Università Commerciale "Luigi Bocconi" – Milano
Ph.D. in Business Administration and Management
(Dottorato di Ricerca in Economia Aziendale e Management)
Cycle XVI, 2001-2004

Intangibles' Endowment and Capability to Leverage it: Short and Long Run Evidence of Glamour and Value Acquirers' Returns

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Academic year 2004-2005

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2004

Key Words: Intangible Assets, Mergers and Acquisitions, Cumulative Abnormal Returns (CARs), Buy-and-Hold Abnormal Returns (BHAR), Fama and French Three-Factor model, Bidder Gains, Price to Tangible Book, Price to Book Value, Market Momentum, Merger Momentum, Method of payment, ROE, Cost of Equity, ROE spread.

Data avalaibility: The data in this study are from public sources identified in the text.

[1] This dissertation is intended as a partial fullfillment for the achievement of my Ph.D. in Business Administration and Management at Bocconi University in Milan.

Ai miei genitori, prima di tutto,

con immenso amore ed infinita gratitudine

A Francesca

Ai miei nonni,

ed in particolare alla memoria di mio nonno Pippo

Acknowledgments

I would like to express my sincere gratitude to the members of my committee Mauro Bini, Salvatore Vicari and Alfredo Viganò, for the continuous mentoring and support in setting the framework of the research, for their encouragement and infinite patience. Their guidance has led to great improvements in my study. This research, which represents a Ph.D. dissertation, was deepened while I was a Visiting Scholar at the Stern School of Business of the New York University. I am indebted with Eli Bartov, my faculty sponsor at NYU Stern, with the entire faculty of the Accounting Department, with the Ph.D. students and the Ph.D. candidates in Accounting for their useful comments. I wish to express my sincere gratitude to Fabrizio Ferri: I have benefited greatly from his essential advises on the research methodology and econometric issues and his many comments on the results. Of course all errors remain my own.

Abstract

M&As are strategic weapons to acquire and internalise intangible assets which otherwise don't have a proper market for their negotiation. M&As can perform the role of market for trading intangible assets, which are not marketable being embedded in the organizational capital. This paper investigates in the short and in the long run the returns of public bidders which acquire public targets. I hypothesize and find that an acquirer, to which the capital market recognizes a strong intangibles endowment *(a glamour acquirer)*, is better off, in relative terms, when buying a target with a strong endowment of generic intangibles (that is intangibles that cannot be sold separatly), even if it has to put a premium on the current market price of that company. Though I provide evidence that this happens when this fundamental relation holds: the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is greater than the corresponding percentage for the target company. If this relation does not hold, the glamour acquirer acquiring a high PTTB (Price To Tangible Book) target is heavily punished by the market. I show that both in the short-run and in the long-run the market does not penalize heavily the acquirer which respects this conditions, in relative terms, with respect to both a glamour acquirer acquiring a glamour target not respecting this condition and a glamour acquirer acquiring a value target. Actually when these conditions hold, the bidder has a greater capability to transform in current income (that is in money terms: a tangible result) its intangibles' endowment than the target. This transformation in tangible results is a good if it does not consume the intangibles' endowment. Just profitable intangible-based acquirers are able to successfully capture the potential value creation coming from the internalisation of the intangible resources of the target and are value builders. Otherwise they are value destroyers, showing incapability to perform a value appropriation. The relation is strengthened after controlling for the characteristics of the offer and the contest. My findings are robust enough being supported under different model specifications.

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INTRODUCTION

The role of M&As as a market for trading intangible assets and the characteristics of a successful glamour acquirer

My dissertation analyses the bidding firms' performance on the announcement of a merger or acquisition, investigating the market reaction in the short and in the long run (looking if in the post-acquisition period the market reassess his judgement on the deal as the results of the acquisition become clear) and focusing on M&As which are used to leverage the own endowment of intangibles by acquirers searching for internalize the intangibles' endowment of target. *The **primary research question** is whether and under which conditions a glamour acquirer, that is a firm to which the capital market attaches a strong intangibles endowment, is better off when buying a target with a strong endowment of generic intangibles (that is intangibles that cannot be sold separatly), even if it has to put a premium on the current market price of that company.*

I hypothesize that an intangible-based acquirer (glamour acquirer), buying an intangible-based target, while in the short run does not experience a very negative market reaction comparatevely to other acquirers, is rewarded or at least not heavily punished (in relative terms with respect to other acquirers) by the capital market in the long run. Though, I hypothesize that this happen when the acquirer has clearly shown to have the capability to leverage its own intangibles' endowment, justifying the reward gained from the market. I operationalyse this concept arguing that this relation has to hold for a "successful" glamour acquirer: *the percentage of the acquirer's intangible assets explained by the spread*

between ROE and cost of equity is greater than the corresponding percentage for the target company[2].

As a natural consequence of my primary research question, I investigate the method of payment adopted by glamour acquirers. I speculate that intangible-based acquirers prefer to use stock as a method of payment, since the paper should be valuable. In this case, I investigate whether they report positive or negative returns using stock, hypothesizing positive returns just in the case of cash financing.

* * *

My research re-analyses a stream of research in corporate finance that has received more attention than any other in recent years, that of the share price performance of acquirers. One of the main reasons for this renouved attention, in addition to the importance of takeover activity to economic activity, lies in raising new questions about the behaviour of security markets and the measurement of risk-adjusted security returns, especially in the post-takeover share price performance of the acquirers.

The market for corporate control has been extensively studied by researchers, at least focusing on the short run period of market reaction. This research contributes to the field of study applying a different framework and searching for new evidence.

While it has been extensively documented that, at the bid announcement, shareholders of the target firms report abnormal returns averaging over 30%, wealth effects for the shareholders of the acquiring firms are somehow puzzling, with either zero or negative excess returns for the bidders [Jarrell and Poulsen (1989) and Loderer and Martin (1990) document the absence of gains for acquirers in U.S. domestic acquisitions]. This documented evidence of zero or abnormal returns to bidding firms could suggest that those acquisitions may reflect neutral or bad investments decided by the management of the acquirer firms. Turning to the long run performance of acquirers, this is still unresolved and the empirical evidence is controversial. Not only the price behavior of bidding firms is not

[2] I.e. the percentage of the acquirer's intangibles explained by its ROE greater than its COE is greater than the percentage of the target's intangibles explained by its ROE greater than its COE.

well defined, but also the determinants which impact on that performance are not clear. Other authors also claim that past research is flawed by methodological errors in the identification of long-run returns. These errors may arise either through the choice of inappropriate control models or through the introduction of some element of bias either in the chosen sample, the benchmark control or both.

In this framework, the importance of intangibles in explaining the bidder returns is receiving more and more attention in the very recent years (but until now the focus has just been on glamour acquirers[3], without considering the target's endowment of intangibles). Intangible assets are information-based resources ranging from intellectual property rights through know-how to brand and reputation [Hall (1993)], which can provide a sustainable competitive advantage being hard-to-imitate and hard-to-cumulate [Dierickx and Cool (1989), Barney (1991)]. Acquiring a company represents a means of buying intangible resources that are otherwise non-marketable [Wernerfelt (1994)]. This is because of the difficulty in assessing the quality of intangibles [Chi (1994), Coff (1999)] and of the tacitness and socially complex aspects [Kogut and Zander (1992)].

As Lev and Radhakrishnan (2004) point out *"organization capital"*, the knowledge used to uniquely combine human skills and physical capital to deliver superior results, is a resource of production that is firm-specific (because it is embodied in employees) and is thus capable of yielding above the cost of capital returns. Today the other factors of production are commodities. Consequently, such commoditized factors yield, at best, the cost of capital. *According to the authors, in merger and acquisitions, the value of organization capital should play a prominent role because such capital is predominately tacit and difficult to transfer across firms, and hence of questionable value in acquisitions.* But the authors limit themselves to this statement, without going into it with a dedicated research.

Since the organizational capital is embedded in the human capital of the firm's employees, intangibles are someway tacit and socially complex, and because of this are difficult to estimate.

[3] In particular Rau and Vermaelen (1998) for U.S. evidence and Sudarsanam and Mahate (2003) for the U.K.

There is no "market" for organizational capital that could be used to generate a book value for it. Unlike general human capital, the organizational capital is not portable.

The organizational capital, along with other firm-specific intangible resources, mostly linked with knowledge, cannot be completely codified and hence transferred to other companies or fully imitated by them. So the only way a firm can incorporate these unique resources embodied in firm-specific organization designs and processes, is by internalizing them, by means of acquisition.

M&As are strategic weapons to acquire and internalise intangible assets which otherwise don't have a proper market for their negotiation. M&As can perform the role of market for trading intangible assets. If public targets show a propensity for the redeployment of their intangible resources, they should exhibit a potential for value creation, because the reconfiguration of intangibles is an opportunity to enhance revenues and improve efficiency [Capron (1999)]. *But this potential for value creation has to be materialized by the acquirer's superior performance.*

Capital markets provide important valuation information about intangible assets [Brynjolfsson, Hitt and Yang (2002)]. By this way the choice of using the capital markets by acquirers to search for intangible-based targets may help reducing the adverse selection problem which arise in the market for corporate control. This study can be collocated in this emergent framework stating that equity markets can influence the market for corporate control [Zingales (1995); Pagano, Panetta and Zingales (1998); Reuer and Shen (2002)]. Equity markets reduce the adverse selection problem caused by the information asymmetry and the use of private information, increasing the efficiency of the market for corporate control. Moreover, equity markets could improve the redeployment of intangible assets after the M&A, reducing the agency problem.

* * *

I examine a sample of 3,389 successfully completed mergers and acquisitions, occurring between January 1980 and December 2000, where both the bidding firms and the

target firms are listed on both the CRSP (Center for Research in Security Prices) NYSE/AMEX/NASDAQ tapes and COMPUSTAT.

I partition the sample of both acquirers and targets according to the PTTB (Price To Tangible Book) multiple, building High PTTB portfolios (respectively acquirers and targets above the PTTB median) and Low PTTB portfolios (respectively acquirers and targets below the PTTB median).

To test my hypotheses, I apply standard event study techniques to calculate Cumulative Abnormal Returns (CARs) and Buy-and-Hold Abnormal Returns (BHARs) over different event windows, and then perform standard t-test for testing bidder returns significantly different from zero and perform standard parametric and non-parametric tests for their differences in means.

The empirical results I obtained through my univariate and multivariate analyses are consistent with my hypotheses. I find that an acquirer, to which the capital market attaches a strong intangibles endowment, is better off when buying a target with a strong endowment of generic intangibles (that is intangibles that cannot be sold separatly), even if it has to put a premium on the current market price of that company. Though this happens when this relation holds*: the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is greater than the corresponding percentage for the target company.* If this relation does not hold, the glamour acquirer acquiring a high PTTB target is heavily punished by the market.

I show that both in the short-run and in the long-run the market does not penalize heavily the acquirer which respects this conditions, in relative terms, with respect to both a glamour acquirer acquiring a glamour target not respecting this condition and a glamour acquirer acquiring a value target. Actually when these conditions hold, the bidder has a greater capability to transform in current income (that is in money terms: a tangible result) its intangibles' endowment than the target. This transformation in tangible results is a good if it does not consume the intangibles' endowment. Just profitable intangible-based acquirers are able to successfully capture the potential value creation coming from the

internalisation of the intangible resources of the target and are value builders. Otherwise they are value destroyers, showing incapability to perform a value appropriation[4].

I also document that glamour acquirers tend to use their own stock to finance their acquisition.

I provide evidence that the bidder returns, both in the short and in the long run, are positely related to this situation: a glamour acquirer acquiring a glamour target when the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is greater than the corresponding percentage for the target company. The relation is strengthened (meaning the significance of the relation is enhanced) after controlling for the characteristics of the offer and the contest. My findings are robust enough being supported under different model specifications.

This paper contributes to the existing literature in two ways essentially.

First, I theorize a relation to identify "successful" acquirers based both on the intangibles' endowment ant the capability to leverage it. I then document empirically this relation, providing a robust evidence of it. My work sheds light on the long-term returns of bidding firms, adding a new determinant affecting bidder returns. This contribution, while primarily drawing on and enriching the literature on the market for corporate control, can also be of interest for the literature of the value relevance of intangibles.

Second, this study investigates whether the short-term excess returns capture or not the full effects of the investors reaction to a merger or acquisition[5], which otherwise could be displayed in the long run. This represents an emerging body of literature and empirical evidence, not only in the study of the market for corporate control[6]. My findings suggest that the short run return, even if meaningful, still doesn't tell the whole story, since long-term returns highlight clearlier the rewards of successful glamour acquirers.

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[4] My findings are in the framework of a *resource-based view* argument according to which competitive advantage does not necessarily lead to superior performance, because the lack of bargaining power vis-à-vis stakeholders may result in zero returns to the shareholders of the focal firm [Coff (1999)]. A successful acquirer, not only has to select a target with a high value creation potential, but has to recognize how to materialize that potential through its superior performance, gaining bargaining power and fully appropriating the value.

[5] As it is assumed by event studies based only on short term reactions.

[6] For instance a new stream of literature focuses on delayed reactions when investigating *IPOs* [*Initial Public Offerings*, see Ritter (1991), Brav and Gompers, (1997)], *SEOs* [*Seasoned Equity Offerings*, see Lughran and Ritter (1997)], share repurchases [see Ikenberry et al. (1995)], etc.

Finally, besides adding to the academic literature on motives and causes of bidder's returns, by offering systematic evidence on the importance of the capability to leverage the endowment of intangibles, my findings may be of significant interest to practitioners (firms and their financial consultants), as well as to investors broadly considered. The feedback provided by this research informs managers and Board of Directors about the feasibility of an acquisition by a glamour bidder and the rewards/punishments connected.

These contributions are of particular importance at a time when the role of intangible assets and their value-relevance is under scrutiny.

* * *

The remainder of this paper is organized as follows.

The dissertation is divided into parts, and the parts into sections.

Part I is devoted to the literature review. The first section comprehensively reviews the related theoretical literature, while the second section exaustively enough summarizes the existing empirical evidence of acquisition activity.

Part II proceeds to develop my hypotheses. Outlining the research objective and the relevance of the topic, the part provides the motivations for the research question and develops the hypotheses.

Part III explaines the research design and the methodology used in the analysis, discussing the robustness check performed.

Part IV provides the sample and the data, analysing some descriptive statistics.

Part V is devoted to the empirical analysis of the excess returns of the bidders, presenting the results and discussing the implications.

Finally the conclusions summarize the findings, providing some final remarks, including the limitations of the study and further research to be done in the future.

PART I

LITERATURE REVIEW

1.1. Theoretical literature on the market for corporate control

1.1.1. Hypotheses on the reasons behind a takeover

It is possible to classify the traditional hypotheses developed by the research studying the market for corporate control[7] and related to the reasons for the takeover of firms. They are:

1. *The size hypothesis*: Growth maximization theory states that managers would prefer larger rather than smaller acquisition. The size hypothesis argues that a larger firm is more likely to be a takeover target with respect to a smaller firm because of the higher costs of searching for the supposed right small firm target and the greater uncertainty about the future success of a small firm. To research this hypothesis, the total assets and the total sales of the target firms are used as the proxy of firm size. However, Palepu suggests a different relationship: the likelihood of acquisition decreases with size mainly because of the size-related "transaction costs". There is also a logic argument to support this view: the probability of acquisition decreases with size where the number of firms larger than the target decreases. For very large firms, the number of firms that could possibly bid for them is small.

[7] See in particular Palepu for a detailed review (1986).

2. *The hypothesis of growth potential or redeployment of corporate capital.* This hypothesis was suggested by Weston and Mansinghka (1971). It argues that a firm which operates in a mature industry can increase the growth rate of earnings by acquiring a firm in a growing industry. Following this perspective, one believes that a firm which shows a higher growth rate of sales or total assets, presents more profitable investment opportunities and positive earnings prospects than a firm which has a lower growth rate. According to this hypothesis, one utilizes as a proxy to research on the subject the average annual growth in sales and total assets over the five years preceding the event.

3. *The hypothesis of growth-resource mismatch.* Another of the causes that could lead to the takeover of a firm is the intention on the part of the bidder to take advantage of an imbalance between the expectations for growth and the amount of available resources within the target firm. Thus, it could be expected that those firms which present such an imbalance have a higher likelihood of being a takeover target. This hypothesis states that firms which present a growth-resource imbalance (i.e. low growth but resources rich firms and high growth but resources poor firms) are natural acquisition targets (Cosh, Hughes and Singh, 1980, Levine and Aaronovitch). Firms with a large amount of available resources and limited growth opportunities are attractive for potential bidders interested in taking advantage of the excess resources. For instance, a target's managers may not be fully utilizing its physical resources and thus firms with low activity ratios may be attractive to ambitious management teams. At the same way, firms which show low growth histories are likely to have a high probability of takeover. The other related aspect of the growth-resources mismatch investigates the adequacy of financial resources for the firm. The prospects of a high growth firm may be unexploited if it has inadequate cash; this firm would be an attractive target to an acquirer with financial resources available to finance the growth. Of course there are other potential growth-resource mismatches. A cash-rich firm may be vulnerable because it is attractive to a cash-starved acquirer and viceversa: a cash-starved target could be

attractive because it is a channel for the cash rich acquirer's funds. The free cash-flow theory advanced by Jensen (1986) also indicates that firms with resources that are in excess of that required to fund their investment projects that have a positive net present value have a higher likelihood of being acquired. The financial literature that analyses investment and financing decisions under the hypothesis of asymmetric information (Myers and Majluf, 1984) suggests that firms with an imbalance in the opposite direction, that is to say, with many growth opportunities but limited available resources, also have a higher likelihood of being acquired. A number of works, such as those of Palepu (1986), Ambrose and Megginson (1992) and Powell (1997) have tried to empirically test this theory, although only the first of these has offered some support for it. Thus, Palepu found that the existence of an imbalance between available resources and growth opportunities had a positive effect on the likelihood of a firm being a takeover target. The direction of such an imbalance appeared to be that of many resources and limited growth opportunities, given the lower rate of indebtedness and growth that he observed for the firms under study.

4. *The hypothesis of undervaluation of the target company*: Marris first (1964) argued that the main reason for the takeover of firms was the search for assets that were undervalued by the capital market. The market to book value ratio is used as proxy for the hypothesis as suggested by Palepu (1986). If the market to book value ratio is low (that means less than "one" or relatively small), the firm's market value is quoted on the stock market a discount relative to its book value recorded in the balance sheet. In this case the target's assets may be undervalued by the stock market. For a firm interested in a market entry (i.e. introducing itself in a new sector), the acquisition of an undervalued firm would appear to be an interesting option from a financial point of view (Hasbrouck, 1985), instead of starting from scratch a new concern. This hypothesis suggests that the acquiring firm identifies an undervalued target and buys it at a bargain price. The attractiveness of a firm – that is undervalued on the stock market relative to its value – relates to a potential

acquirer who may be able to "break up" the company or sell off some of its assets thereby making a quick profit. The empirical evidence in this regard is still not conclusive and focus on the Anglo-Saxon countries. The results of some studies (Ciccolo and Fromn, 1979; Malkiel et al.,1979; Hasbrouck, 1985; Bartley and Boardman, 1986), confirm the hypothesis of Marris. However, there are others (Palepu, 1986; Ambrose and Megginson, 1992; Song and Walkling, 1993; Berger and Ofek, 1996; Powell, 1997; Barnes, 1999) which show that the valuation ratio has no significant effect on the probability that a firm will be the subject of a takeover bid.

5. *The hypothesis of transfer of technology.* This hypothesis argues that a possible reason for a takeover relates to the possibility of acquiring the technological advantages or knowledge capital of the target firm. Therefore, a firm with successful output of R&D has a greater likelyhood of being acquired. A proxy adopted to measure the technological capability or knowledge capital is the ratio of R&D expenditures to sales. This hypothesis is thougth as a major motivation for foreign acquisitions as suggested by Harris and Ravenscraft (1991) and Neubauser and Cowley (1992). The hypothesis states that the higher the R&D expenditures, the greater the probability of being acquired by a foreign bidder rather than by a domestic bidder.

6. *The hypothesis of the inefficient financial structure (or hypothesis of co-insurance effect).* This hypothesis investigates the degree of leverage of the target firm, trying to understand how much the company has taken advantage of the benefits of leverage. Actually low leverage may signal unused debt capacity which the potential acquirer could exploit to his advantage (Lewellen, 1971). But also the opposite of this became the main reason for mergers in the UK during the late 1980s and early 1990s. The recession in the economy transformed over-levered firms with related financial difficulties vulnerable to takeover bids which could reduce their leverage (Fallon and Srodes, 1988). A merger will reduce the risk of the combined

firm's default, thus increasing the combined firm's debt capacity. Kim and McConnell (1997) argue that if the debt has tax advantage, increasing debt capacity will enhance the value of the combined firm. Thus, the lower the debt level of a target firm, the more attractive a target firm becomes. Total liabilities/common equity is used to measure the debt level.

7. *The hypothesis of tax advantage.* This hypothesis, linked to the previos one, states that the acquiring firm might have the advantage to carry forward the tax loss of the target firm to offset its taxable income. The operating-loss-carry forward-to-total-assets ratio is used as a proxy variable.

8. *The hypothesis of enhanced liquidity.* This hypothesis indicates that if a firm has a reserve of liquidity, then it could become an attractive takeover target. For instance, if a firm generates good cash flow or has excessive current assets, it could have high probability to be a takeover target. The proxies used to research on this area are the quick ratio and the current ratio.

9. *The hypothesis of inefficient management.* This hypothesis argues that if the managers of a firm fail to maximize its market value, then the firm is likely to be an acquisition target. Then the further value creation process would be put in place through the replacement of the inefficient management. The proxies to test this hypothesis are the return on equity and the return of assets. It is often suggested that mergers are a market mechanism by which resources are transferred from inefficient managers to efficient ones (Marris, 1964).

10. *The hypothesis of economic disturbance.* Gort (1969) argues that a firm with a higher level of economic disturbance (i.e. the stock price volatility to earnings per share within a period), has greater variance in the valuations of investors. The proxy to measure the economic disturbance is the difference between the highest price per

share and the lowest price per share divided by the earnings per share of a certain year is used.

