Sources of Value in Mergers and Acquisitions

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Abstract

This PhD thesis investigates sources of value in mergers and acquisitions, using a discounted cash-flow valuation method to develop a model that explains sources of economic gains. The model identifies three major sources of value in mergers, each of which can reduce or contribute to the combined wealth effect of a takeover deal. The overall value of the acquisition deal is a sum of the impacts of these factors on the combined value.

The research significantly contributes to new knowledge regarding the sources of economic benefit in a merger. There are implications for researchers, practitioners and teachers. This research significantly contributes new knowledge on sources of value in mergers. Future research about mechanisms through which mergers create or destroy value flows from analysis and findings of this thesis. Moreover, using the model developed in this study, shareholders, investors, and analysts can make a more accurate estimation of value effects of mergers. This also helps investors and shareholders of the merging firms to make better investment decisions.

Policy makers will also find the results of this study helpful. Although findings of the study suggest an actual value creation in mergers, it seems that a significant amount of value transfers from acquirer bondholders to target bondholders. This observation has implications for policy makers to regulate the market for corporate control in a way that minimises expropriation of wealth. The formulas and empirical findings of this thesis will also enrich the teaching agenda of corporate finance.

The model developed in this thesis suggests that the combined value effect of mergers can be broken down into three parts: (1) earnings synergies discounted at the rate of the WACC of the combined firm; (2) value effect of the difference between the WACCs of the combined firm and the acquirer; and (3) the difference between the WACCs of the combined firm and the target.

In any given merger, each of these components may add to or deduct from the total value of the merger. Moreover, the combined value of an acquisition estimated using this model might be negative, suggesting that the acquisition destroys value, or positive, suggesting that the acquisition creates value. The explanation of how mergers can be value creating, or value destroying, observes that the difference between the combined firm's weighted average cost of capital and that of the acquirer and the target, along with the operating synergies, can account for total value effects of mergers.

In the second stage, a sample of 68 US acquisitions during the period 1998 to 2011 is employed to empirically decompose the total value effect of acquisitions (TVA) as suggested by the model. This study uses the mean I/B/E/S forecasts for stand-alone acquirer and target firms prior to the acquisition and forecasts for the combined firm in the month subsequent to the acquisition' month in order to

estimate changes in forecasted earnings that occur following an acquisition. These forecasts are also used to estimate implied cost of equity of the firms prior and subsequent to acquisitions. Since I/B/E/S forecasts are typically one month apart, any change in the forecasts can be attributed to the impact of the acquisition.

The empirical analysis provides important findings regarding the relative importance of the three components of the model suggested by this study. Specifically, the evidence provided in this study show that earnings synergies and the difference between the WACCs of the combined firm and the acquirer have a more significant role in value creation through mergers compared to the value effect of the difference between the WACCs of the combined firm and the target. Empirical evidence provided in this research shows that the combined value effect of acquisitions is positive, around 4%, on average. Aside from that, the results suggest that the two first components of the model account for more than 90% of value effect of acquisitions.

While much emphasis is put on synergy gains from acquisitions by managers, analysts and researchers, the evidence provided in this study shows that the WACC of the combined firm and the merging firms may have a significant role on the value effect of mergers. These findings suggest that changes in the capital structure of the combined firm, compared to capital structures of the acquirer and the target, play a key role in determining the value of an acquisition. For example, all the value created because of synergies between the operations of the acquirer and the target can be counterbalanced by raising too much debt for financing the acquisition, which in turn increases the risk of default and cost of capital of the combined firm. Moreover, reducing the cost of capital of the combined firm

compared to the merging firms, is value creating even in the absence of operating synergies.

The empirical evidence provided in this study shows that the component of value associated with the difference between the WACCs of the combined firm and the acquirer is mainly determined by leverage of the acquiring firm and the method of payment. While cash payment is value creating, high leverage of the acquirer prior to an acquisition can destroy value by raising the cost of capital of the firm too much. This is especially important to managers when they are planning an acquisition.

Although an acquisition might potentially create significant synergies in earnings, it may also increase the WACC of the combined firm. As a result, total value created or destroyed in that merger will depend on the extent to which value creating components and value-destroying components of an acquisition counteract and neutralise each other. In other words, the value created because of synergies in earnings might be countervailed, for example, by raising too much debt for financing the acquisition which in turn increases cost of capital to a value-destroying level.

Finally, univariate and regression analyses are used to further investigate the relationship between components of the TVA and a number of acquirer and deal characteristics that are suggested to affect value of acquisitions. The results suggest that diversifying mergers create negative synergies in earnings and destroy value this way. However, diversification does not reduce the WACC of the combined firm compared to the WACC of the acquirer. Moreover, cash payments and lower levels of debt in the capital structure of the acquirer reduce the WACC of the combined firm and create value.

By developing a model that creates a novel framework for decomposing value effects of merges, by documenting the relative importance of the components of the model, and by documenting how acquirer and deal characteristics affect value of acquisitions, this dissertation opens up opportunities for future investigations.

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I dedicate this thesis to

my parents, Fahimeh and Asad

my wife, Maryam

my sister, Mona, and my brother, Ehsan

for their constant support and unconditional love.

I love you all dearly.

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Chapter 1 Introduction

1.1 Introduction

This chapter provides a framework for the dissertation. It concisely describes the significance of the study, research questions, research methods and structure of the dissertation. The chapter also reports a summary of findings and conclusions.

The sources of value in mergers have been widely discussed and the literature presents a significant volume of repetition. While Andrade, Mitchell, and Stafford (2001a) noted more than a decade ago, "We hope that over the next decade merger research will move beyond the basic issue of measuring and assigning gains and losses to tackle the more fundamental question of how mergers actually create or destroy value", there is not a lot of new thinking reflected in research during the last ten years.

This study addresses the sources of value in mergers and acquisitions in a different way by developing a discounted cash-flow model in order to explore the possible sources of merger wealth effects. Then it explores the relative empirical importance of the three components of the model. It further investigates the relationship between components of value effects of mergers with factors that are suggested by prior research to affect these components.

The findings of the study significantly contribute to knowledge regarding sources of value in mergers. Moreover, the study provides interesting evidence on how deal and acquirer characteristics affect value of acquisitions. Besides, the results of the study will help managers of acquiring firms to better analyse consequences of acquisitions and make more accurate estimations of value effects of mergers.

Financial analysts and investors will also find the findings of this study fruitful. They can incorporate the results to estimating value of the combined firms that come out from acquisitions.

The discounted cash-flow model of valuation suggests that present value of an on-going concern is a function of its expected future cash-flows and an appropriate discount rate at which these cash-flows are discounted. However, prior research on value effects of mergers[1] and acquisitions mainly addresses the changes in incremental cash-flows subsequent to acquisitions. On the other hand, relatively little evidence is available on the impact of changes in the appropriate discount rate on the value effects of mergers. Modigliani and Miller (1958, 1963) suggest that the weighted average cost of capital (WACC) of a firm is an appropriate discount rate for valuation of future cash-flows of that firm. The WACC rate at which the cash-flows should be discounted is subject to change subsequent to mergers due to fundamental differences in the risk factors of the combined firm compared to the risk factors of the acquirer and the target firm prior to the merger. This study investigates the relative contribution of operating synergies and the WACC impact to the total value effect of acquisitions.

This study develops a discounted cash-flow model that demonstrates combined acquisition value is a sum of three main components that may affect the combined value in different directions. In addition, the potential contribution of these components on the combined value effect of mergers is examined[2]. The first component is the present value of the expected future cash-flows generated or

[1] Terms mergers, acquisitions, and takeovers are used interchangeably in this dissertation.

[2] Testing the model is parallel to testing market efficiency. The Efficient Market Hypothesis is not testable due to the joint test problem (Fama, 1970, 1991, 1998). Similarly, any difference between the market reaction to announcement of a merger and the value effect estimated by using a model like the one suggested in this study can be either attributed to market inefficiency or to the "bad model" problem. However, if we calculate the NPV of an acquisition as sum of the three components of the model, it is possible to decompose the contributions of each part of the model to the combined value effect of mergers.

destroyed because of the acquisition. This part of the acquisition value comprises all types of operating synergies that might be utilised, subsequent to, and because of the acquisition deal. These operating synergies include increases in revenues, decreases in operating costs, decreases in sales and distribution expenses, and reductions in capital expenditures. The present value of such cash-flows also depends on the post-merger WACC of the combined firm. If the marginal cost of capital exceeds the marginal changes in operating cash-flows, the contribution of this component of the model to the total combined value will be negative.

Other components of the model focus on the rate at which the future cash-flows of the acquirer and the target are discounted. These components detect the value effects of the acquisition which take place because of changes in the discount rates. Specifically, the difference between pre- and post-merger present value of expected future cash-flows of the acquirer depends on the difference between the WACC of the combined firm and that of the acquirer. In this sense, we expect the combined value effect of a given acquisition to be negatively related to the change in the discount rate. If the WACC of the combined firm is greater than the WACC of the acquirer, then the present value of acquirer's future cash-flows decreases. This devaluation negatively influences the combined value of the acquisition. Conversely, if the WACC rate of the combined firm is less than the WACC of the acquirer, the present value of expected future cash-flows of the acquirer increases, and positively contributes to the combined value of the acquisition.

Likewise, the difference between pre- and post-merger present value of the expected future cash-flows of the target is related to the difference between the WACCs of the combined firm and the target, i.e. the greater the difference in the WACCs, the greater the value effect. When the WACC of the combined firm is

greater than the WACC of the target, the contribution of this part of the model to the combined value of the acquisition is negative, and vice versa.

This study is related to several other studies seeking sources of gains from mergers. Among recent studies, Devos, Kadapakkam, and Krishnamurthy (2009) investigate three potential sources of synergy gains in merger, namely, productive efficiencies, tax savings and increased market power. Their findings suggest that the main source of gains from mergers is better utilization of available resources in the economy rather than tax savings and exercising market power. Wang (2009) provides evidence that suggests transfer of control from poorly managed targets to well-governed acquirers is a source of synergistic gains in takeovers. His findings are consistent with those of Lang, Stulz, and Walkling (1989) and Servaes (1991) who find well-managed acquirers with higher Tobin's Q compared to their targets generate higher total gains. Almeida, Campello, and Hackbarth (2011) show that even in the absence of operational synergies, liquid firms acquire financially distressed firms in their industries in order to reallocate liquidity to firms that are otherwise inefficiently terminated.

1.2 Significance of the study

The value effect of mergers has been extensively studied in prior research. However, there is relatively little known about how mergers create or destroy value. Prior studies generally focus on the operating synergies gained from acquisitions. These synergies can be generated through productive efficiencies in the form of improvements in operating profits or reductions in capital investments (Devos et al., 2009). One exception is the studies that investigate the changes in interest tax shields that occur because of the acquisitions (e.g. Hayn, 1989; Leland, 2007). Therefore, relatively little is known about the role of WACC

changes in merger gains. In contrast to prior research, this study examines the impact of the difference between the WACC of the acquirer and the target prior to an acquisition, and the WACC of the combined firm subsequent to that acquisition, in order to estimate the influence of this difference on the value effects of mergers. This study then further breaks down combined acquisition wealth effects, as suggested by the model that is developed in chapter 3, to estimate the relative role of the components of the model.

Although the model developed in this study includes possible sources of synergies proposed by prior studies, it is different in four specific ways. First, it sees merger gains as an accumulation of different sources of gains that may vary in extent across merger deals, rather than looking for a single dominant source that can explain the wealth creating character of mergers. In a given merger, value creation and destruction take place concurrently and total value of a merger depends on the extent to which value destroying and value creating sources countervail. Second, it does not assume that the sum of the elements that affect acquisition value is positive for every takeover in the population. Third, rather than focusing on abnormal operating performance measures as evidence of synergistic gains, it explains that the net present value of acquisitions is affected by changes in both future cash-flows and cost of capital. Improvements in operating performance of a firm do not necessarily result in a greater present value, as the cost of capital may increase simultaneously, for example due to higher risk of investment in the combined firm. Finally, the model developed in this study suggests a novel source of gain, which is related to the difference between cost of capital of the target company and the combined entity.

Aside from contributions of the theoretical model, empirical findings of the current research contribute to knowledge in three ways. First, the empirical findings of this study show that changes in the WACC of the combined firm compared to those of the acquirer and the target have a significant role in value creation through mergers. Second, the study documents the relative importance of the components of value that are suggested by the theoretical model. Third, the results show that factors that are suggested to affect value of acquisitions have different and even opposite impacts on different components of value of mergers. For example, diversifying mergers are associated with negative earnings synergies. However this does not explain the value created or destroyed because of the difference between cost of capital of the combined firm and the acquirer, as suggested by the regression analysis of this study.

1.3 Research questions

An influential body of research investigates the value effects of mergers. Yet, there is relatively little known about the mechanisms through which mergers influence shareholder wealth. A summary of studies on the combined wealth effects of takeovers is shown in Table 1. These findings show that although acquirers fail to enhance shareholder value through mergers, the average combined value gain to targets and acquirers is significantly positive. As Shleifer and Summers (1988) point out, if the value gains through mergers are merely transfers of wealth from other stakeholders to shareholders, they do not represent efficiency improvements. However, reviewing redistribution theories and related empirical studies, Jarrell, Brickley, and Netter (1988) conclude that little evidence has been found to support substantial wealth transfers from any group. Andrade et

al. (2001a) support this argument. The first question that this study addresses is: if acquisitions generate value for shareholders and this value is not transferred from other stakeholders, then what are its possible sources? [3]

By answering the first question, this research decomposes value effects of mergers and provides three possible sources of value that can be measured separately. This provides a novel framework for empirical decomposition of sources of value in mergers. Another key question of this study is about the relative importance of the value effect of changes in the WACCs of the merging firms and the combined firm compared to the value effect of earnings synergies. Most prior investigations in this area focus on potential synergies and changes in expected cash-flows as factors that can explain the overall value-enhancing effect of mergers (Berkovitch & Narayanan, 1993; Bradley, Desai, & Kim, 1983, 1988; Caron & Jeffrey, 1999; Chatterjee, 1992; Devos et al., 2009; Firth, 1978; Hackbarth & Miao, 2012; Harrison, Hitt, Hoskisson, & Ireland, 1991; Stan Xiao & Royston, 2004). However, as the discounted cash-flow model of valuation suggests, there is another important factor that can affect the value of mergers. That is the rate at which future cash-flows are discounted. The extent of the value effect of changes in the discount rate compared to the value effect of earnings synergies is undetermined yet. Thus, the second question that this research addresses is: what is the relative importance of possible sources of value in mergers as suggested by the theoretical model of this study?

[3] This study does not intend to analyse how the value created through mergers is divided between the acquirer and the target. Rather, it explains how mergers can create or destroy value as suggested by findings of prior empirical studies.

Table 1.3-1 Key extant studies addressing overall wealth effect of mergers

				CAARs (%)		
Author(s)	**Period**	**Sample Size**	**Event window**	**Acquirer**	**Target**	**Combined**
Wang and Xie (2009)	1990- 2004	396	(-5, +5)	−2.91***	21.52***	0.97**
Bhagat, Dong, Hirshleifer, and Noah (2005)	1962-2001	1018	(-5, +5)	0.18	30.01***	5.27***
Andrade et al. (2001a)	1973-79	598	(-1, +1)	−0.3	16.0***	1.5
	1980-89	1,226		−0.4	16.0***	2.6***
	1990-98	1,864		−1.0	15.9***	1.4***
Mulherin and Boone (2000)	1990-99	281	(-1, +1)	−0.37	21.2***	3.56**
Smith and Kim (1994)	1980-86	177	(-5, +5)	0.50	30.19**	8.88**
Healy, Palepu, and Ruback (1992)	1979-84	50	(-5, close)	−2.2	45.6***	9.1***
Franks, Harris, and Titman (1991)	1975-84	399	(-5, +5)	−1.02*	28.04***	3.90***
Lang et al. (1989)	1968-86	87	(-5, +5)	0.01	40.30***	11.31***
Bradley et al. (1988)	1963-68	74	(-10, +20)	4.09	18.92***	7.78***
	1968-80	127		1.30	35.29***	7.08***
	1981-84	203		−2.93***	35.34***	8.00***

*** significance at 1% level.

** significance at 5% level.

* significance at 10% level.

Empirical decomposition of value of acquisitions opens up a new opportunity for investigating how a number of acquirer and deal characteristics are related to different sources of value in mergers. Do these characteristics have similar effects on different components of value or they influence value in different or even opposite ways? For example, theoretical discussions suggest that related mergers by firms from the same industry are more likely to generate operating synergies. On the other hand, diversifying mergers are suggested to reduce cost of capital by creating a coinsurance effect and reducing the cost of capital. Therefore, diversification has different potential effects on the components of value. Similarly, other factors may have different effects on different components of value effect of mergers. A deeper understanding of these relationships can potentially contribute to a better understanding of sources of value in mergers. Hence, the third and last question that this research addresses is: What are the relationships between different acquirer and deal characteristics and the components of value effect of acquisitions?

1.4 Method

Prior empirical investigations provide evidence suggesting that, overall, mergers create value (Andrade et al., 2001a; Healy et al., 1992; Lang et al., 1989; Wang & Xie, 2009). In other words, the combined wealth effect of mergers on the acquirer and target shareholders is positive, on average. A model of net present value of mergers is developed in chapter 3, in order to answer the first question of the research. The model yields predictions about the ways through which mergers can create value. Specifically, it demonstrates how discounting future cash-flows of a

target at the rate of weighted average cost of capital (WACC) of the merged firm can be value enhancing.

In order to address the second and the third question of the research, this study compares analyst forecasts from before the acquisition to forecasts after the acquisition to detect the value changes that take place because of the deal. This approach avoids the limitations of conventional methods which rely on industry benchmarks to estimate the abnormal returns from acquisitions. The neoclassical theory of mergers suggests that acquisitions are clustered in industries through time and this clustering happens because of economic, technological and regulatory shocks especially at the industry level. Therefore, using conventional benchmarks to detect long-term measures of abnormal operating performance can result in biased inferences as these benchmarks do not control for the impact of severe environmental shocks. Since analyst forecasts provided by I/B/E/S are typically one month apart, expected changes in the industry are already incorporated in the pre-acquisition forecasts. Therefore, the differences in forecasts can be considered as a relatively precise measure of acquisition impact on the combined value of the firms.

The method of this study is similar to Devos et al. (2009) who use analyst forecasts for estimation of acquisition effect of forecasted cash-flows. However, it is fundamentally different in three ways. First, this study estimates the effect of WACC differences as mentioned above and compares the relative importance of these effects to the operating synergies. This study uses an implied cost of capital method as proposed by Gebhardt, Lee, and Swaminathan (2001) and the CAPM to estimate cost of equity capital. Second, this study investigates a sample of mergers from a more recent time period; mergers from 1998 to 2011. Finally, while Devos

et al. (2009) and others only consider different types of cash-flow synergies, this study highlights the role of the WACC as another source of value effect in mergers. This study uses I/B/E/S analyst forecasts and DataStream corporate bond yields for a sample of 68 acquisitions by US firms over the period 1998-2011 to decompose the effect of the three components of our model on the combined value of acquisitions.

1.5 Research contributions

This study develops a theoretical model that decomposes value effects of mergers in a novel way and provides empirical evidence on the relative importance of the components of the model. First, the current study compares the analyst forecasts prior and subsequent to our sample mergers to estimate the magnitude of effect of the merger announcement on the earnings forecasts and the WACC at which the forecasted earnings are discounted. This study shows that the difference between cost of capital of acquirers and combined firms is significant. It also shows that the cost of capital of the combined firm is significantly different from cost of capital of the target. Second, the impact of each component of the model proposed in this study is estimated and subsequently total value effect of each acquisition (TVA) is calculated. Finally, this study discusses the impact of factors such as method of payment and industry relatedness on the value components and the TVA.

Specifically, this study finds that acquisitions create around 4% value, on average. More than 90% of value created through mergers comes from earnings synergies and the difference between cost of capital of the combined firm and the acquirer. The role of the difference between the WACCs of the combined firm and the

acquirer is more pronounced when the CAPM is used for estimating the cost of equity. Moreover, diversifying mergers are found to underperform related mergers mainly because these mergers create less synergy. Besides, cash payments are associated with less synergy gains but positive value effect from the difference between the WACCs of the combined firm and the acquirer. In addition, acquisitions returns decrease in percentage of debt in the capital structure of the acquirer. This relationship is especially significant between leverage of the acquirer and the value effect of the difference between the WACCs of the combined firm and the acquirer.

This study is also relevant to an influential body of research which investigates the causes of merger waves. The neoclassical theory of mergers suggests that acquisitions happen in waves because of the need for restructuring at the industry level which is mainly driven by regulatory, technological and economic shocks (Gort, 1969; Harford, 2005; Jensen, 1993; Mitchell & Mulherin, 1996). In contrast, the behavioural theory of mergers argues that acquisition waves are driven by market mis-valuation (Bouwman, Fuller, & Nain, 2009; Dong, Hirshleifer, Richardson, & Teoh, 2006; Shleifer & Vishny, 2003). According to this theory in a period of high merger activity, relatively overvalued firms use their stocks to acquire undervalued or less overvalued firms to take advantage of the hot acquisition market and create value for the acquirer shareholders at the expense of losses to the target shareholders or long-term shareholders of the combined firm. Therefore, under the behavioural argument potential synergies are not the drivers of acquisition but acquisitions are “market-driven”. Our findings do not support the theory of market-driven mergers.

1.6 Structure of the thesis

This dissertation is organized as follows. Chapter 1 provides an introduction. Chapter 2 reviews extant literature on mergers and acquisitions. Chapter 3 constructs the theoretical model of this study. Chapter 4 provides details of the data used for this study and describes the sample. Chapter 5 discusses the method of analysis, and Chapter 6 reports the empirical findings. Chapter 7 provides inferences and discussions regarding the findings of the study. Chapter 8 draws conclusions and recommends directions for further research.

Chapter 1: Introduction

This chapter provides a framework for the dissertation. Significance of the study, research questions, research methods and structure of the dissertation are explained in this chapter. The chapter also reports a summary of findings and conclusions. This chapter is the foundation for the following chapters.

Chapter 2: Literature review

This chapter reviews an extensive body of research regarding mergers and acquisitions. It summarises extant literature and presents theoretical explanations and empirical evidence regarding causes and consequences of acquisitions as well as the factors that may affect performance of acquisitions. The material provided in this chapter helps to understand what drives acquisitions, why mergers and acquisitions are clustered in industries over time, what theories are proposed by prior studies to explain sources of value in mergers, what different methods have been used by previous research to estimate acquisition returns and what are their findings, and finally what are the factors that are suggested to influence acquisition returns.

Chapter 3: Theoretical model of the study

This chapter develops a model for decomposing value effect of mergers. This model is used in the empirical part of the study to investigate relative contribution of synergy gains and changes in the rate of cost of capital on total value effect of acquisitions. The chapter also provides theoretical discussions on how acquisitions affect WACC of the combined firm.

Chapter 4: Data and summary statistics

This chapter explains the procedure through which this study constructed a sample of acquisitions and collected data in order to empirically decompose the value effects of mergers and acquisitions based on the model introduced in chapter 3. In this chapter it is explained that how the sample of the study is constructed. Moreover, it explains why analyst forecasts are used for estimating implied cost of equity capital of merging firms and synergies created through mergers. This chapter also provides information about sources of data and summary statistics for the sample of this study.

Chapter 5: Research method

This chapter provides details of the method of this study. In order to decompose the combined value effect of an acquisition to its components as suggested by the model introduced in chapter 3 synergy effects as well as the WACCs of the acquirer, the target and the combined firm are required. In this chapter it is discussed that how each of these elements, the three components of the model and total value of acquisition (TVA) are estimated. Besides, factors that may affect the TVA and its components, and the method of analysis are discussed. This chapter also explains the method of calculation of synergy gains from mergers and also

discusses the method of calculation of the WACC as a weighted average of cost of debt and cost of equity. Methods of estimation of cost of debt and cost of equity are also talked over in separate subsections. Furthermore, this chapter discusses differences between the WACCs of the combined firm and the acquirer as well as the difference between the WACCs of the combined firm and the target. In addition, this chapter discusses the factors that are likely to impact the TVA and its components and provides details of the tests that are used to identify such impacts.

Chapter 6: Empirical findings

This chapter reports empirical findings of the study that are found using a sample set explained in chapter 4 and the methods that are discussed in chapter 5. The findings reported in this chapter are discussed in chapter 7 in light of different theories presented in chapter 2. The findings are reported in a similar sequence to the material provided in section 5 so that they can be followed seamlessly. This chapter reports the findings about changes in earnings forecasts for acquirers and targets subsequent to acquisitions, and interesting information about differences between WACC of combined firms, acquirers and targets. Further details about the cost of debt and cost of equity of merging firms are also provided in this chapter. Importantly, this chapter reports statistics for the TVA and its components. This chapter also reports estimations for combine abnormal announcement returns of acquisitions, the relationship between the TVA and abnormal announcement returns for market-driven and non-market driven acquisitions, and the relationship between the TVA and abnormal announcement returns for diversifying and non-diversifying mergers. It further provides results and estimations when the CAPM is used for calculating the cost of equity. Finally,

this chapter reports the results of univariate and multivariate analysis on the factors affecting the TVA and its components.

Chapter 7: Discussions

This chapter provides a thorough discussion on the empirical findings provided in chapter 6 in light of the literature reviewed in chapter 2. Discussions follow a similar sequence to the material provided in chapters 5 and 6 and provide inferences drawn from the empirical findings. This chapter discusses the findings about changes in earnings forecasts for acquirers and targets subsequent to acquisitions, and provides inferences about differences between the WACC of combined firms, acquirers and targets. Further discussions about the cost of debt and cost of equity of merging firms are also provided in this chapter. This chapter also discusses findings about the TVA and its components, the relationship between the TVA and combined abnormal announcement returns for market-driven and non-market-driven mergers, and the relationship between the TVA and its components with combined abnormal returns of acquisitions for diversifying and non-diversifying mergers. Finally, it draws inferences from the results of univariate and multivariate analysis on the factors affecting the TVA and its components.

Chapter 8: Summary and conclusions

This is the final chapter of this dissertation. This chapter summarises the findings of the study and draws conclusions from the empirical evidence provided in chapter 6 and the model developed in chapter 3. It also provides questions for future research.

1.7 Summary

This study develops a model that decomposes value of acquisitions into three components and then empirically investigates the relative importance of the components. The evidence provided in this study suggests that synergy gains and the difference between the WACCs of the combined firm and the acquirer have key roles in determining value of acquisitions. The findings suggest that investigating the capital structures and the WACCs of the combined firm and the merging firms contributes to knowledge of sources of value in mergers. This study also shows that investigating the association of the components of value with the factors that are likely to affect them can contribute to discovering mechanisms through which mergers create or destroy value. Finally, it is found that factors such as diversification and method of payment have different and even countervailing effects on the value of acquisitions.

Chapter 2 Literature Review

2.1 Introduction

The literature on mergers and acquisitions is extensive. Mergers are one of the most important corporate activities that significantly influence a wide variety of different stakeholder groups. As a result, mergers have been a topic of immense interest for scholars in terms of theoretical and empirical investigations over the past four decades. Researchers have primarily focused on examining the causes and consequences of acquisitions. As a result, a large body of literature has accumulated that addresses different facets of the topic. This section reviews the relevant literature on mergers and acquisitions in an attempt to provide a comprehensive account of what we know about mergers and which parts of the puzzle are still incomplete.

This literature review consists of three key sections. The first part of this chapter summarises the literature on the cyclical nature of mergers referred to in the literature as merger waves. The second section reviews the causes and consequences of takeovers; it first reviews the causes, or drivers, of acquisitions, while focusing on the fact that acquisitions happen in waves and then reviews the consequences of takeovers, with a predominant focus on the impacts of mergers on the economic performance of acquirers. The third part of the review summarises the theories as well as previous empirical studies on determinants of announcement returns and post-acquisition performance of combined firms.

2.2 Merger waves

It has been well-established that mergers place in waves throughout time. There have been six key waves of merger activity as evidenced in the extant literature. These waves have occurred mainly in the USA since the late 1890s. Since the sample of our study includes mergers from recent waves, and also because most previous studies address specific characteristics and abnormal returns of recent takeover waves, this literature review generally focuses on recent merger waves. However, this section does provide a brief insight into the first three waves. Table 2.2-1 presents a summary of key attributes of different merger waves and average acquisition performance found by prior studies during each wave since the 1890s. The first merger wave, which started in the late 1890s, is characterised by horizontal consolidation of industrial production. The wave followed radical changes in technology after the electrification of industries. Incidentally, this period became known as an era of economic expansion and innovation. Stigler (1950) suggests that development of modern corporations with limited liability and also modern capital markets triggered the potential of profitable monopolistic gains through mergers. The takeover wave resulted in monopolistic power for many giant firms in their respective industries. The era of merger for monopoly ended in 1904 when a decision on Northern Securities made it clear that the monopolistic mergers were prohibited by antitrust laws.

The second merger wave commenced in the late 1910s after a period of cold takeover market, which was affected by the First World War. Stigler (1950) argues that the new goal of mergers in this period was oligopoly. As the evidence shows, formation of oligopolies were mostly effected by the second class firms who took the opportunity to use antitrust legislation to reduce the market power of

the dominant firms in almost every industry. Stigler suggests that the Sherman Law was "the fundamental cause for the shift from merger for monopoly to merger for oligopoly" in the United States. Moreover, he argues that the capital requirements of mergers, and the tendency of rivals to grow in number and size, became barriers for dominant firms that could continue to engage in monopoly mergers. This wave of takeover activity ended at the start of the great economic recession in 1929.

The third merger wave took place in the 1960s. The main attribute of this wave was diversification by firms that aimed to benefit from growth opportunities in new product markets through building large conglomerates. By this time, anti-trust regulations had become even tighter in the United States. During the 1960s, rightly or wrongly, the market viewed conglomerates more favourably than we do today (Holmstrom & Kaplan, 2001). Indeed, stock markets reacted positively to most conglomerates in the 1960s (Matsusaka, 1993). Diversification could reduce earnings' volatility and risk, and introduced the internal capital market as an alternative for imperfect external capital markets. Acquisition activity, however, declined in early 1970s when the oil crisis led the global economy into recession and did not return for more than a decade.

The fourth takeover wave emerged in 1981. This wave is generally characterised as highly leveraged and hostile. Emergence of new financing methods, which were mainly based on bank debt and junk bonds, changes in anti-trust policies and the deregulations in the financial services industry along with innovations in the electronics industry, triggered the takeover activity that occurred during the 1980s. Holmstrom and Kaplan (2001) report that the use of leverage was so great that from 1984 to 1990, more than $500 billion of equity was retired on net as

corporations repurchased their own shares, borrowed to finance takeovers and were taken private in leveraged buyouts. Although this merger wave of the 1980s is generally characterised as hostile, Andrade et al. (2001a) report that only 14 per cent of their sample in the 1980s were hostile bids. It is still significantly more than the four per cent share of hostile bids in their sample of 1990s takeovers, but less than the 23 per cent portion of hostile bids reported by Mitchell and Mulherin (1996). These authors used a sample from the Value Line Investment Survey which usually reports acquisition by generally larger and better-known firms.

Jensen (1986a, 1988, 1993) suggests the 1980s takeovers were ultimately driven by a failure in the internal governance mechanisms of US corporations. According to Jensen (1993), corporate mismanagement in the 1970s finally caused capital markets to react. The large windfall gains from the oil crisis that were spent on excessive oil exploration and diversification were a concrete trigger. Nevertheless, changes in technology and regulation more broadly had led to a large amount of excess capacity in many US industries. Managers were unwilling to pare down their operations or simply to exit as long as they had the financial resources to continue. In the early and mid-1980s, the capital markets finally found the instruments to reduce excess capacity. Leveraged acquisitions, leveraged buyouts, hostile takeovers, and stock buybacks were successful in eliminating free cash flow, because the debt service requirements that usually accompanied them prodded managers to find ways to generate cash to make interest payments.

Table 2.2-1 Mergers waves: main industries and key attributes

Wave period	Main Industries	Key attributes
2003-2007	Banking Media & telecom. Utilities	Global scope Cross-border acquisitions Cash payments Friendly negotiations
1993-2000	Metal mining Media & telecom. Banking Real estates Hotels	Related mergers Consolidation of major industries Response to deregulation Stock payments
1981-1989	Oil & gas Textiles Misc. manufacturing Non-depositary credit Food	Hostile Leveraged takeovers using bank debt and junk bonds Split up 1960s conglomerates Efficiency gains
1965-1969	Electricity Chemicals Combustion engines	Diversification
1916-1929	Food Steam engines Steel Railways	Move towards oligopolies
1897-1904	Steel production Hydraulic power Textiles	Merging to form monopolies Horizontal consolidation of production

This table summarises key attributes of the merger waves and the main industries that contributed to each wave. While the first four waves took place in production and manufacturing industries the two recent waves are mainly concentrated in service industries such as banking and telecommunications.

The fifth wave of merger activity commenced in the early 1990s. Andrade et al. (2001a) describe the picture of mergers in the 1990s as takeovers where merging parties, often in closely related industries, negotiate a friendly stock swap. During this wave of takeover activity, major industries became more consolidated through related acquisitions, which were paid for by stocks. Andrade et al. (2001a) suggest mergers in the 1990s were responses to deregulation in major industries. Holmstrom and Kaplan (2001) argue that corporations in the 1990s began to emulate many of the beneficial attributes of leveraged buyouts of the 1980s. However, they suggest two reasons for decline in the number of hostile takeovers. First, hostile takeovers were no longer needed as companies voluntarily restructured and adopted a shareholder value perspective with prodding from time to time of institutional shareholders. The fear of the 1980s-style hostile takeovers likely played a part on this development. Moreover, the researchers explain that managers became aware of the potential benefits of pursuing shareholder value by observing the success of LBOs and takeovers in the 1980s. Helped along by generous stock option programs, management came to endorse shareholder value in the 1990s and to pursue it with vigour.

The sixth wave of takeovers started in 2003 after the economic downturn at the beginning of the 21st century. A unique characteristic of this recent wave is the large number of cross-border acquisitions. Also, international consolidation of industries continued during the takeover wave of the 2000s. Acquisitions were mostly completed through friendly negotiations, and cash payments which were financed by corporate cash-holdings and debt were popular. This last wave of takeover activity ended with the start of economic recession in 2008.

2.3 Acquisitions: causes and consequences

The causes and consequences of acquisitions has been a topic of interest for researchers in the finance arena for several decades. Amongst the large number of theories that have been proposed to explain drivers and results of mergers, some are related to specific merger waves, while others stand out and retain their explanatory power through different waves. Dominant theories regarding causes and consequences of acquisitions are reviewed in this section. Theories which explain causes of acquisitions often make predictions about their testable consequences. Therefore testing these implications is a standard way to assess the validity of the theories.

2.3.1 Causes of acquisitions

An influential body of research that dates back to Nelson (1959), suggests acquisitions are clustered through time. These time-clustered takeovers shape wave-looking plots of merger activity, known as merger waves. This stylised fact raises the question as to why mergers should happen in waves. The theories that attempt to explain merger waves provide reasons for the emergence of a wave, as well as its endurance, and death. Prior studies, which attempt to examine why mergers happen, offer several possible drivers. These drivers can be clustered in four groups. First, mergers can be explained by causes "on the part of individual decision makers". These studies attribute mergers to managers of the acquiring firms hoping to create value for shareholders, for their self-interests, or because of their overconfidence. Second, scholars ascribe mergers to industry-level factors, such as industry shocks or distribution of firm sizes, within an industry. The third merger activity is related to economic conditions and the fourth group comprises behavioural studies. The behavioural hypothesis of mergers suggests that mis-

valuation drives mergers. These theories are explained in detail in the following subsections.

Managerial theories

Separation of control from ownership and shift of control from owners to managers is a well-known result of the industrial revolution. This phenomenon puts managers in the centre of attention when important corporate decisions such as mergers are investigated. Jensen and Ruback (1983) give mangers a prominent role in takeovers. They see the takeover market (also known as the market for corporate control) as a market driven by competition between management teams who want to take control of valuable corporate resources. Jensen & Ruback (1983) explain that when a bidding firm acquires a target, the right to manage target resources are transferred to top management of the acquirer. In this view, regardless of what motivates managers to compete for corporate resources, the competition itself is the main reason for takeover activity. In fact, the theory does not make any specific mention of the motives managers use to engage in acquisitions. However, there are two potential possibilities. First managers can act to maximize shareholder wealth, which is an assumption from the neoclassical theory of mergers. Second, managers might pursue their own interests even if their decisions negatively affect shareholders. The latter possibility is an assumption of the agency costs hypothesis of mergers.

