Short selling constraints, divergence of opinion and gains to acquisitions

Alexandridis, George

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By George Alexandridis

Principle Supervisors: Prof. Antonios Antoniou and Dr. Huainan Zhao

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In memory of my Father

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Abstract

In this thesis, I examine whether specific variables that have been directly identified as factors that have a bearing on asset pricing constitute significant determinants of short and long run gains to acquisitions. Existing literature, starting from Miller (1977), explicitly associates these factors, namely the degree of short selling constraints and disagreement among investors, with overvaluation and asset pricing bubbles. Along these lines, I examine whether these also determine the degree of overpricing of acquiring firms prior to acquisitions and thus their subsequent performance around the acquisition announcement and in the post-acquisition period. In this investigation I control for a number of distinctive characteristics and performance determinants identified in the literature related to gains to acquiring firms. Results indicate that indeed binding short selling constraints and high divergence of opinion about the value of an acquirer leads to its stock being severely overpriced in the pre-acquisition period or around the announcement. This rationally leads to extensive underperformance in the post acquisition period. My evidence can help explain several anomalous stock return patterns related to acquisitions and suggest that the success of an acquisition in terms of creating value for shareholders can be to a large extent determined by the extent of disagreement between investors about the price of the acquiring firm's stock preceding the acquisition announcement.

The material contained in this thesis has not previously submitted for a degree in this or any other university.

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Chapter 1: Introduction

1.1 Introduction

Mergers and Acquisitions has been one of the most extensively researched areas in the field of corporate finance within the last two decades. The main question that motivates this strand of research concentrates on whether acquisitions create value for shareholders of acquiring as well as target firms. While there exists some agreement that target firms' shareholders gain significantly after acquisition announcements, there exists extensive debate on whether acquiring firms benefit from acquisitions. The main rationale behind creating value from mergers is that the present value of synergies must be greater than the premium paid. Nevertheless, most M&A transactions globally involve a premium of 35-50%. Further, the practical constraints of mergers often prevent the expected benefits from being fully achieved and the synergy promised by dealmakers might just fall short.

Given that post acquisition integration is rarely as smooth as expected, it is not surprising that mergers in general fail to create value for acquiring firms' shareholders in the long-run. In fact, a large number of studies on long-run post takeover stock performance have disturbingly documented persistent negative abnormal returns to bidding firms acquiring listed targets. Several reasons have been offered in the voluminous merger literature that aims to explain this pattern. Along these lines, a number of recent papers argue that the well documented long run underperformance is by no means a universal phenomenon and clearly depends on specific deal and acquirer characteristics such as the method of payment used in the transaction, the mode of acquisition, the size of the acquiring firm and/or the size of the target and the

benchmark model used to assess performance. On the other hand, literature related to short run gains from acquisitions mainly documents that such gains mainly depend on the type of target firm acquired and the method of payment used in the transaction. In this thesis I examine whether additional factors that are believed to play a major role in asset pricing determine such long and short run gains from acquisitions.

Accordingly, most valuation models used in academic literature and to an extent in investment institutions for the purpose of pricing financial assets assume that investors have identical estimates of expected returns and that information is commonly available to all agents. In reality, evidence based on the sciences of economics, finance, and psychology suggests it is possible that investors disagree about asset values as they interpret the same information in different ways. In addition, it is likely that in some cases there may exist informational asymmetries in financial markets, leading to a more "rational divergence" of investors opinions.

Academic interest on this nexus has been renewed in the last thirty years mainly due to a seminal paper published by Edward Miller in 1977 that essentially stimulated the beginning of more sophisticated studies surrounding this issue. The author laid a theoretical ground for divergence of opinion to have a direct effect on asset valuation and hence stock returns. His theory suggests that when optimistic investors drive security prices to "unreasonable highs" and pessimistic investors are obliged to stay out of the market due to the existence of short selling constraints, prices may overshoot. This overvaluation will naturally lead to subsequent underperformance and thus, by using this theory as a benchmark, we could theoretically identify overpriced

stocks and avoid them. This is in sharp contrast with the cornerstone of the rational side of finance predicting that return predictability is virtually impossible. Moreover, if we consider that the more investors disagree, the higher the uncertainty in the market, this theory significantly diverges from the view that higher uncertainty should generate higher returns rather than lower.

Miller's theory has only recently been empirically tested due to the difficulties researches face in constructing a proxy that realistically measures investors' difference of opinion. The majority of studies find great support for Miller's hypothesis, although due to the controversial nature of recent findings the issue remains far from settled. Most recent papers examine the relation between investors' divergence of expectations and stock returns in the cross section. In other words, they sort stocks every month or quarter based on the degree of opinion difference or short selling constraints they are subject to and then examine their subsequent performance. In this thesis I use acquisition announcements to test this hypothesis. In this way, as argued earlier, I examine whether divergence of opinion among investors and short selling constraints, the two main components of the "premium hypothesis", are also significant determinants of short and long-run gains to acquisitions.

According to my conjecture, if an acquiring firm is already severely overpriced before it announces an acquisition due to optimistic investors' determining its value, it is very much likely that it will at some point underperform irrespective of whether the acquisition decision itself was of high quality or not. Of course the quality of the acquisition and valuation play a direct role in determining the success of an acquisition

but an overpriced acquirer, say at a high valuation period, will naturally underperform when more information arrives in the market about its value, ceteris paribus. Along these lines, one reason for some acquiring firms destroying value for investors after acquisitions may be related to the pre-event differences of opinion about their stock and the degree of short selling constraints they are subject to.

Accordingly, in chapter 2, I review in great detail the literature related to Miller's premium hypothesis. The building blocks of the theory and the empirical findings of existing research that tests this theory are discussed. Further, the proxies used to capture short selling restrictions and dispersion of investors' opinion are outlined. Lastly, I review the empirical findings of any existing tests of Miller's hypothesis under an event study framework. Note that the literature related to acquisitions and the link between this literature and the divergence of opinion literature are reviewed and explained in each of chapters 3, 4 and 5.

In chapter 3, I investigate the role that short selling constraints play in determining post acquisition performance. Given that most common asset pricing models assume that investors can freely short sale any stock and that several stock market anomalies have been attributed by researchers to market wide short selling constraints, it is also possible that the long run underperformance of acquiring firms bidding for listed targets can also be attributed to shorting restrictions. I thus examine whether acquirers that are relatively hard to short (i.e. are subject to low institutional ownership) underperform acquirers that are easy to short. The main finding that emerges from this study is that indeed statistically significant post acquisition value

destruction is only present in segments of acquirers subject to binding short selling restrictions prior to the acquisition.

Along these lines, chapter 3 uncovers a significant role of short selling constraints as proxied for by the degree of institutional ownership in determining post acquisition performance. In Miller's setting however, given that there exist market wide short sale constraints and the fact that acquirers are in general hard to short according to existing literature, divergence of opinion should actually be a main determinant of the magnitude of overpricing for acquiring firms' stock. Thus, in chapter 4, I examine the role that divergence of opinion plays in determining post acquisition performance. Results indicate that indeed divergence of opinion among investors about acquiring firms' stock can independently determine post acquisition performance.

The research design of chapter 4 was based on the fact that most empirical studies assume that short run overpricing is manifested through long run underperformance. However, no study actually examines the short-run effect of opinion dispersion on stock returns. In the case of an acquisition announcement, high pre-event dispersion of opinion about the value of an acquirer can indicate that there exist many optimistic as well as pessimistic investors about the value of its stock. If the negative opinions are somehow restricted after the announcement and this announcement conveys in general positive news to investors about the future of the acquiring firms then we would expect the optimists to lead the price of the acquirer in the short run to unreasonable highs.

Therefore, the higher the short run gains, according to Miller's theory, the worse the long-run performance. As a result, chapter 5 links Miller's theory with behavioral theories based on investors' overreaction and subsequent burst of bubbles to explain both short and long-run performance of acquiring firms. For this purpose i limit my sample to acquisition announcements that are likely to further encourage optimistic opinions and prevent the pessimistic ones. Results clearly reflect that divergence of opinion is also a major determinant of short run gains to acquisitions and indicates that investors should dispose acquiring firms' stocks that were subject to high value ambiguity shortly after they experience the short run gains.

Chapter 2: Literature Review

2.1 Introduction

The rational school of thought predicts that in financial markets no abnormal returns can be earned consistently on the basis of publicly available information (Fama (1970, 1991))[1]. The most common asset pricing models that are explicitly related to the efficient market hypothesis (EMH) such as the CAPM or the Fama and French (1993) three factor model imply that return is a compensation for bearing risk and thus attribute any observed profitable investment strategies to significant risk exposure involved. These models assume that information is commonly available to all investors and that the latter interpret information in an identical way. Accordingly, the main assumption set in most common asset pricing models and valuation formulas used both in academia and investment institutions are that investors are rational and have homogeneous expectations. The second fundamental assumption ensuring that prices do not deviate from fundamental values persistently is that arbitrage takes place rapidly and effectively. These building blocks do not allow for: i) investors to interpret information in different ways, that according to the behavioral finance school of though constitutes a plausible possibility, ii) the existence of informational asymmetries in financial markets, and iii) market frictions such as trading costs and short sale constraints to deteriorate arbitrageurs.

The divergence of opinion theory, as developed by Miller (1977) has recently revolutionalised the world/literature of finance as it involves relaxation of the above

[1] Fama (1991) suggest that an efficient market is one in which deviations from the extreme version of the efficiency hypothesis (strong form efficiency) are within information and trading costs. If frictions are large, efficient prices may be far from frictionless prices.

assumptions. It posits that when investors disagree about the value of equities then optimistic investors with the highest valuations for these stocks temporarily drive stock prices away from fundamental values. The mechanism of arbitrage predicts that pessimistic investors in the latter case will engage in short selling[2] and prices will immediately fall back to reflect the average valuations of all investors. Nevertheless, short sale constraints could theoretically lead to arbitrage in this case being ineffective and hence to prices being driven temporarily to "unreasonable highs".

The original hypothesis relied in demand and supply analysis within which it was demonstrated that wide divergence of opinion leads to a downward sloping demand curve that in turn results in a temporarily inflated price. This hypothesis has been only recently tested in a reliable way and indeed it was showed that opinion divergence plays a major role in stock valuation. On the one hand, several empirical investigations confirm the original hypothesis that premiums or 'bubbles' are the result of wide disagreement among investors and severe short sale constraints. On the other hand others have proved that differences of opinion reflect Knightian (Knight (1927)) uncertainty and suggested that such component should be priced in markets in addition to risk. Motivated from the controversial nature of the empirical evidence this project aims to review the relevant literature and propose additional research that will shed light to this puzzle.

[2] The sale of shares not owed by the investor but borrowed though a broker and later repurchased to replace the loan. Jones and Lamont (2002) suggest that in order to sell short, one must borrow the stock from a current owner, and this stock lender charges a fee to the short seller. The fee is determined by the forces of supply and demand for the stock in the stock loan market.

The remainder of this chapter is organized as follows: Section 2.2 discusses the theoretical building blocks of this theory. Section 2.3 explains the measures of investors' disagreement and presents the relevant empirical evidence. Section 2.4 discusses the empirical evidence related to event studies.

2.2 Building Blocks of the Theory

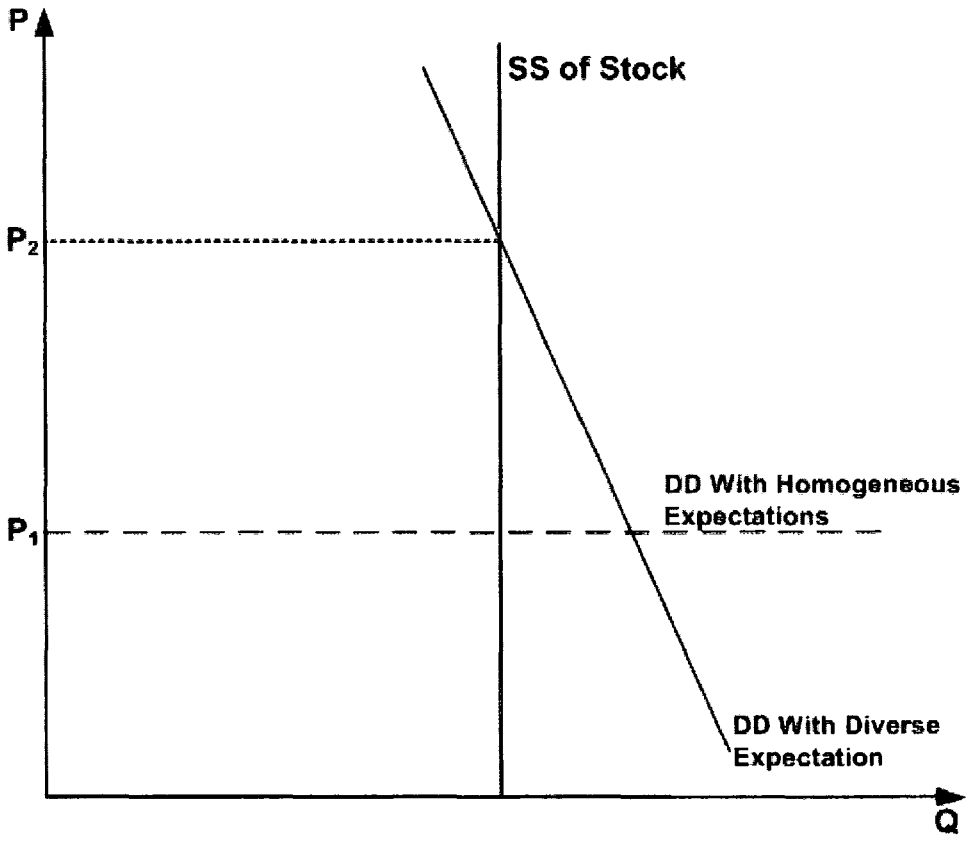
Miller (1977) argues that opinion divergence is priced at a premium when short sale constraints that prevent the revelation of negative information by pessimistic investors are imposed. More specifically, given a constant vertical supply curve, wide opinion dispersion leads to a steep demand curve hence rising security prices (Figure 1). The author relaxes the two most significant assumptions of the CAPM to explain why the Security Market Line (SML) is flatter than expected by the typical investor[3]. When investors' opinions diverge and short sale constraints bind, stock market equilibria initially determined by homogeneous expectations can theoretically change (Goetzmann and Massa (2001))[4]. Accordingly, in Miller's world, one group of investors, the "optimists", have extremely positive opinions about the value of specific stocks. Harrison and Kreps (1978), suggest that such investors are confident they can resell the overpriced stock to even more optimistic ones hence providing a behavioral explanation as to why the former hold these stocks. Further, limits to arbitrage

[3] Although Miller admits that opinion divergence reflects uncertainty (as opposed to risk) in the context of Knight (1927), he posits that this is not always priced at a discount drawing from early evidence documenting less than expected variation of stock returns with systematic risk in some cases.

[4] The authors show that the dispersion of opinion, proxied by the heterogeneity of trade among investor classes, explains part of the returns not accounted for by standard asset pricing factors.

generated by constrained short sales lead to pessimistic investors being kept out of the market hence preventing equilibrating forces from keeping prices on fundamental grounds. Schleifer and Vishny (1997) and Chen et al (2000) provide theoretical models on the limited arbitrage trade-off that implicitly support the possibility that Miller's theory can be realistic.

Figure 1: *The role of Diversity of Opinion*



The "premium hypothesis" generated a strand of theoretical literature in the 80's where its main building blocks were either supported or strongly challenged. Diamond and Verrecchia (1987) construct a model where in the presence of costly sort selling some investors cannot profitably act on their information set. However, their model

predicts that markets will not systematically overvalue short sale constrained securities as opposed to what implied by Miller. Jarrow (1980) also criticizes Miller's indirect implication that market wide short sale constraints would lead to pervasive overpricing of the entire market. In contrast, the general equilibrium model Jarrow builds demonstrates that when sort constraints are widely prohibited across a market, the individual valuation effect on a specific firm is uncertain.

Further, several models such as Williams (1977), Mayshar (1983), Merston (1987) and Varian (1985) and Epstein and Wang (1994) predict that investor disagreement should be priced at a discount as it reflects Knightian uncertainty and thus risk. According to these models the more investors disagree about the value of a stock the higher the future returns for this stock should be. Lastly, Hong and Stein (2003) built a theoretical model where stock prices aggregate all investors' valuations in an unbiased way and are thus not affected by divergence of opinion. Nevertheless, the majority of the above mentioned models either ignores short sale constraints or are based on the rather strong assumption that effective and timely arbitrage takes place within markets.

2.3 Measures of Investor Disagreement and Empirical Findings

The debate that has been raised from the controversial theoretical predictions also holds when considering the nature of the empirical findings. There are three strands of empirical investigations that attempt to test the predictions sourcing from Miller's theory. The first strand tests one side of the theory and attempts to shed light on the effect of short sale constraints on equity returns. Along these lines, Figlewski (1981)

provides support for the overvaluation hypothesis by using the percentage of outstanding stock held short (short interest) as a proxy for short sale supply. Nevertheless, Figlewski's finding that more intensively sorted firms under-perform less severely sorted is not statistically significant in most cases. Diamond and Verrecchia (1987) interpret the level of stock held short relative to shares outstanding in a different way. The authors produce a model where the level of observed short interest reflects greater negative information among pessimists that are deteriorated by short sale restrictions. Further, Asquith and Meulbroek (1995) and Desai et al (2002) find that severely shorted NYSE and NASDAQ firms respectively, experience economically and statistically significant underperformance. Nevertheless, Brent, Morse and Stice (1990) and Figlewski and Web (1993) find no relation between the percentage of outstanding stock held short and future returns.

Later work indicated that short sellers (i.e. the pessimists in Miller's hypothesis) face various fees or costs when selling short a security. Jones and Lamont (2002) use the interest rate earned on the proceeds when selling borrowed stock as a proxy of the cost of selling short. They find strong support of the overvaluation hypothesis as their results reflect that costly to short NYSE firms under-perform in the long run. Along these lines, D'Avolio (2002) and Duffie et al (2002) find that short sale fees in the US are high and hence limits to arbitrage are likely to be strict hence generating low returns for costly to short firms. Along similar lines Bris et al (2006) uncover a positive association between negative skewness of world markets' returns and short sale restrictions. Further, Chen et al (2002) argue that such restrictions become higher when institutional ownership is low. Their results imply that breadth of institutional

ownership is a reliable predictor of the cross section of stock returns and thus support the notion that severely short constrained stocks will experience negative abnormal returns, as they will be overpriced in the short run. Additionally, Nagel (2003) argue that when institutional ownership is low, stock loan supply tends to be sparse, and short-sale constraints are thus more likely to bind. The author presents evidence that overpricing of costly-to-short low book-to-market (B/M) stocks generates a substantial part of the book-to-market effect in stock returns[5]. Lastly, Asquith, Pathak and Ritter (2005) employ a moderate research design where they simultaneously examine both the level of shorting demand (i.e. the level of short interest) and shorting supply (i.e. Institutional ownership) for NYSE, NASDAQ and AMEX stocks. They find that more severely short constrained stocks under-perform in the long-run and thus provide support for the overvaluation hypothesis.

The second strand of empirical work tests the other dimension of Miller's verbal model, namely the possibility that high disagreement among investors will result in short run overpricing and subsequent low returns. Diether, Malloy and Sherbrina (2002) test the overvaluation hypothesis using analysts forecast dispersion as a proxy for investor disagreement[6]. They report that stocks subject to high dispersion under-perform stocks subject to low dispersion by a surprisingly large margin, after

[5] As stated by D'Avolio (2002), stocks that have low institutional ownership are most likely to become costly to short, because the supply of stock loans to short-sellers originates primarily from institutional portfolios.

[6] Diether et al (2002) suggest that investors believe and follow analysts and thus the degree of analyst disagreement will greatly reflect investors actual disagreement. For relevant literature on using analysts' forecasts proxies to capture investors beliefs in empirical research see for instance: Abarbanell, Lanen and Verrecchia (1995).

controlling for size, book-to-market and momentum effects. DMS results are consistent with the notion that opinion difference is priced at a premium according to Miller. This prediction is also supported by Park (2001) and Bokhyeon and Park (2001) deriving a negative relationship between dispersion in analysts forecasts and stock returns at intermediate horizons (25 to 44 months). In contrast, Cragg and Malkiel (1968, 1982), Friend, Westerfield, and Granito (1978), and Harris (1986) provide some evidence in favor of a positive association between stock returns and dispersion in analysts' earnings forecasts. Accordingly, Doukas et al (2004a), suggest that value stocks are subject to more analyst forecast dispersion and this alone confirms that disagreement is related to uncertainty and should therefore be priced at a discount. Their findings are based on a diversity measure that is free of the analysts' uncertainty bias.

Nevertheless the reliability of analyst forecast dispersion as a proxy capturing opinion dispersion has been recently questioned. Johnson (2004) offers a simple explanation for DMSs puzzle based on the interpretation of dispersion in analysts' forecasts as a proxy for unpriced information risk arising when asset values are unobservable. Note that analyst forecast dispersion may fail to use as much information about investors' opinions as is actually available and as Scherbrina (2004) documents investors do not necessarily believe and follow analysts. In addition, as Garfinkel (2004) argues that opinion should be expressed by putting wealth at risk and analysts' wealth may actually benefit rather than suffer from false opinion expressions.

Given the unreliability of analyst forecast dispersion as a measure of opinion differentials many authors argue that alternatives should be examined that are tied specifically to investor behavior. Some present theoretical models correlating belief dispersion with asset time series volatility and trading volume (Jones, Kaul and Lipson 1994). These include Shalen (1993) and Harris and Raviv (1993). Chen et al (1999), and Garfinkel (2004) have developed alternative proxies for differences of opinion such as unexplained trading volume/turnover (ΔVol), bid ask spread and limit orders and find support for the premium hypothesis. Finally, Wu (2004) test a proxy of investor disagreement based on Tauchen and Pitts' (1983) Mixture of Distribution hypothesis and establish that high divergence of opinion leads to upward biased stock prices and subsequent low stock returns.

The final strand of empirical literature investigates both Miller's overpricing conditions in a two dimensional framework. Boehme et al (2006) use alternative opinion divergence proxies (i.e. idiosyncratic volatility and turnover) and conclude that premiums occur only among small, more difficult to short and lacking exchange traded options stocks. In this way they provide evidence both in favour of Miller (1977) and Varian (1985) who suggest that divergence of opinion is priced at a discount or a premium respectively depending on the level of short sale constraints. Furthermore, Doukas et al (2004b) use analyst forecast dispersion as a measure of opinion divergence and find that this is priced at a discount even when short constraints as measured by three different proxies[7] are present. Lastly, Nagel (2005) proves that short

[7] The tree different proxies used are the size (SIZE), institutional ownership (IO), a short-sale costs index (SSCI), and relative short interest (RSI). There results are robust when controlling for different time intervals, optimism in analysts' forecasts, and herding in analysts' behavior.

sale constraints as measured by the extent of institutional ownership are the driving force behind most common asset pricing anomalies. The author's results implicitly suggest that high divergence of opinion lead to low subsequent return only in portfolios where institutional ownership is low. This study reflects the superiority of short sale constraints as a key condition for overvaluation.

2.4 Divergence of Opinion and Event Studies

Recently, empirical research on the issue has turned its focus towards examining the relation between opinion dispersion and stock returns based on an event study context. The important advantage related to this research design is that researchers are able to isolate disagreement effects specific to a corporate decision such as Initial Public Offerings (IPOs), Seasoned Equity Offerings (SEOs), and Mergers and Acquisitions (M&A). The original "premium hypothesis" expressed by Miller (1977) and advanced by the same author in 2000 suggests that greater divergence of opinion or uncertainty about an IPO can generate short-run overvaluation and subsequent long-run underperformance. Todd, Loughram, Suchanek, and Yan (2001) examined this relation and found that the well-documented underperformance of IPOs is due to the high disagreement among investors immediately after the offerings. They use three opening day proxies for the divergence of opinion about an IPO, namely the percentage opening bid-ask spread, the time of the first trade, and the flipping ratio.

Further, Diether (2004) attributes SEOs long run underperformance to temporary overpricing immediately after the issuance. The author suggests that equity offerings

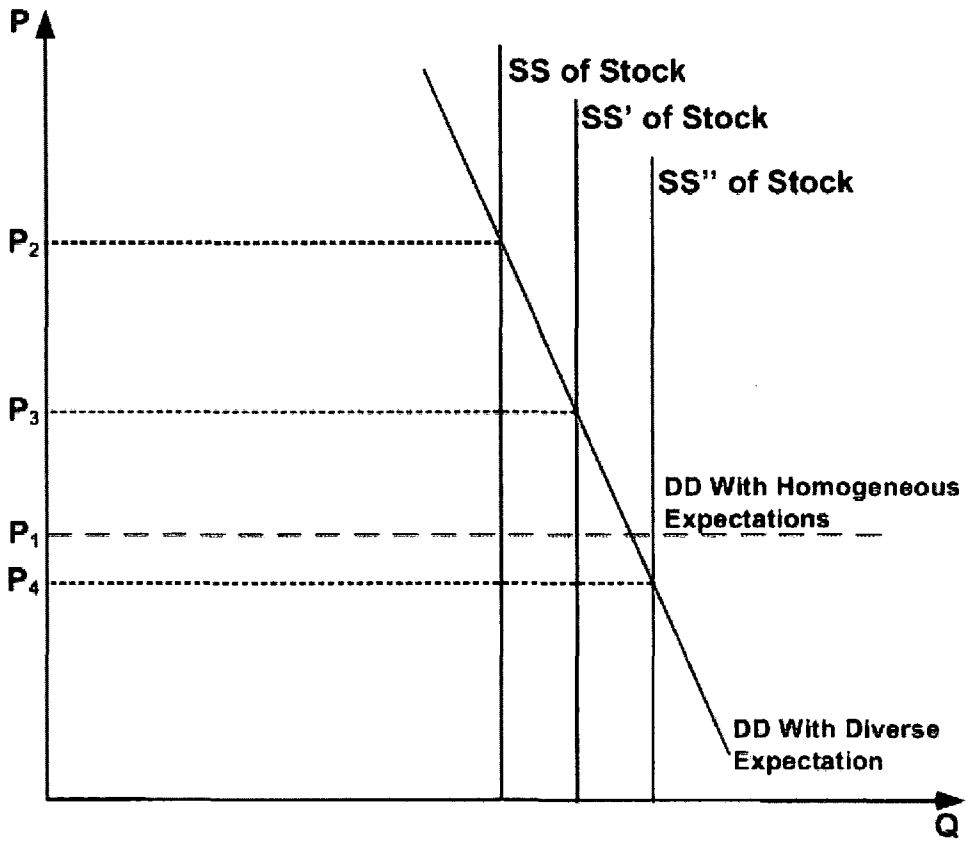
have a high probability of being subject to severe short sale constraints and finds accordingly that shorting demand for these stocks is initially elevated. Results based on opinion divergence proxies used (i.e. volume turnover, dispersion in analysts forecasts and changes in mutual fund ownership) indicate that high volumes of these variables lead to significant negative abnormal returns after issuance of additional stock. The main conclusion drawn from this study is that, according to Miller, the combination of binding short sale restrictions and investor disagreement can explain the well-documented underperformance of SEOs[8].

Along similar lines, Moeller et al (2004) suggest that bidding firms, for which opinion disagreement is high, that use stock financing as method of payment when buying public targets, experience significant loss immediately after a merger. They attribute this downward drift to the increase in the supply of shares in the market associated with equity payments (figure 2). On this issue, Baker et al (2006)[9] argue that when analyst forecast dispersion is wide, returns should be lower for mergers where target investors are less likely to be "sleepy", that is for acquisitions involving stock swaps. It is essential to note here that Miller argues that one necessary condition for overpricing is that the existing supply has been absorbed by the minority of potential investors. When however the supply of existing shares increases we would naturally expect that potential buyers (i.e. pessimists) that were originally restricted by short sale restrictions are now able to "jump in the bandwagon" and buy shares in

[8] For evidence of long run SEO underperformance refer to Loughran and Ritter (1995), Mitchel and Stafford (2000) and Brav, Geczy and Gompers (2000).

[9] They investigate the relationship between merger returns and diversity of opinion by using a sample of stock swaps.

Figure 2: ***The role of diversity of opinion: Acquisitions involving stock issuance.***



advantageous prices. This will result in temporary price pressure (Mitchel and Stafford (2004)) after the issuance of new stock resulting in long run underperformance. Accordingly, Diether (2004) showed that higher dispersion of opinion is associated with lower long-term returns following corporate actions such as equity issues and mergers paid for with equity.

2.4 Conclusion

It appears that the majority of empirical findings until now provide support to Miller's premium hypothesis and that studies have now turned their focus towards examining whether the two components related to this theory can in practice determine post managerial decision performance. Along these lines, given the findings and arguments presented above, it would be of crucial importance to examine thoroughly the relation between divergence of opinion and short selling constraints and long and/or short run gains from acquisitions.

According to my conjecture these variables that are believed to convey important information about the degree of overpricing of stocks and the persistence of this overpricing can help identify overpriced acquirers prior to acquisition announcements. If, for instance, a negative relationship between these variables and acquisition performance exists this can help explain several stock return patters related to acquisitions and significantly add to our knowledge about what factors play a role in shaping those patterns. To my knowledge this is a first attempt to shed light on this issue. The specific hypotheses examined in this thesis and the importance in examining the relationships described above are outlined in detail in each of chapters 3, 4 and 5.

Chapter 3: Valuation Effects of Short Sale Constraints: The Case of Corporate Takeovers*

* A large part of the material from this chapter has been published in the European Financial Management Journal.

3.1 Introduction

As explained in the introduction and literature review section the main aim of this thesis is to examine whether the two components of Miller's theory can have a direct impact on gains from acquisitions. A large number of studies on long-run post takeover stock performance have disturbingly documented persistent negative abnormal returns to bidding firms acquiring listed targets and offer several reasons have to explain this pattern. This chapter examines whether short sale constraints qualify as a potential source for this long-run underperformance. The motivation behind such investigation stems from Miller's (1977) argument; when negative information is not initially impounded into prices, because pessimistic investors are kept out of the market due to restricted short sales, stocks can be overvalued.