1.1.2. Factors affecting bidding returns

The literature has identified many determinants of bidder returns surronding bid announcement.

a) *Relative size of the target with respect to the bidder.* Research has shown that the relative size of the target with respect to the acquirer has an impact on the capability to capture value. Actually the larger the bidder size relative to the target one, the smaller the wealth effect on its stock returns. Asquith, Bruner and Mullins (1983), and Jarrell and Poulsen (1989) show a significant positive correlation between bidder returns and the targets size relative to the bidder one. However, large targets could be more difficult to integrate, as shown by Ahuja and Katila (2001). Finally Travlos (1987) find no significant relationship between these two variables.

b) *Toehold.* Research has documented a positive impact of an acquirer toehold in targets on bidder returns. Large ex-ante shake held before the acquisition by the bidder reduce the search costs for information on acquisition benefits [(Grossman and Hart (1980) and Shleifer and Vishny (1986)].

c) *The method of payment.* Research has documented that the method of payment disclose information about the perceived value of the firm, meaning that stock financing occurs only when bidders are supposed to be overvalued. This is in line with the asymmetric information hypothesis [Myers and Majluf (1984)], according to which acquirers offer stock when they believe their firm is overvalued, thus justifying a following stock price decrease. Travlos (1987), Asquith, Bruner and

Mullins (1983) report acquiring firm returns that are significantly lower in offers financed with stocks than in those financed with cash.

d) *Debt of the acquirer.* Agency theory developed by Jensen and Meckling (1976) suggests different means by which shareholders attempt to enforce value maximization, given that managers pursue their own different objectives departing from profit-maximing decisions. The larger the level of the debt, the higher the level of monitoring of the bidding managers by their creditors, who scrutinize potential investments, and the higher the commitment of the management not to waste cash. If the debt performs a monitoring role, reducing the free cash flow issue, higher debt should be associated to a lower likelihood that a bad acquisition takes place [McCormick and Mitchell (1993), Kang (1993) and Kang et al. (1993)].

e) *Relatedness of the acquisition.* An acquisition is related when the acquirer and the target operate and compete in the same industry. Related acquisitions are often motivated by economies of scale (horizontal business combinations), synergies (vertical business combinations) or other cost efficiencies. Acquirer's excess returns are higher for non-diversifying acquisitions (acquisitions in the same industry of the acquirer). For instance Maquieira, Megginson, and Nail (1990) show this result. Related acquisitions are more likely to benefit shareholders than diversifying acquisitions, because of the higher potential for cost savings or revenue enhancement opportunities coming from synergies and reconfiguration opportunities [Berger and Ofek (19949, John and Ofek (1994), Lang and Stulz (1994)]. However, Amihud and Lev (1981) argue that less diversified firms are subject to higher risks, thus reducing acquirer performance. Shleifer and Vishny (1990) argue that unrelated acquisitions serve to improve manager's job security by diversifying the risk of their human capital, and are not aimed at benefiting shareholders.

f) *Hostile bid.* The reaction of the target's management to the offer is shown to affect the returns of the acquirer. Actually, if the offer is resisted, acquirers will be forced to propose higher bid premiums with respect to a friendly transaction. Walkling (1985) and Datta, Narayana and Pinches (1992) document that resisted offers provide lower bidder's returns than friendly ones.

g) *Multiple bidders.* Because of competition, acquirers will pay a higher bid premium if there are multiple bidders than if they are the only bidder. Previous studies have shown that returns to bidding firms are significantly positive in single-bidder contests and insignificantly different from zero in multiple-bidder contests [Bradley Desay and Kim (1998), Jarrell and Poulsen (1989)]. De, Fedenia and Triantis (1996) document that acquirers show significantly negative returns and perform significantly worse in multiple bidder offers than in single bidder offers.

1.2. Empirical literature on short and long term bidder returns: previous findings

Research devoted to the market for corporate control has reached a common consensus about the gains achieved by the shareholders of the target firms. Extensive empirical evidence largely supports the view that mergers and tender offers are beneficial to acquired firm shareholders[8]. On the contrary, the same consensus about the returns to the shareholders of the acquiring firm is not reached, since the empirical evidence on the excess returns experienced by bidders is mixed. The uncertainty about the outcome for the bidder increases if the results are analysed also in the long run, when the evidence is more unclear with respect to the short run. Not only the price behavior of bidding firms is not

[8] For instance, Dodd and Ruback (1977), Bradley (1980) and Jarrell and Poulsen (1989) document in the U.S. average returns to target shareholders of 21.2%, 32.2% and 28.9% respectively.

well defined, but also the determinants which impact on that performance are not clear. Other authors also claim that past research is flawed by methodological errors in the identification of long-run returns. These errors may arise either through the choice of inappropriate control models or through the introduction of some element of bias either in the chosen sample, the benchmark control or both.

Next I briefly summarize the previous empirical literature on both short and long term bidder returns.

1.2.1. Short-run announcement returns of acquirers

Research[9] *focused on the short term reaction* has shown that bidders that acquire listed targets reports zero or negative announcement period excess returns when acquiring listed targets. For instance Hansen and Lott (1996), analyzing the market reaction for acquirers of listed targets, find an average excess return of –0.98. Or again Chang (1998): –1.49%; Fueller et al. (2002) –1.00%; Moeller et al. (2003): –0.40%. Jensen and Ruback summarize the results of a number of empirical studies on mergers and acquisition from the 1950s to the 1970s. They argue that it seems that announcement returns to bidders are approximately zero.

Bradley, Desai, and Kim (1988) document how bidders returns fall from 4% in the 1960s to 1.3% in the 1970s, and to –3% in 1980s. More recently, Fuller, Netter and Stegemoller (2002) report that bidders that make multiple acquisitions in 1990s earn statistically significant positive return of 1.77%.

[9] All the literature quoted, unless otherwise stated, is referred to U.S. takeovers, which constitute the sample of study of my dissertation. For European acquisitions, it's worth mentioning in this context Faccio et al., which in a recent paper (2003) analyze if the "listing effect" is a key determinant in acquirer's returns. On a sample of deals in 17 Western European countries over the period 1996 through 2001, they report that acquirers of listed targets earn an insignificant average excess return of –0.38%.

1.2.2. Long-run performance of acquirers

The *long-run* returns of bidding firms are still a puzzle, with contrasting evidence. Some of the existing studies on long-term returns following acquisitions of public firm suggest that shareholders fare poorly following acquisitions paid for with equity [for instance, Loughran and Vijh (1997)], but other studies do not find poor returns following such acquisitions [for instance Mitchell and Stafford (2000) and Dong, Hirshleifer, Richardson and Teoh (2002)].

Bradley and Jarrell (1988) and Franks, Harris and Titman (1991) don't report significant negative bidders' returns in the two to three years after the acquisition, while Asquith (1983) and Agrawal, Jaffe and Mandelkar (1992) document on the contrary that acquirers show significant negative returns in the first post-merger years (2-5 years). Loderer and Martin (1992) report that the negative performance of bidding firms diminishes year by year in the sixties and in the seventies, and even disappears in the eighties. Loughran and Vijh (1997) document that acquirers financing the deal with stock experience a lower long-run performance with respect of acquirers using cash. They also show that tender offers have significantly positive long run returns while mergers[10] have significantly negative long-run returns. Rau and Vermaelen (1998), on a sample of 987 US takeovers during the period 1980-1991, document that acquirers with a high market to book ratios show post-merger returns after three years of –10.8% (–5.6% in the first year post-merger, –5.4% in the second year and finally 0.1% in the third year) while acquirers with a low market to book ratios experience post-merger returns of 9.9% after three years (5.6%, –1.1% and 5.4% respectively in the first, second and third year).

Unlike in the case of short-run returns, the sensitivity of the long-run performance to the benchmark model for long-run abnormal returns has raised a huge methodological

[10] A *merger* is usually a friendly transactions between the Board of Directors of the bidding firm and the Board of Directors of the target firm, while a *tender offer* involves the purchase of shares without a previous agreement by the Board of Directors of the target.

issue[11] and still remains unresolved. Agrawal, Jaffe and Mandelker (1992) and Loderer and Martin (1992) in order to improve the computation of the long-run abnormal returns performed by the acquirers, adjuste for firm size and beta. However, Fama and French (1992) argue that firm size and beta are not sufficient to capture the cross sectional variations in stock returns and affirm that the combined impact of firm size, beta and market-to-book value better explain the cross-sectional variations in stock returns.

[11] Agrawal and Jaffe (2000), rewieving 22 U.S. and U.K. studies of long-run post-acquisition performance, discuss the methodological problems related to the assessment of this performance.

PART II

HYPOTHESES DEVELOPMENT

2.1. Motivation and hypotheses development

This paper investigates in the short and in the long run the returns of publicly-traded bidders acquiring public targets. In particular the goal of the research lies in extrapolating bidding firms with a huge endowment of intangible assets, being able to leverage them, that in turn acquire targets with a strong endowment of intangibles, and then investigating their short and long run performance, looking if the evidence of the short-run reaction to an announcement is reversed or not in the long-run. I try to explain the results according to the capability of the acquirer, in absolute terms and relative to the target, to successfully leverage its endowment of intangibles. I look at the percentage of the intangible assets explained by the ROE spread as a proxy for the capability of a company to leverage its own endowment of intangibles. It follows that for a successful glamour acquirer *the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is greater than the corresponding percentage for the target company.* I define a bidder which buy a target respecting this condition as an acquirer ***"value builder".***

I split both acquirers and target in two portfolios according to the multiple PTTB (Price to Tangible Book): *High PTTB portfolio* (above the median of the multiple) and *Low PTTB portfolio* (below the median). I define a bidder ***"glamour"*** if it ranks in the High PTTB portfolio of acquirers. A bidder in the Low PTTB portfolio is defined as ***"value"*** acquirer.

The expertise of the bidding firm, when combined with that of the target firm, leads to valuable new production–investment opportunities for the combined firm. The value creation based upon the internalisation of the intangible resources of the target and its

successful exploitation by the bidder is based on unique combinations of bidding and target firms.

This research relies above all on the equity market to infer the value of intangibles. The underlying assumption of the *equity market measurement approach* is that if the equity market reveals the intrinsic value of the firm, then subtracting the value of the firm's tangible assets from its market value reveals the value of the firm's intangible assets.

Actually the assumption underlying my model is that the endowment of a firm's intangible assets (both acquirer and target) is given as a proxy by the Price to Tangible Book.

The acquirer seeks to create wealth by fully appropriating the rent generated from economies obtained from using the target's intangible assets on a larger scale. When an acquisition is motivated by the acquirer's desire to redeploy the combined assets, both tangible and intangible, of its target and itself toward higher-valued uses, the acquisition should generate synergistic gains.

The internalisation by a value builder acquirer of the target's endowment of intangibles, via its reconfiguration and synergy exploitation, is potentially a high value creation process. This is because of the construction of a sustainable competitive advantage, difficult to imitate.

Intangible-based acquirers, capable of successfully exploit their own intangibles, should be able to successfully capture the potential value creation coming from the internalisation of the intangible resources of the target. They should show a superior capability to perform a value appropriation.

It is possible that the capital market doesn't correctly anticipate the costs and benefits of acquisitions for shareholders of acquiring firms, perhaps because of a biased assessment of the value of the acquisitions. Therefore I investigate and compare both the short-run and the long-run performance of acquirers to examine my research question.

The combined analyses which I conducted in this research are intended to help improve our understanding of the role of intangible assets and of the corresponding behavior of capital markets in response to a major corporate event.

These issues provide the motivation for my study.

2.1.1. *Capturing the contribution of intangible resources and the capability of the management to leverage them*

If mergers are made to exploit and leverage the intangibles endowment, then they should add to firm value in the long-run.

I define a *glamour acquirer* (target) a bidding firm (target) whose stocks receive premium ratings in the form of a high Price to Tangible Book. An acquirer (target) for which holds the opposite is defined as *value* acquirer (target). I employ the Price to Tangible Book as a proxy of intangibles' endowment, which qualifies the glamour/value status[12]. This variable is expected to capture the presence and magnitude of intangible assets respectively in the acquirer firm and in the target firm.

I speculate that an acquirer, to which the capital market attaches a strong intangibles endowment, is better off when buying a target with a strong endowment of generic intangibles[13] (that is intangibles that cannot be sold separatly), even if it has to put a premium on the current market price of that company. A company can show a strong intangibles' endowment because of a competitive advantage which even today it is expressed via a positive ROE spread, or otherwise via expectations of a future positive and strong ROE spread. If the acquirer is not penalized by the market at the announcement of the acquisition because the market discounts a superior capability to exploit, more rapidly, the intangibles acquired, this has to happen when this relation holds: *the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is greater than the corresponding percentage for the target company.* I define a bidder for which this condition holds as a *Value Builder* acquirer.

[12] Other studies have adopted other proxies for the glamour/value status. For instance, Rau and Vermaelen (1998) employ the market to book value of equity, while Sudarsanam and Mahate (2003) employ both the PE ratio and the MTBV.

[13] Noticeably Rhodes-Kropf, Robinson and Viswanthan (2003) provide evidence that the market-to-book ratio for firms (both acquirers and targets) involved in mergers are considerably higher than those for non-merger firms. When they compare acquirors and targets, they find that M/B is significantly higher for acquirors than for targets. However, average M/B ratios for targets are statistically larger than for non-merger firms. Thus, the conventional wisdom that high M/B buys low M/B is somewhat misguided: high M/B firms buy lower M/B firms, but these targets have higher M/B ratios than the average firm. High M/B firms are involved in mergers; the very highest M/B firms buy higher than average M/B firms.

Let's make a simple example to clarify the concept in a straight way.

Let's suppose a bidder shows these numbers:

- P/BV = 7x
- P/Tangible Book = 8x
- ROE = 30%
- COE (Cost of equity) = 10%
- ROE/COE = 3x (this multiple equals a P/BV for a steady state company)

So for this company intangible assets are 8/9 of the market capitalization (being the multiple Price to Tangible Book = 8x). Though 3/7 of these intangibles are explained by the ROE spread (being the ROE greater than the cost of equity in ratio 3:1, while the intangibles are greater than the book value in ratio 7:1)

Now let's suppose a target shows these numbers:

- P/BV = 5x
- P/Tangible Book = 5x
- ROE = 3%
- COE (Cost of equity) = 9%
- ROE/COE = 0,33x

In this case 100% of the target intangibles are not explained by the ROE.

In this example, the percentage of the acquirer's intangibles explained by the spread between ROE and cost of equity is greater than the corresponding percentage for the target company.

I argue that:

When the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is greater than the corresponding percentage for the target company, that is when:

$$\frac{\frac{Acq\_ROE}{Acq\_COE}}{Acq\_PTBV} > \frac{\frac{Tgt\_ROE}{Tgt\_COE}}{Tgt\_PTBV}$$

(where $\frac{\frac{ROE}{COE}}{PTBV}$ is the percentage of intangibles explained by a ROE greater than the cost of equity)

then in the short and in the long run the market does not penalize the acquirer which respects this conditions, as opposite to an acquirer who does not.

Actually when these conditions hold, the bidder has a greater capability to transform in current income (that is in money terms: a tangible result) its intangibles' endowment than the target. This transformation in tangible results is a good if it does not consume the intangibles' endowment.

So this lead to the following hypotheses:

> ***Hypothesis 1a:*** *"Value Builder" bidders – i.e. bidders with greater ability to leverage on intangible assets – will earn higher CAR upon bid announcement relative to value destroyer bidders (non value builders).*

> ***Hypothesis 1b:*** *"Value Builder" bidders – i.e. bidders with greater ability to leverage on intangible assets – will earn higher BHAR in the post-acquisition period relative to value destroyer bidders (non value builders).*

A bidder is defined as value builder if the percentage of intangible assets explained by the spread between ROE and cost of equity is greater than the corresponding percentage for the target company.

Hypothesis 2a: *The CAR upon announcement of a merger between a glamour acquirer and a glamour target will be more positive (or less negative) when the acquirer is a value builder.*

Hypothesis 2b: *The BHAR during the post-acquisition period of a merger between a glamour acquirer and a glamour target will be more positive (or less negative) when the acquirer is a value builder.*

An acquirer (target) is defined glamour if its PTTB is above the median, otherwise it is defined a value acquirer (target).

Hypothesis 3a: *The CAR upon announcement of a merger between a glamour acquirer value builder and a glamour target will be more positive (or less negative) than the CAR upon announcement of a merger between a glamour acquirer value destroyer and a value target.*

Hypothesis 3b: *The BHAR during the post-acquisition period of a merger between a glamour acquirer value builder and a glamour target will be more positive (or less negative) than the BHAR upon announcement of a merger between a glamour acquirer value destroyer and a value target.*

Book value (data item 60) and Tangible Book Value (data item 11), that is book value excluding intangible assets, are taken from COMPUSTAT Industrial Annual for the previous fiscal year, while market value is taken from CRSP and computed as the number of shares outstanding times the fiscal year closing price.

2.1.2. The method of payment for a glamour acquirer

The method of payment used by acquirers involves the use of cash, stock[14] or a mix of both. Payment made by shares will have an impact on the value of the acquirers, especially in the case of merger[15]. My hypothesis is that intangible-based acquirers prefer to use stock as a method of payment, since the paper should be valuable. If the bidder is an intangible-based company (or glamour acquirer), then it will be profitable for the acquirer to exploit and convert its valued equity into real assets. But I hypothesize that a glamour acquirer value builder, acquiring a High PTTB target, should report positive abnormal returns when paying with cash and not when paying with stock. Actually in cash transactions, shareholders of the acquiring firm bear on the entire risk that the expected synergy value embedded in the acquisition premium will not materialize. In stock transactions, that risk is shared with the shareholders of the target firm, in proportion to the percentage of the combined company the acquiring and selling shareholders each will own. Put in this perspective, the decision to finance the acquisition with stock or cash also sends signal about the acquirer's estimation of the risks of failing to achieve the expected synergies from the deal. A really confident acquirer would be expected to pay for the acquisition with cash so that its shareholders would not have to give any of the anticipated merger gains to the shareholders of the target company. Thus paying with cash may indicate greater confidence in the acquirer's ability to exploit the intangible assets of the target. But if on the contrary the management of the acquiring company believe the risk of not achieving the required level of synergy is substantial, they can be expected to try to hedge by offering stock. That's why, even if glamour acquirers tend to use their own stock to finance their acquisition, just the glamour acquirers that use cash should achieve positive returns.

[14] Payment by shares includes various types of shares (e.g. ordinary shares, preference shares, mix of both, etc.)

[15] Regarding the method of payment, the empirical literature mostly supports the *asymmetric information hypothesis* (or *means of payment hypothesis*). According to this hypothesis, discussed by Myers and Majluf (1984), which argue that bidding firms offer stock when they believe their firm is overvalued, bidder returns decrease with the fraction of the price paid with stocks [Asquith, Bruner and Mullins (1983), Lang et al. (1991) and Travlos (1987)]. Takeovers financed with cash result in significantly higher returns for acquiring firms than those financed with equity issues. Anyway many factors influence the choice regarding the mode of payment, including tax issues, control issues, the expected growth opportunities, the free cash flow of the acquirer.

This leads to my fourth hypothesis:

Hypothesis 4: *Glamour acquirers prefer to finance the acquisition with their equity. But a glamour acquirer value builder acquiring a High PTTB target should report positive abnormal returns when these transactions are financed with cash.*

PART III

RESEARCH DESIGN AND METHODOLOGY

3.1. Research methodology

3.1.1. Research design

The empirical model is set up to test how the intangibles' endowment and the percentage of intangibles explained by a ROE greater than the cost of equity affect the market reaction to an acquisition announcement in both the short-run and the long-run.

In this way I document the impact of M&As on the value of the acquiring firms in the short term (event period) and in the long term (three years) and compare the results. Actually there has been increasing concern in the literature that announcement returns may not be capturing the whole impact of an acquisition. It is possible that bidder returns incorporate information differently across firm characteristics and deal type.

I design the research both in a univariate and in a multivariate setting, because of different model specifications which allow me to test my hypotheses:

- splitting the sample in the first setting;
- allowing the interaction among variables while running the cross-sectional analysis in the second setting.

To test my hypotheses in a ***univariate setting***, I split both the acquirers and the targets into two groups respectively: firms with a PTTB above the sub-sample of the acquirers (targets) multiple's median (High PTTB portfolio) and firms with a PTTB below the sub-sample of the acquirers (targets) multiple's median (Low PTTB portfolio). I also split the acquirers according to their relative (with respect to the target) capability to exploit the

intangibles' endowment. I then conduct both t-tests for difference of means and nonparametric Wilcoxon rank-sum tests[16]. A first set of univariate tests separates bidder returns across PTTB portfolios of acquirers and targets, and the relative percentage of intangibles explained by a ROE greater than the cost of capital. A second set of univariate test takes into consideration also the method of payment.

My *parametric (t-test) and non-parametric (Wilcoxon Rank Sum)[17] tests* assess the relationship between the bidder returns and the bidder characteristics in a static setting that doesn't allow for the interaction of the different explanatory variables. Thus, I next turn my attention to a multivariate analysis, designed to allow the interaction among two critical variables: the intangibles' endowment (PTTB) and the percentage of intangibles explained by a ROE greater than the cost of equity.

In a ***multivariate setting***, I use an OLS regression to examine the following theoretical model:

Bidder Return = f (Intangibles' endowment, Percentage of intangibles explained by a ROE greater than the cost of equity)

and, as a control model:

[16] The two-sample *t* test is based on several mathematical assumptions. In particular, it is assumed that both populations have normal distributions with equal variances. When the assumptions are not satisfied, the *t* test may still be valid, in the sense that the nominal probabilities are approximately correct, particurarly if the sample sizes are large and equal. Even so, there is another hypothesis-testing method, the Wilcoxon rank sum test, that requires weaker mathematical assumptions, is almost as powerful when the *t* assumptions are satisfied, and is more powerful in other situations. The Wilcoxon rank sum test is a direct competitor of the two-sample *t* test. In most situations, the two tests give the same basic conclusion, so it doesn't matter which test is used. The rank sum requires fewer assumptions than the *t* test (in particular it does not assume population normality), but it uses less information from the data; only ordering information is relevant to the rank sum test. Both theoretical results and simulations clearly indicate that a *t* test will have correct α values and optimal power for normal populations. For obviosly nonnormal data, the rank sum test has a more believable α value and it usually has better power.

[17] The mathematical assumption for this test is that independent random samples are taken from two populations; the null hypothesis is that the two population distributions are identical (but not necessarily normal). The test is based on the ranks of the sample data values. The rank of an individual observation is its position in the combined sample: rank 1 indicates the smallest value, rank 2 the next smallest value, and so on. As the phrase "rank sum test" indicates, the Wilcoxon rank sum test is based on the sum of the ranks in either sample. Under the null hypothesis of identical distributions, the sum of the ranks in one sample is proportional to the sample size. If one population is shifted to the right of another, that is, if the first population tends to yield larger observations, the rank sum for the first sample tends to be large. Of course, a small rank sum for the first sample indicates that the first population is shifted to the left of the second.

Bidder Return = f (Intangibles' endowment, Percentage of intangibles explained by a ROE greater than the cost of equity, Method of payment, Type of acquisition, Momentum, Deal-specific control variables)

The dependent variable in the model, the bidder return, is measured over two horizons: in the short time it is measured as a CAR (Cumulative Abnormal Returns) and in the long run it is measured as a BHAR (Buy-and-Hold Abnormal Returns).

I give the details in the related section 3.1.3.

3.1.2. Event study methodology: the estimate of CARs and BHARs

I investigate both the short-term and the long-term returns surrounding the announcement of the transaction.

I use the event study methodology to estimate abnormal returns to the acquirers. The market model is assumed to be a valid representation of the stochastic process generating security returns.

* * *

The estimate of CARs

Cumulative Abnormal Returns (CARs) are calculated applying the methodology of the market model. For the event studies [(Brown and Warner (1985)] the parameter estimation period is taken as starting 522 working days and finishing 20 days prior to the announcement. The *event (or announcement) date* of each acquisition is the trading day during which the deal was firstly announced. This announcement date is provided by *SDC Platinum™ Worldwide Mergers and Acquisitions Database.*

Thus, the event date zero is the actual announcement date. The *event window* includes three working days surrounding the announcements (-1 to +1 days)[18].

The simulation results obtained by Brown and Warner (1980; 1985) on both monthly and daily data suggest that in most of the cases relatively straightforward procedures are as powerful as more elaborate tests in detecting abnormal returns.

The *market model* assumes that a security follows a single factor market model:

$$R_{jt} = \alpha_j + \beta_j R_{mt} + \varepsilon_{jt}$$

where:

- R_{jt} is the rate of return of the common stock of the j^{th} firm on day t;
- β_j is a parameter that measures the sensitivity of R_{jt} to the market index;
- R_{mt} is the rate of return of a market index on day t (in this research I use the return on a value-weighted market index);
- ε_{jt} is a random variable that, by construction, must have an expected value of zero, and is assumed to be uncorrelated with R_{mt}, uncorrelated with R_{kt} for $k \neq j$, not autocorrelated, and homoscedastic;

This equation is estimated for each acquisition announcement. The estimation period is from $t = -522$ to $t = -20$. The intercept and slope, α and β, are estimated using daily returns over a 2 years period ending 4 weeks prior to the announcement date. For each stock I also compute the *beta* using daily returns over a 2 years period ending 4 weeks prior to the announcement date. I require at least 100 non-zero daily acquirers returns.