The neo-classical theory of mergers suggests that managers undertake acquisitions in order to maximize shareholders' wealth. In this sense, managers of the acquiring companies seek value creating opportunities and possible synergies that can be achieved through economies of scale and scope, tax savings or replacement of inefficient, incumbent managers of the target company with a more efficient

management team. Thus, value creating deals are acquisitions that can find these opportunities and utilise them to generate wealth. On the other hand, non-value-creating deals are attributed to mistaken decisions. The "hubris hypothesis" of mergers proposed by Roll (1986) explains a source for such wrong decisions. The hypothesis suggests that over-confident bidder managers convince themselves that their valuation of the target company is right and the market does not reflect the full economic value of the combined firm. Therefore if, as empirical evidence from event studies shows, there are no overall gains from takeover deals, it is due to the overbearing opinions of acquirers that their valuations are correct. Roll argues that "even if gains do exist for some corporate combinations, at least part of the average observed takeover premium could still be caused by valuation error and hubris. The left tail of the distribution of valuations is truncated by the current market price. To the extent that there are errors in valuation, fewer negative errors will be observed other than positive errors." Inefficient management hypothesis asserts that takeovers are partly motivated by the desire to improve poorly performing firms. Nevertheless, conducting a study on a large sample of acquisitions from 1926 to 1996, Agrawal and Jaffe (2003) suggest that empirical evidence does not support the conjecture that targets perform poorly before acquisition.

Contrary to neo-classical theory, "agency costs hypothesis" suggests that managers undertake takeover deals out of self-interest, not as a result of shareholder interests. Studies that take this perspective propose a number of scenarios that managers may take advantage of when making acquisitions in order to maximise their self-interests. For instance, Jensen (1986a, 1986b) argues that a major cause of acquisitions are the agency costs associated with manager-shareholder conflicts over the pay-out of free cash flow. Free cash flow is cash-

flow in excess of that is needed to finance all positive net present value projects of a firm. If managers do not pay out free cash flows, for example through stock repurchases or dividends, it is likely that they spend it on non-profitable investments such as value-destroying acquisitions. Paying dividends reduces the resources under managers' control, and subsequently reduces their power. Later, when the firm requires new capital, managers are subject to monitoring by the capital markets which re-assess their performance. Jensen (1986b) also suggests that managers of firms with unused borrowing power are more likely to undertake low-benefit or even value-destroying mergers. He explains that large amounts of debt set up organisational incentives to motivate managers to pay out free cash flow. Therefore, debt reduces the agency costs of free cash flow which, in the case of takeovers, implies that managers who pay-out free cash flow to bondholders are less likely to undertake value destroying acquisitions.

Previous studies also suggest other incentives for managers to commence non-value-creating acquisitions. Amihud and Lev (1981) suggest that managers may undertake conglomerate mergers in order to diversify their personal portfolio to reduce their "employment risk". In conglomerate mergers synergies are not expected from the combined firm because acquirer and target are functionally unrelated. They find that diversification is most likely when acquiring firms have a dispersed ownership structure and are controlled by non-owner managers. Although conglomerate mergers still make a considerable proportion of mergers the sample of Amihud and Lev's study is selected from the third wave of mergers when takeover activity was dominated by this type of acquisition. Shleifer and Vishny (1989) explain managers can "entrench" themselves, i.e. make themselves valuable to shareholders and costly to replace, and decrease chances of being replaced by diversifying through acquisitions. They argue that managers may pay

too much for their targets in order to extract higher salaries and larger perquisites from shareholders. Shleifer and Vishny see management entrenchment as a strategy to counter disciplinary forces such as being monitored by boards of directors, competition in the management labour market, threat of acquisition and also product market competition that puts pressure on managers to perform in the interest of shareholders. Morck, Shleifer, and Vishny (1990) also provide empirical evidence that shows value destroying acquisitions can be driven by self-interested managers.

Conventional theories suggest managerial motives as drivers of mergers do not explain merger waves. Nevertheless recent theories attempt to show that they do. For example, Goel and Thakor (2010) propose that envious CEOs generate merger waves. They explain that in a situation where CEOs envy each other based on "relative compensation" and CEOs of bigger firms earn more, one merger in the industry that increases firm size for a CEO will tempt another envious CEOs to undertake value-destroying but size-enhancing acquisitions. This envy-based competition between CEOs in an industry causes merger waves.

Industry level theories of mergers

Takeover activity clusters disproportionately across industries. Prior studies provide evidence of industry clustering with merger activity through time. This finding suggests that common factors affect the acquisitions taking place in an industry. Andrade et al. (2001a) argue "If mergers come in waves, but each wave is different in terms of industry composition, then a significant portion of merger activity might be due to industry-level shocks." Nelson (1959) notes the differences in takeover rates across industries in the period 1895-1956. Moreover, Gort (1969) finds that the distribution of acquisitions and the distribution of

acquiring firms are highly concentrated in certain industries. As a result, he develops an economic disturbance theory for mergers. He suggests that economic shocks generate discrepancies in valuation of stocks which consequently produce merger waves. Gort (1969) explains that the shock do so in two ways. First, they randomly alter the order of expectations of individuals which results in some non-owners moving to the right of current owners on the value scale. Second, economic disturbances make the future less predictable, which results in an increase in the variance of individual valuations. This mainly occurs because information about the past becomes less effective in predicting the future due to the industry shocks. In fact, the historical data which represents information available to all investors is no more reliable for prediction purposes. Therefore, the common base of assumptions of different investors is narrowed, and consequently, the range of alternative predictions increases. Gort (1969) argues that if as a result of the disturbance, the mean of the entire distribution of valuations shifts to that of current owners or managers, the increased variance of valuations raises the chance that some prospective buyers will place a higher value on the assets of a potential acquisition than the valuation of the group that currently controls the firm.

The emergence of new technologies may, for example, lead either to new products, or to new processes of production, for the same products. From past experience, it is difficult to predict demand, and therefore sales, for new products. It is also difficult to predict costs because total unit costs depend upon volume of production. Contrariwise, when production processes change, future costs are difficult to forecast from past costs; and, to the extent that cost changes are reflected in price changes, future prices and outputs are also independent of past prices and outputs. Thus, when technology changes rapidly, the record of the past

does not necessarily contribute much to the formation of cash flow forecasts. As a result, the discrepancies in the valuations of investors rises and consequently the acquisition rate increases.

Coase (1937), is among the first to note the impact of technology changes on merger activity. Jovanovic and Rousseau (2008) argue that when a new technology arrives, firms which are not sufficiently flexible to adapt become targets for takeovers by those who can utilise the new technology, particularly those who can use it in an efficient manner. The merger wave serves to get the assets into the hands of those who can use these assets best and dies once the reallocation is complete.

Gort's proposition emphasizes the role of industry related causes of acquisitions. The neo-classical theory of mergers sees mergers as an efficiency-improving response to industry shocks. Examples of such shocks are changes in antitrust policy, deregulation, change in input costs, innovation in financing methods, and emergence of new technologies. In this view, trustworthy managers reflect industry shocks in a way that maximises shareholders' wealth. Under this theory, merger momentum may result from shocks that increase synergies for a group of mergers in which acquirers or targets are from a particular industry. Mergers announced following these shocks are expected to be more value-creating than other mergers, leading to correlated announcement returns.

Mitchell and Mulherin (1996) provide evidence of how industry shocks influence the takeover rates in an industry. Patterns in takeover rates in 51 industries were found to be related to the economic shocks that occurred across these industries during 1980s. They show that specific shocks such as deregulations and financing innovations raised the number of acquisitions during the 1980s. The researchers

also suggest that these shocks have general implications for stock price fluctuations around merger announcement and also on the post-completion performance of acquirers. Mitchell and Mulherin (1996) define industry shocks as any factor that alters industry structure and suggest that takeover and restructuring activity accommodates such change. These changes may affect firms in a positive or a negative way and takeovers are the message bearers of such fundamental changes. They study the effect of specific shocks including deregulation, oil price shocks, foreign competition, and financing innovations and show that these shocks can explain a significant proportion of takeover activity. Andrade and Stafford (2004) show that industry clustering continues during 1970-1994 while Mulherin and Boone (2000) provide evidence of industry clustering of acquisitions during 1990s.

Andrade, Mitchell, and Stafford (2001b) investigate the impact of major deregulation in eight industries and find that deregulations trigger takeover activity. They provide three reasons for which they select deregulation among other possible industry shocks. First, deregulation creates new investment opportunities for the industry. Second, it potentially removes long-standing barriers to merging and consolidating, which might have kept the industry artificially dispersed and third, it is fairly well-defined in time and in terms of parties affected, so empirically we know where and when to look.

Harford (2005) provides evidence consistent with the neoclassical theory of mergers. He argues that merger waves take place in response to specific industry shocks such as economic, regulatory and technological shocks that require large scale reallocation of assets. However, he suggests that these shocks are not

enough on their own and sufficient liquidity at macro-level is necessary to accommodate the asset reallocation.

Gorton, Kahl, and Rosen (2009) propose that, in an industry with firms of similar size, anticipation of value-increasing merger opportunities can lead to defensive acquisitions, where managers acquire other firms to avoid losing private benefits if their firms are acquired. On the other hand, they argue that in an industry in which the largest firm is much larger than the other firms, firms undertake acquisitions to become more attractive targets for other firms.

Gorton et al. (2009) suggest an eat-or-be-eaten theory in which a race to increase firm size through mergers, following an industry shock, results in merger waves. Furthermore, they argue that relative size of firms in an industry determines the way these firms react to a shock. The theory explains that in an industry with firms of similar size, anticipation of mergers makes self-interested managers, who intend to remain in control, to undertake unprofitable defensive mergers which only increases the size of their firms and therefore makes them immune from acquisition. On the other hand, if an industry consists of one very large firm and other firms are relatively small, then expectation of potential merger activities motivates managers of smaller firms to acquire other small firms to make themselves more attractive targets for the largest firm in the industry. In industries in which some but not all firms are of similar size both types of suggested acquisition patterns may occur. In such industries medium-sized firms may undertake defensive or positioning acquisitions depending on distribution of firm sizes and how much the managers care about shareholders' value.

Defensive mergers are used to reduce the magnitude of losses an acquirer would face otherwise. For example, Shleifer and Vishny (2003) argue that many

acquisitions of the late 1990s in high-tech industries were a defensive strategy by overvalued acquirers to avoid massive long-term losses that would happen if they were not made. Gorton et al. (2009) suggest that acquisitions for stock by the glamour bidders are in fact a defensive strategy they model.

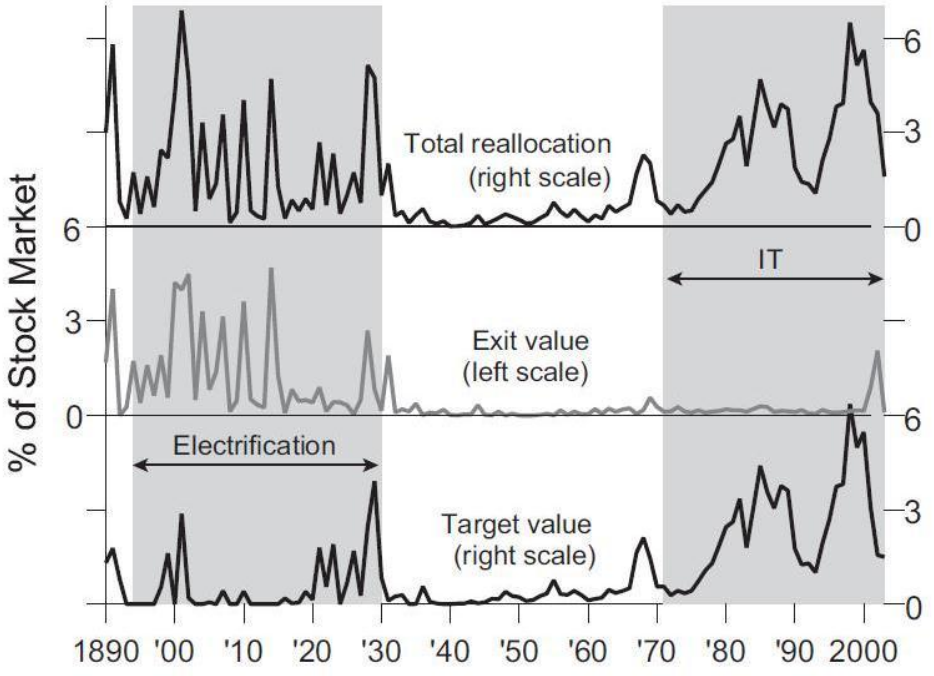
Macroeconomic factors and theory of pro-cyclical mergers

Economy-wide changes such as emergence of general purpose technologies, changes in anti-trust policies, and changes in bankruptcy regulations can partly explain the changes in merger activity level. Maksimovic and Phillips (2001) argue that merger waves are pro-cyclical. Jensen (1993) suggests that technological, regulatory and economic changes are among the drivers of mergers and restructurings of the 1980s. Holmstrom and Kaplan (2001) argue that deregulation and new information technologies which emerged before 1980 created opportunities for many firms to improve their performance. These changes along with the increased role of institutional investors in the growing capital markets empowered investors and put pressure on managers to enhance performance. This combination of opportunity and demand for improving efficiency caused the merger wave of 1980s. With the popularity of stock options "shareholder value became an ally rather than an enemy". Holmstrom and Kaplan suggest that managers, who had learned how to use mergers and other restructuring techniques to improve efficiency, could now share the returns with shareholders. Therefore, after a short decline, takeover activity continued to surge in the 1990s.

A well-recognised theory to explain takeover waves at the industry level is the Q theory of mergers. The Q hypothesis of takeovers (Jovanovic & Rousseau, 2002, 2008; Lang et al., 1989; Servaes, 1991) is an extension of the Q theory of

investments (Brainard & Tobin, 1968). It states that takeovers reallocate target assets for different uses. These uses can generate higher or lower payoffs depending on the quality of bidder and target management, and on the business opportunities of bidder and target firms. Technically, dispersion in Tobin's Q among existing and potential new firms causes reallocation of capital, either through mergers or through exit-and-return of capital. Jovanovic and Rousseau (2008) argue that due to the easing of bankruptcy regulations, mergers became the predominant way of reallocation of capital over the 20th century. They provide appealing evidence of how reallocation activity and also the contribution of mergers in reallocating capital increases during the period of utilisation of new general purpose technologies, namely the "electrification" epoch of 1890-1930 and the recent IT revolution after invention of the 4004 chip by Intel in 1971. Figure 2.3-1 is borrowed from Jovanovic and Rousseau (2008) to demonstrate the magnitude of reallocation activity over the 20th century.

Figure 2.3-1 – Reallocated capital and its components as percentages of stock market value, 1890-2003 (Source: (Jovanovic & Rousseau, 2008))



(Dong et al., 2006) test the Q hypothesis over the period 1987-2000. Although they find empirical evidence that supports this hypothesis in some of their tests, they find that the central prediction of Q hypothesis of takeovers, which suggests that high valuation bidders earn greater announcement stock returns, cannot be confirmed in their sample.

An alternative theory that explains the causes of mergers at the economy-wide level is proposed by Toxvaerd (2008). He suggests a dynamic model of takeover activity in which takeovers occur as an equilibrium phenomenon. In his model an underlying economic fundamental influences merger profitability as an exogenous stochastic process. He argues that, given a set of exogenous economic conditions, merger waves take place as a result of strategic interaction between a set of acquirers who compete over time for a set of scarce targets. The timing of takeovers is determined by the trade-off between the value of waiting for a favourable market condition and the risk of being pre-empted by rival acquirers. This trade-off leads to merger waves. The model has three implications. First, merger activity should be undertaken in beneficial economic conditions. Second, because of competition pressure, mergers occur earlier than suggested by pure profitability considerations. Third, multiple-bid contests are expected to be concentrated at later stages of merger waves, when competition pressure becomes more important.

In summary, it seems plausible to conclude that in the very long run economy-wide wide changes in technologies and regulations (and perhaps globalisation in the current era) are likely to drive huge merger waves (Jovanovic & Rousseau, 2008), which in turn affect different industries in a way that resembles a domino effect. As empirical evidence suggests, some industries seem to be affected sooner

than others. Industry-level theories suggest industry shocks (Mitchell & Mulherin, 1996) and industry structure (Gorton et al., 2009) can explain relatively smaller merger waves that rise and die in a window of a decade. Andrade and Stafford (2004) suggest that merger activity is both related to firm-level and industry-wide drivers. While conventional managerial theories like the hubris hypothesis (Roll, 1986) and management entrenchment hypothesis (Shleifer & Vishny, 1989) demonstrate no power to explain cyclic behaviour of takeover activity, recent theories that suggest managerial envy (Goel & Thakor, 2010) and managerial herding (Bouwman et al., 2009) drive mergers can explain micro merger waves.

Behavioural Theories

Behavioural finance sees corporate policies as a response to market mispricing. In the case of takeovers, behaviouralists suggest that mispricing of corporate stocks gives opportunity to highly overvalued firms to acquire less overvalued or undervalued firms using their overvalued stocks. Moreover, highly undervalued firms are likely to be the target of cash acquisitions which are often hostile (Shleifer & Vishny, 2003).

In contrast with the hubris hypothesis of mergers, which presumes that financial markets are efficient but managers are not rational, the behavioural hypothesis of mergers suggests that mergers are a form of arbitrage by rational managers taking advantage of market inefficiencies. This hypothesis is founded on evidence of positive correlation between stock valuations and merger activity (Golbe & White, 1988; Jovanovic & Rousseau, 2001). Advocates of behavioural hypothesis posit that bidders take advantage of temporary mis-valuations and dispersion in mis-valuations in the market. Behaviouralists also argue that other hypothesised causes of merger waves do not explain the choice of medium of exchange.

Shleifer and Vishny (2003) propose a theory of takeovers based on stock market mis-valuations of the combining firms. In their model, combined long-term value of an acquisition is always zero, i.e. by assumption, mergers do not generate wealth, and therefore, what the bidder gains the target loses. They suggest that targets of cash takeovers are expected to be undervalued firms which must have experienced low returns before being acquired. Such takeovers are more likely to be hostile rather than stock acquisitions. One implication of this proposition, in the context of behavioural finance, is that target managers who are aware of the actual value of their firm are likely to ask higher premiums than the shareholders, therefore it is cheaper for the bidder to launch a hostile takeover and buy the stocks directly from the shareholders. Moreover, they suggest two reasons for why managers of relatively less overvalued firms would agree to be a target for a paid-by-stock merger:

First, the difference in the horizons of various managers, i.e. if the sum of merger benefits is greater than the acquisition premium on the stock price of the target and the bid price is greater than the current market valuation of the target then both target and acquirer shareholders gain in short and long-run, respectively. The former gains the premium, the latter gains the difference between long-term synergies and the premium. The losers are those who hold onto the overvalued stocks of the merged firm in an overvalued market.

Second, agency costs on the target-side, i.e. target managers accept overvalued stocks of the bidder to serve their own interests. It can be done through acceleration in exercise of the stock options, severance pay, or keeping target managers in top positions. Hartzell, Ofek, and Yermack (2004) provide empirical evidence to support this hypothesis.

Shleifer and Vishny (2003) argue that clustering in takeover activity is because stock market valuations drive a substantial portion of mergers. They suggest that bull markets lead groups of firms with overvalued stock to use the stock to acquire assets of undervalued targets through acquisitions. Their model allows for relatively less overvalued targets as well, relying mainly on dispersion in valuations. That is, target managers with short- term horizons are willing to accept the bidder's temporarily overvalued equity. In this sense, overvaluation in the market or in certain industries causes merger waves.

Rhodes-Kropf and Viswanathan (2004) argue that the explanation that overvalued bidders wish to use stock is incomplete, because targets should not be eager to accept overvalued stock. They propose a model of rational managerial behaviour and uncertainty about sources of mis-valuation that would also lead to a correlation between market performance and merger waves. When the market is overvalued, the target rationally reduces the expected value of a given stock offer, and thus the target, on average, values the offer correctly. However, the greater the market overvaluation, the higher the target overvaluation is likely to be, even though the target's own stock is affected by the same market overvaluation. Thus, market overvaluation raises the chance of a merger occurring and a wave can occur due to mis-evaluation even if there is no underlying reason for the mergers.

Rhodes-Kropf & Viswanathan also suggest that mis-valuation influences the medium of exchange. For a stock merger to occur, the target's management must expect the deal to increase value. Managers make errors when evaluating stock offers (although they get it right on average) but not when evaluating cash offers. Therefore, the medium of exchange will contain a higher proportion of stock offers when the market is overvalued and completed deals are more likely to be in

cash in undervalued markets. Furthermore, markets will react more positively to news of a cash merger than to an equity merger.

The model of Rhodes-Kropf and Viswanathan (2004) differs from that of Shleifer and Vishny in that target managers are rational in their model but they make mistakes in accepting overvalued equity because of imperfect information about the degree of synergies rather than their shorter time horizons.

Decomposing market-to-book ratio as a measure of market valuation into three fundamental elements, Rhodes-Kropf, Robinson, and Viswanathan (2005) find that merger intensity is highly positively correlated with short-run deviations in valuation from long-run trends, especially when stock is used as the method of payment. They also find that acquirers with high firm-specific error use stock to buy targets with relatively lower firm-specific error at times when both firms benefit from positive time-series sector error. Moreover, they provide evidence that cash targets are undervalued relative to stock targets and cash acquirers are less overvalued than stock acquirers.

Dong et al. (2006) find that while the Q hypothesis better explains merger activity before 1990, post-1990 takeover activity, which is greater in terms of number and value of the deals, seems to be driven by mis-valuation. Dong et al. (2003) and Ang and Cheng (2003) also use accounting numbers to estimate a fundamental value and find evidence consistent with the behavioural explanation of merger activity. Verter (2002) confirms that the level and dispersion of stock market valuations are correlated with merger activity, especially mergers for stock. While Rhodes-Kropf et al. (2004) recognize alternative interpretations of their evidence and try to distinguish between competing explanations, other studies that examine the behavioural hypothesis tend to only provide evidence consistent with

behavioural explanations, rather than considering both neoclassical and behavioural hypotheses and then formally rejecting the neoclassical.

Rosen (2006) provides evidence of momentum in takeover markets. That is, when the capital markets have been reacting favourably to merger announcements, they tend to continue to do so. Hence, acquirers gain short-term abnormal returns during hot market periods. However, Rosen provides evidence that this short-term reaction reverses in the long-run resulting in long-term decline in the acquirer's stock returns. Rosen concludes that his findings are consistent with investor sentiment being a major factor in the short-term reaction to merger announcements which along with agency-costs theory can explain the long-term reversal.

Harford (2005) argues that "observed relation between high stock market valuations and merger waves has been misattributed to behavioural misvaluation factors. Rather, the relation is actually driven by the higher capital liquidity (lower transaction costs) that accompany an economic expansion." His argument is based on the observation that the proportion of an industry involved in firm-level acquisition is strongly correlated with the proportion involved in partial–firm acquisitions. Since this finding is inconsistent with the behavioural hypothesis of mergers but is consistent with the neoclassical theory, Harford concludes that industy shocks along with market liquidity are the actual drivers of takeover waves.

2.3.2 Consequences of acquisitions

Previous investigations into the consequences of acquisitions are mainly focused on their economic impacts. These studies can be classified into two groups: the

first group is concerned with macroeconomic effects of acquisitions, such as overall productivity gains and possible impairment of market competition. The second group is concerned with microeconomic, or firm-level, effects of acquisition deals on acquirers and targets.

Macroeconomic effects

2.3.2.1.1 ***Overall productivity gains***

Prior studies suggest that combined wealth effects of mergers on acquirer and target shareholders are slightly positive, i.e. around one per cent in most studies (Andrade et al., 2001a; Jensen & Ruback, 1983; Wang & Xie, 2009). Nevertheless, from a macroeconomic perspective, an important question is whether mergers really generate value and improve efficiency or only transfer and redistribute wealth from other groups of stakeholders such as bondholders and employees to stockholders. Put another way; is there any economy-wide productivity gain from mergers? As Shleifer and Summers (1988) point out, if the value gains through mergers are merely transfers of wealth from other stakeholders to shareholders, they do not represent efficiency improvements. However, reviewing redistribution theories and related empirical studies, Jarrell et al. (1988) conclude that little evidence has been found to support substantial wealth transfers from any group. Andrade et al. (2001a) support this argument.

Holmstrom and Kaplan (2001) argue that it is hard to pin down the overall effect of takeovers on the economy, because so many factors are involved that can provide alternative explanations for economy-wide changes in productivity levels. As Andrade et al. (2001a) explain, there are three challenges that make it difficult to conclude that the overall outcome of mergers for the economy is substantial. First, prior empirical studies find a negative long-term wealth effect on acquirers

which may imply that the gains from mergers are overstated or non-existent. Second, underlying sources of gains from mergers are still unknown. More popular large sample studies and in depth case-studies (e.g. Kaplan, 2000), have failed to discover such sources. Finally, most prior empirical findings suggest that all wealth gains from mergers seem to accrue to the target firms and this casts doubt on rationale behind such investment decisions by acquiring managers and make it hard to believe that mergers actually create value.

Andrade and Stafford (2004) also investigate the economic role of mergers at the industry level. They suggest that acquisitions play two main roles: expansion and contraction. They find that mergers play a dual economic role. On one hand they are a means of increasing the capital base of acquiring firms in response to emerging growth opportunities. On the other hand, mergers appear to facilitate industry contraction that in turn improves efficiency.

2.3.2.1.2 ***Impairment of market competition***

Absence of anti-trust regulations can lead to mergers that build monopolies across industries similar to what was experienced in the first merger wave at the beginning of the 20th century. A major effect of a "merging for monopoly" pattern is impairment of market competition. (Stigler, 1950) reports that after the first merger wave, many industries were dominated by giant firms that had more than 50 per cent of the production share in their respective industries. However, anti-trust regulations which were around even before the emergence of the first takeover wave, prevented industries from monopolistic powers and formed oligopolies in long-term.

A number of studies investigate the effect of mergers on market share of acquiring companies and their monopoly power. Mueller (1985) finds that market share of

the acquiring firms substantially decreases after undertaking an acquisition compared to a non-merging benchmark group. His finding is significant for horizontal and vertical mergers. However, Gugler, Mueller, Yurtoglu, and Zulehner (2003) show that despite a significant decrease in sales of acquirers after acquisition, the profit of the combined firm increases, especially in horizontal mergers. They conclude that takeover activity enhances market power of the merging entities.

Microeconomic effects

The most important theories regarding microeconomic consequences of acquisitions which are supported by prior empirical investigations are wealth effects, profitability, risk reduction, growth, excessive leverage effect, and income tax reduction. In this section, acquisition consequences are classified in three groups in order to create a new framework for analysis which reflects the Valuation Model and its elements.

2.3.2.1.3 ***Wealth effects***

Theories that explain causes of mergers imply different predictions about post-acquisition performance of merged firms. Table 2.3-1 presents these theories and their predictions about acquisition performance.

Table 2.3-1 Key predictions of the theories that explain causes of mergers about their consequences

Theory	Key authors	Predictions
Agency costs theory (management entrenchment hypothesis)	(Morck et al., 1990)	Self-interested managers undertake value-destroying acquisitions. Post-merger performance is expected to decline.
Hubris theory	(Roll, 1986)	Over confident managers pay too much premium to acquire a target. Therefore, post-merger performance is expected to decline
Envious managers hypothesis	(Goel & Thakor, 2010)	Envious managers undertake value-destroying acquisitions. Post-merger performance is expected to decline.
Economic disturbance theory	(Gort, 1969)	Takeover Future is unpredictable. Makes no prediction about post-merger performance.
Neoclassical theory (industry shocks hypothesis)	(Harford, 2005; Jensen, 1993; Mitchell & Mulherin, 1996)	Industry shocks that drive mergers might improve or deteriorate industry environment. Thus, post-merger performance should not necessarily be expected to improve or decline.
Q theory of mergers	(Lang et al., 1989); (Jovanovic & Rousseau, 2002, 2008; Servaes, 1991)	Offers by well-governed (high-Q) bidders generate greater total gains from mergers and therefore higher bidder announcement returns.
Dynamic model of takeover activity	(Toxvaerd, 2008)	Merger activity should be undertaken in beneficial economic conditions. Because of competition pressure, mergers occur earlier than suggested by pure profitability considerations. multiple-bid contests are expected to be concentrated at later stages of merger waves, when competition pressure becomes more important.

Theory	Key authors	Predictions
Market-driven mergers (behavioural hypothesis)	(Rhodes-Kropf et al., 2005; Rhodes-Kropf & Viswanathan, 2004; Shleifer & Vishny, 2003)	Combined long-term value of acquisitions is zero Long-term returns to acquirers are likely to be negative in stock acquisitions and positive in cash acquisitions. Short-term returns to acquirers are negative, on average.
Eat-or-be-eaten theory (merger anticipation hypothesis)	(Gorton et al., 2009)	On average, acquirers' abnormal returns are negative. However, profitability of takeovers depends on size of the acquirer as well as the firm size distribution in industry. Acquisition profitability is positively correlated with the ratio of the size of the largest firm in the industry to the size of the other firms in the industry. Large size acquirers destroy and small size acquirers create value through acquisitions. In industries with firms of similar size self-interested managers undertake defensive mergers to reduce the probability that their firms be acquired. Therefore, consistent management entrenchment hypothesis, such acquisitions are expected to be value destroying and cause a decline in post-acquisition performance. In the industries with a high ratio of size of the largest firm to size of the other firms acquisitions are profitable.

Mitchell and Mulherin (1996) argue that, rather than the actual source of performance changes, takeovers is the messengers of the underlying economic changes happening in the industry. Therefore, takeovers cannot be considered as the primary cause of change in a firm's value. An important implication of the neoclassical theory for acquisition performance is if industry shocks are a source of takeover activity then post takeover performance should not necessarily be expected to improve, especially compare to a pre-shock benchmark or to industry cohorts.

2.3.2.1.3.1 Announcement wealth effects

The impact of acquisition deals on value of acquirer and target firms is extensively investigated in prior empirical studies. Table 2.3-2 summarises prior short-term studies on acquisition returns. On the one hand, there are wealth effects on target firms. Since targets, typically, do not exist after completion of acquisition deals the market reaction to an acquisition announcement is often measured as impact of acquisition on value of target firms. Prior researches provide robust evidence of positive abnormal returns for target firms, i.e. the overall value effect of acquisitions on target companies has been significantly positive and has been increasing over the takeover waves. This positive value effect on target shares is logical. Acquirers typically offer premiums to target shareholders to induce them to sell their shares, which consequently escalates market value of the target firms significantly.

On the other hand, several studies have investigated acquisition wealth effects on acquirers. These studies can be classified into two groups: short-term and long-term studies. Short-term studies, similar to those concerned with target wealth effects, measure abnormal announcement returns of acquirers. The evidence from prior investigations suggests that the overall around announcement abnormal returns of acquirers are

economically insignificant. In other words, the average value effects of acquisition announcements on acquirer firms are indistinguishable from zero. This is consistent with "Perfectly Competitive Acquisitions Markets" hypothesis.

Table 2.3-2: Prior studies on market reaction to acquisition announcement

Author(s)	Sample			Method		CAARs (%)		
	Market	Period	Size D/A/T	Event window	Benchmark	Acquirer	Target	Combined
(Golubov, Petmezas, & Travlos, 2012)	US	1996-2009	4803 D	(-2, +2)	MM	0.369		
(Ahn, Jiraporn, & Kim, 2010)	US	1998-2003	1207 A	(-1, 0) (-1, +1) (-2, +2) (-5, +5)	MM	−1.007*** −1.304*** −1.463*** −1.878***		
(Uysal, 2011)	US	1990-2007	7814 D	(-1, +1)	MM	0.10***		
(Ushijima, 2010)	Japan, PM M	1994-2005	106 D 38 D	(-1, +1)	MA	1.3*** 3.8***		
(Bouwman et al., 2009)	US,	1979-2002	2944 D	(-1, +1)	MM	−0.48***		
(Wang & Whyte, 2009)	US	1991-2004	10767 D	(-1, 0)	MM	−0.0001		
(Wang & Xie, 2009)	US, Domestic	1990- 2004	396 D	(-5, +5)	MM	−2.91***	21.52***	0.97**
(Antonios, Dimitris, & Huainan, 2007)	UK, LSE frequent bidders	1987-2004	1401 D	(-2, +2)	MA	1.26***		
(Fan & Goyal, 2006)	US	1962-1996	2162D	(-1, +1) (-10, +10)	MM			1.9*** 2.4***

Author(s)	Sample			Method		CAARs (%)		
	Market	Period	Size D/A/T	Event window	Benchmark	Acquirer	Target	Combined
(Moeller, Schlingemann, & Stulz, 2005)	US	1980-2001	12023D/1967T	(-1, +1)	MM	1.10[NA]		1.35[NA]
(Bhagat et al., 2005)	US	1962-2001	1018	(-5, +5)	MM	0.18	30.01 ***	5.27***
Conn, Cosh, Guest, and Hughes (2005)	UK	1984-00	4320	(-1, +1)	MA	0.59***		
(Danbolt, 2004)	UK	1986-1991	514	(0, +20) (-2, +1)	MA, MA, CAPM, Size-decile	18.76*** 20.64***		
(Moeller, Schlingemann, & Stulz, 2004)	US	1980-2001	12023	(-1, +1)	MM	1.102***		
(Graham, Lemmon, & Wolf, 2002)	US	1980-1995	356	(-1, +1)	MM	−0.78***	22.51***	3.4***
(Bae, Kang, & Kim, 2002)	Korea Non-financial	1981-1997	107 A	(-1, +1) (-5, +5) (-10, +10)	MM	1.841*** 2.666** 3.387**		
(Fuller, Netter, & Stegemoller, 2002)	US	1990-2000	3135D	(-2, +2)	MA	1.77***		
(Datta, Iskandar-Datta, & Raman, 2001)	US	1993-1998	1719D	(-1,0)	MM	0.02		

Author(s)	Sample			Method		CAARs (%)		
	Market	Period	Size D/A/T	Event window	Benchmark	Acquirer	Target	Combined
(Andrade et al., 2001b)	US	1973-1998	3688	(-1, +1)	MM	−0.7	16.0**	1.8**
				(-20, close)		−3.8	23.8**	1.9
(DeLong, 2001)	US, Banking	1988-1995	280	(-10, +1)	MM	−1.68***	16.61***	0.04
(Leeth & Borg, 2000)	US	1919-1930	466A/72T	(-1, close)	MM, MA	0.14	15.57***	
(Walker, 2000)	US	1980-1996	278	(-2, +2)	MA	−0.84*		
(Kang, Shivdasani, & Yamada, 2000)	Japan	1977-1993	154A	(-1, 0)	MM	1.17***		
				(-1, +1)		0.90*		
				(-5, +5)		2.22***		
				(close-1, close)		0.27		
				(-1, close+1)		5.37**		
(Mulherin & Boone, 2000)	US	1990-1999	281D	(-1, +1)	MA	−0.37***	20.2***	3.56***
(Higson & Elliott, 1998)	UK	1975-1990	830	(0, close)	Size-decile	0.43	37.5***	
				(0, +20)		0.20	31.5***	
(Smith & Kim, 1994)	US	1980-86	177	(-5, +5)	MM	0.50	30.19**	8.88**
				(-1, 0)		−0.23**	15.84**	3.79**
(Chatterjee, 1992)	US, TO	1963-1986	436	(0, +20)	MM	3.33*	22.04***	
(Kaplan & Weisbach, 1992)	US	1971-1982	271A/209/209	(-5, +5)	MM	−1.49***	26.9***	3.74***

Author(s)	Sample			Method		CAARs (%)		
	Market	Period	Size D/A/T	Event window	Benchmark	Acquirer	Target	Combined
(Healy et al., 1992)	US, largest acquisitions	1979-1984	50	(-5, close)	MA	−2.2	45.6***	9.1***
(Byrd & Hickman, 1992)	US, TO	1980-1987	128	(-1, 0)	MA	−1.23		
(Franks et al., 1991)	US	1975-1984	399	(-5,5)	MM	−1.02*	28.04***	3.90***
(Servaes, 1991)	US	1972-1987	384/384/704	(0, close)	MM	−1.07**	23.64***	3.66***
(Franks & Harris, 1989)	UK, TO M	1955-1985	1012/1693 46/121	(0, +20)	MA	1.2** −3.6**	24.0** 14.8**	
(Lang et al., 1989)	US, TO	1968-1986	87	(-5, +5)	MM	0.01	40.30***	11.31***
(Eckbo & Langohr, 1989)	France, TO, Pub	1966-1982	52/90	(0, +5)	MM	−0.29	16.48***	
(Dennis & McConnell, 1986)	US, M	1962-1980	90/76	(-19, 0) (-6, +6)	MA	1.07 3.24***	16.67*** 13.74**	
(Asquith, Bruner, & Mullins, 1983)	US, M	1963-1979	214/54	(-20, 0)	MM	2.8***	16.8***	
(Eckbo, 1983)	US, HM	1963-1978	102/57	(-1, +1) (-20, +10)	MM	0.07 1.58	6.24*** 14.08***	
(Asquith, 1983)	US, M	1962-1976	211/196	(-2, 0) (-20, 0)	MM	0.2	6.20***	
(Malatesta, 1983)	US, M	1969-1974	256/83	(0, +20)	MM	0.90	16.8***	

Author(s)	Sample			Method		CAARs (%)		
	Market	Period	Size D/A/T	Event window	Benchmark	Acquirer	Target	Combined
(Bradley, 1980)	US, TO	1962-1977	88/161	(-20, +20)	MM	4.36***	32.18***	
(Dodd, 1980)	US, M	1970-1977	60/71	(-20, 0)	MM in growth return	0.80	21.78***	
(Firth, 1980)	UK, TO	1969-1975	434	(0, +20)	MM	−6.30***	28.1***	
(Kummer & Hoffmeister, 1978)	US, TO	1956-1974	17/50	(0, +20)	CAPM	5.20*	16.85***	
(Dodd & Ruback, 1977)	US, TO	1958-1978	124/133	(0, +20)	MM	2.83**	20.89***	
(Franks, Broyles, & Hecht, 1977)	UK, M	1955-1972	70	(0, +20)	MM	4.60[n/a]	16.0[n/a]	8.60[n/a]

This table summarises prior studies on abnormal announcement returns of mergers and acquisition for firms involved in mergers and acquisitions. While most studies provide abnormal return estimations for acquirers, a number of previous studies also report combined abnormal returns and abnormal returns for target firms. Prior studies document a positive combined abnormal return on average as well as positive and significant abnormal returns for target firms. However, studies in the US and the UK typically report slightly negative and insignificant abnormal returns for acquirers. M: mergers, TO: tender offers, MM: market model, MA: market adjusted model, D: deal, A: Aquirer, T: target, n/a: not available.