Accordingly, the majority of studies that examine the relation between short sale constraints and equity returns conclude that more short constrained stocks yield lower returns in the long run. In the same way, acquiring firms subject to binding short constraints can initially be overvalued as optimistic investors tend to drive their stock price to higher than fundamental grounds. This overpricing will manifest itself through more pronounced long-run underperformance. It is thus possible that the well documented negative abnormal returns following acquisitions can be to a large extent attributed to acquirers subject to binding short constraints. The fact that shorting acquiring firms is relatively costly [Geczy, Musto, and Reed (2002)], suggests that examining the valuation effects of short sale constraints within a corporate takeover framework is essential.

Recent evidence suggests that institutional ownership is a good measure of short sale constraints' severity. D'Avolio (2002) and Jones and Lamont (2002) posit that stock loan supply is limited, short sale fees are high and hence limits to arbitrage strict when institutional ownership is low. It is therefore easier to short stocks subject to high ownership. Given Chen, Hong and Stein's (2002) argument that short interest may well be an insufficient and problematic proxy for short sale constraints, it appears that institutional ownership may be the best available path to capture their severity. In a corporate takeover framework, it can thus be expected that the extent of institutional presence in acquirers reflects the severity of short sale constraints for these stocks and thus conveys important information about the degree of their short-run overpricing. In other words, low ownership levels in acquiring firms renders short-selling more difficult, thereby leading overpriced equity to remain that way for longer than it should.

My findings point to an economically and statistically significant role of institutional block-ownership (henceforth BO) in determining acquirers' post takeover stock returns. Specifically, they document that acquirers subject to low BO underperform those subject to high BO by a significantly large margin of 0.8% a month for a three-year post acquisition event window. Negative post-takeover abnormal return is more significant for acquirers subject to low or non-persistent BO than for their high or persistent BO counterparts. Such significant return differentials corroborate my hypotheses that BO is a major determinant of acquirers' post takeover stock performance. Further, my results are robust after accounting for a range of characteristics such as the method of payment, firm size, and book-to-market ratio.

This study therefore contributes to the existing literature by showing that institutional ownership may help us understand one of the major puzzles in corporate finance, i.e., the long-run post takeover underperformance puzzle. My findings implicitly suggest that institutions can enhance arbitrage through facilitating short sales and therefore preserve efficiency in the takeover markets. They are therefore in line with Nagel's (2005) conclusion that short sale constraints (as measured by the degree of institutional ownership) can help explain various cross sectional stock return anomalies.

The rest of the chapter is organised as follows. Section 3.2 reviews the literature on long run post acquisition stock performance, lays a theoretical ground for the role of short sale constraints in determining post acquisition stock returns and presents the main testable hypotheses. Section 3.3 describes the data and methodological procedures used in my empirical investigation. Section 3.4 presents and discusses the empirical results. Concluding remarks are provided in section 3.5.

3.2 Literature Review

3.2.1 Determinants of Long Run Post Acquisition Performance

3.2.1.1 Post Acquisition Performance in general

In contrast to the central prediction of the efficient market hypothesis, a great majority of studies that examine long-run post takeover stock performance has disturbingly documented significant and persistent negative abnormal returns up to five years following mergers.[10] Along these lines, it has been extensively documented that the magnitude of long-term negative drift in acquiring firm stock prices offsets in some cases the positive short-run stock price reaction[11] documented (Andrade et.al 2001), indicating a strong need to explain such long-run underperformance.

Note that the long run underperformance puzzle is by no means a universal phenomenon and is mainly relevant to acquiring firms buying listed targets. Very few studies have examined the long run performance of acquiring firms buying private targets and in most cases these studies do not find evidence in support of the underperformance hypothesis. Moeller Schlingemann and Stulz (2004) for instance report on average zero abnormal returns for bidders acquiring unlisted targets for three years after the announcement. Given that my study investigates an alternative explanation for the long run underperformance puzzle i concentrate on acquisitions of listed targets, both when reviewing the literature and conducting my tests.

[10] For US empirical evidence, see for example: Asquith (1983), Malatesta (1983), Jensen and Ruback (1983), Magenheim and Mueller (1988), Agrawal, Jaffe, and Mandelker (1992), Loderer and Martin (1992), Anderson and Mandelker (1993), Loughran and Vijh (1997), Rau and Vermaelen (1998), Agrawal and Jaffe (2000). For UK evidence, see for example: Firth (1979), Franks and Harris (1989), Limmack (1991), Kennedy and Limmack (1996), Gregory (1997) and Antoniou, Petmezas and Zhao (2005). There are, however, other studies [e.g., Bradley and Jarrell (1988), and Franks, Harris and Titman (1991)] that do not find significant long run underperformance.

[11] For review of the literature on short run gains from acquisitions see Chapter 3.

In the US, Malatesta (1983), Asquith (1983) and Magenheim and Muller (1988), among others, reported significant negative abnormal returns in the year following acquisition announcements. On the other hand, Malatesta (1983) found that in general negative abnormal returns to acquiring firms are statistically insignificant in the year following the merger announcement. However, the author reports significant negative abnormal returns for bidders in mergers occurring after 1970 and for bidders with smaller equity value.

Agrawal, Jaffe and Mandelker (1992) use a nearly exhaustive sample of US acquisitions and find significant 5-year post share price underperformance of 10% following US mergers after adjusting for firm size and shifts in beta over time. They hypothesise that stock prices adjust to corporate signals slowly but subsequently conclude that such hypothesis is not supported in their sample. Further, Andre et al. (2004) examine the long-term performance of 267 Canadian mergers and acquisitions that take place between 1980 and 2000 and find that Canadian acquirers significantly underperform over the three-year post-event period irrespective of the calendar-time approach used. Their result are robust to the inclusion or not of overlapping cases. They also find that both the extrapolation and the method of payment hypotheses can explain their results, that is, glamour acquirers and equity-financed deals drive the documented underperformance.

Other US studies have however failed to find any evidence in support of the underperformance hypothesis. Langetieg (1978) and Franks et al. (1991), for example, use multifactor benchmarks and report insignificant negative performance over a three-

year period after acquisitions. They thus conclude that previous findings of poor performance after acquisitions can be attributed to benchmark portfolio errors rather than mispricing at the time of the takeover. This seems to imply that the negative post-acquisition performance documented is more a statistical artifact rather than a result of market inefficiency. Further, Agrawal et al. (1992) admit that their results are period specific and, hence, cannot be generalised. Consistent with Franks et al. (1991), Loughran and Vijh (1997) reported that the five-year abnormal return for their entire sample is insignificantly different from zero. Lastly, Loderer and Martin (1992) also reported that the five-year post acquisition performance is positive but insignificantly different from zero.

In the UK, Firth (1980) examines post acquisition performance for a sample of acquisitions over the period 1969-1975 and reports that bidding firms experience negative abnormal returns. Barnes (1984) examines all mergers undertaken by companies listed in the London Stock Exchange (LSE) from 1974-1976 and reports significant share price decreases for acquirers in the long term. Furthermore, Franks and Harris (1989) used a comprehensive sample for a thirty-year period (1955-1985) and found that bidders earn negative post-merger abnormal returns of about 13% two years after the merger. Nevertheless, they report a significantly positive abnormal return (of about 4%) when they use the CAPM instead of the market model as a benchmark. Limmack (1991) reports that on average, over the 24 months after the announcement, acquirers' shareholders experience significantly negative abnormal returns.

Further, Gregory (1997) examines domestic takeovers for the period 1984-1992 and found that, irrespective of the benchmark used, the two-year post-acquisition returns is, on average, significantly negative. Hence, the author suggested (p. 998) that 'the contribution of this paper has been to show that the post-takeover performance of UK companies is unambiguously negative in the longer term'. Gregory (1997) notes that the underperformance for acquiring companies in the UK seems to be more pronounced than for the US. Limmack (1997, p. 1006) points out that 'his conclusion is perhaps a little premature' since there remain at least three possible explanations for the results obtained in this and other studies, which are '(i) the market is inefficient and takeovers are not, on average, in bidding shareholders' interest (ii) results are time and sample specific and (iii) the models or methods selected for control may not be appropriate for the purpose and that there are other as yet unspecified but more appropriate control models or methods'.

Contrary to these studies documenting significantly negative abnormal returns but consistent with Franks et al. (1977), Dodds and Quek (1985) examines post acquisition performance of acquirers over a rather short period, 1974-1976, and found that they earn positive abnormal returns. However, they observed that the positive abnormal returns earned only lasted until the 25th month with acquirers experiencing negative abnormal returns thereafter.

In a recent UK study, Antoniou, Arbour and Zhao (2006) examined takeovers in the 1990s. They found that over a three-year period acquirers earn a positive but insignificantly different from zero abnormal return. However, they reported

significantly negative one-year CAR and one and two-year BHAR abnormal returns. They repeated the three-year performance examination after eliminating the overlapping acquiring firms but found the results to be of the same nature although it is clear that overlapping stock returns inflates the conventional t-test statistic. Hence they conclude that in general, there is no statistically significant three-year post-takeover underperformance.

It becomes obvious that the long run underperformance of acquiring firms after acquisitions is by no means a universal phenomenon and cannot be generalized. Several authors have suggested that the negative performance detected is driven by several acquirer and deal specific characteristics. Accordingly, method of payment and book-to-market effects and slow adjustment of prices to information associated with takeovers have been the most prevailing explanations for this puzzle.[12] Agrawal and Jaffe (1999), in a broad assessment of the literature, identify method of payment, mode of acquisition and performance extrapolation as potential explanations of such underperformance. In the subsequent sections I therefore review evidence on long run performance of acquiring firms based on such characteristics.

3.2.1.2 Method of Payment

The method of payment, according to existing literature, is one of the most important determinants of post acquisition performance. Acquiring firms need to

[12] For extensive discussions on such explanations, see for example, Travlos (1987), Huang and Walking (1987), Amihud, Lev, and Travlos (1990), Agrawal, Jaffe, and Mandelker (1992), Loughran and Vijh (1997), Rau and Vermaelen (1998) and Dong, Hirshleifer, Richardson, and Hong (2006).

specify the method they will use to pay for the target firm irrespective of whether the merger is friendly or hostile. The most common methods are cash, stock, and a combination of both (mixed). Cash stems either from retained earnings or debt issued for the purpose of financing the acquisition. Stock on the other hand involves exchanging stock of the acquiring firm to receive shares of the target firm. According to Fishman ((1989), p 41): 'A key difference between a cash offer and a (risky) securities' offer is that a security's value depends on the profitability of the acquisition, while the value of cash does not'. In a perfect market world of Modigliani and Miller (1958) with certainty, no transaction costs and no-taxes, one would not expect the method of payment to have an effect on shareholder wealth. However, in reality this is not the case.[13] It is widely accepted that the mode of payment provides an important signal about the perceived value of synergy which can in turn explain the long-run post-acquisition performance of bidders.

Myers and Majluf (1984) and Leland and Pyle (1977) argue that the premise of information asymmetry raises the proposition that managers with private information that their firm's shares are overvalued offer these shares in takeover bids. Outside investors, recognizing the adverse selection problem, consequently revise their estimate of the offer's value downwards. The target's shareholders also demand a higher premium in share-based bids as they are forced to share part of the risk that the stock is overvalued (Hansen 1987). This uncertainty (asymmetry) is likely to rise as the targets' assets rise in value relative to those of a bidder (Faccio and Masulis

[13] See DeAngelo and Masulis (1980), Fishman (1989) and Myers and Majluf (1984).

(2005)) As a result it is expected that acquiring firms paying with stock to acquire listed firms will underperform in both the short and long run.

For mergers involving private companies, using stock as medium of payment, the story is diametrically opposed to what described above due to the ownership structure of private companies. The concentrated ownership in private companies makes the creation of large shareholders possible through mergers. If the acquisition is paid using the acquirer's shares, and it creates a large shareholder who can effectively monitor the management's decisions, the acquirer's stock price should not fall afterwards. Similarly, according to the information hypothesis, if the favourable private information of acquiring firms' stocks can be conveyed to the market by the private target's managers' acceptance of blocks of shares, we should not expect any long-run underperformance for acquirers. If the short-run positive bidder abnormal returns are driven by any factors related with long-run fundamental value, we would observe the continuous upward drift in acquirer's stock value if the market underreacts. Over the long run, the blockholder and information stories predict no downward drift in acquiring firms' stock value unless the market overreacts around announcement dates. The evidence below therefore concentrates again on acquiring firms buying listed targets.

Accordingly, Laughran and Vijh (1997) suggest that the significance and sign of abnormal returns for acquiring firms in the US depends mainly on the method of payment (and mode of acquisition) and among other findings also report -24.2% abnormal returns for firms that choose stock financing and 18.5% for cash mergers

during the 5-year post-event period under examination. This latter explanation is consistent with bidders paying with stock underperforming relative to those paying with cash as they signal that their stock is overpriced[14]. Martin (1996) and Loughran and Vijh (1997) however, argue that the form of payment is partly endogenous to the mode of acquisition (mergers/tender offers), which may be the real driving force behind the results (see also Faccio and Masulis (2005)).

Further, Martin (1996) reports that while acquiring firm size is not related to the method of payment, both the acquirer's and the target's investment opportunities are determinants of the form of financing. Consistent with the signaling hypothesis, Franks and Harris (1989) observed that in the UK and US larger bid premia are associated with equity and that acquirers making cash offers have better post-merger performance than those using equity. Antoniou, Arbour and Zhao (2006) found that mixed financing offers are the best performing while stock offers are the worst ones although in the majority of cases their results are not statistically significant.

It becomes obvious that there is a strong tendency of acquirers (buying listed targets) paying with stock underperforming relative to others paying with cash and therefore one should control for method of payment when examining post acquisition abnormal returns.

[14] On the contrary, Dong et.al (2006) and Mitchell and Stafford (2000) find no evidence of poor returns following acquisitions paid for with equity.

3.2.1.3 Mode of Acquisition and Book-to-Market ratio

Several researchers differentiate their findings in terms of the mode of acquisition due to their differing effect on the post-takeover performance of acquirers and have reached a consensus that acquirers under-perform after mergers but not necessarily after tender offers. In mergers, managers of the two sides agree in a friendly environment about the acquisition and on the offer price. It may be the case that two CEOs have incentives on conducting a merger and thus agree on a price that may not be on the best interest of the acquirer's shareholders. On the other hand, tender offers involve a more hostile situation between the two sides' management where bidders attempt to acquirer the target by placing an offer that has to be accepted by target's shareholders. In tender offers it is normally the case that target's management have not been acting in the best interest of their shareholders and thus companies that become takeover targets in this case, although financially healthy firms, are characterized by low Return on Equity (ROE) and stock price underperformance relative to other companies in the same sector. This points out to tender offers yielding a better price for bidding firms than mergers.

Along these lines, Loughran and Vijh (1997) found post-acquisition returns depend on the mode of acquisition. They observed that on average, mergers generate significantly negative post-acquisition returns (-15.9%) but marginally significantly positive abnormal returns (43%) for tender offers. This implies that although mergers are usually friendly to the target managers, on average they are not in shareholders' best interest while tender offers, which are typically hostile to the target managers,

seem to benefit shareholders. The evidence suggests that the disciplining of target managers in tender offers may affect shareholder gains from acquisitions.

Some other researchers argue that size and B/M value proxy for the risk involved and hence determine to an extent acquirers long run share price performance. Consistent with Loughran and Vijh (1997), Rau and Vermaelen (1998) used a size and book-to-market based benchmark proposed by Fama and French (1992) and found that bidders in mergers underperform while acquirers in tender offers overperform (small but statistically significantly positive) the benchmark in the three-year post-acquisition period. In line with Jensen and Ruback (1983), Agrawal et al. (1992) observed no evidence of unusual performance for tender offers (small and insignificantly different from zero) but found that acquiring firms in mergers earn a significantly negative abnormal return of -13.85% in the three-year post-event interval.

Lakonishock et.al. (1994) argue that differential returns of "value" and "growth" stocks are not related to risk but instead on investors overestimation of future performance by extrapolating from past performance. Doukas et.al. (2002) however, finds no evidence of such extrapolation. Rau and Vermaelen (1998) argued that the long-term under-performance of acquirers is not uniform across firms and that this is primarily caused by the poor post-acquisition performance of low book-to-market 'glamour' acquirers (significantly negative -17%). Although Sudarsanam and Mahate (2003) reported the same pattern for the UK, they found, in contrast to the US study, stronger support for the method of payment hypothesis than for the extrapolation hypothesis. They further argued that, in spite of 'glamour' acquirers enjoying

significantly higher announcement returns than 'value' acquirers, they have a much lower three-year post-acquisition return irrespective of the method of payment. In addition, Sudarsanam and Mahate (2003) observed that either when market-to-book-value ratio or price-earning ratio is used as a proxy for glamour/value status, they both lead to similar results.

It becomes obvious that one needs to control for the aforementioned deal and acquirer specific characteristics when assessing acquirers' long term performance. On the methodological ground, many authors argue that the observed underperformance is merely the result of a flawed test of abnormal returns generating spurious findings.[15] According to Andrade et.al (2001) any inferences drawn from models used to capture long run abnormal returns may be misleading since none provides an accurate description of abnormal returns. The contradicting nature of the evidence may also to an extent attributed to the variation of the estimation method used. We rarely observe testing for various explanations by different authors by using the same methodologies and samples. Hence any comparisons between results may be misleading. In the light of such contradicting evidence, the resolution of such efficient-market anomaly still remains a challenge to the profession. Given that most explanations on why mergers fail focus on the large premiums paid by acquirers and on overvaluation of acquiring firm's stock i explore an alternative avenue explicitly related to such issues.

[15] See, for example, Barber and Lyon (1997), Kothari and Warner (1997), Lyon, Barber, and Tsai (1999), Fama (1998), and Mitchell and Stafford (2000).

3.2.2 Short Selling Constraints and Post Acquisition Performance

3.2.2.1 Miller's Hypothesis and the role of Short Selling Constraints

As reflected in figure 1, chapter 2, the vertical supply curve plays a major role in Miller's model. As it is usually the case investors will never have exactly the same expectations about the future growth prospects of a firm and thus the demand curve for a stock will be downward sloping. This will tend to lead the price of a stock to higher than fundamental grounds only when arbitrage is for some reason limited. Only when there is no extra supply in the market and pessimistic investors can't create extra supply by selling short will prices be set by optimistic investors. It becomes therefore obvious that the short sale constraints' condition oils the wheels of overvaluation. As a result, a main strand of empirical investigation that attempts to test the predictions sourcing from Miller's theory concentrates solely at the effect of short sale constraints on equity returns. These studies have been extensively reviewed in Chapter 2.

3.2.2.2 Institutional Ownership, Short Sale Constraints and Market Anomalies

Given that binding short constraints can lead to stocks being overpriced then short selling can be considered as a main ally of market efficiency. The UK Financial Services Authority (2002) emphasizes that the main role of short selling is to support market efficiency through accelerating price corrections in overvalued securities. Loughran and Marietta-Westberg (2005) posit that several frictions may inhibit short selling. The availability of shares for shorting is evidently one of the most important

impediments. Accordingly, Gopalan (2003) constructs a model where institutional holding is a main determinant of the actual severity of short sale constraints and as mentioned in the previous section Chen, Hong and Stein (2002), D'Avolio (2002) and Jones and Lamont (2002) argue that there is a strong negative relation between institutional ownership and short sale constraint severity. Institutional Ownership is therefore perhaps the most accurate proxy used to measure the severity of short selling constraints.

Along these lines Nagel (2005) investigates whether institutional ownership can help explain various cross sectional anomalies and therefore the degree of market efficiency. The author posits that short-sale constraints are most likely to bind among stocks with low institutional ownership. Because of institutional constraints, most professional investors simply never sell short and hence cannot trade against overpricing of stocks they do not own. Furthermore, stock loan supply tends to be sparse and short selling more expensive when institutional ownership is low. Using institutional ownership as a proxy, he finds that short-sale constraints help explain cross-sectional stock return anomalies. Specifically, holding size fixed, the under-performance of stocks with high market-to-book, analyst forecast dispersion, turnover, or volatility is most pronounced among stocks with low institutional ownership. Ownership by passive investors with large stock lending programs partly mitigates this under-performance, indicating some impact of stock loan supply. Lastly, prices of stocks with low institutional ownership also underreact to bad cash-flow news and overreact to good cash-flow news, consistent with the idea that short-sale constraints hold negative opinions off the market for these stocks.

A similar argument has been put forward by Phalippou (2006). This paper shows that the stocks with lowest institutional ownership, which comprise only 7% of the stock market capitalization, exhibit a significant value premium. In addition, it is shown that a decreasing relationship between institutional ownership and the value premium exists, even after accounting for both size and risk using various asset-pricing models. Even the linear relationship between BE/ME and future returns is exclusive to low-IO stocks. These results are at odds with the "rational" paradigm and suggest that the value premium is created by the tendency of some investors to misprice certain stocks that are, in addition, costly to arbitrage. The evidence provided reflect that the value premium, a well researched anomaly, can be mainly attributed to stocks more short sale constrained stocks that are not held by institutional investors. As a result, institutional ownership can help facilitate short selling and thus prevent market efficiency through weakening well documented market anomalies.

3.2.2.3 Institutional Ownership trends

Given the arguments above and that institutional ownership has been increasing through time among both developed and emerging capital markets we would expect to observe a gradual disappearance of market anomalies. Indeed, it is true that markets are becoming more efficient and many well documented anomalies are gradually fading out. The shareholdings and the trading activity of institutional investors have increased dramatically in the past several decades. In 1965, members of the Securities

Industries Association held 16% of U.S. equities; in 2001, they held 61% according to the Securities Industry Association Fact Book (2002).

In the UK, institutions held £2,477bn of funds in 1999, nearly three times the 1990 total, accounting for over 85% of the total funds under management. Insurance and pension schemes account for the bulk of UK institutional funds, although unit trusts and money market funds are also a growing market (IFSL 2001). Fund managers invest funds on behalf of institutions. Their primary task is to invest the flow of cash from pension contributions, insurance premiums and personal savers in portfolios of financial assets that will best meet clients' needs. Nearly 60% of such funds are invested in equity, with 71% of pension funds allocated in domestic and foreign equity being the highest rate relative to all other industrial countries (IFSL 2001).

Furthermore, the Pension Act in 1995 has removed restrictions of investing in specific securities, enabling fund managers to allocate resources in owning large stakes in other firms. As a result, almost 50 per cent of all ordinary shares listed on the London Stock Exchange in 2001 were owned by domestic institutional shareholders (National Statistics, UK). Table 1 below shows government figures for the distribution of ownership of ordinary shares in UK listed companies as at 31 December 2001. The table illustrates that institutional investors, primarily insurance companies and pension funds collectively own 50% of UK shares and therefore have significant power to influence the companies in which they invest. In comparison, UK individuals only own 14.8% of UK shares directly.

Table 3. 1: Ordinary Share Ownership – UK Listed Companies (31 Dec 2001)

	% of total equity owned	£ billion
UK Institutional Investors		
Insurance Companies	20.0%	£310.6
Pension Funds	16.1%	£250.0
Unit & Investment Trusts	4.0%	£62.5
Other Financials	9.9%	£153.2
Sub Total	50.0%	£776.3
UK Individual Investors	14.8%	£229.9
Overseas Investors	31.9%	£496.0
Other Investors	3.3%	£51.9
Total	100.0%	£1554.0

Source: National Statistics UK

3.2.2.4 Hypothesis Development

Given the negative relation between institutional ownership and the severity of short constraints and the predominance of institutions in the stock market, surprisingly the 'efficiency role' of institutional ownership has been scarcely examined within corporate takeovers. Along these lines, short sale constraints, as proxied for by institutional ownership, can theoretically determine post acquisition performance of acquiring firms. The fact that shorting acquiring firms is relatively costly [Geczy, Musto, and Reed (2002)], suggests that examining the valuation effects of short sale constraints within a corporate takeover framework is essential. To my knowledge this is the first attempt to shed light on this hypothesis.

In the case of a public takeover, the relative size of the target to the bidder is usually large and thus uncertainty about the future growth prospects of the restructured firm is relatively high. The mean relative size of the target to the acquirer market value in my sample is 41%, implying that acquisitions do in fact introduce a large degree of uncertainty or divergence of value opinions[16]. A sample of relatively large public acquisitions can capture what Miller (1977) refers to as a situation of high opinion dispersion. Laughran and Westberg (2005) find a negative relation between divergence of opinion around extreme events (IPOs and SEOs) and post issue stock performance. Further, Diether (2005) finds that that diversity of opinion is negatively associated with post event performance. The author concludes however that finds that long-run post equity issue underperformance is attributed to short-run overvaluation due to severe short constraints.

It is therefore possible that short sale constraints actually oil the wheels of mispricing. This argument is partly supported by Boehme et al (2006) who suggest premiums or discounts, in a situation of high uncertainty, depend on the presence of short sale constraints. Furthermore, Gopalan (2003) derives a model in which short constraints bind with opinion dispersion among other factors, hence suggesting that the two notions are usually correlated. I argue that the unusually high uncertainty (i.e. investor disagreement) about acquiring firms (buying large, listed targets) at days surrounding takeovers is an unambiguous fact, and this alone could help us generate a

[16] Miller (1977) and Doukas, Chansog, and Pantzalis (2004) explain why wide opinion dispersion implies great uncertainty.

reliable test of Miller's joint hypothesis of overpricing by using only the short sale constraint proxy (i.e. the IO).

As a result, acquirers can become overpriced if they are subject to severe short sale constraints that eventually oil the wheels of short run mispricing. Given that large institutional stakes are associated with superior lending capacity, short sale ease for acquiring firms' equity should be more pronounced as concentrated institutional ownership in those firms increases. After the completion of a takeover, uncertainty continuously diminishes as some first results for acquirers become public. Accordingly, long-run underperformance of acquiring firms should be more pronounced in segments where blockholder ownership (BO) is inferior (i.e., higher level of short sale constraints) both in terms of the extent and persistence.

Given the discussion above I form the following testable hypotheses:

Hypothesis 1

The extent of block-holder institutional ownership determines acquirers' long-run post takeover stock returns since it reflects the level of short sale constraints for acquiring firms' equity that in turn explains the degree of short-run overpricing.

Hypothesis 2

The persistence of block-holder ownership also determines acquirers' long-run post takeover stock returns as it reflects the time horizon within which short sales may be effectively practiced.

This latter hypothesis accounts for the persistence of the short sale constraint during the three-year post takeover event window under examination and hence for the speed of adjustment of stock prices to equilibrium. If BO in some acquirers lasts for the entire examination period then arbitrage is expected to be more effective for these stocks.

In particular I investigate:

(i) Whether acquirers subject to High-IO (at the event year) outperform ones with Low-BO, and

(ii) Whether acquirers subject to Extensive-BO and/or Persistent-BO outperform their peers that are subject to Moderate-BO and/or Non-Persistent BO respectively.

3.3 Data and Methodology

3.3.1 Hemscott's Blockholder Ownership Database

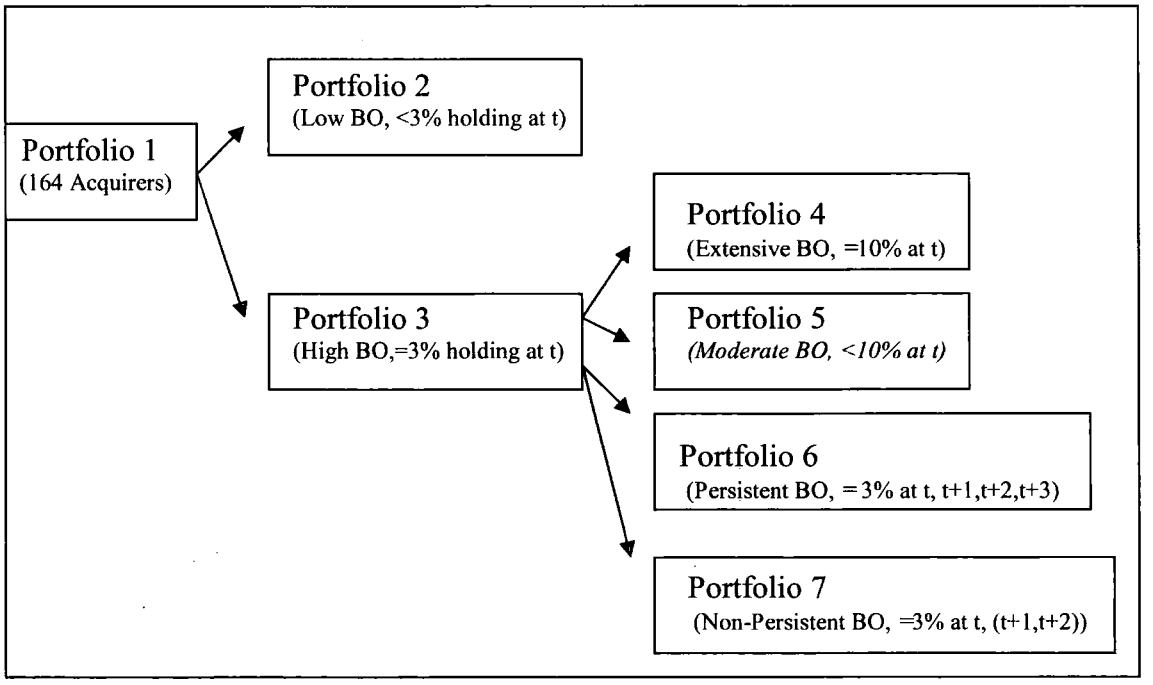
The Companies Act (1985) (sections 198 and 199) requires that if an institutional holding reaches or exceeds 3% of the company's market value it must be declared. Hemscott Plc (a London Stock Exchange listed data company), the only source of historical institutional ownership data for the UK reports only block-holders' ownership, i.e. greater or equal to 3%. Hemscott collects RNA announcements that

include data on block-holder ownership, which are received daily via their live feed from the LSE, or via the latest Annual Report. The database consists of 67,416 company-holding observations. This covers 2,091 dead and alive LSE firms and 7,210 domestic institutional investors over the period 1993-2001. The database reports among other fields (appendix 1): company name and ISIN code (the name and ISIN code of the company for which shareholdings are reported, shareholder name and ID, name of umbrella organisation that holds the stock, holding date, current holding and current percentage holding. The database reports holdings by insurance companies, pension funds, unit and investment trusts and other financial companies. Shareholdings in each company are classified by the umbrella organisation as the shareholder's name may include subsidiaries, trusts etc. of the umbrella organisations.

