0.47***	-0.11***	-0.46***	-0.48***	-0.33***	0.13***	-0.53***	-0.39***	-0.37***	0.16***
	N	1838	627	607	604	-	626	672	540		637	602	599	
Panel D. Target Status														
PRIVATE	mean	-0.41***	-0.33***	-0.43***	-0.48***	-0.15***	-0.45***	-0.48***	-0.30***	0.15***	-0.51***	-0.39***	-0.33***	0.18***
	N	3062	1026	1043	992		1023	1117	921		1069	992	1000	
PUBLIC	mean	-0.37***	-0.23***	-0.43***	-0.44***	-0.21***	-0.46***	-0.42***	-0.24***	0.22***	-0.42***	-0.37***	-0.31***	0.11*
	N	561	181	165	215		204	159	198		187	194	180	

Excess returns are estimated using calendar time regressions for each portfolio for 3 years post-event holding periods. This table presents all acquisitions for 36-months after the deal announcement according to the source of valuation (i.e firm, market and industry). We then present long-run returns based on multiple deals (Panel B), the method of payment (i.e. cash, stock, mix) in Panel C, and target status (i.e. private and public) in Panel D. Each portfolio is rebalanced each month to include firms that just announced a deal. The monthly abnormal returns are measured by intercepts as shown below:

$$\left(R_{p,t} - R_{f,t}\right) = a_p + \beta_p \left(R_{m,t} - R_{f,t}\right) + s_p SMB_t + h_p HML_t + \varepsilon_t$$

where $R_{p,t}$ is the calendar time portfolio return, $R_{f,t}$ is the return on one month T-bill during month t; SMB stands for small minus big and is the excess return of a portfolio of small firms over a portfolio of large firms and finally HML stands for high minus low and is the excess return of a portfolio of value firms over glamour firms. SMB and HML are estimated following Fama and French (1996) methodology.

a_p measures the monthly average risk adjusted excess returns after controlling for the three risk factors. The dependent variable $\left(R_{p,t} - R_{f,t}\right)$ is the monthly excess return of the calendar-time portfolio of bidders over the risk free rate; $\left(R_{m,t} - R_{f,t}\right)$ is the excess return of the market portfoli; A t-test is used to examine whether the monthly abnormal returns are significantly different from zero.

Table 4.9 Cross-Sectional Analysis - Determinants of Acquirers Announcement AR

	Dependent variable = five-day CAR					
Explanatory Variables	Model	1	2	3	4	5
Intercept		0.033***	0.033***	0.033***	0.032***	0.032***
PRIVATE		-0.028***	-0.028***	-0.028***	-0.028***	-0.028***
CASH		0.003	0.002	0.002	0.003	0.002
STOCK		-0.004	-0.003	-0.004	-0.004	-0.003
LRATIO		0.005***	0.004***	0.005***	0.004***	0.004***
LMV		-0.001	-0.001	-0.001	-0.002	-0.001
CBA		-0.003	-0.003	-0.003	-0.003	-0.002
HOSTILE		-0.002	-0.002	-0.002	-0.003	-0.002
MULTIPLE		0.009	0.010*	0.009	0.009	0.010*
LOW_FIRM_VALUATION			0.002			0.001
HIGH_FIRM_VALUATION			-0.007*			-0.006**
LOW_MARKET_VALUATION				-0.006**		-0.004
HIGH_MARKET_VALUATION				0.009***		0.008**
LOW_IND_VALUATION					-0.004	0.000
HIGH_IND_VALUATION					0.008**	0.005
Obs = 3622						
Adjusted-R^2		2.43%	2.61%	2.99%	2.78%	2.85%