The estimated parameters, $\hat{\alpha}_j, \hat{\beta}_j$, and the realized return on the value-weighted market index[19] on day t are used to predict normal returns around the event date. Daily excess

[18] The three-day window is one of the two most commonly used event windows for mergers and acquisitions studies. The other window most commonly used starts before the announcement and ends with the completion of the deal.

returns are then computed as the deviation between realized returns and estimated normal returns. Daily excess returns are calculated for each firm over the window $t = -1$ to $t = +1$.

The market return is the value-weighted[20] index of returns (including dividends) for the combined New York Stock Exchange, American Stock Exchange, and NASDAQ from the Center for Research in Security Prices (CRSP)[21]. This is intended as an index that is highly correlated with what the returns on the bidding firm would be if it had not announced a merger.

Each day's abnormal return is obtained as the bidder's return[22] less the expected return based on the market model (less α plus β times the CRSP Index value weighted).

For each firm in my sample, I cumulate the daily abnormal return over the interval to obtain the Cumulative Abnormal Return (CAR). The CAR is computed from one trading day before the announcement date through one day after the announcement date. The three daily abnormal returns are so summed to obtain the CAR[23].

* * *

[19] Value-weighted returns are calculated using the market value of the firm at the end of the month prior to the beginning of the event month.

[20] Bidder equity market values cover up a wide diversity, since their dispersion (as measured by the standard deviation of their market value with respect to their mean) is high. Therefore, the equally-weighted returns do not provide the most appropriate measure to evaluate the profitability of the acquirers returns. To take the dispersion of bidder sizes into account, I calculate a market value-weighted portfolio return.

[21] This is a sound choice according to the literature. For instance, Fuller et al. (2002) use the value-weighted market index as the benchmark for measuring the CAR.

[22] The daily returns for each bidder is inclusive of the dividends, that is:

$$R_{jt} = \frac{P_{jt} - P_{jt-1} + D_{it}}{P_{it-1}}$$

where

R_{jt} = daily return for bidder j at day t

P_{jt} = stock price for bidder j at day t

P_{jt-1} = stock price for bidder j at day t-1

D_{it} = gross dividend if the share becomes ex-div on day t.

[23] In the robustness check I begin to cumulate the CAR some more days before the announcement in order to capture any anticipatory price behavior due to some possible leakage of information that may occur before the actual public announcement. The alternative event windows used as to check the results and to controls for market rumors are: [-5, +1] and [-10, +1].

Let's put it in a more formal way[24]. Summarizing in analytical terms, to obtain the *abnormal return* (or *prediction error*) for the common stock of the j^{th} firm on day t, I use the standard event study methodology of Brown and Warner (1985) with the market model:

$$A_{jt} = R_{jt} - (\hat{\alpha}_j + \hat{\beta}_j R_{mt})$$

where the coefficients $\hat{\alpha}_j$ and $\hat{\beta}_j$ are ordinary least squares estimates of α_j and β_j (market model parameter estimates).

The *Cumulative Abnormal Return (CAR)* for each j^{th} firm is formed by summing individual abnormal returns over time:

$$CAR_{T_1T_2} = \sum_{j=1}^{N} \sum_{t=T1}^{T_2} A_{jt}$$

* * *

The estimate of BHARs

Next I enlarge the window of analysis to see the results of the transaction in the long run. In this way I test the capability of the acquirer to exploit the intangible's endowment of the target acquired in a three years horizon.

I take into consideration a period of three years from the announcement of the deal which should be enough for the acquirer to exploit the deal potential.

Many recent studies focus on the long-run performance of stocks following major corporate events such as acquisitions, security offerings, dividend initiation, stock splits, etc. There is considerable variation in the measures of abnormal returns and the statistical tests that researchers use to detect long-run abnormal stock returns.

[24] See the appendix for a complete formal derivation and for more details on statistical tests.

To measure the bidders' returns I use the ***Buy-and-Hold Abnormal Returns (BHAR)***, which is the methodology usually most reliable to estimate the long-run performance[25] (see, e.g., Rau and Vermaelen, 1998; Barber, Lyon, and Tsai, 1999; Loughran and Ritter, 2000). Actually Buy-and-Hold Abnormal Returns have become the standard method of measuring long-term abnormal returns [Barber and Lyon (1997), Lyon, Barber and Tsai (1999)[26]].

The approach I choose to develop a benchmark for long-run stock returns is the three-factor model of Fama and French (1993). To measure abnormal performance in the long-run, I use the common technique of computing three-year Buy-and-Hold Abnormal Returns relative to a benchmark adjusted for risk, book-to-market ratio, and size factor[27]. This benchmark is the expected return estimated by the Fama and French three-factor model.

The BHAR is defined as the value of holding a long position in the stock of the bidding firm and a short position in a benchmark over the time horizon. The BHAR captures the value of investing in the average sample firm relative to an appropriate benchmark over the horizon of interest. The Buy-and-Hold Abnormal return, representing the long-run excess return available to an investor, is measured by comparing the Buy-and-Hold cumulative Return on the sample observation with the Buy-and-Hold Return on the benchmark. The return on a Buy-and-Hold investment in the sample firm less the return on a Buy-and-Hold investment in a benchmark with an appropriate expected return is then[28]:

$$BHAR_{it} = \prod_{t=1}^{T}(1+R_{it}) - \prod_{t=1}^{T}[1+E(R_{it})]$$

[25] This implies using a compounded return computation instead of the additive cumulation of abnormal returns that leads to the CAR. Actually the differences between the CARs and BHARs results form the effect of monthly compounding; CARs ignor compounding, while BHARs include the effect of compounding. If individual security returns are more volatile than the returns on the market index, it can be shown that CARs will be greater than BHARs if the BHAR is less than or equal to zero. As the annual BHAR becomes increasingly positive, the difference between the CAR and BHAR will approach zero and eventually become negative. These results are empirically verified by Barber and Lyon (1997).

[26] Barber and Lyon (1997) and Lyon, Barber and Tsai (1999) argue that BHARs are important because they "precisely measure investor experience". Barber and Lyon (1997) argue that researchers should calculate abnormal returns as the simple buy-and-hold return on a sample firm less the simple buy-and-hold return on a reference portfolio or control firm. They document the biases that are induced by *summing* (and not *compounding*) daily or monthly abnormal returns (referred to in the financial economics literature as Cumulative Abnormal Return).

[27] Using a size-based benchmark, i.e. a CRSP value-weighted index, does not significantly alter the results.

[28] For a more formal derivation of the BHAR, see the Appendix.

where R_{it} is the month t simple return on a sample firm and $E(R_{it})$ is the month t expected return for the sample firm (that is the return on the control company – or portfolio – in the corresponding period).

To calculate the expected return on the sample firm, $E(R_{it})$, I used the *Fama-French three-factor model returns*[29]. I apply a three single-factor benchmarks based on size and book-to-market values. The Fama-French model is based on Fama-French[30] (1993), which presents a time-series model describing the evolution of security returns as a function of market returns on the size decile portfolios to which the sample firm belongs, a high-minus-low market-to-book ratio factor, and a small-minus-big market capitalization factor[31]. I used a data set containing the needed factors[32].

I use the common technique of computing buy-and-hold returns relative to a size and book-to-market based benchmark[33]. Specifically, to create the reference portfolios, I calculate 50 size and book-to-market portfolios, following Fama and French (1993) market equity and book-to-market portfolios. The size and book-to-market portfolios are created in two steps.

In the first step, I form 10 size deciles at the end of every month on the basis of the market capitalization of firms listed in the CRSP database and I rank each of those firms into one of the 10 portfolios. This decile formation and ranking procedure is repeated every month between January 1980 and December 2000.

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[29] This is not the *calendar-time portfolio approach* (which does not produce BHAR) for measuring long term abnormal performance as Fama advocates (1998). Instead it is a model, based on Fama-French, which yields an expected return based on the three factors, which is in turn subtracted to the return of the sample firm to obtain the BHAR (see the Appendix). Actually, despite the apparent attractiveness of the calendar-time portfolio approach, Barber, Lyon, and Tsai (1999) and Loughran and Ritter (in press) prefer the BHAR methodology. Loughran and Ritter argue that the calendar-time portfolio approach has low power to detect abnormal performance because it averages over months of "hot" and "cold" event activity. For example, the calendar-time portfolio approach may fail to measure significant abnormal return if abnormal performance primarily exists in months of heavy event activity.

[30] See the Appendix for more details on the Fama-French three-factor model.

[31] Following Fama and French (1992, 1993), virtually all recent studies documenting long-term abnormal returns use some form of risk adjustement that assumes that the cross-section of expected returns can be completely described by size and book-to-market equity.

[32] This data set is downloaded from Professor French's website which provides the monthly factors.

[33] This sequential sort procedure is employed by Barber and Lyon (1997), Barber, Lyon, and Tsay (1999), Rau and Vermaelen (1998), Kothari and Warner (1997).

In the second step, within each size decile, firms are sorted into quintiles based on their book-to-market ratios. When the size deciles are further sorted into quintiles using book-to-market ratios, I end up with 50 control portfolios (10 times 5).

Portfolio returns are then formed every month by averaging the monthly returns for these 50 portfolios. These returns are then used as benchmarks to calculate the buy-and-hold returns: abnormal returns are calculated for each firm of my sample of acquirers relative to its size and book-to-market benchmark (as the difference between its monthly return and that of its control portfolio) every month for 36 months after the acquisition announcement date.

I choose a post-acquisition horizon of three years because it should be the right timeframe for acquirers during which execute and complete the post-merger management, achieving the expected synergies (a longer period would involve a higher risk to include confounding events causing noise in the analysis[34]). However, not all the acquirers survive[35] the three years[36]. Then I make the assumption, frequent in the literature, that when a company is delisted from CRSP, it earns the benchmark return for the remaining horizon. In other words, I calculate the Buy-and-Hold Abnormal Returns for the acquirers until the delisting date; after, non-survivors earn zero abnormal return until the expiring of the three-years period[37].

* * *

[34] Previous studies have used a period of two years [Gregory (1997)], three years [Sudarsanam and Mahate (2003), Rau and Vermaelen (1998)], and five years [Loughran and Vijh (1997)].

[35] Michell and Lehn (1990) provide evidence that bidders that make poor acquisitions become themselves takeover targets. This probability is showed to be inversely related to the market reaction: the more negative the market reaction, the higher the probability of a future takeover.

[36] Their possible exclusion could have led to a survivorship bias. Anyway, the literature has shown that survivorship bias appear not to be a serious problems [see Baker and Limmach (2001) and Highson and Elliott (1998), who find that the difference in BHARs between tests including and excluding non-surviving firms is not statistically significant].

[37] Baker and Limmack (2001) document that even assuming that acquirers which do not survive earn gains equal to the mean returns of the portfolio, this does not produce qualitatively different results.

Statistical tests for CARs and BHARs

The *significance of the CARs and the BHARs (abnormal returns significantly different from zero)* is tested for using the conventional *t-test.*

The *difference in CARs and BHARs means* respectively, *between subgroups of acquirers,* are again tested for using the conventional *t-tests* of significance, but I also carry out a *Wilcoxon Rank Sum Test* for the difference in means[38].

3.1.3. Univariate and multivariate settings for the analysis of short-term and long-term returns

I investigate my research question performing several univariate and multivariate tests.

To test my hypotheses in a **univariate setting**, using standard tests for differences in sample means across relevant sub-samples, I split my sample according to:

- the PTTB multiple (High PTTB portfolio vs. Low PTTB portfolio, both for acquirers and targets) to capture the intangibles endowment;
- the relative (with respect to the target) capability of the acquirer to exploit the intangibles' endowment [I define an acquirer a relative (with respect to the target) value builder when the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is greater than the corresponding percentage for the target company].

I then conduct both t-tests for difference of means and nonparametric Wilcoxon rank-sum tests.

* * *

[38] Non-parametric tests represent a suggested solution to the problem of skewed distributions (anyway this should not be a major issue in this study and shold not lead to any bias).

In the **multivariate setting** I combine the results of the event study with OLS regressions. Ordinary least squares regression analysis is used to determine the explanatory power of the independent variables in explaining the bidder's returns. So the dependent variables in my cross-sectional regressions are a 3-days CAR and a 3-years BHAR respectively.

To investigate whether the effect of the acquirer and target's intangibles endowment is different among acquirers with a better (worse) relative (with respect to the target) capability to exploit intangibles, four interaction variables are included. In other words, I designed the multivariate analysis to allow the interactions between two critical variables: the intangibles' endowment (PTTB) and the percentage of intangibles explained by the spread between the ROE and the cost of equity. I consider the sign and the magnitude of the sum of the coefficients to explain the results.

In a multivariate setting, to account for the variables interaction, I run the following ***CAR cross-sectional regressions***:

$$CAR = \alpha_0 + \alpha_1\ Acq\_HighPTTB + \alpha_2\ Tgt\_HighPTTB + \alpha_3\ Acq\_ValueBuilder + \alpha_4\ Acq\_HighPTTB * Tgt\_HighPTTB + \alpha_5\ Acq\_HighPTTB * Acq\_ValueBuilder + \alpha_6\ Tgt\_HighPTTB * Acq\_ValueBuilder + \alpha_7\ Acq\_HighPTTB * Tgt\_HighPTTB * Acq\_ValueBuilder + \varepsilon$$

and, inserting the control variables as a following robustness check:

$$CAR = \alpha_0 + \alpha_1\ Acq\_HighPTTB + \alpha_2\ Tgt\_HighPTTB + \alpha_3\ Acq\_ValueBuilder + \alpha_4\ Acq\_HighPTTB * Tgt\_HighPTTB + \alpha_5\ Acq\_HighPTTB * Acq\_ValueBuilder + \alpha_6\ Tgt\_HighPTTB * Acq\_ValueBuilder + \alpha_7\ Acq\_HighPTTB * Tgt\_HighPTTB * Acq\_ValueBuilder + \alpha_8\ Cash + \alpha_9\ Tender + \alpha_{10}\ Var\_CRSP + \alpha_{11}\ N\_Deals + \alpha_{12}\ Relative\_Size + \alpha_{13}\ Toehold + \alpha_{14}\ Acq\_Leverage + \alpha_{15}\ Related + \alpha_{16}\ Hostile + \varepsilon$$

where:

Acq_HighPTTB: A dummy variable which equals 1 if acquirer *i* is in the High PTTB portfolio of acquirers, and 0 otherwise;

Tgt_HighPTTB: A dummy variable which equals 1 if target *j* is in the High PTTB portfolio of targets, and 0 otherwise;

Acq_ValueBuilder: A dummy variable which:

= 1 if the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is *greater* than the corresponding percentage for the target company, that is if:

$$\frac{\frac{Acq\_ROE}{Acq\_COE}}{Acq\_PTBV} > \frac{\frac{Tgt\_ROE}{Tgt\_COE}}{Tgt\_PTBV}$$

= 0 if the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is *lesser* than the corresponding percentage for the target company, that is if:

$$\frac{\frac{Acq\_ROE}{Acq\_COE}}{Acq\_PTBV} < \frac{\frac{Tgt\_ROE}{Tgt\_COE}}{Tgt\_PTBV}$$

Cash: A dummy variable which equals 1 if the payment is made in cash and 0 otherwise;

Tender: A dummy variable which equals 1 if the stocks are tendered, and 0 otherwise;

Var_CRSP: Return on the CRSP[39] value-weighted index (including dividends) during the period starting one year prior to a merger announcement and ending ten days before the announcement;

N_Deals: Number of mergers in the year prior to a particular announcement;

Relative_Size: The market value of the target's equity divided by the market value of the acquirers' equity (four week prior to the announcement date);

Toehold: Fraction (percentage) of equity held by the acquirer prior to the announcement date;

Acq_Leverage: Ratio of total financial debt to the sum of book value of equity plus book value of financial debt[40];

[39] Center for Research in Security Prices.

Related: A dummy variable which equals 1 if the acquirer is in the same line of business as the target (same two-digit SIC), 0 otherwise;

Hostile: A dummy variable which equals 1 if the acquisition is hostile, and 0 if it is friendly.

This model enables me to analyze the incremental effect of the intangible' endowment conditional upon the acquirer's relative capability (with respect to the target) to leverage it, and, in the regression with other control, the bidder returns as a function of the method of payment, the type of acquisition, the market and merger momentum, the deal characteristics.

- ***In accordance with hypothesis 1a,*** I expect that $\alpha_3 > 0$
- ***In accordance with hypothesis 2a,*** I expect that CAR {Acq_HighPTTB = 1, Tgt_HighPTTB = 1, Acq_ValueBuilder = 1} > CAR {Acq_HighPTTB = 1, Tgt_HighPTTB = 1, Acq_ValueBuilder = 0}, this means that: $\alpha_0 + \alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \alpha_5 + \alpha_6 + \alpha_7 > \alpha_0 + \alpha_1 + \alpha_2 + \alpha_4$, that is: $\alpha_3 + \alpha_5 + \alpha_6 + \alpha_7 > 0$
- ***In accordance with hypothesis 3a,*** I expect that CAR {Acq HighPTTB = 1, Tgt_HighPTTB = 1, Acq_ValueBuilder = 1} > CAR {Acq_HighPTTB = 1, Tgt_HighPTTB = 0, Acq_ValueBuilder = 0}, this means that $\alpha_0 + \alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \alpha_5 + \alpha_6 + \alpha_7 > \alpha_0 + \alpha_1$, that is $\alpha_2 + \alpha_3 + \alpha_4 + \alpha_5 + \alpha_6 + \alpha_7 > 0$

* * *

In a multivariate setting, to account for the variables interaction, I will run the following ***BHAR cross-sectional regressions***, designed in a similar fashion with respect to the CAR specifications:

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[40] I also used as a measure of leverage the debt-to-equity ratio and the debt-to-assets retio. Results are basically unchanged.

$$BHAR = \alpha_0 + \alpha_1\ Acq\_HighPTTB + \alpha_2\ Tgt\_HighPTTB + \alpha_3\ Acq\_ValueBuilder + \alpha_4\ Acq\_HighPTTB * Tgt\_HighPTTB + \alpha_5\ Acq\_HighPTTB * Acq\_ValueBuilder + \alpha_6\ Tgt\_HighPTTB * Acq\_ValueBuilder + \alpha_7\ Acq\_HighPTTB * Tgt\_HighPTTB * Acq\_ValueBuilder + \varepsilon$$

and, inserting the control variables, as a following robustness check:

$$BHAR = \alpha_0 + \alpha_1\ Acq\_HighPTTB + \alpha_2\ Tgt\_HighPTTB + \alpha_3\ Acq\_ValueBuilder + \alpha_4\ Acq\_HighPTTB * Tgt\_HighPTTB + \alpha_5\ Acq\_HighPTTB * Acq\_ValueBuilder + \alpha_6\ Tgt\_HighPTTB * Acq\_ValueBuilder + \alpha_7\ Acq\_HighPTTB * Tgt\_HighPTTB * Acq\_ValueBuilder + \alpha_8\ Cash + \alpha_9\ Tender + \alpha_{10}\ Var\_CRSP + \alpha_{11}\ N\_Deals + \alpha_{12}\ Relative\_Size + \alpha_{13}\ Toehold + \alpha_{14}\ Acq\_Leverage + \alpha_{15}\ Related + \alpha_{16}\ Hostile + \varepsilon$$

where the variables are the same as in the CAR specification.

- ***In accordance with hypothesis 1b***, I expect that $\alpha_3 > 0$
- ***In accordance with hypothesis 2b***, I expect that BHAR { Acq_HighPTTB = 1, Tgt_High PTTB = 1, Acq_ValueBuilder = 1 } > BHAR { Acq_HighPTTB = 1, Tgt_High PTTB = 1, Acq_ValueBuilder = 0 }, this means that: $\alpha_0 + \alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \alpha_5 + \alpha_6 + \alpha_7 > \alpha_0 + \alpha_1 + \alpha_2 + \alpha_4$ that is in the end: $\alpha_3 + \alpha_5 + \alpha_6 + \alpha_7 > 0$
- ***In accordance with hypothesis 3b***, I expect that BHAR {Acq HighPTTB = 1, Tgt_HighPTTB = 1, Acq_ValueBuilder = 1} > BHAR {Acq_HighPTTB = 1, Tgt_HighPTTB = 0, Acq_ValueBuilder = 0}, this means that $\alpha_0 + \alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \alpha_5 + \alpha_6 + \alpha_7 > \alpha_0 + \alpha_1$, that is $\alpha_2 + \alpha_3 + \alpha_4 + \alpha_5 + \alpha_6 + \alpha_7 > 0$

3.1.4. Methodology for the computation of the ROE Spread

The ***ROE spread*** is computed as the difference between the ROE and the cost of equity for the company.

The ***Return on Equity (ROE)*** is calculated using data drawn by COMPUSTAT, taking the net income in the year prior to the acquisition announcement (data item 172) and dividing it by the total common equity at the end of that year (data item 60).

The ***Cost of Equity (COE)*** is calculated using the CAPM (Capital Asset Pricing Model)[41]. The inputs are calculated as follows:

- The *risk-free rate* is the 10-year U.S. Treasury Bond[42] rate for the year of the acquisition;
- *Betas* are estimated by regressing stock returns against market returns[43]. The beta for each stock is calculated using daily stock returns over a 2 years period ending 60 days prior to the announcement date. I require at least 100 non-zero daily acquirers returns. The index for the market model estimation is the CRSP value-weighted index.
- The *Equity Risk Premia*[44] are calculated using a *rolling*[45] geometric average starting from the year 1928[46]. In other words the equity risk premium for a given year is the difference between *i)* the geometric average, from 1928 to the given year, of the

[41] According to the *CAPM*:

$$K_e = R_f + \beta \times (R_m - R_f)$$

where K_e is the cost of equity, R_f is the risk-free rate, β is a measure of the non-diversifiable risk, R_m is the return on the market index. $R_m - R_f$ is the equity risk premium.

[42] In valuation, the time horizon is generally infinite, leading to the conclusion that a *long term risk-free rate* will always be preferable to a short term rate.

[43] The standard procedure for estimating *betas* is to regress stock returns (R_j) against market returns (R_m):

$R_j = a + bR_m$

The slope of the regression *(b)* corresponds to the beta of the stock, and measures the riskiness of the stock.

[44] The *historical premium* is the premium that stocks have historically earned over riskless securities. It is sensitive to how far back one goes in history, whether one use T. Bill rates or T. Bonds rates and whether one uses geometric or arithmetic averages. I went back as far back as I could (1928) in order to minimize the standard error. I calculated the premium over T. Bonds, in order to be consistent with the risk-free rate I used (long term bond rates). Finally I used the *geometric risk premium*, because it is closer to how investors think about risk premiums over long periods.

[45] In other words, for the acquirers and targets related to the deals occurred in 1980, I calculated the geometric average for the year 1928-1980; for the acquirers and targets related to the deals occurred in 1981, I calculated the geometric average for the year 1928-1981; for the acquirers and targets related to the deals occurred in 1982, I calculated the geometric average for the year 1928-1982; and so on.

[46] I thank Aswath Damodaran for providing me with the data regarding annual returns on U.S. stocks and U.S. Treasury Bonds from 1928 to 2002 which I used to calculate my rolling equity risk premia via geometric average.

annual returns on stock and *ii)* the geometric average, from 1928 to the given year, of the annual return on the T. Bond.

[– INSERT TABLE A1 ABOUT HERE –]
[– INSERT TABLE A2 ABOUT HERE –]
[– INSERT TABLE A3 ABOUT HERE –]

3.2. Robustness check

Considerable attention is given to establishing the robustness of my conclusions by examining the sensitivity of measured excess returns to alternative specifications of my models.

To deal with the issues involved, I perform the following robustness checks.

The literature describes a number of further factors that may affect bidder returns. In order to keep the model parsimonious, I do not include them in a first model. In performing the robustness check, I add these variables simultaneously, both in the CAR regression and in the BHAR regression, and then perform the sum of coefficient tests based on the new coefficients from the full regressions.