Data are collected on an annual basis for the period 1993 to 2001. For each year (in the 1993-1998 period) I sum up all block-holdings by institutions in each acquiring firm to obtain the overall amount of BO. I calculate average annual ownership in each acquirer using Hemscott's current percentage BO in the 'major shareholdings' database. I ensure ownership data are reported before the takeover effective dates in order to realistically reflect institutional presence around the takeover. This was achieved by allowing some takeover observations with effective dates near the start of year to match with BO data in the mid or end of the previous year. Consequently, when referring to BO at the event year, in some cases this may have been shaped by BO at the previous year. Low BO acquirers, although in Hemscott's ownership reports, are not subject to any greater or equal to 3% institutional holdings at the event year.

Acquiring firms are sorted into BO portfolios (Figure 2) as follows: i) High-BO (Low-BO) acquirers are subject to at least (less than) 3% overall BO at the event year. The High-BO portfolio is subsequently subdivided in two different ways in order to capture the extent and persistence of BO. ii) Extensive-BO (Moderate-BO) acquirers are subject to at least (less than) 10% overall BO at the event year.[17] Further, iii) acquirers in the Persistent-BO (Non-Persistent-BO) portfolio are subject to more than 3% overall BO for at least (at most) three-years (two-years) following the event. Figure 2 below provides details on the sub-portfolios based on block-holder ownership examined.

Figure 3 : *Block-holder Ownership Portfolios (sub-samples)*



[17] 10% is the median BO for all acquirers in the High-BO sample.

3.3.2 Sample Selection

I download a sample of UK successful takeovers for the period 1993-1998[18] and all related information relevant to each transaction from Thomson Financial SDC Mergers and Acquisitions Database. The following criteria are used in the selection of the final sample:

- Both the acquiring and the target firm are listed in the London Stock Exchange.

- Transactions where the acquirer and/or target firm are financial or/and utility firms are excluded.

- Following Lyon, Barber and Tsai (1999), firms with a negative equity book value, although relatively rare, are excluded from the analysis.

- Bidding firms with no price, market value or/and book to market data available from Thomson Financial Datastream are also omitted.

- The transaction value is above 1 million dollars

Acquirers' monthly stock prices, size (market value), and book-to-market ratios are obtained from Thomson Financial Datastream and these are matched with Hemscott data using the unique ISIN code for each company. 164 UK acquiring firms are finally selected from the intersection of the three databases; a rather small sample but still

[18] This is due to examining 3-year post acquisition performance.

sufficient if we consider that the examination period is only six years (1993-1998) as the UK ownership data (from Hemscott) are not available prior to 1993.[19]

3.3.3 Sample Statistics

Table 2 reports the sample statistics. It is evident that in each year the number of public acquisitions is similar and averages to 27 with 33 being the highest in 1995 and 22 the lowest in 1996. It is hence unlikely that my results are subject to more weight being given to specific trends in takeovers occurring at any particular year. The fact that for all years the mean size of acquirers is significantly higher than its corresponding median reflects that some very large firms have been involved in public takeovers during my sample period. Finally, the mode of payment data shows that stock financing is the least common payment method.

Institutional holding statistics per year for the period under examination (1993-1998) along with the allocation of the 164 acquirers in sub-samples formed on the basis of BO are reported in Table 3. We observe that takeover activity in the Low-BO sample varies each year and is concentrated mainly in the first two years (1993 and 1994). On the other hand, takeover activity in the High-BO sample is mainly concentrated in the last two years (1997 and 1998). Such pattern reflects a significant increase in institutional funds invested in UK acquirers during the last decade. The observation that in 1999, UK institutions held £2,477 billion of assets, nearly three times the 1990

[19] Note that only a small number of 'public', relatively large deals (above 1 million dollars) take place during this period in the UK.

total (IFSL 2001), confirms this pattern and suggests that my sample is also representative of the general institutional investment activity throughout the UK. In addition, it also reflects the necessity to study thoroughly the role of institutions in corporate takeovers in the last decade where BO is more intense than prior to the 1990s. Table 2 also reveals that the number of acquirers with Persistent and Extensive BO have both been increasing through time. The gradual increase of BO in UK acquirers during my sample period is represented diagrammatically in Figure 3.

3.3.4 Methodology

The entire sample is initially split into the High-BO and Low-BO subsamples to examine the overall role of BO in determining acquiring firms' post takeover stock returns. The High-BO sample is subdivided in two different ways in order to capture the effects of both extent and persistence of BO on acquirers' stock returns. I then calculate long-run post takeover abnormal returns for each of the sub-samples identified.

When post takeover share price data are downloaded, returns are computed as changes in the natural log of monthly average stock prices, i.e with S_{it} denoting the price of stock i in month t, $r_{it} = \ln\left(\frac{S_{it}}{S_{i,t-1}}\right)$. The datatype RI (Total Return Index) from Datastream is used when downloading monthly price data to incorporate dividends into the calculation of returns.

Researchers apply various approaches to measure abnormal returns for event firms. It is evident that each of these approaches solves several methodological problems on the one hand but creates different problems on the other. The cumulative approach that sums the abnormal return in each month (i.e CARs), or takes the average of the monthly abnormal returns (i.e AARs) is to an extent advocated by Fama (1998) as asset pricing models commonly assure that normally distributed returns and normality is a better approximation for shorter horizons than longer ones. Ritter (1991) postulates that whether to use CARs or BHARs (Buy-and-Hold abnormal returns) depends on the research question we would like to address.

Barber and Lyon (1997) for instance posit that a test of the null hypothesis that a n-month CAR is zero is equivalent to a test of the null hypothesis that a mean monthly abnormal return of a sample firm during the event year is equal to zero; *it is not* a test of the null hypothesis that that the mean annual abnormal return is equal to zero. To test the later hypothesis Barber and Lyon suggest using the BHAR approach. The cross correlation of long term BHARs is a major problem encountered and among the solutions proposed is the elaborate scheme (to adjust for the cross-correlation) introduced by Brav (2000). Fama (1998) however suggests that the number of return covariances to be estimated (to provide a full solution to the problem) is greater than the number of time series observations casting doubt on the robustness of the results generated by using these methodologies.

The "rolling portfolio approach" (or calendar time methodology as more commonly known), originally used by Jaffe (1974) and Mandelker (1974), advocated by Fama

(1998) and later applied by Laughran and Ritter (1995), Brav and Gompers (1997), Mitchell and Stafford (2000) Ikenberry, Lakonishok and Vermaelen (2000), and Boehme and Sorescu (2002)[20] to mitigate the problem of cross sectional dependence of stock returns is used for the purpose of this examination. Since the time series variation of the monthly abnormal return on the portfolio already captures the effects of the correlation of returns across event stocks missed by the equilibrium model used, the problem of the cross sectional dependence of abnormal returns is solved.

However, Loughran and Ritter (2000) strongly oppose the calendar time approach and argue that it is the least powerful test of market efficiency as it weights each month equally. But usually there will be more events in some months than others due to firms picking periods of misvaluation to announce corporate events such as takeovers. According to Mitchell and Stafford (2000), due to the number of firms being different for each month heteroscedastic residuals are likely to be present when regressing calendar time average portfolio returns in excess of the risk free rate against the factors of an asset pricing model. Hence, when performing the regressions report heteroscedasticity adjusted t-statistics so as to realistically assess the validity of my results.

For each calendar month, a portfolio is formed by including all qualifying takeovers during the last three years. On the first month only takeovers with effective date on this

[20] Mitchel and Stafford (2000) find empirical evidence that BHAR methodology is likely to produce downward biased standard errors and consequently overstated t-statistics. They also suggest that calendar time returns are less subject to the bad model problem, a finding also supported by Boehme and Sorescu (2002).

particular month are included[21]. Each month I rebalance my portfolio to include all acquirers that have just completed an event and to disregard all the ones that have just completed 36 months in my calendar approach. Equal weighted and value weighted returns are used to average the performance of individual returns in my sample. Fama (1998) favours value weighted returns as all common asset pricing models have systematic problems in explaining the average returns of small stocks. Nevertheless, Laughran and Ritter (2000) prove by using simulation and sensitivity analysis that that value weighted returns tend to underestimate abnormal returns to managerial choice variables such as takeovers. In general, value and equally weighted returns address different research questions. Value weighted returns indicate whether an investor holding the value weighted portfolio of event firm will earn abnormal returns while equal-weighted returns reflect whether on average, event firms experience abnormal returns. We are interested in both questions and hence use both approaches (as complementary) to calculate monthly AARs.

I then estimate the following three-factor regression model originally used by Fama (1993) but using the approximation scheme of Dimson et al. (2003) to account for UK size and BV/MV peculiarities[22]:

[21] Price data for each acquirer are downloaded starting from the effective month of the takeover in each case. Consequently the returns data generated for each acquirer are available from the month following the effective month and for 36 subsequent months i.e t+1 to t+36). This approach is preferable in my case as we are more interested in whether slow information diffusion generates overpricing and subsequent long-run underperformance. Any short run wealth effect is not captured as it addresses a rather different research question.

[22] Dimson (2003) uses different breakpoints to those of Fama (1993) to construct size and Book-to-Market portfolios mainly due to size and value being negatively correlated in the UK and large firms (small firms) being concentrated in the low (high) BE/ME quartile.

$R_{pt} - R_{ft} = a_p + \beta_p(R_{mt} - R_{ft}) + s_p SMB_t + h_p HML_t + e_{pt}$, where R_{pt} is the return of calendar time portfolio of takeover firms in month t and R_{ft} is the monthly UK Treasury bill. The market factor $R_{mt} - R_{ft}$ is the return on a value weighted market index minus the risk free rate each month. Size factor is the average return on three small cap portfolios, minus the average return on three large-cap portfolios. Finally HML factor is the differential average return on two high book-to market-portfolios and two low book-to-market-portfolios. The intercept may then be interpreted as the mean monthly abnormal return of the event portfolio across all months. Note that the intercept (alpha) in this regression is the mean monthly abnormal return for each portfolio over the estimation period. For robustness i also estimate the CAPM intercepts that are however not reported in my empirical discussion for brevity. Note though that when focusing on CAPM alphas the results more strongly support my hypotheses.

The above procedure is repeated for all my samples. To an extent, any statistically and economically important differentials in abnormal returns between the paired-samples are driven by the differentials in BO. I use zero investment portfolios to assess return differentials between paired samples to ensure that the actual observed differentials are realistic. Finally, i control for method of payment, size, and/or book-to-market characteristics.

3.4 Empirical Results

Table 4 reports estimates of monthly average abnormal returns (i.e., the intercept alpha) for the calendar time portfolios formed on the basis of BO in acquiring firms using the Fama-French 3-factor model. For the full sample, i find a negative (-1%) and highly significant (t-stat: -4.58) alpha when equal-weighted portfolio returns are used. For the value-weighted calendar portfolio the negative abnormal return declines (-0.57%) but is still statistically significant (t-stat: -5.16). This finding is consistent with previous studies that have documented significant negative post takeover abnormal returns when listed targets are involved.

As defined earlier, the entire sample is divided into High-BO and Low-BO subsamples. For the Low-BO sample, negative abnormal returns are economically and statistically significant for both equal (-1.71% significant at the 1% level) and value weighted (-0.62% significant at the 1% level) calendar portfolios. The large equally weighted negative abnormal return reflects to a great extent that size plays a significant role in addition to BO in determining the amount of shortable shares or shorting costs and thus stock performance. This is consistent with previous findings on the relation between size, institutional ownership and equity returns such as Chen et al (2002), Nagel (2005) and Boehme et al (2006). Overall, acquirers in the Low-BO sample underperform the benchmark in the long run regardless of the weighting scheme. Note that alphas in this case imply a -62% three-year abnormal return under equal weighting and -22% under value weighting that are substantially more negative than in any other sub-samples subsequently examined.

For acquirers in the High-BO sample the picture is clearly different. Abnormal returns remain negative but their economical significance is weaker relative to the Low-BO sample for both equal- and value-weighted calendar portfolio returns. On an equal-weighted basis alpha (-0.86%) is 50% smaller than that in the Low-BO sample and statistically significant (t-stat: -4.78) while on a value-weighted basis alpha (-0.51%) also declines by 17%. Overall, even though inferences from equal-weighted returns may be considered as more reliable in a small sample, still the High-BO sample significantly outperforms the Low-BO one by a statistically and economically important margin regardless of the weighting scheme applied. Note that the High minus Low BO monthly percentage differential from a zero-investment portfolio (Table 5) is a statistically significant 0.8% when equally weighted (0.22% when value weighted). This finding to a great extent demonstrates the importance of high BO in alleviating short-run overpricing.

The High-BO sample is divided into two: Moderate-BO (acquirers with 3-10% BO) and Extensive-BO (acquirers with more than 10% BO). Table 3 presents the results for these two subsamples. Under both equal- and value-weighting schemes, the Extensive-BO sample's alphas are statistically insignificant -0.58% (t-stat: -1.34) and –0.28% (t-stat: -1.64) respectively. On the other hand, alphas for the Moderate-BO sample are statistically significant under both weighting schemes (-0.89% with t-stat -4.26 when equal weighting and -0.51% with t stat -4.43 when value weighting). The equal-weighted monthly return differential (Table 5) of Extensive minus Moderate BO is 0.27% (0.18% when value weighting) and even though statistically insignificant, is still sufficient in order to eliminate overpricing for the extensive BO sample (Table 4).

Such results further strengthen my argument regarding the significant role of BO in corporate takeovers, which predicts that not only large but also extensive ownership (at the event year) contributes in more effectively eliminating short-run overpricing through facilitating short sales, thus leading to better performance.

I finally split the High-BO sample into two other subsamples in order to examine the significance of the persistence or duration of BO (i.e., the time-window during which short sales are likely to be constrained) and further enrich my evidence. Table 4 reports the results for both the Non-Persistent and the Persistent-BO samples. Clearly, negative abnormal returns decline in economic and statistical terms when moving from the former sample to the latter for equally weighted alphas. In this case alphas are respectively –0.87% (t-stat: -3.96) and –0.62% (t-stat: -1.45) for the two subsamples, which indicates that persistently held acquirers outperform the non-persistently held ones. When value-weighted returns are considered however, no significant difference in abnormal returns between the Persistent-BO sample (-0.45% with t-stat –2.21) and the Non-Persistent (-0.38% with t-stat -5.85) is detected. On average, Non-Persistently held acquirers underperform Persistently held ones and thus long term concentrated institutional presence can lead to persistently less constrained short sales that effectively deteriorate any short-run overpricing of acquirers surrounding the takeover event.

Table 5 reports actual percentage differentials in alphas as well as abnormal returns of zero-investment portfolios of each paired subsample. The latter alphas are obtained

by regressing mean calendar portfolio return differentials on the Fama-French three factors. Results demonstrate that investors experience less loss when investing in acquirers subject to High rather than Low BO. In addition, investing in acquirers subject to Extensive rather than simply High BO, results in even less loss. The 0.25% equal-weighted differential in alphas (0.26% for the zero-investment portfolio) between persistent and non-persistent BO acquirers confirms the prediction of the second hypothesis. The 0.73% Extensive minus Low BO and the 1% Persistent minus Low BO (both statistically significant at the 1% level) equal-weighted zero-investment portfolio alphas demonstrate that both the extent and the persistence of BO can play a vital role in eliminating overpricing.

Note that despite such differentials, abnormal returns still remain negative and significant for the High BO portfolio. However, bearing in mind that the High BO sample includes a large number of acquirers that exhibit Non-Extensive BO (i.e. less than 10%) and given that the Low BO sample can in practice include acquirers subject to high overall institutional ownership disguised into smaller than 3% block holdings, it would be in this case more reasonable to place more weight on return differentials between more extreme portfolios; that is between the Low and the Extensive, Persistent BO portfolios. We observe for instance that negative abnormal returns decline substantially and become statistically insignificant in the Extensive BO portfolio. Given that shorting acquirers is generally costly according to Geczy, Musto and Reed (2002), it is reasonable that elimination of the short sale constraint effect is more pronounced among extreme BO portfolios. This argument is consistent with

Nagel (2005) who finds that certain anomalies disappear only in the highest institutional ownership portfolios he examines.

The statistical and/or economic differentials in alphas obtained could possibly be driven by the majority of acquirers in some subsamples being tiled towards specific firm/deal characteristics (for instance method of payment, size, and book-to-market ratio) identified as having systematic impact on bidders' performance. Table 6 can help resolve to an extent such concerns as it presents abnormal returns and number of acquirers on the two dimensional space of BO and such characteristics. Abnormal returns decay by approximately 50% as we move from the High to the Low BO portfolios irrespective of method of payment, size and market-to-book ratio of the acquiring firms. Note that within the sample of small acquirers for which short selling is naturally more constrained the High minus Low BO zero-investment portfolio yields a statistically significant difference of 1.45% per month. The positive High minus Low BO abnormal return differential is large although small firms are mainly concentrated in the High-BO sample rather than the Low BO one.[23]

Further, negative abnormal returns decay considerably and become statistically insignificant in all but one case as we move from the Moderate to the Extensive BO samples. This result confirms my previous findings that in portfolios where concentrated ownership is extensive, long run negative abnormal returns to acquiring

[23] Since small acquiring firms in general underperform large ones in my sample then we should expect more negative abnormal returns with higher concentration of small acquirers (i.e., for the High-BO group).

firms engaging in public acquisitions disappear. Lastly, Persistent minus Non-Persistent differentials are positive and statistically significant in three out of six cases. However, where negative alphas are obtained from zero-investment portfolios these are statistically insignificant and thus do not affect my main conclusions. Again here within the sample of small acquirers the Persistent minus Non-Persistent BO zero-investment portfolio yields a statistically significant difference of 0.92% per month reflecting that the persistence of ownership plays an important role in facilitating effective arbitrage in small stocks. Further, the positive Persistent minus Non-Persistent BO abnormal return differential (Table 5) is positive although small firms are mainly concentrated in the Persistent-BO sample. Interestingly, underperformance declines substantially in most cases in economic and statistical terms as the extent and persistence of BO increase for high book-to-market acquirers and non-cash payments. Overall results in table 6 reflect that, on average, long run post takeover underperformance decays in economic and statistical terms as the extent and persistence of institutional block-holder ownership increase, after accounting for the size, book-to-market and method of payment effects.

3.5 Conclusion

This chapter demonstrates that the level of short sale constraints (as proxied for by institutional block-holders' ownership) plays a major role in determining post takeover stock performance. Overall, the Low-BO, Moderate-BO and Non-Persistent-BO acquirer portfolios underperform their High-BO, Extensive-BO and Persistent-BO peers in the long run. The significant return differentials between the paired portfolios

show that BO, both in terms of extent and persistence, plays a pivotal role in explaining post takeover abnormal returns. My findings therefore suggest that the widely documented post-merger underperformance puzzle could largely be attributed to less effective arbitrage in the case where acquirers exhibit low and/or non-persistent institutional investment rather than to size, book-to-market, and method of payment effects.

My evidence reveals that negative abnormal returns decay in statistical and/or economic terms as the extent and persistence of BO increases, which thus suggests that BO is indeed a key factor in explaining the degree of acquirers' overpricing. This result is consistent with the continuously growing literature postulating that short sale constraints can induce short-run overpricing and hence lead to long-run negative abnormal returns as efficiency takes its course. The presence of institutions is therefore vital in ensuring the efficiency of the takeover market since extensive BO significantly deteriorates short-run overpricing and thus eliminates the chances for post takeover return reversals. The latter statement is consistent with Nagel (2005) who finds that short sale constraints drive most common cross sectional anomalies documented in the literature and Phalippou (2005) who suggests that the increasing significance of institutional investors can lead to gradual disappearance of certain stock anomalies. Accordingly, i hope this study forms the basis for more extensive future examinations on the valuation implications of institutional ownership as related to corporate takeovers or other events and on the general role of institutions in preserving efficiency in financial markets through facilitating shorting opportunities.

Appendix 1: Major Institutional Shareholding's Database

Details on fields provided by Hemscott plc

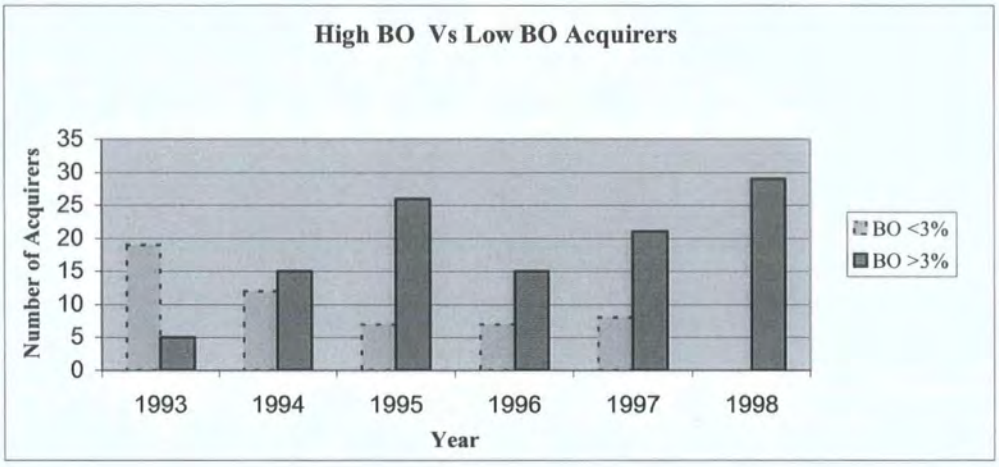
EXTRHOLD.DBF

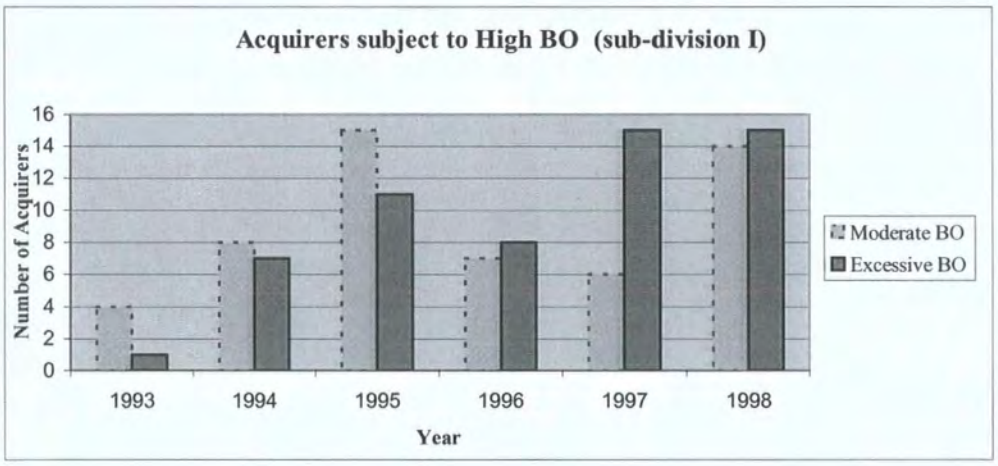
```
"long_desc" ,"C", 36, 0     //  name of the security

"shrhldrID" ,"C",  6, 0     // shareholder ID
"off_recno" ,"C",  6, 0     // officer ID

"coy_id"    ,"C",  5, 0     //  company ID
"coy_name"  ,"C", 50, 0     //  company name
"IssuerCode","C",  6, 0     //  LSE Issuer Code
"ISIN"      ,"C", 12, 0     //  ISIN of Prime security
"EPIC"      ,"C",  4, 0     //  EPIC code of prime
security
"umbrella"  ,"C", 30, 0     //  umbrella name (alpha
oriented)
"hldr_abb"  ,"C", 30, 0     //  shareholder abbreviated
name
"hldr_name" ,"C", 60, 0     //  full shareholder name
"hldr_desc" ,"C", 40, 0     //  additional eg "(with
spouse)"
"hldr_cat"  ,"C",  1, 0     //  Type of shareholder where
                        //  M=major (ie over 3%)
                        //  D=director
"hldng_type","C",  1, 0     //  Type of shareholding where
                        //  B=beneficial
                        //  F=family
                        //  I=incentive
                        //  N=non-beneficial
// holding
"current"   ,"L",  1, 0     //  current holding indicator
"hold_date" ,"D",  8, 0     //  conf date of current
holding
"curr_hold" ,"N", 11, 0     //  current share holding
"curr_pcent","N", 10, 6     //  current percentage holding
```

Fig. 3.2: Block-holder Ownership in UK Acquiring Firms (1993-1998)





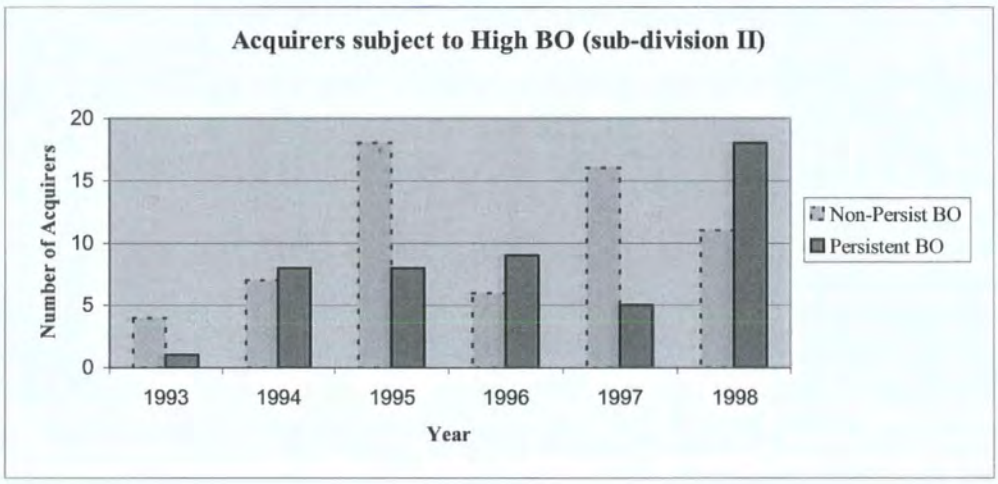


Table 3. 2: Summary Statistics: Size, Book to Market Ratio, and Method of Payment.
The full sample consists of 164 UK public domestic mergers with a deal value of one million dollars or more. Size is the market value of the acquirer one month prior to the event reported in million pounds. B/M is the book to market value of the acquirer one month prior to the event. There are three methods of payment: pure cash, pure stock, and mixed. The mixed payment subset consists of all mergers where the payment method is neither pure cash nor pure stock. The table reports number of acquirers, mean and median size and book-to-market ratios, and the percentage of deals under different methods of payment for each calendar year.

		Size (£m)		B/M		Method of Payment		
Years	**Acquirers**	**Mean**	**Median**	**Mean**	**Median**	**Cash (%)**	**Stock (%)**	**Mixed (%)**
1993	24	2126	423	0.44	0.32	37.5	12.5	50
1994	27	2647	471	0.33	0.30	37	14.8	48.2
1995	33	2472	237	0.42	0.42	30	6.6	63.4
1996	22	4276	491	0.29	0.19	45.5	22.7	22.8
1997	29	1082	256	0.43	0.39	31	27.6	41.4
1998	29	688	103	0.72	0.71	44.8	17.2	48
All	**164**	**2131**	**318**	**0.44**	**0.34**	**37.8**	**19.7**	**43.3**

Table 3. 3: Block-holder ownership statistics and allocation of acquirers in sub-samples

BO data are collected manually on an annual basis from a database provided by Hemscott for the period 1993-1998. For each year we sum up all block-holdings (i.e. institutional holdings greater than 3%) by institutions in each acquiring firm to obtain the overall amount of BO. The table presents year-by-year acquirers' allocation (for the full sample of 164 acquirers) in Block-Ownership (BO) sub-samples. The full sample is divided into BO sub-samples in three different ways. First, the entire sample is split into the Low BO (i.e., BO<3% at year t, the merger completion year) and High BO (i.e., BO≥3% at year t) sub-samples. Low BO acquirers, although in Hemscott's share ownership reports, are not subject to any greater or equal to 3% institutional holdings at the event year. Second, the High BO group is divided into two sub-samples, one with acquirers subject to block-holding of 3-10% (i.e., the Moderate BO group) at year t and one with acquirers subject to block-holding greater than 10% at year t (i.e., the Extensive BO group). Finally, the High BO sample is divided into two alternative sub-samples. One with acquirers subject to institutional holding of ≥3% for a period of at most 2 years following the event year (i.e., the Non-Persistent BO sample), and one with acquirers subject to institutional holding of ≥3% for at least 3 years following the event (i.e., the Persistent BO sample).