Estimates of cross-sectional determinants of announcement period gains of acquirers are reported in this table. Announcement period 5-day excess returns of bidders are regressed against a set of explanatory variables. PRIVATE is an indicator variable that takes the value 1 if and only if the target is a private firm. CASH is a dummy variable that takes the value of 1 if the acquisition is financed with cash only, and STOCK is a dummy variable that takes the value of 1 if the acquisitions is financed with stock only. LRATIO is the log value of the ratio of the deal's value to the market value of the acquirer. LMV is the log value of the acquirer's market value. CBA is a dummy variable that equals 1 if the target is a foreign firm. HOSTILE is a dummy variable that equals 1 if the deal is hostile and zero otherwise. MULTIPLE is a dummy variable that equals 1 if the deal was announced by an acquirer who also announced at least 5 deals within 3 years. LOW_FIRM_VALUATION and HIGH_FIRM_VALUATION is a dummy variable that equals 1 if the deals was announced during a low firm valuation period, or a high firm valuation period, respectively as captured by the P/B ratio. LOW_MARKET_VALUATIO, HIGH_MARKET_VALUATION, LOW_IND_VALUATION, and HIGH_IND_VALUATION variables are defined analogously using the market P/E ratio and the industry P/E ratio. The intercept measures the excess return to bidders after accounting of the effects of all explanatory variables. The following equation is estimated using OLS regression:

$$CAR_{i,t} = \alpha + \sum_{i=1}^{N} X_i + \varepsilon_i$$

Adjusted -R^2 is reported for each model. Significant level of 1%, 5% and 10% are indicated with *, **, and *** respectively.

Chapter 5: Conclusion

5.1 Concluding remarks

This thesis examines three very important aspects of Mergers and Acquisitions to shed more light on acquiring firms' returns; the motives, the bankruptcy risk and the valuation errors. The motive behind a corporate project defines the process and the outcome of the project. Thus acquisitions which do not improve the financial performance of the firm might take place for other reasons than to improve shareholders' wealth. We use the relationships between bidder, target and total gains to distinguish among three of the most prominent merger motives and also investigate whether market conditions (such as waves and misvaluation) will alter these motives. In addition, diversification has been known as a risk management tool due to the operational hedging that can be accomplished via a diversified merger. Recent empirical evidence show that mergers increase risk. This study explores acquiring firm's risk variation in different diversification strategies. Finally, valuation errors stemming from the firm, the market or the industry have been found to affect the acquirers' returns. We investigate the effect of these three sources of misvaluation on acquiring firms' abnormal returns after we control for various factors which affect takeover process and outcome, such as multiple deals, the method of payment, the target status, the relative size and cross border acquisitions.

The first empirical part of this thesis, Chapter 2, considers the relation between wealth gains of the target, the acquirer and the total gains to distinguish between synergistic mergers, mergers which are driven by managerialism and those driven by hubris in the US market. Our sample period spans from 1980 to 2010. We also recognize the importance role of merger waves and market valuations during the announcement of a merger and explore whether merger motives differ during these periods. We extent Berkovitch and Narayanan (1993) to control for other variables that might affect takeover process. We identify common dominant variables that affect the correlation analysis across our three main sub-samples, entire sample, tender and non-tender acquisitions and also show that univariate findings become stronger or improve their significant power in the multivariate analysis. More specific, we find that both tender and non-tender offers are driven by synergy, value-increasing acquisitions are driven by both synergy and hubris, whereas value-decreasing by managerialism. Therefore the nature of the deal (hostile or non-hostile) does not affect the primary motives of the acquisition. The motive patterns remain robust across high and low valuation periods and

most wave periods and after filtering the impact of several characteristics affecting takeover process. Finally, for robustness purposes we capture managerial motives using other proxies (i.e. total gains for synergy, Ney buyer measure for hubris and G-index for managerialism) and our results remain.

In the next empirical chapter, Chapter 3, we investigate which diversification types affect acquiring firms' default risk after the merger announcement. We compare default risk prior to the announcement and six months after the merger completion in vertical, horizontal, mixed vertical/horizontal and conglomerate acquisitions. The question to diversify will always be a calculated risk; however the profitability of the merger and realizing the diversification benefits in terms of risk are greatly depended upon the manager of the acquiring firm and how capable is to complete the deal. Persuading an unrelated merger might be riskier than a related one, due to the uncertainty of entering a new market/industry and the information asymmetry in terms of integrating with a firm in an unfamiliar market/industry. The acquirer is more likely to overlook critical factors and overpay the target firm and experience monitoring problems once the merger is completed.