To explain the cross-sectional variation in short and long run bidder returns, I control on the merger momentum and on the market momentum, in order to isolate and analyse behavioural aspects of capital market and their impact. Furthermore, I control for other characteristics both of the market and of the specific bid which previous studies had found to be somewhat significant in explaining returns to bidding firms (i.e. the method of payment, the type of acquisition, the relative size of the target, the toehold, the debt of the acquirer, the relatedness of the acquisition, the reaction of the target's management, the extent of competition for the target).

Tables 14-17 run a set of regressions and perform the sum of coefficients tests that allow controlling for these factors, which I explaine in detail in the next two paragraphs[47].

3.2.1. Controlling for the momentum: do merger waves or broad market conditions matter?

In order to offer a better understanding of the results, I investigate whether the market reaction to an acquisition announcement depends on the recent merger history and/or on the overall stock market behavior and how big is the possible impact of these events. Recently the academic literature has documented that mergers and acquisitions occur more frequently in period of high market valuation [Jovanovic and Rousseau (2001)]. In particular Shleifer and Vishny (2001) develop a theoretical model that shows the influence of market valuation on the market for corporate control.

To account for this, I include in the empirical model two measures of momentum, one to capture mergers waves *(merger momentum)* and the other one to capture stock market performance *(market momentum).*

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[47] I also performed other robustness checks, not reported, but I will summarize them in the empirical analysis section.
First, it is not possible to be sure that the market was not informed before the close of the trading day prior to the announcement date. In particular in the case of mergers and acquisitions, it is possible that rumors were spread before the announcement date. Moreover, acquirers may start building up their stake well before the announcement of bids and hence it could be interesting adopting a wider window, especially for the period prior to the announcement of the transaction. To deal with this problem, I replicate the analysis using two alternative and larger event windows for the CAR: (-5, +1) and (-10, +1).
Second, many of the mergers in the SDC database involve a target that is much smaller than the bidding firm. Previous research has shown that the average rate of return to *all* bidding firms may not be a proper measure of the returns because of the disparity between the values of the target and acquiring firms. In other words, a very large firm acquiring a very small firm could experience an imperceptible effect on the return regardless of the worthiness of the acquisition. Actually, Asquith, Bruner and Mullins (1983) document that the bidders CARs are positively related to a dummy variable indicating whether the target is at least 10% of the value of the bidder. Jarrell (1983) reports a continuous positive function of the bidder CAR with respect to the relative value of the target. To concentrate on deals most likely to have a significant effect on the bidding firm's stock price, I check the analysis focusing on the largest bids and requiring that the size of the target is at least 10% of the size of the bidder. To measure the relative size of the target and the bidder, I calculate the ratio of the market value of the target to the market value of the bidder.

I analyse the impact of the ***merger momentum*** *(hot merger market vs. cold merger market)*: it is possible that when the market has been reacting favorably to merger announcements, it tends to continue to do so. In particular during my sample period two mergers waves occurred: the wave in the mid-1980s and the wave in the late-1990s. The stock market reaction to a merger announcement is thought to be positively related to the reaction to other recent merger announcements. A hot merger market is one where the announcement reaction to recent mergers has been positive and should be linked with merger waves (measured by the number of mergers in the market). If investors beliefs are irrationally optimistic in relation to merger announcements, then the returns to bidding firms from merger announcements should be autocorrelated and more positive that in other periods[48]. I use the number of mergers in the year prior to a particular announcement as a measure of the merger momentum [N_Deals].

I also analyse the impact of ***market momentum*** *(hot stock market vs. cold stock market)*: transactions announced during hot stock markets should get a better reaction from the market than those announced in a cold market. Actually merger waves generally occur in periods of rising stock prices. So I use the CRSP value-weighted index (including dividends) as an indicator of the general level of stock prices, and, in order to determine a bull or a bear market, I take the change in the index during the period starting one year prior to a merger announcement and ending ten days before the announcement [Var_CRSP].

I also investigate which is the impact of the merger and market momentum on the long run, analysing the bidders' performance after three years and relating it to the momentum linked to the announcement date. If the momentum influence the takeover decision, then it is worth investigating which is the link with the intangibles' endowment and the bidder performance.

[48] Shughart and Tollison (1984) document that there is autocorrelation in merger activity, with the number of mergers in a year helping predict the number of mergers in the next year.

3.2.2. Other control variables

Among the independent variables, it is important to include some factors shown to be correlated some way with acquirers' excess returns in other studies, in order to control for their impact (see for more details previous section 1.1.2.).

I control for these other factors that may affect acquirers' returns[49]:

- *Method of payment:* I control for the method of payment using a dummy variable [Cash] equal to 1 if the payment is in cash, and 0 otherwise. I expect higher bidder returns for cash offers than for stock offers.
- *Type of acquisition:* I control for the type of acquisition using a dummy variable [Tender] equal to 1 if the acquisition is a tender offer, and 0 otherwise. I expect higher bidder returns for tender offers than for mergers.
- *Relative size of the target with respect to the bidder:* the control variable I use is the market value of the target's equity divided by the market value of the acquirer's equity, four weeks prior to the announcement date [Relative_Size]. I expect a positive relationship between the acquirer return and the relative size ratio.
- *Toehold:* I control for the fraction of equity held by the acquirer prior to the announcement date [Toehold]. I expect a positive relationship between the acquirer return and the toehold.
- *Leverage of the acquirer:* I use the ratio of total financial debt to the sum of book value of equity plus book value of financial debt [Acq_Leverage]. I expect a positive relationship between the acquirer return and the acquirer leverage.
- *Relatedness of acquisition:* I define the acquisition as related when the acquirer's and the target's primary two-digits SIC code are identical and in order to control for this, I include a dummy variable [Related] equal to 1 when the acquirer and the target have the same two-digit SIC code (and 0 otherwise). I

[49] I did not control for the *number of multiple bidders*, because this variable is highly correlated (Pearson and Sperman coefficients both equals to 0.968) with the variable *"Hostile"*. Obviously the inclusion of both variables would have lead to a clear multicollinearity problem in the cross-sectional analysis.

expect a positive relationship between the acquirer return and the relatedness of the acquisition.

- *Hostile bid:* a dummy variable [Hostile] equal to 1 if the acquisition is hostile, and equal to 0 if it is friendly. I expect a negative relationship between the acquirer return and the circumstance that the acquisition is hostile.

[– INSERT TABLE 1 ABOUT HERE –]

PART IV

SAMPLE SELECTION AND DATA DESCRIPTION

4.1. Sample selection process

My study is based on a sample of mergers and acquisitions occurring from January 1980 until December 2000[50]. The sample consists only of successfully completed transactions. All mergers and acquisitions where both the acquirer and the target are listed in the U.S. during the sample period is taken as the population, subject to the condition that the acquiring firm held less than 10 percent of the target at the time of the acquisition announcement and achieved a majority stakeholding in the target by virtue of the acquisition. This criterion is adopted in order to limit my sample to control transactions. The first criterion (the listing status) is imposed as enables me to use both the CRSP (Center for Research in Security Prices) daily stock return data to calculate the bidders' returns and the COMPUSTAT data to calculate the Price to Tangible Book and the Price to Book Value of the acquirer and the target.

The required data are collected from various sources. The initial sample of mergers and acquisitions on the U.S. stock market is identified through the *SDC (Securities Data Corp.'s) Platinum™ Worldwide Mergers and Acquisitions Database* provided by Thomson Financial Securities Data, a comprehensive listing of every merger and acquisition event in the U.S. since 1979. The stock market data and various firm-specific information are collected from CRSP NYSE/AMEX/NASDAQ tapes and COMPUSTAT Industrial Annual.

[50] I stopped to the year 2000 because I required three years following the acquisition in order to calculate the Buy-and-Hold Abnormal Returns.

Summarizing, to be included in my sample, mergers and acquisitions must meet the following requirements:

- The bidder and the target were publicly traded;
- The merger or acquisition was announced *(announcement date)*[51] between January 1, 1980 and December 31, 2000;
- The merger or acquisition was completed *(effective date)* in the same time horizon;
- The deal is classified either as a merger or an acquisition of majority interest or as a tender offer;
- After the transaction the bidder controlled more than 50% of votes (because I search for deals at which completed control is realized);
- I eliminate companies with a negative book value.

These requirements led to a final sample of 3,389 observations.

4.2. Descriptive statistics and correlations

Descriptive statistics for the key characteristics of targets and bidders are shown in tables 2-6, while table 7 shows the correlation matrix. Descriptives, other than providing some parameters about the sample and the differences between acquirers and targets, and between the portfolio of High PTTB acquires (targets) vs. the portfolio of Low PTTB acquirers (targets), allow to search for a confirmation of some of the hypotheses on the reasons behind a takeover (see section 1.1.1.).

[51] The *announcement date* is defined as the date when the deal was first announced and it is drawed from the SDC database.

In figure 1 I report the aggregate deal value (transaction value)[52] per year, that is the pattern over time of the yearly amount spent on acquisitions. It is clear that the magnitudes of the last six years of the sample for amounts spent are very different from what they are for the other years. The aggregate deal value increased substantially from 1995 on.

[– INSERT FIGURE 1 ABOUT HERE –]

In my sample, the method of payment[53] was cash in 847 deals (25.0%), stock in 1,420 transactions (41.9%), while in the remaining 1,122 (33.1%) was a combination of both (table 2). Mergers are 83.4% of the transactions, while tender offers are 16.6%. 96.2% of acquisitions are friendly, while 3.8% are hostile. In the majority of transactions (96.1%) there is one single bidder, while 3.9% of acquisitions involves multiple bidders.

[– INSERT TABLE 2 ABOUT HERE –]

Comparing the sample of acquirers with the sample of targets as a whole, it turns out the following.

The average acquirer in my sample as a mean assets size of 5,170.72 million and a median value of 1,085.25 million, while the means assets size for the targets is 1,229.50, with a median value of 169.40. Targets are smaller in size with respect to the acquirers. Acquirers show size measures higher than targets and a higher relative valuation, except for

[52] The *deal value* (or *transaction value*) is the total value of consideration paid by the acquiror, excluding fees and expenses. The dollar value includes the amount paid for all common stock, common stock equivalents, preferred stock, debt, options, assets, warrants, and stake purchases made within six months of the announcement date of the transaction. Liabilities assumed are included in the value if they are publicly disclosed. Preferred stock is only included if it is being acquired as part of a 100% acquisition. If a portion of the consideration paid by the acquiror is common stock, the stock is valued using the closing price on the last full trading day prior to the announcement of the terms of the stock swap. If the exchange ratio of shares offered changes, the stock is valued based on its closing price on the last full trading date prior to the date of the exchange ratio change. For public target 100% acquisitions, the number of shares at date of announcement is used. Deal values are drawn from the *SDC (Securities Data Corp.'s) Platinum™ Worldwide Mergers and Acquisitions Database* provided by Thomson Financial Securities Data.

[53] I define a transaction a cash offer if the final consideration paid is 100% cash. I define a transaction a stock offer if the final consideration is 100% bidder's equity. I define a transaction a mixed offer if the final consideration is a mix of cash, equity or any other security.

the ratio R&D/sales. Targets as a whole invest more in R&D than acquirers. Targets show a mean (median) R&D/Sales of 35.75 (8.60), while acquirers invest in mean (median) 17.35 (6.14). This can confirm the hypothesis of the transfer of technology (see section 1.1.1.), which argues that a possible reason for a takeover relates to the possibility of acquiring the technological advantages or knowledge capital of the target firm. Therefore, a firm with a successful output of R&D has a greater likelihood of being acquired. The higher the R&D expenditures, the greater the probability of being acquired.

Moreover, acquirers have a mean (median) ROE higher than the targets. Actually targets in the 25th percentile suffer losses and so the ROE is even negative. This is coherent with the hypothesis of tax advantage (see section 1.1.1.), which states that acquiring firm might have the advantage to carry forward the tax loss of the target firm to offset its taxable income, and with the hypothesis of inefficient management, which argues that if the management of the firm is poorly performed, then the firm is likely to be an acquisition target (see section 1.1.1.).

Overall, it seems that targets are less levered than acquirers. One of the reasons to acquire is actually to exploit the leverage of the targets, as predicted by the hypothesis of the inefficient financial structure (see section 1.1.1.), according to which low leverage in the target may signal unused debt capacity which the potential acquirer could exploit to his advantage.

The mean (median) PTBV value for the acquirers is 3.26 (2.04), while for the targets is 2.69 (1.37)[54]. I divide my sample of acquirers and targets according to the median of the PTTB multiple. The mean (median) PTTB value for the acquirers is 4.67 (2.30), while for the targets is 3.99 (1.85).

[– INSERT TABLE 3 ABOUT HERE –]

[54] This is in line with previous studies. For instance, Sudarsanam and Mahate (2003) found for the entire sample of acquirers a mean PTBV of 2.46 and a median PTBV of 1.82. They divided their sample of 519 acquirers into 3 equally sized portfolios based on their PTBV ratios three months prior to the bid announcement. The high PTBV portfolio has a mean PTBV value of 4.28, compared to 1.7 and 0.86 for the Medium and the Low portfolios respectively, while the corresponding median value are 3.3, 1.7 and 0.9 for the High, Medium and Low PTBV portfolios respectively. Feng Li (2004) for his sample of 644 U.S. acquirers reports a mean market-to-book ratio of 2.06, while the median is 1.51, and for his sample of 637 targets the mean and the median market-to-book ratio are respectively 1.90 and 1.29.

[– INSERT TABLE 4 ABOUT HERE –]

* * *

Comparing the High PTTB portfolio of acquirers with the Low PTTB portfolio of acquirers, and comparing the High PTTB portfolio of targets with the Low PTTB portfolio of targets, it turns out the following.

The mean (median) PTTB value for the High PTTB portfolio of acquirer is 7.50 (2.31), compared to the 1.75 (1.46) of the Low PTTB portfolio. In the case of targets, the High Portfolio has a mean (median) PTTB value of 5.16 (2.83), while the mean (median) for the Low Portfolio is 1.63 (0,98).

Acquirers in the Low PTTB portfolio have a Capex very low. Actually the median value of Capex is zero (the mean value is 77.90), and the capital expenditures in the 10^{th}, 25^{th} and 50^{th} percentile is zero. On the contrary, acquirers in the High PTTB portfolio have a mean (median) Capex of 182.67 (11.91). The same applies to the targets partition, with the targets in the Low PTTB portfolio (mean Capex of 34.29, median Capex of 0.80) investing less than the targets in the High PTTB portfolio (mean Capex of 28.12, but median Capex of 2.27, and higher values in the percentiles).

Acquirers in the High PTTB portfolio invest more in R&D than acquirers in the Low portfolio. Actually the ratio R&D/Sales of acquirers in this portfolio is higher (mean 21.06, median 6.56) with respect to acquirers in the Low PTTB portfolio (mean 7.81, median 3.22). Same for the targets: mean (median) for the High PTTB portfolio of 42.54 (11.10), and mean (median) for the Low PTTB portfolio of 19.43 (4.48).

[– INSERT TABLE 5 ABOUT HERE –]

[– INSERT TABLE 6 ABOUT HERE –]

Table 7 is the correlation matrix of the indipendent variables. The highest correlation is 40.2% between the variables "Cash" and "Tender". Since none of the correlations is particularly high, no corrections are made to the analysis[55].

[– INSERT TABLE 7 ABOUT HERE –]

[55] If the simple correlation among indipendent variables is too high, there could be a problem of multicollinearity. Multicollinearity between two indipendent variables, biases the *t*-statistics of the estimated coefficients toward zero. Anyway, this is not a relevant issue in my study, since the control variables are used just in the robustness tests of the multivariate analysis, to verify if the main hypothesized relationships related to my research question still hold after a stiffer challenge.

PART V

EMPIRICAL EVIDENCE AND FINDINGS

5.1. Empirical analysis

In this section I present the results of my primary research question, namely whether an acquirer, to which the capital market attaches a strong intangibles endowment, is better off when buying a target with a strong endowment of generic intangibles (that is intangibles that cannot be sold separately), even if it has to put a premium on the current market price of that company (primary research question).

First I present the results of the univariate tests, and then the results of the multivariate tests, together with the results of the robustness tests.

5.2. Univariate tests

In this section I present the results I obtained from the univariate tests.

In a univariate setting, I test my hypotheses using standard tests for differences in sample means across the relevant sub-samples. In order to understand *i)* the impact of the endowment of intangible resources on the wealth effects of bidding firms, and *ii)* the relative (with respect to the target) capability of the acquirer to leverage it, I split my sample into subgroups to study the inter-sample effects of my variables. I test for the

impact of the endowment of intangibles assets and the capability to leverage it on bidding firms' excess returns. Univariate tests provide significant support for all my hypotheses.

5.2.1. Interaction between PTTB portfolios and percentage of intangibles explained by the spread between ROE and Cost of Equity

As predicted by my primary research question (HP2a and HP2b), I observe that the CAR and the BHAR are significantly less negative for high PTTB bidders acquiring high PTTB targets, when the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is *greater* than the corresponding percentage for the target company. Difference-in-means tests show that, consistent with HP2a and HP2b, the CAR and the BHAR are significantly lower (more negative) for high PTTB bidders acquiring high PTTB targets, when the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is *lesser* than the corresponding percentage for the target company.

For the bid announcement period, Panel A of table 8 shows that glamour acquirers (acquirers in the High PTTB portfolio) value builders acquiring High PTTB targets experience mean CAR of -0.25% (p-value 0.038), while glamour acquirers value destroyers acquiring high PTTB targets experience mean CAR of -1.43%. The difference in mean Cumulative Abnormal Returns (1.18) between the two groups is statistically significant at the 5% level (p-value of 0.032 with the t-test, and p-value of 0.054 with the Wilcoxon test).

For post-acquisition period, Panel A of table 8 shows mean BHAR[56] of -1.59% (p-value of 0.052) for glamour acquirers value builders acquiring High PTTB targets, while glamour acquirers value destroyers acquiring high PTTB targets experience mean BHAR of -11.49% (p-value of 0.031). The difference in mean Buy-and-Hold Abnormal Returns

[56] The estimate of long-run performance is in the range of estimates by earlier studies (e.g. Loughran and Vijh, 1997, Rau and Vermaelen, 1998, and Mitchell and Stafford, 2000).

(9.90) is significant (at the 5% level, p-value of 0.045, with the t-test, and at the 10% level, p-value of 0.061, with the Wilcoxon test).

Thus, consistent with HP2a/b, there is evidence of a huge outperformance (CAR = 1.18 and BHAR = 9.90) by glamour acquirers value builders acquiring High PTTB targets with respect to glamour acquirers value destroyers acquiring High PTTB targets.

Glamour acquirers value builders acquiring Low PTTB targets (panel A) experience at bid announcement an insignificant CAR of -0.28, significantly outperforming glamour acquirers value destroyers acquiring High PTTB targets by 1.15[57] (p-value of 0.012 with the t-test and 0.031 with the Wilcoxon rank sum test). In the long run they experience a significant loss: the BHAR is -7.59 (p-value of 0.053), underperforming significantly glamour acquirers value builders acquiring High PTTB targets by a significant 6.01 (p-value with the t-test of 0.094, with the Wilcoxon rank sum test of 0.054).

Glamour acquirers value destroyers acquiring Low PTTB targets experience at bid announcement a significant CAR of -0.83, while in the long run they experience a significant loss: the BHAR is 9.26 (p-value of 0.064), underperforming significantly glamour acquirers value builders acquiring High PTTB targets by a significant 7.68 (p-value with the t-test of 0.057, with the Wilcoxon rank sum test of 0.058).

[– INSERT TABLE 8 PANEL A ABOUT HERE –]

Value acquirers value builders acquiring high PTTB targets (panel B) experience at bid announcement a significant (at 5% level, p-value of 0.044) CAR of -0.36, significantly outperforming value acquirers value destroyers acquiring high PTTB targets (which show a significant CAR of -1.14) by 0.78 (p-value with the t-test of 0.021, and with the Wilcoxon rank sum test of 0.049). So value acquirers acquiring targets with a huge endowment of intangibles are punished by the market if they are not better able, relatively to the target, to leverage on these intangible assets. In the long run value acquirers value builders acquiring high PTTB targets experience an insignificant BHAR of 2.98, but value acquirers value destroyers acquiring high PTTB targets experience a significant (at 5% level, p-value of

[57] Of course in the table the sign is minus because it is -1.43- (-0.28) which gives -1.15.

0.050) CAR of -2.18, confirming the fact that also in the post-acquisition period the market punishes acquirers buying a huge endowment of intangibles without a better capability to leverage it.

Noticeably value acquirers value destroyers acquiring high PTTB targets underperform, both in the short-run and in the long-run, value acquirers (both value builders and value destroyers) acquiring low PTTB targets (panel B). At bid announcement, they significantly (at 5% level, p-value of 0.040 with the t-test, 0.014 with the Wilcoxon rank sum test) underperform value acquirers value builders acquiring low PTTB targets by a difference in mean CAR of -1.15, and in the long-run by a significant (just under the t-test, p-value of 0.024, while the Wilcoxon rank sum test gives a p-value of 0.112) difference in mean BHAR of -10.66. With respect to value acquirers value destroyers acquiring low PTTB targets, value acquirers value destroyers acquiring high PTTB targets underperform in the short-run by a significant (at 10% level, p-value of 0.081 with the t-test, of 0.084 with the Wilcoxon rank sum test) difference in mean CAR of -1.31, and in the long-run by a significant (at 5% level with the t-test, p-value of 0.030, at 10% level with the Wilcoxon rank sum test) difference in mean BHAR of -10.61. The market heavily punishes value acquirers value destroyers acquiring targets with a huge intangibles' endowment with respect to value acquirers value builders acquiring targets with a little intangible base.

For value acquirers acquiring low PTTB targets (panel B), it doesn't matter the difference between acquirers value builders and value destroyers. They outperform all the other categories of acquirers, and experience both in the short-run and in the long-run positive abnormal returns, which are very close among them [value acquirers value builders acquiring low PTTB targets show an insignificant CAR of 0.01 and a significant (at 1% level, p-value of 0.014) BHAR of 8.48, while value acquirers value destroyers acquiring low PTTB targets show an insignificant CAR of 0.17 and a significant (at 5% level, p-value of 0.024) BHAR of 8.43]. However, at bid announcement, the CARs, while positive, are not statistically significant and their difference is also not significant. Thus the two value acquirers portfolios acquiring low PTTB targets (value builders and value destroyers) generate similar returns from a statistical point of view. This sounds reasonable, since the intangibles endowment is not huge both in value acquirers and in low PTTB targets.

[– INSERT TABLE 8 PANEL B ABOUT HERE –]

At bid announcement, glamour acquirers value builders acquiring high PTTB targets (panel C) significantly outperform value acquirers, both value builders and value destroyers, acquiring High PTTB targets (panel C), the former with a difference in mean CAR of 0.11 (significant at 10%, p-value of 0.083 with the t-test, and of 0.093 with the Wilcoxon rank sum test) and the latter with a difference in mean CAR of 0.89 (significant at 10% level with the t-test, p-value of 0.083 and at 5% level with the Wilcoxon rank sum test, p-value of 0.031). This is consistent with my research question, highlighting again how glamour acquirers value builders acquiring high PTTB targets perform better with respect to other acquirers (value) which acquire the same kind of targets (high PTTB).

Glamour acquirers value destroyers acquiring high PTTB targets significantly underperform value acquirers value builders acquiring high PTTB targets (panel C) at bid announcement (difference in mean CAR of -1.07, significant at 10% with the t-test, p-value of 0.068, at 5% with the Wilcoxon rank sum test, p-value of 0.033) and in the post-acquisition period (difference in mean BHAR of -14.47, significant at 1% level with the t-test, p-value of 0.012, and at 5% level with the Wilcoxon rank sum test, p-value of 0.024). This is an evidence of the fact that glamour acquirers acquiring high PTTB targets, when are not better able to leverage on intangible assets, are punished more than other acquirers (value) which acquire the same kind of targets (high PTTB) but are value builders, better able to leverage on the intangible endowment.