*** significance at 1% level.

** significance at 5% level.

* significance at 10% level.

If as short–term studies assume financial markets are semi-strongly efficient, these results imply that acquisitions, on average, are zero net present value projects for acquirers. Behaviouralists, nevertheless, argue that this is only the reaction of market to acquisition announcements and does not necessarily reflect the value effects of the deals. For example, Rosen (2006) suggests that acquirers are likely to gain positive announcement abnormal returns if recent mergers by other firms has been received well or if the overall stock market is doing better. He suggests, however, there is long-term reversal in returns for acquirers who make a deal during hot market periods compare to those who acquire at other times.

2.3.2.1.3.2 Long-term wealth effects

Long-term studies, alternatively, investigate the long-term value effects of undertaking an acquisition deal on an acquirer's returns. The results of prior investigations on long-term effects of acquisitions are highly dependent on the estimation method used to calculate the benchmark return. However, evidence suggests that overall long-term abnormal returns are either negative or insignificant. Table 2.3-3 presents a brief review of prior long-term investigations.

Long-term post-completion performance of acquirers has been a focus of study for researchers during the past three decades. Table 2.3-3 includes an abstract of the numerous studies that have been undertaken to measure performance. A number of methods and metrics have been developed through efforts of several investigators and multiple influencing factors have been investigated, too. A number of questions remain unanswered. Most importantly, from a decision making perspective, the question is: will a particular acqusition deal improve the long-term performance of an acquirer firm?

A variety of metrics have been used for measurement of post-completion long-term performance. However, there is not an overall agreement about average return for acquisitions. It is apparent that the results between investigations vary depending on the metric types (see Table 2.3-3), benchmarks and samples of the different studies. Most of the previous research that uses the long-term abnormal return method provides evidence that the post-completion performance of acquirers, on average, is negative or optimistically around zero. However, a number of studies that use accounting ratios or economic value-added methods document positive average performance.

A number of investigations address the accuracy of different metrics and the appropriate benchmarks, predominantly concerning long-term abnormal returns on stock price. Although these discussions contribute to improved metrics, investigations are generally limited to one aspect of corporate performance and ignore the other dimensions. Aside from that, the variance surrounding the association between acquisition activity and post-completion performance suggests that subgroups of firms do experience significant positive returns from such activity (King, Dalton, Daily, & Covin, 2004).

Table 2.3-3: Prior studies on long-term abnormal returns of acquisitions

	Sample			Method			
Author(s)	**Market**	**Period**	**Size**	**Benchmark**	**Event window (months)**	**Metric**	**Abnormal return (%)**
(Bouwman et al., 2009)	US	1979-02	2944	Size & B/M	(+1, +24)	BHAR	−7.22***
			252	Four factor model		CALT	15.84***
(Croci, 2007)	EU	1990-01	83		(0, +12)	BHAR	−9.47
			50		(0, +24)		−24.36**
			23		(0, +36)		−6.94
(Gregory & McCorriston, 2005)	Cross-border acquisitions by UK acquirers	1984-94	333	Size & B/M	(+1, +12)	BHAR	0.65
					(+1, +36)	BHAR	−3.90
					(+1, +60)	BHAR	−9.29
(Conn, Cosh, Guest, & Hughes, 2005)	UK	1984-00	4,344	Size & B/M	(+1, +36)	BHAR	−9.02
						CALT	−0.21
(Aw & Chatterjee, 2004)	UK	1991-96	77	MM	(+1, +6)	CAR	−1.86
					(+1, +12)		−8.01***
					(+1, +18)		−9.45***
					(+1, +24)		−17.87***

	Sample			Method			
Author(s)	**Market**	**Period**	**Size**	**Benchmark**	**Event window (months)**	**Metric**	**Abnormal return (%)**
(Moeller et al., 2004)	US	1980-01	12,023	Four factor model	(0, +36)	CALT (Ave. Mnth Return)	6.48 (0.018)
(Sudarsanam & Mahate, 2003)	UK	1983-95	519	Size, B/M, MA	(+2, +36)	BHAR	−14.76***
(Datta et al., 2001)	US	1993-98	485	Size, B/M one-year pre-acquisition stock return, matched firm	(0, +36)	BHAR	−9.31
(Chatterjee, 2000)	UK	1977-90	153	MA	(0, +12) (0, +24) (0, +36)	CAR	5.4 −4.1 −17.9
(Mitchell & Stafford, 2000)	US	1961-93	2,068 389 366	Size & B/M FF3FM	(+1, +36)	BHAR-EW BHAR-VW CALT-EW CALT-VW CALT-EW CALT-VW	−1.0 −3.8** −1.44 −1.08 −5.04*** −2.52*

	Sample			Method			
Author(s)	**Market**	**Period**	**Size**	**Benchmark**	**Event window (months)**	**Metric**	**Abnormal return (%)**
(Higson & Elliott, 1998)	UK	1975-90	814	Size	(0, +12)	BHAR	−0.74
			776		(0, +24)		−1.14
			722		(0, +36)		0.83
(Loughran & Vijh, 1997)	US	1970-1989	947	Size, B/M firm	(+1, +60)	BHAR	−6.5
(Gregory, 1997)	US	1984-92	452	FF3FM	(A, +6)	CAR	−5.12***
					(A, +12)		−10.63***
					(A, +24)		−18.01***
(Kennedy & Limmack, 1996)	UK	1980-1989	345	Size	(0, +23)	CAR	−5.03*
(Agrawal, Jaffe, & Gershon, 1992)	US	1955-87	765	Size & beta	(+1, +60)	CAR	−10.26**
(Bühner, 1991)	Germany	1973-85	110	MM	(+1, +12)		−6.93
					(+1, +24)		−5.98
(Franks et al., 1991)	US	1975-84	399	size	(+1, +36)	CALT	1.8
(Limmack, 1991)	UK	1977-86	448	Adjusted Beta	(A, +24)	CAR	−4.67*
				MM			−14.96***
				MA			−7.43***
(Franks & Harris, 1989)	UK	1960-85	1048	MM	(+1, +24)	CAR	−12.6***
				MA			4.8**
				CAPM			4.5**
(Eckbo, 1986)	Canada	1964-83	1138	MM	(+1, +12)	CAR	1.00**

	Sample			Method			
Author(s)	**Market**	**Period**	**Size**	**Benchmark**	**Event window (months)**	**Metric**	**Abnormal return (%)**
(Asquith, 1983)	US	1962-76	196	Beta port.	(0, +12)	CAR	−7.2***
(Malatesta, 1983)	US	1969-74	256	MM	(0, +36)	CAR	−7.6***
(Firth, 1980)	UK	1969-75	434	MM	(+1, +12) (+13, +36)	CAR	0.5 −0.4
(Langetieg, 1978)	US	1929-69	149	Industry	(+1, +12) (+1, +24)	CAR	−0.87** −1.08**
(Dodd & Ruback, 1977)	US	1958-76	124	MA	(0, +60)	CAR	−5.9
(Franks et al., 1977)	UK	1955-72	94	MM	(-40, +40)	CAR	−0.04
(Mandelker, 1974)	US	1941-62	241	MA	(+1, +12)	CALT	0.6***

This table summarises prior studies on long-term abnormal returns of mergers. Prior studies typically document negative long-term abnormal returns. M: mergers, TO: tender offers, MM: market model, MA: market adjusted model, CAR: cumulative abnormal returns, CALT: calendar-time portfolios, BHAR: buy and hold abnormal returns.

*** significance at 1% level.

** significance at 5% level.

* significance at 10% level.

2.3.2.1.4 ***Profitability and operating synergies***

Devos et al. (2009) break down synergy gains from mergers. They suggest that operating synergies account for a major part of the synergy gains. Besides, synergies from interest tax shields contribute to 17per cent of gains in their sample of 266 large acquisitions in unregulated industries.

(Houston, James, & Ryngaert, 2001) use management forecasts and estimate synergies in large bank mergers to average about 13 per cent. (Bhagat et al., 2005) find average value improvements of 13.1per cent in a sample of tender offers with competing bidders. Several previous studies use either *ex post* accounting performance or plant level productivity data to infer the existence of operating improvements and provide mixed evidence. For example, (Ghosh, 2001) finds little evidence of operating improvements compared to control firms matched on size and prior performance. Similarly, (Ravenscraft & Scherer, 1987) find no evidence of operating improvements for targets of tender offers using line of business data from the Federal Trade Commission. However, (Healy et al., 1992) and (Heron & Lie, 2002) rely on *ex post* accounting performance and find that operating performance improves after a merger. (Healy et al., 1992) also find that gains arise from improvements in asset turnover rather than operating margins. They document savings in capital expenditure to the tune of 25.4%. Maksimovic and Phillips (2001) use plant-level data for manufacturing firms from the Longitudinal Research Database maintained at the Bureau of the Census of the US, and find no evidence that the productivity of the acquirer's assets improves after a merger. But, when a firm adds capacity to its main divisions and increases

its focus, productivity increases too. Overall, this body of evidence does not permit definitive conclusions about improvements in operating performance following mergers.

Houston et al. (2001) rely on management forecasts to assess synergy gains in 41 large bank mergers. They document average gains of about 13 per cent and report that gains arise from cost savings rather than revenue increases. Bernile (2004) finds that management forecasts of synergy average about 6 per cent for a sample of 324 mergers during 1991–1999.

Enhancement in operating cash-flows is especially important in the case of related mergers where merging firms are likely to enhance their combined operating income or reduce their operating costs through merging their operational activities. Rhodes-Kropf and Robinson (2008) suggest that similarity and asset complementarity motivate mergers. Hoberg and Phillips (2010) provide evidence that acquiring firms that offer asset complementarities but are also different from rival firms in the industry provide significant synergy gains. If present value of future cash-flows generated through such synergies is greater than zero then the merger is value creating, ceteris paribus. However, diversifying mergers are unlikely to reduce operating costs or enhance operating incomes significantly (Maquieira, Megginson, & Nail, 1998). Thus, in such mergers this part of the model is negligible. In fact, it is not able to explain value creation through diversifying mergers which were especially popular in 1960s where findings of prior empirical studies show that the combined value effects of such mergers are positive as well and even greater (e.g. Bradley et al., 1988).

Table 2.3-4 Prior studies on profitability of acquisitions

Author(s)	Sample			Method			Average Annual Abnormal operating performance %	
	Market	Period	Size	Benchmark	Event window (years)	Metric	Mean	Median[1]
(Wang & Xie, 2009)	US	1990-04	297	Performance adj. control firm	(+1, +3)	3Y average ROA 3Y average ROS	0. 3*** 0. 4**	
(Carline, Linn, & Yadav, 2009)	UK	1985-94	81	Industry Pre-performance	(0, +5)	IAOCF/MVA	10.6***	6.3***
(Powell & Stark, 2005)	UK	1985-93	191	Industry Size Pre-performance	(0, +3)	IAOP/TMV IAOP/ATMV IAOP/BV IAOP/Sales ISPAOP/TMV ISPAOP/ATMV ISPAOP/BV ISPAOP/Sales		−0.14 0.35 −0.35 0.67 0.79 1.61 0.13 0.80

Author(s)	Sample				Method		Average Annual Abnormal operating performance %	
	Market	Period	Size	Benchmark	Event window (years)	Metric	Mean	Median[1]
(Gugler et al., 2003)	Worldwide	1981-98	2704	Industry	(+1, +5)	Profit change	10.90	
	US		1950	Acquisition-year			10.84	
	UK		362	performance of			11.82	
	EU		178	Acquirer+target			18.27	
	Japan		20				-12.50	
			165				-0.58	
	AU/NZ/CA		42				39.12	
	N					Sales change	−19.54	
	ROW						−20.30	
							−16.89	
							−17.77	
							−7.13	
							−25.61	
							−18.04	
(Linn & Switzer, 2001)	US	1967-87	413	Industry Pre-performance	(+1, +5)	IAOCF/MVA		1.81***

Author(s)	Sample			Method			Average Annual Abnormal operating performance %	
	Market	Period	Size	Benchmark	Event window (years)	Metric	Mean	Median[1]
(Ghosh, 2001)	US	1981-95	315	Industry size & pre-performance	(+1, +3)	IACF/MVA CF/MVA CF/Sales Sales growth Employees/Sales	0.66 1.25 0.79 0.03 −2.23	0.27 0.26 1.06 0.02 −0.09
(Dickerson, Gibson, & Tsakalotos, 1997)	US	1948-77	2914	Non-acquirers +firm specific effects +time effects	(+1, +5)	ROA	−2.4 −4.9 −1.7	
(Switzer, 1996)	US	1967-87	324	industry	(+1,+5)	IACF/(MVA+BV-Debt+P-stock)		1.97***
(Clark & Ofek, 1994)	US	1981-88	31	Industry	(+1, +3)	EBITD/Revenues	−2.26[3]	−0.6
(Healy et al., 1992)	US	1979-84	46 48 44	Industry Pre-performance	(+1, +5)	CF/Sales Asset Turnover Employee growth rate	0.2 0.2* −2.3**	
(Cornett & Tehranian, 1992)	US, banks	1982-87	30	Industry	(+1, +3)	OPTCF/MVA	1.2**	

Author(s)	Sample				Method		Average Annual Abnormal operating performance %	
	Market	Period	Size	Benchmark	Event window (years)	Metric	Mean	Median[1]
(Odagiri & Hase, 1989)	Japan	1980-87	46	Pre-performance	(+1, +2)	Gross Profit/BVA	−7.6	
			33			Sales growth[4]	0.2	
					(+1, +3)	Gross Profit/BVA	−4.3	
						Sales growth	−3.7	

This table summarises prior studies on long-term abnormal profit of mergers. Prior studies typically document negative long-term abnormal returns. IAOP: industry adjusted operating profit, BV: book value of equity, ISPAOP: industry, size and pre-acquisition performance adjusted operating profit, IAOCF: industry adjusted operating cash-flow return, MVA: market value of assets, OPTCF: Operating pre-tax cash-flow, BVA: Book value of total assets.

[1] Medians in the pre- and post-acquisition periods are the median values of the variables across the *n* years.

[2] Percentage changes are calculated from tables 2B, 3A and 3B of Gugler et al. (2003), significance levels are not available.

[3] Calculated from table 4, panel A as average of mean and median of returns over 3 years subsequent to merger

[4] The ratio of one year's sales to that of the previous year

[***] significance at 1% level.

[**] significance at 5% level.

[*] significance at 10% level.

2.3.2.1.5 ***Operating synergies versus financial synergies***

Prior research proposes two types of synergies that can be retained from mergers: operational synergies and financial synergies. Operational synergies include different types of reduction in production and distribution costs whereas financial synergies comprise the use of underutilised tax-shields, increased leverage, reduced risk of default, and reduced agency costs because of higher debt (e.g. Jensen, 1986b; Jensen & Ruback, 1983). Operational synergies are extensively investigated in extant literature (e.g. Berkovitch & Narayanan, 1993; Bradley et al., 1983, 1988; Caron & Jeffrey, 1999; Chatterjee, 1992; Devos et al., 2009; Firth, 1978; Harrison et al., 1991; Stan Xiao & Royston, 2004). Reduction in production and distribution costs can be achieved through realisation of economies of scale and scope, using more efficient technologies, and the benefits of changes in control (e.g. Wang & Xie, 2009).

On the other hand, the literature on financial synergies from mergers is not as extensive. Lewellen (1971) suggests that mergers reduce risk of default and thereby cost of capital. Leland (2007) argues that Lewellen's proposition, although correct, is incomplete in that financial synergies are not always positive. Leland breaks down financial synergies from an acquisition into three components: (1) the change in unlevered firm value that results from an acquisition, (2) the change in the value of tax savings from optimal leveraging of the combined versus stand-alone merging firms, and (3) the change in the value of default costs. Leland assumes that there is no operational synergy from mergers in developing his model.

Studies that compare the magnitude of operational and financial synergies are rare. An exception is research by Devos et al. (2009) who decompose synergy gains from mergers. They suggest that operating synergies account for a major part of the synergy gains. Besides, synergies from interest tax shields contribute to 17 per cent of gains in their sample of 266 large acquisitions in unregulated industries. Their proxy for financial synergies, however, is limited to tax benefits of debt.

Prior research also suggests that components of the WACC, such as cost of debt (Billett, King, & Mauer, 2004) financial leverage (Harford, Klasa, & Walcott, 2009) and effective tax rate of acquirers (Devos et al., 2009) change substantially subsequent to acquisitions. These findings imply that the WACC of the combined firm is expected to be different from that of the acquirer and the target.

Acquisitions and financial leverage of merging firms

Prior studies find that acquirers are significantly less levered compared to a portfolio of control firms prior to acquisitions and increase their leverage levels subsequent to acquisitions (Uysal, 2011; Welch, 2004). Lewellen (1971) argues that mergers reduce the risk of default, and thus increase debt capacity. This increased debt capacity in turn leads to greater leverage and greater tax savings that generate financial synergies and create value. Ghosh and Jain (2000) provide evidence that shows combined firms can increase their financial leverage mostly because of an increase in their debt capacity compared to acquirers. This increase in debt capacity can be attributed to unused debt capacity of the merging firms (e.g. Bruner, 1988) from the pre-merger years[4]. Moreover, in diversifying mergers

[4] Clayton and Ravid (2002) find that firms with higher leverage are likely to lose bidding contests. Therefore it is likely that acquirers have some unused debt capacity prior to acquisitions. Ghosh

where there exists an imperfect correlation between cash-flows of the acquirer and the target, a coinsurance effect can reduce cost of capital of the combined firm compared to the stand-alone merging firms (Hann, Ogneva, & Ozbas, 2013; Leland, 2007). The coinsurance effect that reduces cash-flow volatility may consequently reduce both cost of debt and cost of equity capital. The new rates for cost of capital components lead to a new optimal capital structure that might be different from optimal capital structure of each of the merging firms. This study argues that this does not necessarily lead the combined firm to a leverage level higher than that of the acquirer. While tax benefits from higher leverage are realised as enhanced cash-flows, a reduction in the WACC may also create value. Therefore, the notion that mergers only produce new debt capacity seems to be naïve. This is especially important when decomposing the value effect of acquisitions where ignoring this effect may lead to underestimation of the value effect of mergers.

A number of prior studies investigate the distribution of merger gains between extant bondholders and stockholders (Higgins & Schall, 1975; Kim & McConnell, 1977; Scott, 1977; Shastri, 1990). They argue that if the merging firms have existing debt that is callable at par, or can be retired at a price that reflects pre-acquisition risks, then bondholders of the stand-alone merging firms will not participate in gains from an acquisition. However, this is not typically the case. For example, while bondholders of nonfinancial acquirers earn negative announcement period returns (Billett et al., 2004), bondholders of banks earn significantly positive returns during a two-year window around merger announcements (Penas & Unal, 2004). On the other hand, bondholders of both

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and Jain (2000) find weak evidence that some of the increase in financial leverage of the acquirer following the merger is due to its past unused debt capacity. Palepu (1986) finds that highly levered firms are less likely to be acquired.

financial and non-financial targets are reported to gain significantly positive returns.

Mergers that increase debt capacity create opportunities for decreasing cost of capital and increasing tax benefits from leveraging up. Debt-holders gain profits from relatively safer debt whereas tax benefits from increased leverage go to share-holders. Although shareholders can appropriate benefits from bondholders by increasing financial leverage, there is a limit for this expropriation as becoming overleveraged destroys value. Therefore, shareholders are only able to appropriate benefits from debt-holders to an optimum point where the value of the combined firm is maximised.

Leland (2007) argues that a number of factors including tax rates, default costs, relative size, and the riskiness and correlation of cash-flows determine the magnitude of financial synergies. He suggests that although the coinsurance effect reduces risk of default and the cost of capital of firms who engage in diversifying mergers, it does not always overcome the disadvantage of forcing a single financial structure onto multiple activities. Therefore, diversifying mergers are value-creating only when the coinsurance effect dominates. In fact, financial synergies from acquisitions can be negative when firms have very different risks or default costs. Leland (2007) suggests that "financial synergies by themselves are insufficient to justify mergers, but they can become important in specialised circumstances.

2.4 Determinants of acquisition performance

Since the aggregate results are inconclusive, identification of the factors likely to affect long-term performance is crucial. The impact of various factors on post-

completion performance has been studied in a number of prior empirical studies. In the current proposal, these factors have been categorized in five main groups:

1) Acquirer Characteristics
2) Target Characteristics
3) Bid Characteristics
4) Industry and Competition Factors
5) Economic Environment

2.4.1 Acquirer Characteristics

Relationships between a number of acquirer characteristics and post-completion performance have been investigated in previous studies. One of these characteristics is the experience of the acquirer in M&A activity. Kusewitt (1985) suggests a significant negative relationship between the number of previous M&A experiences and the firm performance. In contrast, a number of studies (e.g. Fowler & Schmidt, 1989) argue that there is a significant positive correlation between experience and long-term performance of M&A.

Size

Prior studies document that acquirer returns are negatively correlated with acquirer size (Gorton et al., 2009; Moeller et al., 2004). In other words, while very large acquirers lose value around announcement date of mergers, small acquirers tend to gain abnormal returns.

Tobin's Q

Another acquirer characteristic that has been investigated previously is the pre-bid historical performance of the acquirer measured by Tobin's Q. It is expected that well-governed acquirers with higher Tobin's Q perform better in acquisitions,

especially when the target's Q ratio is low. That is, acquisition of poorly managed firms by well-managed acquirers is value creating. Lang et al. (1991) investigated 209 successful tender offers and suggest that the relationship between cash flow and acquirer returns differs significantly for low Q and high Q acquirers. They also argue that acquirer returns are significantly negatively related to cash flow for low Q acquirers but not for high Q acquirers. Moreover, investigating 704 takeovers, Servaes (1991) argues that acquirers with high Q ratio experience a higher post-completion return.

However, a number of recent studies suggest otherwise. Bhagat et al. (2005) find that acquirer's Q is negatively correlated with synergies from acquisitions. Dong et al. (2006) and Moeller et al. (2004) also suggest that acquirer's Q and its close substitutes, such as market-to-book ratio, have negative effects on acquirer returns.

Glamour versus value acquirers

Rau and Vermaelen (1998) propose the "extrapolation hypothesis" that suggests the market overreacts to the past performance of acquirers at the time of announcement of an acquisition. Glamour acquirers with a low book-to- market ratio tend to have a high share price that reflects their recent high growth in cash-flows and earnings as well as signalling high expected future growth to the market. The extrapolation hypothesis suggests that, based on past performance of managers of these acquirers, the market reacts positively to the announcement of a new acquisition plan by glamour firms. On the other hand, the market reacts negatively to acquisition announcements by value acquirers with low market-to-book ratios based on their weak, recent performance. However, over time the

market reassesses the post-acquisition performance of the acquirer and corrects the previous over-extrapolation of past performance.

Rau and Vermaelen (1998) provide evidence in support of their extrapolation hypothesis. They examine a sample of US takeovers during the period 1980 to 1991 and find that glamour acquirers experienced gains of -5.6%, -5.4% and 0.1% during the first, second and third year respectively after completion. Conversely, value acquirers in their sample gain 5.6%, -1.1% and 5.4% during the first, second and third year respectively after completion. Sudarsanam and Mahate (2003) re-examine this hypothesis on a sample of UK acquisitions during the period 1983 to 1995 and that value acquirers outperform glamour acquirers by 0.9% around announcement of acquisitions. However, in the long-term, their results are consistent with those of Rau and Vermaelen (1998) over the three post acquisition years. Both studies find that, in the long-term, glamour acquirers with high market-to-book ratios underperform value acquirers with low market-to-book ratios. Conn et al. (2005) also find that glamour acquirers experience long-run negative returns in public acquisitions. However, they find no evidence of this in private acquisitions where value acquirers experience negative long-run returns. Table 2.4-1 reports findings of prior studies that compare returns of glamour and value acquirers from acquisition activities.

Table 2.4-1 Value versus glamour acquirers

Author(s)	Sample			Method		Type of Acquirer	
	Market	Period	Size G/V	Metric, Horizon	Event window	Glamour High M/B	Value Low M/B
(Conn et al., 2005)	UK	1984-00	705/3,615	CAR, short	(-1, +1)	0.42**	0.71**
				CALT	(+1, +36)	−0.16	−0.94***
(Sudarsanam & Mahate, 2003)	UK	1983-95	173/173	CAR, short	(-1, +1)	- 1.84***	-0.91**
				BHAR	(+43,+750)[1]	-19.13***	-13.00***
(Datta et al., 2001)	US	1993-98	214/199	BHAR	(0, +36)	−1.96	0.83
(Mitchell & Stafford, 2000)	US	1961-93	526/257	BHAR-EW	(+1, +36)	1.8	2.7
				BHAR-VW	(+1, +36)	−3.1	−14.2
(Rau & Vermaelen, 1998)	US, mergers		932/931	CAR	(+1, +36)	−17.26***	7.64
	US, TO		105/104		(+1, +36)	4.25	15.53

This table summarises prior studies on abnormal returns to glamour and value acquirers. TO: tender offers, CAR: announcement cumulative abnormal returns, CALT: calendar-time portfolios, BHAR: buy and hold abnormal returns, EW: equally weighted, VW: value weighted, G: glamour acquirer, V: value acquirer.

*** significance at 1% level.

** significance at 5% level.

* significance at 10% level.

[1] +43 to +750 Days

Cash-holdings

Prior studies find that firms with greater cash reserves are more likely to make acquisitions that destroy value. Harford (1999) suggests that acquisitions by cash-rich firms (i.e. firms that have accumulated cash reserves above predictions) are value decreasing. He argues that, on average, such acquisitions are followed by abnormal declines in their stock price. He also proposes that, consistent with the stock return evidence, mergers in which the bidder is cash-rich show declines in abnormal operating performance. Overall, the evidence of his study supports the agency costs of free cash flow explanation for acquisitions by cash-rich firms. Devos et al. (2009) find evidence consistent with this idea. They find that firms with higher levels of liquidity make poorer acquisition decisions.

Ownership structure

A number of studies investigate the relationship between ownership structure of a firm and its long-term performance in different regions around the world (e.g. Lichtenberg & Pushner, 1994; Thomsen & Pedersen, 2000). Jensen (1993) proposes that corporate performance increases with the portion of managerial equity ownership. This is in contrast with Morck et al. (1988b), McConnell & Servaes (1990, 1995), and Kole (1995) who suggest a non-linearity in the relationship between insiders' ownership and corporate performance. More specifically, Wright et al. (2002) propose that CEO stock ownership has a non-linear relationship with acquisition abnormal returns. They also suggest that institutional investors influence the profitability of acquisitions. Moreover, Cosh, Guest, and Hughes (2006) suggest a strong positive relationship between takeover performance and CEO ownership, which holds for both long- run returns and operating performance measures. They propose that shareholdings of other

executive directors, non-executive directors, and non-board holdings have no significant effect on takeover performance.

Experience

Undertaking an investigation from a behavioural learning perspective, Haleblian & Finkelstein (1999) propose a U-shaped non-linear relationship between acquirer experience and acquirer long-term accounting performance. They find the best performers are either those without experience or those who had a significant amount of experience. Hayward (2002) provides more details by investigating the nature, performance and timing of a firm's acquisition experience. Investigating acquisitions by 100 of the largest US firms in six different industries, the study suggests that a firm's focal acquisition performance positively relates to prior acquisitions that are, 1) not highly similar or dissimilar to the focal acquisition, 2) associated with small announcement losses and 3) not too temporally close to or distant from the focal acquisition. His findings endorse the view that quality of acquisition experiences is important in addition to the quantity.

Hayward's (2002) first finding implies a non-linear relationship between performance of acquirer and similarity of previous targets with the focal target. This will be discussed more under the bid characteristics subsection. His second proposition implies that acquirer performance is related to the announcement returns of previous acquisition experiences. Although, as he explains, this measure taps the market's view that the acquisition has resulted in a small mistake and acquiring managers may not share that view. He argues that firm managers are likely to follow the market's reaction to their acquisition announcements and thus such reactions may affect managers' views about acquisition performance. Therefore, this will be the second variable.

The third finding of Hayward's study is a non-linear relationship between the time-lag of the focal acquisition and the last acquisition activity of acquirers and their performance. However, his investigation is limited to abnormal stock returns one year after the announcement of an acquisition. On the other hand, this current study will contribute to the explanations, investigating the impact of these variables on long-term performance of acquirers.

Board size

Cheng (2008), suggests that corporate performance variability and the frequency of acquisition activity of a firm are negatively associated with board size. His results imply that firms with larger boards undertake less risky activities such as acquisitions. Hence they tend to have less variation (risk) in returns. Another implication might be that firms with larger boards make acquisitions that are more likely to create wealth for stockholders and they avoid risky acquisition activities. On this ground, a relationship is expected between acquisition success and board size of a firm. Carline et al. (2009) argue that corporate governance characteristics of acquiring firms such as board ownership, board size, and block-holder control have an economically and statistically significant impact on operating performance changes following mergers.

Executive compensation

Consistent with the agency problem hypothesis, prior research finds that equity-based executive compensation is positively correlated with acquisition returns. Datta et al. (2001) examine how executive compensation structure determines corporate acquisition decisions. They find a strong positive relation between acquiring managers' equity-based compensation and announcement and post-completion returns of acquirers. They also find that compared to managers whose

compensation contracts are less equity based, managers with equity-based compensation contracts pay lower acquisition premiums, acquire targets with higher growth opportunities, and make acquisitions engendering larger increases in firm risk.

2.4.2 Target Characteristics

There are also a number of target characteristics that are likely to be related to returns from acquisitions. Public status of the target, and its historical and premerger performance are two factors that are investigated in previous studies

Public versus private targets

Prior research finds that acquirers of privately held targets outperform acquirers of private targets. A summary of findings of the studies comparing acquisition of public and private targets is provided in table 2.4-2. In an interesting study, Chang (1998) examines three hypotheses that are suggested to explain acquirer returns from taking over private targets with regard to method of payment: (1) the limited competition hypothesis; (2) the monitoring hypothesis; and (3) the information hypothesis.

According to the limited competition hypothesis, if the acquisition market is competitive, the acquisition itself will be a zero net present value project. Therefore, acquiring firms will experience no abnormal stock returns when they pay cash for an acquisition. However, if the competition for privately held targets is limited, perhaps because of high information search costs, acquirers can experience positive stock returns because the likelihood of underpayment is high. Alternatively, acquirer returns can be positive when the acquisition creates acquirer-specific synergy gains.

The monitoring hypothesis suggests that acquiring privately held firms through common stock exchanges creates outside block-holders and increases value because these block-holders can serve as effective monitors of managerial performance (Shleifer & Vishny, 1986). On the other hand, more concentrated ownership can be value destroying if it allows managerial entrenchment or makes takeovers more costly (Fama & Jensen, 1983; Morck et al., 1988b).

The asymmetric information hypothesis suggests that offering stock payments in acquisition deals signals that the acquirer's stocks are overvalued (Myers & Majluf, 1984). According to this hypothesis, market reaction to acquisition announcement will be negative. However, in case of acquisition of privately held targets with a small number of shareholders, this problem can be mitigated through the disclosure of private information of acquiring firm's managers to the target shareholders. The target shareholders assess the acquirer's prospect carefully as they intend to hold a substantial amount of acquirer's stocks after acquisition. Thus, when they decide to hold a large block of acquirer's shares, this results in a positive reaction from the market and increases the stock price of the acquirer.

Chang (1998) finds that, in contrast with the negative acquirer abnormal returns that are found for acquirers who acquire publicly traded firms, acquirers who takeover privately held targets experience positive abnormal returns. However, acquirers gain no abnormal returns in cash-paid acquisitions. Chang suggests that the positive wealth effect is related to better monitoring by target shareholders and decreased information asymmetries.

Table 2.4-2: Public versus private targets and acquirer abnormal performance

Author(s)	Sample			Method		Type of target	
	Market	Period	Size Pub/Prv	Metric, Horizon	Event window	Public	Private
(Moeller et al., 2004)	US	1980-2004	2642/5583	CAR, Short	(-1, +1)	−1.02***	+1.49***
(Fuller et al., 2002)	US	1990-2000	456/2060	CAR, Short	(-2, +2)	−1.0**	+2.08***
(Chang, 1998)	Stock	1981-1992	154/150	CAR, Short	(-1, 0)	−2.46***	+2.64***
	Cash		101/131			−0.02	+0.09
	US,						
(Faccio, McConnell, & Stolin, 2006)	Europe	1996-2001	735/3694	CAR, Short	(-2, +2)	-0.38	+1.48***
(Conn et al., 2005)	UK	1984-00	705/3,615	CAR, short	(-1, +1)	−0.82***	0.86***

This table summarises prior studies on abnormal returns to acquirers of public and private target firms. Prior studies suggest that acquisitions of privately held firms are more profitable especially when the acquisition is paid by stocks. CAR: announcement cumulative abnormal returns.

*** significance at 1% level.

** significance at 5% level.

* significance at 10% level.

Premerger performance of target

Historical performance of the target is one of the characteristics that are proposed to affect post-acquisition returns. Lang et al. (1989) and Servaes (1991) propose that acquisition abnormal returns are larger when targets have low Tobin's Q ratios. Morck et al. (1990) find that announcement abnormal returns to the bidders are negatively correlated with pre-announcement performance of the targets in non-banking industries. Likewise, DeLong (2001) finds that abnormal performance of acquirer upon announcement decreases in the pre-merger performance of target, in the banking industry.

2.4.3 Bid Characteristics

The relationship between post-completion performance and bid characteristics has been investigated by a number of researchers. Method of payment, mode, industry relatedness of acquirer and target, domesticity, cultural compatibility, and level of rivalry between acquirers of a bid are some of the variables that are likely to be related to post-completion performance of acquirers.

Stock versus cash versus mix payment

Method of payment is often mentioned as a factor that affects market reaction to an acquisition announcement. Table 2.4-3 gives a summary of the findings of prior studies concerning method of payment and acquisition returns. There are three methods of payment for acquisitions: (1) cash, (2) equity, and (3) mixed cash and equity. Amihud, Lev, and Travlos (1990) discuss two hypotheses regarding the method of financing. First, target stockholders would prefer stock because cash acquisitions create an immediate tax liability for them, while stock payments are taxable only when they are redeemed. Second, the information

asymmetries hypothesis suggests that acquirers who use stock to purchase a target are signalling to the market that their stock is overvalued. Hence, their stock price declines around announcement of the acquisition. In contrast, stockholders of targets who know their stock is undervalued prefer payment in stock rather than cash so they may enjoy the benefits of corrected valuation. While theory offers several conflicting interpretations of the choice of financing, empirical evidence by Amihud et al. (1990) and Travlos (1987), among others, shows that acquirers who pay in cash earn significantly more than those who choose stock payments.

Aside from that, a number of studies investigate such a relationship in the long-term (e.g. Linn & Switzer, 2001). A recent study Savor and Lu (2009) proposes a 31.2% abnormal return for successful stock acquirers compared to a benchmark portfolio of unsuccessful acquirers. Their results are consistent with the hypothesis that stock-financed acquirers create value for their long-term shareholders. Acquirers can also use their overvalued equity to purchase hard assets of the target at an effective discount.

Stock financed mergers, from an acquirer point of view, are in fact two corporate events occurring simultaneously: a merger and an equity issue. Therefore, the value changes cannot be interpreted as pure merger effects. Prior studies suggest that equity issues are associated with negative abnormal returns of about -2 to -3 per cent around the announcement day. An explanation is that by issuing equity, mangers signal to the market that the stocks of their firms are overvalued. Consequently, investors adjust for the equity issue news and the stock price declines (Myers & Majluf, 1984). Hence, it is essential to consider the equity issue effect in the analysis of acquisition returns. In fact, prior empirical studies

suggest that negative market reaction to acquisitions is limited to acquirers who finance the takeover with stock.

Shleifer and Vishny (2003) suggest that managers of overvalued acquirers use their stock to acquire relatively less overvalued targets to benefit their shareholders. They conclude that the decline in long-term performance of acquirers who use stock is because they are initially overvalued, not due to their bad performance after acquisition. However, Lehn and Zhao (2006) find no significant relationship between method of payment and the probability of CEO turnover of unsuccessful acquirers. They argue that stock acquisitions with negative long-term returns destroy value because whether managers use stock or cash as the medium of exchange to take over a target firm, they are equally likely to lose their jobs after acquisition if they make negative returns.