Year	Acquirers	Low BO <3% at year t	High BO ≥3% at year t	Moderate BO 3-10% at year t	Extensive BO ≥10% at year t	Non-Persistent BO ≥3% at year(s) t, (t+1, t+2)	Persistent BO ≥3% at years t, t+1, t+2, t+3
1993	24	19	5	4	1	4	1
1994	27	12	15	8	7	7	8
1995	33	7	26	15	11	18	8
1996	22	7	15	7	8	6	9
1997	29	8	21	6	15	16	5
1998	29	0	29	14	15	11	18
Overall	**164**	**53**	**111**	**54**	**57**	**62**	**49**

Table 3. 4: Calendar Time Portfolio Monthly Average Returns in Excess of the CAPM and Fama and French 3-Factor Model

The table presents OLS estimates of monthly abnormal returns (alphas) to takeover samples for i) all 164 acquirers in the full sample; ii) the Low BO (i.e., <3% block-holding at year t, the merger completion year); iii) the High BO (i.e., ≥3% block-holding at year t; iv) the Moderate BO (i.e., 3-10% holding at year t); v) the Extensive BO (i.e., ≥10% holding at year t); vi) the Non-Persistent BO (i.e., ≥3% holding for at most 2 years and vii) the Persistent BO (i.e., ≥3% holding for at least 3 years). Calendar-time portfolio regressions were performed for each of the seven samples formed on the basis of percentage BO. Acquirers enter the portfolio on the effective month of the takeover and remain for 36 months. Calendar portfolios are rebalanced each month to include firms that have just completed a takeover and to disregard the ones that have just fulfilled 36 months. The monthly abnormal returns are intercepts ap in the CAPM model and the Fama and French three-factor model, respectively: $R_{pt} - R_{ft} = a_p + \beta_p(R_{mt} - R_{ft}) + e_{pt}$ *and* $R_{pt} - R_{ft} = a_p + \beta_p(R_{mt} - R_{ft}) + s_p SMB_t + h_p HML_t + e_{pt}$

Where R_{pt} is the calendar time portfolio return, R_{ft} is the return on a one-month T-bill during month t, SMB is the difference in returns of value weighted portfolios of small firms and big firms during month t, HML is the return differential of value weighted portfolios of high and low book-to-market ratio firms in month t, β_p, s_p and h_p are regression parameters specific to the portfolio and e_{pt} is the error term. Heteroscedasticity and autocorrelation adjusted t-statistics are reported in brackets below each estimate. N is the number of acquirers in each sample and Cal. Months is the number of calendar months for each calendar portfolio regression.

		All	Low BO	High BO	Moderate BO	Extensive BO	Non-Persistent BO	Persistent BO
CAPM a	**EW**	-0.62 [-1.78]^c	-1.53 [-3.05]^a	-0.51 [-1.49]	-0.61 [-1.93]^c	-0.27 [0.50]	-0.45 [-1.14]	-0.41 [-0.82]
	VW	-0.55 [-5.59]^a	-0.60 [-5.16]^a	-0.48 [-4.22]^a	-0.47 [-3.89]^a	-0.23 [-1.42]	-0.33 [-4.01]^a	-0.44 [-2.08]^b
FF a	**EW**	-1.02 [-4.58]^a	-1.71 [3.73]^a	-0.86 [-4.78]^a	-0.89 [-4.26]^a	-0.58 [-1.34]	-0.87 [-3.96]^a	-0.62 [-1.45]
	VW	-0.57 [-5.16]^a	-0.62 [-5.03]^a	-0.51 [-4.70]^a	-0.51 -4.43	-0.28 [-1.64]	-0.39 [-5.80]^a	-0.45 [-2.20]^b
N		164	53	111	54	57	62	49
Cal. Months		105	94	105	105	98	103	100

a,b,c indicate significance at the 1,5 ,10 percent level for two-tailed t-tests.

Table 3. 5: Zero-Investment Portfolio and Economic Differentials between Calendar Time Portfolio Monthly Average Returns in Excess of the Fama and French 3-Factor Model

The table presents zero-investment portfolio and economic percentage differentials between OLS estimates of monthly abnormal returns (alphas) to takeover samples involving: i) the Low BO (i.e., <3% block-holding at year t, the merger completion year); ii) the High BO (i.e., ≥3% block-holding at year t; iii) the Moderate BO (i.e., 3-10% holding at year t; iv) the Extensive BO (i.e., ≥10% holding at year t); v) the Non-Persistent BO (i.e., ≥3% holding for at most 2 years following the event) and vi) the Persistent BO (i.e., ≥3% holding for at least 3 years following the event). Hedge portfolios' (i.e. zero-investment portfolios', ZIP) mean calendar time portfolio return differentials are regressed on the FF 3-Factor model. The regression procedure is identical to that described in table 3. Economic Differentials are the differences between the actual alphas obtained in table 3. Both, economic differentials between actual alphas and hedge portfolios' alphas are reported on both equal- (EW) and value-weighted (VW) basis. Heteroscedasticity and autocorrelation adjusted t-statistics in brackets under zero-investment portfolios' estimates are obtained from a one-tail t-test.

		High - Low	Extensive – Moderate	Persistent - Non Persistent	Extensive - Low	Persistent - Low
EW	**FF a**	0.80	0.27	0.26	0.73	1.00
	ZIP	[2.01]^{b}	[0.55]	[0.51]	[1.51]^{c}	[2.02]^{b}
	FF actual differential	0.85	0.31	0.25	1.13	1.09
VW	**FF a**	0.22	0.18	0.01	0.36	0.34
	ZIP	[1.65]^{c}	[1.00]	[0.10]	[1.78]^{b}	[1.70]^{b}
	FF actual differential	0.11	0.23	-0.07	0.34	0.17

a,b,c indicate significance at the 1,5 ,10 percent level for one-tail t-test.

Table 3. 6: Sorts on Blockholder Ownership, Mode of Payment, Size and Book-to-Market value of the acquiring firm.

The table presents OLS estimates of monthly abnormal returns (alphas) in the 2-dimensional space of BO samples and method of payment, size and book-to-market (B/M) of the acquiring firm. The regression procedure is identical to that described in table 3. All 164 acquirers are firstly sorted according to method of payment, size and book-to-market ratio. Acquirers paying with pure cash are in the cash payments' sample while acquirers paying with pure stock, any combination of cash and stock or other (as classified by SDC) mode of payment are in the non-cash sample. Each size (small and large) and book-to-market (high and low) groups of the entire sample represesent 50% of that sample. Acquiring firms are also ranked individually into BO samples as in table 3. The table also reports zero investment portfolio alphas between paired BO portfolios. Heteroscedasticity and autocorrelation adjusted t-statistics in parentheses under individual BO portfolios and zero-investment portfolios' estimates are obtained from two-tail t-tests and one-tail t-tests respectively. The number of firms involved in each regression is reported in brackets below the t-statistic.

BO Portfolios / Acquirer/Deal Characteristics	Low BO	High BO	High - Low	Moderate BO	Extensive BO	Extensive - Moderate	Non-Persistent BO	Persistent BO	Persistent - Non-Persistent
Cash Payments	-1.67[a] (-2.66) [20]	-0.70[a] (-2.92) [43]	0.86[c] (1.40)	-0.81[a] (-3.07) [24]	-0.37 (-1.03) [20]	0.44 (1.03)	-0.37 (-1.39) [25]	-0.99[b] (-2.01) [17]	-0.60 (-1.04)
Non-Cash Payments	-1.63[a] (-3.83) [19]	-0.87[a] (-2.83) [46]	0.73[c] (1.52)	-0.97[a] (-3.30) [19]	-0.66 (-1.19) [26]	0.37 (0.59)	-1.36[a] (-5.25) [22]	-0.32 (-0.61) [25]	1.02[b] (1.78)
Small Size	-2.31[a] (-2.75) [19]	-0.86[a] (-2.78) [63]	1.45[b] (1.77)	-0.85[b] (-2.59) [31]	-0.71 (-1.22) [32]	0.20 (0.29)	-1.32[a] (-3.93) [26]	-0.41 (-0.82) [37]	0.92[c] (1.45)
Large Size	-1.29[a] (-3.14) [34]	-0.82[a] (-3.08) [48]	0.38 (0.96)	-1.35[a] (-3.69) [23]	-0.48 (-1.38) [25]	0.90[b] (1.76)	-0.63[b] (-2.37) [36]	-1.15[c] (-1.80) [12]	-0.46 (-0.70)
High B/M	-1.70[a] (-3.03) [20]	-1.26[a] (-4.77) [62]	0.35 (0.75)	-1.78[a] (-5.12) [28]	-0.47 (-0.92) [34]	1.24[b] (1.98)	-1.60[a] (-4.89) [35]	-0.50 (-0.95) [27]	1.11[b] (1.70)
Low B/M	-1.71[a] (-2.72) [33]	-0.28 (-0.99) [49]	1.53[a] (2.45)	0.08 (0.27) [26]	-0.88[c] (-1.92) [23]	-0.68 (-1.12)	0.10 (0.23) [27]	-0.75[c] (-1.81) [22]	-0.52 (-1.06)

a,b,c indicate significance at the 1,5 ,10 percent level.

Chapter 4: Divergence of Opinion and Post Acquisition Performance*

* A major part of the material in this chapter is accepted for publication in the Journal of Business, Finance and Accounting

4.1 Introduction

In chapter 3 I investigate the relation between the level of short selling constraints the acquiring firm is subject to and post-acquisition performance. The distinct role that divergence of opinion among investors may have in shaping this performance was not examined. Along these lines, the standard asset pricing theory assumes that all investors have identical estimates of expected return on all securities. In reality however, the existence of informational asymmetries and the tendency of investors to assess information in different ways renders the assumption of homogenous expectations among all investors unlikely to hold outside the Sharpe-Lintner's world. The divergence of opinion premium hypothesis as developed by Miller (1977) and Harison and Kreps (1978) predicts that in case investors disagree about the value of a stock, its price will be initially set by optimistic investors when short sale constraints that deteriorate the creation of new supply are present. The downward sloping demand curve generated in this case creates an upward bias in stock prices that is corrected through time as more information arrives.

As a result, a growing body of recent empirical work emerged that is concentrated on the relation between divergence of opinion among investors and stock returns. Diether, Malloy and Scherbina (2002) for example show that, in the cross section, high opinion dispersion leads to low future returns, thereby providing support to the 'premium hypothesis'. In this chapter, I investigate the relation between divergence of opinion about the value of acquiring firms in the pre-acquisition period and post-acquisition stock returns.

The voluminous literature on post-acquisition return determinants does not consider the effect of opinion divergence about the value of the acquirer. In a recent paper, Moeller, Schlingemann and Stulz (2006) show that investor disagreement about the acquirer can largely explain short-run gains to acquisitions. The authors find that high dispersion acquirers bidding for listed targets experience significant announcement losses when paying with stock. They argue that this is due to an increase in the bidders' float caused by the equity issues involved and the negative signals conveyed by such type of announcements. The divergence of opinion premium hypothesis implies that opinion divergence can have a long-term effect in the price of an acquirer in case negative opinions about its value cannot be initially revealed. The existence of short selling constraints for example can deteriorate the creation of new supply and thereby prevent pessimistic beliefs from being reflected in stock prices. Geczy, Musto and Reed (2002) show that borrowing acquirers for shorting purposes is costly. Given the fact that a large number of acquirers in my sample engage in frequent acquisitions and are relatively small,[24] high shorting costs for these stocks are expected to persist, therefore leading to slow adjustment of prices back to fundamentals in case these are initially overvalued.

Further, Moeller et al. (2006) show that the bidder's float is only likely to significantly increase as a result of an acquisition of a public target financed with stock. Accordingly, the supply of shares of the bidder remains to a large extent unchanged in all other cases. Given that acquisitions should, in general, reflect value-increasing projects, the arrival of

[24] More than 50% of acquirers in my sample engage in more than one acquisition within a 1-year period. In addition the average market value of an acquirer in my sample is three times less that the average market value of all UK public firms during the sample period mainly due to the prevalence of acquisitions of small, private targets in the UK.

acquisition related news should indicate that the existing supply has been absorbed by the minority of potential investors. As a result, pessimistic beliefs should be largely constrained around acquisition announcements involving private targets, given that the supply of shares remains unchanged. In this case, initial overpricing of high dispersion acquirers should persist through time, given the existence of short selling constraints, manifesting itself through long-run underperformance of their stock. Acquisitions of private targets comprise approximately 90% of the UK sample which therefore forms a relevant basis to investigate this hypothesis.[25]

Given the discussion above, i conjecture that *acquirers subject to high pre-event opinion divergence underperform, in the long-run, acquirers subject to low divergence.*[26] Further, we should expect that *negative post-event abnormal returns to acquiring firms should be mainly concentrated in the high divergence of opinion (henceforth DIVOP) portfolios.* Accordingly, the well documented *long-run underperformance of acquirers buying public targets*[27] *can be to a large extent driven by the high DIVOP subset.* To my knowledge this is the first attempt to shed light on this issue.

[25] Faccio and Masulis (2005) report that 90% of UK (and Irish) acquisitions involve unlisted and subsidiary targets. The UK acquisition market mainly consists of transactions involving private or subsidiary targets (91.2% in my sample) that are rarely financed with pure equity payments.

[26] Along similar lines, Houge, Loughran, Suchanek and Yan (2001) and Diether (2006) find a negative relation between opinion dispersion among investors and long-run IPO and SEO performance respectively.

[27] For US evidence, see for example: Asquith (1983), Malatesta (1983), Jensen and Ruback (1983), Magenheim and Mueller (1988), Agrawal, Jaffe, and Mandelker (1992), Loderer and Martin (1992), Anderson and Mandelker (1993), Loughran and Vijh (1997), Rau and Vermaelen (1998), Agrawal and Jaffe (2000), and Megginson, Morgan, and Nail (2004). For UK evidence, see for example: Firth (1979), Franks and Harris (1989), Limmack (1991), Kennedy and Limmack (1996), and Gregory (1997).

My task is twofold: to investigate whether such hypotheses are supported by the data and to do so by using DIVOP proxies that are tied specifically to investor behaviour. Several proxies capturing DIVOP such as analyst forecast dispersion may fail to use as much information about investors' opinions as is actually available. Specifically, Michaely and Womack (1999) and Scherbina (2004) cast doubts that the assumption that investors presumably believe and follow analysts is realistic. As Garfinkel (2005) points out, opinion should be expressed by putting wealth at risk and analysts' wealth may actually benefit rather than suffer from false opinion expressions.

On the other hand, proxies such as idiosyncratic volatility or sigma (e.g., Dierkens (1991), Boehme, Danielsen and Sorescu (2006) and Moeller et al. (2006)) and the bid-ask spread (e.g., George, Kaul and Nimalendran (1991), Houge, Lougran, Suchanek and Yan (2001), and Garfinkel (2005)) have been argued as more appropriate measures of information asymmetries and opinion differences. Using such measures has the ultimate advantage that does not involve exclusion of small firms for which disagreement is naturally expected to be more significant. Further, data on these proxies are widely available for UK firms and this enables us to examine opinion dispersion effects among a near exhaustive sample of 4,641 bidders acquiring public, private and/or subsidiary targets. Importantly, while idiosyncratic volatility (sigma) mainly captures informational and thus belief asymmetry, bid-ask spread may also convey information about liquidity, trading costs and size. Sadka and Scherbina (2004) posit that one reason mispricing persists through time is due to the high trading costs associated with high opinion dispersion stocks. Further, stocks with high spreads are normally small stocks, subject to more severe short constraints. Frictions preventing the revelation of information into stock prices such as trading costs and

short constraints can generate persistent overpricing. As a result, bid-ask spread may actually be more appropriate in capturing both the extent and persistence of overpricing and should be used as a complementary measure when examining valuation effects of opinion dispersion.

My evidence reveals that UK acquirers subject to low DIVOP experience insignificant abnormal returns for 1- and 3-year post-event windows. On the other hand, the negative and significant abnormal return for acquirers subject to high DIVOP reaches -0.42% (-0.78%) a month for the 1-year (3-year) window. The documented misvaluation persists within two-dimensional sorts of DIVOP and method of payment, acquiring firms' size, book-to-market value, target firms' inter/intra-industry or domestic/cross-border status. The negative association between DIVOP and post-event returns is robust irrespective of the proxy used and for all types of target (i.e., public, private, and subsidiary). Note that even the well documented underperformance of acquirers bidding for listed targets is limited to the high DIVOP subset. Such results point to a significant role of DIVOP in determining post-acquisition performance and suggest that acquirers subject to high pre-takeover investor disagreement are likely to be overpriced and subsequently underperform, irrespective of the information conveyed in the acquisition announcement.

Given that the literature related to Miller's divergence of opinion theory and the issues related to post acquisition performance have been discussed in chapters 2 and 3 respectively, the rest of the chapter is organized as follows. Section 4.2 describes the data and methodological procedures used in my empirical investigation. Section 4.3 presents and discusses the empirical results. Concluding remarks are provided in section 4.4.

4.2 Data and Methodology

I use a sample of UK acquisitions to examine the relation between DIVOP and long-run post-acquisition returns. I obtain all successful acquisitions from Thomson Financial Securities Data Corporation (SDC) UK mergers and acquisitions database. The final sample meets the following criteria:

- All acquisitions were announced in the period 1/1/1986 to 31/12/2002. Transactions involving financial and/or utility firms are excluded from the sample.

-All bidders are UK public firms while targets are either UK or foreign public, private or subsidiary firms.

-Deal value is above 1 million US dollars[28] and acquisitions involve more than 50% of target shares acquired.

-The deal value represents at least 1% of acquirer's market capitalisation one month prior to the acquisition announcement.[29] This ensures that only economically significant deals are examined as relatively small transactions would only add noise to the analysis.

-Price data for the acquirer is available from Thomson Financial Datastream.

I identify 4,641 UK transactions that meet the aforementioned criteria.

[28] We employ a one-million US dollars cut-off point to avoid results being generated by very small deals. Similarly, studies like Fuller, Netter, and Stegemoller (2002), Moeller, Schlingemann, and Stulz (2004) in the US use a cut-off point of one million dollars.

[29] The same criterion is applied by Morck, Shleifer and Vishny (1990).

I initially sort acquirers based on their pre-event levels of idiosyncratic volatility (the standard deviation in daily market adjusted residuals), average percentage daily bid-ask spread, and acquirer/deal characteristics. Sigma and bid-ask spread are measured over a 100-day period preceding the acquisition announcement.[30] Bid-Ask spread coverage for UK firms in Datastream is not as comprehensive as stock price coverage.[31] As a result when initially sorting with bid-ask spread my sample reduces to 3,747. Depending on the post-event window examined i include in each test acquirers that have return data for the 1- or 3-year post-acquisition period. I examine long-run post-acquisition stock returns (1- and 3-year) using calendar time portfolio regressions (CTPR) to account for the cross-sectional dependence of stock returns particularly due to the inclusion of frequent acquirers in the sample.

Each calendar month, a portfolio is formed by including all stocks with event participation (i.e. acquisition announcement) during the past 12 or 36 months.[32] The portfolio is rebalanced every month to include acquirers that execute a transaction and disregard the ones that have completed 12 or 36 months in the calendar approach. The average monthly abnormal return during each post-event period is the intercept (alpha) from the time-series regression of the calendar portfolio return over the market factor (the

[30] Boehme et al. (2006) use the same window when employing idiosyncratic volatility as a measure of opinion dispersion.

[31] Bid-ask spread data for most sample acquirers is available after 01/1990.

[32] Given that the UK market is overpopulated with acquisitions of private targets with relatively low target to-bidder relative size the 1-year window may be more sufficient to capture post-acquisition performance. Further, Boehme et al. (2006) examine valuation effects of opinion dispersion for the US using a 1-year window. Nevertheless, we examine also a 3-year window to assess the variation in persistence of overpricing when measuring DIVOP using alternative proxies.

CAPM) or the Fama and French 3 factors. The SMB and HML factors are constructed as in Fama and French (1993). Zero-investment portfolio regressions are employed to measure return differentials between extreme sub-samples.

Table 1 presents summary deal (Panel A) and acquirer specific (Panel B) statistics. It appears that the UK sample is overpopulated with acquisitions of private (55%) and subsidiary (36%) targets. Only a small fraction comprises of acquisitions involving public targets (9%) while pure equity financing is the least common way of financing (4.5%). I follow Conn, Cosh, Guest and Hughes (2005) and partition transactions by method of payment by considering pure cash and non-cash payments. Pure cash transactions account for 55.7% of all deals. Further, 31.5% of acquisitions involve foreign targets and 49.2% inter-industry targets.

The transaction value, market value of the acquirer and the target-to-bidder relative size are significantly larger when public targets are involved. It appears that, on average, acquirers bidding for private targets are the smallest in the sample. As a result mean and median DIVOP as measured by sigma and bid-ask spread are considerably higher for this group of acquirers. This confirms that small, less liquid stocks are naturally subject to higher investor disagreement. While the average market value of a UK public firm over the sample period is about 1.7 billion pounds, the average market value of acquirers in the sample is only 518 million pounds, mainly because acquirers buying private targets are relatively small. Geczy et al. (2002) find that borrowing acquirers for shorting purposes is costly especially if these are small capitalisation stocks and thus the average acquirer in the sample should be in general subject to binding short selling constraints.

The correlation between sigma and bid-ask spread is 38% suggesting that the 2 proxies are highly related. While the correlation between sigma and the log of acquirer size is only -11%, the correlation between bid-ask spread and log of size is -56%. This reflects that the smallest acquirers are concentrated in the high bid-ask spread portfolio. Although, small, less liquid firms should naturally expected to be subject to high bid-ask spread and thus DIVOP, i need to ensure that my results are not merely driven by a size effect. Lastly, correlations between the DIVOP proxies and market-to-book value are relatively low (2.7% for sigma and -5% for bid-ask spread).

4.3 Empirical Results

4.3.1 Long-run Post-Acquisition Stock Returns

Table 2 shows that UK acquirers earn negative post-acquisition returns irrespective of the event window (1- or 3-year) examined and the benchmark model used (FF 3-factor model or CAPM). Note that the intercept from the FF 3-factor model indicates that acquirers are subject to statistically insignificant average monthly abnormal return of -0.11% for a 1-year post-acquisition window. When the CAPM is used abnormal return reaches -0.67% and is statistically significant. For the 3-year window alphas are negative (-0.93% for the CAPM and -0.48% for the FF 3-factor model) and statistically significant. It appears that alpha always takes higher values when using the CAPM and that the size and book-to-market factors have substantial additional explanatory power. CAPM alphas that are used for robustness reasons and to a major extent confirm Fama-French alphas are

therefore not frequently reported in my discussion for brevity. Further, intercepts from 3-year CTRPs are always higher reflecting that acquiring firms on average underperform the benchmark significantly for more extensive post-acquisition windows. One of the aims of this chapter is to investigate whether this underperformance can be attributed to acquirers subject to high DIVOP that become overpriced and subsequently underperform.

I first examine whether common acquirer and deal characteristics reported in the literature can individually explain post-acquisition return for acquiring firms. Table 3 reports abnormal returns (CAPM and FF alphas) sorted by acquirer's size and market-to-book value. Panel A reports CAPM and FF alphas for 3 size groups (small, mid and large). Results based on the FF-3 factor model indicate that for the 1-year post-event window large acquirers underperform small by a statistically significant margin (-0.29%). On the other hand, the picture is less clear for the 3-year post-event window where the large minus small (size) return differential is positive (0.18%) but statistically insignificant. In general, acquirer's size seems to explain post-acquisition performance only when looking at 1-year window results, although the 'large minus small' differential is insignificant when the CAPM is used. Since in this case small acquirers, on average, outperform large and given that the divergence of opinion premium hypothesis predicts that high DIVOP acquirers are expected to experience lower (rather than higher) returns, small firm concentration in the high DIVOP (and particularly bid-ask spread) subset is unlikely to contaminate the results.

Panel B reports CAPM and FF alphas for 3 market-to-book groups (low, mid and high). Glamour acquirers underperform value firms irrespective of the post-event window and the benchmark used. Accordingly, Rau and Vermaelen (1998) find that value acquirers

outperform glamour acquirers in the long-run. The high minus low market-to-book value average monthly return differences are -0.44% and -0.34% for 1- and 3- year event windows respectively when the FF factors are used. Given that glamour firms are more likely to be overvalued, we can expect that overpricing is more pronounced for glamour acquirers that are simultaneously subject to high DIVOP. Subsequent underperformance should therefore be more pronounced for this group. I address this issue when sorting acquirers by market-to-book value and DIVOP in the next section. Further, the low correlation between the DIVOP proxies and market-to-book suggest that is highly unlikely that growth acquirers are concentrated in the high DIVOP group and thus drive the negative performance in this group.

Since i include in the sample both domestic and cross-border acquisitions, i report in Table 4 (Panel A) long-run post-acquisition performance by domestic/cross-border status of the target. Differences in performance between acquirers engaging in cross-border and those engaging in domestic acquisitions are economically and statistically insignificant irrespective of the post-event window and the benchmark model used. This reflects that target origin is not individually important in explaining post-acquisition stock returns. Table 4 (panel B) also reports abnormal returns by intra/inter-industry status of the target. It appears that acquirers engaging in inter-industry transactions underperform their peers bidding for intra-industry targets. However, the inter- minus intra-industry monthly return differential (-0.20%) is only significant for the 3-year event window and when using the FF-3 factor model.

4.3.2. Divergence of opinion and Post-Acquisition Stock Returns

In this section i test my main hypothesis and report results on the valuation effects of opinion dispersion. Acquirers are initially sorted in DIVOP portfolios (high, mid and low) as discussed earlier. Table 5, Panel A presents the results for sigma (idiosyncratic volatility) and Panel B for percentage average bid-ask spread, both measured over the 100 days preceding the acquisition announcement. Panel A reveals a strong negative relation between post-acquisition returns and DIVOP measured by sigma. The 1-year average monthly abnormal return measured using the FF-3 factor model (CAPM) decreases from 0.01% (-0.24%) to -0.42% (-1.10%) as we move from the low to the high sigma portfolio. The high minus low zero-investment portfolio alphas are -0.42% and -0.96% when using FF and CAPM respectively. Statistically significant negative abnormal return is detected only in the high DIVOP portfolio, suggesting that acquirers subject to high pre-announcement investor disagreement become overpriced and subsequently underperform.

Results for the 3-year post-event window confirm this pattern. FF (CAPM) alphas decrease from -0.14% (-0.33%) to -0.78% (-1.37%) from the low to the high sigma portfolio while statistically significant negative abnormal return is reported for the mid and high sigma groups. Results therefore strongly support my hypothesis that DIVOP as measured by sigma is priced at a premium around the announcement leading to long-run underperformance. The fact that high idiosyncratic volatility explains well post-acquisition performance is in line with recent evidence by Ang, Hodrick, Xing, and Zhang (2006) that stocks subject to high past firm-level volatility have low future returns.

Further, the pattern remains when sorting acquirers in three groups of percentage average pre-announcement bid-ask spread (Panel B). The negative relation documented between bid-ask spread and post-acquisition returns is evident for both 1- and 3-year post-event windows. High minus low (bid-ask spread) zero-investment portfolio alphas are all negative and statistically significant irrespective of the window and benchmark used. These are -0.44% and -0.34% for the 1- and 3-year post-event windows respectively when using the FF factors. Note that the intercept from the 3-factor regression is statistically significant for the high bid-ask group only for the 3-year window. This finding may be associated with more persistent overpricing for high bid-ask spread acquirers. Accordingly, if high bid-ask spread acquirers are subject to high DIVOP and high trading costs, overpricing for their stock can last for longer and a more extensive post-event window will be necessary to uncover underperformance.[33] Alternatively, small acquirers performing better than large acquirers in the 1-year window (Table 3, for FF alpha) may be the reason for the less negative alpha in the case of the high bid-ask spread subset, given that size and bid-ask spread are negatively correlated. In general however, results for DIVOP as measured by bid-ask spread seem to corroborate results based on sigma.

4.3.3. Two-dimensional Sorting Tests

To ensure that results based on DIVOP reported in table 5 are not driven by any acquirer or deal specific characteristics i sort deals in the two dimensional space of DIVOP and such characteristics. All acquirers are initially ranked individually into 3 groups of DIVOP (low, medium and high), 2 payment method groups (cash and non-cash transactions), 2 groups

[33] Sadka and Scherbina (2004) argue that one reason mispricing persists through time is due to the high trading costs associated with high opinion dispersion stocks.

based on the size of the acquirer (small and large), 2 groups based on acquirer's market-to-book value (low and high),[34] 2 groups based on whether the acquisition is cross-border or domestic and 2 groups based on whether the target firm is in the same or different industry to the target's (intra- or inter-industry respectively). I form mutually exclusive portfolios from the intersection of the above groups. The divergence of opinion premium hypothesis implies that overpriced acquirers should be located in the high DIVOP group and therefore only acquirers in this group should experience statistically significant underperformance in the long-run, irrespective of other deal and acquirer characteristics. Table 6 reports FF 3-factor intercepts from calendar time regressions for high and low DIVOP sub-portfolios within the two dimensional space of DIVOP (measured by sigma in Panel A and bid-ask spread in panel B) and acquirer/deal specific characteristics. It also reports zero-investment portfolio intercepts that reflect return differentials between the high and low DIVOP sub-groups in each case.

Table 6 (Panel A) shows that high sigma acquirers underperform low sigma acquirers by an economically and statistically significant in most cases margin, irrespective of deal and acquirer characteristics. High minus low DIVOP return differentials are negative in all cases and statistically significant in 16 out of 22. The majority of negative and statistically significant differentials are however mainly detected when examining a 3-year post-event window. Negative abnormal returns are mainly concentrated in the high DIVOP subset (in all cases for the 3-year post-event window) while abnormal returns are statistically insignificant in 20 out of 22 cases for the low DIVOP subset.

[34] The reason for employing 2 mutually exclusive sub-samples for size and book-to-market is to maintain a sufficient number of firms in each calendar time portfolio.

Further, non-cash financed deals seem to underperform cash deals and the DIVOP premium effect is present irrespective of the payment method used in the transaction. Underperformance for the high sigma group is more pronounced for small acquirers. The return differential between high and low acquirers within the small size category is -0.43% (-0.58%) for the 1-year (3-year) window, although small/high sigma acquirers are subject to statistically insignificant negative abnormal return. Given however that according to table 3, small acquirers perform better for the 1-year window, it appears that small size combined with high sigma leads to substantially lower returns. Since small firms are more likely to be subject to binding short selling constraints (Boehme et al. (2006)), overpricing of high sigma acquirers should be more pronounced for small acquirers. Still differentials between high and low sigma acquirers are also large within the large size segment. Lastly, the premium effect is to a great extent robust irrespective of the market-to-book value of the acquirer and the intra/inter-industry and cross-border/domestic status of the transaction. Yet, statistically significant negative abnormal returns in the high sigma subset for the 1-year window are only present for glamour acquirers, domestic and inter-industry acquisitions.