Moreover, glamour acquirers value destroyers acquiring high PTTB targets significantly underperform in the long run value acquirers value destroyers acquiring high PTTB targets by a difference mean in BHAR of -9.31 (significance at 5% level with the t-test, p-value of 0.051, and at 10% level with the Wilcoxon rank sum test, p-value of 0.061).

[– INSERT TABLE 8 PANEL C ABOUT HERE –]

Glamour acquirers acquiring low PTTB targets strongly and significantly underperform value acquirers acquiring the same kind of targets (low PTTB), irrespective of the value builders/destroyers status (panel D). The differences in BHAR, all significant, range in the post-acquisition period from -16.02 to-17.77.

[– INSERT TABLE 8 PANEL D ABOUT HERE –]

Consistent with HP1a/b, "Value Builder" bidders – i.e. bidders with greater ability to leverage on intangible assets – earn systematically higher CAR upon bid announcement relative to value destroyer bidders (non value builders) and higher BHAR in the post-acquisition period relative to value destroyer bidders (even if the difference in mean is not always significant, the direction is as predicted). Just in the case of value bidders acquiring low PTTB targets the difference between value builder bidders and value destroyer bidders doesn't matter, probably for the reasons just stated.

Glamour acquirers value builders acquiring High PTTB targets earn at bid announcement a significant (at 5% level, p-value of 0.028) -0.25 CAR. Glamour acquirers value destroyers acquiring Low PTTB targets earn at bid announcement a significant (at 5% level, p-value of 0.047) -0.83 CAR. The difference in mean is 0.56, which however is not significant. The direction is as predicted, and this gives minimal support to HP3a, which however, the difference in means being not significant, is not verified.

On the contrary, HP3b is verified. Actually, glamour acquirers value builders acquiring High PTTB targets earn in the post-acquisition period a significant (at 5% level, p-value of 0.052) -1.59 BHAR. Glamour acquirers value destroyers acquiring Low PTTB targets earn in the post-acquisition period a significant (at 10% level, p-value of 0.064) -9.26 BHAR. The difference in mean is 7.68, which is significant (at 10% level, p-value of the t-test of 0.057 and p-value of the Wilcoxon rank sum test of 0.058). This is consistent with HP3b

5.2.2. *Interaction between PTTB portfolios, percentage of intangibles explained by the spread between ROE and Cost of Equity, and method of payment*

In table 9 (panels A-D) I present the statistics for the test of difference relative to the method of payment selected by acquirers. Table 9 (panel A and B) shows that glamour acquirers (acquiring both High and Low PTTB targets and irrespective of the capability to leverage on intangible assets) tend to use their own stock to finance their acquisition.

[– INSERT TABLE 9 PANEL A ABOUT HERE –]

[– INSERT TABLE 9 PANEL B ABOUT HERE –]

As predicted by the first part of Hypothesis 4, in the high PTTB portfolio of acquirers, the glamour group, the proportion of acquirers making pure equity offers is higher than that of pure cash acquirers. In the case of glamour acquirers as a whole, 47.8% of the transactions are financed by equity. On the contrary, 25.2% are financed by cash.

But one thing is worth to notice. The proportion of transactions financed with equity is lower when glamour acquirers value builders acquire high PTTB targets (47.4%) than when glamour acquirers value destroyers acquire high PTTB targets (60.3%) (panel A). It seems that when glamour acquirers acquiring High PTTB targets have a superior capability to leverage on the intangibles endowment of the target, they are more willing to pay in cash, because they feel more confident in the success of the integration.

In the low PTTB portfolio of acquires, the value group, pure cash offers almost equals in proportion pure equity. In all the two portfolios (value acquirers acquiring High and Low PTTB targets) mixed offers are more frequent (except in the case value acquirers value builders acquiring Low PTTB targets) than either cash or equity offers.

[– INSERT TABLE 9 PANEL C ABOUT HERE –]

[– INSERT TABLE 9 PANEL D ABOUT HERE –]

So there is significant support for the hypothesis tha glamour acquirers are more likely to use equity to finance the acquisition, while for value acquirers the use of cash or stock is equally frequent to finance the acquisiton.

* * *

Next I examine the comparative returns in the short-run (CAR) and in the long-run (BHAR) of cash and equity offers in each group.

Bidders financing the deal with cash outperform bidders offering stock, both in the short term and in the long term and irrespective of the difference between glamour and value status, value builders and value destroyers and High or Low PTTB targets. In the short and in the long run, cash strongly outperforms equity offers both in the glamour and in the value group of acquirers: the difference tests are statistically significant. That is the cash method of payment dominates the stock method of payment in generating shareholder value creation, irrespective of the glamour/value status of the acquirer.

Consistent with Hypothesis 4, glamour acquirers value builders acquiring High PTTB targets, when paying with cash (panel A), show a significant (at 5% level, p-value of 0.049) and positive CAR (0.33) and a significant (at 5% level, p-value of 0.041) and positive BHAR (4.53). The difference in mean abnormal returns between cash and stock payments for this group, is significant both in the short and in the long term (just in the short run and under the Wilcoxon test the difference is not significant). Glamour acquirers value builders acquiring high PTTB targets paying with cash significanlty outperform at bid announcement those acquirers of the same group paying with stock by a difference in CAR of 0.91 (significant at 10% level with the t-test, p-value of 0.089), and in the long-run significantly outperform by a difference in BHAR of 7.74 (significance at 10% level, p-value of 0.096 with the t-test and p-value of 0.072 with the Wilcoxon rank sum test).

Noticeably, glamour acquirers value destroyers acquiring high PTTB targets are heavily punished when paying with stock: they highly significantly report at bid announcement a CAR of -2.03 (significance at 1% level with the t-test, p-value <0.001) and in the post-acquisition period a BHAR of -14.67 (p-value <0.001).

Glamour acquirers value builders acquiring low PTTB targets (panel B), in the short-run show a significant difference in mean CAR of 0.84 between the sub-group paying with cash and the sub-group paying with stock. However, in the long-run, they show a significant BHAR of -2.54 (at 5% level, p-value of 0.052) when paying with cash, and of -11.33 (at 1% level, p-value of 0.011) when paying with stock.

Glamour acquirers value destroyers acquiring low PTTB targets (panel B) perform even worse, showing a significant (at 10% level, p-value of 0.068) -5.74 BHAR when paying with cash, and a significant (at 5% level, p-value of 0.039) -11.84 BHAR when paying with stock.

It is worth noting that glamour acquirers financing the transaction with equity underperform with respect to those glamour acquirers financing with cash, even when the glamour acquirers are value builders and they acquire High PTTB targets.

Value acquirers value builders acquiring high PTTB targets (panel C) report at bid announcement a significant (at 5% level, p-value of 0.019 with the t-test, and of 0.026 with the Wilcoxon rank sum test) difference in CAR of 1.55 between the returns of the sub-group paying in cash and the sub-group paying in stock. But in the long-run they show a strongly positive and significant (at 5% level, p-value of 0.047) BHAR of 9.67 and a significant (at 5% level, p-value of 0.048 with the t-test, and of 0.014 with the Wilcoxon ranks sum test) difference in BHAR of 14.63 between the returns of the sub-group paying with cash and the sub-group paying with stock.

Value acquirers value builders acquiring low PTTB targets (panel D) report at bid announcement a significant (at 10% level, p-value of 0.107) CAR of 0.95 and a significant BHAR (at 1% level, p-value of 0.003) when paying with cash. When paying with stock, they report at bid announcement a significant (at 1% level, p-value <0.001) CAR of -0.91. At bid announcement, the difference in mean CAR of 1.86 between the cash and the stock sub-group is significant (at 1% level with the t-test, p-value of 0.001, and at 10% level with the Wilcoxon ranks sum test, p-value of 0.088), while in the long-run, the difference in mean BHAR of 10.56 is significant (at 5% level, p-value of 0.024 with the t-test, and of 0.023 with the Wilcoxon rank sum test).

Value acquirers value destroyers acquiring high PTTB targets (panel D), still showing that for this group the value builders/value destroyers status doesn't matter, show in the long-run a significant (at 1% level, p-value of 0.008) BHAR of 14.30 when paying with cash. They show at bid announcement a significant (at 5% level with the t-test, p-value of 0.035, and at the 1% level with the Wilcoxon rank sum test, p-value of 0.011) difference in mean CAR of 1.09 between the sub-group paying in cash and the sub-group paying in stock, and in the long-run a significant (at 5% level, p-value of 0.045 with the t-test and of 0.054 with the Wilcoxon rank sum test) difference in mean BHAR of 13.13.

5.3. Multivariate tests (cross-sectional analysis)

My univariate tests appear to demonstrate that CAR and BHAR are significantly less negative for glamour bidders acquiring High PTTB targets, when the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is *greater* than the corresponding percentage for the target company. I now turn to multivariate tests to determine whether my primary research findings persist when I put it to the stiffer challenge of standing up to a panel of independent variables.

I attempt to explain the cross-sectional variations in wealth effects for bidder firms. I use variable-window CARs and BHARs to examine the cross-sectional differences in returns to the stockholders of the acquiring firms. Specifically, I examine the effects of the endowment of intangibles assets of both target and acquiring firms. I use standardized least squares regression analysis to determine the impact of the explanatory variables on the bidding firms' abnormal returns at the announcement of the acquisitions and after the post-acquisition period.

The tables are linked on a couple basis. The first table displays the results for the abnormal return (CAR or BHAR) analyses. Panel A reports the "raw" regression results. The second table, divided into Panels B-D, uses the results in the previous table to

summarize the incremental effect associated with the intangibles' endowment and the relative (with respect to the target) capability of the acquirer to leverage it. The second table provides the results of the sum of coefficient tests. This kind of test is necessary to investigate my hypotheses since I used the interaction variables, and so the sum of coefficients test captures the incremental effect associated with each interaction variable.

While it is important to see the coefficients and the significant of the variables Acq_HighPTTB, TgtHighPTTB and Acq_ValueBuilder as a single variable in the regression, one cannot conclude anything on the coefficient and the significance of the variables interaction between Acq_HighPTTB, Tgt_HighPTTB and Acq_ValueBuilder, because this variables capture the incremental effect and so one has to look at the sum of coefficients test to draw some conclusions.

It follows that, to answer my research question and verify my hypotheses, the focus is on the second table related to the each regression, the one dedicated to the sum of coefficients tests.

Multivariate tests confirm the results obtained with my univariate tests, both without and with control variables.

5.3.1. Short-term returns without control variables

This section examines in a multivariate setting the stock market's initial reation to an acquisition announcement.

The models I described in the research methodology section enable me to analyze the incremental effect of the intangible' endowment conditional upon the acquirer's relative capability (with respect to the target) to leverage it. In this section I begin to analyze the determinants of Cumulative Abnormal Returns without inserting control variables (table 10).

The coefficients of Acq_HighPTTB and Tgt_HighPTTB are both negative and significant (p-value of 0.075 and 0.034 respectively). This is an important result, because it

means that the endowment of intangibles, per se, is in the short run negatively related to the CAR. The coefficient of Acq_ValueBuilder is negative (in contrast with my HP1a) but it is not significant.

The other coefficients on the interaction variables are not significant.

The explanatory power of the regression model is low[58]. However, a number of important control variables have been omitted from the model. Control variables are added to the regression in the section related to the robustness tests.

[– INSERT TABLE 10 ABOUT HERE –]

Then I turn to the sum of coefficient tests (table 11).

As already one can see in the regression, the coefficient on Acq_ValueBuilder is negative but not significant (panel B). So the Hypothesis 1a is not verified.

Panel C shows that the CAR for glamour acquirers value builders acquiring High PTTB targets is significantly (at 5%, p-value of 0.017) higher than the CAR of glamour acquirers value destroyers acquiring High PTTB targets. Hence, it seems that it is not the intangibles' endowment per se but rather the combination of a huge acquirer and target's endowment of intangibles and the relative (with respect to the target) capability of the acquirer to leverage it that creates the potential for higher abnormal return. Panel C displays the incremental effect of Acq_ValueBuilder on the CAR of glamour acquirers acquiring High PTTB target. There is a positive and significant association. The CAR is, on average, 0.01182 higher for glamour acquirers value builders acquiring High PTTB targets than for glamour acquirers value destroyers acquiring High PTTB targets. This result is consistent with Hypothesis 2a.

Panel D shows that the CAR for glamour acquirers value builders acquiring High PTTB targets is insignificantly (p-value of 0.303) higher than the CAR of glamour acquirers value destroyers acquiring Low PTTB targets. While the direction is as predicted, Hypothesis 3a is not fully supported from a statistical point of view.

[58] The explanatory power of all my regresssions is generally low, but this is the rule for cross-sectional regressions of bidder abnormal returns. For instance, see Travlos (1987), Morck, Shleifer and Vishny (1990) for their very low reported R^2s.

[– INSERT TABLE 11 ABOUT HERE –]

5.3.2. Long-term returns without control variables

This section examines in a multivariate setting the long-run returns to an acquisition announcement, without inserting in the regression the control variables (table 12).

The coefficients of Acq_HighPTTB and Tgt_HighPTTB are both negative and significant (p-value >0.001 and 0.029 respectively). This is an important result, because it means that even in the long-run the endowment of intangibles, per se, is negatively related to the BHAR. The coefficient of Acq_ValueBuilder is positive (according with my HP1a) but it is not significant.

The coefficient of the variable interaction between Acq_HighPTTB, Tgt_HighPTTB and Acq_ValueBuilder (while one cannot conclude anything, because this variable alone captures the incremental effect and so one has to look at the sum of coefficients test), is positive (according to my research question) and significant.

The other coefficients on the interaction variables are not significant.

[– INSERT TABLE 12 ABOUT HERE –]

Then I turn to the sum of coefficient tests (table 13).

As already one can see in the regression, the coefficient on Acq_ValueBuilder is positive but not significant (panel B). So the Hypothesis 1b is not verified.

Panel C shows that the BHAR for glamour acquirers value builders acquiring High PTTB targets is significantly (at 1%, p-value of 0.011) higher than the BHAR of glamour acquirers value destroyers acquiring High PTTB targets. Hence, even in the long-run, it seems that it is not the intangibles' endowment per se but rather the combination of a huge acquirer and target's endowment of intangibles and the relative (with respect to the target) capability of the acquirer to leverage it that creates the potential for higher abnormal return.

Panel C displays the incremental effect of Acq_ValueBuilder on the BHAR of glamour acquirers acquiring High PTTB target. There is a positive and significant association. The BHAR is, on average, 0.09901 higher for glamour acquirers value builders acquiring High PTTB targets than for glamour acquirers value destroyers acquiring High PTTB targets. This result is consistent with Hypothesis 2b.

Panel D shows that the BHAR for glamour acquirers value builders acquiring High PTTB targets is significantly (at 10% level, p-value of 0.081) higher than the BHAR of glamour acquirers value destroyers acquiring Low PTTB targets. The BHAR is, on average, 0.07677 higher for glamour acquirers value builders acquiring High PTTB targets than for glamour acquirers value destroyers acquiring Low PTTB targets. Differently from the short-run, in the long-run hypothesis 3b is fully supported.

Panel C and D both provide evidence of the role of Acq_ValueBuilder in the long-run, when this charactheristic of the bidder is linked to both a High PTTB acquirer and a High PTTB target.

[– INSERT TABLE 13 ABOUT HERE –]

5.4. Robustness tests

I examine the robusteness of my results to insure that my inferences hold up when I control for other factors shown to be correlated with acquirers' excess returns[59]. Through

[59] I also performed some sensitivity tests (not shown) both on my base model and on my full model with the control variables, replicating the analysis using 2 alternative event windows for the CAR: (-5, +1) and (-10, +1), and an alternative window for the BHAR (+40, 3 years) The results are basically unchanged and are consistent with the findings I present with the other windows. I also performed (untabulated) sensitivity tests on certain control variables. All the results are basically unchanged when I define Acq_Debt as debt-to-equity ratio (rather than total financial debt-to-sum of book value of equity plus book value of financial debt), or I take the natural logarithm of the relative market value (rather than the relative market value). I also focused only on the largest bids, i.e. those in which the relative value of the target is at least 10% of the value of the bidder (not shown). The results are still confirmed.

the inclusion of these control variables I conduct the same robustness checks using the CAR as I do with the BHAR.

Each of the full model (that is including the control variables) for CAR and BHAR, while broadly following the literature predictions related to the other explanatory variables, confirms the results of the base model. After controlling for the characteristics of the offer and the contest, the relation among the intangibles' variables and the relative percentage of intangibles explained by a ROE greater than the cost of equity, maintein the same direction and almost the same significance.

So the pattern observed in my results is remarkably robust.

5.4.1. Short-term returns with control variables

This section examines in a multivariate setting the short-run returns to an acquisition announcement, inserting in the regression the control variables (table 14).

The coefficients of Acq_HighPTTB and Tgt_HighPTTB are both negative but, contrary to the regression without control variables, they are insignificant. The coefficient of Acq_ValueBuilder turns out to be positive (contrary to the regression without control variables) but it is not significant.

Many of the control variables are significant and in the hypothesized direction, consistent with the earlier literature. The variable Cash is positive and significant at 1% level (p-value <0.001), the variable Tender is positive and significant at 5% level (p-value of 0.031). The coefficient on the twelve months return on the CRSP value-weigthed index (Var_CRSP), expressive of the market momentum, is positive and weakly statistically significant (the p-value is 0.105): this provides evidence that announcing a transaction in a bull market yields a better CAR than announcing one in a bear market. The coefficient on the overall number of mergers in the prior year (N_Deals), expressive of the merger momentum, even if in the hypothesized direction (positive), is on the contrary insignificant. Relative_Size is positive and significant at the 5% level (p-value of 0.015), Toehold is

positive and significant at the 5% level (p-value of 0.027), Acq_Leverage is positive and significant at 5% level (p-value of 0.043), Related is positive and significant at 5% level (p-value of 0.019). Hostile is negative (as predicted), but insignificant.

[– INSERT TABLE 14 ABOUT HERE –]

Then I turn to the sum of coefficient tests (table 15).

As already one can see in the regression, the coefficient on Acq_ValueBuilder is positive but not significant (panel B). So the Hypothesis 1a is still not verified.

Panel C shows that the CAR for glamour acquirers value builders acquiring High PTTB targets is significantly (at 5%, p-value of 0.033) higher than the CAR of glamour acquirers value destroyers acquiring High PTTB targets. Hence, even with the control variables, it seems that it is not the intangibles' endowment per se but rather the combination of a huge acquirer and target's endowment of intangibles and the relative (with respect to the target) capability of the acquirer to leverage it that creates the potential for higher abnormal return. Panel C displays the incremental effect of Acq_ValueBuilder on the CAR of glamour acquirers acquiring High PTTB targets. There is a positive and significant association. The CAR is, on average, 0.01016 higher for glamour acquirers value builders acquiring High PTTB targets than for glamour acquirers value destroyers acquiring High PTTB targets. This result is consistent with Hypothesis 2a.

Panel D shows that the CAR for glamour acquirers value builders acquiring High PTTB targets is insignificantly (p-value of 0.143) higher than the CAR of glamour acquirers value destroyers acquiring Low PTTB targets. While the direction is as predicted, Hypothesis 3a is not fully supported from a statistical point of view.

[– INSERT TABLE 15 ABOUT HERE –]

5.4.2. Long-term returns with control variables

This section examines in a multivariate setting the long-run returns to an acquisition announcement, inserting in the regression the control variables (table 16).

The coefficients of Acq_HighPTTB and Tgt_HighPTTB are both negative but, contrary to the regression without control variables, just Acq_HighPTTB is significant. The coefficient of Acq_ValueBuilder continues to be positive but it is still not significant.

Some of the control variables are significant and in the hypothesized direction. Cash is positive and significant at the 5% level (p-value of 0.049), Tender is positive and significant at the 5% level (p-value of 0.023), Related is positive and significant at the 10% level (0.062). The coefficient on the return on the CRSP value-weighted index (Var_CRSP) over the twelve months prior to a bid announcement is negative but insignificant. This could provide some support that an acquisition occurred during hot market, *ceteris paribus*, performs worse than one announced during a cold market. The coefficient on the overall number of mergers in the prior year (N_Deals), expressive of the merger momentum, is negative and insignificant (providing anyway some support that acquisitions announced during waves are worse in the long-run with respect to acquisitions announced during other periods).

[– INSERT TABLE 16 ABOUT HERE –]

Then I turn to the sum of coefficient tests (table 17).

As already one can see in the regression, the coefficient on Acq_ValueBuilder is positive but not significant (panel B). So the Hypothesis 1b is still not verified.

Panel C shows that the BHAR for glamour acquirers value builders acquiring High PTTB targets is significantly (at 5%, p-value of 0.015) higher than the BHAR of glamour acquirers value destroyers acquiring High PTTB targets. Hence, even with the control variables, it seems that in the long-run it is not the intangibles' endowment per se but rather the combination of a huge acquirer and target's endowment of intangibles and the relative (with respect to the target) capability of the acquirer to leverage it that creates the potential

for higher abnormal return. Panel C displays the incremental effect of Acq_ValueBuilder on the BHAR of glamour acquirers acquiring High PTTB targets. There is a positive and significant association. The BHAR is, on average, 0.09296 higher for glamour acquirers value builders acquiring High PTTB targets than for glamour acquirers value destroyers acquiring High PTTB targets. This result is consistent with Hypothesis 2b.

Panel D shows that the BHAR for glamour acquirers value builders acquiring High PTTB targets is significantly (at 10% level, p-value of 0.090) higher than the BHAR of glamour acquirers value destroyers acquiring Low PTTB targets. The BHAR is, on average, 0.07546 higher for glamour acquirers value builders acquiring High PTTB targets than for glamour acquirers value destroyers acquiring Low PTTB targets. In the long-run hypothesis 3b is still fully supported even with the control variables.

Panel C and D both provide evidence of the role of Acq_ValueBuilder in the long-run, when this charactheristic of the bidder is linked to both a High PTTB acquirer and a High PTTB target.

[– INSERT TABLE 17 ABOUT HERE –]

5.5. Discussion of results

I estimate the effects on bidding U.S. shareholders' wealth as a result of acquisitions of U.S. target firms, both in the short and in the long run, analysing if in the post-acquisition period investors reassess the acquirer performance. I examine if such wealth effects can be explained by the endowment of intangible resources by the acquirers and the targets, and the capability of the acquirer to leverage it, and if the intangibles' endowment is linked to the method of payment chosen by the acquirer.

As predicted by my primary research question (HP2a and HP2b), I observe that the CAR and the BHAR are significantly less negative for High PTTB bidders acquiring High

PTTB targets, when the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is *greater* than the corresponding percentage for the target company. Difference-in-means tests show that, consistent with HP2a and HP2b, the CAR and the BHAR are significantly lower (more negative) for High PTTB bidders acquiring High PTTB targets, when the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is *lesser* than the corresponding percentage for the target company.

For value acquirers acquiring low PTTB targets, it doesn't matter the difference between acquirers value builders and value destroyers. They outperform all the other categories of acquirers, and experience both in the short-run and in the long-run positive abnormal returns, which are very close among them. The two value acquirers portfolios acquiring low PTTB targets (value builders and value destroyers) generate similar returns from a statistical point of view. This sounds reasonable, since the intangibles' endowment is not huge both in value acquirers and in low PTTB targets.