Table 2.4-3: Method of payment and acquirer abnormal performance

Author(s)	Sample			Method		Method of payment		
	Market	Period	Size C/S/M	Metric, Horizon	Event window	Stock	Cash	Mixed
(Travlos, 1987)	US, M	1972-1981	60/100	CAR (MM), Short	(-10, +10)	−1.6	−0.13	
(Uysal, 2011)	US, 3M	1990-2007	7814	CAR, Short	(-1, +1)	0.008**	0.017***	0.014***
(Savor & Lu, 2009)	US	1978-2003	1000/926	CAR, short	(-1, +1)	−3.3***	0.3	
				BHAR, Long	(-1, +250)	−7.0***	3.0*	
					(-1, +500)	−9.8***	3.0	
				CT-FF3, Long	(-1, +750)	−13.1***	1.6	
					(0, 12)	−0.2	0.2	
					(0, 24)	−0.4***	0.0	
					(0, 36)	−0.4***	−0.1	
(Dong et al., 2006)	US	1964-1982	34/92/56	CAR	(0, +20)	+3.86***	+0.87	+2.10***
(Franks et al., 1991)	US	1975-1984	128/156/114	CAR, Short	(-5, +5)	−3.15***	+0.83	−1.18
(Leeth & Borg, 2000)	US	1919-1930	156/41	CAR, Short	(-1, CD)	−1.12	+2.47	
(Chang, 1998)	Public targets	1981-1992	154/101	CAR, Short	(-1, 0)	−2.46***	−0.02	
	Privet targets		150/131			+2.64***	+0.09	
	US,							
(Loughran & Vijh, 1997)	US	1970-1989	405/314/228	BHAR	(+1, +60)	−24.2***	18.5	−9.6
(Gregory, 1997)	US	1984-92	333/84/35	CAR	(A, +24)	−19.23***	−9.8**	−4.17
(Kang et al., 2000)	Japan	1977-1993	95/59	CAR, Short	(-1, 0)	+1.0**		+1.4*
(Kohers & Kohers, 2000)	US, High Tech	1987-1996	673/961	CAR, Short	(0, +1)	+1.09***	+1.37***	
(Datta et al., 2001)	US	1993-1998	337/1382	CAR	(-1, 0)	N/A	+0.52***	−0.10
			125/360	BHAR	(0, +36)	NA	−18.82*	−6.00* (Non cash)

Author(s)	Sample			Method		Method of payment		
	Market	Period	Size C/S/M	Metric, Horizon	Event window	Stock	Cash	Mixed
(Moeller et al., 2004)	US	1980-2004	2958/4862/4203	CAR, Short	(-1, +1)	+0.15***	+1.38***	+1.45***
(Faccio et al., 2006)	Public targets	1996-2001	189/436/110	CAR	(-2, +2)	−1.81**	+0.30	−0.66
	Privet targets		201/2876/617			+3.90***	+1.17***	+2.14***
	Europe							
(Goergen & Renneboog, 2004)	Europe	1993-2001	33/86/23	CAR	(-2, +2)	+2.57***	+0.90*	+0.22
(Andrade et al., 2001b)	US	1973-1998	2194/1494	CAR	(-1, +1)	−1.5***	NA	+0.4
								Non-stock
(Franks, Harris, & Mayer, 1988)	US	1955-1984	392/127	CAAR, long	(+1, +24)	−1.8**	−3.6	
	UK		207/221			−9.4	+1.75**	
(Conn et al., 2005)	UK	1984-00	2,273/1,958	CAR, Short	(-1, +1)	NA	0.53***	0.63***
				CALT	(+1, +36)	NA	−0.25	−0.19
								Non-cash
(Linn & Switzer, 2001)	US	1967-87	152/211/50	IAOCF/MVA	(+1Y, +5Y)	0.77	3.14***	2.03

This table summarises prior studies on abnormal returns and the method of payment. Prior studies suggest contradictory evidence about the relationship between acquisition returns and the method of payment in acquisition deals, the findings are different across samples from different markets and different periods. CALT: calendar-time portfolios, BHAR: buy and hold abnormal returns, CAAR, long-term cumulative abnormal returns. IAOCF: industry adjusted operating cash-flows, MVA: market value of assets, CD: completion date.

*** significance at 1% level.

** significance at 5% level.

* significance at 10% level.

Tender offers versus mergers

The other deal characteristic that is likely to affect the post-completion performance of acquirers is whether the acquisition is a merger or a tender offer. Table 2.4-4 reports a summary of results of previous studies on the difference between tender offers and mergers in terms of acquirer returns. Most studies find that tender offers outperform mergers.

Friendly versus hostile

Mode acquisition and its impact on acquirer performance is another deal characteristic that has been investigated in prior research; i.e. whether an acquisition is friendly or hostile. In recent decades, most acquisitions have been negotiated mergers. However, a number of tender offers are announced and completed every year. Table 2.4-5 summarises findings of prior research regarding the effect of the mode of acquisition on announcement and post-completion acquirer returns. Moreover, (Schwert, 2000) documents that hostile takeovers result in lower target valuations than those of average targets.

(Schwert, 2000) examines the relationship between different measures of hostility and finds that that most deals described as hostile in the press are not distinguishable from friendly deals in economic terms, except that hostile transactions involve publicity as part of the bargaining process. He also documents that the correlations among different measures of hostility are positive, but not high. He argues that the phrase "hostile takeover" has different meanings for different people, and thus, the ambiguities inherent in this classification should be understood and the term should be used carefully by researchers and professionals.

Table 2.4-4 Acquirer returns in mergers and tender offers

Author(s)	Sample			Method		Abnormal performance	
	Market	Period	Size M/T	Metric, Horizon	Event window	Merger	Tender offer
(Kohers, Kohers, & Kohers, 2007)	US	1984-99	1239/332	CAR, short	(-1, 0)	−0.95	0.03
(Datta et al., 2001)	US	1993-1998	1577/142	CAR	(-1, 0)	−0.003***	−0.23
			125/360	BHAR	(0, +36)	−10.67***	6.20
(Walker, 2000)	US	1980-1996	278	CAR, Short	(-2, +2)	−1.3**	0.51
(Loughran & Vijh, 1997)	US	1970-1989	788/135	BHAR	(+1, +60)	−15.9***	43.0*
(Loderer & Martin, 1990)	US	1966-1984	1135/274	CAR, short	(-5, 0)	0.99**	0.52**

This table summarises prior studies on abnormal returns to acquirers in mergers and tender offers. Prior studies suggest that tender offers typically outperform mergers. CAR: announcement cumulative abnormal returns, BHAR: buy and hold abnormal returns.

*** significance at 1% level.
** significance at 5% level.
* significance at 10% level.

Table 2.4-5 - Acquirer Returns in Friendly and hostile acquisitions

Author(s)	Sample			Method		Abnormal performance	
	Market	Period	Size F/H	Metric, Horizon	Event window	Friendly	Hostile
(Leeth & Borg, 2000)	US	1919-1930	156/41	CAR, Short	(-1, CD)	0.38	−3.62
(Schwert, 1996)	US	1975-1991	959/564	CAR, Short	(0, close)	−3.4*	2.5
(Servaes, 1991)	US	1972-1987	307/77	CAR, short	(0, close)	−0.16	−4.71

This table summarises prior studies on abnormal returns to acquirers in mergers and tender offers. (Schwert, 2000) argues that the phrase "hostile takeover" has different meanings for different people, and thus, the ambiguities inherent in this classification should be understood and the term should be used carefully by researchers and professionals. CAR: announcement cumulative abnormal returns, CD: completion date.

*** significance at 1% level.
** significance at 5% level.
* significance at 10% level.

Focused versus Diversifying

Diversification is another factor that has appealed to investigators as a factor that may affect the performance of acquirers. In theory, diversification may cause a co-insurance effect and reduce cash-flow volatility. This effect reduces cost of capital of the acquirer and creates value. On the other hand, if managers undertake diversifying acquisitions to reduce their personal risk (Amihud & Lev, 1981), they may sacrifice value of their firm and make value destroying takeovers. Consistent with this idea Morck et al. (1990) find that diversifying mergers are value destroying. Moreover, DeLong (2001) finds that bank mergers that are non-diversifying create value, whereas diversifying mergers are value-destroying. Other prior empirical studies provide different and mixed evidence on the relationship between diversification and acquisition returns. While a number of researchers suggest a positive relationship between industrial relatedness and acquisition returns (e.g. Anand & Singh, 1997; Walker, 2000), some of them argue that related mergers do not outperform unrelated ones (e.g. Matsusaka, 1993; Seth, 1990), and others suggest a nonlinear relationship (Gautam & Riitta, 2001). A summary of findings of previous research on the effect of diversification on acquirer returns is provided in table 2.4-6.

Table 2.4-6: Diversification and acquirer abnormal performance

Author(s)	Sample			Method		Abnormal performance	
	Market	Period	Size R/U	Metric, Horizon	Event window	Related	Unrelated
(Akbulut & Matsusaka, 2010)	US	1950-2006	3472/1291	CAR, Short	(-1, +1)	−1.3***	−0.6***
(Doukas, Holmen, & Travlos, 2002)	Sweden	1980-1995	46/46	CAR, Short	(-5, +5)	+2.74***	−2.37*
(Bae et al., 2002)	Korea	1981-1997	66/41	CAR, Short	(-5, +5)	+3.94***	+0.672
(DeLong, 2001)	US, Banking	1988-1995	280	CAR, Short	(-10, +1)	+1.47***	−0.91**
(Leeth & Borg, 2000)	US	1919-1930	417/28	CAR, Short	(-1, CD)	+0.61	−2.30
(Kang et al., 2000)	Japan	1977-1993	104/50	CAR, Short	(-1, 0)	+1.4**	+0.8
(Hubbard & Palia, 1999)	US	1961-1970	392	CAR, Short	(-5, +5)	+1.61***	+0.24
(Morck, Shleifer, & Vishny, 1988a)	US	1975-1979	34/120	CAR, Short	(-2, +1)	+1.54	+0.23
		1980-1987	57/115			+2.88	−4.09**
(Eckbo, 1986)	Canada	1964-4983	215/552	CAAR, long	(+1, +12)	+0.60	+0.74**
(Haugen & Udell, 1972)	US	1961-1967	21/27	BHAR, long	(0, +48)	+3.0	+6.6**
(Gregory, 1997)	US	1984-92	269/183	CAR, long	(0, +24)	−12.19**	−15.69***
(Agrawal et al., 1992)	US	1955-87	79/686	CAR, long	(+1, +60)	−25.5***	−8.6

This table summarises prior studies on abnormal returns to acquirers in diversifying and non-diversifying acquisitions. Prior studies suggest the acquirers gain more in related acquisition in short-term. However, the results vary across samples and different methods of estimation in long-term. BHAR: buy and hold abnormal returns, CAR, long-term cumulative abnormal returns, CD: completion date, R: related mergers, U: unrelated mergers.

*** significance at 1% level.

** significance at 5% level.

* significance at 10% level.

Domestic versus cross-border mergers

A number of prior studies propose that cross-border acquisitions demonstrate different post-completion performance effects compared to domestic mergers. For instance, Moeller and Schlingemann (2005a) document that domestic US mergers have higher announcement returns than cross-border acquisitions by US acquirers. Moreover, Conn et al. (2005) find that domestic mergers outperform cross-border mergers both in announcement and post-completion returns for UK acquirers. Moreover, some investigations provide evidence that the long-term performance of acquirers depends on specifications of the acquirer and target countries. Kiymaz and Mukherjee (2000) argue that the impact of cross-border mergers on firm performance varies, depending on the country affiliations of the two merging firms. They also find returns are inversely related to the degree of economic co-movement between acquirer and target countries. Moeller and Schlingemann (2005a) argue that acquirer returns are positively related to takeover activity in the target country and to a legal system offering better shareholder rights.

Relative size of target to acquirer

James and Wier (1987) find a positive relationship between relative size of the target to bidder and acquirer's return in the banking industry. DeLong (2001) finds that the relative size of target to bidder is positively related to the announcement abnormal return of acquirer in the banking industry. In contrast, Gorton et al. (2009) argue that announcement returns to medium-sized acquirers decrease as the relative size of target-to-bidder increases. They also suggest a number of reasons for why we rarely see firms acquire larger rivals. First, a larger acquisition is more difficult to finance. Typically, it is more difficult to raise funds by issuing debt for a larger acquisition. Adding too much debt can extensively

increase the chance of financial distress, and managers of the acquirer avoid this because managers of financially distressed firms are more likely to lose their jobs (Gilson, 1989). On the other hand, acquiring a larger firm with stock dilutes the acquirer's ownership of the combined company and perhaps leads to a loss of control for incumbent management.

Termination fees and lockups

A large number of merger agreements include a target termination fee or a lockup option clause. A target termination (or breakup) fee clause in an acquisition agreement requires the target to pay the bidder a fixed cash fee if the target denies completing the agreed acquisition. Lockup options (lockups) serve a similar role, but in a different form. That is, a selected bidder is granted a call option to purchase a portion of the target stocks or important assets at a discount off the price any competing bidder must pay. On the one hand, in the context of agency costs theory, entrenchment hypothesis presumes that self-interested target managers use termination fees to discourage competing bids and protect deals with one particular bidder in return for benefits such as job security, which consequently results in lower premiums for target shareholders. On the other hand, the shareholder interest hypothesis posits that the termination fees and lockups serve a less exploitative role as contractual devices that efficiently solve contracting problems between parties (Officer, 2003). For example, the bidder deals with the risk of exposing future plans to competing bidders who may offer a higher premium to the target if they get access to the plans of the first bidder. Therefore, target termination fees can protect a bidder's investment and increase their willingness to invest in the acquisition.

Prior studies provide empirical evidence that, on average, acquisition contracts with termination-fees or a lockup option clause have a greater chance of succeeding and involve significantly higher premiums (Burch, 2001; Coates & Subramanian, 2000; Officer, 2003). Burch (2001) finds that bidders in deals with lockup options earn significantly lower announcement returns. However, he suggests that a significant lower return is not the case when the long-term post announcement performance for completed acquisitions by the bidder is considered.

Termination fees and lockup options seem to discourage competition. However, it is also possible for them to benefit target shareholders. In other words, termination fees and lockups can increase target management's bargaining power when negotiating a deal with a bidder. For example, suppose bidder A owns no toehold in the target. If a bidder with a higher valuation appears, bidder A may have little incentive to compete. Because of this possibility, granting an exclusionary lockup option to bidder A can increase the joint gains to trade for the target and bidder A. By eliminating the possibility that bidder A will lose the target, the lockup option increases bidder A's ex ante expected value from signing the merger deal. This value improvement can in theory be split between the target and acquirer through the negotiation process.

2.4.4 Industry Characteristics

Despite the large number of studies on the relationship between corporate acquisition activity and acquirer performance, the role of the external environmental context, i.e. industry and macro-environment, on such a relationship remains underexplored (Wan & Yiu, 2009). However, as systems theory proposes, to have a complete model of investigation the impact of the

external environment should not be overlooked. Prior investigations provide evidence that appropriate timing of acquisition activity is associated with acquirer success. The extant literature suggests that acquisitions occur in waves (e.g. Andrade & Stafford, 2004; Mitchell & Mulherin, 1996). Carow et al. (2004) argue that early-mover acquirers who can capitalise on their superior information in order to identify and/or act upon some initiatives to gain a head start over peer firms at the beginning of merger waves (Lieberman & Montgomery, 1988) capture significant advantages.

Carow et al. (2004) also propose that early-mover acquirers who realize superior stock returns are those that conduct acquisitions during industry expansionary phases. In other words, the firms that undertake acquisitions during growth phases in an industry's life cycle are more likely to improve their performance because of the market growth opportunities that appear in growth periods. On the other hand, a number of studies (e.g. Stimpert & Duhaime, 1997) suggest that firms operating in declining industries are more likely to undertake unrelated acquisition, which as Anand and Singh (1997) argue, are expected to underperform related acquisition. Hence, it can be postulated that post-completion performance of an acquirer is likely to be related to timing of an acquisition over the life cycle of the acquirer and target's industries.

Shahrur (2005) shows that industry concentration impacts total acquisition gains as measured by the combined wealth effects to the acquirer and target shareholders. Gorton et al. (2009) argue that profitability of acquisitions is positively correlated to the ratio of size of the largest firm in the industry to the size of the other firms in the industry. Andrade et al. (2001a) suggest that empirical research on mergers should attempt to control for industry shocks.

Moreover, several studies on merger returns focus on a particular industry. Investigating deals in a particular industry controls for industry-specific factors that could affect returns. For example, DeLong (2001) focuses on banking industry mergers to control for interest rate risk and other bank-related risks.

2.4.5 Macro-Environment Characteristics

The characteristics of target and acquirer's macro-environments are also expected to affect the post-completion performance of acquisitions. Level of market activity, regulations and cultural differences are among factors that have a significant impact on returns from merger activities.

High-market versus low-market

Previous studies show that the acquisitions market is significantly more active when stock markets are booming than when markets are depressed. For example, Jovanovic and Rousseau (2001) show that level of market activity is correlated with the level of market valuation. Bouwman et al. (2009) find that acquirers who buy during high-valuation markets have significantly higher announcement returns but lower long-run abnormal stock and operating performance than those buying during low-valuation markets. Moreover, Rosen (2006) argues that firms announcing an acquisition during a hot acquisition market perform no better in the long-term and possibly worse than those announcing at other times.

Regulatory system

A sizable stream of research suggests that international variation in rules and regulations affects firm value (La Porta, Lopez-de-Silanes, & Shleifer, 1999; LaPorta, Lopez-de-Silanes, & Shleifer, 2008; LaPorta, Lopez-de-Silanes, Shleifer, & Vishny, 2002). Regulations not only influence the market for corporate control,

as discussed in section 2.3.1, but also affect acquisition premium (Palia, 1993) and therefore the division of returns between parties involved in the deal (Daines, 2001).

2.5 Summary

The literature on mergers and acquisitions is extensive. Mergers are one of the most important corporate activities that significantly influence a wide variety of different stakeholder groups. In this section, the main findings and propositions of prior studies are reviewed in detail to create a complete picture of extant literature on mergers and acquisitions. This chapter comprises three sections in which merger waves, causes and consequences of acquisitions and determinants of acquisition performance are discussed.

Main findings and propositions of previous studies in the area of mergers and acquisitions are:

- Merger activity demonstrates a wavy pattern, i.e. mergers are clustered in industries through time.
- The causes suggested for this fluctuating pattern include industry and economy-level shocks, mis-valuation, and managerial herding.
- Market reaction to announcement of acquisitions is, on average, slightly negative for acquirer stocks and significantly positive for target stocks. The combined abnormal return is positive. These findings have been consistent over several decades of investigation.
- The prior research also identifies a number of factors that are related to performance of acquisitions. These factors are categorised and reviewed in five different groups: (1) Acquirer characteristics, (2) Target

characteristics, (3) Bid characteristics, (4) Industry characteristics, and (5) Macro-environment characteristics

The review of extant literature also illustrates a number of issues. Prior research is heavily biased towards gains to acquirers and factors that affect these gains. It is also biased towards finding sources of value creation through mergers despite the fact that several theories suggest that mergers can be value-destroying. In fact, value destruction is often attributed to managers' self-interest (agency problem) and mistakes (hubris). However, the mechanisms through which mergers destroy value are rarely addressed. Aside from that, the possibility of simultaneous creation and destruction of value in acquisitions is not often considered. Finally, after several decades of investigation a key question is not completely answered yet: "what are the sources of value in mergers and acquisitions?"

Chapter 3 Theoretical Model of the Study

3.1 Introduction

This chapter introduces a model for decomposing value effect of mergers. Subsequent chapters use this model to investigate the relative contribution of synergy gains and changes in rate of cost of capital on the total value effect of acquisitions. This chapter also provides theoretical discussions on how acquisitions affect WACC of the combined firm.

3.2 Construction of the model

Miller and Modigliani (1961) show that the value to an acquirer from acquiring an on-going concern can be expressed as the present value of the target's future cash-flows and the discounted growth opportunities the acquisition provides. As long as the expected rate of return on the growth opportunities is greater than the cost of capital, the acquisition creates value and should be undertaken. Conversely, when the expected rate of return on these growth opportunities is less than the cost of capital, the merged entity destroys value and the merger should not take place.

Assuming that a firm has a very long life, the general form of the discounted cash-flow model can be written as:

$$NPV = \lim_{T\to\infty} \sum_{t=0}^{T} \frac{FCF_t}{(1+c)^t} \quad (3.2\text{-}1)$$

Where:

NPV = Net Present Value

$FCF_t = Future\ cash\ flow\ generated\ at\ period\ t$

t = Number of periods that FCF_t is discounted for

T = Total number of periods

c = Cost of capital

Therefore, value of an acquirer before acquisition can be calculated as:

$$NPV_A = \lim_{T\to\infty} \sum_{t=0}^{T} \frac{FCF_{A,t}}{(1+c_A)^t} \quad (3.2\text{-}2)$$

Where:

$FCF_{A,t}$ = Expected future cash flow of target generated at period t

c_A = Cost of capital of acquirer

Net present value of target can be calculated as:

$$NPV_G = \lim_{T\to\infty} \sum_{t=0}^{T} \frac{FCF_{G,t}}{(1+c_G)^t} \quad (3.2\text{-}3)$$

Where:

$FCF_{G,t}$ = Expected future cash flow of target generated at period t

c_G = Cost of capital of target

When acquiring a target, the acquirer's payment as initial investment ($FCF_{P,0}$) consists of current value of the target (NPV_G) plus an acquisition premium (M_D):

$$FCF_{P,0} = NPV_G + M_D \quad (3.2\text{-}4)$$

The future cash flow of the merged firm for each period will be the sum of expected future cash-flows of the acquirer ($FCF_{A,t}$), future expected

cash-flows of the target ($FCF_{G,t}$), and also expected future cash-flows purely associated with the acquisition project ($FCF_{S,t}$), for example, due to synergy effects. On the other hand, cost of capital of the acquirer is subject to change after completion of the deal. Thus, for accurate estimation of net present value, future cash-flows of the merged firm must be discounted at the new rate of WACC (c_P). Therefore, net present value of the merged firm can be calculated as:

$$NPV_P = lim_{T\to\infty} \sum_{t=\mathbf{0}}^{T} \frac{FCF_{A,t}+FCF_{G,t}+FCF_{S,t}}{(1+c_P)^t} - FCF_{P,0} \quad (3.2\text{-}5)$$

Net present value of an acquisition deal (NPV_D) can be calculated as post-acquisition value of the merged firm (NPV_P) minus pre-acquisition value of the acquirer:

$$NPV_D = NPV_P - NPV_A \quad (3.2\text{-}6)$$

Or[5],

$$NPV_D = \left(\sum_{t=0}^{T} \frac{FCF_{A,t}+FCF_{G,t}+FCF_{S,t}}{(1+c_P)^t} - \left(\sum_{t=0}^{T} \frac{FCF_{G,t}}{(1+c_G)^t} + M_D\right)\right) - \sum_{t=0}^{T} \frac{FCF_{A,t}}{(1+c_A)^t} \quad (3.2\text{-}7)$$

Rearranging equation (3.2-7) we have:

$$NPV_D =$$

$$\left(\sum_{t=\mathbf{0}}^{T} \frac{FCF_{S,t}}{(1+c_P)^t} - M_D\right) +$$

$$\left(\sum_{t=\mathbf{0}}^{T} \frac{FCF_{A,t}}{(1+c_P)^t} - \sum_{t=0}^{T} \frac{FCF_{A,t}}{(1+c_A)^t}\right) + \left(\sum_{t=\mathbf{0}}^{T} \frac{FCF_{G,t}}{(1+c_P)^t} - \sum_{t=0}^{T} \frac{FCF_{G,t}}{(1+c_G)^t}\right) \quad (3.2\text{-}8)$$

Combined value of an acquisition is sum of NPV_D and M_D:

[5] For brevity $lim_{T\to\infty} \sum$ is written as $\sum$ hereafter.

$$NPV_D + M_D =$$

$$\sum_{t=0}^{T} \frac{FCF_{S,t}}{(1+c_P)^t} + \left(\sum_{t=0}^{T} \frac{FCF_{A,t}}{(1+c_P)^t} - \sum_{t=0}^{T} \frac{FCF_{A,t}}{(1+c_A)^t}\right) + \left(\sum_{t=0}^{T} \frac{FCF_{G,t}}{(1+c_P)^t} - \sum_{t=0}^{T} \frac{FCF_{G,t}}{(1+c_G)^t}\right) \quad (3.2\text{-}9)$$

Equation 9 shows that the combined value of a merger, i.e. sum of the value effects on acquirer and the target ($NPV_D + M_D$) comprises three components: (1) merger benefits such as synergy gains ($\sum_{t=0}^{T} \frac{FCF_{S,t}}{(1+c_P)^t}$); (2) the difference between pre- and post-merger present value of future cash-flows of the acquirer ($\sum_{t=0}^{T} \frac{FCF_{A,t}}{(1+c_P)^t} - \sum_{t=0}^{T} \frac{FCF_{A,t}}{(1+c_A)^t}$); and (3) the difference between pre- and post-merger present value of future cash flows of the target ($\sum_{t=0}^{T} \frac{FCF_{G,t}}{(1+c_P)^t} - \sum_{t=0}^{T} \frac{FCF_{G,t}}{(1+c_G)^t}$). This model provides a novel framework for analysis of value creation through mergers and suggests variables and parameters that may affect the extent of impact of the deal on the combined value effect of the parties. The next section analyses the model.

3.3 Implications of the model

3.3.1 Synergy gains

Synergy gains are reflected in the model as the component including all changes in future cash-flows of the combined firm that occur due to the acquisition. Prior studies suggest several sources for such changes. Operating cash-flows may increase due to increase in revenues or reduction in production and distribution costs. Theory suggests that this may occur either as a result of efficiency improvements or through

exercise of market power by the merged firm. However, an improvement in market power is not supported by most prior empirical research. Theory also suggests that efficiency improvements might be related to better post-merger governance or eliminating inefficient management. Wang and Xie (2009) find that synergy gains from acquisitions have a positive relationship with stronger acquirer's shareholder rights relative to the target's. They conclude that acquisition of firms with poor corporate governance by well-governed firms creates greater combined value.[6]

Operating cash-flows can also improve because of economies in capital expenditure and decreases in working capital. Devos et al. (2009) show that these types of investment cutbacks have significant impact on operating synergies in mergers. Mergers can also improve future cash-flows of the combined firm by offering new investment opportunities. Wang and Xie (2009) argue that when a bidder with good investment opportunities acquires a target with poor investment opportunities, the combination may create value because after the transaction, the target's assets will be used to exploit the better investment opportunities available to the bidder. John, Litov, and Yeung (2008) suggest that better investor protection could lead corporations to undertake riskier but value enhancing investments. Their argument is consistent with findings of Wang and Xie (2009) regarding the difference between shareholder rights of the acquirer and the target in relation to acquisition synergies.

[6] Better governance can also reduce cost of capital. This issue is discussed in the next section 3.3.2, "Mergers and cost of capital of the combined firm".

Enhancement of operating cash-flows is especially important in the case of related mergers where merging firms are likely to enhance their combined operating income or reduce their operating costs through merging their operational activities. Rhodes-Kropf and Robinson (2008) suggest that similarity and asset complementarity motivate mergers. Hoberg and Phillips (2010) provide evidence that acquiring firms that offer asset complementarities, but are also different from rival firms in the industry, provide significant synergy gains. If present value of future cash-flows generated through such synergies is greater than zero then the merger is value creating, ceteris paribus. However, diversifying mergers are unlikely to reduce operating costs or enhance operating incomes significantly (Maquieira et al., 1998). Thus, in such mergers, this part of the model is negligible. In fact, it is not able to explain value creation through diversifying mergers, which were especially popular in 1960s, where findings of prior empirical studies show that the combined value effects of such mergers are positive as well and even greater (e.g. Bradley et al., 1988). If synergy gains cannot explain acquisition returns completely, then we need to question what the other possible sources of value in mergers are.

3.3.2 Mergers and cost of capital of the combined firm

Holmstrom and Kaplan (2001) point out that leveraged takeovers in the 1980s forced managers to recognize the cost of capital. They argue that it was no longer possible for managers to treat capital as costless because of the strong financial discipline imposed on them by the high amount of debt incurred in the leveraged takeovers during the 1980s. This situation

is in contrast with the perceived cost of capital in firms with a low degree of leverage. Holmstrom and Kaplan (2001) suggest that this change in perception of cost of capital motivated the creation of performance metrics like Economic Value Added (EVA) and Total Business Return (TBR), which measure returns net of the cost of capital. Managers are then monitored and compensated on the extent to which the return on capital exceeds the cost of capital.

Jensen and Ruback (1983) suggest that financial motivations including underutilised tax shields, increased leverage, and other types of tax advantages can drive mergers. Hayn (1989) provides empirical evidence that shows tax attributes of target firms are significant in explaining abnormal returns. She finds that the amount of net operating loss which may be carried forward is the most important tax attribute in tax-free acquisitions during the period 1970-1985[7]. Recently, Devos et al. (2009) report that the interest tax shield accounts for 17% of synergy gains, realized in their sample of 246 large US mergers from 1980 to 2004.

Prior studies focus on leverage and tax benefits of mergers. Using a related but different approach this study analyses the impact of acquisitions on components of WACC including leverage and interest tax shields. This research suggests that a tax shield is only one of the components of WACC that can be affected by merger activity. Mergers'

[7] Tax Reform Act of 1986 strictly restricted the use of net operating loss carry-forwards in mergers which may partially explain the decline observed in combined abnormal returns of mergers reported by studies which investigate post-1986 samples as presented in table 1.1-1.

impact on WACC is complex and the aggregate impact may vary in different acquisitions. In this study WACC is defined as:

$$c = w_d(1 - T)r_d + w_e r_e \quad (10)$$

Where

c = weighted average cost of capital

T = tax rate

w_d = weight of debt

r_d = cost of debt

w_e = weight of equity

r_d = cost of equity

Our model suggests that once an acquisition is completed, net present value of the combined firm is determined through discounting future cash-flows at the rate of WACC of the new combined entity. This new discount rate is different from WACC of the acquirer and the target. It can be affected by leverage ratio of the combined firm, the new tax rate applied to incomes of the firm, revised cost of debt and revised cost of equity. The current reasearch argues that these factors are subject to dramatic changes around mergers and can be very different from that of the merging firms, when it is determined for the resulting combined firm. Consequently, the appropriate discount rate of the discounted cash-flow model for the combined firm is different from the discount rates of the merging firms. This study specifically emphasises the influence of method of payment on WACC of the combined firm.

The magnitude of change in components of WACC may vary across acquisitions and depends on a number of decisions made by acquirers regarding the merger; mainly choice of target and method of payment. Target characteristics such as beta, size and leverage influence WACC of the combined firm. Ceteris paribus, acquiring riskier assets generally increases expected return on equity, and therefore cost of equity capital of the combined firm would be relatively higher than that of the acquirer. Size and leverage of the target firm in conjuction with method of payment affects size of the combined firm and its leverage. The larger the target, the greater either the size of the combined firm or its leverage. Consequently, cost of capital is affected because size and leverage are two determinants of WACC.

Prior studies suggest that characteristics of the acquirer, industry and economy-wide conditions may affect choice of target and method of payment. For example, acquirers prefer targets with similar market-to-book ratios as their own (Rhodes-Kropf & Robinson, 2008). Moreover, smaller firms and firms with lower levels of debt are more likely to be acquired (Garvey & Hanka, 1999). Besides, in choosing a target firm and planning method of payment, acquirers consider current variation from their target leverage (Harford et al., 2009; Uysal, 2011). García-Feijóo, Madura, and Ngo (2012) show that method of payment is affected by industry structure. Moreover, empirical studies suggest that stock payments are more common during high stock valuation periods (Jovanovic & Rousseau, 2001; Maksimovic & Phillips, 2001).

These factors that influence acquirer decisions are related to WACC of the combined firm. Leverage is determined by weight of debt and weight of equity in the capital structure of a firm. Thus, it is affected by changes in either debt or equity. It increases (decreases) with the level of debt (equity) in the capital structure. According to the trade-off theory of capital structure, firms have target debt levels which are reached when they trade off tax benefits of debt financing against financial distress costs (Modigliani & Miller, 1963) and agency costs of debt (Jensen & Meckling, 1976). The current study argues that in the case of acquisitions, target leverage of the combined firm, where WACC is minimized, is not necessarily the same as target leverage of the acquirer. Since method of payment is the most effective tool in hand that can be used to adjust the capital structure of the combined firm, it takes an influential role in determining its WACC and therefore NPV of the acquisition.

When acquisitions are paid by cash, their source of funding is usually either debt or internal financing.[8] This method of payment retires equities of the target firm, and in cases that the source of cash is new debt replaces them with debt for the combined firm.[9] As a result, leverage of the combined firm resides at a higher level compared to that of the acquirer. Stock-paid acquisitions have the opposite impact. They increase the portion of stocks in the combined firm's capital structure. However, that does not necessarily mean that leverage of the combined firm is lower than the acquirer, because the combined firm will still have the debt of the

[8] According to the pecking order theory of capital structure (Myers & Majluf, 1984), firms first use their internal funds for new investments, then they use debt if sufficient internal funds are not available, and if neither internal funds nor debt were available at a reasonable cost, then they issue new equities.

[9] Even when the source of cash funding is internal financing the reduced portion of equity in the capital structure of the combined firm increases the firms leverage.

target firm in its capital structure. In fact, the leverage ratio of the combined firm can be estimated as weighted average of leverage ratios of the acquirer and the target. The mix of payments by cash and stock can tune the impact that the method of payment has on the leverage of the firms. Harford et al. (2009) show that when planning large acquisitions, acquirers take into account their target leverage. When a bidder's debt level is over its target level, the bidder is less likely to finance the acquisition with debt and more likely to finance the acquisition with equity. Their finding supports the propositionregarding the role of method of payment when adjusting capital structure of the combined firm.

Other components of WACC can also be affected by takeovers. Tax rates applied to corporate incomes can make a difference; especially in cases of cross-border mergers where tax rates may essentially vary from country to country and international double taxation increases the amount of tax applied to the combined firm's income. For example, Huizinga and Voget (2009) show that the international tax system systematically affects the choice of parent country in cross-border mergers in a parent-subsidiary relationship framework. In fact, merging firms choose the parent entity in a way that minimizes their international double tax liabilities. Huizinga and Voget's finding emphasizes the fact that tax considerations affect value of acquisitions, and therefore the decisions of acquirers.

Another element of WACC that can be influenced by merger activity is cost of debt. Cost of debt is expected to increase with the level of debt as the credit rating of a firm downgrades with higher risk of default and potentially bankruptcy where the firm is unable to repay its debt to

creditors. That is, debt holders of firms with higher leverage expect higher yields. Therefore, if a merger drives the cost of debt beyond its optimum level, according to trade off theory of capital structure, an acquisition can be value destroying as it increases the cost of capital. Likewise, if it deleverages the combined firm in a way that pushes interest tax shields below the optimum point or increases agency costs of debt to points above the optimum point, it may destroy value as well.

In addition, cost of equity capital, measured as expected return on equity, can be affected by risk factors, such as beta in the capital asset pricing model (CAPM) (Black, 1972; Da, Guo, & Jagannathan, 2012; Lintner, 1965; Sharpe, 1964) and the size and book-to-market ratio (B/M) of a firm (Fama & French, 1992, 1993). Beta, as a measure of relative risk, is a conventional determinant of expected return, i.e. the higher the beta, the higher the expected return. Although, the validity of CAPM in estimation of expected returns on equity of firms has been criticized by several studies, Da et al. (2012) show that the empirical evidence against CAPM based on stock returns does not invalidate its use for estimating the cost of capital for projects when making capital budgeting decisions. A difficulty is that the beta of the combined firm is not immediately available on completion of a merger because historical data on its stock prices do not exist. However, it can be calculated as beta of a pseudo portfolio of the acquirer and the target, i.e. weighted average beta of the merged parties. This can range between betas of the acquirer and the target and typically tends to be similar to that of the acquirer due to its greater weight in the pseudo portfolio.

Size, or market value of equity, is another determinant of expected return. Generally, smaller firms are expected to provide greater returns. The size of the combined firm depends on size of the acquirer, size of the target, and also method of payment. Acquisitions, typically, increase the size of the acquirer. Thus, the return on equity of the combined firm is generally expected to be lower than that of the acquirer. In mixed acquisitions, where payment is made through a combination of cash and stock, ratio of cash-to-stock payment can be used as a tool to adjust the size of the combined firm.

Book-to-market ratio (B/M) is the other factor that is suggested to explain expected return on a firm's equity. Prior investigations suggest that firms with higher B/M typically have greater expected returns. B/M of the combined firm depends on B/M of the acquirer and target and also method of payment. In stock-paid acquisitions both book value and market value of the combined firm can be estimated as sum of the respective values of the acquirer and the target. Nevertheless, since B/M ratios of the parties are normally similar (Rhodes-Kropf & Robinson, 2008) significant differences in B/M between the acquirer and the combined firm are not expected in stock acquisitions. Similar to its effect on size, cash-stock combination determines B/M of the combined firm in mixed-paid acquisitions.