Panel B, shows the results for subsets of DIVOP measured by bid-ask spread. Again here, high bid-ask spread acquirers underperform low bid-ask spread acquirers by an economically and statistically significant margin in the majority of cases and irrespective of other deal and acquirer characteristics. High minus low bid-ask return differentials are negative in all but one cases and statistically significant in 14 out of 22. As in the case of sigma, the majority of negative and statistically significant differentials are detected in the 3-year post-event subset. Negative abnormal returns for high bid-ask acquirers are statistically significant mainly for the 3-year window while only in 2 cases this holds true

for the 1-year window. Such pattern may again reflect that high bid-ask spread acquirers are subject to more persistent overpricing that manifests itself through pronounced underperformance when using longer post-acquisition windows.

The individual effects of deal and acquirer characteristics are less clear in the case of the bid-ask spread. While non-cash transactions underperform on average cash transactions for both low and high bid-ask spread subsets, large acquirers in the high bid-ask group clearly underperform small acquirers. The fact that high bid-ask spread acquirers are already relatively small firms may have generated this result. In general, the premium effect is to a great extent robust irrespective of method of payment, acquirer's size and market-to-book value and intra/inter-industry and cross-border/domestic status of the transaction.

I further test the DIVOP hypothesis individually for bidders acquiring private, public or subsidiary targets to assess whether my results are induced by a specific type of target (Table 7). Results are supportive to my main hypothesis irrespective of the type of target. That is, intercepts from high minus low DIVOP zero-investement portfolio regressions are negative and economically significant in all but one case. On average, acquisitions of public targets result in negative abnormal returns (of -0.53% per month for a 1-year and -0.61% for a 3-year window) irrespective of the post-event window used to assess performance. This is consistent with previous studies documenting long-run underperformance of public acquisitions. However, this negative performance is clearly generated by the high DIVOP subset. Accordingly, high DIVOP acquirers buying listed targets lose on average over 0.90% a month while low DIVOP acquirers are subject to statistically insignificant abnormal returns in the majority of cases. For acquisitions of private and subsidiary targets

low underperformance is again concentrated in the high DIVOP subsets while low DIVOP acquirers experience statistically insignificant abnormal returns. The high minus low DIVOP differentials are negative in all cases but more pronounced for the 3-year window.

4.4. Conclusion

Following a growing body of recent work studying the asset pricing implications of heterogeneous beliefs, this chapter examines the relation between divergence of opinion and post-acquisition stock returns. I show that the degree of pre-event diversity of opinion about the value of the acquiring firm explains to a large extent post-acquisition stock performance. Results point to a negative relation between pre-event divergence of opinion and post-acquisition stock returns. While, negative long-run abnormal returns are mainly present when opinion dispersion is high, low dispersion acquirers are in the majority of cases subject to no abnormal returns. Results are robust to alternative opinion divergence measures used and after controlling for a range of deal/firm characteristics. Consistent with Miller (1977), my findings demonstrate that acquiring firms subject to high investor disagreement are overpriced around the acquisition announcement. Short-run overpricing for those firms is corrected gradually, thus generating post-acquisition underperformance.

More interestingly, these results in general provide some notable implications. First, the significant abnormal returns detected in excess of the CAPM are only a necessary but not a sufficient condition to reject both the CAPM and the market efficiency when opinion dispersion is high, since without homogeneity the assumptions of CAPM do not suffice to guarantee that the market portfolio is a mean-variance efficient portfolio, thereby violating

the equilibrium model. Second, the significant abnormal returns observed in excess of the Fama-French 3-factor model imply that the FF model does not fully capture all the valuation components given the presence of wide opinion diversity. Put together, i consider this work as one of the first attempts towards examining the impact of opinion dispersion in a corporate takeover context. I believe that this can form a good basis for future research on how divergence of opinion affects post-managerial decision performance.

Table 4. 1: Summary Statistics

The table presents summary statistics (means and medians) for a sample of 4641 UK acquisitions. All transactions are by listed UK acquirers, take place in the period 1986-2002 and are downloaded from Thomson Financial SDC mergers and acquisitions database. The sample is restricted to deals above one million dollars and where the acquirer obtains more than 50 percent of target's shares as a result of the acquisition. Panel A reports deal specific statistics. The transaction value (TV) is from SDC and represents the total value in million pounds paid by the acquirer for each bid. Relative size of the target to the acquirer is the transaction value divided by the acquirer's market value (TV/MV). Days to completion measures the number of days between the announcement and the effective date. Cross-border are transactions where the target is not a UK firm. Inter-industry transactions involve targets with different 2-digit SIC code to that of the acquirer. Method of payment statistics are reported in percentages relative to each specific target type as well as the entire sample (in parentheses) where relevant. Cash offers include pure cash (100%) offers. Non-cash offers comprise all remaining offers. Panel B reports acquirer specific statistics. The market value of the acquirer is reported in million pounds. Market-to-book value is the market value of equity of the acquirer divided by its book value one month prior to the acquisition. Divergence of opinion is measured by i) Sigma (idiosyncratic volatility), the standard deviation of daily market adjusted residuals for the acquirer over the period (t-100, t-5), where t is the acquisition announcement day and ii) Percentage average daily Bid-Ask spread for the acquirer over the period (t-100, t-5). Bid-Ask spread data are only available for the period 1990-2002.

	Target Type							
	All (n=4641)		Public (n=406)		Private (n=2567)		Subsidiary (n=1668)	
Panel A: Deal Statistics	**mean**	**median**	**mean**	**mean**	**mean**	**median**	**mean**	**median**
Transaction Value (TV)	57.41	7.00	342.44	42.84	17.16	5.00	50.09	8.71
Relative Size (TV/ MV)	0.18	0.06	0.41	0.21	0.14	0.06	0.19	0.06
Days to Completion	28.30	0.00	82.25	63.00	21.00	0.00	26.45	0.00
Percentage of Cross-Border Transactions	31.52		27.34		33.31		29.79	
Percentage of Inter-Industry Transactions	49.28		54.19		48.27		49.64	
Percentage of pure Cash Transactions	55.74		49.75		45.65		72.72	
(percentage of entire sample)			(4.35)		(25.25)		(26.14)	
Percentage of Non-Cash Transactions	44.26		50.25		54.35		27.28	
(percentage of entire sample)			(4.40)		(30.06)		(9.80)	
Panel B: Acquirer Statistics								
Market Value	518.41	101.91	1321.50	237.93	294.98	80.76	666.78	129.35
Market-to-Book Value	3.99	2.11	3.95	2.01	4.25	2.24	3.61	1.89
Opinion Dispersion (Sigma)	0.019	0.015	0.019	0.015	0.020	0.016	0.018	0.015
Opinion Dispersion (Bid-Ask Spread)	0.033	0.027	0.027	0.015	0.036	0.025	0.030	0.022
Percentage of Sample with Bid-Ask Spread Data	80.74		81.77		78.92		83.27	

Table 4. 2: Post-acquisition Performance.
The table reports monthly estimates of calendar time portfolio abnormal returns (alphas) to acquiring firms for i) a period of 12 months (1 year) and ii) a period of 36 months (3 years). Each calendar month, a portfolio is formed by including all stocks with event participation (i.e. acquisition announcement) during the past 12 or 36 months. Portfolios are rebalanced each month to include firms that have just completed an event. CAPM and Fama and French 3-factor intercepts (alphas) are estimated by the following calendar time portfolio regressions:

$$R_{pt} - R_{ft} = a_p + \beta_p (R_{mt} - R_{ft}) + e_{pt}$$
$$R_{pt} - R_{ft} = a_p + \beta_p (R_{mt} - R_{ft}) + s_p SMB_t + h_p HML + e_{pt}$$

where Rpt is the calendar time portfolio return, Rft is the return on a one-month T-bill during month t, Rmt is the value-weighted market index return, SMB is the difference in returns of value-weighted portfolios of small firms and big firms during month t, HML is the return differential of value-weighted portfolios of high and low book-to-market firms in month t, βp, sp and hp are regression parameters specific to the portfolio and ept is the error term. Heteroskedasticity adjusted t-statistics appear in parentheses below each parameter. a, b and c indicate significance at the 1, 5, 10 percent level respectively based on two tail t-tests. Cal. Months is the number of calendar months and N is the sample size involved in portfolio regression.

Post-Acquisition Performance				
	1-Year alpha	**Adj. R^2**	**3-Year alpha**	**Adj. R^2**
CAPM α	**-0.67** [a]	66%	**-0.93** [a]	68%
	(-2.73)		**(-3.90)**	
FF α	-0.11	88%	**-0.48** [a]	88%
	(-0.70)		**(-3.03)**	
Cal. Months	216		216	
n	4641		4090	

Table 4. 3: Post-Acquisition Performance by Acquirer's Size and Book-to-Market Value
The table reports monthly estimates of calendar time portfolio abnormal returns (alphas) to acquiring firms for i) a period of 12 months (1 year) and ii) a period of 36 months (3 years). Each calendar month, a portfolio is formed by including all stocks with event participation (i.e. acquisition announcement) during the past 12 or 36 months. Portfolios are rebalanced each month to include firms that have just completed an event. Estimates are sorted by i) acquirer's market value (Panel A) measured one month prior to the acquisition announcement and ii) acquirer's book-to-market value (Panel B) measured by the market value of equity of the acquirer divided by its book value one month prior to the announcement. CAPM and Fama and French 3-factor intercepts (alphas) are estimated by the following calendar time portfolio regressions:

$$R_{pt} - R_{ft} = a_p + \beta_p (R_{mt} - R_{ft}) + e_{pt}$$
$$R_{pt} - R_{ft} = a_p + \beta_p (R_{mt} - R_{ft}) + s_p SMB_t + h_p HML + e_{pt}$$

where Rpt is the calendar time portfolio return, Rft is the return on a one-month T-bill during month t, Rmt is the value-weighted market index return, SMB is the difference in returns of value-weighted portfolios of small firms and big firms during month t, HML is the return differential of value-weighted portfolios of high and low book-to-market firms in month t, βp, sp and hp are regression parameters specific to the portfolio and ept is the error term. Heteroskedasticity adjusted t-statistics appear in parentheses below each parameter. Large minus Small and High minus Low differences and corresponding t-statistics are from zero investment portfolio alphas for CAPM and FF-3 factor regressions. a, b and c indicate significance at the 1, 5, 10 percent level respectively based on two tail t-tests except for zero-investment portfolio regressions where one-tail t-tests are used. Cal. Months is the number of calendar months and n is the sample size involved in each portfolio.

Panel A: Long-Run Performance by Acquirer's Market Value

1 Year

	Small		**Mid**		**Large**		**Large-Small**
		Adj. R^2		**Adj. R^2**		**Adj. R^2**	
CAPM α	**-0.61** [b]	49%	**-0.67** [b]	60%	**-0.74** [a]	75%	-0.20
	(-2.05)		**(-2.39)**		**(-3.23)**		(-0.90)
FF α	0.01	87%	-0.10	82%	-0.24	83%	**-0.29** [c]
	(0.04)		(-0.49)		(-1.18)		**(-1.49)**
Cal. Months	210		215		215		210
n	1547		1547		1547		

3 Years

	Small		**Mid**		**Large**		**Large**
		Adj. R^2		**Adj. R^2**		**Adj. R^2**	
CAPM α	**-0.98** [a]	53%	**-0.95** [a]	64%	**-0.83** [a]	74%	0.07
	(-3.50)		**(-3.59)**		**(-3.53)**		(0.31)
FF α	**-0.59** [a]	86%	**-0.52** [a]	84%	**-0.37** [c]	83%	0.18
	(-3.52)		**(-2.70)**		**(-1.75)**		(0.88)
Cal. Months	210		216		215		210
n	1351		1409		1330		

Panel B: Long-Run Performance by Acquirer's Market-to-Book Value

1 Year

	Low	Adj. R^2	Mid	Adj. R^2	High	Adj. R^2	High-Low
CAPM α	-0.12	60%	**-0.90** [a]	66%	**-1.06** [a]	60%	**-0.94** [a]
	(-0.47)		**(-3.59)**		**(-3.38)**		**(-3.77)**
FF α	0.19	83%	**-0.33** [c]	84%	-0.20	81%	**-0.44** [b]
	(1.08)		**(-1.82)**		(-0.84)		**(-1.74)**
Cal. Months	216		212		207		207
n	1547		1547		1547		

3 Years

	Low	Adj. R^2	Mid	Adj. R^2	High	Adj. R^2	High-Low
CAPM α	**-0.53** [b]	63%	**-0.95** [a]	66%	**-1.42** [a]	64%	**-0.88** [a]
	(-2.19)		**(-3.72)**		**(-4.67)**		**(-3.65)**
FF α	**-0.39** [b]	81%	**-0.44** [b]	83%	**-0.70** [a]	86%	**-0.34** [c]
	(-2.10)		**(-2.23)**		**(-3.37)**		**(-1.42)**
Cal. Months	216		212		207		207
n	1309		1373		1408		

Table 4. 4: Post-Acquisition Performance by the Target Origin and Industry of Target and Acquirer

The table reports monthly estimates of calendar time portfolio abnormal returns (alphas) to acquiring firms for i) a period of 12 months (1 year) and ii) a period of 36 months (3 years). Each calendar month, a portfolio is formed by including all stocks with event participation (i.e. acquisition announcement) during the past 12 or 36 months. Portfolios are rebalanced each month to include firms that have just completed an event. Estimates are sorted by i) domestic and cross-border deals (Panel A) and ii) by intra- and inter-industry deals (Panel B). Domestic (Cross-border) are transactions where the target is (not) a UK firm. Intra- (Inter-) industry transactions involve targets with the same (different) 2-digit SIC code to that of the acquirer. CAPM and Fama and French 3-factor intercepts (alphas) are estimated by the following calendar time portfolio regressions:

$$R_{pt} - R_{ft} = a_p + \beta_p (R_{mt} - R_{ft}) + e_{pt}$$

$$R_{pt} - R_{ft} = a_p + \beta_p (R_{mt} - R_{ft}) + s_p SMB_t + h_p HML + e_{pt}$$

where Rpt is the calendar time portfolio return, Rft is the return on a one-month T-bill during month t, Rmt is the value-weighted market index return, SMB is the difference in returns of value-weighted portfolios of small firms and big firms during month t, HML is the return differential of value-weighted portfolios of high and low book-to-market firms in month t, βp, sp and hp are regression parameters specific to the portfolio and ept is the error term. Heteroskedasticity adjusted t-statistics appear in parentheses below each parameter. CB (cross-border) minus Dom (domestic) and Inter- minus Intra-industry differences and corresponding t-statistics are from zero investment portfolio alphas for CAPM and FF-3 factor regressions. a, b and c indicate significance at the 1, 5, 10 percent level respectively based on two tail t-tests except for zero-investment portfolio regressions where one-tail t-tests are used. Cal. Months is the number of calendar months and n is the sample size involved in each portfolio

Panel A: Long-Run Performance by Target Origin

1 Year

	Domestic		Cross Border		CB-Dom
		Adj. R^2		Adj. R^2	
CAPM α	**-0.65** [a]	64%	**-0.71** [a]	66%	-0.09
	(-2.67)		**(-2.60)**		(-0.54)
FF α	-0.12	88%	-0.11	82%	-0.01
	(-0.77)		(-0.51)		(-0.03)
Cal. Months	216		215		215
n	1463		3178		

3 Years

	Domestic		Cross Border		CB-Dom
		Adj. R^2		Adj. R^2	
CAPM α	**-0.88** [a]	67%	**-1.04** [a]	67%	-0.18
	(-3.78)		**(-3.77)**		(-1.19)
FF α	**-0.52** [a]	88%	**-0.44** [b]	83%	0.07
	(-3.41)		**(-2.06)**		(0.42)
Cal. Months	216		215		215
n	2803		1287		

Panel B: Long-Run Performance by Industry of Target and Acquirer

1 Year

	Intra	Adj. R^2	Inter	Adj. R^2	Inter-Intra
CAPM α	**-0.59** [b]	66%	**-0.72** [a]	64%	-0.09
	(-2.37)		**(-2.83)**		(-0.66)
FF α	-0.01	87%	-0.18	86%	-0.14
	(-0.06)		(-1.02)		(-0.90)
Cal. Months	216		212		212
n	2354		2287		

3 Years

	Intra	Adj. R^2	Inter	Adj. R^2	Inter-Intra
CAPM α	**-0.83** [a]	68%	**-1.02** [a]	66%	-0.14
	(-3.49)		**(-4.05)**		(-1.21)
FF α	**-0.36** [b]	88%	**-0.60** [a]	85%	**-0.20** [c]
	(-2.24)		**(-3.35)**		**(-1.60)**
Cal. Months	216		212		212
n	2024		2066		

Table 4. 5: Post-Acquisition Performance by Divergence of Opinion (DIVOP)

The table reports monthly estimates of calendar time portfolio abnormal returns (alphas) to acquiring firms for i) a period of 12 months (1 year) and ii) a period of 36 months (3 years). Each calendar month, a portfolio is formed by including all stocks with event participation (i.e. acquisition announcement) during the past 12 or 36 months. Portfolios are rebalanced each month to include firms that have just completed an event. Estimates are sorted by divergence of opinion (DIVOP) groups (High, Mid and Low). Acquirers are originally classified into the three groups each representing one third of the entire sample. DIVOP is measured by i) Sigma (Panel A), the standard deviation of daily market adjusted residuals (Sigma) over the period (t-100, t-5) where t is the announcement day and ii) Percentage average daily Bid-Ask spread (Panel B) for the acquirer over the period (t-100, t-5). CAPM and Fama and French 3-factor intercepts (alphas) are estimated by the following calendar time portfolio regressions:

$$R_{pt} - R_{ft} = a_p + \beta_p (R_{mt} - R_{ft}) + e_{pt}$$

$$R_{pt} - R_{ft} = a_p + \beta_p (R_{mt} - R_{ft}) + s_p SMB_t + h_p HML + e_{pt}$$

where Rpt is the calendar time portfolio return, Rft is the return on a one-month T-bill during month t, Rmt is the value-weighted market index return, SMB is the difference in returns of value-weighted portfolios of small firms and big firms during month t, HML is the return differential of value-weighted portfolios of high and low book-to-market firms in month t, βp, sp and hp are regression parameters specific to the portfolio and ept is the error term. Heteroskedasticity adjusted t-statistics appear in parentheses below each parameter. High minus Low differences and corresponding t-statistics are from zero investment portfolio alphas for CAPM and FF-3 factor regressions. a, b and c indicate significance at the 1, 5, 10 percent level respectively based on two tail t-tests except for zero-investment portfolio regressions where one-tail t-tests are used. Cal. Months is the number of calendar months and n is the sample size involved in each portfolio.

Panel A: Long-Run Performance by DIVOP (Sigma)

1 Year

	Low	Adj. R^2	Mid	Adj. R^2	High	Adj. R^2	High-Low
CAPM α	-0.24	62%	-0.40	61%	**-1.10** [a]	60%	**-0.96** [a]
	(-1.08)		(-1.61)		**(-3.35)**		**(-3.26)**
FF α	0.01	75%	-0.14	81%	**-0.42** [c]	81%	**-0.42** [c]
	(0.03)		(-0.75)		**(-1.72)**		**(-1.40)**
Cal. Months	209		215		210		203
n	1547		1547		1547		

3 Years

	Low	Adj. R^2	Mid	Adj. R^2	High	Adj. R^2	High-Low
CAPM α	-0.33	63%	**-0.63** [b]	64%	**-1.37** [a]	63%	**-1.03** [a]
	(-1.42)		**(-2.55)**		**(-4.44)**		**(-3.93)**
FF α	-0.14	77%	**-0.46** [b]	83%	**-0.78** [a]	85%	**-0.65** [a]
	(-0.70)		**(-2.48)**		**(-3.70)**		**(-2.47)**
Cal. Months	216		215		210		210
n	1528		1388		1174		

Panel B: Long-Run Performance by DIVOP (Bid-Ask Spread)

1 Year

	Low	Adj. R^2	Mid	Adj. R^2	High	Adj. R^2	High-Low
CAPM α	-0.18	76%	-0.28	65%	**-1.01** [a]	45%	**-0.81** [a]
	(-0.94)		(-1.07)		**(-3.04)**		**(-2.90)**
FF α	0.06	83%	0.09	83%	-0.30	78%	**-0.34** [c]
	(0.34)		(0.48)		(-1.31)		**(-1.36)**
Cal. Months	203		203		202		202
n	1249		1249		1249		

3 Years

	Low	Adj. R^2	Mid	Adj. R^2	High	Adj. R^2	High-Low
CAPM α	**-0.34** [c]	77%	**-0.54** [b]	66%	**-1.07** [a]	51%	**-0.71** [a]
	(-1.67)		**(-2.18)**		**(-3.57)**		**(-3.24)**
FF α	-0.09	84%	-0.23	84%	**-0.55** [a]	82%	**-0.44** [b]
	(-0.48)		(-1.22)		**(-2.78)**		**(-2.25)**
Cal. Months	203		203		202		202
n	1130		1103		996		

Table 4. 6: Post-Acquisition Performance by Divergence of Opinion (DIVOP) and Deal/Acquirer Characteristics.

The table reports monthly estimates of calendar time portfolio abnormal returns (alphas) to acquiring firms for i) a period of 12 months (1 year) and ii) a period of 36 months (3 years). Each calendar month, a portfolio is formed by including all stocks with event participation (i.e. acquisition announcement) during the past 12 or 36 months. Portfolios are rebalanced each month to include firms that have just completed an event. Estimates are sorted by divergence of opinion (DIVOP) groups (High and Low) based on the original (High, Mid and Low) classification in table 5. DIVOP is measured by i) Sigma (Panel A), the standard deviation of daily market adjusted residuals (Sigma) over the period (t-100, t-5) where t is the announcement day and ii) Percentage average daily Bid-Ask spread (Panel B) for the acquirer over the period (t-100, t-5). Acquirers are simultaneously sorted by deal/acquirer characteristics. Cash offers include pure cash (100%) offers. Non-cash offers comprise all remaining offers. Size is the market value of the acquirer one month preceding the acquisition announcement and acquirers are originally sorted in two size groups on a 50-50 basis. M/B is the acquirer's market-to-book value one month prior to the announcement and acquirers are originally sorted in two M/B groups on a 50-50 basis. Domestic (Cross-border) are transactions where the target is (not) a UK firm. Inter- (Intra-) industry transactions involve targets with different (same) 2-digit SIC code to that of the acquirer. Fama and French 3-factor intercepts (alphas) are estimated by the following calendar time portfolio regression:

$$R_{pt} - R_{ft} = a_p + \beta_p (R_{mt} - R_{ft}) + s_p SMB_t + h_p HML + e_{pt}$$

where Rpt is the calendar time portfolio return, Rft is the return on a one-month T-bill during month t, Rmt is the value-weighted market index return, SMB is the difference in returns of value-weighted portfolios of small firms and big firms during month t, HML is the return differential of value-weighted portfolios of high and low book-to-market firms in month t, βp, sp and hp are regression parameters specific to the portfolio and ept is the error term. Heteroskedasticity adjusted t-statistics appear in parentheses below each parameter. High minus Low differences and corresponding t-statistics are from zero investment portfolio alphas for FF-3 factor regressions. a, b and c indicate significance at the 1, 5, 10 percent level respectively based on two tail t-tests except for zero-investment portfolio regressions where one-tail t-tests are used. CM is the number of calendar months and n is the sample size involved in each portfolio.

Panel A: DIVOP by Sigma

	High DIVOP						Low DIVOP						High-Low	
	1 Year	N	CM	3 Years	N	CM	1 Year	N	CM	3 Years	N	CM	1 Year	3 Years
ALL	**-0.42** [c]	1547	210	**-0.78** [a]	1174	210	0.01	1547	209	-0.14	1528	216	**-0.42** [c]	**-0.65** [a]
	(-1.72)			**(-3.70)**			(0.03)			(-0.70)			**(-1.40)**	**(-2.47)**
Cash	-0.15	757	210	**-0.57** [a]	592	210	-0.11	915	209	-0.05	903	216	-0.02	**-0.54** [b]
	(-0.61)			**(-2.69)**			(-0.47)			(-0.21)			(-0.08)	**(-2.16)**
Non-Cash	-0.42	790	202	**-0.84** [a]	582	202	0.19	632	197	**-0.34** [c]	625	203	**-0.55** [c]	**-0.44** [c]
	(-1.36)			**(-3.18)**			(0.85)			**(-1.91)**			**(-1.46)**	**(-1.46)**
Small Size	-0.31	873	210	**-0.81** [a]	677	210	0.24	709	196	-0.17	704	205	**-0.43** [c]	**-0.58** [b]
	(-1.24)			**(-3.71)**			(0.97)			(-0.79)			**(-1.31)**	**(-2.04)**
Large Size	-0.39	674	205	**-0.65** [b]	497	205	-0.12	838	209	-0.13	824	216	-0.23	**-0.52** [b]
	(-1.05)			**(-2.33)**			(-0.53)			(-0.60)			(-0.57)	**(-1.68)**
Low M/B	-0.27	784	210	**-0.73** [a]	559	210	0.23	717	209	-0.30	706	215	**-0.55** [b]	**-0.48** [b]
	(-0.96)			**(-3.12)**			(1.01)			(-1.44)			**(-1.66)**	**(-1.82)**
High M/B	**-0.64** [c]	763	207	**-0.79** [a]	615	207	-0.22	830	198	-0.15	822	205	-0.30	**-0.64** [b]
	(-1.83)			**(-2.79)**			(-0.96)			(-0.60)			(-0.75)	**(-1.86)**
Cross-Border	-0.28	523	207	**-0.62** [b]	398	207	-0.21	480	200	0.13	474	209	-0.01	**-0.72** [b]
	(-0.72)			**(-2.27)**			(-0.81)			(0.47)			(-0.02)	**(-2.03)**
Domestic	**-0.47** [c]	1024	210	**-0.86** [a]	776	210	0.11	1067	209	**-0.32** [c]	1054	215	**-0.58** [b]	**-0.55** [b]
	(-1.71)			**(-3.89)**			(0.53)			**(-1.73)**			**(-1.79)**	**(-2.13)**
Inter-Industry	**-0.52** [c]	721	210	**-0.80** [a]	567	210	-0.14	858	205	-0.16	851	212	-0.38	**-0.63** [b]
	(-1.82)			**(-3.36)**			(0.58)			(-0.67)			(-1.07)	**(-2.08)**
Intra-Industry	-0.20	826	205	**-0.63** [a]	607	205	0.19	689	209	-0.04	677	214	-0.40	**-0.62** [b]
	(-0.73)			**(-2.67)**			(0.89)			(-0.18)			(-1.14)	**(-2.07)**

	High DIVOP						Low DIVOP						High-Low	
	1 Year	N	CM	3 Years	N	CM	1 Year	N	CM	3 Years	N	CM	1 Year	3 Years
ALL	-0.29	1249	202	**-0.55** [a]	996	202	0.06	1249	203	-0.09	1130	203	**-0.34** [c]	**-0.44** [b]
	(-1.31)			**(-2.78)**			(0.34)			(-0.48)			**(-1.36)**	**(-2.25)**
Cash	-0.26	584	192	**-0.38** [c]	489	193	0.20	785	203	0.07	703	203	**-0.37** [c]	**-0.35** [b]
	(-1.06)			**(-1.65)**			(0.95)			(0.36)			**(-1.41)**	**(-1.65)**
Non-Cash	-0.25	665	202	**-0.72** [a]	507	202	-0.18	464	202	**-0.39** [c]	427	202	-0.08	**-0.32** [c]
	(-0.94)			**(-3.14)**			(-0.83)			**(-1.85)**			(-0.25)	**(-1.58)**
Small Size	-0.20	1051	202	**-0.58** [a]	851	202	0.11	105	181	0.41	96	197	-0.27	**-0.93** [a]
	(-0.87)			**(-2.92)**			(0.28)			(1.21)			(-0.63)	**(-2.63)**
Large Size	**-0.72** [c]	197	192	**-0.70** [b]	145	193	0.04	1144	202	-0.14	1034	202	**-0.76** [b]	**-0.54** [c]
	(-1.71)			**(-1.98)**			(0.18)			(-0.75)			**(-1.80)**	**(-1.50)**
Low M/B	-0.18	807	202	**-0.44** [c]	644	202	0.13	480	203	0.06	413	203	-0.29	**-0.47** [b]
	(-0.69)			**(-1.92)**			(0.53)			(0.24)			(-0.94)	**(-1.90)**
High M/B	-0.42	442	201	**-0.66** [b]	351	201	-0.03	769	202	-0.21	717	202	-0.43	**-0.49** [b]
	(-1.18)			**(-2.38)**			(-0.47)			(-1.05)			(-1.23)	**(-1.74)**
Cross-Border	0.11	251	191	-0.28	200	193	-0.14	533	203	-0.04	476	203	0.23	-0.22
	(0.28)			(-1.00)			(0.60)			(-0.17)			(0.55)	(-0.74)
Domestic	**-0.42** [c]	997	202	**-0.66** [a]	796	202	0.21	716	202	-0.11	654	202	**-0.63** [a]	**-0.55** [a]
	(-1.86)			**(-3.25)**			(1.10)			(-0.57)			**(-2.46)**	**(-2.51)**
Inter-Industry	-0.35	612	202	**-0.52** [b]	518	202	0.03	622	202	-0.14	574	202	-0.38	**-0.37** [c]
	(-1.36)			**(-2.38)**			(0.14)			(-0.62)			(-1.21)	**(-1.57)**
Intra-Industry	-0.22	637	201	**-0.56** [b]	478	201	0.05	627	203	-0.04	556	203	-0.20	**-0.46** [b]
	(-0.76)			**(-2.31)**			(0.25)			(-0.24)			(-0.69)	**(-1.98)**

Table 4. 7: Post-Acquisition Performance by Divergence of Opinion (DIVOP) and Target Type.