I also document that glamour acquirers tend to use their own stock to finance their acquisitions. In cash transactions, shareholders of the acquiring firm bear on the entire risk that the expected synergy value embedded in the acquisition premium will not materialize. In stock transactions, that risk is shared with the shareholders of the target firm, in proportion to the percentage of the combined company the acquiring and selling shareholders each will own. Put in this perspective, the decision to finance the acquisition with stock or cash also sends signal about the acquirer's estimation of the risks of failing to achieve the expected synergies from the deal. A really confident acquirer would be expected to pay for the acquisition with cash so that its shareholders would not have to give any of the anticipated merger gains to the shareholders of the target company. Thus paying with cash may indicate greater confidence in the acquirer's ability to exploit the intangible assets of the target. But if on the contrary the management of the acquiring company believe the risk of not achieving the required level of synergy is substantial, they can be expected to try to hedge by offering stock. That's why, even if glamour acquirers tend to use their own stock to finance their acquisition, just the glamour acquirers that use cash achieve positive returns.

From the cross-sectional analysis, it seems that Acq_ValueBuilder (the relative capability of the acquirer to leverage on the intangibles' endowment) alone is not enough. Its incremental effect displays its positive effect on the abnormal return when in conjunction with a huge intangibles' endowment of both the acquirer and the target. In other words the relative (with respect to the target) capability of the acquirer to leverage on the intangibles' endowment is important when *there is* an intangible asset base to work on. So Hypotheses 1a/b are not verified.

The incremental effect associated with Acq_ValueBuilder increases in magnitude (larger coefficients) and statistical strength (lower p-values) as the focus moves from the short-term to the long-term.

While the abnormal return for glamour acquirers value builders acquiring High PTTB targets is significantly higher than the abnormal return of glamour acquirers value destroyers acquiring High PTTB targets both in the short-run and in the long-run (and so HP2a/b are verified), the abnormal return for glamour acquirers value builders acquiring High PTTB targets is significantly higher than the abnormal return of glamour acquirers value destroyers acquiring Low PTTB targets just in the long-run (so it is verified HP3b, but not HP3a).

In cross-sectional regressions in which the CAR or the BHAR respectively are the dependent variable, the economic intuition holds even including a variety of control variables as the method of payment, the type of acquisition, the return on the CRSP value-weighted index in the year prior to the announcement, the number of deals in the year prior to the announcement, the relative market value, the toehold, the acquirer's debt, the relatedness of the acquisition, and the reaction of the target's management.

My research adds to the evidence provided by former and extensive literature related to the value destruction in U.S. acquisitions. However, I proved that under some critical conditions, the acquisition by glamour acquirers can lead to better results.

I provide evidence that short-term returns do not capture the full effects of the market reaction to an event.

CONCLUSIONS

Summary and concluding remarks

M&As are strategic weapons to acquire and internalise intangible assets which otherwise don't have a proper market for their negotiation. M&As can perform the role of market for trading intangible assets, which are not marketable being embedded in the organizational capital. This paper investigates in the short and in the long run the returns of public bidders which acquire public targets. While almost all the previous studies document positive abnormal returns for the shareholders of target firms, wealth effects on shareholders of acquiring firms are puzzling, with either zero or negative wealth effects at bid announcement. This paper provides a theoretical and empirical analysis of the bidders' returns, trying to understand the contribution of intangibles resources. I hypothesize and find that an acquirer, to which the capital market recognizes a strong intangibles endowment *(a glamour acquirer)*, is better off when buying a target with a strong endowment of generic intangibles (that is intangibles that cannot be sold separatly), even if it has to put a premium on the current market price of that company. Though I provide evidence that this happens when this fundamental relation holds: *the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is greater than the corresponding percentage for the target company.* If this relation does not hold, the glamour acquirer acquiring a high PTTB target is heavily punished by the market. I show that both in the short-run and in the long-run the market does not penalize heavily the acquirer which respects this conditions, in relative terms, with respect to both a glamour acquirer acquiring a glamour target not respecting this condition and a glamour acquirer acquiring a value target. Actually when these conditions hold, the bidder has a greater

capability to transform in current income (that is in money terms: a tangible result) its intangibles' endowment than the target. This transformation in tangible results is a good if it does not consume the intangibles' endowment. Just profitable intangible-based acquirers are able to successfully capture the potential value creation coming from the internalisation of the intangible resources of the target and are value builders. Otherwise they are value destroyers, showing incapability to perform a value appropriation.

I also document that glamour acquirers tend to use their own stock to finance their acquisition. I also demonstrate that cash acquirers outperform equity acquirers irrespective of the glamour/value status.

A successful glamour acquirer has a huge intangibles' endowment and the capital market recognizes this endowment through a high Price to Book Value and a high Price to Tangible Book. This implies an excellent capability to communicate with the capital market by the successful glamour acquirer. So, if the success of an acquisition is strictly linked to intangible assets not recorded by the accounting, and to the capability to leverage them, the information gap between companies and financial market is a critical issue. Even if companies have a huge intangibles' endowment, greater than competitors, the successful glamour acquirers are able to measure and communicate in convincing and credible ways the value of the assets which assure the competitive advantage. The communication of the intangibles allow investors and financial analysts to understand the real value of intangible assets.

Important is the concept of the trust by the capital market in successful glamour acquirers: in other words the result obtained is a confirmation of the trust by the financial market in the capability of the successful glamour acquirer to obtain an extra-return. The capital market trusts the capability by the successful glamour acquirers to increase this extra-return in the future: investors don't trust just in keeping the current profitability in the future, but also believe in the capability of the management to increase it. This confidence relies above all on the main resources of glamour acquirers: the intangible assets. Acquirers transparent with the capital market and which are able to realize the commitments made before in term of development, gain the trust of the investors. The other acquirers loose the trust of the capital market, with the obvious consequences on the share price.

The value of the intangibles internally generated and of the acquired intangibles is linked to the execution capability of the management of the acquiring company. A permanent loss of value of the acquired intangibles through a downsizing of the expected synergies is a clear signal of the management inability to realize the strategy conceived at the beginning. This is especially true in a world in which the attention of the financial analysts is directed toward the capacity of execution of the strategic plans communicated by the management. On the basis of this capability demonstrated in the past the capital market will measure the real capability of the management to enhance the value of the acquired intangibles in the future. The conclusion of this line of reasoning can be summarized in these few words: *No execution? No trust! No trust? No intangible value!*

To the best of my knowledge, my setting is unique in that it analyses a new relation in explaining the returns of the bidders. In this respect, my study provides a unique opportunity to explore the contribution of intangible assets to the analysis of the market reaction at an acquisition announcement.

This paper contributes to the existing literature in two ways essentially.

First, I theorize a relation to identify "successful" acquirers based both on the intangibles' endowment ant the capability to leverage it. I then document empirically this relation, providing a robust evidence of it. My work shed light on the long-term returns of bidding firms, adding a new determinant affecting bidder returns. This contribution, while primarily drawing on and enriching the literature on the market for corporate control, can also be of interest for the literature of the value relevance of intangibles.

Second, this study investigates whether the short-term excess returns capture or not the full effects of the investors reaction to a merger or acquisition[60], which otherwise could be displayed in the long-run. This represents an emerging body of literature and empirical evidence, not only in the study of the market for corporate control[61]. My finding suggests that the short-run return, even if meaningful, still doesn't tell the whole story, since long-term returns highlight clearlier the rewards of successful glamour acquirers.

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[60] As it is assumed by event studies based only on short-term reactions.

[61] For instance a new stream of literature focuses on delayed reactions when investigating *IPOs* [*Initial Public Offerings*, see Ritter (1991), Brav and Gompers, (1997)], *SEOs* [*Seasoned Equity Offerings*, see Lughran and Ritter (1997)], share repurchases [see Ikenberry et al. (1995)], etc.

Finally, besides adding to the academic literature on motives and causes of bidder's returns, by offering systematic evidence on the importance of the capability to leverage the endowment of intangibles, my findings may be of significant interest to practitioners (firms and their financial consultants), as well as to investors broadly considered. The feedback provided by this research informs managers and Board of Directors about the feasibility of an acquisition by a glamour bidder and the rewards/punishements connected.

These contributions are of particular importance at a time when the role of intangible assets and their value-relevance is under scrutiny.

Further research should be directed towards linking the excess returns with better measures of organizational capital, maybe using the methodology developed by Baruch Lev and Suresh Radhakrishnan in a very recent work (2003). Another stream of research could investigate the reasons behind the circumstance that the short-term returns do not capture the full effects of the market reaction to an acquisition.

FIGURES AND TABLES

Figure 1

Aggregate deal value per year

The deal value (or transaction value) is the total value of consideration paid by the acquiror, excluding fees and expenses. The dollar value includes the amount paid for all common stock, common stock equivalents, preferred stock, debt, options, assets, warrants, and stake purchases made within six months of the announcement date of the transaction. Liabilities assumed are included in the value if they are publicly disclosed. Preferred stock is only included if it is being acquired as part of a 100% acquisition. If a portion of the consideration paid by the acquiror is common stock, the stock is valued using the closing price on the last full trading day prior to the announcement of the terms of the stock swap. If the exchange ratio of shares offered changes, the stock is valued based on its closing price on the last full trading date prior to the date of the exchange ratio change. For public target 100% acquisitions, the number of shares at date of announcement is used. Deal values are drawn from the *SDC (Securities Data Corp.'s) Platinum™ Worldwide Mergers and Acquisitions Database* provided by Thomson Financial Securities Data. The figure displays the aggregate amount invested on acquisitions of public targets by public bidders over the period 1980-2000. The data in this figure include all transactions meeting the sample criteria.

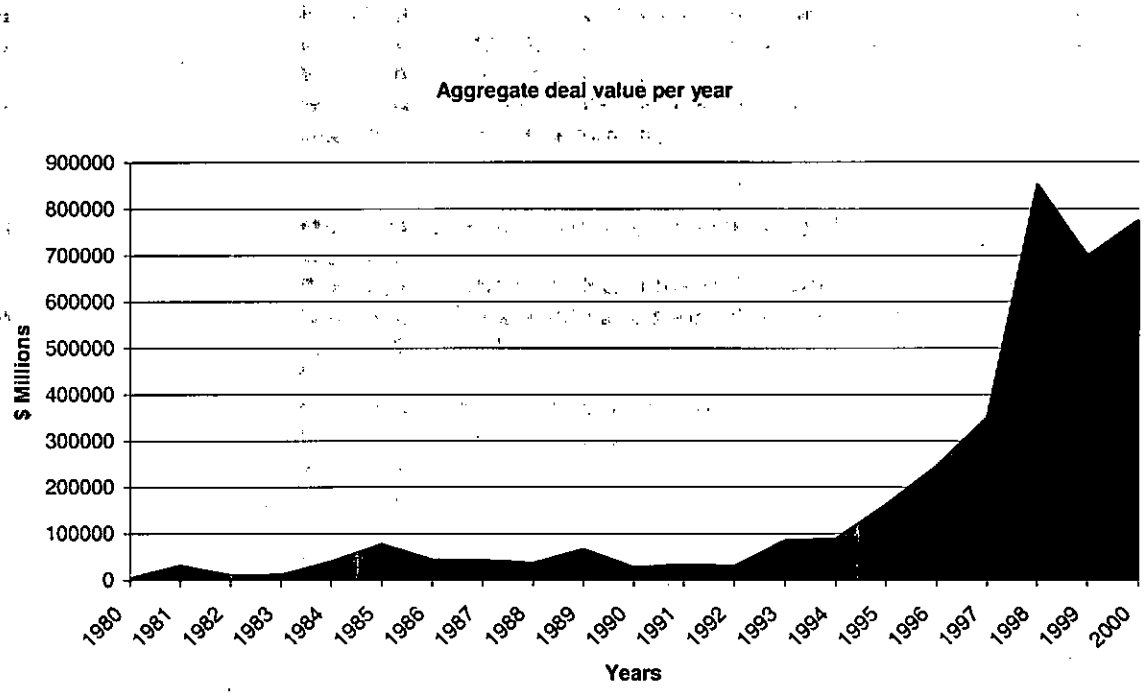

Table 1
Variables definition[62]

Panel A: Dependent variables	
CAR	Cumulative Abnormal Return at the bid announcement (-1, +1)
BHAR	Buy-and-Hold Abnormal Return in the post-acquisition period (+20 days, 3 years)

Panel B: Independent *(explanatory)* variables	
Proxies for the intangibles assets' endowment	
Acq_HighPTTB	Dummy variable = 1 if acquirer is in the High PTTB portfolio of acquirers = 0 otherwise
Tgt_HighPTTB	Dummy variable = 1 if target is in the High PTTB portfolio of targets = 0 otherwise
Proxies for the value creation capability	
Acq_ValueBuilder	Dummy variable =1 if the percentage of the acquirer's intangibles explained by a ROE greater than the cost of equity is greater than the percentage of the target's intangibles explained by a ROE greater than the cost of equity, that is if: $\frac{\frac{Acq\_ROE}{Acq\_COE}}{Acq\_PTBV} > \frac{\frac{Tgt\_ROE}{Tgt\_COE}}{Tgt\_PTBV}$ = 0 if the percentage of the acquirer's intangibles explained by a ROE greater than the cost of equity is lesser than the percentage of the target's intangibles explained by a ROE greater than the cost of equity, that is if: $\frac{\frac{Acq\_ROE}{Acq\_COE}}{Acq\_PTBV} < \frac{\frac{Tgt\_ROE}{Tgt\_COE}}{Tgt\_PTBV}$

[62] This table provides the definitions for the variables used in the multivariate analysis. Expressions used in the univariate analysis and in the other tables are defined in the notes below the proper table.

Table 1 (cont'd)

Variables definition

Panel C: Independent *(Control)* variables	
Method of payment	
Cash	Dummy variable = 1 if the acquisition is fully paid with cash; = 0 otherwise
Type of acquisition	
Tender	Dummy variable = 1 if the deal is a tender offer = 0 otherwise
Momentum (market and merger)	
Var_CRSP	Return on the CRSP value-weighted index (including dividends) during the period starting one year prior to a merger announcement and ending ten days before the announcement
N_Deals	Number of acquisitions in the year prior to a particular announcement as a measure of the merger momentum
Other controls	
Relative_Size	Market value of the target's equity divided by the market value of the acquirer's equity
Toehold	% equity stake held by the bidder before the announcement
Acq_Leverage	Ratio of total financial debt to the sum of book value of equity plus book value of financial debt
Related	Dummy variable = 1 if the acquirer is in the same line of business as the target (when the bidder's and the target's primary two-digits code coincide) = 0 otherwise
Hostile	Dummy variable = 1 if the acquisition is hostile = 0 otherwise (acquisition friendly)

Table 2

Method of payment, type of acquisition, reaction of the target's management and number of bidders per acquisition

The initial sample of mergers and acquisitions on the U.S. stock market is identified through the *SDC (Securities Data Corp.'s) Platinum™ Worldwide Mergers and Acquisitions Database* provided by Thomson Financial Securities Data. An offer is considered hostile if the management of the target firm does not support the initial offer. The methods of payment used by acquirers involves the use of cash, stock or a mix of both. The data are all obtained from the *SDC (Securities Data Corp.'s) Platinum™ Worldwide Mergers and Acquisitions Database* provided by Thomson Financial Securities Data.

	Number of acquisitions	***Percentage***
Panel A: Method of payment		
Cash	847	*25.0*
Stock	1,420	*41.9*
Mixed	1,122	*33.1*
Panel B: Type of acquisition		
Mergers	2,826	*83.4*
Tender Offers	563	*16.6*
Panel C: Reaction of the target's management		
Friendly acquisitions	3,261	*96.2*
Hostile acquisitions	128	*3.8*
Panel D: Number of bidders per acquisition		
Single bidder	3,257	*96.1*
Multiple bidders	132	*3.9*

Table 3

Descriptive statistics for acquirers (all sample)

VARIABLE	Mean	Std Dev	Median	Minimum	Percentile					Maximum
					10th	25th	50th	75th	90th	
Size measures										
Assets ($mil)	5,170.72	22,950.33	1,085.25	0.57	62.24	237.46	1,085.25	3,820.4	107,03.98	716,937
Book Value ($mil)	971.02	2,740.92	229.27	0.49	26.20	78.48	229.27	838.11	2,080.5	103,198
Tangible Book Value ($mil)	893.47	2,614.83	214.57	0.25	21.63	68.10	214.57	741.42	1,965.69	51,238
CAPEX ($mil)	130.74	480.16	4.11	0	0	0	4.11	59.07	309.46	8,716
Net Income ($mil)	140.21	565.08	24.07	-4,978	-0.78	4.70	24.07	92.31	291.02	9,867
Net Sales ($mil)	2,044.03	5,320.89	347.25	0.04	23.66	95.96	347.25	1,585.34	5,348.61	82,005
R&D/Sales (%)	17.35	105.24	6.14	0	0.89	2.23	6.14	11.83	21.94	55.79
Relative valuation										
PTBV	3.26	4.30	2.04	0.02	1.01	1.38	2.04	3.53	6.33	57.32
PTTB	4.67	12.78	2.30	0.02	1.10	1.51	2.30	4.44	8.51	61.10
Performance measures										
ROE (%)	12.84	211.68	13.35	-2.12	-2.89	7.78	13.35	17.28	23.63	59.06
COE (%)	10.91	3.98	10.44	3.81	6.27	8.03	10.44	13.30	16.18	28.54
Leverage										
Debt/Assets (%)	18.28	17.46	14.41	0	0	4.72	14.41	26.75	42.41	55.65
Debt/Equity (%)	38.12	74.86	35.26	0	0	10.80	35.26	59.98	74.11	82.31

Table 4

Descriptive statistics for targets (all sample)

VARIABLE	Mean	Std Dev	Median	Minimum	Percentile					Maximum
					10th	25th	50th	75th	90th	
Size measures										
Assets ($mil)	1,229.50	6459.34	169.40	0.59	17.55	51.09	169.40	587.91	2,094.95	196,446
Book Value ($mil)	223.21	718.34	53.96	0.13	8.64	20.61	53.96	158.65	405.38	12,132
Tangible Book Value ($mil)	186.30	581.12	47.03	0.03	7.37	18.2	47.03	135.02	361.34	10,629
CAPEX ($mil)	31.02	182.34	1.68	0	0	0	1.68	10.29	42.20	5653.73
Net Income ($mil)	14.44	144.50	2.34	-3,960.35	-12.46	-0.40	2.34	11.48	45.38	2,296
Sales ($mil)	493.30	1764.79	83.88	0.02	11.06	28.38	83.88	291.73	970.32	42,383
R&D/Sales (%)	35.75	1.32	8.60	0	1.02	2.61	8.60	20.53	42.39	58.89
Relative valuation										
PTBV	2.69	7.33	1.37	0.07	0.75	1.09	1.37	2.26	4.73	57.83
PTTB	3.99	10.03	1.85	0.14	0.81	1.20	1.85	3.36	6.57	59.04
Performance measures										
ROE (%)	-34.29	358.25	8.45	-98.45	-55.05	-3.73	8.45	14.39	21.02	42.37
COE (%)	9.93	3.81	9.31	3.81	5.70	7.16	9.31	12.12	14.94	27.79
Leverage										
Debt/Assets (%)	21.06	32.60	13.56	0	0	1.23	13.56	32.87	50.47	66.42
Debt/Equity (%)	34.76	63.97	29.49	0	0	2.05	29.49	56.44	75.57	82.78

Table 5

Descriptive statistics for acquirers sorted by PTTB

PANEL A: Acquirers in the High PTTB Portfolio

VARIABLE	Mean	Std Dev	Median	Minimum	Percentile					Maximum
					10th	25th	50th	75th	90th	
Size measures										
Assets ($mil)	5,199.90	29,069.04	745.77	1.44	44.00	164.72	745.77	3,357.24	10,545	716,937
Book Value ($mil)	1,195.24	3,456.50	240.69	0.49	21.44	69.63	240.69	1,015.25	2,527.90	103,198
Tangible Book Value ($mil)	1,060.44	3,241.18	212.00	0.25	15.91	57.26	212.00	854.08	2,459.59	51,238
CAPEX ($mil)	182.67	602.54	11.91	0	0	0.38	11.91	110.73	411.65	8,716
Net Income ($mil)	202.63	713.55	27.77	-930	0.93	6.39	27.77	136.3	467	9,867
Net Sales ($mil)	2,466.07	6,029.20	357.37	0.04	21.89	95.02	357.37	1,904.00	7,363.97	82,005
R&D/Sales (%)	21.06	1.23	6.56	0	1.08	2.80	6.56	12.74	23.11	55.79
Relative valuation										
PTBV	4.78	5.25	3.28	1.34	2.00	2.46	3.28	5.12	8.55	57.32
PTTB	7.50	4.17	4.17	2.31	2.46	2.92	4.17	7.28	12.87	61.10
Performance measures										
ROE (%)	13.03	0.51	15.00	-1.14	2.44	9.39	15.11	20.50	27.92	59.06
COE (%)	11.39	0.04	10.88	4.09	6.45	8.53	10.88	13.78	16.78	28.54
Leverage										
Debt/Assets (%)	19.33	16.66	16.63	0	0.29	5.41	16.63	28.61	41.75	51.34
Debt/Equity (%)	36.33	73.32	33.46	0	0.35	11.06	33.46	55.72	72.01	78.56

Table 5 (cont'd)

Descriptive statistics for acquirers sorted by PTTB

PANEL B: Acquirers in the Low PTTB Portfolio

VARIABLE	Mean	Std Dev	Median	Minimum	Percentile					Maximum
					10th	25th	50th	75th	90th	
Size measures										
Assets ($mil)	5,138.84	13,391.64	1,411.58	0.57	101.37	370.20	1,411.58	4,260.63	10,778	153,890
Book Value ($mil)	720.66	1,564.26	221.04	0.52	31.70	87.99	221.04	669.42	1,654.83	23,219
Tangible Book Value ($mil)	696.59	1,563.66	215.91	0.49	30.32	83.13	215.91	642.71	1,592.41	23,219
CAPEX ($mil)	77.90	300.54	0	0	0	0	0	23.17	162.09	4,930
Net Income ($mil)	76.26	341.91	20.22	-4,978	-0.58	3.1	20.22	69.1	187.79	5,485
Net Sales ($mil)	1,583.30	4,375.69	343.09	0.60	24.35	100.11	343.09	1,144.24	3,963.82	74,581.5
R&D/Sales (%)	7.81	13.19	3.22	0	0.64	1.42	3.22	8.78	17.33	22.79
Relative valuation										
PTBV	1.66	1.98	1.39	0.02	0.82	1.08	1.39	1.73	2.04	2.60
PTTB	1.75	0.42	1.46	0.02	0.86	1.14	1.46	1.78	2.02	2.30
Performance measures										
ROE (%)	12.55	296.84	12.02	-2.12	-3.26	6.45	12.02	15.00	17.79	36.89
COE (%)	10.48	3.84	10.01	3.81	6.17	7.73	10.01	12.82	15.55	24.52
Leverage										
Debt/Assets (%)	19.16	18.02	14.86	0	0	5.29	14.86	28	44.45	55.65
Debt/Equity (%)	42.05	32.44	44.73	0	0	17.46	44.73	66.11	78.41	82.31

Table 6

Descriptives statistics for targets sorted by PTTB

PANEL A: Targets in the High PTTB Portfolio

VARIABLE	Mean	Std Dev	Median	Minimum	Percentile					Maximum
					10th	25th	50th	75th	90th	
Size measures										
Assets ($mil)	1156.11	5,917.30	132.46	0.59	14.52	42.78	132.46	498.34	1,708.49	120,094
Book Value ($mil)	229.87	794.12	55.06	0.13	8.50	22.13	55.06	150.93	399.24	12,132
Tangible Book Value ($mil)	189.60	639.62	47.18	0.03	7.05	18.28	47.18	124.95	350.60	10,629
CAPEX ($mil)	28.12	128.33	2.27	0	0	0.16	2.27	11.45	42.16	2,641
Net Income ($mil)	16.22	145.31	2.42	-2,312	-15.73	-1.70	2.42	11.53	45.76	2296
Net Sales ($mil)	493.48	1,866.90	87.58	0.11	11.33	29.85	87.58	275.71	925.57	42,383
R&D/Sales (%)	42.54	135.00	11.10	0	1.27	3.74	11.10	23.06	54.39	58.89
Relative valuation										
PTBV	3.74	7.85	2.08	1.02	1.24	1.37	2.08	3.54	6.45	57.83
PTTB	5.16	11.99	2.83	1.85	1.96	2.13	2.83	4.36	8.01	59.04
Performance measures										
ROE (%)	-40.60	404.13	8.18	-102.45	-63.25	-7.64	8.18	14.69	21.37	42.37
COE (%)	10.10	3.98	9.58	3.81	5.76	7.20	9.58	12.32	15.36	27.00
Leverage										
Debt/Assets (%)	20.03	38.81	12.00	0	0	1.14	12.00	30.48	47.40	66.42
Debt/Equity (%)	30.17	57.90	23.60	0	0	1.28	23.60	52.09	73.41	82.78