3.3.3 Post-merger NPV of target's cash-flows

Another fact that has received even less attention is that when calculating NPV of mergers, future cash-flows of the target should be discounted at the rate of WACC of the acquirer once the acquisition is complete. If

WACC of the combined firm is greater than WACC of the target then the merger destroys value in this part of the model of this study. In contrast, when WACC of the combined firm is smaller than WACC of the target, the acquisition can be value-creating even in the absence of operating synergies and reduction in WACC of the acquirer. Here again, pre-merger size and leverage of the acquirer and the target, along with method of payment, determine the new appropriate discount rate for future cash-flows of the acquired firm. Lower risk, larger size or lower B/M of the combined firm, compared to the target firm, results in lower cost of equity which in turn enhances the present value of future cash-flows of the target. Likewise, if the target is underleveraged and has unutilised debt capacity, a debt- financed acquisition can utilise this capacity and create value. Moreover, when the target firm is overleveraged, the acquirer can use stock or its cash reserves to retire part of the debt of the acquired firm, resulting in minimum cost of capital of the combined firm and value creation. In this sense, it is possible to create wealth through mergers even without generating synergistic cash-flows. The greater the difference between WACC of the combined firm and the target, the greater the value created in a merger through reallocation of capital. This is consistent with the neoclassical view of mergers which suggests mergers reallocate capital to value enhancing activities.

Counter scenarios are also possible, perhaps due to the agency problem on the acquirer side, or because of mis-estimating the extent of value-creation by the acquirer managers. For example, an incorrect combination of the medium of exchange, unsuitable sources for financing a takeover deal, or selecting a target firm with inappropriate size or leverage -

whatever the underlying motivation - destroys value. If these counter scenarios take place, the acquisition is expected to decrease the value of the prospect cash-flows of the acquired firm. This, in turn, results in lower total value of the acquisition.

Improvement in quality of governance can also reduce cost of capital and result in higher valuation of the prospect cash-flows of the acquired firm. Thus, if the combined firm provides better governance than the acquired firm, and everything else being equal, we expect higher value for its future cash-flows as part of the cash-flows of the combined firm. Prior studies in this area investigate the effect of investor protection on the cost of capital (Castro, Clementi, & MacDonald, 2004; Shleifer & Wolfenzon, 2002). These studies suggest that better investor protection reduces cost of capital. In this sense, acquisition of firms located in countries with poor minority investor protection by firms from countries with strong investor protection decreases cost of capital and creates value. This value cannot be attributed to improvements in operating profits nor to lower cost of capital of the combined firm relative to the acquirer. Such value creations solely result from the difference between cost of capital of the combined firm and cost of capital of the target.

3.4 Summary

This chapter introduced a discounted cash-flow model that decomposes value effect of acquisitions into three components. While one of these components captures synergy gains from mergers, two others detect potential gains that may occur because of the difference between the

WACC of the combined firm and the WACC of the acquirer and the target. It is emphasised that in each given merger, the value of each of the components of the model can be positive or negative. In other words, value can be created or destroyed in each component of the model. Therefore, combined value effect of an acquisition, as a sum of these components, can be positive or negative. This implies that value creation and value destruction can take place simultaneously in an acquisition and the acquisition itself can be value-creating or value-destroying at the aggregate level.

Chapter 4 Data and Summary Statistics

4.1 Introduction

This chapter explains how this study constructed a sample of acquisitions and collected data in order to empirically decompose the value effects of mergers and acquisitions based on the model introduced in chapter 3. The next subsection of this chapter explains how the study sample is constructed. Section 4.3 explains why analyst forecasts are used for estimating implied cost of equity capital of merging firms and synergies created through mergers. Section 4.4 provides information about sources of data. Section 4.5 provides summary statistics for the sample of this study.

4.2 Sample

The list of mergers and acquisitions completed between July 1981 and December 2011 is drawn from the Securities Data Corporation (SDC) Platinum database, initially totaling 4223 acquisitions. The initial sample comprised completed domestic US acquisitions involving public companies listed on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and Nasdaq. From this list, the researcher identifies all completed domestic mergers during 1998–2011 where:

a) both merging firms are listed on Nasdaq, AMEX or NYSE,
b) the acquirer takes over 100% of the target firm (partial acquisitions, sales of subsidiaries, etc. are excluded),
c) the consideration offered includes cash, common or preferred stock, or debt,

d) value of the acquisition is at least $10 million, and

e) the ratio of value of the deal to total book value of assets of the acquirer is greater than 10%.

f) Stock price data and required financial data are available.

This study excludes mergers in regulated industries such as utilities, financial services, and telecommunications, retaining 466 mergers involving industrial firms. It further requires that target, acquirer and the combined firm to be either zero-debt[10] firms or have data for non-convertible corporate bond yields available on Datastream. This restriction limits the number of sample acquisitions to 74. This study chooses a sample of relatively recent acquisitions mainly because corporate bond yields are generally not available for the sample firms prior to 1998. Finally, this study also require the firms to be followed by I/B/E/S. This results in a sample of 68 mergers.

4.3 Using analyst forecasts for estimating implied cost of capital and synergies

Three sources of data have primarily been used in prior research in order to estimate synergy gains from mergers: ex post realized data, management forecasts, and analyst forecasts. In these studies, ex post realized accounting data have been used to detect operating synergies generated in acquisitions. The studies often compare changes in operating performance of the acquiring firm to an industry benchmark to identify abnormal performance related to the acquisition. Extant literature raises two concerns about the accuracy of operating synergies estimated using this method. First, employing a long time series of

[10] We define a firm zero-debt if its market leverage is less than 0.01%.

financial data increases the likelihood that other factors have changed during this period, rendering the estimates noisy. The neoclassical theory of mergers suggests that mergers are often responses to significant changes, such as regulatory and technological changes in the industry conditions (Harford, 2005; Mitchell & Mulherin, 1996). These changes could trigger significant restructuring, and entry and exit of firms, exacerbating concerns about the appropriateness of benchmarks used to estimate abnormal operating performance several years into the future. For example, in case studies of two mergers, Kaplan, Mitchell, and Wruck (2000) provide evidence that traditional measures of operating performance may lead to incorrect inferences about the success of acquisition deals. Moreover, using ex post realized data to estimate operating synergies introduces a survivorship bias. Consistent with the literature of the market for corporate control, Mitchell and Lehn (1990) show that the firms that make value-destroying acquisitions are more likely to become the target of acquisition attempts. Hence, combined firms that emerge from value-creating mergers are more likely to survive. Since employing ex post realized accounting data requires the combined firm to survive for several years after the completion of the acquisition, presence of survivorship bias in such analyses is likely.

Management forecasts are also used by a number of prior studies to estimate the synergy gains through mergers. These forecasts, however, tend to be biased according to the evidence provided by prior research. Two types of error may affect these forecasts. First, selection bias may affect inferences drawn from management forecasts because it is likely that management unveils detailed synergy forecasts only when they are expected to be significantly positive. Consistent with an optimistic bias in management forecasts, Houston, James, and Ryngaert (2001) report 3.15 per cent combined bidder and target abnormal

announcement return for the 41 mergers where managers disclose precise estimates of cost savings and revenue enhancements related to the merger, compared to −0.48 per cent in the other 23 mergers in which no such information is disclosed.

Second, using management forecasts could yield inaccurate synergy estimates if managers manipulate the estimations, using expected operating improvements that may already exist even in absence of the merger, to make the merger look better than it actually is. For example, in the case of the Chase Manhattan-Chemical Bank merger in 1995, $250 million of the forecasted $1.5 billion cost savings was attributed to cost-cutting programmes that were already underway (Houston et al., 2001). Ismail (2011) finds that synergy does not explain the premium paid for mergers, implying that it may have been announced to persuade shareholders to agree with the deal. Devos et al. (2009) also find evidence consistent with management optimistic bias. They find that all the management forecasts of post-merger incremental cash flows in their sample acquisitions were positive. However, they report that classifying mergers into value-enhancing and value-destroying mergers based on Value Line synergy forecasts reveals that in value-destroying mergers, management forecasts are significantly higher than Value Line forecasts in the years following mergers. Nevertheless, in value-enhancing mergers, they do not find a significant difference between Value Line and management forecasts.

In addition to the errors that management forecasts are likely to cause, the forecasts typically provide aggregate predictions about merger synergies that are expected to be realized over a period of time. In such forecasts, details of

individual synergy components and the timing of the synergy gains which are crucial for the purpose of this study are often not reported.

In contrast, as Schwert (2000) suggests, the security analysts' reaction to the acquisition announcement provides an unbiased assessment of acquisition effects by independent parties. Besides, analyst forecasts from I/B/E/S provide one-year and two-year forecasts for a complete set of variables that are required for estimation of the implied cost of equity capital and changes in forecasted cash-flows. In addition, it provides an estimated long-term growth rate which enables us to estimate the required variables in the long term. These long-term estimates are especially necessary in calculation of terminal values of forecasted cash-flows. Analyst forecasts from I/B/E/S are also frequently used by extant literature for estimating the implied cost of equity capital. Therefore, I/B/E/S forecasts enable us to measure the timing and magnitude of all three components of combined value effect of acquisitions for the sample of this study. To analyse combined value effect of acquisitions, I compare the earnings forecasts and WACCs estimated using I/B/E/S forecasts for the individual acquiring and target firms in the month before the month of the acquisition announcement, with the first available forecasts for the combined firm in the month following the month of acquisition. The time gap between these forecasts is typically two months. This short gap in the timing of the forecasts minimizes the concerns regarding survivorship bias and extraneous noise associated with using a long time-series of realized cash flows.

The model suggested in chapter 3 provides a theoretical basis for decomposition of value effects of mergers. For determining the contribution of each component of this model it is necessary to calculate the expected synergy gains as well as the

WACC of the target, the acquirer and the combined firm. In an efficient market, the stock price of a given firm is a precise estimation of the present value of expected future cash-flows of the firm, based on available information. Prior to the merger announcement, stock prices of both the acquirer and the target reflect the available information about their future cash-flows and their WACC. Combined abnormal return to the firms is measured as the weighted average of the abnormal returns to the merging firms, and is attributed to the announcement of the merger. Therefore, combined abnormal return is equal to the difference between present value of the combined forecasted cash-flows of the merging firms prior to the merger announcement and that of the combined firm subsequent to the announcement. I use forecasts immediately before and after the announcement, which are typically only two calendar months apart. This method minimizes the noise caused from other factors affecting the forecasts.

4.4 Data

SDC Platinum provides data on transaction value, method of payment, whether the deal was a tender-offer or not, and announcement and closing dates for mergers. Returns and financial data are from DataStream. I require firms to have book value, earnings, dividends and long-term debt, corporate bond yields, stock prices, and shares outstanding information available on DataStream. The expected future earnings of acquirers and targets are estimated from I/B/E/S analyst forecasts prior to the acquisition announcement. Expected cash-flows of the combined-firm are calculated from the analyst forecasts subsequent to the acquisition announcement.

Figure 4.4-1 Measurements timeline

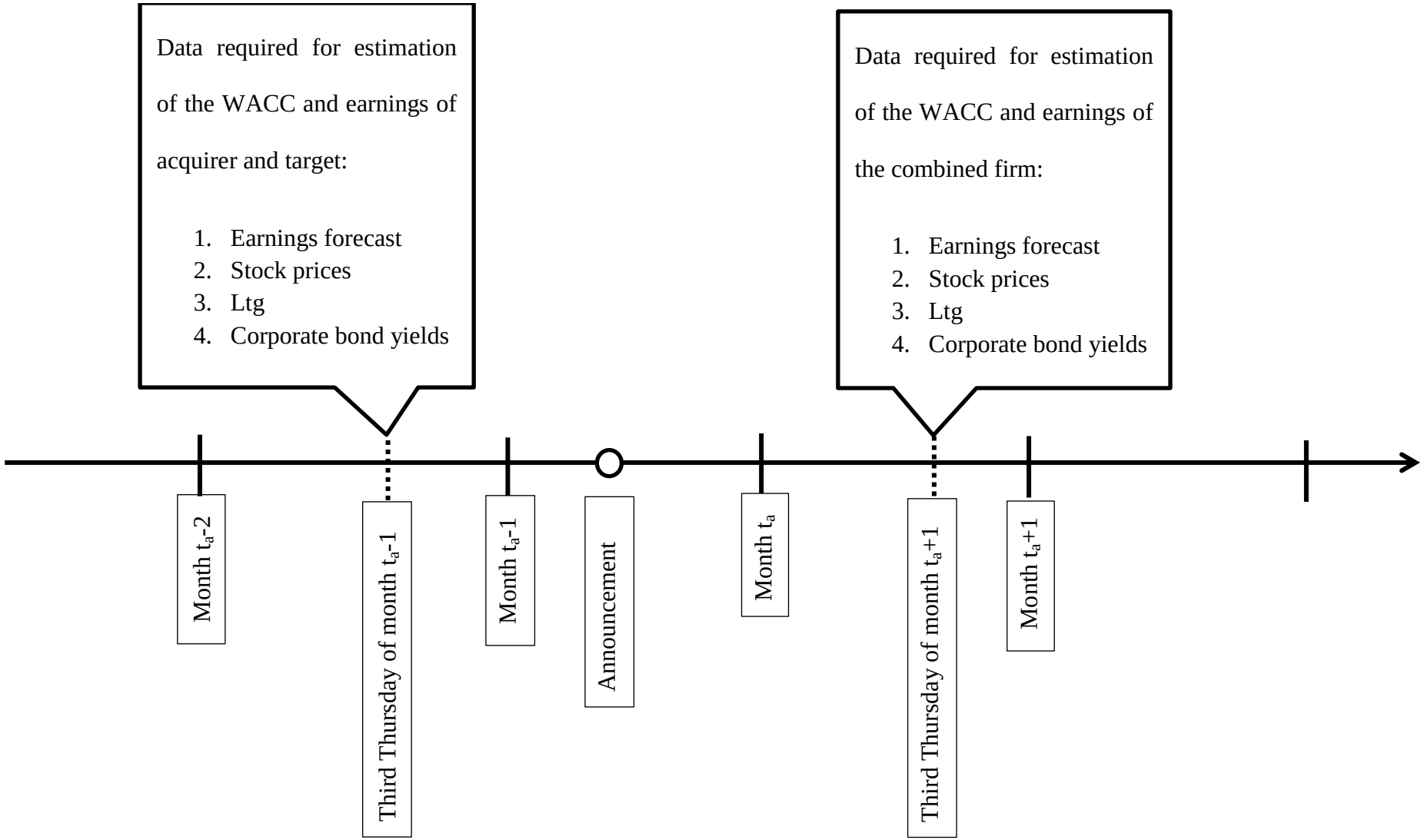


Figure 4.4-1 depicts the timing of data items calculated for estimation of components of the model of this study. Data items for estimation of forecasted earnings and corporate bond yields of acquirers and targets are collected on the third Thursday of the month preceding the month of acquisition. This includes stock prices, earnings forecasts, long-term growth rates (Ltg), and corporate bond yields. Moreover, Data items for estimation of forecasted earnings and corporate bond yields of combined firms are collected on the third Thursday of the month following the month of acquisition.

I estimate implied cost of capital for stand-alone acquirer and target firms from the last available forecast before the acquisition. Moreover, implied cost of capital is estimated for the combined firm using a mean analyst forecast provided for the month subsequent to the month of the acquisition announcement. Implied costs of capital are estimated by substituting the forecasted earnings and book values into equation 5.3.1 and solving the resulting equation for r_e.

4.5 Summary Statistics

Although the sample size of this study is relatively small, it is well distributed across industries and time periods. The sample comprises mergers with acquirers from 24 Fama and French (1997) industry classifications. The target firms in the sample come from 26 different industries. The sample mergers are also well spread through the years of investigation - 1998 to 2011. Panel C of table 4.5-1 reports distribution of sample mergers through time. The first and last sub-period consists of four years, while two other sub-periods comprise three years each. The first sub-period (1998-2001) accounts for 25.7% of the sample and the second

sub-period accounts for 24.3% of the sample. Two other sub-periods account for 29.7% and 20.3%, respectively.

The mean transaction value in the sample of this study is about $6.3 billion. This mean value is greater than mean transaction value of other studies (e.g. Moeller et al., 2004), mainly because this study requires yield to maturity of sample merging firms to be available. This restriction drops mostly smaller acquisitions in which the acquirer or the target is not followed by DataStream's Bonds and Convertibles database. Although the study sample mainly comprises large acquisitions, it also includes smaller acquisitions since the first quartile of transaction value is about $248 million. The mean market value of acquirers and targets calculated on the third Thursday of the month preceding the mergers month are $15.5 and $4.6 billion, respectively. The liquidity ratio measured as cash and short-term investments over total assets is 29% for acquirers and 31% for targets.

Table 4.5-1 Summary Statistics

Panel A: merging firms' characteristics

	Mean	Median	Q1	Q3	# of Observations
Deal Value ($ million)	6,337.874	1,447.515	248.741	4,732.713	68
Acquirer characteristics					
MV ($ million)	15,500	2,629.756	679.162	1,290	68
Leverage (%) (Ex. zero-debt)	22.78	19.03	7.21	35.43	68
Liquidity (%)	29.06	20.83	5.93	50.51	68
BTM of equity	0.52	0.42	0.16	0.61	68
Target characteristics					
MV ($ million)	4,678.197	913.121	164.736	4,194.273	68
Leverage (%) (Ex. zero-debt)	29.89	24.74	14.25	36.57	68
Liquidity (%)	31.41	22.41	4.20	53.14	68
BTM of equity	0.59	0.37	0.20	0.69	68

Liquidity is measured as cash and short-term investments over total assets. Leverage is measured as the ratio of long-term debt to common equity.

Panel B: Characteristics of sample mergers

	% Yes	% No
All-cash	27.9	72.1
Diversifying merger	42.6	57.4
Tender offer	10.8	89.2
Zero-debt acquirer	35.3	64.7

Panel C: Distribution of sample through period of investigation

Period	1998-01	2002-04	2005-07	2008-11
% in period	25.7	24.3	29.7	20.3

Book-to-market ratio (BTM) of equity is 0.52 for acquirers. This is comparable to 0.55 and 0.50 bidders' BTM of equity reported in Moeller et al. (2004) and Devos et al. (2009). Moreover, BTM of equity of the sample targets in this study is 0.59 which is similar to 0.61 in the study by Devos et al. (2009). Mean leverage of non-zero-debt acquirers and targets are 22.8% and 29.9%, respectively. All-cash acquisitions account for 27.9 % of the sample while 72.1% of acquisitions in the sample of this study are paid by stocks or a mix of cash and stocks. Related mergers, identified based on a 4-digit SIC industry classification, account for 57.4% of the sample. On the other hand, 42.6% of the sample of this study consists of diversifying acquisitions. An acquisition is defined as related when both acquirer and target firms are from same 4 digit SIC code industry, otherwise it is defined as diversifying. Furthermore, while 10.8% of acquisitions are tender offers, 89.2% of the sample are negotiated mergers. Finally, 38.2% of acquirers are zero-debt firms and 61.8% of acquirers are leveraged firms. This sample characteristic is different from samples in other studies on mergers and acquisitions, again mainly because of the unavailability of cost of debt for leveraged firms. This increases the relative proportion of mergers by zero-debt firms in the sample. The impacts of this observation on the results of this study are further discussed in empirical findings of chapter 6.

Chapter 5 Research Method

5.1 Introduction

This chapter provides details of the study method. In order to break down the combined value effect of an acquisition to its components, as suggested by the equation 3.2-9, synergy effects, and the WACCs of the acquirer, target and combined firm are all required. This chapter discusses how each of these elements, the three components of equation 3.2-9 and the total value of acquisition (TVA) are estimated. Factors that may affect TVA and its components, and the method of analysis are also discussed. Section 5.2 explains the method of calculation of synergy gains from mergers. Section 5.3 discusses the method of calculation of the WACC as a weighted average of cost of debt and cost of equity. Methods of estimation of cost of debt and cost of equity are also talked over in separate subsections. Furthermore, this section discusses differences between the WACCs of the combined firm and the acquirer and the differences between the WACCs of the combined firm and the target. Section 5.4 explains the method of calculation of the TVA and breaks down TVA into its comprising components. Section 5.5 discusses the factors that are likely to impact TVA and its components and provides details of the tests used to identify such impacts. Section 5.6 discusses combined announcement abnormal returns and their relationship with TVA.

First, synergy gains are calculated. Then the WACCs of the individual acquirer and target firms and the combined companies are estimated. The investigation shows that WACCs of the combined firms are significantly different from those of the acquirer and the target. Then, calculated synergy gains and estimated WACCs

are applied to equation 5.4-1 in order to estimate TVA for each sample acquisition. We also divide total value effect of acquisition into its components: earnings synergies, WACC synergies for the acquirer, and WACC synergies for the target. Then we examine the relationship between calculated TVAs and combined announcement returns of the merging firms. Finally, cross sectional tests are employed to explore the association of estimated TVAs and their components with firm and deal characteristics that are suggested to affect value of acquisitions.

This study uses the mean I/B/E/S forecasts for stand-alone acquirer and target firms prior to the acquisition and forecasts for the combined firm in the month subsequent to the acquisition' month in order to estimate changes in forecasted earnings that occur following an acquisition. These forecasts are also used to estimate the WACC of the firms prior and subsequent to acquisitions. Since I/B/E/S forecasts are typically one month apart, any change in the forecasts can be attributed to the impact of the acquisition. Although other factors that affect the forecasts may add noise, these noises should not make a bias when averaged across the sample (Devos et al., 2009). The forecasts are extracted for forecasted earnings per share (FEPS) of fiscal year 1 and fiscal year 2 and also for long-term growth rate (Ltg) from I/B/E/S. The values of FEPS are then estimated for the intervening years using long-term growth rates provided by I/B/E/S.

5.2 Earnings forecasts changes subsequent to acquisitions

There are three sets of forecasts for each acquisition, including two sets of forecasts prior to the acquisition for the acquirer and the target, and one set of forecasts for the combined firm subsequent to the acquisition. These sets of

forecasts are used to estimate changes in expected earnings following an acquisition from equation 5.2-1. Changes in expected earnings of each year ($FE_{OS,t}$) are measured as the difference between the sum of forecasted earnings for the acquirer and the target before the acquisition $\left(FE_{A,t} + FE_{G,t}\right)$ and forecasted earnings of the combined firm subsequent to the acquisition ($FE_{P,t}$), where the two analyst forecasts are two months apart. Forecasted earnings (*FE*) of a firm are defined as the number of shares outstanding for that firm multiplied by their FEPS. FE of the combined firm is estimated as FE of portfolio of the acquirer and the target subsequent to an acquisition announcement.

$$FE_{OS,t} = FE_{P,t} - \left(FE_{A,t} + FE_{G,t}\right) \quad (5.2\text{-}1)$$

Equation 3.2-9 suggests that the appropriate discount rate for the changes in expected cash-flows that take place because of the acquisition is the WACC of the combined firm rather than the WACC of the acquirer prior to the merger. Consistent with this notion, this study estimates the present value of such changes in cash-flows by using the WACC rate of the combined firm. The method for WACC estimation is discussed in section 5.3.

5.3 WACC differences

5.3.1 Details of calculation of weighted average cost of capital

Examining the effect of WACC on the combined value of acquisitions is an important question of this study. In this study, WACC is calculated as a sum of weighted after-tax cost of debt and weighted cost of equity. Prior studies use corporate bond yields as a proxy for the cost of debt. Consistent with this idea, pre-acquisition cost of debt for the acquirer and the target is measured as the

weighted average of the yields on corporate debt issues prior to announcement of the acquisition where the weights are market values of the bonds. Similarly, post-acquisition cost of debt of the combined firms is measured as the weighted average yields on a portfolio of acquirer and target debt issues subsequent to announcement of the acquisition.[11] The cost of debt is then adjusted to an after-tax measure by multiplying it by (1- T_{avg}), where T_{avg} is the tax rate equal with 35%. Finally, this research follows recent literature on implied cost of capital to calculate the cost of equity. The details of calculation of implied cost of equity capital is provided in section 3.2.2 of chapter 3.

The weight of each component of the WACC for both acquirer and target is calculated as the relative percentage of a firm's capital structure; that is debt or equity at the end of the fiscal year prior to the year of merger announcement. Likewise, the weight of each cost of capital measure for the combined firm is calculated as the relative percentage of a firm's capital structure - that is debt or equity at the end of the year of acquisition announcement. Specifically, for stand-alone acquirer and target firms, firms' debt is calculated as the level of long-term debt at the end of the year prior to the year of acquisition. Moreover, combined firms' debt is calculated as the level of long-term debt at the end of the year of acquisition. Further, firms' equity is calculated as the market value of equity at the end of the year prior to the year of acquisition for stand-alone target and acquirer firms, and combined firms' equity as the market value of equity at the end of the year of acquisition. We then multiply the after-tax cost of debt estimate by the relative percentage of debt in the firm's capital structure (i.e., firms' debt divided by the sum of firms' debt and equity). Similarly, we weight the cost of equity

[11] Credit ratings do not incorporate information that is priced by debt markets (Campbell et al., 2012). Therefore, they are not appropriate proxies for cost of debt.

estimate by the relative percentage of equity in the firm's capital structure (i.e., firms' equity divided by the sum of firms' debt and equity).

5.3.2 Implied cost of equity capital

Conventional methods of estimation of cost of capital use the CAPM and Fama and French (1992, 1993) three factor model (FF3F) and ex post realized returns to estimate the unobservable ex ante expected returns. These methods are supported by the argument that in an efficient market where risk is priced appropriately, the average realized returns should be an unbiased estimator of ex ante expected returns. However, even in an efficient market, this argument is not necessarily correct. For example, Miller (1977) points out that in a market with heterogeneous expectations and short-selling constraints, ex post mean returns reflect the expectations of a minority of most optimistic investors about a stock, rather than the expectations of the average investor. In addition, empirical tests of the CAPM and FF3F show that these estimates of cost of capital are not accurate. Fama and French (1997) suggest that difficulties in identifying the right asset pricing model, imprecision in the estimates of factor loadings and inaccuracies in the estimates of factor risk premia are three potential problems that make the expected returns calculated by these models inaccurate.

The case is even more complicated when these models are applied to estimate the cost of equity capital of the firms involving merger activities. The neoclassical theory of mergers suggests that industry shocks such as economic shocks, deregulations, and emergence of new technologies and new financing methods drive merger waves (Harford, 2005; Mitchell & Mulherin, 1996). These shocks make severe changes in the industry environment and consequently increase uncertainty (Duchin & Schmidt, 2012; Gort, 1969). Since the new business

environment is different from what is experienced previously, ex post realized risk factors are not precise estimators of corporate risk under new industry conditions. In addition, the combined firm may have different risk factors than those of the acquirer and the target. For example, beta, size and leverage of the combined firm are likely to be different from the relative factors of the acquirer and the target prior to the acquisition. These factors are not estimable for the combined firm based on ex post realized data because there is no historical data available for it. Hence, these abrupt changes in the risk factors make ex post estimates of cost of capital even more imprecise.

Gebhardt et al. (2001) propose a method based on the residual income model for calculating implied cost of capital as an alternative solution. They argue that if the market consistently assigns a higher or lower discount rate to certain firms and industries, these relationships should be exploited to derive a cost of capital estimate for valuation and investment purposes. They also provide empirical evidence which supports this argument. An important advantage of this approach is that, in contrast with conventional asset pricing models, it does not rely on ex post realized returns. This is especially important when investigating value effects of acquisitions where the cost of capital of the combined firm is not precisely estimable based on ex post return data due to the problems discussed in preceding paragraphs. In fact, this characteristic of the implied cost of capital approach resolves the problems faced when estimating the appropriate cost of capital at which the forecasted cash-flows of the firms should be discounted around mergers.

Other researchers also suggest a variety of methods for estimating implied cost of capital. For example, Easton, Taylor, Shroff, and Sougiannis (2002) propose a

method for simultaneous calculation of implied cost of capital and the rate of growth that is implied by the market prices, book values and forecasts of earnings. However, evidence on the relationship between a firm's risk, measured as its market beta, and implied cost of capital estimated by using different methods suggested in extant literature, is mixed. While a number of studies find a positive relationship between the implied cost of capital and market beta (Botosan, 1997; Easton & Monahan, 2005; Gode & Mohanram, 2003; Kaplan & Ruback, 1995), others report an insignificant relationship (Gebhardt et al., 2001; Lee, Ng, & Swaminathan, 2009). Still some other studies suggest that implied cost of capital is more closely related to stock return volatility than to beta. Botosan and Plumlee (2005) report that a number of implied cost of capital measures are significantly related to firm risk, while others are not. Botosan and Plumlee (2005) assess the usefulness of five measures of implied cost of capital based on their ability to capture the cross-sectional relation between expected returns and risk. They suggest that some of these measures are related to firm risk while others are not. Pastor, Sinha, and Swaminathan (2008) undertake a similar approach and assess implied cost of capital based on its ability to detect the time series relation between expected returns and risk. They suggest that implied cost of capital measured by methods of either Gebhardt et al. (2001), or Easton et al. (2002), can effectively capture this relationship and therefore is "quite useful". Based on these findings of prior studies this study mainly uses the method proposed by Gebhardt et al. (2001) to calculate implied cost of equity capital.

5.3.3 Details of calculation of implied cost of equity capital

This study uses I/B/E/S analyst forecasts to estimate the implied cost of equity capital (r_e) for acquirer and target prior to acquisition, and for the combined firm

subsequent to acquisition. Then these implied cost of equity measures are used to calculate WACCs of the acquirer, the target and the combined firm. Subsequently, these WACCs are used to estimate the impact of capital synergies and cash-flow synergies on the acquisition value effect. Moreover, the combined value effect of mergers is estimated as the sum of the abnormal returns to the acquirer and the target around the announcement of the acquisition. An OLS model is then used to estimate the significance of impact of each of these components on the combined value effect of acquisition.

Pastor et al. (2008) show that implied cost of equity measures capture time variation in expected stock returns better than that ex post realized returns do. This study follows them and uses the Gebhardt et al. (2001) model to estimate implied cost of equity capital. The model equates market value of equity of the firm to its discounted future cash-flows. The implied cost of equity capital is the discount rate at which the present value of future cash-flows of the firm is equal with its current market value. This study follows Campbell, Dhaliwal, and Schwartz (2012) and uses analyst forecasts of firm's earning per share to estimate future cash-flows, and then solves equation (5.3-1) below for the discount rate, r_e.

$$P_t = B_t + \frac{FROE_{t+1} - r_e}{1 + r_e} B_t + \frac{FROE_{t+2} - r_e}{(1+r_e)^2} B_{t+1} + TV \qquad (5.3\text{-}1)$$

Where

P_t = price per share of common stock,

B_t = Book value at the end of year t divided by the number of common shares outstanding at the end of year t,

r_e = the implied cost of equity

$FROE_{t+i}$ = forecasted return on equity for year t + i. For years 1-3, this variable is equal to $FEPS_{t+i}$ /B_{t+i-1}. Beyond year 3, $FROE_{t+i}$ is a linear interpolation to the industry median ROE. Industry median ROE is defined as the moving median ROE for the prior 5–10 years for the firm's industry (excluding loss firm-years). Industries are defined using the 48 classifications in Fama and French (1997).

$B_{t+i} = B_{t+i-1} + FEPS_{t+i} - FDPS_{t+i}$, where $FDPS_{t+i}$ is the forecasted dividend per share for year $t + i$, estimated using the current dividend payout ratio (k). Specifically, we assume $FDPS_{t+i} = FEPS_{t+i} \times k$,

For any Horizon T, the terminal value is calculated as:

$$TV = \sum_{i=3}^{T-1} \frac{FROE_{t+i} - r_e}{(1+r_e)^i} B_{t+i-1} + \frac{FROE_{t+T} - r_e}{r_e(1+r_e)^{T-1}} B_{t+T-1} \quad (5.3\text{-}2)$$

The last I/B/E/S data available before the acquisition announcement is used to estimate implied cost of capital for a given acquirer or target firm. Besides, the first I/B/E/S data available after the acquisition announcement is used to estimate implied cost of equity for a given combined firm.

This study follows Gebhardt et al. (2001) and estimates FROEs and future book values as follows. Earnings forecasts are extracted from I/B/E/S for the next three years. I/B/E/S analysts provide one-year-ahead ($FROE_{t+1}$) and two-year-ahead ($FROE_{t+2}$) EPS forecasts well as a long-term growth rate (Ltg). This study uses Ltg to estimate EPS forecast for the third year: $FROE_{t+3} = FROE_{t+2}(1 + Ltg)$. The mean of the analysts' EPS and Ltg forecasts are used for the estimations in this study. Theses earnings forecasts are then used in conjunction with the dividend pay-out ratios to generate explicit forecasts of future book values and ROEs. A clean surplus accounting approach is used for this purpose where all gains and

losses influencing book value are included in earnings. On this basis, the change in book value from period to period is calculated as earnings minus net dividends ($b_t - b_{t-1} = NI_t - D_t$).

To calculate future book values or free cash-flows, an estimate of the expected proportion of earnings that is paid out as dividends is required. This ratio is calculated as actual dividends from the most recent fiscal year divided by earnings over the same time period. [12] For firms experiencing negative earnings, the pay-out ratio is estimated as dividends paid divided by 0.06 × total assets. The pay-out ratios of less than zero are assigned zero and those greater than one are assigned one. Future book values are then calculated as follows: $B_{t+1} = B_t + NI_{t+1} \times (1-k)$, where k is the dividend pay-out ratio.

The discount rate estimated by using this method is my main measure of implied cost of equity capital. This discount rate is estimated for the acquirer and the target using market value and analyst forecasts prior to the acquisition announcement to calculate their implied cost of equity capital. Moreover, market value of the combined firm and its forecasted future cash-flows subsequent to announcement of the deal are used to estimate the implied cost of equity capital of the combined firm. These estimated measures are then used to calculate the relevant WACCs.

5.3.4 The cost of debt of acquirers, targets, and combined firms

The cost of debt of the acquirer is estimated as the weighted average of yields on a portfolio of bonds of the acquirer on the third Thursday of the month preceding the acquisition announcement, where the weights are market values of the bonds. Similarly, the cost of debt of the target is calculated as the weighted average of

[12] Share repurchases are excluded due to practical problems discussed in Gebhardt et al. (2001).

yields on a portfolio of bonds of the target on the third Thursday of the month preceding the merger announcement. The cost of debt of the combined firm is estimated as weighted average yield of a portfolio of bonds of the acquirer and the target on third Thursday of the month following month of a merger. Third Thursday of each month is the day on which I/B/E/S analyst forecasts are available. Yields from third Thursday of a month are used to assure that our measures of cost of debt and implied cost of equity are consistent.

5.4 Measuring total value effect of acquisitions

This study collects three sets of I/B/E/S forecasts for each sample acquisition, including two sets for pre-merger individual acquirer and target firms and one set of analyst forecasts for the combined firm. These forecasts are then used to estimate the implied cost of equity for each firm. The estimated implied cost of equity is used along with an up-to-date yield to maturity of long-term debt to calculate WACC of each firm as discussed in section 3.3 of chapter 3. Subsequently, net present value (NPV) of I/B/E/S forecasted earnings are calculated by discounting them at the rate of respective estimated WACC. Finally, equation 5.4-1 is used to calculate the total value effect of an acquisition (TVA):

$$TVA =$$

$$\sum_{t=\mathbf{0}}^{T} \frac{FE_{OS,t}}{(1+c_P)^t} +$$

$$\left(\sum_{t=\mathbf{0}}^{T} \frac{FE_{A,t}}{(1+c_P)^t} - \sum_{t=0}^{T} \frac{FE_{A,t}}{(1+c_A)^t}\right) +$$

$$\left(\sum_{t=\mathbf{0}}^{T} \frac{FE_{G,t}}{(1+c_P)^t} - \sum_{t=0}^{T} \frac{FE_{G,t}}{(1+c_G)^t}\right) \qquad (5.4\text{-}1)$$

This research uses a 12-year time horizon for estimation of TVA and its components. Although using the last forecast reports for the merging firms prior

to the merger for value estimations is plausible, identifying appropriate forecast reports for the combined firm is not as straightforward. The reason being it may take a few months for the merging firms to close a deal. The probability of factors other than the acquisition impacting on analyst forecasts increases with the time distance between the announcement date and the closing date of a merger. Therefore, post-completion analyst forecasts may become too noisy, being affected by industry-wide changes or other firm-level plans. On the other hand, first post-announcement analyst forecasts provide relatively precise estimations of expected changes in future cash-flows and cost of capital. Therefore, to minimise the noise when estimating value effects of mergers this study uses first post-announcement analyst forecast for a portfolio of the acquirer and the target as a forecast for the combined firm. .