The table reports monthly estimates of calendar time portfolio abnormal returns (alphas) to acquiring firms for i) a period of 12 months (1 year) and ii) a period of 36 months (3 years). Each calendar month, a portfolio is formed by including all stocks with event participation (i.e. acquisition announcement) during the past 12 or 36 months. Portfolios are rebalanced each month to include firms that have just completed an event. Estimates are sorted by divergence of opinion (DIVOP) groups (High and Low) based on the original (High, Mid and Low) classification in table 5. DIVOP is measured by i) Sigma (Panel A), the standard deviation of daily market adjusted residuals (Sigma) over the period (t-100, t-5) where t is the announcement day and ii) Percentage average daily Bid-Ask spread (Panel B) for the acquirer over the period (t-100, t-5). Acquirers are simultaneously sorted by target type (public, private or subsidiary). Fama and French 3-factor intercepts (alphas) are estimated by the following calendar time portfolio regression:

$$R_{pt} - R_{ft} = a_p + \beta_p (R_{mt} - R_{ft}) + s_p SMB_t + h_p HML + e_{pt}$$

where Rpt is the calendar time portfolio return, Rft is the return on a one-month T-bill during month t, Rmt is the value-weighted market index return, SMB is the difference in returns of value-weighted portfolios of small firms and big firms during month t, HML is the return differential of value-weighted portfolios of high and low book-to-market firms in month t, βp, sp and hp are regression parameters specific to the portfolio and ept is the error term. Heteroskedasticity adjusted t-statistics appear in parentheses below each parameter. High minus Low differences and corresponding t-statistics are from zero-investment portfolio alphas for FF-3 factor regressions. a, b and c indicate significance at the 1, 5, 10 percent level respectively based on two tail t-tests except for zero investment portfolio regressions where one-tail t-tests are used.

	All		**Sigma**						**Bid-Ask Spread**					
			High Sigma		**Low Sigma**		**High-Low**		**High Bid-Ask**		**Low Bid-Ask**		**High-Low**	
Type of Target	**1 Year**	**3 Years**	**1 Year**	**3 Years**	**1 Year**	**3 Years**	**1 Year**	**3 Years**	**1 Year**	**3 Years**	**1 Year**	**3 Years**	**1 Year**	**3 Years**
Public	**-0.53** [b]	**-0.61** [a]	-0.92	**-0.99** [a]	-0.17	-0.37	-0.76	-0.52	**-2.10** [a]	**-0.94** [b]	-0.25	**-0.41** [b]	**-1.83** [a]	-0.47
	(-2.42)	**(-3.01)**	(-1.61)	**(-2.85)**	(-0.50)	(-1.47)	(-1.03)	(-1.18)	**(-3.24)**	**(-2.33)**	(-1.15)	**(-1.97)**	**(-2.81)**	(-1.17)
Private	-0.17	**-0.56** [a]	**-0.63** [c]	**-0.82** [a]	-0.18	-0.25	-0.45	**-0.59** [b]	-0.23	**-0.53** [b]	0.07	-0.14	-0.29	**-0.39** [b]
	(-0.95)	**(-3.36)**	**(-1.95)**	**(-3.56)**	(-0.79)	(-1.21)	(-1.17)	**(-2.07)**	(-0.86)	**(-2.48)**	(0.27)	(-0.67)	(-0.93)	**(-1.68)**
Subsidiary	0.03	**-0.35** [c]	-0.18	**-0.49** [b]	0.32	-0.03	-0.38	**-0.41** [c]	-0.16	**-0.66** [a]	0.23	0.11	-0.27	**-0.65** [a]
	(0.19)	**(-1.90)**	(-0.66)	**(-2.16)**	(0.98)	(-0.14)	(-0.93)	**(-1.51)**	(-0.56)	**(-2.72)**	(1.10)	(0.53)	(-0.86)	**(-2.82)**

Chapter 5: Belief Asymmetry and Gains from Acquisitions

5.1. Introduction

Chapter 4 demonstrated that there exists a negative and statistically significant relation between the degree of pre-event divergence of opinion among investors about the price of an acquirer and post acquisition stock returns. This relation can be largely explained by Miller's "premium hypothesis" and is in complete agreement with more general examinations such as Chen, Hong, and Stein's (2001) showing that negative asymmetries in stock returns are more likely when investor disagreement is high as the latter initially induces short run overpricing. This chapter takes a step further and examines whether Belief Asymmetry (henceforth BA) can also determine acquisition performance around the announcement of an acquisition and thus looks at the short run effects of BA rather than the long run.

Accordingly, it appears that corporate events such as acquisition announcements provide suitable test grounds to examine whether BA generates systematic valuation effects[35] as they convey information about the value of firms involved. Investors respond to this information revelation and it is reasonable that their reaction depends on the nature of the announcement. According to the divergence of opinion 'premium hypothesis' high BA about the value of an acquirer prior to an announcement indicates that there exist many investors with higher than fundamental beliefs about its value. If the nature of the

[35] Some recent papers use corporate events to examine Miller's hypothesis. Houge, Loughran, Suchanek and Yan (2001) find a negative relation between IPOs long run performance and investor disagreement. Diether (2004) and Moeller et al (2005) argue that equity issues related to SEOs or acquisitions implemented entirely with equity will result in lower returns when belief asymmetry is high. Moreover Loughran and Westberg (2005) find a strong negative relation between IPOs and SEOs long run performance and divergence of opinion.

acquisition announcement conveys positive information about the value of the acquirer it will tend to develop further such optimistic beliefs. As a result, it is highly likely that optimistic investors overreact to such favourable information and tend to drive prices away from fundamental grounds.[36]

I argue that acquisitions of private targets form a relevant basis for the investigation of this hypothesis. First, such type of acquisitions is in the majority of cases implemented directly at the announcement leading to an instantaneous revelation of investors' beliefs. This feature generates an appropriate basis to capture the bulk of investors' degree of reaction following acquisition announcements. Second, it has been shown that acquisitions of unlisted targets result in positive announcement gains for acquirers.[37] Along these lines, several studies argue that there is limited competition for private targets and thus favour that acquirers buy undervalued targets because the bargaining power of managers is high *(limited competition hypothesis)*. In addition, it is highly likely that acquisitions of smaller, less known targets, for which information available to investors is scarce, will be mainly motivated by maximising potential synergies (*managerial motive hypothesis*).[38] These hypotheses explicitly suggest that such type of acquisitions convey on average 'good news' about the value of the acquirer.[39] Moeller, Schlingemann, and Stulz (2005) argue that the

[36] Harison and Kreps (1978) and Sheinkman and Xiong (2003) argue in the presence of short sale constraints, overconfident and thus optimistic investors will pay a premium because of their expectation to resell at even higher prices.

[37] See for example Da Silva Rosa et al (2001), Ang and Kohers (2001), Fuller, Netter and Stegemoller (2002), Draper and Paudyal (2006) and Conn et al (2005).

[38] For explanations on these two hypotheses see for example Chang (1998), Rosa, Limmack and Woodliff (2004) and Draper and Paudyal (2006).

[39] The information hypothesis (Chang, 1998) implies that only acquisitions of unlisted targets paid for entirely with equity convey positive news to the market about the value of acquiring firms. However, several studies,

larger the uncertainty about the value of a firm, then good news must be perceived as even better news by investors. As a result, in the presence of high BA, optimistic investors are likely to overreact to acquisition announcements of private targets and pay a premium to buy into the acquiring firm. I use a UK acquisition sample which forms a relevant basis for this investigation as it is overpopulated by acquisitions of private targets.[40] In this way i am able to draw fruitful conclusions for the behaviour of an entire acquisition market despite concentrating only on acquisitions of unlisted targets.

It is vital to note that if a friction is present that prevents the immediate revelation of negative opinions, by preventing the creation of new supply, overpricing should be particularly pronounced around the announcement and persist through time.[41] Additional supply of shares can in practice be created either through short selling or issuing new equity. Geczy, Musto, and Reed (2002) suggest that it is more costly to short acquiring firms, especially if these are small capitalisation stocks. I report that acquirers engaging in acquisitions of unlisted targets that constitute over 90% of the UK sample are on average much smaller than those biding for listed firms. Accordingly, the average market value of an acquirer in my sample (£466mil) is approximately two times less than the average market value of all UK listed firms during the sample period. As a result, short selling is

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including this, report persistent positive abnormal returns earned by acquirers announcing acquisitions of unlisted targets irrespective of the payment method used. These results must reflect that in general investors perceive announcements involving acquisitions of unlisted targets favorably.

[40] Moeller et al (2005) find that approximately 47% of US acquisitions in their sample involve listed targets and 53% private. In contrast, Faccio and Masulis (2005) report that 90% of UK (and Irish) acquisitions involve private and subsidiary targets.

[41] Shleifer and Vishny (1997) and Chen, Hong and Stein (2001) explain why arbitrage can be in practice limited.

likely to be on average constrained for UK acquirers. Such binding short-sale constraint can prevent effective arbitrage around the acquisition announcement.

Further, it is highly unlikely that acquisitions of private targets will increase the bidder's float even if these are financed with equity (Moeller et al, 2005). On the other hand, since almost half of the acquisition transactions involving listed targets are financed with equity, they are expected to increase the supply of shares of the bidder after the acquisition therefore allowing for pessimistic views to be instantaneously revealed. Given that such type of acquisitions reflect that the bidder's equity is already overvalued (Myers and Majluf, 1984), any existing overpricing generated by optimistic investors preceding the announcement is likely to be instantaneously eliminated. Lastly, acquirers bidding for listed targets normally experience negative abnormal returns around the announcement and such empirical observation can per se discourage optimistic beliefs and prevent overpricing around the announcement.

The main prediction arising from the above arguments is that *acquirers subject to high pre-announcement BA that buy private targets should earn larger positive (negative) abnormal returns in the short (long) run than low BA acquirers*. Even if high BA acquirers are already overpriced before the announcement[42], its favourable nature is expected to generate further overvaluation instantaneously. In fact, since already overvalued acquirers have done well in the past, good news in this case can be perceived as even better news, particularly by optimistic investors.

[42] BA is measured at the pre-announcement period and therefore it is highly likely that high BA acquirers are already overvalued preceding the announcement.

Consistent with my predictions, i find that positive abnormal returns to acquirers increase with pre-announcement BA about their value. The announcement abnormal return differential between high and low BA acquirers is 1.2% for a near exhaustive sample that includes 3528 economically significant UK deals taking place within the period 1985 to 2004. This difference becomes 1.5% when concentrating on acquirers bidding for private targets that ultimately drive the differential for the entire sample. The positive relation documented remains significant irrespective of the choice of the measure used to capture BA (analyst forecast dispersion or idiosyncratic volatility) and after accounting for other firm and deal characteristics, some of which are explicitly related with BA. These include the size, prior performance, age and market-to-book ratio of the acquirer, the relative size of the target to the bidder, the method of payment used in the transaction and industry diversification effects.

In the long-run, acquirers subject to high BA experience significant losses twelve months after the announcement (-0.39% a month). The abnormal return differential between high and low BA acquirers is a statistically significant -0.7% per month. Such findings reflect that *high BA about the value of firms that engage in acquisitions conveying positive information causes their price to overshoot in the short run. Optimistic investors' overreaction to 'good news' is a potential source for the observed overpricing that, as predicted by Miller, leads to relatively worse performance in the long run.*

This study contributes both to the value ambiguity and acquisition literature in three important ways. First, it suggests that high BA over-valuation effects are likely to develop when positive information is released, leading to optimistic views being dominant in the

market. Second, it extends prior literature on the causes of positive abnormal returns earned around the acquisition announcement by acquiring firms bidding for private targets. It appears that there is a strong positive relation between the magnitude of these gains and the degree of BA about the value of the acquiring firm at the pre-announcement period. Third, the fact that this misvaluation is only corrected through time suggests that the revelation of negative opinions in a situation of high investor disagreement is largely restricted around acquisition announcements.

Since the hypotheses and aims of this study have been extensively explained above, the rest of this chapter is organised as follows. Section 5.2 reviews the literature related to short run gains from acquisitions. Section 5.3 reviews the data and methodological procedures used for the purpose of this investigation. Section 5.4 presents the empirical findings and section 5.5 concludes.

5.2 Literature Review

5.2.1 Short Run Gains to Acquisitions

5.2.1.1 Returns to Bidding Firms acquiring Public Targets

One of the most extensively researched, but at the same time argumentative, areas in finance has been whether mergers create value for the shareholders of the bidder and target firms. Both US and UK studies conclude that shareholders of target firms receive economically large and statistically significant wealth gains. However, reported returns to

bidder firm shareholders are quite ambiguous, since either small positive, negative (the largest body in the literature) or zero returns have been recorded.

In their widely cited survey of share price performance around takeover bids, Jensen and Ruback (1983) review the evidence on returns to acquiring firms over the immediate bid announcement period and draw the conclusion that bidders' shareholders do not lose from acquisitions. Subsequent studies document considerable divergence in announcement period returns that is systematically associated with method of payment, as predicted by Carleton et al. (1983).

Jarrell, Brickley and Netter (1988) examined data on returns to shareholders of acquiring companies for a sequence of decades. For the 1960s, they obtained quite similar results to Jensen and Ruback (1983). For a window of 15 days [-10, +5], the excess returns to successful bidders in tender offers were 4.4%. When the window was extended to 20 days following the event date, the Cumulative Abnormal Returns (CARs) rose to 4.95% and were statistically highly significant. For the 70s, the excess returns dropped to approximately 2%, while for the 80s they became negative (approximately 1%), but were not statistically significant.

In another US study, Bradley, Desai and Kim (1988) documented similar results for tender offers. They reported that for subperiods approximating the 1960s, the excess returns to acquiring firms were slightly over 4% and in general the abnormal returns to acquiring firms for the total period 1963 to 1984 were positive and significant.

The first major study of UK acquisitions by Firth (1980) examines bidders in 434 successful bids and 129 unsuccessful bids over the period from 1969 to 1975. It uses a market model with parameters estimated using pre-event data, and finds that bidding firms experienced statistically significant negative residuals (-6.3% for the announcement month). Limmack (1991) examines the post-acquisition performance of acquirers in 448 successful and 81 unsuccessful bids announced during 1977-1986, where abnormal performance is measured relative to the market index (a market model using London Business School (LBS) beta and alpha values is applied). He finds that CARs for completed bids for the period from the beginning of the bid month to the end of the completion month are an insignificant –0.2% for bidders.

A very interesting study was presented by Higson and Elliott (1993), who used the simple Dimson and Marsh (1986) size-decile control method (performance was measured by a 'zero-one' market adjusted model) to consider size effects. The study covers 726 acquisitions between 1974 and 1990 and concludes to announcement returns of -4.4% (-3.90% on a 'zero-one' basis). Sudarsanam, Holl and Salami (1996) investigate announcement period returns associated with 429 UK bidders over the period 1980-1990. Overall, they find significant CARs of -4.04% over the period [–20, +40] days around the bid announcement date. Gregory (1997) presents a rather exhaustive work on returns (six models are used: CAPM, Dimson and Marsh Risk and Size Adjustment (DM), Simple Size control portfolio (SS), Multi-Index model (SML), Value-Weighted Multi-Index Model and Fama-French three-factor model). His sample has a maximum of 452 acquisitions for models which do not require market capitalization, and a minimum of 403 (for the Dimson-Marsh, 1986, size and risk control model). In all cases, announcement returns are

significantly negative varying from –0.30% to –0.71%. Similarly, Holl and Kyriazis (1997) display significantly negative average residuals for the announcement month (-1.7%) for a sample of 178 bids covering the period 1979-1989. On the other hand, Higson and Elliott (1998) find positive bidders' announcement returns (0.43%), by using a sample of 30 successful takeovers during the period 1975 to 1990. In addition, Sudarsanam and Mahate (2003) use a sample of 519 acquirers over a 1983-1995 period. The study applies the Buy-and-Hold Average Residuals (BHARs) model, using four different benchmark models, and concludes that the whole sample of acquirers experiences statistically significant negative abnormal returns of about -1.4%. Finally, in the most recent UK M&A study, Draper and Paudyal (2005) report that acquirers of listed targets do not experience any substantial change in their share price around the announcement of bids; they either break even or suffer a small loss, depending on the excess return metric.

5.2.1.2. Returns to Bidding Firms acquiring Private Targets

There is very little evidence on shareholders' wealth effects when the target is a private company and also the impact of its relationship with the method of payment used in the transaction.

Chang (1998) examines the announcement returns (two-day window) of bidding firms acquiring 281 privately held targets during the period from 1991 to 1998 and compares them to bidder returns for 255 public targets from 1981 to 1988. The main findings are the positive abnormal returns (2.64%) in stock offers (in contrast to the results in which the target is publicly traded) and also the zero abnormal returns when the method of payment is

cash, consistent with the studies of Wruck (1989) and Hertzel and Smith (1993). One explanation, given by Chang (1998), for the above results is the information hypothesis. Although the bidding firm's managers disclose private information to the shareholders, in the case of a private target, its shareholders appear to be extremely careful in the evaluation of information and their final decision, because they will end up holding a large amount of bidding stock.

One way to avoid the "double lemons" impasse is through the exchange of information among bidders and targets that reduces their joint information asymmetry. As a consequence, the acceptance of a stock offer conveys to the market favourable information on the prospects of a bidding firm and a signal that the deal is expected to create value (positive NPV of bidders) or, more weakly, that the bidder's shares are not overvalued. Furthermore, in general, the positive performance of bidders when the acquired firms are private is supported by the limited competition hypothesis. If the market is competitive, the acquisition will be a zero NPV project (no abnormal returns for acquisitions with cash). However, if competition is limited then positive returns are exhibited for bidders because the likelihood of underpayment is high. Finally, Chang (1998) suggests the monitoring hypothesis. By using stock as a means of payment, acquirers tend to create outside blockholders because the targets are owned by a small group of shareholders. These can increase the firm's value because they can serve as effective monitors of managerial performance or facilitate takeovers.[43] More specifically, he finds 4.96% and 1.77% announcement abnormal returns if a new blockholder is formed or not respectively. Large

[43] On the other hand, increase in managerial ownership can decrease firm value if it allows managerial entrenchment or makes takeovers more costly.

blockholders can be created for public firms as well, however, in fact these firms have less concentrated ownership[44] and therefore higher agency conflicts than private firms.

Hansen and Lott (1996) also examine the announcement returns to bidders acquiring both public and private targets. They show that bidders earn on average 2% higher returns when they acquire a private firm. The explanation they offer, in turn, for this result is that since investors are diversified the aim of the manager of a firm is not to maximize shareholder value but, instead, to maximize the value of the shareholder's portfolio. Hence, when a publicly traded firm acquires a public target, diversified shareholders will be indifferent to the way the gains from the acquisitions are divided, assuming they hold stock in both firms, a condition which is unlikely to be met for private firms. However, the opposite will happen in the case of a private target, since the bidder's shareholders will capture part of the gains of the acquisition, assuming the bid is value increasing.

Da Silva Rosa et al. (2001) document more or less similar results (signalling implications of the method of payment are likely to differ across bids for public and private targets) in their research concerning a sample of private and public Australian bids. Cash based bids generate a significantly positive return of 3.26%, but share bids earn an insignificant average return of 1.65%. In addition, in both cases the excess returns to bidders of private targets are significantly higher than the excess returns to bidders of public targets.

[44] However, this differential may to some extent be offset if we take notice that the relative size of public targets is generally larger than the private target's one. Therefore they either hold a larger ownership stake in the bidder, or private managers may not be interested in becoming effective monitors, since they may use the takeover activity as an exit strategy. In addition, private deals are almost all completed, while the public deals may not be completed.

Da Silva Rosa et al. (2001) argue that it is likely that the level of competition in the market for corporate control is lower for private targets and this can also be expected to affect acquiring firms' returns from acquisitions. Auction-style takeovers (which are mainly accompanied by decreasing returns for acquiring firms) is a common phenomenon in public targets since there is no cost for obtaining information and more is known about the target. On the other hand, privately held firms are not obliged to release relevant valuable information to the public. Therefore the higher cost of obtaining information on privately held firms is very likely to be associated with higher returns for the acquiring firms since they capture a greater proportion of the expected gains, particularly if there are only few firms with whom the target may reap synergistic gains.

Ang and Kohers (2001) use a sample of 7,070 US acquisitions from 1988 to June 1992 and document substantial gains for bidders regardless of the method of payment (positive and statistically significant for both cash and stock). Two main interpretations are provided: First, it appears, as already discussed above, that private firms have concentrated ownership which enables them to have lower agency conflicts, while public firms generally have more dispersed ownership. Second, bidders avoid the public pressure from outside investors and therefore they have the opportunity to avoid hubris-motivated takeovers. This gives them the 'privilege' to stop any negotiations without incurring high 'prestige' costs. In addition, the nature of bidding private targets 'auto-protects' the acquiring company by the managers' empire building incentives, since in most cases such acquisitions do not offer them the prestige they pursue.

5.2.1.3. Returns to Bidding Firms acquiring Subsidiary Targets

To my knowledge, there are three papers in the literature that examine bidding returns when the target is a subsidiary firm and which at the same time take notice of the method of payment. Fuller et al. (2002) use a sample of 539 US bidders that make many acquisitions (3135) within a three-year period. They provide evidence that acquiring firms exhibit significantly positive returns (2.75%) when purchasing subsidiary firms, and these returns become higher (3.23%) when stock is used as a method of payment. Moeller, Schlingemann and Stulz (2004) also find positive and significant abnormal returns for acquisitions of subsidiary targets. According to Fuller et al. (2002), one reason why a firm sells a subsidiary is to gain from increased focus, and therefore diversified firms might accept a relatively lower price for an asset sale than a non-diversified firm. However, there is poor evidence that diversified parents will sell subsidiaries at a discount relative to non-diversified parents.

In addition, Faccio and Masulis (2005) posit that when a subsidiary acquisition takes place cash is preferred as a method of payment. Bidders are likely to prefer cash, given the illiquid and concentrated nature of their portfolio holdings and the often-impending retirement of a controlling shareholder manager. Similarly, corporations selling subsidiaries are often motivated by financial distress concerns or a desire to restructure towards their core competency. Consequently, there is strong preference for cash consideration in order to realize these financial or asset restructuring goals and also due to the fact that bidders are frequently motivated to divest subsidiaries to finance new acquisitions or to reduce their tax burden.

5.2.1.4. Method of Payment in Mergers and Acquisitions

5.2.1.4.1. In general

Fishman (1989), Berkovitch and Narayanan (1990), Brown and Ryngaert (1991) document higher returns for cash offers than stock offers at the bid announcement. Travlos (1987), among others, by using a sample of US public targets, finds negative returns because of stock financing regardless of the outcome of the bid (successful/unsuccessful) and positive returns for cash offers. His results are also independent of the type of takeover (merger, tender offer). In sum, generally the stock (or mixed) offer reflects negative information about the bidder, whereas zero returns are displayed for cash offers. Therefore, it seems that a crucial issue concerning the determinants of acquiring firms' returns is the means of payment that is used at the acquisition.

5.2.1.4.2. Determinants of Method of Payment

5.2.1.4.2.1. Asymmetric Information Hypothesis

Bidding companies pay the shareholders of the target firms using a variety of means. Common practices include payment in cash, exchange of shares, and a combination of both (shareholders may be given a choice). The most common argument for the choice of cash or stock, as the method of payment, is the information asymmetry-signaling hypothesis that arises. In the absence of full information regarding the value of a merger (for example, the estimated value of potential benefits to be achieved through synergy) the mode of payment

conveys a signal to investors. Myers and Majluf (1984) and Leland and Pyle (1977) argue that the premise of information asymmetry raises the proposition that managers with private information that their firm's shares are overvalued offer these shares in takeover bids. Outside investors, recognizing the adverse selection problem, consequently revise their estimate of the offer's value downwards. The target's shareholders also demand a higher premium to compensate for the 'lemons' problem in share-based bids, and therefore this seems a plausible explanation for the negative share price performance of bidders when they use stock in takeovers.

Hansen (1987) and Fishman (1989) enrich the asymmetric information hypothesis by considering the case where the target firm's managers are better informed about their firm's value. Hansen (1987) posits that when bidders and targets have private information, then a 'double lemons' problem is set up, since bidders do not offer stock when they believe their shares are undervalued and targets only accept cash when their share value (based on their private information) is less than the offer. In other words, the double lemon problem sources from both bidders' and targets' managers recognizing the adverse selection bias in the other's decision. Hansen's (1987) model addresses the issue of uncertainty in target valuation, and therefore in this case a stock offer is suggested as it has 'a contingency pricing effect'. In such a case, targets are forced to share part of the risk that the stock is overvalued.[45] In any case, Hansen's (1987) model predicts that cash offers always send a credible signal that the bidder's shares are undervalued and also they should be selected when there is high uncertainty on their own firm's value, while a stock offer should be made

[45] In cash offers the bidder bears the entire cost of overpayment (Eckbo et. al., 1990).

when there is high uncertainty on the target's value.[46] This uncertainty (asymmetry) is likely to rise as the targets' assets rise in value relative to those of a bidder (Faccio and Masulis (2005)).

In Fishman's (1989) analysis, bidding firms decide between cash and share offers on the basis of their private information about the value of the merger. Bidders who estimate a high value make high preemptive cash bids to deter potential competing bidders, assuming that the bidder's expected pay off is decreasing in the initial bidder's valuation of the target. However, targets with private information about their own value make cash exchange risky for the bidders because of the adverse selection problem. In sum, a cash offer has the advantage of preempting potential competing bidders, while the advantage of a share offer is that it induces the target to make an efficient accept/reject decision and thereby reveal its private information about expected future cash flows. Fishman (1989) predicts that an initial bidder's expected pay off is higher if cash is offered rather than shares. Similarly, Berkovitch and Narayanan (1990) argue that bidders whose private information is more favourable regarding either their own pre-merger values or the synergy use cash and this explains why bidders' prices react more favourably to cash rather than stock offers.

5.2.1.4.2.2. Relative Size Proposition

Numerous studies have also been launched with regard to the impact of relative size of target-to-bidder on payment methods. According to Jensen and Ruback (1983), the return of bidders depends on the relative size of targets. The main findings are: i) the larger the

[46] Berkovitch and Narayanan (1990) and Eckbo et al. (1990) show that higher valued bidders will use cash or a higher proportion of cash to signal their value to the market.

relative size of targets to bidders, the higher the CAR will be (Asquith et al. (1983), Jarrell and Poulsen (1989) and Kang, (1993)). This is linked to the suggestion made by Loderer and Martin (1990) who claim that large firms seem to pay too much for their targets and large bids seem to be overpriced on average- facts that deteriorate the share price performance. Ang and Kohers (2001) proceed to a further analysis concerning relative size, supporting first that the relative size of target to bidder is critical to the bidder's performance, and second that the acquiring return when bidding for a public target is significantly smaller than the return when bidding for a private target. ii) The larger the size of the target firm, the more likely the acquirer is to use share financing in M&A deals (Myers and Majluf (1984) and DeAngelo et al. (1984)). Grullon, Michaely and Swary (1997) examine 146 mergers during the period 1981-1990 to explore the determinants of payment methods by testing the capital position of the merged companies, the relative size of targets, and the return on equity of both parties. They find that share exchange is more likely to be used in mergers where targets have a high capital adequacy relative to the bidders as indicated by the higher ratio of share-to-cash, which is equal to 2.12%.

5.2.1.4.2.3. Managerial Ownership Proposition

The choice of financing alternatives in corporate acquisitions must be related to the managerial ownership fraction of both parties (acquirer and target). It is often viewed that the greater the management's share of the acquiring or target firm, the more likely cash financing is adopted. One explanation of this strategy in M&A deals is that the managers of both parties offer (or accept) cash as the medium of exchange in order not to dilute their already existing control after the acquisition. Stulz (1988) examines the relationship

between the choice of payment methods and the managerial ownership of acquiring firms. His study shows that the larger the fraction of the ownership held by the acquiring firm, the less likely an acquisition is financed by using a share exchange. Under such a circumstance, the management of the bidder is reluctant to offer shares in order to avoid diluting their original control after the acquisition.

Amihud, Lev and Travlos (1990) use a sample of 209 US acquisitions during the years 1981-1983 and document negative returns for bidders that use stock financing, as a means of exchange, and have low managerial ownership. They find that in cash financing deals the top five officers and directors of the firm hold about 11% of the company's shares, while in share financing, less than 7% are held by them. This result indicates that managers with relatively higher shareholdings in their firms prefer financing acquisitions with the use of cash to share, because, as Amihud et al. (1990) point out, they do not want to increase the risk of losing control after the acquisitions.[47] However, given the above argument, the use of stock may signal to investors that the acquisition is not value decreasing.

Finally, Faccio and Masulis (2005) argue that cash is the method of payment that should be preferred when preserving control is important for bidders, especially under circumstances where continued corporate control is threatened. The corporate control incentives to choose cash are likely to be strongest when a target's share ownership is concentrated. On the other hand, stock financing would have better effects if the shareholder has supermajority voting rights because, in this case, it would not have the opportunity to threaten the continued control of shareholder.

[47] The same view is analyzed by Martin (1996).

5.2.1.4.2.4. Taxation Implication Proposition

It is well known that any capital gains must be realised immediately for tax purposes due to higher depreciation tax shields (Carleton et al. (1983)). Therefore, a cash offer in M&As could, in theory, bring about higher premiums when compared with a share exchange. In other words, due to the existence of different tax treatments, the acquirer must pay a higher acquisition price in the case of the cash offer to offset the tax burden of the target shareholders, while many stock exchanges will be treated as tax-free transactions. This proposition has long been addressed and confirmed by earlier studies.

Wansley, Lane and Yang (1983) link their study to the relationship between the tax status and payment methods. They find that targets' returns are higher when financed by cash (33.54% by cash versus 17.47% by stock) and contribute this result to the taxation implication theory. They conclude that the fact of the substantially higher returns to target shareholders when financed by a cash offer indicates that acquirers need to pay the additional tax burden for the targets under such a circumstance. In this respect, a share exchange will defer the tax consequences until the share is eventually sold. If this is valuable, they may accept a discounted price and therefore, due to the lower price, bidders will perform higher returns under a stock offer.