Table 6 (cont'd)

Descriptives statistics for targets sorted by PTTB

PANEL B: Targets in the Low PTTB Portfolio

VARIABLE	Mean	Std Dev	Median	Minimum	Percentile					Maximum
					10th	25th	50th	75th	90th	
Size measures										
Assets ($mil)	1,316.09	7,047.32	225.49	0.59	22.23	62.99	225.49	689.23	2,542.57	196,446
Book Value ($mil)	215.40	618.11	53.22	0.32	8.97	19.04	53.22	166.37	415.20	9,054
Tangible Book Value ($mil)	182.45	504.64	46.91	0.32	7.95	18.08	46.91	148.37	373.11	7,193
CAPEX ($mil)	34.29	228.34	0.80	0	0	0	0.80	9.06	42.59	5653.73
Net Income ($mil)	12.431	143.61	2.31	-3,960.35	-8.64	0	2.31	11.49	45.11	1,902
Net Sales ($mil)	493.09	1636.05	80.28	0.02	10.56	26.03	80.28	315.51	1,042.46	31,963
R&D/Sales (%)	19.43	123.30	4.48	0	0.65	1.51	4.48	12.99	26.95	36.87
Relative valuation										
PTBV	1.15	6.57	0.77	0.07	0.46	0.51	0.77	0.99	1.04	1.50
PTTB	1.63	6.86	0.98	0.14	0.50	0.62	0.98	1.41	1.65	1.85
Performance measures										
ROE (%)	-26.88	295.38	8.71	-98.45	-42.92	-0.21	8.71	14.04	20.50	39.62
COE (%)	9.75	3.71	9.16	3.81	5.62	7.10	9.16	11.97	14.63	27.79
Leverage										
Debt/Assets (%)	22.22	23.71	15.44	0	0	1.74	15.44	35.50	55.39	64.87
Debt/Equity (%)	39.94	69.85	35.53	0	0	4.05	35.53	58.92	78.80	81.44

Table 7

Correlation matrix

(Pairwise correlations: Pearson correlations are in the lower triangle while Spearman correlations are in the upper triangle)

Variables	1	2	3	4	5	6	7	8	9	10	11	12
		0.249	**0.137**	0.015	**0.058**	0.009	**0.264**	**-0.205**	-0.015	**-0.049**	-0.017	0.017
1 Acq_HighPTTB	1	*(<0.001)*	*(<0.001)*	*(0.276)*	*(<0.001)*	*(0.505)*	*(<0.001)*	*(<0.001)*	*(0.259)*	*(0.003)*	*(0.214)*	*(0.221)*
	0.249		**-0.023**	**-0.026**	**0.094**	**0.053**	**0.188**	**0.059**	0.007	**0.028**	**-0.079**	0.018
2 Tgt_HighPTTB	*(<0.001)*	1	*(0.094)*	*(0.055)*	*(<0.001)*	*(<0.001)*	*(<0.001)*	*(0.002)*	*(0.616)*	*(0.082*	*(<0.001)*	*(0.193)*
	0.137	**-0.023**		**0.031**	0.005	**-0.031**	0.004	**-0.086**	0.007	**-0.103**	**0.058**	0.001
3 Acq_ValueBuilder	*(<0.001)*	*(0.094)*	1	*(0.023)*	*(0.707)*	*(0.025)*	*(0.774)*	*(<0.001)*	*(0.595)*	*(<0.001)*	*(<0.001)*	*(0.930)*
	0.015	**-0.026**	**0.031**		**0.402**	**-0.045**	**-0.055**	**-0.192**	**0.121**	0.012	**-0.117**	**0.072**
4 Cash	*(0.276)*	*(0.055)*	*(0.023)*	1	*(<0.001)*	*(0.001)*	*(<0.001)*	*(<0.001)*	*(<0.001)*	*(0.463)*	*(<0.001)*	*(<0.001)*
	0.058	**0.094**	0.005	**0.402**		-0.008	**-0.063**	-0.013	**0.100**	**0.071**	**-0.121**	**0.175**
5 Tender	*(<0.001)*	*(<0.001)*	*(0.707)*	*(<0.001)*	1	*(0.536)*	*(<0.001)*	*(0.495)*	*(<0.001)*	*(<0.001)*	*(<0.001)*	*(<0.001)*
	-0.004	**0.050**	**-0.035**	**-0.061**	-0.010		**0.222**	**0.055**	**-0.025**	**0.029**	0.004	-0.005
6 Var_CRSP	*(0.791)*	*(<0.001)*	*(0.010)*	*(<0.001)*	*(0.470)*	1	*(<0.001)*	*(0.003)*	*(0.067)*	*(0.079)*	*(0.791)*	*(0.697)*
	0.262	**0.186**	0.002	**-0.064**	**-0.068**	**0.201**		**-0.049**	**-0.070**	0.002	**0.065**	**-0.042**
7 N_Deals	*(<0.001)*	*(<0.001)*	*(0.860)*	*(<0.001)*	*(<0.001)*	*(<0.001)*	1	*(0.009)*	*(<0.001)*	*(0.920)*	*(<0.001)*	*(0.002)*
	-0.030	-0.002	0.002	-0.016	-0.013	-0.004	0.002		0.025	**0.056**	**0.113**	**0.057**
8 Relative size	*(0.110)*	*(0.924)*	*(0.910)*	*(0.397)*	*(0.489)*	*(0.834)*	*(0.897)*	1	*(0.178)*	*(0.003)*	*(<0.001)*	*(0.002)*
	-0.022	0.003	0.000	**0.091**	**0.047**	**-0.032**	**-0.050**	-0.005		**0.073**	**-0.070**	**0.028**
9 Toehold	*(0.111)*	*(0.820)*	*(0.973)*	*(<0.001)*	*(0.001)*	*(0.017)*	*(<0.001)*	*(0.808)*	1	*(<0.001)*	*(<0.001)*	*(0.043)*
	-0.068	0.000	**-0.110**	-0.005	**0.035**	-0.007	-0.011	-0.016	**0.059**		**-0.076**	**0.041**
10 Acq_Leverage	*(<0.001)*	*(0.978)*	*(<0.001)*	*(0.736)*	*(0.034)*	*(0.678)*	*(0.517)*	*(0.400))*	*(<0.001)*	1	*(<0.001)*	*(0.011)*
	-0.017	**-0.079**	**0.058**	**-0.117**	**-0.121**	0.004	**0.068**	-0.006	**-0.074**	**-0.080**		-0.004
11 Related	*(0.214)*	*(<0.001)*	*(<0.001)*	*(<0.001)*	*(<0.001)*	*(0.744)*	*(<0.001)*	*(0.742)*	*(<0.001)*	*(<0.001)*	1	*(0.750)*
	0.017	0.018	0.001	**0.072**	**0.175**	-0.15	**-0.048**	-0.006	-0.007	**0.039**	-0.004	
12 Hostile	*(0.221)*	*(0.193)*	*(0.930)*	*(<0.001)*	*(<0.001)*	*(0.283)*	*(<0.001)*	*(0.768)*	*(0.624)*	*(0.016)*	*(0.750)*	1

Notes

The significance of the Pearson and Spearman correlations between each pair of variables is indicated in *italics* under the correlation value (p-values for two-tailed tests are reported below the coefficients and are in *italics*). Bold font indicates significance.

Table 8

Parametric and non-parametric univariate tests for difference respectively in CARs and in BHARs across PTTB portfolios and percentage of intangibles explained by the spread between ROE and cost of equity

The tables show Cumulative Abnormal Returns and Buy-and-Hold Abnormal Returns of deals sorted by the PTTB portfolios and the percentage of intangibles explained by the spread between ROE and Cost of Equity, to test the equality of returns, the null hypothesis being that there is no significant difference between the mean abnormal returns of different sub-samples of acquirers. The rows show mean abnormal returns for sub-samples of acquirers, the differences in mean and their stastistical significance based on t-test [Wilcoxon test]. The first row includes the mean 3-days acquirer CAR. The second row includes the 3-years BHAR. The final row for each sub-group lists the number of observations. I split the sample of acquirers (targets) into two sub-samples, High PTTB (glamour sub-sample) and Low PTTB (value sub-sample), which group firms whose PTTB are above and below the median respectively. Superscripts denote the significance of the **t-test** *that mean returns equal zero* (H_0), where the null hypothesis is rejected at the 1% level, 5% level or 10% level. The table shows also the significance of equality tests (p-value in parenthesis), that are based on **t-tests** (Pr>t) *for equality of the means (parametric test)* and a **Wilcoxon Rank Sum test** (Pr>z) *(non-parametric test)*, where the null hypothesis (H_0) of equal group mean is rejected at the 1% level, 5% level or 10% level. Bold font indicates significance and superscripts indicate the level of significance. Significance at the 1%, 5% and 10% level is denoted with [a], [b], and [c]. P-values for two-tailed tests are reported below the coefficients and are in italics.

Table 8 (cont'd)

Parametric and non-parametric univariate tests for difference respectively in CARs and in BHARs across PTTB portfolios and percentage of intangibles explained by the spread between ROE and cost of equity

Panel A	Acquirers in the High PTTB portfolio (Glamour acquirers) acquiring:									
	Targets in the High PTTB portfolio and holding the relation:		Difference tests in mean *(T-test: Pr>t) [Wicoxon test: Pr>z]*	Targets in the Low PTTB portfolio and holding the relation:		Difference tests in mean *(T-test: Pr>t) [Wicoxon test: Pr>z]*	Difference tests in mean *(T-test: Pr>t) [Wicoxon test: Pr>z]*			
	%Acq_IntRoeSpread > %Tgt_IntRoeSpread (a)	%Acq_IntRoeSpread < %Tgt_IntRoeSpread (b)	(a-b)	%Acq_IntRoeSpread > %Tgt_IntRoeSpread (c)	%Acq_IntRoeSpread < %Tgt_IntRoeSpread (d)	(c-d)	(a-c)	(a-d)	(b-c)	(b-d)
CAR [-1,1] (%)	-0.25	-1.43	1.18	-0.28	-0.83	0.54	0.03	0.56	-1.15	-0.61
(T Test)	*(0.038)* [b]	*(0.024)* [b]	*(0.032)* [b]	*(0.352)*	*(0.047)* [b]	*(0.286)*	*(0.936)*	*(0.239)*	*(0.012)* [b]	*(0.262)*
[Wilcoxon R.. S.Test]			*[0.054]* [b]			*[0.334]*	*[0.764]*	*[0.171]*	*[0.031]* [b]	*[0.350]*
BHAR [+20, 750] (%)	-1.59	-11.49	9.90	-7.59	-9.26	1.67	6.01	7.68	-3.89	-2.22
(T Test)	*(0.052)* [b]	*(0.031)* [b]	*(0.045)* [b]	*(0.053)* [b]	*(0.064)* [c]	*(0.688)*	*(0.094)* [c]	*(0.057)* [c]	*(0.316)*	*(0.614)*
[Wilcoxon R.. S.Test]			*[0.061]* [c]			*[0.980]*	*[0.054]* [c]	*[0.058]* [c]	*[0.462]*	*[0.485]*
N	458	413		477	271					

[a] Denotes significance at the 1% level, using a two-tail test.
[b] Denotes significance at the 5% level, using a two-tail test.
[c] Denotes significance at the 10% level, using a two-tail test.

Acq_ValueBuilder holds when **%Acq_IntRoeSpread > %Tgt_IntRoeSpread**,that is when *the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is greater than the corresponding percentage for the target company,* that is when:

$$\frac{\frac{Acq\_ROE}{Acq\_COE}}{Acq\_PTBV} > \frac{\frac{Tgt\_ROE}{Tgt\_COE}}{Tgt\_PTBV}$$

Acq_ValueDestroyer holds when **%Acq_IntRoeSpread < %Tgt_IntRoeSpread**, that is when *the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is lesser than the corresponding percentage for the target company,* that is when:

$$\frac{\frac{Acq\_ROE}{Acq\_COE}}{Acq\_PTBV} < \frac{\frac{Tgt\_ROE}{Tgt\_COE}}{Tgt\_PTBV}$$

Table 8 (cont'd)

Parametric and non-parametric univariate tests for difference respectively in CARs and in BHARs across PTTB portfolios and percentage of intangibles explained by the spread between ROE and cost of equity

Panel B	Acquirers in the Low PTTB portfolio (Value acquirers) acquiring:									
	Targets in the High PTTB portfolio and holding the relation:		Difference tests in mean *(T-test: Pr>t) [Wicoxon test: Pr>z]*	Targets in the Low PTTB portfolio and holding the relation:		Difference tests in mean (T-test: Pr>t) [Wicoxon test: Pr>z]	Difference tests in mean (T-test: Pr>t) [Wicoxon test: Pr>z]			
	%Acq_IntRoeSpread > %Tgt_IntRoeSpread (a)	%Acq_IntRoeSpread < %Tgt_IntRoeSpread (b)	(a-b)	%Acq_IntRoeSpread > %Tgt_IntRoeSpread (c)	%Acq_IntRoeSpread < %Tgt_IntRoeSpread (d)	(c-d)	(a-c)	(a-d)	(b-c)	(b-d)
CAR [-1,1] (%)	-0.36	-1.14	0.78	0.01	0.17	-0.16	-0.37	-0.53	-1.15	-1.31
(T Test)	*(0.044)* [b]	*(0.007)* [a]	*(0.021)* [b]	*(0.906)*	*(0.712)*	*(0.740)*	*(0.509)*	*(0.483)*	*(0.040)* [b]	*(0.081)* [c]
[Wilcoxon R.. S.Test]			*[0.049]* [b]			*[0.477]*	*[[0.890]*	*[0.612]*	*[0.014]* [b]	*[0.084]* [c]
BHAR [+20, 750] (%)	2.98	-2.18	5.15	8.48	8.43	0.06	-5.51	-5.45	-10.66	-10.61
(T Test)	*(0.328)*	*(0.050)* [b]	*(0.248)*	*(0.014)* [a]	*(0.024)* [b]	*(0.988)*	*(0.236)*	*(0.254)*	*(0.024)* [b]	*(0.030)* [b]
[Wilcoxon R.. S.Test]			*[0.485]*			*[0.741]*	*[0.455]*	*[0.361]*	*[0.112]*	*[0.107]* [c]
N	206	200		905	459					

[a] Denotes significance at the 1% level, using a two-tail test.
[b] Denotes significance at the 5% level, using a two-tail test.
[c] Denotes significance at the 10% level, using a two-tail test.

Acq_ValueBuilder holds when **%Acq_IntRoeSpread > %Tgt_IntRoeSpread**,that is when *the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is greater than the corresponding percentage for the target company*, that is when:

$$\frac{\frac{Acq\_ROE}{Acq\_COE}}{Acq\_PTBV} > \frac{\frac{Tgt\_ROE}{Tgt\_COE}}{Tgt\_PTBV}$$

Acq_ValueDestroyer holds when **%Acq_IntRoeSpread < %Tgt_IntRoeSpread**, that is when *the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is lesser than the corresponding percentage for the target company*, that is when:

$$\frac{\frac{Acq\_ROE}{Acq\_COE}}{Acq\_PTBV} < \frac{\frac{Tgt\_ROE}{Tgt\_COE}}{Tgt\_PTBV}$$

Table 8 (cont'd)

Parametric and non-parametric univariate tests for difference respectively in CARs and in BHARs across PTTB portfolios and percentage of intangibles explained by the spread between ROE and cost of equity

Panel C	Acquirers in the High PTTB portfolio (Glamour acquirers) acquiring:			Acquirers in the Low PTTB portfolio (Value acquirers) acquiring:						
	Targets in the High PTTB portfolio and holding the relation:		Difference tests in mean *(T-test: Pr>t) [Wicoxon test: Pr>z]*	Targets in the Hight PTTB portfolio and holding the relation:		Difference tests in mean *(T-test: Pr>t) [Wicoxon test: Pr>z]*	Difference tests in mean *(T-test: Pr>t) [Wicoxon test: Pr>z]*			
	%Acq_IntRoeSpread > %Tgt_IntRoeSpread (a)	%Acq_IntRoeSpread < %Tgt_IntRoeSpread (b)	(a-b)	%Acq_IntRoeSpread > %Tgt_IntRoeSpread (c)	%Acq_IntRoeSpread < %Tgt_IntRoeSpread (d)	(c-d)	(a-c)	(a-d)	(b-c)	(b-d)
CAR [-1,1] (%)	-0.25	-1.43	1.18	-0.36	-1.14	0.78	0.11	0.89	-1.07	-0.29
(T Test)	*(0.038)* [b]	*(0.024)* [b]	*(0.032)* [b]	*(0.044)* [b]	*(0.007)* [a]	*(0.021)* [b]	*(0.083)* [c]	*(0.083)* [c]	*(0.068)* [c]	*(0.610)*
[Wilcoxon R.. S.Test]			*[0.054]* [b]			*[0.049]* [b]	*[0.093]* [c]	*[0.031]* [b]	*[0.033]* [b]	*[0.898]*
BHAR [+20, 750] (%)	-1.59	-11.49	9.90	2.98	-2.18	5.15	-4.56	0.59	-14.47	-9.31
(T Test)	*(0.052)* [b]	*(0.031)* [b]	*(0.045)* [b]	*(0.328)*	*(0.050)* [b]	*(0.248)*	*(0.280)*	*(0.891)*	*(0.012)* [a]	*(0.051)* [b]
[Wilcoxon R.. S.Test]			*[0.061]* [c]			*[0.485]*	*[0.869]*	*[0.599]*	*[0.024]* [b]	*[0.061]* [c]
N	458	413		206	200					

[a] Denotes significance at the 1% level, using a two-tail test.
[b] Denotes significance at the 5% level, using a two-tail test.
[c] Denotes significance at the 10% level, using a two-tail test.

Acq_ValueBuilder holds when **%Acq_IntRoeSpread > %Tgt_IntRoeSpread**,that is when *the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is greater than the corresponding percentage for the target company*, that is when:

$$\frac{\frac{Acq\_ROE}{Acq\_COE}}{Acq\_PTBV} > \frac{\frac{Tgt\_ROE}{Tgt\_COE}}{Tgt\_PTBV}$$

Acq_ValueDestroyer holds when **%Acq_IntRoeSpread < %Tgt_IntRoeSpread**, that is when *the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is lesser than the corresponding percentage for the target company*, that is when:

$$\frac{\frac{Acq\_ROE}{Acq\_COE}}{Acq\_PTBV} < \frac{\frac{Tgt\_ROE}{Tgt\_COE}}{Tgt\_PTBV}$$

Table 8 (cont'd)

Parametric and non-parametric univariate tests for difference respectively in CARs and in BHARs across PTTB portfolios and percentage of intangibles explained by the spread between ROE and cost of equity

Panel D	Acquirers in the High PTTB portfolio (Glamour acquirers) acquiring:			Acquirers in the Low PTTB portfolio (Value acquirers) acquiring:						
	Targets in the Low PTTB portfolio and holding the relation:		Difference tests in mean *(T-test: Pr>t)* *[Wicoxon test: Pr>z]*	Targets in the Low PTTB portfolio and holding the relation:		Difference tests in mean *(T-test: Pr>t)* *[Wicoxon test: Pr>z]*	Difference tests in mean *(T-test: Pr>t)* *[Wicoxon test: Pr>z]*			
	%Acq_IntRoeSpread > %Tgt_IntRoeSpread (a)	%Acq_IntRoeSpread < %Tgt_IntRoeSpread (b)	(a-b)	%Acq_IntRoeSpread > %Tgt_IntRoeSpread (c)	%Acq_IntRoeSpread < %Tgt_IntRoeSpread (d)	(c-d)	(a-c)	(a-d)	(b-c)	(b-d)
CAR [-1,1] (%)	-0.28	-0.83	0.54	0.01	0.17	-0.16	-0.29	-0.45	-0.84	-1.00
(T Test)	*(0.352)*	*(0.047)* [b]	*(0.286)*	*(0.906)*	*(0.712)*	*(0.740)*	*[0.467]*	*(0.408)*	*(0.097)* [c]	*(0.108)*
[Wilcoxon R.. S.Test]			*[0.334]*			*[0.477]*	*[0.711]*	*[0.858]*	*[0.129]*	*[0.448]*
BHAR [+20, 750] (%)	-7.59	-9.26	1.67	8.48	8.43	0.06	-16.08	-16.02	-17.77	-17.69
(T Test)	*(0.053)* [b]	*(0.064)* [c]	*(0.688)*	*(0.014)* [a]	*(0.024)* [b]	*(0.988)*	*(0.032)* [b]	*(0.045)* [b]	*(0.018)* [b]	*(0.021)* [b]
[Wilcoxon R.. S.Test]			*[0.980]*			*[0.741]*	*[0.069]* [c]	*[0.092]* [c]	*[0.084]* [c]	*[0.089]* [c]
N	477	271		905	459					

[a] Denotes significance at the 1% level, using a two-tail test.
[b] Denotes significance at the 5% level, using a two-tail test.
[c] Denotes significance at the 10% level, using a two-tail test.

Acq_ValueBuilder holds when **%Acq_IntRoeSpread > %Tgt_IntRoeSpread**,that is when *the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is greater than the corresponding percentage for the target company*, that is when:

$$\frac{\frac{Acq\_ROE}{Acq\_COE}}{Acq\_PTBV} > \frac{\frac{Tgt\_ROE}{Tgt\_COE}}{Tgt\_PTBV}$$

Acq_ValueDestroyer holds when **%Acq_IntRoeSpread < %Tgt_IntRoeSpread**, that is when *the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is lesser than the corresponding percentage for the target company*, that is when:

$$\frac{\frac{Acq\_ROE}{Acq\_COE}}{Acq\_PTBV} < \frac{\frac{Tgt\_ROE}{Tgt\_COE}}{Tgt\_PTBV}$$

Table 9

Parametric and non-parametric univariate tests for difference respectively in CARs and in BHARs across PTTB portfolios, percentage of intangibles explained by the spread between ROE and cost of equity and method of payment

The tables show Cumulative Abnormal Returns and Buy-and-Hold Abnormal Returns of deals sorted by the PTTB portfolios, across the percentage of intangibles explained by the spread between ROE and Cost of Equity and the method of payment, to test the equality of returns, the null hypothesis being that there is no significant difference between the mean abnormal returns of different sub-samples of acquirers. The rows show mean abnormal returns for sub-samples of acquirers, the differences in mean and their stastistical significance based on t-test [Wilcoxon test]. The first row includes the mean 3-days acquirer CAR. The second row includes the 3-years BHAR. The final row for each sub-group lists the number of observations. I split the sample of acquirers (targets) into two sub-samples, High PTTB (glamour sub-sample) and Low PTTB (value sub-sample), which group firms whose PTTB are above and below the median respectively. I then distinguish each sub-group according to the method of payment used to finance the transaction: stock, cash or mixed. Superscripts denote the significance of the **t-test** *that mean returns equal zero* (H_0), where the null hypothesis is rejected at the 1% level, 5% level or 10% level. The table shows also the significance of equality tests (p-value in parenthesis), that are based on **t-tests** (Pr>t) *for equality of the means (parametric test)* and a **Wilcoxon Rank Sum test** (Pr>z) *(non-parametric test)*, where the null hypothesis (H_0) of equal group mean is rejected at the 1% level, 5% level or 10% level. Bold font indicates significance and superscripts indicate the level of significance. Significance at the 1%, 5% and 10% level is denoted with [a], [b], and [c]. P-values for two-tailed tests are reported below the coefficients and are in italics.