5.5 Factors affecting the components of combined value of mergers

Prior research suggests that a number of deal and firm characteristics influence abnormal returns of mergers. Main factors suggested by extant literature include method of payment (e.g. Loughran & Vijh, 1997; Moeller et al., 2004; Travlos, 1987; Uysal, 2011), size of the acquirer (Moeller et al., 2004), relative size of the merging firms (DeLong, 2001; James & Wier, 1987), value of the deal (Moeller et al., 2005), B/M ratio of equity of the acquirer (Rau & Vermaelen, 1998; Sudarsanam & Mahate, 2003), the industry-diversifying nature of the deal (Graham et al., 2002), whether the acquisition is domestic or cross-border (Moeller & Schlingemann, 2005b), level of leverage of the merging firms (Morellec & Zhdanov, 2008), whether the acquisition is a tender offer or a merger (Loughran & Vijh, 1997; Walker, 2000), level of bidding competition (Bradley et

al., 1988; Limmack, 1993), bidder's toehold (Betton & Eckbo, 2000), and termination fees and lockup contracts (Burch, 2001; Coates & Subramanian, 2000; Officer, 2003). This study distinguishes between those firm and deal characteristics that can contribute to the TVA of acquisitions and those that determine how the generated TVA is divided between the parties. Our criterion for this separation of the factors is whether or not they can affect at least one of the components of TVA as are expressed in equation 5.4-1. This study further examines factors that are likely to affect TVA and look for variables that can explain TVA and/or its components. The impact of these factors on TVA and its three components are tested. If market reaction to an acquisition announcement is related to TVA, then one expects to find evidence consistent with the studies that investigate the impact of these factors on the abnormal acquisition returns.

Other characteristics of acquisition deals that are known to be able to explain the division abnormal returns are not likely to have an impact on TVA as they are basically theoretical explanations for how an acquirer can take a bigger part of the TVA cake. For example, in a hostile multi-bidder acquisition it is likely that all generated TVA goes to the target firm as suggested by the perfectly competitive acquisition market hypothesis (Mandelker, 1974). In contrast, in a solo-bidder friendly merger, the acquirer may retain a considerable part of the TVA, especially if an agency problem is present on the sell-side.

It is well documented that size, measured as market value of equity, book-to-market ratio of equity and leverage of a firm, explain a major part of expected returns on the firm's debt and equity (Fama & French, 1992; 1993, among others). As is discussed in section 5.3.2, historical relationships between return and size or B/M of equity of the acquirer do not provide precise estimations of expected

returns of the combined firm because the characteristics of the combined firm can be severely different from those of the acquirer. However, size and B/M ratio of equity of the merging firms and the combined firm are related to TVA. These relationships are multidimensional and complex. Size of the merging companies may affect operating synergies from mergers, i.e. the larger the merging firms the greater the potential operating synergies, in presence of industry-relatedness, similarity and asset complementarity (Rhodes-Kropf & Robinson, 2008). Besides, these factors determine cost of debt and cost of equity of the acquirer and the target. These measures of cost of capital along with leverage of these firms determine their WACCs.

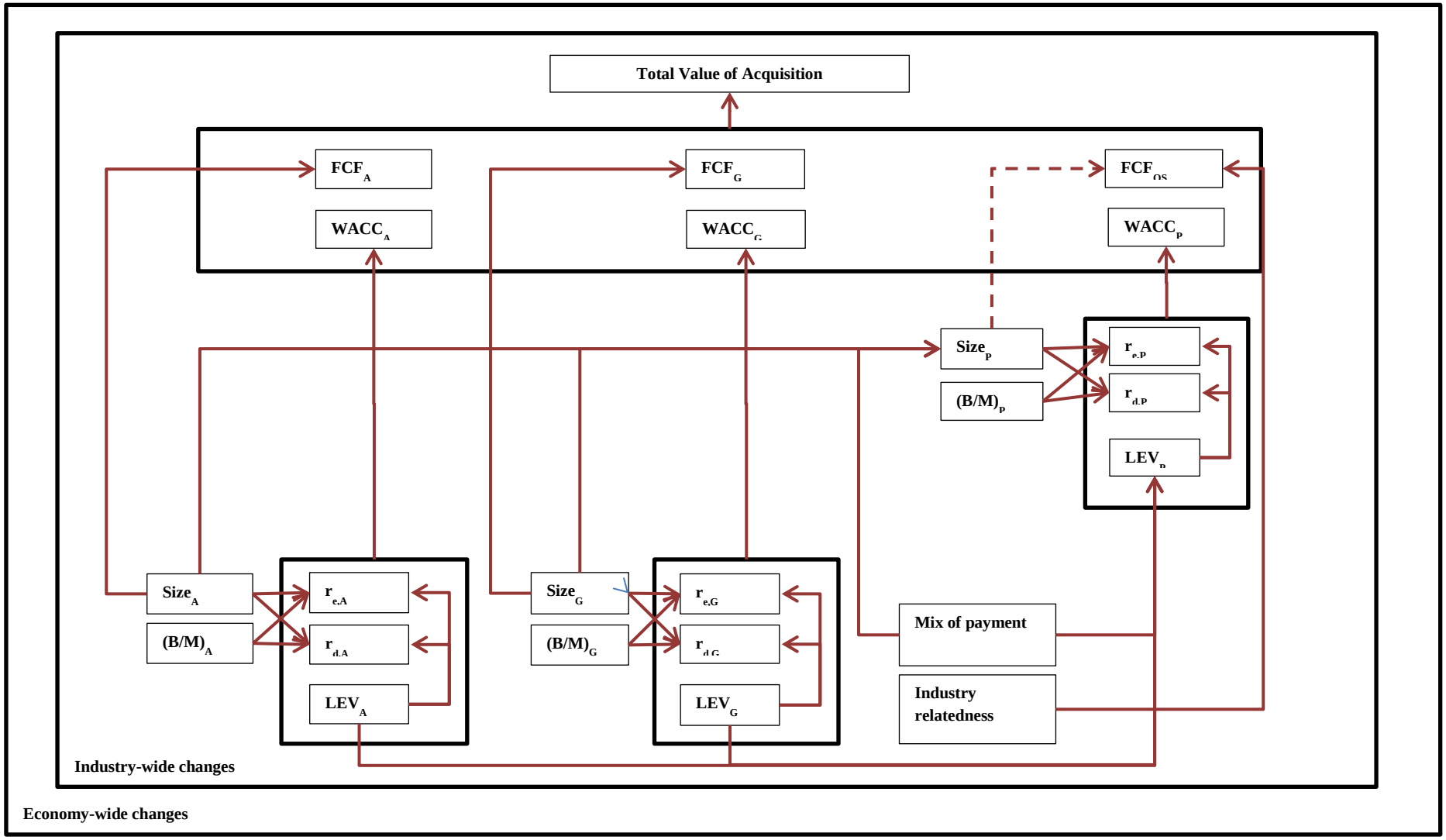
Aside from that, as discussed in chapter 3, the role of market value of equity (i.e. size) and leverage of the merging firms and method of payment in determining financial leverage of the combined firm is important. Moreover, size and book-to-market ratio of the combined firm are two important determinants of cost of debt and cost of equity. These capital costs in combination with leverage of the combined firm determine the combined firm's WACC. Finally, WACC of the combined firm and WACCs of the merging firms, in conjunction with operating synergies from an acquisition, determine TVA as calculated by equation 5.4-1.

Value of transaction is also shown to explain acquisition returns (Moeller et al., 2005). I decompose value of transaction into two parts: (a) pre-merger market value of equity (i.e. size) of the target, and (b) acquisition premium. These two parts of the transaction value impact leverage of the combined firm. Additionally, they are determinants of the size of target and size of the combined firm. These factors, in conjunction with other factors that have been discussed previously, ultimately determine TVA. Therefore, it is plausible to examine value components

of the deal as determinants of TVA. Figure 5.5-1 depicts how characteristics of an acquisition deal, such as method of payment, industry-relatedness and acquisition premium, along with firm characteristics, such as size, B/M of equity and leverage, can affect combined value effect of acquisitions. This discussion sheds light on the mechanisms through which acquisitions are affected by a number of factors that are distinguished by prior research.

Industry related acquisitions can provide greater operating synergies through reduction of operating costs and improving efficiency. On the other hand, diversifying acquisitions may reduce cost of capital of the combined firm. Hann et al. (2013) find that diversified firms have a lower cost of capital than comparable portfolios of standalone firms. They also find that the reduction in cost of capital is strongly associated with the correlation of business unit cash-flows. Therefore, diversification can reduce cost of capital of the combined firm because acquiring target firms from other industries that provide imperfect cash-flow correlations with the acquirer's industry, causes a "coinsurance effect". Hence, related and diversifying acquisitions can be both potentially value-creating and value-destroying. However, actual value effects will depend on the extent to which synergistic cash-flows and the WACC are affected by an acquisition deal.

Figure 5.5-1 Factors influencing total value of acquisitions



5.6 Combined announcement returns

We follow Bradley et al. (1988) and calculate combined acquisition return as the weighted average of announcement returns for the acquirer and the target. The announcement abnormal returns are calculated over a 21-day window using the market adjusted abnormal returns. We expect the level of corporate risk to be largely affected by the acquisition announcement. Hence, using a market model or the CAPM for estimating the abnormal returns will be spurious as these models are based on the historical data and are essentially insufficient for estimation of the expected returns. Although the choice of method does not significantly affect the results of the estimations (Brown & Warner, 1985), this study uses the simpler market adjusted returns method because it is not based on the historical returns of the acquirer or the target.

5.7 Value-creating mergers versus overvalued stocks

In the absence of payments by over-valued acquirer stocks we expect three components of equation 5.4-1 to explain total value effect of acquisitions. However, if, as the theory of market-driven mergers suggests, overvalued stocks are used as medium of exchange in acquisition deals, then we expect the relationship between TVA and combined abnormal returns to be weak.

Stock-paid acquisitions that are undertaken by highly valued acquirers are more likely to be market-driven mergers (Devos et al., 2009). Therefore, this study identifies a merger as a market-driven acquisition (MDA) if at least 50% of value of the acquisition is paid by stocks and the acquirer's BTM ratio is in the bottom one-third. Moreover, if combined market reaction to the merger announcement

reflects factors other than value creation, the relationship between the TVA and the combined abnormal returns is expected to be weaker for market-driven acquisitions.

An ordinary least square (OLS) regression is used in this study in order to estimate the relationship between combined abnormal announcement returns (RTRN) and the TVA. The dependent variable in this regression is the combined abnormal announcement return. The explanatory variables are two interaction terms: TVA × MDA and TVA × NonMDA. TVA is estimated by equation 5.4-1. MDA takes the value of 1 for market-driven acquisitions and 0 for other acquisitions. Conversely, NonMDA takes the value of 1 for other acquisitions and 0 for market-driven acquisitions. MDA and relative size (RelSize) are included as control variables. The variables are winsorized at 1% and 99% to prevent distortions by outliers.

5.8 Diversifying mergers and components of TVA

This study also investigates whether the relationship between components of the TVA and abnormal announcement returns is different for related and diversifying acquisitions. As discussed in section 2.4.3 of chapter 2, diversifying mergers are expected to reduce the WACC because of a coinsurance effect that reduces risk of the combined firm compared to risks of stand-alone acquirer and target firms. Therefore, diversifying mergers are expected to demonstrate a stronger relationship with the components of TVA that capture differences between the WACC of the combined firm and those of the acquirer and target. An acquisition is classified as diversifying in this research when the acquirer and the target are not from the same Fama and French (1997) industry.

An OLS regression is used in order to estimate the relationship between combined abnormal announcement returns (RTRN) and the component of TVA that captures value effect of the difference between the WACCs of the combined firm and the acquirer. The dependent variable in this regression is the combined abnormal announcement return. The explanatory variables are two interaction terms: CAW × DIV and CAW × NonDIV. CAW is estimated as the change in present value of future earnings of the acquirer that takes place merely because of a change in the WACC and is a part of equation 5.4-1. DIV takes the value of 1 for diversifying acquisitions and zero for non-diversifying acquisitions. Conversely, NonDIV takes the value of 1 for non-diversifying acquisitions and 0 for diversifying acquisitions. DIV and relative size (RelSize) are included as control variables.

Another OLS regression is employed to investigate the relationship between combined abnormal announcement returns and the component of TVA that captures value effect of the difference between the WACCs of the combined firm and the target firm. The dependent variable in this regression is again the combined abnormal announcement return (RTRN). The explanatory variables are two interaction terms: CTW × DIV and CTW × NonDIV. CTW is estimated as the change in present value of future earnings of the target that occurs purely because of a change in the WACC. CTW is a part of equation 5.4-1. DIV takes the value of 1 for diversifying acquisitions and 0 for non-diversifying acquisitions. On the contrary, NonDIV takes the value of 1 for non-diversifying acquisitions and 0 for diversifying acquisitions. Here again, DIV and relative size (RelSize) are included as control variables. In all regression estimates, the variables are winsorized at 1% and 99% to prevent distortions by outliers.

5.9 Measuring cost of equity of merging firms and the combined firm using CAPM

This study also uses CAPM to estimate an alternative cost of equity measure for acquirer, target and the combined firm and then repeats all univariate and multivariate analyses described above. The study further compares the results of two alternative methods of estimating the cost of equity to provide insights how analyses from analyst forecasts may differ from an asset pricing model that has roots in the finance literature. First, this study estimates 5-year beta of acquirer and target using monthly returns and S&P 500 Composite Index. The beta of the combined firm is computed in three steps. First, the unlevered betas for acquirer and target are estimated using equation (5.9-1):

$$Unlevered\ Beta = \frac{Current\ Beta}{1 + (1 - Tax) \times (5 - year\ average\ debt\ to\ market\ equity\ ratio)} \quad (5.9\text{-}1)$$

Second, unlevered beta of the combined firm is estimated as weighted average of unlevered betas of acquirer and target using market value of equity of the firms on the third Thursday of the month preceding merger month as weights.

Finally, this research uses debt to equity ratio for the combined firm to estimate levered beta, and the CAPM to estimate cost of capital for the combined firm. The debt to equity ratio of the combined firm is estimated as a sum of outstanding long-term debt of acquirer and target over their market value of equity. This study uses a 7% market risk premium in the calculations.

Chapter 6 Empirical findings

6.1 Introduction

This chapter reports empirical findings of the study that are found using a sample set explained in chapter 4 and the methods that are discussed in chapter 5. This chapter discusses the findings in light of different theories discussed in chapter 2, the literature review. The findings are reported in a similar sequence to the material provided in the method section so that they can be followed seamlessly. Section 6.2 reports the findings about changes in earnings forecasts for acquirers and targets subsequent to acquisitions. Section 6.3 provides information about differences between WACC of combined firms, acquirers and targets. Further details about the cost of debt and cost of equity of merging firms are also provided in this section. Section 6.4 reports statistics for TVA and its components. In section 6.5, combined abnormal announcement returns are reported. Section 6.6 investigates the relationship between the TVA and abnormal announcement returns for market-driven and non-market-driven acquisitions. Subsequently, section 6.7 investigates the relationship between the TVA and abnormal announcement returns for diversifying and non-diversifying mergers. Section 6.8 provides results and estimations when the CAPM is used for calculating the cost of equity. Finally, section 6.9 reports the results of univariate and multivariate analysis on the factors affecting TVA and its components.

6.2 Changes in earnings forecasts subsequent to acquisitions

Table 6.2-1 reports analyst earnings forecasts and the changes in average forecasts subsequent to acquisitions. Column (1) of the table reports summary statistics for

acquirers. Besides, Column (2) provides statistics for target firms. Statistics of combined firms are reported in column 3. Finally, column (4) reports the difference between forecasts for the combined firms and a portfolio of the acquirer and the target prior to announcement of the acquisition. Table 6.2-1 is organised in three panels. Panel A provides statistics for fiscal year 1 average forecasted earnings, scaled by total assets of firms. Panel B reports statistics for fiscal year 2, average forecasted earnings scaled by total assets of firms. Lastly, panel C provides statistics of forecasted growth rates for sample firms in this study. Mean, median, first quartile, third quartile and number of observations are reported in each panel.

As shown in panel A of table 6.2-1, mean (median) forecasted earnings for fiscal year 1 scaled by total assets at the end of the year prior to the acquisition announcement is 9.0% (6.8%) for acquirers. Moreover, mean (median) forecasted earnings for fiscal year 1 scaled by total assets is 7.4% (3.7%) for target firms. In addition, combined firms have a mean (median) forecasted earnings scaled by total assets for fiscal year 1 equal with 8.4% (7.2%). Finally, percentage difference between forecasted earnings of the combined firm and those of a portfolio of the acquirer and the target is averaged as 6.0% (t=1.78) with a median equal to 0.5%. These findings show a significant increase in fiscal year 1 average analyst forecasts subsequent to announcement of acquisition.

Panel B reports mean (median) fiscal year 2 forecasted earnings scaled by total assets as 10.6% (7.9%) for acquirers. Mean (median) fiscal year 2 forecast for target firms is 10.7% (5.7%) of their total assets and combined firms' mean (median) forecasted earnings over total assets is 10.3% (8.5%). Finally, percentage difference between forecasted earnings of the combined firm and those of a portfolio of the acquirer and the target is averaged as 4.3% (t= 2.23) with a

median equal to 0.9%. These findings also show a significant increase in fiscal year 2 average analyst forecasts subsequent to announcement of acquisitions.

Table 6.2-1 Analyst forecasts for acquirer, target, and combined firm

	(1)	(2)	(3)	(4)
	Acquirer	Target	Combined firm	%Δ (3) , (1+2)
Panel A: Fiscal year 1 forecasted earnings scaled by total assets				
Mean	8.9657***	7.3958***	8.3706***	6.02*
[t stat.]	[8.39]	[2.85]	[8.50]	[1.78]
Median	6.7512	3.7084	7.1838	0.53
Q1	3.8151	2.0231	3.5736	-1.82
Q3	12.8010	9.8450	10.4494	9.51
#of Observations	68	68	68	68
Panel B: Fiscal year 2 forecasted earnings scaled by total assets				
Mean	10.6785***	10.7288***	10.2611***	4.29**
[t stat.]	[8.57]	[3.70]	[8.83]	[2.23]
Median	7.9773	5.7061	8.5182	0.89
Q1	5.3393	3.5484	4.7049	-1.42
Q3	13.1926	11.5614	13.6333	8.63
#of Observations	68	68	68	68
Panel C: Forecasted long-term growth rate (Ltg)				
Mean	16.7390***	16.6891***	16.8438***	2.72
[t stat.]	[10.45]	[9.95]	[10.69]	[1.05]
Median	14.5500	15.2850	14.8409	0.00
Q1	10.0000	9.8750	11.1172	-3.61
Q3	19.3300	18.6200	18.0000	3.13
#of Observations	68	68	68	68

This table reports analyst earnings forecasts and the changes in average forecasts subsequent to acquisitions. Column (1) of the table reports summary statistics for acquirers. Column (2) provides statistics for target firms. Statistics of combined firms are reported in column 3. Finally, column (4) reports the difference between forecasts for the combined firms and a portfolio of acquirer and target prior to announcement of the acquisition. The table is organised in three panels. Panel A provides statistics for fiscal year 1 average forecasted earnings scaled by total assets of firms. Panel B reports statistics for fiscal year 2 average forecasted earnings scaled by total assets of firms. Lastly, Panel C provides statistics of forecasted growth rates for sample firms of this study.

Forecasted Ltgs are reported in panel C of table 6.2-1. As reported in the table, mean (median) forecasted long-term growth rate for acquirers is 16.7% (14.6%). Moreover, mean (median) Ltg for target firms is 16.7.9% (15.3%). In addition, combined firms have a mean (median) of 16.8% (14.8%). Finally, percentage difference between forecasted Ltg of the combined firm and Ltg of a portfolio of the acquirer and the target is 2.7% (t= 1.05) on average, with a median equal with 1.3%. Similar to those of forecasted earnings, these findings again show an increase in Ltg forecasts subsequent to announcement of acquisitions. However, this difference is not statistically significant at conventional levels.

6.3 Differences in WACCs

6.3.1 Cost of debt

Table 6.3-1 reports findings of this study about cost of debt of firms involved in mergers. The results are reported for acquisitions in which the acquirer and the target are non-zero debt firms and for which corporate bond yields are available.[13]

[13] Cost of debt of a larger sample of acquirers and targets were also investigated for robustness checks. Un-tabulated results provide similar evidence to those reported in table 6.3-1. However, since there were non-zero debt firms with non-available cost of debt, it was not possible to estimate acquisition effect on cost of debt accurately. Therefore, the results are reported only for acquisitions that have corporate bond yields available for the acquirer and the target.

Table 6.3-1 Cost of debt of firms involved in mergers

	(1)	(2)	(3)	(4)	(5)
	Acquirer	Target	Combined firm	%Δ (3) , (1)	%Δ (3) , (2)
Mean	6.2282***	7.2249***	6.6817***	5.85***	- 5.69**
[t stat.]	[24.34]	[21.32]	[24.22]	[3.34]	[-2.21]
Median	6.0958	6.6547	6.3668	5.38	-6.61
Q1	5.2506	6.1221	5.5583	-1.14	-11.73
Q3	6.9969	8.7719	7.2729	12.82	-0.12
#of observations	42	42	42	42	42

This table reports findings about cost of debt of firms involved in mergers. Columns (1) and (2) of the table provide statistics about cost of debt of acquirers and target firms, respectively. Column (3) reports statistics for cost of debt of combined firms. In column (4) percentage difference between combined firm's mean cost of debt and that of the acquirer prior to the merger is calculated. Similarly, in column (5) percentage difference between combined firm's mean cost of debt and that of the target prior to the merger is calculated. While mean cost of debt of combined firms is 5.9% greater than acquirers, it is 5.7% smaller compared to the mean cost of debt of targets. Both differences are significant.

Columns (1) and (2) of the table provide statistics about cost of debt of acquirers and target firms, respectively. Column (3) reports statistics for cost of debt of combined firms. Column (4) reports the findings about the difference between cost of debt of combined firms and cost of debt of acquirers. Lastly, column (5) of the table provides findings regarding the difference between cost of debt of combined firms and cost of debt of target firms prior to announcement of acquisitions. Mean, median, first quartile, third quartile cost of debt and number of observations are reported in the table.

As reported in table 6.3-1, mean (median) estimated cost of debt of sample acquirers is 6.2% (6.1%). Moreover, target firms have a mean (median) cost of debt equal with 7.2% (6.7%). Besides, average (median) cost of debt of combined firms is 6.7% (6.4%). In addition, the average difference between cost of debt of

combined firms and cost of debt of acquirers is a significant 5.9% (t = 3.34). This observation means that cost of debt of combined firms is on average 5.9% greater than the cost of acquirer's debt before the acquisition announcement. . . The median of such a difference is 5.4%. Finally, the average difference between cost of debt of combined firms and cost of debt of target firms is a significant -5.7% (t = -2.21). This observation implies that cost of debt of combined firms is on average smaller than the target's by 5.7% of target's cost of debt prior to the acquisition announcement. The median of such a difference is -6.6%.

6.3.2 Implied cost of equity

Implied cost of equity is estimated for acquirers, targets and combined firms using the method explained in section 5.3.3 of chapter 5. The results of estimations are reported in table 6.3-2. Columns (1) and (2) of the table provide statistics for implied cost of equity of acquirers and target firms, respectively. Column (3) reports statistics for implied cost of capital of combined firms. Column (4) reports the findings about the difference between implied cost of capital of combined firms and cost of debt of acquirers. Lastly, column (5) provides findings regarding the difference between implied cost of equity of combined firms and implied cost of equity of target firms prior to announcement of acquisitions. Mean, median, first quartile, third quartile cost of equity and number of observations are reported in the table.

Table 6.3-2 Implied cost of equity of firms involved in mergers

	(1)	(2)	(3)	(4)	(5)
	Acquirer's	Target's	Combined firm's	%Δ (3) , (1)	%Δ (3) , (2)
Mean	9.4018	9.4077	8.9151	7.99	11.11
[t stat.]	[9.60]	[10.54]	[11.29]	[1.53]	[1.07]
Median	8.1306	8.4735	7.4872	-3.80	-10.05
Q1	4.8283	5.1030	4.8438	-12.23	-24.45
Q3	12.5495	12.0468	14.7411	14.74	22.63
# of observations	68	68	68	68	68

This table reports findings regarding implied cost of equity of firms involved in mergers. Columns (1) and (2) of the table provide statistics about cost of equity of acquirers and target firms, respectively. Column (3) reports statistics for cost of equity of combined firms. In column (4) percentage difference between the combined firm's mean cost of equity and that of the acquirer prior to the merger is calculated. Similarly, in column (5) percentage difference between the combined firm's mean cost of equity and that of the target prior to the merger is calculated. The evidence shows that cost of equity of combined firms is 8.0% greater than cost of equity of acquirers, and 11.1 % greater than cost of equity of targets, on average.

According to table 6.3-2, the mean (median) estimated cost of equity of sample acquirers is 9.4% (8.1%). Target firms have a mean (median) cost of equity equal to 9.4% (8.5%). The average (median) cost of equity of combined firms is 8.9% (7.5%). In addition, the average difference between cost of equity of combined firms and cost of equity of acquirers is 8.0% (t =1.53). This observation means that cost of equity of combined firms is on average 8.0% smaller than the cost of acquirer's pre-announcement equity. The median of such a difference is -3.8%. Finally, the average difference between cost of equity of combined firms and cost of equity of targets is 11.1% (t =1.07*)*. This result implies that cost of equity of combined firms is on average greater than cost of equity of targets by 11.1% of target's cost of equity prior to announcement of the acquisition. The median of such a difference is -10.1%.

6.3.3 WACC

This section provides findings of the current research regarding WACC estimations along with summary statistics for the WACC of acquirers, targets and combined firms. The results are reported in table 6.3-3. Columns (1) and (2) of the table provide summary statistics for the WACC of acquirers and targets, correspondingly. Column (3) reports statistics for combined firms' WACC. Then, column (4) reports the percentage difference between the WACC of combined firms and acquirers, and column (5) provides statistics for the percentage difference between the WACC of combined firms and targets. Table 6.3-3 reports mean, median, first and third quartile WACC, and number of observations in each column.

As reported in table 6.3-3, mean (median) WACC of acquirers is 8.9% (7.0%). Moreover, mean (median) WACC of targets is 8.9% (7.5%). Mean (median) WACC is 8.3% (6.7%) for combined firms. Average percentage difference between the WACC of combined firms and acquirers is 5.4% (t = 1.13). This observation implies that average WACC of combined firms is 5.4% greater than the acquirer's pre-announcement average WACC. The median of this difference is -3.5%. In addition, mean percentage difference between the WACC of the target and the WACC of the acquirer is 6.2% (t = 0.79). This finding shows that mean WACC of the combined firm is 6.2% greater than the mean WACC of target firms. The median of this difference is -10.11%.

Table 6.3-3 WACCs of combined firms, acquirers and targets

	(1)	(2)	(3)	(4)	(5)
	Acquirer's WACC	Target's WACC	Combined firm's WACC	%Δ (3) , (1)	%Δ (3) , (2)
Mean	8.8569***	8.8513***	8.2842***	5.44	6.16
[t stat.]	[9.29]	[10.59]	[10.86]	[1.13]	[0.79]
Median	7.0406	7.5050	6.6764	-3.49	-10.11
Q1	4.8283	4.8581	4.5516	-15.53	-22.66
Q3	11.1578	12.0468	11.5368	14.41	17.22
# of observations	68	68	68	68	68

This table reports findings of this study regarding the WACC of acquirers, targets and combined firms. Columns (1) and (2) of the table provide statistics about the WACC of acquirer and target firms, respectively. Column (3) reports statistics for the WACC of combined firms. In column (4) percentage difference between combined firm's WACC and that of the acquirer prior to the merger is calculated. Similarly, in column (5) percentage difference between combined firm's WACC and the WACC of targets prior to the merger is calculated. The evidence suggests that WACC of combined firms is 5.4% greater than WACC of acquirers, and 6.2 % greater than WACC of targets, on average.

6.4 Sources of value in acquisitions

Results of the study regarding the TVA and its components are reported in table 6.4-1. The first column provides summary statistics for the TVA in the sample of this study. The second column reports statistics for the component of the TVA that detects earnings synergies. The third column reports the effect of the difference between the WACC of combined firms and the WACC of acquirers on the TVA. Lastly, the fourth column reports the effect of the difference between the WACC of combined firms and the WACC of targets on the TVA. Table 6.4-1 reports mean, median, first and third quartile value effects as well as the percentage of samples with positive value effects.

Table 6.4-1 Components of combined acquisition value effects

	TVA	Earnings synergies	WACC synergies of acquirer	WACC synergies of target
Mean	3.7156	2.2141	0.9838	0.5178
% of TVA	100%	59.5%	26.6%	13.9%
[t stat.]	[1.22]	[0.96]	[0.47]	[0.75]
Median	2.5718	0.2144	1.3681	0.6903
Q1	-3.8822	-4.0325	-1.6952	-0. 6186
Q3	10.7677	8.9634	4.0081	2.6515
% > 0	63.2	51.4	60.3	57.8

This table reports the results of the study regarding the TVA and its components. The first column provides summary statistics for the TVA in the sample of this study. The second column reports statistics for that component of the TVA that detects earnings synergies. The third column reports the effect of the difference between the WACC of combined firms and the WACC of acquirers on the TVA. Lastly, the fourth column reports the effect of the difference between the WACC of combined firms and the WACC of targets on the TVA. The table reports mean, median, t statistics, first and third quartile value effects as well as the percentage of samples with positive value effects.

In table 6.4-1 the reported value effects are deflated by the combined pre-merger market value of equity of the merging firms. That is because larger firms are expected to create larger cash-flows and generate greater values. Moreover, the size of the cash flows can also influence the value effect of changes in the WACC, i.e. the greater the cash-flows, the greater the value effect by changing the WACC. Therefore, combinations of relatively larger firms are expected to cause relatively greater value effects, when stated in dollars. Hence, it is necessary to deflate the estimated value effects by size of the firms to be able to make an apple-to-apple comparison.

As table 6.4-1 reports, mean TVA is equal with 3.7% (t=1.22) of market value of equity of merging firms, which is not significantly different from zero. Besides, median TVA is 2.6% where 63.2% of estimated TVAs are positive. The value

effect of earnings synergies is 2.2% (t = 0.96) on average which accounts for 60.4% of mean TVA. Median value effect of synergy earnings is 0.2% and 51.4% of earning's synergies are positive. In addition, the value effect of the difference between the WACC of the combined firm and the acquirer is 1.0% (t=0.47) on average, with a median of 1.4%. This result accounts for around 26.5% of average TVA. Finally, mean value effect of the difference between the WACC of combined firms and targets is 0.5% (t = 0.75) where the median of this effect is 0.7%. This result accounts for around 13.9% of average TVA.

6.5 Combined announcement abnormal returns

Abnormal announcement returns of acquirers, targets and combined firms are reported in table 6.5-1. The first column of the table reports summary statistics for acquirer abnormal returns over a 21-day window around announcement of acquisitions in the study sample. The second column provides statistics for target abnormal returns over the same period. Finally, the third column reports combined abnormal returns. Table 6.5-1 reports mean, median, first and third quartile announcement abnormal returns as well as the number of observations. The results are consistent with findings of several prior studies. Table 6.5-1 provides evidence of positive and significant abnormal returns for target firms. The average abnormal announcement returns for target firms is 19.45% (*t =7.02)*. Moreover, mean abnormal return of acquirers is around zero. That is, acquirers gain 0.2% (*t* = 0.09) on average. The median of abnormal announcement returns is -0.6% and 16.2% for acquirers and targets, respectively. The average combined announcement return is a significant 4.5% (*t* = 2.73) and the median of combined abnormal returns is 4.4%.

Table 6.5-1 Announcement abnormal returns

	Acquirer (%)	Target (%)	Combined (%)
Mean	0.1625	19.4536***	4.4556***
[t stat.]	[0.09]	[7.02]	[2.73]
Median	-0.5863	16.1879	4.4373
Q1	-8.5533	9.6215	-3.0562
Q3	9.3611	30.7627	12.1280
# of observations	68	68	68

This table reports abnormal announcement returns of acquirers, targets and combined firms. The first column of the table reports summary statistics for acquirer abnormal returns over a 21-day window around announcement of acquisitions. The second column provides statistics for target abnormal returns over the same period. The third column reports combined abnormal returns. Mean, median, first and third quartile announcement abnormal returns as well as numbers of observations are reported.

6.6 Value-creating mergers versus overvalued stocks

This section reports the results of the regression model that is used to investigate the relationship between stock returns and the TVA for market-driven and non-market-driven mergers. The method of regression analysis is discussed in section 5.7 of chapter 5. Table 6.6-1 reports the intercept and coefficients of the regression model along with their *t*-statistics. *R*-squared and the number of observations are also reported. The coefficient β_1 on TVA × MDA is -0.004 (t = -0.44) and the coefficient β_2 on TVA × NonMDA is an insignificant 0.004 (t = 0.04).

Table 6.6-1 Stock returns, the TVA and market-driven acquisitions

	Coefficient	***t* statistic**
intercept	0.125***	4.51
β_1	-0.004**	-0.44
β_2	0.004	0.04
β_3	-0.074*	-2.30
β_4	-0.110**	-2.68
R^2	0.28	
# of observations	68	

$RTRN = \beta_1 \times TVA \times MDA + \beta_2 \times TVA \times NonMDA + \beta_3 \times MDA + \beta_4 \times RelSize.$

An OLS regression is used to estimate the relationship between combined abnormal announcement returns (RTRN) and the TVA. The dependent variable in this regression is the combined abnormal announcement return. The explanatory variables are two interaction terms: TVA × MDA and TVA × NonMDA. TVA is estimated by equation 5.4-1. MDA takes the value of 1 for market-driven acquisitions and zero for other acquisitions. Conversely, NonMDA takes the value of 1 for other acquisitions and 0 for market-driven acquisitions. MDA and relative size (RelSize) are included as control variables. The variables are winsorized at 1% and 99% to prevent distortions by outliers.

*Significance at 10% level.
**Significance at 5% level.
***Significance at 1% level.

6.7 Diversifying mergers and the TVA

The results reported in this section provide evidence from four regression models that investigate the relationships between combined announcement returns and the TVA for diversifying and non-diversifying mergers. Table 6.7-1 presents the findings of these regression analyses. In first column the intercept and coefficients of the first regression model are reported along with their t statistics.

Table 6.7-1 Stock returns, the TVA and diversifying acquisitions

	(1)	(2)	(3)	(4)
	TVA	**Earnings synergies**	**Effect of $WACC_{P-A}$**	**Effect of $WACC_{P-G}$**
intercept	0.053	0.060	0.061	0.051
	[1.57]	[1.76]	[1.51]	[1.44]
β_1	0.183	0.157	0.800	-0.133
	[1.54]	[1.32]	[0.29]	[-0.56]
β_2	0.05	0.039	0.300	0.048
	[0.51]	[0.35]	[0.67]	[0.04]
β_3	0.045	0.038	0.034	0.043
	[1.37]	[1.16]	[1.01]	[1.25]
β_4	- 0.075*	- 0.087*	-0.083*	-0.076*
	[-1.70]	[-1.93]	[-1.81]	[-1.71]
R^2	0.17	0.13	.21	.23
# of observations	68	68	68	68

$RTRN = \beta_1 \times TVA \times DIV + \beta_2 \times TVA \times NonDIV + \beta_3 \times DIV + \beta_4 \times RelSize.$

Four OLS regressions are used to estimate the relationship between combined abnormal announcement returns (RTRN) and value effects of acquisitions. The dependent variable in these regressions is the combined abnormal announcement return. The explanatory variables in the first regression are two interaction terms: TVA × DIV and TVA × NonDIV. In three other regressions TVA is replaced by that regression's respective component of TVA. TVA and its components are estimated by equation 5.4-1. DIV takes the value of 1 for diversifying acquisitions and zero for non-diversifying acquisitions. Conversely, NonDIV takes the value of 1 for non-diversifying acquisitions and 0 for diversifying acquisitions. DIV and relative size (RelSize) are included as control variables. The variables are winsorized at 1% and 99% to prevent distortions by outliers.
*Significance at 10% level.
**Significance at 5% level.
***Significance at 1% level.

Column (2) reports the intercept and coefficients of a regression that investigates the relationship between abnormal announcement returns and earnings synergies from diversifying and non-diversifying mergers. Columns (3) and (4) provide findings about the relationship between abnormal announcement returns and the components of TVA that capture value effects due to differences between the

WACC of the combined firm and those of the acquirer and the target, respectively.

In model (1), the coefficient β_1 on TVA × DIV is an insignificant 0.18 (t = 1.54) and the coefficient β_2 on TVA × NonDIV is an insignificant 0.05 (t = 0.51). In model (2) these coefficients are similar to those of model (1) perhaps because of the relatively large impact of earnings synergies on the TVA. In model (3), the coefficient β_1 on TVA × DIV is an insignificant 0.80 (t = 0.29) and the coefficient β_2 on TVA × NonDIV is an insignificant 0.3 (t = 0.67). Finally, in model (4) the coefficient β_1 on TVA × DIV is an insignificant -0.13 (t = -0.56) and the coefficient β_2 on TVA × NonDIV is an insignificant 0.05 (t = 0.04).

6.8 Using CAPM for estimating cost of equity

In order to check the robustness of the results reported in previous sections this study also estimates cost of equity for acquirers, targets and combined firms using CAPM. The results of estimations are reported in table 6.8-1. Columns (1) and (2) of the table provide statistics for implied cost of equity of acquirers and target firms, respectively. Column (3) reports statistics for implied cost of capital of combined firms and column (4) reports the findings regarding the difference between implied cost of capital of combined firms and cost of debt of acquirers. Lastly, column (5) of the table provides findings regarding the difference between implied cost of equity of combined firms and implied cost of equity of target firms prior to announcement of acquisitions. Mean, median, first quartile, third quartile cost of equity and the number of observations are reported.