According to Franks, Harris and Mayer (1988), however, there seems to be no clear evidence showing that the capital gain taxes are the main concern of the acquisition financing when cash is used in this circumstance. As they show, cash financing in the period 1965-1969 declines (with a percentage of 18.6%) when compared with that of the previous period 1960-1964 (29.2%). However, this trend was reversed from 1975 to 1979 with the

proportion of cash financing rising to 33.6%. Consequently, this empirical evidence does not show a strong linkage between the capital gain tax and the use of cash as the medium of exchange.

5.2.1.4.2.5. The Growth Opportunity Proposition

Glamour acquirers are those firms that are highly valued as a result of their prior stock market performance. Their stocks receive premium ratings in the form of low B/M value. In contrast, firms with high B/M value ratings are undervalued, but they may have the potential for subsequent value gains (high growth opportunities). In other words, glamour stocks are high growth firms and value stocks are low growth firms. Rau and Vermaelen (1998) suggest that glamour acquirers outperform value acquirers after merger, irrespective of the payment method used.[48] In some ways the market fails to understand that past managerial performance is not necessarily a good indicator of future performance, at least in the case of acquisitions.[49] This result is in contrast to their findings for the long-run performance of bidding firms. They also report a significant tendency of glamour acquirers to finance their acquisitions with their own stock[50] and this tendency is stronger in mergers than in tender offers.

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[48] The main argument here is the extrapolation hypothesis that explains the differential performance of glamour and value acquirers. Acquirers commanding a high market rating due to their recent performance and expected future performance (glamour acquirers) may act out of overconfidence or hubris in making acquisitions. The stocks of such companies may also be overvalued and although the managers may be aware of such overvaluation, the stock market may be not.

[49] However, Sudarsanam and Mahate (2003) find, by using a sample of UK public firms, that overall value acquirers outperform glamour acquirers at bid announcement.

[50] Consistent with the information asymmetry argument, glamour acquirers tend to have high past share price returns, while the opposite is true for value acquirers. Hence, it seems plausible for glamour acquirers to use

Taking the above into consideration, the alternatives for payment methods used in M&A deals depend, to some extent, upon the acquiring firm's growth opportunities. Martin (1996) uses a sample of 846 US acquisitions for the period 1979-1988 and finds, in contrast to Rau and Vermaelen (1998), that acquiring firms with greater growth opportunities (value acquirers) are more likely to use share exchange in acquisitions. A possible interpretation of this result is that acquiring firms would need more cash (if available) under such a circumstance to satisfy their growth opportunities, while they would also aim to mitigate the possibilities of overpayment (especially when the target's B/M value is also high).

5.2.1.4.2.6. Joint Method of Payment

The form of cash-share combination has most commonly been used in the UK rather than in the US. The literature provides ambiguous results with regards to the empirical evidence from acquiring firms' abnormal returns when they select to use both cash and stock as the method of payment. For example, Eckbo et al. (1990) find significantly positive abnormal returns for mixed offers, which are also higher than for either all stock or all cash bids. On the other hand, Travlos (1987) and Asquith, Bruner and Mullins (1983) find negative excess returns for combined cash/stock offers.

According to Eckbo et al. (1990) it appears that there is a relation between mixed payment and the bidder's private information about its value and the value of the synergy, as well as that only mixed payments contain signalling information and synergy revaluation components. As they suggest, two-sided information asymmetries between the bidder and

their 'overvalued' equity as a method of payment and value acquirers to use cash for the opposite reasons. This view is also supported by Dong et al. (2006).

the target firms can lead to an optimal mix of cash and stock as payment in the transaction, while the value of the bidder's residual claim increases with the size of cash offer. Blackburn et al. (1997) argue that the joint method of exchange functions as a viable mechanism for overcoming the information asymmetry dilemmas (pure cash or stock). In addition, the combination of cash with stock payment may represent the only instance in which both signaling and re-evaluations exist.

5.2.2 Conclusion

It has become obvious from the discussion above that several factors affect or determine short run gains to acquiring firms announcing acquisitions. As explained in the introduction of this chapter the main aim is to examine whether belief asymmetry plays a significant role in determining such short run gains. The literature related to this issue is extensively explained in the introduction of this chapter as well as in chapter 2. While trying to uncover whether a relation between belief asymmetry and gains from acquisitions exists i control for a series of characteristics identified in the literature and mentioned in part 5.2.1 above.

5.3. Data and Methodology

I use a UK sample of successful, domestic acquisition announcements to examine the relation between BA and gains from acquisitions both in the short and long run. All data on acquisition announcements are from Thomson Financial Securities Data Corporation (SDC)

UK mergers and acquisitions database but exclude all transactions where financial and/or utility firms are involved. The final sample meets the following criteria:

- Acquisitions were announced during the period from 1/1/1985 to 31/12/2004 and acquiring firms are not involved in other announcements within the 5-day abnormal return window examined.

- Acquiring firms are listed in the London Stock Exchange while targets are UK public, private or subsidiary firms. All subsidiary targets are not listed firms.

-Deal value is equal to or greater than $1 million and acquisitions involve more than 50% of shares acquired.

- The deal value corresponds to at least 1% of the market value of the acquiring firm.

- Data required for the acquirer is available from Thomson Financial Datastream.

I collect a sample of 3528 acquisition announcements that satisfy the above criteria. I subsequently measure pre-announcement belief asymmetry about the value of the acquirer involved in each announcement.

Recent papers argue that idiosyncratic volatility (or sigma) can proxy for asymmetric beliefs (Danielsen and Sorescu, 2001, Boehme, Danielsen and Sorescu, 2006 and Moeller et al. 2005) or value uncertainty (Pastor and Veronesi, 2003). This BA measure is not only tied

directly with investors' behavior but also has the ultimate advantage that does not involve exclusion of relatively small stocks due to poor analyst coverage.[51] Thus, it allows us to study a near exhaustive sample of 3528 UK acquisition announcements. Idiosyncratic volatility (Sigma) is calculated as the standard deviation of market adjusted residuals of the daily stock returns measured during the period (t-205, t-6) where t is the acquisition announcement day.[52]

I also examine a sub-set of 1608 firms for which analyst forecast dispersion data from I/B/E/S is available. I measure dispersion in analyst earnings' forecasts about the acquiring firm (DISP) as the standard deviation of all one-year ahead earnings per share forecasts one month prior to the announcement. It is thus required that at least two analysts follow the firm around this period.

Table 1 provides information on deal and acquirer characteristics for the full sample of acquisitions and the sub-sample with analyst forecast data. It appears that the UK market is overpopulated by acquisitions of private targets (91.5%), with only 8.5% involving acquisitions of listed targets. 54% of the deals are financed with pure cash while only 5.5% of the transactions are paid for entirely with equity.[53] The mixed/other payments subset (i.e. neither pure cash, nor pure stock) comprises more than 40% of the UK sample. The average

[51] Moeller et al's (2005) sample dramatically reduces by 70% due to the analyst forecasts' requirement. Pastor and Versonesi (2003) and Boehme et al (2005) argue that the use of analyst forecast dispersion involves exclusion of relatively small stocks; a particularly significant category, given that investor disagreement/value uncertainty is naturally expected to be high for these stocks.

[52] Dierkens (1991) uses the same event window to capture the degree of pre-event information asymmetry.

[53] Similarly, Faccio and Masulis (2005) report that only 5.9 percent of UK M&A deals are financed with pure equity payments.

market value of all acquirers (£466mil) is approximately two times less than the average market value of all FTSE All-Share firms during the sample period, therefore reflecting that the majority of UK acquisitions are undertaken by relatively small firms. Further, the prevalence of acquisitions of private targets (91.5%) has an important effect. For more than 70% of the deals the announcement date is also the effective date of the acquisition. It is reasonable that this immediate implementation of acquisitions leads to high volume of belief disclosure related to information conveyed by the announcement. Such feature forms a coherent basis to capture investors' reaction to positive news about the value of acquiring firms. The statistics reported above do not significantly differ for the subset with analyst forecast information (Table 1-Panel B).

Table 2 presents summary statistics sorted by pre-announcement BA (measured by Sigma in Panel A and DISP in panel B) and type of target. Acquirers are originally classified into three BA groups (low, mid and high) each corresponding to one third of sample. Statistics for each deal/acquirer characteristic are reported within each of the three BA groups and high minus low differences of means and medians are calculated in order to provide a clear picture about the determinants of Sigma and DISP. I focus more on medians as these are less susceptible to biases generated by outliers. The size of the acquirer appears to be negatively related with Sigma. This is consistent with the view that BA is naturally higher for small stocks, as information about their fundamental value is scarce.[54] The correlation between the logarithm of acquirer's size and Sigma however is -0.19 suggesting that the latter by no means proxies merely for size. The size effect is not present when acquirers are sorted into BA portfolios based on DISP (Table 2, Panel B). Accordingly, the

[54] See for example Diether et al (2002).

correlation between the logarithm of acquirer's size and DISP is only -0.08 reflecting that DISP is less susceptible to the size effect.

Moreover, there appears to be a strong positive relation between the relative size of the target to the acquirer and belief asymmetry about the acquirer, irrespective of the target type involved and the proxy used to capture BA. For panel A, this relation may be due to the size effect reported earlier (i.e. smaller firms being subject to higher Sigma), given the negative correlation (-0.22) between the size of the acquirer and the transaction relative size.

The market-to-book value means reflect that glamour firms are subject to higher Sigma. Moeller et al (2005) argue that firms with high market-to-book are subject to high information asymmetries because a large part of their value comes from intangible assets. Pastor and Veronesi (2003) develop a model where uncertainty about a firm's average profitability increases the firm's market-to-book ratio as well as its idiosyncratic return volatility. On the other hand, Doukas, Chansog, and Pantzalis (2004) show that value firms are subject to higher analyst dispersion which is supported by the market-to-book medians in panel B. Lastly, Pastor and Veronesi (2003) also argue that firm age and idiosyncratic volatility are negatively related and interpret this as evidence that newly listed firms are subject to higher value uncertainty. My statistics provide strong support to this observation. I subsequently account for all characteristics that appear to be related to BA in the cross sectional regressions to ensure that my results are due to BA rather than any confounding effects generated by such characteristics.

Since 30% of the acquiring firms in the sample engage in frequent acquisitions within 200 days, previous announcements will be included in the estimation period rendering market parameter estimation to an extent biased. I thus follow Fuller, Netter and Stegemoller (2002) and report short run abnormal returns using a modified market model:

$$AR_i = R_i - R_m$$

Where R_i is the return on firm i and R_m is the value weighted market index return. I then estimate CARs for the five-day period (-2, +2) around the announcement date. Note that market parameter estimation in the spirit of Brown and Warner (1985) yields very similar results that i do not report for brevity.

For the long-run analysis i estimate 12-month abnormal returns using calendar time portfolio regressions (CTPRs) to account for the cross-sectional dependence of stock returns.[55] The decision to examine one-year abnormal returns is mainly motivated by the small median target-to-bidder relative size (7%) of the acquisitions comprising the UK sample. Given the existence of multiple acquirers, this implies that, we would not able to identify isolated economic effects from examining the performance of relatively small mergers over more extensive post acquisition windows. Further, this is in line with Boehme et al (2006) who use a one-year period to examine valuation effects of opinion dispersion. Accordingly, each calendar month, a portfolio is formed by including all stocks with event participation during the past 12 months. The portfolio is rebalanced every month to include acquirers that announce a transaction in the previous month and disregard the ones that have completed 12 months in the calendar approach. The average monthly abnormal return

[55] For detailed explanation on the CTPR see for example, Mitchell and Stafford (2000) and Ikenberry, Lakonishok and Vermaelen (2000).

during the post-event period is the intercept (alpha) from the time-series regression of the portfolio return over the market factor or the Fama and French 3 factors for the UK. Zero investment portfolio regressions are employed to measure abnormal return differentials between the high and low BA portfolios.

5.4. Empirical Results

5.4.1 Gains from Acquisitions of Private Targets

My main hypothesis is based on the assumption that acquisitions of private targets (as opposed to acquisitions of listed targets) convey on average 'good news' about the value of acquiring firms. If such acquisitions earn systematically positive abnormal returns irrespective of the payment method used, then this assumption would indeed be realistic. Table 3 presents abnormal returns to acquiring firms sorted by target type and method of payment. UK acquirers in general earn abnormal gains of 0.92% (significant at the 1% level) on the 5-day window around the announcement. Acquisitions of private targets yield 1.16% abnormal returns with stock transactions (2.01%) outperforming cash (0.87%) and mixed/other (1.49%) respectively. These results are in line with the majority of studies for similar event windows[56] and suggest that acquisitions of private targets must convey on average positive information to investors about the value of the acquiring firm. The opposite is evident for acquisition announcements of public targets that result on average in negative gains of -1.67%. Abnormal return differentials between acquisitions involving private and

[56] Chang (1998), Da Silva Rosa et al (2001), Ang and Kohers (2001), Fuller et al (2002), Draper and Paudyal (2004) and Conn et al (2005) document positive and significant abnormal returns for acquisitions of private (and/or subsidiary) targets.

public targets are in all cases positive and average to 2.83%. It appears that only acquisitions of private targets systematically lead to positive abnormal returns for acquiring firms. As a result, related announcements are likely to attract more optimistic investors and further develop previously optimistic beliefs about the value of the acquirer. I therefore subsequently examine valuation effects of BA for acquisitions of private targets.

5.4.2 Belief Asymmetry and Short-Run Gains from Acquisitions

Table 4 reports market adjusted returns over the 5-day announcement window sorted simultaneously by pre-event BA (in panel A measured by Sigma and panel B by DISP), target type and method of payment. Positive abnormal returns increase systematically with the level of Sigma irrespective of payment method. For the entire sample, firms in the low (high) BA portfolio experience statistically significant abnormal gains of 0.35% (1.51%). The high minus low differential (1.16%) is statistically significant at the 1% level. For private targets this difference reaches 1.48%. When further differentiating the results on the basis of method of payment, the difference is 1.02% and 1.85% for pure cash and mixed/other payments respectively. When equity payments are considered this reaches 2.34% but is statistically insignificant. The pattern evident here reflects that, on average, pre-announcement BA about the value of the acquiring firm is positively related with abnormal returns at the announcement. In other words, the more intense the disagreement between investors about the value of a firm, the higher the abnormal increase in value when this firm announces an acquisition.

Moeller et al (2005) obtain similar results for their entire sample when using analyst forecast dispersion as a proxy of BA. For acquisitions of private targets however, they only report findings for stock offers that represent the minority of this sub-sample. Their results in this case are qualitatively similar with mine in that a positive but statistically insignificant relation is present between BA and short run gains to acquiring firms. The authors also report a negative relation between analyst forecast dispersion and short-run gains to equity offers for public targets. This relation is positive but insignificant for cash (equity) offers to public (private) targets. It is thus likely that the positive and significant difference between high and low dispersion acquirers (0.8%) for their entire sample is driven by the missing category of acquisitions of private targets involving cash and mixed/other offers. As they concentrate on the combined effects of an increase in the supply of shares and opinion divergence, these payment method categories are rationally not the main interest of their study but are highly relevant to my investigation. Note that Moeller et al (2005) interpret the positive relation between idiosyncratic volatility and stock financed acquisitions of unlisted targets as evidence in support of asymmetric information models. They accordingly argue that the more the value uncertainty about a stock, then good news will be interpreted as even better news by investors.

Table 4, Panel B reports results for acquirers sorted on DISP. While high minus low DISP differentials are lower, still remain positive and significant irrespective of target type and method of payment. For the entire sample this differential is 0.75% and for acquisition of private targets is 0.82%. Importantly, in three out of five cases the positive return earned by low BA acquirers is statistically insignificant. These results clearly confirm that pre-event BA is priced at a premium around the acquisition announcement.

5.4.3 Cross-Sectional Regression Analysis

In this section i perform multivariate tests on the determinants of returns to acquiring firms. In this way i investigate whether the return differentials detected (table 4) are merely the result of other announcement return determinants identified in the literature rather than my measures of belief asymmetry. Table 5 reports regression results where the dependent variable is the 5-day CAR to acquiring firms. The control variables have been identified as determinants of short-run returns to acquiring firms and/or have been directly associated with value ambiguity. Panel A reports regression results for the entire sample and panel B for the subset with DISP data available. As in the univariate analysis, regressions (1) and (4) show a strong positive relation between BA as measured by Sigma and DISP respectively and announcement returns with the coefficient of BA in both cases being statistically significant at the 1% level.

It has been argued that belief asymmetry is naturally higher for small stocks due to the scarcity of information about their value. Moeller et al (2004) find that acquisitions by small firms gain higher abnormal returns. Given that the correlation between sigma and log(size) is -0.19 it is possible that high Sigma acquirers earn higher returns simply because they are smaller firms. Regression (2) shows that although the CAR and acquirer's size are negatively related the coefficient of Sigma remains positive and significant when adding log(size) in addition to Sigma as a control variable. It is hence unlikely that high Sigma acquirers perform better merely due to their small size. The introduction of log(size) as an explanatory variable also leaves the coefficient of DISP unchanged in regression (6).

The size of the target has also been identified as a short run return determinant with large transactions yielding larger abnormal returns to acquiring firms. I thus follow Asquith, Bruner and Mullins (1983) and include it as a control variable in the cross sectional regressions. The relative size can be further associated with the degree of investor reaction to an acquisition announcement. The larger the target size the more the original structure of the latter firm changes as a result of an acquisition and thus the higher the uncertainty about the future of the combined entity. In Table 2 i report a positive relation between relative size and BA that may reflect that high BA acquirers gain more due to engaging in larger acquisitions. However, the coefficient of relative size is statistically insignificant in all regression specifications but (3).

Further, Rau and Vermaelen (1998) argue that glamour acquirers perform worse in the long run than value acquirers, which is consistent with the performance extrapolation hypothesis. Along these lines, Lang et al (1989), Servaes (1991), and Sudarsanam and Mahate (2003) find that in the short run glamour bidders earn higher returns than value ones. To the extent that acquirers with high (low) market-to-book value are subject to high Sigma (DISP) as shown in Table 2, they should experience higher (lower) abnormal returns in the short run. In regressions (3) and (6) however i find no statistically significant relation between market-to-book value and returns to acquiring firms.

Pastor and Veronesi (2003) develop a model where uncertainty about a firm's profitability is especially large for newly listed firms. As reported in Table 2 acquirers subject to high pre-announcement BA about their value tend to be younger firms. To the

extent that high uncertainty can introduce sizeable BA about the value of a firm, we expect younger firms to earn higher returns in the short run. In regressions (3) and (6) i add a dummy variable that takes the value of 1 if the firm was listed within the past year. The coefficient of the variable however is statistically insignificant in all specifications.

It is possible that acquirers' past performance is an important determinant of gains they earn at the acquisition announcement. According to my conjecture, a firm that experiences superior performance at the pre-announcement period is expected to attract more optimistic investors when announcing a value increasing acquisition and thus experience relatively larger gains. The positive relation documented between announcement return and past performance is statistically significant at the 1% level in regression (3). Adding this control variable however does not exert an influence on the coefficient of Sigma. Note that, the coefficient of acquirer's past performance is statistically insignificant in regression (6) performed only for the subset with analyst information available.

Chang (1998) finds that acquisitions of private firms financed entirely with equity earn higher returns than others paid for with cash. In Table 3 i confirm this result. If acquisitions of private targets paid for with equity convey more positive news to the market about the value of acquiring firms[57] then we expect high BA combined with equity payments to generate the highest short run abnormal returns. Table 4 confirms this prediction but the differential between high and low BA is not statistically significant. I add a binary variable

[57] The information hypothesis posits that although the bidding firm's managers disclose private information to the shareholders, in the case of a private target, its shareholders appear to be extremely careful in the evaluation of information and their final decision, because they will end up holding a large amount of bidding stock.

that takes the value of 1 if the acquisition was financed entirely with equity. This has a positive yet statistically insignificant coefficient in regressions (3) and (6) when the target is private. The negative and significant coefficient of this dummy in the same regressions for all acquisitions is merely due to the fact that bidders buying listed targets with stock experience significant negative abnormal returns. The dummy 'cash' that takes the value of 1 if the payment method is pure cash has a statistically insignificant coefficient in all specifications.

Finally, i introduce a dummy variable to examine the role of diversifying acquisitions in determining announcement window abnormal returns. The coefficient of a dummy variable that takes the value of 1 when the acquirer and the target are in the same industry (i.e. the same 2-digit SIC) is negative but statistically insignificant in regression specifications (3) and (6).

Importantly, although the coefficient of Sigma declines when adding all control variables it still remains statistically significant at the 1% level. Such results point to a relatively important role of sigma as a measure of BA in determining announcement window returns and corroborate the positive relationship between the two. Note that the coefficient of Sigma takes its highest value in specifications (5) and (6) where the analyst forecast availability requirement is imposed indicating that its role in determining announcement returns is robust when examining different samples. Further, DISP also remains positive and statistically significant irrespective of what control variables are added in the regressions. Sigma and DISP appear to be complementary significant in explaining

short run gains to acquisitions as they both have a positive and significant coefficient when they are simultaneously introduced in regressions (5) and (6).

Results, up until now, constitute a first indication that high BA about the value of an acquirer prior to an acquisition announcement that conveys positive news, results in higher abnormal returns, due to optimistic views being prevalent in the market. However, the short run analysis is by no means sufficient to identify overpricing at the announcement of an acquisition. If however the group of high BA acquirers significantly underperforms low BA acquirers in the long run then this would constitute evidence in favour of my hypothesis.

5.4.4 Belief Asymmetry and Long-Run Abnormal Returns

In this section i turn my focus towards the long run valuation effects of BA. Table 6 reports monthly estimates of calendar time portfolio abnormal returns to acquiring firms for a period of 12 months following each acquisition announcement. Long-run abnormal returns are reported for i) the entire UK acquisition sample and ii) acquisitions of private targets. Abnormal returns are measured using calendar time portfolio market adjusted returns and calendar time regression intercepts. Panel A reports results for BA portfolios as measured by Sigma and Panel B as measured by DISP. Classification of acquirers in the high, mid and low BA subsets is based on the original classification in Table 4. On average, UK acquirers lose -0.60% a month (significant at the 1% level) in the 12-month period following acquisition announcements when market adjusted returns or the CAPM's alpha are used as measures of abnormal returns. This negative pattern remains when focusing on acquirers bidding for private targets that represent a major part of the entire sample. When

regressing portfolio excess returns on the Fama and French 3 factors negative abnormal returns for both samples disappear. As a result, given that the Fama and French 3 factors are more reliable in explaining the cross section of stock returns, UK acquirers do not experience any long run abnormal returns.

High minus Low BA return differences are negative and statistically significant irrespective of the benchmark model and the BA proxy used. This difference is approximately -1.20% (-0.85%) a month for market adjusted returns in Panel A (Panel B). For acquisitions of private targets, the intercepts from (high minus low) zero investment portfolio regressions are -1.30% (-0.83) and -0.70% (-0.77%) respectively when using the CAPM and FF 3-factor model in Panel A (Panel B). In all cases the negative High minus Low BA return differentials are statistically significant. This pattern unambiguously reflects that high BA acquirers underperform low BA ones in the 12 month period following acquisition announcements. This result is consistent with Ang, Hodrick, Xing and Zhangal (2004) and Diether et al (2002) in that stocks subject to high idiosyncratic volatility and dispersion in analyst earnings' forecasts respectively earn relatively low future returns. Guo and Savickas (2004) suggest that the negative relation between idiosyncratic volatility and long-run returns can be due to a divergence of opinion premium effect. Consistent with this explanation, my findings suggest that the relatively higher short run gains to high BA acquirers are merely due to their stock trading at a premium at the acquisition announcement. As predicted by Miller such 'bubbles' caused by high BA will eventually burst leading to long-run underperformance. The strong pattern evident here is also consistent with the hypothesis that the revelation of negative opinions is largely constrained at the initial stage of the announcement either due to short selling acquirers being expensive

or due to any friction that prevents arbitrageurs from driving prices instantaneously back to fundamental values. Given that acquisitions of private targets do not affect the bidder's float (i.e. supply of shares), the high premium paid by optimistic investors for acquirers subject to high BA cannot be arbitraged away instantaneously.

5.5. Conclusion

In this chapter I examine valuation effects of belief asymmetry around acquisition announcements involving private targets. The fact that UK acquirers engaging in such acquisitions persistently gain positive abnormal returns in the short-run corroborates the hypothesis that such type of acquisition announcements are perceived as 'good news' by investors. On the basis of the divergence of opinion 'premium hypothesis' bidder prices at the announcement tend to be set by optimistic investors when diversity of beliefs about their value is high. Accordingly, this causes the price of the acquirer to overshoot in the short run, therefore leading to long-run underperformance. My results confirm this hypothesis as they reflect a strong positive (negative) relation between short-run (long run) returns to acquiring firms and the degree of pre-announcement belief asymmetry about their value. This evidence indicates that optimistic investors' overreaction to positive information when belief asymmetry about the value of a firm is high, combined with ineffective arbitrage at the acquisition announcement, can largely explain the short and long-run performance of acquiring firms. It would be therefore not only interesting but also vital for future research to further explore valuation effects of BA around events that are expected to attract and further develop optimistic beliefs about the value of a stock.

Table 5. 1: Summary Statistics by Target Type

The Table presents summary statistics (means and medians) by type of target for i) a sample of 3528 acquisitions and ii) a sample of 1608 acquisitions for which analyst forecasts for the acquiring firm through I/B/E/S are available. All transactions are by listed UK acquirers, take place in the period 1985-2004 and are downloaded from Thomson Financial SDC mergers and acquisitions database. The sample is restricted to deals above one million dollars and where the acquirer obtains more than 50 percent of target's shares as a result of the acquisition. It excludes cases where the acquirer has another merger announcement within the 5-day window (t-2, t+2) where t is the announcement day. Panel A reports deal specific statistics. The transaction value (TV) is from SDC and represents the total value in million pounds paid by the acquirer for each bid. Relative size of the target to the acquirer is the transaction value divided by the acquirer's market value (TV/MV). 'Days to completion' is the number of days between the announcement and the effective date. Intra-industry transactions involve targets with the same 2-digit SIC code as that of the acquirer. Method of payment statistics are reported in percentages relative to each specific target type as well as the entire sample (in parentheses) where relevant. Panel B reports acquirer specific statistics. Age is the age of the acquirer in days at the time of the announcement. The market value of the acquirer is reported in million pounds. Market-to-book value is the market value of equity of the acquirer divided by its book value one month prior to the acquisition. Belief asymmetry is measured by i) Sigma (idiosyncratic volatility), the standard deviation of daily market adjusted residuals for the acquirer over the period (t-205, t-6), where t is the acquisition announcement day and ii) DISP, the standard deviation of all 1-year ahead analyst earning forecasts for the acquiring firm one month prior to the acquisition announcement.

	All						Sample with Analyst Dispersion					
	All (n=3528)		Private (n=3227)		Public (n=301)		All (n=1608)		Private (n=1449)		Public (n=159)	
Panel A: Deal Statistics	**mean**	**median**	**mean**	**mean**	**mean**	**median**	**mean**	**median**	**mean**	**median**	**mean**	**median**
Transaction Value (TV)	31.03	5.00	17.68	4.40	174.10	32.00	46.41	8.70	24.58	7.23	245.21	46.48
Relative Size (TV/ MV)	0.21	0.07	0.18	0.05	0.47	0.25	0.16	0.05	0.13	0.04	0.37	0.20
Days to Completion	18.00	0.00	18.12	0.00	81.70	62.00	26.00	0.00	20.00	0.00	85.00	63.00
Percentage of Intra-Industry Transactions	50.14		50.26		45.51		53.79		54.45		47.80	
Percentage of Transactions financed with Pure Cash	54.13		55.35		41.19		56.59		57.97		44.03	
(percentage of entire sample)			(50.62)		(3.51)				(52.24)		(4.35)	
Percentage of Transactions financed with Pure Stock	5.44		3.19		29.57		43.53		1.93		26.42	
(percentage of entire sample)			(2.92)		(2.52)				(1.74)		(2.61)	
Percentage of Transactions financed with Mixed/Other Payments	40.43		41.46		29.24		39.05		40.09		29.56	
(percentage of entire sample)			(37.93)		(2.49)				(36.13)		(2.92)	
Panel B: Acquirer Statistics												
Age (days)	5829	5074	5762	4948	6540	6854	6081	5481	6019	5369	6644	6854
Market Value	466.19	99.11	415.66	95.54	1007.90	155.50	412.94	146.18	348.09	137.43	1003.97	282.37
Market-to-Book Value	4.06	1.95	4.09	1.97	3.64	1.74	4.36	1.99	4.41	2.00	3.90	1.92
Belief Asymmetry (Sigma)	0.019	0.016	0.019	0.016	0.019	0.017	0.017	0.015	0.017	0.015	0.0165	0.0152
Belief Asymmetry (DISP)							0.087	0.043	0.089	0.043	0.069	0.038

Table 5. 2: Summary Statistics by belief Asymmetry and Target Type

The table presents summary statistics (means and medians) by belief asymmetry and target type for i) a sample of 3528 acquisitions (Panel A) and ii) a sample of 1608 acquisitions for which analyst forecasts for the acquiring firm through I/B/E/S are available (Panel B). All transactions are by listed UK acquirers, take place in the period 1985-2004 and are downloaded from Thomson Financial SDC mergers and acquisitions database. The sample is restricted to deals above one million dollars and where the acquirer obtains more than 50 percent of target's shares as a result of the acquisition. The sample excludes cases where the acquirer has another merger announcement within the 5-day window (t-2, t+2) where t is the announcement day. Acquirers are divided in three Belief Asymmetry (BA) groups, Low, Mid and High. BA is measured by i) Sigma (in Panel A), the standard deviation of daily market adjusted residuals for the acquirer over the period (t-205, t-6) where t is the announcement day and ii) DISP (in Panel B), the standard deviation of all 1-year ahead analyst earning forecasts for the acquiring firm one month prior to the acquisition announcement. Acquirer's market value is measured one month prior to the acquisition announcement and is reported in million pounds. Acquirer's past performance is measured by the mean market adjusted return over the month preceding the acquisition announcement. Relative size is the transaction value divided by the acquirer's market value (TV/MV). The transaction value (TV) is from SDC and represents the total value in million pounds paid by the acquirer for each bid. Market-to-book value is the market to book value of equity of the acquirer one month prior to the acquisition announcement. Age is the age of the acquirer in days at the time of the announcement. H-L are the mean and median differences between the high and low BA groups. P-values for differences are reported in brackets below each difference estimate and are from two sample t-tests for means and Wilcoxon tests for medians. a, b, c denote statistical significance at the 1, 5 and 10 percent levels respectively.