Information asymmetry concept dates back to Akerlof, (1970); the model assumes that due to information asymmetry the buyer cannot tell the bad-quality products. We therefore argue that the acquirer has more difficulties to communicate and to verify the benefits of an unrelated acquisition and it creates a risk of adverse selection. On the other hand when the acquirer makes a related acquisition, he is familiar with the nature of the business, the industry and the production process of the target and therefore the choice of a firm that will be both profitable and decrease default risk, is easier. Since horizontal diversification is the merger of two firms that belong in the same industry and in the same stage of production, then information asymmetry between the acquirer and the target minimizes which in turn should reduce default risk for the acquiring firm to the minimum.

The last empirical part, Chapter 4, concentrates on the UK market and provides new supporting evidence on the misvaluation theory of mergers. We study how firm, market, or industry valuation errors affect the acquiring firms' returns after controlling for multiple deals, the method of payment, the target's firm status, the relative size, the acquirer's size and for cross-border acquisitions. We find that, during high market/industry valuation periods mergers increase returns for the acquiring firms and although returns are reversed in the long-run, these mergers are less value destroying compared with mergers during low

market/industry valuation periods. We also show that undervalued firms, high relative size deals, multiple and cash acquisitions are more profitable in both short and long run period.

Consistent with previous studies, our results suggest that information asymmetry and investors' sentiment may play an important role in explaining the acquiring firms' returns patterns. Antoniou, Guo and Petmezas (2008) show that the performance of UK acquirers during high market valuation periods is driven by investors' sentiment. We argue that since investors value firms based on the availability of relevant information (information asymmetry), during booming markets optimism can intensify investors' positive expectations (investor sentiment hypothesis). A merger announcement releases information to the market and helps investors to adjust their views on the firms' value. Deal and firm characteristics of the merger also work as a signaling tool in the market (Myers and Majluf, 1984). For example an acquirer offering his stock as the method of payment, is usually perceived as a signal that the acquirer is overvalued or a cash acquisitions is viewed positively by investors (Schlingemann, 2004; Martynova and Renneboog, 2007). At the same time, investors' expectations can be elevated during periods of extreme market/industry valuations and drive up or down the stock market price around the announcement.

5.2 Implications of the study

The empirical results on the motives, default risk and valuation error in Corporate Takeovers and the suggested mechanisms under which these factors work, significantly improve the knowledge on Mergers and Acquisitions not only for researchers but also for corporations and investors. This thesis underlies the significance role of market conditions on the takeover motives. Specifically, in Chapter 2 we show that merger motives are driven by the state of the market (i.e. booming or depressing) and the merger waves, whilst the nature of the deal (i.e. tender, non-tender) does not affect the primary motives. In addition, new empirical evidence on mergers and default risk from Chapter 3 offer valuable insight on the risk reduction benefit of diversified mergers. Finally, in the last empirical study, Chapter 4, we provide direct empirical evidence from the UK takeover market that valuation status during the acquisition announcement is an important motive for firms to make acquisitions. Acquirer's gains are positively related with high market/industry valuation periods and negatively with acquiring firm's valuation. Our results remain robust after controlling for the multiple deals, method of payment, target status, relative size, acquirer's size and cross border acquisitions.

5.3 Limitations of the study and Recommendations for future research

In a financial market every single factor is significant and all elements are inter-connected and work together to form the market. However, in every empirical study there is always a dependent variable and a set of explanatory set of variables. For example, takeover motives is the dependent variable in the first chapter, default risk in the second chapter and acquiring firms' returns around the announcement in the last chapter. In each chapter several independent variables have been considered based on how significant is their impact on depend variable. It is possible in every study that you have omitted factors that are relevant to the explanation of the variation of the depend variable. Therefore, there is always room for improvement in future research that will allow the use of other control variables and the interaction between these variables.

A natural extension of this thesis will be to study default risk changes in takeovers in specific industries or other markets and make a comparison to US market. In addition, it would be interesting to see how the target firm's default risk or the origin of the target (domestic or foreign), firm and deal characteristics (such as the method of payment) and also the unique features of each region would affect the outcome of the takeovers.

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