Table 6.8-1 Cost of equity of the firms involved in mergers using the CAPM

	(1)	(2)	(3)	(4)	(5)
	Acquirer	Target	Combined firm	%Δ (3) , (1)	%Δ (3) , (2)
Mean	10.9256***	11.5927***	10.1793***	0.99	-4.16
[t stat.]	[11.11]	[11.52]	[12.60]	[t=0.29]	[t=-0.70]
Median	9.5625	10.3631	9.8098	-3.52	- 10.79
Q1	5.8482	6.1055	5.7379	-9.34	- 26.46
Q3	15.4563	15.2383	13.6470	6.20	7.42
# of Observations	68	68	68	68	68

This table reports findings regarding implied cost of equity of firms involved in mergers. Column (1) and (2) of the table provide statistics about cost of equity of acquirers and target firms, respectively. Column (3) reports statistics for cost of equity of combined firms. In column (4) percentage difference between combined firm's mean cost of equity and that of the acquirer prior to the merger is calculated. Similarly, in column (5) percentage difference between combined firm's mean cost of equity and that of the target prior to the merger is calculated. The evidence shows that cost of equity of combined firms is 1.0% greater than cost of equity of acquirers, and 4.2% smaller than cost of equity of targets, on average.

According to table 6.8-1, the mean (median) estimated cost of equity of sample acquirers is 10.9% (9.6%). Moreover, target firms have a mean (median) cost of equity equal with 11.6% (10.4%). Besides, average (median) cost of equity of combined firms is 10.2% (9.8%). In addition, the average difference between cost

of equity of combined firms and cost of equity of acquirers is 1.0% (t =0.29). This observation means that cost of equity of combined firms is on average 1.0% greater than the cost of acquirer equity prior to announcement. The median of this difference is -3.5%. Finally, the average difference between cost of equity of combined firms and cost of equity of targets is -4.2% (*t =-0.70)*. This result implies that cost of equity of combined firms is on average smaller than cost of equity of targets by -4.2% of acquirer's cost of debt prior to announcement of the acquisition. The median of such a difference is -10.8%.

This section also re-estimates WACC for acquirers, targets and combined firms. The results are reported in table 6.6-2. Columns (1) and (2) of the table provide summary statistics for the WACC of acquirers and targets, correspondingly. Column (3) reports statistics for combined firms' WACC. Then, column (4) reports the percentage difference between the WACC of combined firms and acquirers and column (5) provides statistics for the percentage difference between the WACC of combined firms and targets. Table 6.6-2 reports mean, median, first and third quartile WACC, and number of observations in each column.

As reported in table 6.8-2, mean (median) WACC of acquirers is 10.4% (8.0%). Moreover, mean (median) WACC of targets is 10.8% (8.8%). Mean (median) WACC is 9.5% (8.1%) for combined firms. The average percentage difference between the WACC of combined firms and acquirers is -1.7% (t = -0.57). This observation implies that average WACC of combined firms is smaller than average WACC of acquirers by 1.7% of acquirers' WACC prior to announcement of acquisitions. The median of this difference is -3.8%. In addition, mean percentage difference between the WACC of the target and the WACC of the acquirer is -5.2% (t = -0.95). This finding shows that the mean WACC of the combined firm is 5.2% smaller than the mean WACC of target firms. The median of this difference is -10.11%.

Table 6.8-2 WACCs of combined firms, acquirers and targets using CAPM

	(1)	(2)	(3)	(4)	(5)
	Acquirer's WACC	Target's WACC	Combined firm's WACC	%Δ (3) , (1)	%Δ (3) , (2)
Mean	10.3583***	10.8329***	9.5042***	- 1.71	-5.24
[t stat.]	[10.60]	[11.18]	[11.78]	[-0.57]	[-0.95]
Median	7.9786	8.8099	8.0692	- 3.81	-10.11
Q1	5.7655	5.5448	5.4497	-8.86	-26.53
Q3	13.8760	14.2426	12.0282	6.20	8.80
# of observations	68	68	68	68	68

This table reports findings of this study regarding the WACC of acquirers, targets and combined firms. Column (1) and (2) of the table provide statistics about the WACC of acquirer and target firms, respectively. Column (3) reports statistics for the WACC of combined firms. In column (4) percentage difference between combined firm's WACC and that of the acquirer prior to the merger is calculated. Similarly, in column (5) percentage difference between combined firm's WACC and the WACC of targets prior to the merger is calculated. The evidence suggests that WACC of combined firms is 1.7% smaller than WACC of acquirers, and 5.2 % smaller than WACC of targets, on average.

Table 6.8-3 gives the results of the TVA and its components when CAPM is used to estimate cost of equity. The first column provides summary statistics for the TVA in the sample of this study. The second column reports statistics for the component of the TVA that detects earnings synergies. The third column reports the effect of the difference between the WACC of combined firms and the WACC of acquirers on the TVA.

Table 6.8-3 TVA and its components when the CAPM is used for estimating cost of equity

	TVA	**Earnings synergies**	**Effect of $WACC_{P-A}$**	**Effect of $WACC_{P-G}$**
Mean	4.0649**	2.0038	1.7393**	0.3217
% of TVA	100%	49.4%	43.5%	7.1%
[t]	[2.02]	[0.79]	[2.23]	[0.40]
Median	2.6302	0.2245	1.3684	0.8667
Q1	-3.7148	-3.8448	-1.2839	-0.0472
Q3	12.0676	8.6773	3.7843	2.5862
% > 0	61.8	52.9	67.6	66.2

This table reports the estimates of TVA and its components where the CAPM is used for estimating cost of equity. The value effects are deflated by the market value of equity of the respective firms in order to make an apple-to-apple comparison possible. The table reports the mean and median value effects along with respective t statistics and p-values.
*Significance at 10% level.
**Significance at 5% level.
***Significance at 1% level.

Lastly, the fourth column reports the effect of the difference between the WACC of combined firms and the WACC of targets on the TVA. Table 6.8-3 reports mean, median, first and third quartile value effects as well as the percentage of samples with positive value effects. As with the reasons explained in section 6.4 regarding table 6.4-1, table 6.8-3 also reports the value effects are deflated by the combined pre-merger market value of equity of the merging firms.

As table 6.8-3 also reports, mean TVA is equal with 4.1% (t=1.44) of market value of equity of merging firms. Median TVA is 2.6% where 61.8% of estimated TVAs are positive. The value effect of earnings synergies is 2.0% (t = 0.79) on average which accounts for 49.3% of mean TVA. Median value effect of synergy earnings is 0.22%, and 52.9% of earning's synergies are positive. In addition, the value effect of the difference between the WACC of the combined firm and the acquirer is a significant 1.7% (t=2.23) on average with a median of 1.4. This

effect is economically significant and accounts for around 42.8% of average TVA. Finally, mean value effect of the difference between the WACC of combined firms and targets is 0.3% (t = 0.40) where the median of this effect is 0.9%. This value effect accounts for 7.9% of average TVA.

Table 6.8-4 presents the results of the regression model that is used to investigate the relationship between stock returns and the TVA[14] for market-driven and non-market-driven mergers. The method of regression analysis is discussed in section 5.7 of chapter 5 and the CAPM is used for estimating cost of equity.

Table 6.8-4 Stock returns, the TVA and market-driven acquisitions CAPM

	Coefficient	***t* statistic**
intercept	0.112***	3.78
β_1	0.124	0.93
β_2	0.012	0.12
β_3	-0.061*	-1.80
β_4	-0.108**	-2.43
R^2	0.16	
# of observations	68	

$RTRN = \beta_1 \times TVA \times MDA + \beta_2 \times TVA \times NonMDA + \beta_3 \times MDA + \beta_4 \times RelSize.$

An OLS regression is used to estimate the relationship between combined abnormal announcement returns (RTRN) and the TVA. The dependent variable in this regression is the combined abnormal announcement return. The explanatory variables are two interaction terms: TVA × MDA and TVA × NonMDA. TVA is estimated by equation 5.4-1 where the CAPM is used for estimating cost of equity. MDA takes the value of 1 for market-driven acquisitions and zero for other acquisitions. Conversely, NonMDA takes the value of 1 for other acquisitions and 0 for market-driven acquisitions. MDA and relative size (RelSize) are included as control variables. The variables are winsorized at 1% and 99% to prevent distortions by outliers.
*Significance at 10% level.
**Significance at 5% level.
***Significance at 1% level.

[14] I regressed combined abnormal returns on the TVA and its components. When the implied cost of equity method is used the coefficient is 0.1 (t =1.22) and when the CAPM is used for estimating the cost of equity the results do not show a significant correlation.
Interestingly, when the CAPM is used, the correlation coefficient between the combined abnormal returns and the effect of $WACC_{P\text{-}A}$ is 0.65 ** (t= 2.08) which shows the market is aware of the value effect of the changes in the WACC.

Table 6.8-5 Stock returns, the TVA and diversifying acquisitions

	TVA	**Earnings synergies**	**Effect of $WACC_{P-A}$**	**Effect of $WACC_{P-G}$**
intercept	0.044	0.048	0.048	0.049
	[1.24]	[1.76]	[1.45]	[1.36]
β_1	0.004	0.009	0.776**	-0.638**
	[0.03]	[0.06]	[2.36]	[-2.16]
β_2	0.146	0.144	0.180	1.092
	[1.16]	[1.08]	[0.28]	[0.92]
β_3	0.051	0.047	0.027	0.049
	[1.48]	[1.40]	[0.75]	[1.36]
β_4	- 0.079*	- 0.080*	-0.067*	-0.095**
	[-1.79]	[-1.77]	[-1.56]	[-2.20]
R^2	0.17	0.14	.22	.22
# of observations	68	68	68	68

RTRN $= \beta_1 \times$ TVA $\times$ DIV $+ \beta_2 \times$ TVA $\times$ NonDIV $+ \beta_3 \times$ DIV $+ \beta_4 \times$ RelSize.

Four OLS regressions are used to estimate the relationship between combined abnormal announcement returns (RTRN) and value effects of acquisitions. The dependent variable in these regressions is the combined abnormal announcement return. The explanatory variables in the first regression are two interaction terms: TVA × DIV and TVA × NonDIV. In three other regressions TVA is replaced by that regression's respective component of TVA. TVA and its components are estimated by equation 5.4-1 where the CAPM is for estimating cost of equity. DIV takes the value of 1 for diversifying acquisitions and zero for non-diversifying acquisitions. Conversely, NonDIV takes the value of 1 for non-diversifying acquisitions and 0 for diversifying acquisitions. DIV and relative size (RelSize) are included as control variables. The variables are winsorized at 1% and 99% to prevent distortions by outliers.
*Significance at 10% level.
**Significance at 5% level.
***Significance at 1% level.

Table 6.8-4 reports the intercept and coefficients of the regression model along with their *t* statistics. *R*-squared and the number of observations are also reported. The coefficient β_1 on TVA × MDA is 0.12 (t = 0.93) and the coefficient β_2 on TVA × NonMDA is an insignificant 0.01 (t = 0.12).

Table 6.8-5 presents the findings of these regression analyses that investigate the relationships between combined announcement returns and the TVA for diversifying and non-diversifying mergers. In the first column the intercept and

coefficients of the first regression model are reported along with their *t*- statistics. Column (2) reports the intercept and coefficients of a regression that investigates the relationship between abnormal announcement returns and earnings synergies from diversifying and non-diversifying mergers. Columns (3) and (4) provide findings about the relationship between abnormal announcement returns and the components of TVA that capture value effects due to differences between the WACC of the combined firm and those of the acquirer and the target, respectively.

In model (1), the coefficient β_1 on TVA × DIV is an insignificant 0.00 (t = 0.03) and the coefficient β_2 on TVA × NonDIV is an insignificant 0.15 (t = 1.16). In model (2) these coefficients are similar to those of model (1). In model (3), the coefficient β_1 on TVA × DIV is a significant 0.77 (t = 2.36) and the coefficient β_2 on TVA × NonDIV is an insignificant 0.18 (t = 0.28). These results suggest that value effects from lower cost of capital of the combined firm compared to the acquirer is a driving force behind diversifying acquisitions. Finally, in model (4) the coefficient β_1 on TVA × DIV is a significant -0.63 (t = -2.16) and the coefficient β_2 on TVA × NonDIV is an insignificant 1.09 (t = 0.92).

6.9 Factors affecting TVA

6.9.1 Univariate analysis

This section investigates the impacts of factors likely to affect value effects of mergers. The findings are presented in tables 6.9-1 and 6.9-2. The findings reported in these two tables are different in their methods of estimation of cost of equity. While table 6.9-1 reports estimations of value effects based on implied cost of equity, table 6.9-2 presents findings estimated by using CAPM for cost of

equity. The tables are organised identically, each comprising seven panels. Each panel reports mean value effects of two groups that are separated based on a factor that is likely to determine value effects of mergers. Differences between mean value effects of the groups are also reported. Specifically, panel A of each table reports the difference between value effects of diversifying and related acquisitions. Panel B reports the difference between mean value effects of cash and non-cash acquisitions. Panels C and D present differences between below and above median relative size and relative WACC of target to acquirer, respectively. Then panels E, F, and G report differences between average value effects of below and above median acquirer's BTM of equity, leverage and liquidity, respectively. Four columns of the tables report TVA, earnings synergies, value effect of the difference between the WACCs of the combined firm and the acquirer, and finally, value effect of the difference between the WACCs of the combined firm and the target.

As reported in table 6.9-1, the difference between average TVA of related and diversifying mergers is 4.4% (t = 0.75). This difference for mean value effects of earnings synergies is 2.9% (t = 0.53), for mean value effect of $WACC_{P\text{-}A}$ is -1.0% (t = -0.51), and for mean value effect of $WACC_{P\text{-}G}$ is 2.5% (t = 1.17). In addition, the difference between average TVA of cash and non-cash acquisitions is -3.0% (t = -0.35). This difference for mean value effect of earnings synergies is -8.2% (t = -1.10), for mean value effect of $WACC_{P\text{-}A}$ is 2.2% (t = 1.20), and for mean value effect of $WACC_{P\text{-}G}$ is 3.1% (t = 1.13). Besides, the difference between average TVA of acquisitions with below and above median relative size of the target to the acquirer is 0.24% (t = 0.04). This difference for mean value effects of earnings synergies is 5.05% (t = 0.86), for mean value effect of $WACC_{P\text{-}A}$ is -2.7% (t = -0.03), and for mean value effect of $WACC_{P\text{-}G}$ is -2.1% (t = -0.96).

Table 6.9-1 Factors affecting TVA

	TVA (%)	Earnings synergies (%)	Effect of $WACC_{P-A}$ (%)	Effect of $WACC_{P-G}$ (%)
Panel A: Diversifying versus related acquisitions				
Related (N = 29)	5.58	3.44	0.55	1.59
[t stat.]	[1.23]	[0.74]	[0.37]	[1.06]
Diversifying (N = 39)	1.17	0.54	1.58	-0.95
[t stat.]	[0.32]	[0.18]	[1.20]	[-0.61]
Difference	4.41	2.91	-1.03	2.53
[t stat.]	[0.75]	[0.53]	[-0.51]	[1.17]
Panel B: Cash versus non-cash acquisitions				
Cash (N = 19)	2.86	-0.18	1.61	1.42
[t stat.]	[1.00]	[-0.06]	[1.19]	[1.26]
Non-cash (N = 49)	5.83	8.10	-0.55	-1.71
[t stat.]	[0.73]	[1.17]	[-0.47]	[-0.68]
Difference	-2.98	-8.27	2.16	3.14
[t stat.]	[-0.35]	[-1.10]	[1.20]	[1.13]
Panel C: Relative size				
<Median relative size (N = 34)	3.84	4.80	-0.40]	-0.55
[t stat.]	[0.81]	[1.19]	[-0.28	[-0.34]
>Median Relative size (N = 34)	3.60	-0.26	2.31	1.54
[t stat.]	[0.91]	[-0.06]	[1.64]	[1.04]
Difference	0.24	5.05	-2.72	-2.09
[t stat.]	[0.04]	[0.86]	[-0.03]	[-0.96]
Panel D: Relative WACC				
<Median relative WACC (N = 34)	1.75	-0.17051	-2.58**	4.50***
[t stat.]	[0.49]	[-0.05]	[-1.85]	[3.30]
>Median relative WACC (N = 34)	5.60	4.49	4.40***	-3.29***
[t stat.]	[1.14]	[0.99]	[3.93]	[-2.61]
Difference	-3.85	-4.67	-6.98***	7.80***
[t stat.]	[-0.63]	[-0.79]	[-3.90]	[4.19]

	TVA (%)	Earnings synergies (%)	Effect of $WACC_{P-A}$ (%)	Effect of $WACC_{P-G}$ (%)
Panel E: Acquirer's book to market of equity				
<Median BTM of equity (N = 34)	1.92	-1.31	2.06	1.17
[t stat.]	[0.44]	[-0.31]	[1.17]	[0.57]
>Median BTM of equity (N = 34)	5.43	5.59	-0.05	-0.11
[t stat.]	[1.26]	[1.39]	[-0.04]	[-0.12]
Difference	-3.51	-6.90	2.11	1.28
[t stat.]	[-0.57]	[-1.18]	[1.02]	[0.57]
Panel F: Acquirer's leverage				
<Median acquirer leverage (N = 34)	4.41	2.98	1.51	-0.09
[t stat.]	[0.86]	[0.59]	[1.18]	[-0.04]
>Median acquirer leverage (N = 34)	3.06	1.48	0.48	1.09
[t stat.]	[0.88]	[0.45]	[0.30]	[1.47]
Difference	1.35	1.50	1.03	-1.18
[t stat.]	[0.22]	[0.25]	[0.50]	[-0.53]
Panel G: Acquirer's liquidity				
<Median acquirer liquidity (N = 34)	3.27	1.01	1.56	0.70
[t stat.]	[1.11]	[0.38]	[0.94]	[0.88]
>Median acquirer liquidity (N = 34)	4.14	3.37	0.43	0.35
[t stat.]	[0.78]	[0.65]	[0.34]	[0.17]
Difference	-0.88	-2.36	1.13	0.35
[t stat.]	[-0.14]	[-0.40]	[0.54]	[0.16]

This table reports estimations of value effects based on implied cost of equity. Each panel reports mean value effects of two groups that are separated based on a factor that is likely to determine value effects of mergers. Differences between mean value effects of the groups are also reported. Panel A reports the difference between value effects of diversifying and related acquisitions. Panel B reports the difference between mean value effects of cash and non-cash acquisitions. Panels C and D present differences between value effects of acquisitions with below and above median relative size, and relative WACC of target to acquirer, respectively. Panels E, F, and G report differences between average value effects of acquisitions with below and above median acquirer's BTM of equity, leverage and liquidity, respectively. Four columns of the table report TVA, earnings synergies, value effect of the difference between the WACCs of the combined firm and the acquirer ($WACC_{P-A}$), and finally, value effect of the difference between the WACCs of the combined firm and the target ($WACC_{P-G}$).

*Significance at 10% level

**Significance at 5% level

***Significance at 1% level

Moreover, the difference between average TVA of mergers with below and above median relative WACC of target to acquirer is -3.85% (t = -0.63). This difference for mean value effects of earnings synergies is -4.7% (t = -0.79), for mean value effect of $WACC_{P\text{-}A}$ is -7.0% (t = -3.9), and for mean value effect of $WACC_{P\text{-}G}$ is 7.8% (t = 4.19). Furthermore, the difference between average TVA of deals with below and above median acquirer's BTM of equity is -3.5% (t = -0.57). This difference for mean value effects of earnings synergies is -6.9% (t = -1.18), for mean value effect of $WACC_{P\text{-}A}$ is 2.1% (t = 1.02), and for mean value effect of $WACC_{P\text{-}G}$ is 1.28% (t = 0.57). Likewise, the difference between average TVA of mergers with below and above median acquirer's leverage is 1.4% (t = 0.22). This difference for mean value effects of earnings synergies is 1.5% (t = 0.25), for mean value effect of $WACC_{P\text{-}A}$ is 1.03% (t = 0.50), and for mean value effect of $WACC_{P\text{-}G}$ is -1.2% (t = -0.53). Finally, the difference between average TVA of acquisitions with below and above median acquirer's liquidity is -0.9% (t = -0.14). This difference for mean value effects of earnings synergies is -2.4% (t = 0.81), for mean value effect of $WACC_{P\text{-}A}$ is 1.13% (t = 0.54), and for mean value effect of $WACC_{P\text{-}G}$ is 0.35% (t = 0.16).

According to table 6.9-2, the difference between average TVA of related and diversifying mergers is 7.8% (t = 1.38). This difference for mean value effects of earnings synergies is 7.1% (t = 1.41), for mean value effect of $WACC_{P\text{-}A}$ is -1.3% (t = -0.83), and for mean value effect of $WACC_{P\text{-}G}$ is 2.0% (t = 1.20). Furthermore, the difference between average TVA of cash and non-cash acquisitions is -2.7% (t = -0.43). This difference for mean value effects of earnings synergies is -6.0% (t = -1.07), for mean value effect of $WACC_{P\text{-}A}$ is 4.5% (t = 2.78), and for mean value effect of $WACC_{P\text{-}G}$ is -1.2% (t = -0.65).

Table 6.9-2 Factors affecting TVA When the CAPM is used for estimating cost of equity

	TVA (%)	Earnings synergies (%)	Effect of $WACC_{P-A}$ (%)	Effect of $WACC_{P-G}$ (%)
Panel A: Diversifying versus related acquisitions				
Related (N=29)	8.56*	6.13	0.98	1.46***
[t stat.]	[1.89]	[1.43]	[1.17]	[3.17]
Diversifying (N= 39)	0.78	-1.01	2.29*	-0.05
[t stat.]	[0.22]	[-0.34]	[1.90	[-0.37]
Difference	7.79	7.14	-1.32	1.96
[t stat.]	[1.38]	[1.41]	[-0.83	[1.20]
Panel B: Cash versus non-cash acquisitions				
Cash (N=19)	2.15	-2.23	4.90**	-0.05
[t stat.]	[0.40]	[-0.44]	[2.92]	[-0.39]
Non-cash (N= 49)	4.84	3.73	0.05	0.67
[t stat.]	[1.45]	[1.28]	[0.59]	[0.66]
Difference	-2.70	-5.96	4.45***	-1.19
[t stat.]	[-0.43]	[- 1.07]	[2.78]	[-0.66]
Panel C: Relative size				
<Median relative size (N = 34)	7.36***	3.95*	1.68	1.73**
[t stat.]	[3.32]	[1.89]	[1.55]	[2.06]
>Median relative size (N = 34)	0.62	-0.03	1.80	-1.15
[t stat.]	[0.12]	[-0.01]	[1.57]	[-0.84]
Difference	6.74	3.98	-0.12	2.87*
[t stat.]	[1.20]	[0.78]	[-0.07]	[1.81]
Panel D: Relative WACC				
<Median relative WACC (N = 34)	0.91	-1.09	2.82**	-0.83
[t stat.]	[0.23]	[-0.33]	[2.43]	[-0.56]
>Median relative WACC (N = 34)	7.36*	5.23	0.61	1.52**
[t stat.]	[1.88]	[1.37]	[0.61]	[2.69]
Difference	-6.45	-6.31	2.21	-2.35
[t stat.]	[-1.15]	[-1.26]	[1.44]	[-1.46]

	TVA (%)	Earnings synergies (%)	Effect of $WACC_{P-A}$ (%)	Effect of $WACC_{P-G}$ (%)
Panel E: Acquirer's book to market of equity				
<Median BTM of equity (N = 34)	3.40	1.97	0.56*	0.87
[t stat.]	[0.96]	[0.17]	[1.80]	[0.83]
>Median BTM of equity (N = 34)	4.76	1.50	3.51	-0.26
[t stat.]	[1.06]	[0.90]	[1.32]	[-0.20]
Difference	-1.36	0.47	-2.96	1.13
[t stat.]	[-0.24]	[0.30]	[-0.58]	[0.69]
Panel F: Acquirer's leverage				
<Median acquirer leverage (N = 34)	6.49**	3.08	3.13***	0.28
[t stat.]	[2.52]	[1.38]	[2.82]	[0.43]
>Median acquirer leverage (N = 34)	1.53	0.88	0.28	0.37
[t stat.]	[0.30]	[0.19]	[0.27]	[0.24]
Difference	4.96	2.20	2.85*	-0.09
[t stat.]	[0.88]	[0.43]	[1.88]	[-0.06]
Panel G: Acquirer's liquidity				
<Median acquirer liquidity (N = 34)	2.91	1.89	0.57	0.45
[t stat.]	[0.58]	[0.42]	[0.56]	[0.30]
>Median acquirer liquidity (N = 34)	5.27*	2.12	2.97**	0.19
[t stat.]	[2.04]	[0.92]	[2.57]	[0.28]
Difference	-2.36	-0.23	-2.39	0.26
[t stat.]	[-0.41]	[-0.04]	[-1.56]	[0.16]

This table reports estimations of value effects when the CAPM is used to estimate the cost of equity. Each panel reports mean value effects of two groups that are separated based on a factor that is likely to determine value effects of mergers. Differences between mean value effects of the groups are also reported. Panel A reports the difference between value effects of diversifying and related acquisitions. Panel B reports the difference between mean value effects of cash and non-cash acquisitions. Panels C and D present differences between value effects of acquisitions with below and above median relative size, and relative WACC of target to acquirer, respectively. Panels E, F, and G report differences between average value effects of acquisitions with below and above median acquirer's BTM of equity, leverage and liquidity, respectively. Four columns of the table report TVA, earnings synergies, value effect of the difference between the WACCs of the combined firm and the acquirer ($WACC_{P-A}$), and finally, value effect of the difference between the WACCs of the combined firm and the target ($WACC_{P-G}$).

*Significance at 10% level
**Significance at 5% level
***Significance at 1% level

Moreover, the difference between average TVA of acquisitions with below and above median relative size of target to acquirer is 6.7% (t = 1.20). This difference for mean value effects of earnings synergies is 4.0% (t = 0.78), for mean value effect of $WACC_{P\text{-}A}$ is -0.1% (t = -0.07), and for mean value effect of $WACC_{P\text{-}G}$ is 2.9% (t = 1.81). Besides, the difference between average TVA of mergers with below and above median relative WACC of target to acquirer is -6.4% (t = -1.15). This difference for mean value effects of earnings synergies is -6.3% (t = -1.26), for mean value effect of $WACC_{P\text{-}A}$ is 2.2% (t = 1.44), and for mean value effect of $WACC_{P\text{-}G}$ is -2.4% (t = -1.46). In addition, the difference between average TVA of deals with below and above median acquirer's BTM of equity is -1.4% (t = -0.23). This difference for mean value effects of earnings synergies is 0.5% (t = 0.29), for mean value effect of $WACC_{P\text{-}A}$ is -3.0% (t = -0.58), and for mean value effect of $WACC_{P\text{-}G}$ is 1.1% (t = 0.70). Likewise, the difference between average TVA of mergers with below and above median acquirer's leverage is 5.0% (t = 0.87). This difference for mean value effects of earnings synergies is 2.2% (t = 0.43), for mean value effect of $WACC_{P\text{-}A}$ is 2.9% (t = 1.88), and for mean value effect of $WACC_{P\text{-}G}$ is -0.1% (t = -0.06). Finally, the difference between average TVA of acquisitions with below and above median acquirer's liquidity is -2.3% (t = -0.41). This difference for mean value effects of earnings synergies is -0.2% (t = -0.04), for mean value effect of $WACC_{P\text{-}A}$ is -2.4% (t = -1.55), and for mean value effect of $WACC_{P\text{-}G}$ is 0.3% (t = 0.15).

6.9.2 Multivariate analysis

This section reports results of regression analysis of factors that are likely to affect the TVA. The findings are presented in tables 6.9-3 and 6.9-4. While table 6.9-3 reports the findings estimated by using implied cost of equity, table 6.9-4 reports

the results where cost of equity is estimated using the CAPM. Four regression models are estimated in each table. *Diversifying* is a dummy variable that takes value of 1 if acquirer and target are from different 4 digits SIC industries and 0 otherwise. *Cash* is a dummy variable that takes value of 1 if an acquisition is paid 100% by cash and 0 otherwise. *RelWACC* is the ratio of WACC of target to the WACC of acquirer. *RelSize* is the ratio of market value of equity of the target to the market value of equity of the acquirer on the third Thursday of the month preceding the month of acquisition announcement. *Leverage* is the ratio of long-term debt of acquirer to market value of equity of the acquirer. *Liquidity* is the ratio of cash and short-term investments of the acquirer deflated by total assets of the acquirer. *BTM* is book-to-market equity ratio of the acquirer. *Size* is market value of equity of the acquirer on the third Thursday of the month preceding the month of acquisition announcement.

First estimation, which is presented in column (1), includes all seven variables that are reported in table 6.9-1 plus market value of equity. Column (2) reports estimations for the second regression model. Five variables with more significant coefficients from model (1) are included in this model. Column (3) presents estimations for the third regression model. In this model three more significant independent variables from model (2) are used. Finally, column (4) reports coefficient estimations for the last model in which only two independent variables, *Diversifying* and *Leverage*, are used. As reported in table 6.9-3, the coefficient of variable *Diversifying* in model (1) is -0.04 (t = -0.53), the coefficient of variable *Cash* is -0.02 (t = -0.25), the coefficient of variable *RelWACC* is 0.70 (t = 1.65), and the coefficient of variable *RelSize* is -0.39 (t = -0.36). Moreover, the coefficient of variable *Leverage* is -0.27 (t = -1.08), the

Table 6.9-3 Relationship of estimated TVA with deal and firm characteristics

	(1)	(2)	(3)	(4)
Intercept	0.140	0.152	0.154	0.180**
	[0.97]	[1.46]	[1.53]	[2.09]
Deal characteristics				
Diversifying	-0.037	-0.030	-0.032	
	[-0.53]	[-0.45]	[-0.50]	
Cash	-0.020	-0.010		
	[-0.25]	[-0.14]		
RelWACC	0.70	0.062	0.063	0.063
	[1.65]	[1.56]	[1.60]	[1.61]
RelSize	-0.39			
	[-0.36]			
Acquirer characteristics				
Leverage	-0.273	-0.244	-0.244	-0.270
	[-1.08]	[-1.04]	[-1.05]	[-1.21]
Liquidity	-0.131	-0.125	-0.127	-0.145
	[-0.67]	[-0.71]	[-0.74]	[-0.87]
BTM	-0.027			
	[-0.20]			
Size	0.000			
	[0.47]			
R^2	0.10	0.09	0.09	0.08
N	68	68	68	68

Four regression models are presented in this table. First estimation includes all seven variables that are reported in table 6.9-1 plus market value of equity. Column (2) reports estimations for the second regression model. Five variables with more significant coefficients from model (1) are included in this model. Column (3) presents estimations for the third regression model. In this model three more significant independent variables from model (2) are used. Finally, column (4) reports coefficient estimations for the last model in which only two independent variables, including *Diversifying* and *Leverage*, are used. The variables are winsorized at 0.1% and 99% levels to prevent distortions by outliers. *t*-statistics are reported in brackets.

** significance at 5% level.

Table 6.9-4 Relationship of estimated TVA with deal and firm characteristics when CAPM is used for estimating cost of equity

	(1)	(2)	(3)	(4)
Intercept	0.137	0.122	0.132*	0.102*
	[1.01]	[1.24]	[1.75]	[2.00]
Deal characteristics				
Diversifying acquisition	-0.093	-0.089	-0.090	-0.083
	[-1.41]	[-1.42]	[-1.51]	[-1.44]
Cash	-0.138	-0.005		
	[-0.18]	[-0.08]		
Relative WACC	0.011	0.007		
	[0.28]	[0.19]		
Relative size	-0.029			
	[-0.28]			
Acquirer characteristics				
Leverage (D/E)	-0.158	-0.164	-0.171	-0.109
	[-0.66]	[-0.75]	[-0.80]	[-0.61]
Liquidity	-0.086	-0.081	-0.086	
	[-0.47]	[-0.49]	[-0.54]	
BTM of equity	-0.012			
	[-0.10]			
Size	0.000			
	[0.15]			
R^2	0.09	0.07	0.07	0.08
N	68	68	68	68

Four regression models are presented in this table. First estimation includes all seven variables that are reported in table 6.9-2 plus market value of equity. Column (2) reports estimations for the second regression model. Five variables with more significant coefficients from model (1) are included in this model. Column (3) presents estimations for the third regression model. In this model three more significant independent variables from model (2) are used. Finally, column (4) reports coefficient estimations for the last model in which only two independent variables, including *Diversifying* and *Leverage*, are used. The variables are winsorized at 0.1% and 99% levels to prevent distortions by outliers. *t*-statistics are reported in brackets.

* significance at 10% level

coefficient of variable *Liquidity* is -0.13 (*t* = -0.67), the coefficient of variable *BTM* is -0.03 (*t* =- 0.20), the coefficient of variable *Size* is 0.00 (*t* = 0.47). In model (2), the coefficient of variable *Diversifying* is -0.03 (*t* = -0.45), the coefficient of variable *Cash* is -0.01 (*t* = -0.14), and the coefficient of variable *RelWACC* is 0.06 (*t* = 1.56). The coefficient of variable *Leverage* is -0.24 (*t* = -1.04), and the coefficient of variable *Liquidity* is -0.13 (*t* = -0.71). In model (3), the coefficient of variable *Diversifying* is -0.03 (*t* = -0.45), and the coefficient of variable *RelWACC* is 0.06 (*t* = 1.60). The coefficient of variable *Leverage* is -0.24 (*t* = -1.05), and the coefficient of variable *Liquidity* is -0.13 (*t* = -0.74). In model (4), the coefficient of variable *RelWACC* is 0.06 (*t* = 1.61), the coefficient of variable *Leverage* is -0.27 (*t* = -1.21), and the coefficient of variable *Liquidity* is -0.15 (*t* = -0.87).

Table 6.9-4, on the other hand, reports coefficients of regression models similar to those reported in table 6.9-3 when the CAPM is used for estimating cost of equity. According to this table, the coefficient of variable *Diversifying* in model (1) is -0.09 (*t* = -1.41), the coefficient of variable *Cash* is -0.14 (*t* = -0.18), the coefficient of variable *RelWACC* is 0.01 (*t* = 0.28), and the coefficient of variable *RelSize* is -0.03 (*t* = -0.28). Moreover, the coefficient of variable *Leverage* is -0.16 (*t* = -0.66), the coefficient of variable *Liquidity* is -0.08 (*t* = -0.47), the coefficient of variable *BTM* is -0.01 (*t* = -0.10), the coefficient of variable *Size* is 0.00 (*t* = 0.15). In model (2), the coefficient of variable *Diversifying* is -0.09 (*t* = -1.42), the coefficient of variable *Cash* is -0.01 (*t* = -0.08), and the coefficient of variable *RelWACC* is 0.01 (*t* = 0.19). Moreover, the coefficient of variable *Leverage* is -0.16 (*t* = -0.75), and the coefficient of variable *Liquidity* is -0.08 (*t* = -0.49). In model (3), the coefficient of variable *Diversifying* is -0.09

(t = -1.51). Moreover, the coefficient of variable *Leverage* is -0.17 (t = -0.80), and the coefficient of variable *Liquidity* is -0.09 (t = -0.54). In model (4), the coefficient of variable *Diversifying* is -0.08 (t = -1.44), and the coefficient of variable *Leverage* is -0.11 (t = -0.61).

This study further investigates the relationship between components of the TVA and factors that are likely to affect them using regression models reported in table 6.9-5. Several possible regression models were developed. However, only regressions that could best explain the relationships between independent variables and components of the TVA are reported. Moreover, from three components of the TVA, table 6.9-5 only reports findings regarding earnings synergies and value effects of the difference between WACC of the combined firm and acquirer. However, in untabulated results no significant relationship was found between $WACC_{P\text{-}G}$ and the variables introduced in table 6.9-1.

As reported in table 6.9-5, in regression (1) the coefficient of variable *diversifying* is -0.089 (t = -1.59), the coefficient of variable *leverage* is -0.20 (t = -0.90), and the coefficient of variable *liquidity* is -0.21 (t = -1.27). In regression (2) the coefficient of variable *cash* is 0.29 (t = 1.81), and the coefficient of variable *liquidity* is 0.06 (t = 6.84). In regression (3) the coefficient of variable *Diversifying* is -0.06 (t = -1.17), the coefficient of variable *Cash* is 0.04 (t = -0.73), and the coefficient of variable *liquidity* is -0.07 (t = -0.63). Finally, in regression (4) the coefficient of variable *Cash* is 0.05 (t = 3.01), and the coefficient of variable *Leverage* is -0.10 (t = -2.38).

Implications and interpretations of the findings reported in this chapter are discussed in chapter 7.