Panel A: BA measured by Sigma

	Target Type											
	All (n=3528)				Private (n=3227)				Public (n=301)			
Deal/Acquirer Characteristics	**Low Sigma (n=1176)**	**Mid Sigma (n=1176)**	**High Sigma (n=1176)**	**H-L Difference**	**Low Sigma (n=1073)**	**Mid Sigma (n=1085)**	**High Sigma (n=1069)**	**H-L Difference**	**Low Sigma (n=103)**	**Mid Sigma (n=91)**	**High Sigma (n=107)**	**H-L Difference**
Belief Asymmetry (Sigma) (mean)	0.011	0.017	0.031	**0.020 [a] [0.000]**	0.010	0.016	0.031	**0.020 [a] [0.000]**	0.011	0.017	0.028	**0.017 [a] [0.000]**
(median)	0.011	0.016	0.026	**0.015 [a] [0.000]**	0.011	0.016	0.027	**0.016 [a] [0.000]**	0.011	0.017	0.026	**0.015 [a] [0.000]**
Acquirers' Market Value (mean)	508.3	440.3	449.9	-58.40 [0.376]	482.5	399.5	365.0	**-117.50 [b] [0.041]**	777.6	927.2	1298.2	520.6 [0.233]
(median)	137.9	102.7	52.8	**-85.16 [a] [0.000]**	186.6	155.7	101.1	**-85.50 [a] [0.000]**	221.9	161.7	85.1	**-136.8 [a] [0.003]**
Acquirers' Past Performance (mean)	-0.000	0.000	0.000	**0.000 [c] [0.073]**	-0.000	0.000	0.000	0.000 [0.262]	0.000	0.000	0.001	**0.001 [a] [0.003]**
(median)	-0.000	0.000	0.000	**0.000 [b] [0.017]**	-0.000	0.000	0.000	0.000 [0.124]	-0.000	0.000	0.001	**0.001 [a] [0.002]**
Relative Size (TV/MV) (mean)	0.16	0.18	0.27	**0.110 [a] [0.001]**	0.139	0.149	0.241	**0.102 [a] [0.004]**	0.36	0.53	0.54	**0.180 [b] [0.016]**
(median)	0.04	0.06	0.09	**0.044 [a] [0.000]**	0.054	0.078	0.117	**0.063 [a] [0.000]**	0.22	0.25	0.30	**0.078 [b] [0.034]**
Acquirer's Market-to-Book value (mean)	3.42	4.22	4.54	**1.120 [b] [0.014]**	3.372	4.350	4.578	**1.206 [b] [0.011]**	3.95	2.71	4.12	0.173 [0.913]
(median)	2.10	1.84	1.92	-0.180 [0.262]	2.290	2.140	2.420	-0.130 [0.452]	1.78	2.72	1.60	-0.180 [0.249]
Acquirer's Age (mean)	6598	6093	4826	**-1772 [a] [0.000]**	6513	6029	4739	**-1774 [a] [0.000]**	7136	6852	5701	**-1434 [a] [0.008]**
(median)	7689	5395	3565	**-4124 [a] [0.000]**	6366	6021	4367	**-1999 [a] [0.000]**	8052	6847	4536	**-3516 [a] [0.009]**

Panel B: BA measured by DISP	Target Type											
	All (n=1608)				Private (n=1449)				Public (n=159)			
Deal/Acquirer Characteristics	Low DISP (n=536)	Mid DISP (n=536)	High DISP (n=536)	H-L Difference	Low DISP (n=482)	Mid DISP (n=476)	High DISP (n=491)	H-L Difference	Low DISP (n=103)	Mid DISP (n=91)	High DISP (n=107)	H-L Difference
Analyst Dispersion (DISP) (mean)	0.018	0.044	0.200	**0.182** [a] **[0.000]**	0.018	0.044	0.202	**0.185** [a] **[0.000]**	0.019	0.040	0.165	**0.146** [a] **[0.000]**
(median)	0.019	0.043	0.108	**0.089** [a] **[0.000]**	0.019	0.043	0.108	**0.089** [a] **[0.000]**	0.021	0.043	0.123	**0.102** [a] **[0.000]**
Belief Asymmetry (Sigma) (mean)	0.015	0.016	0.019	**0.004** [a] **[0.000]**	0.015	0.016	0.019	**0.004** [a] **[0.000]**	0.015	0.015	0.019	**0.004** [a] **[0.003]**
(median)	0.014	0.014	0.017	**0.003** [a] **[0.000]**	0.014	0.015	0.017	**0.003** [a] **[0.000]**	0.015	0.012	0.019	**0.004** [a] **[0.005]**
Acquirers' Market Value (mean)	416.1	503.5	319.3	-96.8 [0.114]	362.3	428.9	255.7	-106.5 [0.032]	896.2	1095.4	1011.5	115.5 [0.796]
(median)	130.4	188.9	130.8	0.40 [0.216]	120.1	181.0	124.7	4.60 [0.153]	209.2	347.3	233.5	24.3 [0.529]
Acquirers' Past Performance (mean)	0.000	0.000	0.000	0.000 [0.384]	0.000	0.000	0.000	0.000 [0.575]	-0.000	0.000	0.000	0.001 [0.239]
(median)	0.000	0.000	0.000	0.000 [0.487]	0.000	0.000	0.000	0.000 [0.662]	-0.000	0.000	0.000	0.000 [0.320]
Relative Size (TV/MV) (mean)	0.13	0.14	0.20	**0.07** [c] **[0.054]**	0.10	0.12	0.18	**0.08** [c] **[0.054]**	0.38	0.27	0.48	0.098 [0.397]
(median)	0.05	0.05	0.07	**0.02** [a] **[0.000]**	0.04	0.04	0.06	**0.02** [a] **[0.000]**	0.25	0.13	0.24	-0.02 [0.969]
Acquirer's Market-to-Book value (mean)	4.17	4.24	4.66	0.485 [0.813]	3.97	4.45	4.79	0.83 [0.710]	5.97	2.62	3.11	-2.86 [0.298]
(median)	2.38	2.11	1.57	**-0.81** [a] **[0.000]**	2.36	2.13	1.57	**-0.83** [a] **[0.000]**	2.56	1.77	1.41	**-1.15** [a] **[0.008]**
Acquirer's Age (mean)	5812	6436	5995	183 [0.467]	5624	6366	6070	**445** [c] **[0.091]**	7482	6995	5171	**-2311** [a] **[0.005]**
(median)	5024	6255	4971	-53 [0.377]	4686	6185	5411	**725** [c] **[0.069]**	8605	7070	3612	**-4993** [a] **[0.007]**

Table 5. 3: Short Run Gains to Acquisitions

The table presents short-run abnormal returns to acquiring firms sorted by target type and payment method. The mean is the percentage average cumulative abnormal return calculated for the 5-days (-2,+2) around the acquisition announcement (day 0). Abnormal return for day t is estimated as follows:

$$AR_{it} = R_{it} - R_{mt}.$$

Where Rit is the return of firm i and Rmt is the value weighted market index return for day t. Cash offers include transactions financed with pure cash, stock offers include pure stock transactions while Mixed/Other offers comprise all remaining offers. The table also reports mean abnormal return differences between acquirers announcing Private and Public acquisitions for all payment methods. P-values for the means are reported in brackets below each abnormal return estimate. n, the sample size for each group is reported below the p-value. a, b, c denote statistical significance at the 1, 5 and 10 percent levels respectively.

		Payment Method			
Target Type		**All**	**Cash**	**Stock**	**Mixed/Other**
All	Mean	**0.921**[a]	**0.800**[a]	-0.543	**1.281**[a]
	P-value	**[0.000]**	**[0.000]**	[0.491]	**[0.000]**
	n	3528	1910	192	1426
Private	Mean	**1.163**[a]	**0.868**[a]	**2.010**[c]	**1.491**[a]
	P-value	**[0.000]**	**[0.000]**	**[0.070]**	**[0.000]**
	n	3227	1786	103	1338
Public	Mean	**-1.667**[a]	-0.184	**-3.492**[a]	**-1.911**[b]
	P-value	**[0.000]**	[0.726]	**[0.001]**	**[0.046]**
	n	301	124	89	88
Private - Public	Mean	**2.829**[a]	**1.052**[c]	**5.497**[a]	**3.402**[a]
	P-value	**[0.000]**	**[0.052]**	**[0.000]**	**[0.001]**

Table 5. 4: Belief Asymmetry and Short Run Gains to Acquisitions

The table reports short-run abnormal returns to acquiring firms sorted by Belief Asymmetry, Target Type and Payment Method. Panel A reports results for portfolio sorts (Low, Mid and High) based on Sigma, the standard deviation of daily market adjusted residuals that is measured over the period (t-205, t-6) where t is the announcement day. Panel B reports results for portfolio sorts based on DISP, the standard deviation of all 1-year ahead analyst earning forecasts for the acquiring firm one month prior to the acquisition announcement , The mean is the percentage average cumulative abnormal return calculated for the 5-days (-2,+2) around the acquisition announcement (day 0). Abnormal return for day t is estimated as follows:

$$AR_{it} = R_{it} - R_{mt}.$$

Where Rit is the return of firm i and Rmt is the value weighted market index return for day t. Results are divided by Belief Asymmetry groups (High, Mid, Low and Total) and are reported for i) all UK acquirers irrespective of target type and ii) acquirers bidding for private targets. Bids for private targets include bids for subsidiary targets. Results for private targets are further divided by method of payment. Cash offers include transactions financed with pure cash, stock offers include pure stock transactions while Mixed/Other offers comprise all remaining offers. P-values for the means are reported in brackets below each abnormal return estimate. n, the sample size for each group is reported below the p-value. a, b, c denote statistical significance at the 1, 5 and 10 percent levels respectively.

Panel A: BA measured by Sigma

Target Type	Payment Method		Belief Asymmetry (Sigma)				
			Low	Mid	High	Total	High-Low
All	**All**	Mean	**0.349[a]**	**0.905[a]**	**1.509[a]**	**0.921[a]**	**1.160[a]**
		P-Value	**[0.002]**	**[0.000]**	**[0.000]**	**[0.000]**	**[0.000]**
		n	1176	1176	1176	3528	
Private	**All**	Mean	**0.408[a]**	**1.073[a]**	**1.951[a]**	**1.163[a]**	**1.483[a]**
		P-Value	**[0.000]**	**[0.000]**	**[0.000]**	**[0.000]**	**[0.000]**
		n	1073	1085	1069	3227	
	Cash	Mean	**0.350[a]**	**0.821[a]**	**1.467[a]**	**0.868[a]**	**1.017[a]**
		P-Value	**[0.001]**	**[0.000]**	**[0.000]**	**[0.000]**	**[0.003]**
		n	652	629	505	1786	
	Stock	Mean	0.233	3.214	2.577	**2.005[c]**	2.344
		P-Value	[0.785]	[0.135]	[0.255]	**[0.070]**	[0.331]
		n	33	29	41	103	
	Mixed/Other	Mean	**0.517[b]**	**1.299[a]**	**2.370[a]**	**1.491[a]**	**1.852[a]**
		P-Value	**[0.011]**	**[0.000]**	**[0.000]**	**[0.000]**	**[0.000]**
		n	388	427	523	1338	

Panel B: BA measured by DISP

Target Type	Payment Method		Belief Asymmetry (DISP)				
			Low	Mid	High	Total	High-Low
All	**All**	Mean	0.240	**0.846** [a]	**0.992** [a]	**0.693** [a]	**0.752** [a]
		P-Value	[0.204]	**[0.003]**	**[0.000]**	**[0.000]**	**[0.013]**
		n	536	536	536	1608	
Private	**All**	Mean	**0.410** [a]	**1.011** [a]	**1.224** [a]	**0.916** [a]	**0.815** [a]
		P-Value	**[0.007]**	**[0.001]**	**[0.000]**	**[0.000]**	**[0.019]**
		n	482	476	491	1449	
	Cash	Mean	**0.670** [b]	**0.810** [a]	**1.115** [a]	**0.874** [a]	**0.443** [c]
		P-Value	**[0.037]**	**[0.037]**	**[0.000]**	**[0.000]**	**[0.098]**
		n	253	289	298	840	
	Stock	Mean	1.406	2.714	3.442	2.147	3.302
		P-Value	[0.887]	[0.633]	[0.176]	[0.272]	[0.219]
		n	9	9	10	28	
	Mixed/Other	Mean	0.179	**1.513** [a]	**1.229** [a]	**0.918** [a]	**1.050** [b]
		P-Value	[0.540]	**[0.006]**	**[0.005]**	**[0.000]**	**[0.045]**
		n	220	178	183	581	

le 5. 5: Cross Sectional Regressions

nary Least Squares regressions of the 5-day cumulative abnormal return to acquiring firms on the following variables. Sigma, the standard ıtion of daily market adjusted residuals over the period (t-205, t-6) where t is the announcement day. DISP is the standard deviation of all 1-year d analyst earning forecasts for the acquiring firm one month prior to the acquisition announcement. Log (Acquirer's Size) is the logarithm of the irer's market value one month prior to the acquisition announcement. Relative size (TV/MV) is the transaction value in million pounds divided ıe acquirer's market value. Market-to-book value is the market to book value of equity of the acquirer one month prior to the acquisition ıuncement. The newly listed dummy is equal to 1 if the acquirer became listed within the last year. Acquirer's past performance is measured by nean market adjusted return over the month preceding the acquisition announcement. The stock (cash) dummy is equal to 1 if the payment ıod is 100% stock (cash). The same industry dummy is equal to 1 if the acquirer and the target are in the same industry (i.e same 2-digit SIC). :l A reports regression coefficients for the entire sample (3528 deals) and Panel B for the subset with analyst forecast dispersion (1608 deals). F-es and adjusted R^2 s for each regression are reported below intercepts. P values are reported below regression coefficients and a, b, c denote stical significance at the 1, 5 and 10 percent levels respectively based on heteroscedasticity adjusted standard errors.

	Panel A: All						Panel B: With Analyst Forecast Dispersion					
	(1)		(2)		(3)		(4)		(5)		(6)	
	All	Private	All	Private	All	Private	All	Private	All	Private	All	Private
na	**0.298**[a]	**0.431**[a]	**0.201**[b]	**0.344**[a]	**0.216**[b]	**0.318**[a]			**0.435**[b]	**0.547**[a]	**0.516**[a]	**0.556**[a]
	[0.002]	**[0.000]**	**[0.042]**	**[0.000]**	**[0.030]**	**[0.001]**			**[0.014]**	**[0.002]**	**[0.004]**	**[0.002]**
P							**0.018**[a]	**0.017**[a]	**0.016**[a]	**0.015**[a]	**0.014**[b]	**0.014**[b]
							[0.002]	**[0.002]**	**[0.007]**	**[0.009]**	**[0.012]**	**[0.014]**
(Acquirer's			**-0.008**[a]	**-0.007**[a]	**-0.007**[a]	**-0.006**[a]					**-0.005**[c]	-0.002
)			**[0.000]**	**[0.000]**	**[0.000]**	**[0.001]**					**[0.073**	[0.487]
ative Size					0.001	**0.004**[b]					-0.004	0.000
/MV)					[0.570]	**[0.019]**					[0.183]	[0.976]
uirer's Market-					-0.000	-0.000					-0.000	-0.000
Book value					[0.477]	[0.375]					[0.363]	[0.235]
nmy=1 if					0.009	0.006					-0.001	-0.001
uirer is listed												
ıin the last year					[0.320]	[0.459]					[0.974]	[0.932]
uirer's past					**1.126**[a]	**1.348**[a]					0.595	0.503
formance					**[0.000]**	**[0.000]**					[0.125]	[0.201]
nmy=1 if target					**-0.019**[a]	0.002					**-0.013**[c]	0.009
cquired with												
e stock.					**[0.000]**	[0.716]					**[0.067]**	[0.398]
nmy=1 if target					-0.002	-0.004					0.002	0.000
cquired with												
e cash.					[0.331]	[0.117]					[0.449]	[0.874]
nmy=1 if target					-0.003	-0.003					-0.004	-0.004
acquirer are in												
same industry.					[0.151]	[0.260]					[0.129]	[0.130]
rcept	0.003	0.003	**0.021**[a]	**0.019**[a]	**0.023**[a]	**0.019**[a]	**0.005**[a]	**0.007**[a]	-0.002	-0.001	0.009	0.005
	[0.108]	[0.122]	**[0.000]**	**[0.000]**	**[0.000]**	**[0.000]**	**[0.000]**	**[0.000]**	[0.583]	[0.669]	[0.175]	[0.508]
	9.46	19.95	16.26	19.06	7.49	8.32	9.83	9.79	7.97	9.72	3.17	2.63
. R^2	0.3%	0.6%	0.8%	1.2%	1.9%	2.3%	0.6%	0.7%	1.0%	1.3%	1.9%	1.8%

Table 5. 6: Belief Asymmetry and Post Acquisition Performance

The Table reports monthly percentage estimates of calendar time portfolio abnormal returns to acquiring firms for a period of 12 months following the acquisition announcement. Acquirers enter the portfolio on the announcement month of each transaction and remain for 12 months. Portfolios are rebalanced each month to include firms that have just completed an event. Estimates are sorted by Belief Asymmetry groups (High, Mid, Low and Total) based on the original classification in Table 4 and are reported for i) all UK acquirers irrespective of target type and ii) acquirers bidding for unlisted targets. Belief Asymmetry is measured by i) Sigma (Panel A), the standard deviation of daily market adjusted residuals over the period (t-205, t-6) where t is the announcement day and ii) DISP (Panel B), the standard deviation of all 1-year ahead analyst earning forecasts for the acquiring firm one month prior to the acquisition announcement. Market adjusted mean return is the grand mean of all monthly market adjusted calendar portfolio returns that are each calculated as follows:

$$AR_{pt} = R_{pt} - R_{mt}$$

Where Rpt is the calendar time portfolio return and Rmt is the value weighted market index return for month t. CAPM and Fama and French -3 factor intercepts (aps) are estimated by the following calendar time portfolio regressions:

$$R_{pt} - R_{ft} = a_p + \beta_p(R_{mt} - R_{ft}) + e_{pt}$$

$$R_{pt} - R_{ft} = a_p + \beta_p(R_{mt} - R_{ft}) + s_p SMB_t + h_p HML + e_{pt}$$

where Rpt is the calendar time portfolio return , Rft is the return on a one month T-bill during month t, Rmt is is the value weighted market index return, SMB is the difference in returns of value weighted portfolios of small firms and big firms during month t, HML is the return differential of value weighted portfolios of high and low book-to-market firms in month t, βp, sp and hp are regression parameters specific to the portfolio and ept is the error term. Heteroskedasticity adjusted t-statistics appear in paretheses below each parameter. High minus Low differences and corresponding t-statistics are from two sample t-tests for market adjusted mean returns and from zero investment portfolio alphas for CAPM and FF 3-factor regressions. a, b and c indicate significance at the 1, 5, 10 percent level respectively based on two tail t-tests except for zero investment portfolio regressions where one-tail t-tests are used. N.cal is the number of calendar months and n is the sample size involved in each portfolio.

Panel A: BA measured by Sigma

Target Type	Abnormal Return Measure	Belief Asymmetry (Sigma) Low	Mid	High	Total	High-Low
All						
	Market Adj. Mean Return	0.14	-0.32	**-1.06 [a]**	**-0.60 [a]**	**-1.21 [a]**
	t-stat	(0.56)	(-1.31)	**(-3.03)**	**(-2.59)**	**(-2.77)**
	CAPM a	0.19	-0.29	**-1.09 [a]**	**-0.60 [b]**	**-1.28 [a]**
	t-stat	(0.57)	(-1.00)	**(-2.81)**	**(-2.20)**	**(-3.23)**
	FF a	0.26	-0.02	**-0.45 [c]**	-0.09	**-0.67 [b]**
	t-stat	(1.05)	(-0.06)	**(-1.93)**	(-0.52)	**(-2.00)**
	N.cal	211	216	205	216	200
	n	1119	1066	1016	3201	
Private						
	Market Adj. Mean Return	0.19	-0.26	**-1.04 [a]**	**-0.57 [b]**	**-1.22 [a]**
	t-stat	(0.72)	(-1.03)	**(-2.89)**	**(-2.44)**	**(-2.75)**
	CAPM a	0.22	-0.22	**-1.07 [a]**	**-0.57 [b]**	**-1.30 [a]**
	t-stat	(0.67)	(-0.73)	**(-2.67)**	**(2.07)**	**(-3.18)**
	FF a	0.36	0.01	-0.38	-0.04	**-0.70 [b]**
	t-stat	(1.40)	(0.26)	(-1.54)	(-0.23)	**(-2.03)**
	N.cal	211	216	205	216	200
	n	1008	973	914	2895	

Panel B: BA measured by DISP

Target Type	Abnormal Return Measure	Belief Asymmetry (DISP)				
		Low	Mid	High	Total	High-Low
All						
	Market Adj. Mean Return	-0.20	**-0.56** [b]	**-1.06** [a]	**-0.59** [b]	**-0.86** [b]
	t-stat	(-0.81)	**(-2.03)**	**(-3.14)**	**(2.37)**	**(-2.07)**
	CAPM a	-0.18	**-0.55** [b]	**-1.05** [a]	**-0.60** [b]	**-0.84** [a]
	t-stat	(-0.77)	**(-2.03)**	**(-3.15)**	**(-2.36)**	**(-3.43)**
	FF a	0.24	-0.20	-0.42	-0.13	**-0.72** [a]
	t-stat	(1.30)	(-0.87)	(-1.58)	(-0.71)	**(-2.79)**
	N.cal	202	200	197	202	197
	n	467	505	484	1456	
Private						
	Market Adj. Mean Return	-0.15	**-0.52** [c]	**-0.92** [a]	**-0.58** [b]	**-0.78** [c]
	t-stat	(-0.58)	**(-1.84)**	**(-2.70)**	**(-2.26)**	**(-1.82)**
	CAPM a	-0.14	**-0.51** [c]	**-0.93** [a]	**-0.59** [b]	**-0.83** [a]
	t-stat	(-0.54)	**(-1.83)**	**(-2.72)**	**(-2.25)**	**(-3.07)**
	FF a	**0.34** [c]	-0.13	-0.44	-0.09	**-0.77** [a]
	t-stat	**(1.68)**	(-0.55)	(-1.58)	(-0.50)	**(-2.69)**
	N.cal	201	200	202	202	201
	n	431	446	428	1305	

Chapter 6: Conclusion

6.1 Conclusion

This thesis has examined the role of opinion divergence among investors and short selling constraints in determining short and long-run gains from acquisitions and thus has contributed in both the literature related to value ambiguity and gains from acquisitions. Recent evidence on the significant roles of investors' divergence of opinion and short selling constraints in the cross section of stock returns as well as studies trying to uncover important determinants of short and long-run gains to acquiring firms have formed the main body of motivation for this thesis. My work applied a set of tests to examine whether Miller's overpricing components that appear to have a bearing on asset pricing can also determine gains from acquisitions. As originally hypothesized, proxies designed to capture these two important for asset pricing ingredients appear to significantly explain returns to firms involved in acquisitions. My evidence can help explain several anomalous stock return patterns related to acquisitions and suggest that the success of an acquisition in terms of creating value for shareholders can be to a large extent determined by the extent of disagreement between investors about the price of its stock preceding the acquisition announcement.

Chapter 3 examines the individual role that short selling constraints play in determining post acquisition stock performance. Results indicate that the level of short sale constraints (as proxied for by institutional block-holders' ownership) plays a major role in determining post takeover stock performance. Further, it appears that institutional block-holders' ownership, both in terms of extent and persistence, plays a pivotal role in explaining post takeover abnormal returns. As a result, such findings suggest that the widely documented

post-merger underperformance puzzle could largely be attributed to less effective arbitrage in the case where acquirers exhibit low and/or non-persistent institutional investment.

This result is consistent with the continuously growing literature postulating that short sale constraints can induce short-run overpricing and hence lead to long-run negative abnormal returns as efficiency takes its course. The presence of institutions is therefore vital in ensuring the efficiency of the takeover market since extensive BO significantly deteriorates short-run overpricing and thus eliminates the chances for post takeover return reversals. Such evidence is consistent with recent evidence that short sale constraints drive most common cross sectional anomalies documented in the literature and that the increasing significance of institutional investors can lead to gradual disappearance of certain stock anomalies. Accordingly, this study can form the basis for more extensive future examinations on the valuation implications of institutional ownership as related to corporate takeovers or other events and on the general role of institutions in preserving efficiency in financial markets through facilitating shorting opportunities.

This work has also implications for investors, corporate organizations as well as regulatory bodies. First, it implies that investors should be avoiding investing in acquiring firms that undertake large, public acquisitions, when these firms are not backed up by sufficient institutional investment. Accordingly, institutional investors act as arbitrageurs by facilitating short selling and therefore and do not allow acquirers to become overvalued around or after the acquisition announcement. As a result they can prevent inefficient movements of the stock price later. This suggests in turn that regulatory bodies should adopt free short selling in all countries to promote efficient and effective arbitrage that will lead to a more efficient takeover market. Lastly, corporate organizations should encourage long-

term institutional investors to act freely and short sale if necessary around a merger announcement. This will ensure that acquiring firms' prices will not deviate away from fundamental grounds by too much as a result of an important corporate decision announcement.

Chapter 4 has examined the individual role of divergence of investors' opinion in determining post acquisition stock performance. I consider this work as one of the first attempts towards examining the impact of opinion dispersion in a corporate takeover context and believe that this can form a good basis for future research on how divergence of opinion affects post-managerial decision performance. Results demonstrate that the degree of pre-event diversity of opinion about the value of the acquiring firm explains to a large extent post-acquisition stock performance.

More specifically I find a significant negative relation between pre-event divergence of opinion and post-acquisition stock returns. Interestingly, while, negative long-run abnormal returns are mainly present when opinion dispersion is high, low dispersion acquirers are in the majority of cases subject to no abnormal returns. Consistent with Miller's premium hypothesis findings demonstrate that acquiring firms subject to high investor disagreement prior to acquisitions are overpriced around the acquisition announcement and thus underperform in the long-run as this overpricing is gradually corrected. Importantly, the significant abnormal returns observed in excess of the Fama-French 3-factor model imply that the FF model does not fully capture all the valuation components given the presence of wide opinion diversity.

The chapter has significant implications for investors. It demonstrates that acquirers can be already overpriced at the time of the announcement as a result of the high investor disagreement in the pre-acquisition period. In some cases, the price of the overvalued acquirer is not justified neither by fundamentals, nor by the merger itself, resulting in burst of its bubble after the corporate announcement. On average, investors should in the majority of cases avoid long-positions in highly volatile firms that become acquirers as these are shown to significantly underperform in the long-run.

Lastly, chapter 5 links Miller's theory with behavioral theories based on investors' overreaction and subsequent burst of bubbles to explain both short and long-run performance of acquiring firms. For this purpose the sample is limited to acquisition announcements that are likely to further encourage optimistic opinions and prevent the pessimistic ones. The fact that UK acquirers that buy private targets experience positive abnormal returns in the short-run confirms that related announcements are perceived as positive information about the future of the acquirers by investors.

The divergence of opinion 'premium hypothesis' implies that bidder prices around the announcement tend to be set by optimistic investors when diversity of beliefs about their value is high. Along these lines, the price of the acquirer will tend to overshoot in the short run, subsequently leading to long-run underperformance. My results confirm this hypothesis as they reflect a strong positive (negative) relation between short-run (long run) returns to acquiring firms and the degree of pre-announcement belief asymmetry about their value. As argued earlier, such evidence indicates that optimistic investors' overreaction to positive information when belief asymmetry about the value of a firm is high, combined with ineffective arbitrage at the acquisition announcement, can largely explain the short and

long-run performance of acquiring firms. On the basis of these findings it would be therefore important for future research to further explore valuation effects of BA around events that are expected to attract and further develop optimistic beliefs about the value of a stock.

Along these lines one could examine the relation between short and long run gains following earnings announcements and the level of pre-event opinion dispersion. Positive earnings announcements are expected to attract and further develop the previously optimistic views about the stock and are thus likely to induce optimistic investors' overreaction in the same spirit that acquisition of private targets do. Therefore, companies subject to high investor disagreement or value ambiguity that end up beating analysts forecasts can generate significant abnormal gains for investors immediately after acquisitions. This can be expected to lead to relative underperformance as more information about the stock and the earnings announcement becomes available to investors and the 'optimistic' effect that initiated the overreaction decays. Further, the overreaction effect is expected to be more pronounced both in terms of extent and persistence in emerging markets where information diffusion is slow and behavioural effects in general more pronounced. Dividend announcements, stock splits or any other managerial decision can form a basis to examine whether the degree of heterogeneity of expectations can have a direct impact on the event's outcome in terms of creating or destroying value for investors.

Lastly one can suggest that my main results, mainly the ones related to investor disagreement, can be driven by investor overconfidence or value ambiguity/uncertainty rather than opinion divergence as suggested by Miller. Pastor and Veronessi (2005) for instance develop a model where bubbles rationally develop when uncertainty about the

price of a stock is high and burst later when investors revise their expectations. It would be interesting to explore whether overpricing of stocks involved in events, such as mergers, is rationally a product of uncertainty in the market or irrational exuberance of optimistic investors. Also, one may link the overreaction/overpricing hypothesis with models related to investor overconfidence and add more proxies such as the most commonly used 'Turnover' to examine by how much results may be also driven by investor overconfidence. Overall, behavioural elements appear to shape not only investors' but also institutions' actions and investments. As a result, event studies that convey information to both these kind of agents can form a fruitful basis to examine the extent and persistence of such behavioral biases in stock prices.

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