Table 6.9-5 Components of the TVA, diversification and acquirer's leverage

	Implied Cost of equity for WACC		**CAPM for WACC**	
	(1)	**(2)**	**(3)**	**(4)**
	Earnings synergies	**Effect of $WACC_{P-A}$**	**Earnings synergies**	**Effect of $WACC_{P-A}$**
Intercept	0.171**	0.016***	0.087*	0.017*
	[2.05]	[6.65]	[1.74]	[1.74]
Diversifying	-0.089		-0.0631	
	[-1.59]		[-1.17]	
Cash		0.286*	-0.047	0.046***
		[1.81]	[-0.81]	[3.01]
Leverage	-0.195			-0.102**
	[-0.90]			[-2.38]
Liquidity	-0.205	0.062***	-0.075	
	[-1.27]	[6.84]	[-0.63]	
R^2	0.09	0.54	0.07	0.25
N	68	68	68	68

This table reports findings regarding relationship between value effects and the factors that best explain them. Column (1) reports relationships between earnings synergies and the independent variables where the WACC is estimated using implied cost of equity. Column (2) reports relationships between value effect of $WACC_{P-A}$ and the independent variables, where the WACC is estimated using implied cost of equity. Columns (3) and (4) replicate regressions (1) and (2), respectively, where the WACC is estimated using the CAPM model.

*Significance at 10% level
**Significance at 5% level
***Significance at 1% level

Chapter 7 Discussions

7.1 Introduction

This chapter provides a thorough discussion of the empirical findings provided in chapter 6 and in light of the literature reviewed in chapter 2. The literature reviewed in chapter 2 was obviously more extensive. However, not all those theories are germane with this study. Discussions follow a similar sequence to the material provided in chapters 5 and 6 and provide inferences drawn from the empirical findings. Section 7.2 discusses the findings about changes in earnings forecasts for acquirers and targets subsequent to acquisitions. Section 7.3 provides inferences about differences between the WACC of combined firms, acquirers and targets. Further discussions about the cost of debt and cost of equity of merging firms are also provided in this section. Section 7.4 discusses findings about TVA and its components. In section 7.5, the relationship between the TVA and combined abnormal announcement returns for market-driven and non-market-driven mergers is discussed. Section 7.6 provides discussions on the relationship between the TVA and its components with combined abnormal returns of acquisitions for diversifying and non-diversifying mergers. Finally, section 7.7 draws inferences from the results of univariate and multivariate analysis on the factors affecting the TVA and its components.

7.2 Changes in earnings forecasts subsequent to acquisitions

The findings reported in table 6.2-1 show that forecasted earnings and Ltg are on average greater for combined firms than for stand-alone acquirer and target firms. These observations imply that acquisitions generate synergies and improve

growth opportunities. This finding is consistent with the proposition of prior studies - that mergers are partly motivated by opportunities for synergy gains (e.g. Jensen & Ruback, 1983). It is also consistent with findings of a number of prior empirical works on mergers and acquisitions that suggest synergies are a source of value in mergers (e.g. Carline et al., 2009; Devos et al., 2009).

7.3 Differences in WACCs

7.3.1 Cost of debt

Findings about estimated cost of debt of merging firms that are reported in table 6.3-1 indicate that average cost of debt of combined firms is significantly smaller than mean cost of debt of targets. Specifically, mean cost of debt of combined firms is 6% smaller than mean bond yield of targets. On the other hand, it is significantly greater than the mean cost of debt of acquirers. That is, mean bond yield of combined firms is 5.9% greater than mean bond yield of acquirers. The findings presented in table 6.3-1 also show that, on average, acquirers have greater costs of debt than targets.

When cost of debt increases, as was found in this study regarding acquierer's cost of debt, the value of bonds declines and bondholders earn negative returns. Conversely, when cost of debt decreases, the value of bonds increases and bondholders earn positive returns. This is the case for cost of debt of target firms in the sample of this research. These results are consistent with evidence provided by Billett et al. (2004) who find that bondholders of non-financial acquirers earn negative announcement period returns. On the other hand, they find that bondholders of target firms gain significantly positive returns.

Moreover, the results of this study regarding cost of debt of acquirers and combined firms are in line with the idea that mergers increase the default risk of acquirers (Furfine & Rosen, 2011). In fact, cost of debt is positively related to the risk of default. That is, the greater risk of default the greater cost of debt. Therefore, an increase in the cost of debt following an acquisition announcement can be considered as evidence of increase in the risk of default by the acquirer because of the acquisition.

7.3.2 Cost of equity

Table 6.3-2 reports implied cost of equity of merging firms which are estimated based on analyst forecasts. Table 6.8-1 reports cost of equity of merging firms using the CAPM model. Estimated cost of equity for merging firms are around 2% greater when CAPM is used for calculations than when implied cost of equity is calculated. This observation is consistent with findings of previous studies that the implied risk premium is significantly lower than the estimate found from ex post returns (e.g. Claus & Thomas, 2001; Gebhardt et al., 2001; Pastor et al., 2008).

Findings reported in tables 6.3-2 and 6.8-1 show that mean cost of equity of combined firms is greater than cost of equity of acquirers. This difference is around 8% of acquirers cost of equity when implied costs of equity are used and 1% of acquirers cost of equity when the CAPM is used for estimations. However, the median difference between cost of equity of combined firms and acquirers is negative in both tables, indicating a lower cost of equity for the combined firm compared to the acquirer. The difference between mean and median cost of equity in table 6.3-2 is because in four sample acquisitions cost of capital of the target firm is very much larger than that of the acquirer. In all these mergers the acquirer

and the target are from the same industry. Although these cases are relatively rare, they support the notion that even in the absence of operating synergies liquid firms acquire financially distressed firms in their industries in order to reallocate liquidity to firms that are otherwise inefficiently terminated (Almeida et al., 2011).

7.3.3 WACC

Although cost of debt of combined firms is greater than cost of debt of acquirers, the WACC of combined firms is found to be smaller than acquirers because of their smaller cost of equity. Moreover, the WACC of combined firms are smaller than the WACC of target firms as both cost of debt and cost of equity of combined firms are smaller than those of target firms. These findings suggest that the value effects of differences between the WACC of combined firms and the WACCs of acquirers and targets are expected to be positive, on average.

The evidence provided in table 6.3-3 shows that average WACC of acquirers and target firms are both around 8.9% whereas mean WACC of combined firms is slightly lower and is around 8.3%. Similarly, table 6.8-2 reports that mean WACC of combined firms is lower than that of acquirers and targets. The results of mean percentage differences between cost of capital of combined firms and those of targets and acquires are contradictory in tables 6.3-3 and 6.8-2 mainly because of high implied cost of equity of target firms compared to acquirers in a few cases. However, median differences are negative in both tables suggesting declines in the WACC of combined firms compared to acquirers and targets. The potential value effect of these changes in the cost of capital is substantial. For example, in the simple Gordon growth model and under a zero dividend growth assumption, a 1% increase in cost of capital from 10% to 10.1% approximately translates into a

1% decline in firm value. However, the relationship between cost of capital and firm value is nonlinear and depends on other variables in the valuation formula including expected earnings and earnings growth.

7.4 Sources of value in acquisitions

Consistent with prior research, this study finds that the average value effect of acquisitions is positive. In other words, merger activity is value creating. Table 6.4-1 reports that the average TVA of acquisitions included in the sample of this research is 3.7% when implied cost of equity is used for estimation of the WACC. The average TVA is only slightly different when the CAPM is employed for cost of equity and is around 4.1%. Besides, the combined abnormal announcement return for a 21-day event window is 4.5% on average. In addition, consistent with several other studies on synergy effect of mergers, the mean earnings synergies are positive suggesting that mergers create value through utilising potential synergies between acquirers and targets.

As the results suggest, estimation of the TVA is reasonably robust against different methods of estimation of cost of equity capital. However, the contribution of its components is different from one method of estimation to the other. The synergy effect is more pronounced when analyst forecasts are used for estimating cost of equity capital and accounts for around 60% of the TVA. However, when the CAPM is employed, percentage contribution of earnings synergies to the TVA is around 49%. Moreover, value effect of the difference between the WACC of the combined firm and the acquirer accounts for around 26% of the TVA when analyst forecasts are used for estimating cost of equity. However, this value effect is found to be around 43% of the TVA when the

CAPM is employed. Finally, value effect of the difference between the WACCs of combined firms and acquirers is around 13% when implied cost of equity is used, whereas it is around 8% when the CAPM is employed. Based on these observations, it seems that financial analysts tend to under-estimate the effect of changes in the cost of capital on value effect of acquisitions. Moreover, several other studies as well as this one find that implied cost of capital estimated using analyst forecasts is smaller than cost of capital estimated using ex post returns. Therefore, it is likely that changes in the WACC are less pronounced through these smaller estimations.

7.5 Value-creating mergers versus overvalued stocks

The relationship between stock-returns and the TVA are examined in tables 6.6-1 and 6.8-4 to test whether acquisitions are driven by misvaluation of stocks in the market or actual value-creation incentives. If the abnormal announcement returns reflect factors other than expected TVAs, the relationship between estimated TVAs and the combined abnormal returns is expected to be weaker for market-driven acquisitions. Shleifer and Vishny (2003) and Rhodes-Kropf et al. (2005) argue that acquisitions could be driven by stock market misevaluation of the merging firms. They suggest that in such instances overvalued acquirers use their stock as the medium of exchange to make acquisitions. On the other hand, Mitchell and Mulherin (1996) and Harford (2005) argue that industry shocks drive mergers. Harford (2005) argues that the relationship between high stock market valuations and merger waves has been misattributed to behavioral misvaluation factors. Rather, the relationship is actually driven by the higher capital liquidity (lower transaction costs) that accompany an economic expansion. Consistent with the theory of market-driven mergers, Devos et al. (2009) suggest that the

relationship between announcement abnormal returns and synergies is stronger for non-market-driven mergers. In this study, such a stronger relationship is not found between abnormal announcement returns and the TVA. The results reported in tables 6.6-1 and 6.8-4 suggest that the relationship between abnormal returns and the TVA is not significantly weaker for market-driven acquisitions than other mergers. Therefore, these findings do not support the idea of market-driven mergers.

7.6 Diversifying mergers and components of TVA

This study further investigates the relationship between combined abnormal returns and the TVA and its components in related and diversifying mergers. Industry-related acquisitions are more likely to create value through synergy gains. Therefore, such acquisitions are more likely to be motivated by earnings synergies. On the other hand, diversifying mergers are expected to reduce risk and cost of capital. Thus, diversifying mergers are more likely to be motivated by value effects of changes in the cost of capital. In this sense, abnormal stock returns are expected to be related to synergies in non-diversifying mergers. Moreover, abnormal announcement returns are expected to be related to the value effect of changes in the WACC in diversifying acquisitions. As reported in tables 6.7-1 and 6.8-5, findings of this study suggest that the relationship between stock price reaction and synergy effects is stronger in related mergers. Moreover, combined abnormal announcement return is significantly related to value effect of the difference between the WACC of the combined firm and the WACC of the acquirer for diversifying mergers. This relationship is weaker in related acquisitions and is not significant. This evidence confirms that related mergers are

motivated by synergies whereas diversifying mergers are motivated by value creation expected from reducing the cost of capital.

7.7 Factors affecting TVA

7.7.1 Univariate analysis

This research further investigates the impact of a number of factors that are likely to affect returns from acquisitions. This includes the diversifying nature of the acquisition, method of payment, relative WACC of the merging firms, relative size of the merging firms, liquidity of acquirer, BTM ratio of the acquirer and size (market value) of the acquirer. The literature related to these factors and also the mechanisms used that may affect acquisition returns are extensively discussed in chapters 2, 3 and 5 of this dissertation. Results of the investigations are reported in table 6.9-1 when implied cost of equity is used for estimation of the WACC, and in table 6.9-2 when the CAPM is employed.

The results reported in both tables (6.9-1 and 6.9-2) suggest that for mergers where the acquirer and the target firm are from the same industry the TVA is greater than with merging firms from two different industries. However, the differences are not statistically significant. Similarly, earnings synergies are greater for industry-related mergers. However, the difference between the WACC of the combined firm and that of the acquirer seems to be greater in diversifying mergers than related ones, perhaps because diversifying mergers reduce the cost of capital for acquiring firms. In contrast, the value effect of the difference between the WACC of the combined firm and the target is greater in related mergers suggesting that diversification creates value in the third part of equation 5.4-1.

The study findings also provide interesting evidence on how the method of payment affects the TVA. As discussed in section 2.4.3 of chapter 2, there are two hypotheses regarding the market reaction to method of financing. First, target stockholders would prefer stock because cash acquisitions create an immediate tax liability for them, while stock payments are taxable only when they are redeemed. Second, the information asymmetries hypothesis suggests that acquirers who use stock to purchase a target are signalling to the market that their stock is overvalued. Hence, their stock price declines around announcement of the acquisition. In contrast, stockholders of targets who know their stock is undervalued prefer payment in stock rather than cash so they may enjoy the benefits of corrected valuation. While different theories offers several conflicting interpretations of the choice of financing, empirical evidence provided by Amihud et al. (1990) and Travlos (1987), among others, shows that acquirers who pay in cash earn significantly more than those who choose stock payments. Consistent with findings of prior studies, in un-tabulated results, this study finds that both acquirers and targets receive greater abnormal returns around the announcement of the acquisition. In fact, acquirers who pay cash gain 12% ($t = 3.47$) more than non-cash acquirers. Targets of cash acquisitions also earn abnormal returns 8% ($t = 1.36$) greater than targets of non-cash acquisitions. Combined abnormal returns are also greater for cash acquisitions compared to non-cash acquisitions by around 9% ($t = 2.98$).

In contrast with market reaction to announcement of cash acquisitions, the TVA is greater for non-cash takeovers. This result is consistent with the hypothesis that suggests stock-financed acquirers create value for their long-term shareholders (Savor & Lu, 2009). Stock financed mergers are equity issues as well. Therefore, the value changes cannot be interpreted as pure merger effects. Prior studies

suggest that equity issues are associated with negative abnormal returns around the announcement day. An explanation is that by issuing equity, mangers signal to the market that the stocks of their firms are overvalued. Consequently, the investors adjust for the equity issue news and the stock price declines (Myers & Majluf, 1984). Hence, it is essential to consider the equity issue effect in the analysis of acquisition returns. In this sense, worse abnormal return from non-cash acquisitions can be, at least partially, attributed to the effect of the equity offerings.

Although the TVA as a sum of three components is greater for non-cash acquisitions, its components show conflicting effects. The findings of this study show that consistent with the TVA, earnings synergies are greater for non-cash acquisitions. However, the value effect of the difference between the WACCs of the combined firm and the acquirer in cash mergers is significantly greater than non-cash mergers, especially when the CAPM is employed for estimating cost of equity. This finding is interesting. It shows how choice of cash or stock payment can affect the value of an acquisition in two opposite ways. Specifically, it shows that cash payment typically reduces cost of capital for the acquirer, perhaps through increasing leverage and on the other hand, it seems that cash payments are used in mergers that generate negative synergies.

Relative size of the target to the acquirer is another factor that may affect acquisition returns (e.g. Gorton et al., 2009). Results of this study suggest that the average TVA is greater for acquisitions with below-median relative size of the target to the acquirer. In un-tabulated results this study also finds a similar difference between combined abnormal returns of acquisitions with below- and above-median relative size of the merging firms. That is, combined abnormal

returns to the merging firms 21-days around announcement day are around 6% (t = 1.15) greater for acquisitions with below-median relative size. Earnings synergies are also greater for mergers with below-median relative size. However, acquisitions with below- and above-median relative size are not different in the effect of the difference between the WACCs of the combined firm and the target. Interestingly, the results provided in table 6.9-2 suggest that acquisitions with below-median relative size generate significantly greater value because of the difference between the WACCs of the combined firm and the target. This difference implies that when a relatively larger acquirer takes over a relatively small target the decrease in the discount rate of future earnings of the target is so large that despite the small overall effect of this part of the model, it makes a significant difference in the TVA. This difference in the value effect is around 42% of the total difference in the TVAs of acquisitions with below- and above-median relative size and is statistically significant.

This study also finds that acquisitions with greater relative WACC of target to acquirer generate more value. Moreover, earnings synergies and the value effect of the difference between the WACCs of the combined firm and the target are greater for acquisitions with above-median relative WACC. However, the value effect of the difference between the WACCs of the combined firm and the acquirer is smaller for acquisitions with above-median relative WACC.

This study further examines the difference in the TVAs of acquisitions with glamour and value acquirers. Prior studies suggest that glamour acquirers with low BTM ratio of equity underperform value bidders with high BTM ratio of equity in the long term (Datta et al., 2001; Rau & Vermaelen, 1998). As discussed in section 2.4.1 of chapter 2, Rau and Vermaelen (1998) suggest that this is due to

market over reaction to past performance of acquirers at the time of announcement of an acquisition. They call their hypothesis "performance extrapolation". Moreover, it is likely that managers of glamour acquirers become overconfident and overestimate the value they can create through mergers due to hubris (Roll, 1986). Therefore, they are more likely to undertake acquisitions that are value-destroying or less value creating. Consistent with extrapolation and hubris hypotheses, this study finds that acquisitions with below-median BTM ratio of equity of the acquirer generate smaller TVAs compared to those with above-median BTM of equity of the acquirers. Specifically, when implied cost of capital is used for calculating the WACC, acquisitions with value acquirers generate around 7% more TVA than acquisitions with glamour acquirers However, this difference is smaller when the CAPM is employed and is around 1%.

Next, this study investigates the effect of acquirer leverage on the gains from acquisitions. Prior studies find that acquirers are significantly less leveraged compared to a portfolio of control firms prior to acquisitions (Uysal, 2011; Welch, 2004). One possible reason for this observation might be that lower leverage of the acquirer prior to acquisition is value creating. In fact, acquirers with lower leverage may finance the acquisition with a lower cost of capital and avoid value destruction because of too much leverage following the acquisition. This study examines whether lower leverage affects the TVA and its components. Consistent with this idea, the findings suggest that in acquisitions where the acquirer has below-median leverage, the TVA is greater than acquisitions in which the acquirer has above-median leverage. Specifically, when analyst forecasts are employed for estimating cost of equity and calculating the WACC, this difference is around 8%, on average. Similarly, when the CAPM is employed this difference is around 5%

and a significant 3% of it is generated by the difference between the WACC of the combined firm and the acquirer.

Finally, the sample is divided into two groups, based on the liquidity of the acquirer, to test whether acquirer's liquidity affects acquisition returns. Consistent with agency costs hypothesis, Harford (1999) finds that acquirers with greater cash reserves undertake acquisitions with subordinate returns. On the other hand, it is also likely that cash-rich firms, with lower risk of default and lower cost of capital, make better acquisition decisions that create value. Results of this study support the latter idea. That is, acquirers with above-median liquidity undertake acquisitions that generate average TVA around 7% greater than those undertaken by acquirers with below-median liquidity. Similarly, when the CAPM is used for estimating cost of equity, low-leverage acquirers create around 2% more TVA.

7.7.2 Multivariate analysis

The results documented in the univariate analysis section suggest that estimated TVAs vary in the cross section in a manner consistent with prior research. This study uses multivariate regressions to further investigate the cross-sectional patterns in the estimated TVAs. Tables 6.9-3 and 6.9-4 report the results of the multivariate analysis. The dependent variable is the TVA. The explanatory variables are deal and acquirer characteristics used in the univariate analysis as well as size (market value) of the acquirer. Deal-specific variables include relative size, relative WACC and two dummy variables that take the value 1 for diversifying acquisitions and cash acquisitions, and 0 otherwise. Four regression models are developed. Model (1) includes a complete set of explanatory variables. In the three other models, variables with more significant coefficients are included.

If diversifying acquisitions are value-destroying and related acquisitions are value creating, the coefficient on the diversifying dummy variable is expected to be negative. On the contrary, if diversifying mergers create value and enhance the TVA, the coefficient on the diversifying dummy variable is expected to be positive. Moreover, if cash payment is value creating the coefficient on the cash dummy variable should be positive. In contrast, this coefficient is expected to be negative if cash payment decreases the TVA. Acquirer characteristics including leverage, liquidity, BTM ratio of equity and size (market value of equity) are used as control variables.

The multiple regressions show that diversification has a significant role in determining the TVAs of acquisitions. The coefficients on the diversifying dummy variable are negative in all models suggesting that diversification reduces the TVA. This result confirms the finding in tables 6.9-1 and 6.9-2 that related mergers create greater TVAs. As discussed in the previous section, this is mainly because diversifying acquisitions generate negative earnings synergies with an absolute value greater than the positive contribution of reduced cost of capital of the combined firm compared to the acquirer. Consistent with Rau and Vermaelen (1998), the coefficient on the BTM of equity of acquirer is positive, implying that value acquirers undertake better acquisitions. Moreover, consistent with (Harford, 1999), the coefficient on acquirer liquidity is negative, suggesting that cash-rich acquirers undertake acquisitions with less TVA. However, these coefficients are not statistically significant.

Next, this study investigates the relationship between components of the TVA and the explanatory variables. Table 6.9-5 reports the findings. Models (1) and (2) provide the coefficients when implied cost of equity is used for estimation of the

WACC and the TVA, whereas models (3) and (4) report the results when the CAPM is employed. The relationship between the value effect of the difference between the WACCs of the combined firm and the target and the explanatory variables are not reported in this table due to the fact that its effect is small compared to other components of the TVA. In fact, in un-tabulated results no significant relationship is found between the explanatory variables and this component of the TVA.

Findings in table 6.9-5 show that diversification has a negative relationship with the value created because of the earnings synergies. However, diversification does not have a relationship with the effect of the difference between the WACCs of the combined firm and the acquirer as the coefficients of the diversifying dummy variable are around 0 in models (2) and (4). This suggests that diversifying mergers are unlikely to reduce cost of capital of the combined firm compared with the cost of capital of the acquirer. This result potentially suggests that diversifying mergers do not have as much risk reduction effect as a number of scholars believe. In other words, the findings of multivariate analysis suggest that diversifying acquisitions are likely to be motivated by factors other than value creation. This is consistent with the proposition of Amihud and Lev (1981) who suggest managers undertake conglomerate mergers to diversify their personal portfolio and reduce their "employment risk". This finding is also consistent with the "entrenchment hypothesis" of Shleifer and Vishny (1989) that suggests managers make themselves valuable to shareholders and costly to replace by diversifying through acquisitions, and therefore decrease chances of being replaced.

The findings suggest that cash payments are related to negative earnings synergies. On the other hand, the results show a positive and significant relationship between cash payment and value effects of the difference between the WACCs of the combined firm and the acquirer. These observations suggest that acquisitions that are paid for by cash create value as they are more likely to reduce cost of capital of the combined firm compared to the acquirer.

Chapter 8 Summary and conclusions

8.1 Introduction

This chapter summarises contributions to new knowledge that this original research makes. The chapter also provides a summary of findings of the study and draws conclusions from the empirical evidence provided in chapter 6 and the model developed in chapter 3. Section 8.2 summarises main empirical findings and key discussions of this research. Then section 8.3 summarises discussions regarding the model developed by this study to decompose value effects of mergers. Implications of findings for practitioners and researchers are provided in section 8.4. Section 8.5 highlights new questions that can be raised based on the results of this research and makes suggestions for future research. Finally, section 8.6 provides a summary of conclusions.

8.2 Contributions of this research to knowledge

Earlier in this thesis the prior research on value effects of mergers was summarised in Table 1.3-1. Prior studies find that, on average, acquisitions add to the combined value of merging firms. It is apparent that the big question of sources of value in mergers has not been sufficiently developed. The primary contribution of this research is decomposing sources of value in mergers in a novel way. This novel decomposition allows for detecting the impact of changes in the cost of capital on value-effects of mergers.

The model of this study suggests that the combined value effect of mergers can be broken down into three parts: (1) earnings synergies discounted at the rate of the

WACC of the combined firm; (2) value effect of the difference between the WACCs of the combined firm and the acquirer; and (3) the difference between the WACCs of the combined firm and the target. In any given merger, each of these components may add to or deduct from the total value of the merger.

Moreover, the combined value of an acquisition estimated using this model might be negative, suggesting that the acquisition destroys value, or positive, suggesting that the acquisition creates value. Nevertheless, empirical evidence provided in this research shows that the combined value effect of acquisitions is positive and around 4%, on average. An important finding of this research is that average estimated TVAs are very close to the combined announcement returns obtained from the event study. This finding supports the robustness of the methods that are used in this research for measuring economic impacts of mergers.

Aside from that, the results suggest that the two first components of the model account for more than 90% of value effect of acquisitions. The effect of the difference between the WACCs of the combined firm and the acquirer is more pronounced when the CAPM model is used for estimating cost of equity than when the implied cost of equity is used based on analyst forecasts. A possible reason for this observation is that financial analysts underestimate the value effect of changes in the cost of capital of the combined firm compared to the costs of capital of the acquirer and the target, but overestimate the synergy effects instead.

This study further documents how diversification, method of payment and capital structure of the acquiring firm before a merger impacts value of acquisitions. Diversification has a negative effect on earnings synergies and does not have a relationship with the value of the two other components that capture the effect of changes in the WACC. Earnings synergies also decrease in cash payments. In

contrast, the value effect of the difference between the WACCs of the combined firm and the acquirer increases in cash acquisitions. In addition, the value effect of the difference between the WACCs of the combined firm and the acquirer decreases when the acquirer has a greater percentage of debt in its capital structure.

A few examples further explain how decomposing the value effect of mergers based on the proposed model contributes to a better understanding about sources of value in acquisitions. In the first example the acquirer and the target are both from the healthcare industry. The TVA is 7.3% of the value of the acquirer and the target together when the CAPM is used for estimating the cost of equity. The contributions of the three components of the TVA are 5%, 1% and 1% for components (1), (2) and (3), respectively. In this example value is created in all three components of the WACC with the biggest contribution from earnings synergies.

In the second example, the acquirer is from the healthcare industry and the target is from the wholesale industry. This is a diversifying acquisition by a zero-debt acquirer where the settlement is 100% by stocks. In this acquisition the WACC of each of the merging firms is equal to their cost of equity. The TVA is -7.3% where its components are -6.0%, -10.7% and 9.3% for components (1), (2) and (3), respectively. In this example, value is destroyed in the first two components of the model suggesting negative synergy earnings and a greater WACC for the combined firm than the WACC of the acquirer. However, value is created in the third component implying that the WACC of the combined firm is smaller than the WACC of the target. This example shows how different components of the model may have opposite effects on the total value of an acquisition.

In the third example, the TVA is 0.1% and the values of its three components are -3.4%, 2.0% and 1.5% of total value of the acquirer and the target together, respectively. This example is a diversifying merger paid by cash and where the cost of capital of the combined firm is reduced compared to the WACCs of the acquirer and the target causing value creation in parts (2) and (3) of the model. However, the created value disappears because of the negative earnings synergies that destroy value in part (1) of the model.

These examples illustrate how value-destruction and value-creation take place concurrently in an acquisition to determine the TVA. In fact, the three components of the TVA might countervail each other, or all contribute positively or negatively to the TVA of a given acquisition. Understanding the extent to which each of these components contribute to an acquisition helps practitioners to value an acquisition deal more accurately.

This decomposition also contributes to finding mechanisms through which mergers create value by disentangling impact points of various deal and acquirer characteristics that are known to affect value of acquisitions. Each of these factors may have different effects on each component of the TVA. Once the TVA is broken down into its individual components, it will be easier to detect the magnitude of the effect of each factor on a component as well as the factor's total impact. For instance, diversification may destroy value because of unrelated operation lines of the merging firm and concurrently reduce cost of capital of the combined firm compared to the acquirer and therefore create value this way. The overall value effect will then depend on the extent to which these components countervail each other. Therefore, the value effect detected by measures such as abnormal announcement returns cannot be used to determine associations between

diversification and components of value effects that are likely to be affected by diversification.

While much emphasis is put on synergy gains from acquisitions by managers, analysts and researchers, the evidence provided in this study shows that the WACC of the combined firm and the merging firms may have a significant role on the value effect of mergers. These findings suggest that changes in the capital structure of the combined firm compared to capital structures of the acquirer and the target have a key role in determining value of an acquisition. For example, all the value created because of synergies between the operations of the acquirer and the target can be counterbalanced by raising too much debt for financing the acquisition, which in turn increases risk of default and cost of capital of the combined firm. Moreover, reducing cost of capital of the combined firm compared to the merging firms is value creating even in the absence of operating synergies.

The empirical evidence provided in this study shows that the component of value that is associated with the difference between the WACCs of the combined firm and the acquirer is mainly determined by leverage of the acquiring firm and the method of payment. While cash payment is value creating, high leverage of the acquirer prior to an acquisition can destroy value by raising the cost of capital of the firm too much. This is especially important to managers at the stage of planning an acquisition. Although an acquisition might potentially create significant synergies in earnings, it may also increase the WACC of the combined firm. Then total value created or destroyed in that merger will depend on the extent to which value creating components and value-destroying components of an

acquisition counteract and neutralise each other. In other words, the value created because of synergies in earnings might be countervailed, for example, by raising too much debt for financing the acquisition which in turn increases cost of capital to a value-destroying level.

8.3 A model for decomposing value effects of mergers

This research develops a discounted cash-flow model for the combined value effect of acquisitions and provides empirical evidence on how three components of the model are affected by acquisition decisions. The model explains how mergers can create or destroy value depending on synergy gains and the relative WACC of the combined firm compared to WACC of the acquirer and the target. The value effect of mergers consists of three main components. The first component of value effect comprises different synergy effects of acquisitions discounted at the rate of WACC of the combined firm. This includes efficiency improvements resulting from economies of scale and scope, better governance, and new investment opportunities. The second component is merely related to the discount rates at which the future cash-flows of the acquirer should be discounted prior and subsequent to a merger. The third component of value effect is a function of the difference between WACC of target and WACC of the combined firm. The model in this study suggests that the total value effect of any given merger is equal with the aggregate impact of these three components.

The model developed in this study explains how mergers can be value-creating or value-destroying. Importantly, the model per se does not make

any prediction about the outcome of the mergers and the magnitude of their effect on the combined value of the merging firms. It proposes that three key elements of the model in relation to characteristics of the target, such as size and leverage, and industry- and economy-wide conditions, determine the extent to which mergers create or destroy value. However, since non value-creating mergers are less likely to be launched, it is plausible that undertaken mergers create value, on average. In any given set of industry or economic conditions, there are at least two variables as adjustment tools in the hands of decision makers that can determine the total value of acquisitions: choice of target, and method of payment. While characteristics of the targets available for merger determine the limits of profitability of any takeover activity, significant influence of method of payment on leverage, size and BTM of the combined firms gives it a key role in determining WACC of the combined firm.

A further strength of the model developed in this study is that it is consistent with and extends the view to the neoclassical theory of mergers (Harford, 2005; Mitchell & Mulherin, 1996) which explains how industry- and economy-wide shocks, such as technology developments and deregulation, can cause merger waves. In the absence of such shocks possible gains from undertaking acquisitions are generally less than expected costs. Takeover activity thus remains at a low level waiting for a change in the macro environment. Economy-wide and industry-wide shocks bring opportunities for value creation through mergers and trigger the waves.

Under the new conditions, the combination of acquirer and target firms is an option to utilise these opportunities and take advantage of synergies or reductions in the cost of capital. For example, Andrade et al. (2001a), among others, emphasise the role of deregulation as a key driver of merger waves. Ovtchinnikov (2010) shows that deregulation affects leverage decisions of firms in the deregulated industries as well as the determinants of capital structure. She suggests that following deregulation, overleveraged firms are likely to issue equity and reduce leverage. One of the possible ways the new issued equities can be used is by undertaking acquisitions. This is consistent with an increase in number of equity-paid takeovers during the merger waves reported by prior empirical studies (e.g. Rosen, 2006).

8.4 Implications for practitioners and researchers

Commercially, there should be returns to be made by mergers. Understanding sources of value in mergers and acquisitions are of essential importance to several stakeholder groups including shareholders, bond holders, customers, the government, policy makers and managers. Jensen (1984) argues that shareholders are the ultimate right holders of a firm and therefore should be in the centre of investigations regarding value effects of mergers. Consistent with this notion the value effect of mergers is primarily investigated in regard with shareholders' wealth. The findings of prior studies suggest that combined acquisition returns are positive, implying that shareholders gain significantly through mergers.

Although a large body of research suggests that much of merger abnormal returns go to target shareholders, a recent study by Ahern (2012) shows that dollar

abnormal returns to target firms are only slightly greater than dollar abnormal returns to acquirers around announcement of acquisitions. Consistent with prior studies, this research finds that combined abnormal returns of acquisitions and the TVA are positive and significant. Using the model provided in this study, shareholders, investors, and analysts can make a relatively more accurate estimation of value effects of mergers. This may help investors and shareholders of the merging firms to make better investment decisions.

Although shareholders are the ultimate holders of firms, the economic effects of mergers are not limited to the merging firms and their shareholders. Specifically, mergers are likely to affect bond holders, customers and governments. Shareholders can expropriate wealth from bond holders through leverage increasing acquisitions where shareholders can benefit from leverage tax savings at cost of bond holders that bear greater risk of default. On the other hand, a coinsurance effect may reduce the risk associated with the acquirer and the target firm and add to bond holders' wealth in both firms. Aside from that, wealth might be transferred from acquirer bond holders to target bond holders if the combined firm’s risk of default is greater than acquirer's risk but smaller than the target's risk. Moreover, if mergers increase market power of the merging firms and therefore impair competition in their respective product market, then it is likely that the shareholder value created in mergers be simply the transfer of wealth from customers' pocket to shareholders. Besides, shareholders can become wealthier if firms simply pay less tax, for example, through utilizing unused carry forwards that would expire in absence of the merger and expropriate wealth from the government.

Policy makers regulate wealth effects of mergers on different stakeholder groups. In this sense, they are interested to know whether the value created for shareholders is from generated "synergies" or is transferred from other stakeholders to shareholders. If value is transferred from other stakeholders then policy makers may revise regulations in a way that protects rights of all stakeholders. The results of this study show that acquirer bond-holders lose value while target bondholders and shareholders and acquirer shareholders gain. Although findings of the study suggest an actual value creation in mergers it seems that a significant amount of value is transferred from acquirer bondholders to target bondholders. This observation has implications for policy makers to regulate the market for corporate control in a way that minimises expropriation of wealth.

Managers are another group that benefit from a better understanding regarding sources of value in mergers. Managers have been accused to prefer their personal interests to shareholders interests for a long time. They allegedly tend to build empires and reduce their own employment risk through value destroying mergers. They are also accused to make non-profitable acquisitions because of overestimating their governance capabilities and hubris (Roll, 1969) and paying too much premium for target firms. Moreover, prior research suggests that firms who undertake value destroying acquisitions are likely to become acquisition targets later, and their incumbent managers are then likely to be replaced. Understanding sources of value helps managers to avoid risks of undertaking value-destroying mergers. The model suggested by this study and the empirical findings help managers to make accurate estimations of value effects of mergers, and therefore, determine the maximum amount of acquisition premium that does not destroy shareholder value in an acquisition plan. They can also use results and

discussion provided by this study when they choose a mix of different methods of payment and the target of acquisition.

This study also has implications for teachers. The model developed in this study can be added to teaching agenda of corporate finance courses. Moreover, the empirical finding of this study suggest that more emphasise needs to be put on the role of changes in the cost of capital on value effects of acquisitions deals.

8.5 Future research

Future research in several areas flows from the analysis and findings in this thesis. Findings of this study bring up a fundamental question regarding the role of financial leverage of the merging firms in value effects of mergers. On the one hand, mergers are risky investments that increase risk of default and therefore as it is documented in this research cost of debt of the combined firm is significantly greater than cost of debt of the acquirer. Moreover, cost of equity of the combined firm is likely to decrease as the median of changes reported in tables 6.3.2 and 6.8.1 in chapter 6. These observations shows that the ratio of cost of debt to cost of equity if greater for the combined firm than for the acquirer. Therefore, combined firms will typically lose value if they leverage up because increased leverage increases their cost of capital. On the other hand, prior research finds that combined firms leverage up subsequent to acquisitions and suggest that they can enjoy further positive value gains that that come with greater tax shields. Although both arguments are theoretically correct and there are empirical evidences that supports each, it is not clear that which effect is dominant and to what extent these two effects counteract. Addressing this question is left for future

research as data limitations didn't allow further investigation of this question in this study.

The model developed in this study can be extended considering that acquirers can plan multiple acquisitions to maximize value of the combined firm. In such multiple acquisition plans, synergy gains and cost of capital of the combined firm will depend on characteristics of the acquirer and all targets. The combined firm can also take advantage of synergies between the multiple target firms even if one-on-one acquisition of each of the targets does not create synergies. Cost of capital of the combined firm will depend on the leverage and other factors that determine cost of capital of the acquirer and its targets, and also method of payment and value of multiple deals. Further extension of the model and related empirical investigations are left for future research.

8.6 Summary

In summary, the key contributions of this thesis to the knowledge includes commercial, research and teaching implications as discussed above. In this study, sources of value in mergers are broken down into three components. Moreover, the relative importance of each component is empirically investigated. The study finds that synergy gains as well as the difference in the WACCs of the combined firm and the acquirer have key roles in determining value of acquisitions. Specially, it is documented that investigating the capital structures and the WACCs of the combined firm and the merging firms contributes to addressing questions about sources of value in mergers. Furthermore, this study shows that investigating the relationships between the components of value and the factors

that are likely to affect them provides opportunities for discovering mechanisms through which mergers create or destroy value. This study finds that factors such as diversification and method of payment have different and even counteracting effects on the value of acquisitions.

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