Table 9 (cont'd)

Parametric and non-parametric univariate tests for difference respectively in CARs and in BHARs across PTTB portfolios, percentage of intangibles explained by the spread between ROE and cost of equity and method of payment

Panel A	Acquirers in the High PTTB portfolio (Glamour Acquirers) acquiring Targets in the High PTTB portfolio and:											
	holding the relation: %Acq_IntRoeSpread > %Tgt_IntRoeSpread			Difference tests in mean *(T-test: Pr>t)* *[Wicoxon test: Pr>z]*			holding the relation: %Acq_IntRoeSpread < %Tgt_IntRoeSpread			Difference tests in mean *(T-test: Pr>t)* *[Wicoxon test: Pr>z]*		
	When the method of payment is						When the method of payment is					
	Cash (a)	Stock (b)	Mix (c)	(a-b)	(a-c)	(b-c)	Cash (a)	Stock (b)	Mix (c)	(a-b)	(a-c)	(b-c)
CAR [-1,1] (%)	**0.33**	-0.58	-0.24	**0.91**	0.57	-0.35	0.04	**-2.03**	-0.92	**2.07**	0.95	-1.12
(T Test)	*(0.049)* [b]	*(0.212)*	*(0.636)*	*(0.089)* [c]	*(0.413)*	*(0.637)*	*(0.963)*	*(<0.001)* [a]	*(0.149)*	*(0.035)* [b]	*(0.336)*	*(0.187)*
[Wilcoxon R.. S.Test]				*[0.298]*	*[0.327]*	*[0.852]*				*[0.004]* [a]	*[0.208]*	*[0.217]*
BHAR [+20, 750] (%)	**4.53**	**-3.21**	-4.97	**7.74**	9.50	1.76	-4.18	**-14.67**	**-8.41**	10.48	4.23	-6.26
(T Test)	*(0.041)* [b]	*(0.068)* [c]	*(0.413)*	*(0.096)* [c]	*(0.128)*	*(0.757)*	*(0.585)*	*(<0.001)* [a]	*(0.071)* [c]	*(0.224)*	*(0.617)*	*(0.374)*
[Wilcoxon R.. S.Test]				*[0.072]* [c]	*[0.394]*	*[0.723]*				*[0.213]*	*[0.187]*	*[0.517]*
N	123	217	118				68	249	96			

[a] Denotes significance at the 1% level, using a two-tail test.
[b] Denotes significance at the 5% level, using a two-tail test.
[c] Denotes significance at the 10% level, using a two-tail test.

Acq_ValueBuilder holds when **%Acq_IntRoeSpread > %Tgt_IntRoeSpread**,that is when *the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is greater than the corresponding percentage for the target company*, that is when:

$$\frac{\frac{Acq\_ROE}{Acq\_COE}}{Acq\_PTBV} > \frac{\frac{Tgt\_ROE}{Tgt\_COE}}{Tgt\_PTBV}$$

Acq_ValueDestroyer holds when **%Acq_IntRoeSpread < %Tgt_IntRoeSpread**, that is when *the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is lesser than the corresponding percentage for the target company*, that is when:

$$\frac{\frac{Acq\_ROE}{Acq\_COE}}{Acq\_PTBV} < \frac{\frac{Tgt\_ROE}{Tgt\_COE}}{Tgt\_PTBV}$$

Table 9 (cont'd)

Parametric and non-parametric univariate tests for difference respectively in CARs and in BHARs across PTTB portfolios, percentage of intangibles explained by the spread between ROE and cost of equity and method of payment

Panel B	Acquirers in the High PTTB portfolio (Glamour Acquirers) acquiring Targets in the Low PTTB portfolio and:											
	holding the relation: %Acq_IntRoeSpread > %Tgt_IntRoeSpread			Difference tests in mean (T-test: Pr>t) [Wicoxon test: Pr>z]			holding the relation: %Acq_IntRoeSpread < %Tgt_IntRoeSpread			Difference tests in mean (T-test: Pr>t) [Wicoxon test: Pr>z]		
	When the method of payment is						When the method of payment is					
	Cash (a)	Stock (b)	Mix (c)	(a-b)	(a-c)	(b-c)	Cash (a)	Stock (b)	Mix (c)	(a-b)	(a-c)	(b-c)
CAR [-1,1] (%)	0.17	-0.67	-0.21	**0.84**	0.38	-0.46	-0.48	**-1.36**	-0.42	**0.88**	-0.06	**-0.94**
(T Test)	*(0.711)*	*(0.182)*	*(0.732)*	***(0.023)*** [b]	*(0.618)*	*(0.555)*	*(0.589)*	***(0.018)*** [b]	*(0.585)*	***(0.038)*** [b]	*(0.958)*	*(0.313)*
[Wilcoxon R.. S.Test]				***[0.051]*** [c]	*[0.784]*	*[0.694]*				***[0.065]*** [c]	*[0.948]*	***[0.078]*** [c]
BHAR [+20, 750] (%)	**-2.54**	**-11.33**	-7.46	8.79	**4.92**	-3.87	**-5.74**	**-11.84**	-9.01	6.11	3.28	-2.83
(T Test)	***(0.052)*** [b]	***(0.011)*** [a]	*(0.122)*	*(0.158)*	*(0.143)*	*(0.560)*	***(0.068)*** [c]	***(0.039)*** [b]	*(0.123)*	*(0.427)*	*(0.651)*	*(0.732)*
[Wilcoxon R.. S.Test]				*[0.459]*	***[0.072]*** [c]	*[0.350]*				*[0.375]*	*[0.465]*	*[0.899]*
N	141	196	140				76	112	83			

[a] Denotes significance at the 1% level, using a two-tail test.
[b] Denotes significance at the 5% level, using a two-tail test.
[c] Denotes significance at the 10% level, using a two-tail test.

Acq_ValueBuilder holds when **%Acq_IntRoeSpread > %Tgt_IntRoeSpread**,that is when *the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is greater than the corresponding percentage for the target company*, that is when:

$$\frac{\frac{Acq\_ROE}{Acq\_COE}}{Acq\_PTBV} > \frac{\frac{Tgt\_ROE}{Tgt\_COE}}{Tgt\_PTBV}$$

Acq_ValueDestroyer holds when **%Acq_IntRoeSpread < %Tgt_IntRoeSpread**, that is when *the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is lesser than the corresponding percentage for the target company*, that is when:

$$\frac{\frac{Acq\_ROE}{Acq\_COE}}{Acq\_PTBV} < \frac{\frac{Tgt\_ROE}{Tgt\_COE}}{Tgt\_PTBV}$$

Table 9 (cont'd)

Parametric and non-parametric univariate tests for difference respectively in CARs and in BHARs across PTTB portfolios, percentage of intangibles explained by the spread between ROE and cost of equity and method of payment

Panel C	Acquirers in the Low PTTB portfolio (Value Acquirers) acquiring Targets in the High PTTB portfolio and:											
	holding the relation: %Acq_IntRoeSpread > %Tgt_IntRoeSpread			Difference tests in mean (T-test: Pr>t) [Wicoxon test: Pr>z]			holding the relation: %Acq_IntRoeSpread < %Tgt_IntRoeSpread			Difference tests in mean (T-test: Pr>t) [Wicoxon test: Pr>z]		
	When the method of payment is						When the method of payment is					
	Cash (a)	Stock (b)	Mix (c)	(a-b)	(a-c)	(b-c)	Cash (a)	Stock (b)	Mix (c)	(a-b)	(a-c)	(b-c)
CAR [-1,1] (%)	0.50	-1.04	0.41	**1.55**	0.91	-0.63	-0.45	**-1.81**	**-1.02**	**1.36**	0.57	-0.79
(T Test)	*(0.495)*	*(0.248)*	*(0.586)*	***(0.019)*** [b]	*(0.425)*	*(0.594)*	*(0.544)*	***(0.045)*** [b]	***(0.071)*** [c]	***(0.026)*** [b]	*(0.537)*	*(0.435)*
[Wilcoxon R.. S.Test]				***[0.026]*** [b]	*[0.680]*	*[0.458]*				***[0.021]*** [b]	*[0.237]*	*[0.731]*
BHAR [+20, 750] (%)	**9.67**	-4.96	4.28	**14.63**	5.39	-9.24	2.75	-6.48	-1.72	9.23	4.47	-4.77
(T Test)	***(0.047)*** [b]	*(0.364)*	*(0.397)*	***(0.048)*** [b]	*(0.478)*	*(0.229)*	*(0.699)*	*(0.245)*	*(0.697)*	*(0.320)*	*(0.574)*	*(0.515)*
[Wilcoxon R.. S.Test]				***[0.014]*** [b]	*[0.164]*	*[0.245]*				*[0.469]*	*[0.534]*	*[0.804]*
N	53	60	93				52	68	80			

[a] Denotes significance at the 1% level, using a two-tail test.
[b] Denotes significance at the 5% level, using a two-tail test.
[c] Denotes significance at the 10% level, using a two-tail test.

Acq_ValueBuilder holds when **%Acq_IntRoeSpread > %Tgt_IntRoeSpread**,that is when *the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is greater than the corresponding percentage for the target company*, that is when:

$$\frac{\frac{Acq\_ROE}{Acq\_COE}}{Acq\_PTBV} > \frac{\frac{Tgt\_ROE}{Tgt\_COE}}{Tgt\_PTBV}$$

Acq_ValueDestroyer holds when **%Acq_IntRoeSpread < %Tgt_IntRoeSpread**, that is when *the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is lesser than the corresponding percentage for the target company*, that is when:

$$\frac{\frac{Acq\_ROE}{Acq\_COE}}{Acq\_PTBV} < \frac{\frac{Tgt\_ROE}{Tgt\_COE}}{Tgt\_PTBV}$$

Table 9 (cont'd)

Parametric and non-parametric univariate tests for difference respectively in CARs and in BHARs across PTTB portfolios, percentage of intangibles explained by the spread between ROE and cost of equity and method of payment

Panel D	Acquirers in the Low PTTB portfolio (Value Acquirers) acquiring Targets in the Low PTTB portfolio and:											
	holding the relation: %Acq_IntRoeSpread > %Tgt_IntRoeSpread			Difference tests in mean *(T-test: Pr>t)* *[Wicoxon test: Pr>z]*			holding the relation: %Acq_IntRoeSpread < %Tgt_IntRoeSpread			Difference tests in mean *(T-test: Pr>t)* *[Wicoxon test: Pr>z]*		
	When the method of payment is						When the method of payment is					
	Cash (a)	Stock (b)	Mix (c)	(a-b)	(a-c)	(b-c)	Cash (a)	Stock (b)	Mix (c)	(a-b)	(a-c)	(b-c)
CAR [-1,1] (%)	**0.95**	**-0.91**	0.43	**1.86**	0.52	**-1.34**	0.90	-0.19	0.02	**1.09**	0.88	-0.21
(T Test)	*(0.107)* [c]	*(<0.001)* [a]	*(0.390)*	*(0.001)* [a]	*(0.502)*	*(0.012)* [a]	*(0.130)*	*(0.836)*	*(0.981)*	*(0.035)* [b]	*(0.406)*	*(0.857)*
[Wilcoxon R.. S.Test]				*[0.088]* [c]	*[0.928]*	*[0.032]* [b]				*[0.011]* [a]	*[0.163]*	*[0.216]*
BHAR [+20, 750] (%)	**12.13**	1.58	**14.00**	**10.56**	-1.87	**-12.43**	**14.30**	1.17	**10.50**	**13.13**	3.80	-9.33
(T Test)	*(0.003)* [a]	*(0.557)*	*(0.001)* [a]	*(0.024)* [b]	*(0.761)*	*(0.012)* [a]	*(0.008)* [a]	*(0.773)*	*(0.045)* [b]	*(0.045)* [b]	*(0.630)*	*(0.179)*
[Wilcoxon R.. S.Test]				*[0.023]* [b]	*[0.482]*	*[0.151]*				*[0.054]* [b]	*[0.235]*	*[0.424]*
N	219	369	317				115	149	195			

[a] Denotes significance at the 1% level, using a two-tail test.
[b] Denotes significance at the 5% level, using a two-tail test.
[c] Denotes significance at the 10% level, using a two-tail test.

Acq_ValueBuilder holds when **%Acq_IntRoeSpread > %Tgt_IntRoeSpread**,that is when *the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is greater than the corresponding percentage for the target company*, that is when:

$$\frac{\frac{Acq\_ROE}{Acq\_COE}}{Acq\_PTBV} > \frac{\frac{Tgt\_ROE}{Tgt\_COE}}{Tgt\_PTBV}$$

Acq_ValueDestroyer holds when **%Acq_IntRoeSpread < %Tgt_IntRoeSpread**, that is when *the percentage of the acquirer's intangible assets explained by the spread between ROE and cost of equity is lesser than the corresponding percentage for the target company*, that is when:

$$\frac{\frac{Acq\_ROE}{Acq\_COE}}{Acq\_PTBV} < \frac{\frac{Tgt\_ROE}{Tgt\_COE}}{Tgt\_PTBV}$$

Table 10

Determinants of Cumulative Abnormal Returns: Multivariate tests

The table presents a *cross-sectional regression analysis of Cumulative Abnormal Returns.* Bold font indicates significance and superscripts indicate the level of significance. Significance at the 1%, 5% and 10% level is denoted with [a], [b], and [c]. P-values for two-tailed tests are reported below the coefficients and are in *italics*.

$$CAR = \alpha_0 + \alpha_1 \text{ Acq\_HighPTTB} + \alpha_2 \text{ Tgt\_HighPTTB} + \alpha_3 \text{ Acq\_ValueBuilder} + \alpha_4 \text{ Acq\_HighPTTB} * \text{Tgt\_HighPTTB} + \alpha_5 \text{ Acq\_HighPTTB} * \text{Acq\_ValueBuilder} + \alpha_6 \text{ Tgt\_HighPTTB} * \text{Acq\_ValueBuilder} + \alpha_7 \text{ Acq\_HighPTTB} * \text{Tgt\_HighPTTB} * \text{Acq\_ValueBuilder} + \varepsilon$$

PANEL A: Regression results (only with interaction variables)

Dependent variable: CAR	Model	
	Coefficient	*(p-value)*
Intercept	0.00169	*(0.619)*
Intangible assets' endowment		
Acq_HighPTTB	**-0.00995**	***(0.075)*** [c]
Tgt_HighPTTB	**-0.01310**	***(0.034)*** [b]
Value creation capability		
Acq_ValueBuilder	-0.00158	*(0.706)*
Variables interaction		
Acq_HighPTTB * Tgt_HighPTTB	0.00704	*(0.403)*
Acq_HighPTTB * Acq_ValueBuilder	0.00701	*(0.314)*
Tgt_HighPTTB * Acq_ValueBuilder	0.00938	*(0.263)*
Acq_HighPTTB * Tgt_HighPTBB * Acq_ValueBuilder	-0.00299	*(0.790)*
n		3,389
Adjusted R^2		0.008

Table 11

Determinants of Cumulative Abnormal Returns: Sum of coefficients tests

PANEL B: ***Test for HP 1a)*** $\alpha_3 > 0$

	Coefficient	*(p-value.)*
$\alpha_3 > 0$	-0.00158	*(0.706)*

PANEL C: ***Test for HP 2a) CAR { Acq_HighPTTB = 1, Tgt_High PTTB = 1, Acq_ValueBuilder = 1 } > CAR { Acq_HighPTTB = 1, Tgt_High PTTB = 1, Acq_ValueBuilder = 0 }***

	Coefficient	*(p-value.)*
$\alpha_3 + \alpha_5 + \alpha_6 + \alpha_7 > 0$	**0.01182**	***(0.017)*** [b]

PANEL D: ***Test for HP 3a) CAR { Acq_HighPTTB = 1, Tgt_High PTTB = 1, Acq_ValueBuilder = 1 } > CAR { Acq_HighPTTB = 1, Tgt_High PTTB = 0, Acq_ValueBuilder = 0 }.***

	Coefficient	*(p-value.)*
$\alpha_2 + \alpha_3 + \alpha_4 + \alpha_5 + \alpha_6 + \alpha_7 > 0$	0.00576	*(0.303)*

Variables definition

Acq_HighPTTB = A dummy variable which equals 1 if acquirer *i* is in the High PTTB portfolio of acquirers, and 0 otherwise
Tgt_HighPTTB = A dummy variable which equals 1 if target *i* is in the High PTTB portfolio of targets, and 0 otherwise
Acq_ValueBuilder = A dummy variable which:

=1 if the percentage of the acquirer's intangibles explained by a ROE greater than the cost of equity is greater than the percentage of the target's intangibles explained by a ROE greater than the cost of equity, that is if:

$$\frac{\frac{Acq\_ROE}{Acq\_COE}}{Acq\_PTBV} > \frac{\frac{Tgt\_ROE}{Tgt\_COE}}{Tgt\_PTBV}$$

= 0 if the percentage of the acquirer's intangibles explained by a ROE greater than the cost of equity is lesser than the percentage of the target's intangibles explained by a ROE greater than the cost of equity, that is if:

$$\frac{\frac{Acq\_ROE}{Acq\_COE}}{Acq\_PTBV} < \frac{\frac{Tgt\_ROE}{Tgt\_COE}}{Tgt\_PTBV}$$

Notes:
I split the sample of acquirers (targets) into two sub-sample, High PTTB and Low PTTB, which group firms whose PTTB are above and below the median respectively.
The first row for each variable shows the coefficient, while the second row *(in italic)* show the p-value.

[a] Denotes significance at the 1% level, using a two-tail test.
[b] Denotes significance at the 5% level, using a two-tail test.
[c] Denotes significance at the 10% level, using a two-tail test.

See table 1 for definitions of variables

Table 12

Determinants of Buy-and-Hold Abnormal Returns: Multivariate tests

The table presents a *cross-sectional regression analysis of Buy-and-Hold Abnormal Returns.* Bold font indicates significance and superscripts indicate the level of significance. Significance at the 1%, 5% and 10% level is denoted with [a], [b], and [c]. P-values for two-tailed tests are reported below the coefficients and are in italics.

$$BHAR = \alpha_0 + \alpha_1 \text{ Acq\_HighPTTB} + \alpha_2 \text{ Tgt\_HighPTTB} + \alpha_3 \text{ Acq\_ValueBuilder} + \alpha_4 \text{ Acq\_HighPTTB} * \text{Tgt\_HighPTTB} + \alpha_5 \text{ Acq\_HighPTTB} * \text{Acq\_ValueBuilder} + \alpha_6 \text{ Tgt\_HighPTTB} * \text{Acq\_ValueBuilder} + \alpha_7 \text{ Acq\_HighPTTB} * \text{Tgt\_HighPTTB} * \text{Acq\_ValueBuilder} + \varepsilon$$

PANEL A: Regression results (only with interaction variables)

Dependent variable: BHAR	Model	
	Coefficient	*(p-value)*
Intercept	**0.08429**	***(0.001)*** [a]
Intangible assets' endowment		
Acq_HighPTTB	**-0.17693**	***(<0.001)*** [a]
Tgt_HighPTTB	**-0.10606**	***(0.029)*** [b]
Value creation capability		
Acq_ValueBuilder	0.00055	*(0.986)*
Variables interaction		
Acq_HighPTTB * Tgt_HighPTTB	0.08382	*(0.205)*
Acq_HighPTTB * Acq_ValueBuilder	0.01616	*(0.767)*
Tgt_HighPTTB * Acq_ValueBuilder	0.05099	*(0.438)*
Acq_HighPTTB * Tgt_HighPTBB * Acq_ValueBuilder	**0.03131**	***(0.072)*** [c]
n		3,389
Adjusted R^2		0.004

Table 13

Determinants of Buy-and-Hold Abnormal Returns: Sum of coefficients tests

PANEL B: ***Test for HP 1b)*** $\alpha_3 > 0$

	Coefficient	*(p-value.)*
$\alpha_3 > 0$	0.00055	*(0.986)*

PANEL C: ***Test for HP 2b) BHAR { Acq_HighPTTB = 1, Tgt_High PTTB = 1, Acq_ValueBuilder = 1 } > BHAR { Acq_HighPTTB = 1, Tgt_High PTTB = 1, Acq_ValueBuilder = 0 }***

	Coefficient	*(p-value.)*
$\alpha_3 + \alpha_5 + \alpha_6 + \alpha_7 > 0$	**0.09901**	***(0.011)*** [a]

PANEL D: ***Test for HP 3b) BHAR { Acq_HighPTTB = 1, Tgt_High PTTB = 1, Acq_ValueBuilder = 1 } > BHAR { Acq_HighPTTB = 1, Tgt_High PTTB = 0, Acq_ValueBuilder = 0 }***

	Coefficient	*(p-value.)*
$\alpha_2 + \alpha_3 + \alpha_4 + \alpha_5 + \alpha_6 + \alpha_7 > 0$	**0.07677**	***(0.081)*** [c]

Variables definition

Acq_HighPTTB = A dummy variable which equals 1 if acquirer *i* is in the High PTTB portfolio of acquirers, and 0 otherwise
Tgt_HighPTTB = A dummy variable which equals 1 if target *i* is in the High PTTB portfolio of targets, and 0 otherwise
Acq_ValueBuilder = A dummy variable which:

=1 if the percentage of the acquirer's intangibles explained by a ROE greater than the cost of equity is greater than the percentage of the target's intangibles explained by a ROE greater than the cost of equity, that is if:

$$\frac{\frac{Acq\_ROE}{Acq\_COE}}{Acq\_PTBV} > \frac{\frac{Tgt\_ROE}{Tgt\_COE}}{Tgt\_PTBV}$$

= 0 if the percentage of the acquirer's intangibles explained by a ROE greater than the cost of equity is lesser than the percentage of the target's intangibles explained by a ROE greater than the cost of equity, that is if:

$$\frac{\frac{Acq\_ROE}{Acq\_COE}}{Acq\_PTBV} < \frac{\frac{Tgt\_ROE}{Tgt\_COE}}{Tgt\_PTBV}$$

Notes:
I split the sample of acquirers (targets) into two sub-sample, High PTTB and Low PTTB, which group firms whose PTTB are above and below the median respectively.
The first row for each variable shows the coefficient, while the second row *(in italic)* show the p-value.

[a] Denotes significance at the 1% level, using a two-tail test.
[b] Denotes significance at the 5% level, using a two-tail test.
[c] Denotes significance at the 10% level, using a two-tail test.

See table 1 for definition of variables

Table 14

Determinants of Cumulative Abnormal Returns:

Robustness check of multivariate tests

The table presents a *cross-sectional regression analysis of Cumulative Abnormal Returns.* Bold font indicates significance and superscripts indicate the level of significance. Significance at the 1%, 5% and 10% level is denoted with [a], [b], and [c]. P-values for two-tailed tests are reported below the coefficients and are in italics.

$$CAR = \alpha_0 + \alpha_1\ Acq\_HighPTTB + \alpha_2\ Tgt\_HighPTTB + \alpha_3\ Acq\_ValueBuilder + \alpha_4\ Acq\_HighPTTB * Tgt\_HighPTTB + \alpha_5\ Acq\_HighPTTB * Acq\_ValueBuilder + \alpha_6\ Tgt\_HighPTTB * Acq\_ValueBuilder + \alpha_7\ Acq\_HighPTTB * Tgt\_HighPTTB * Acq\_ValueBuilder + \alpha_8\ Cash + \alpha_9\ Tender + \alpha_{10}\ Var\_CRSP + \alpha_{11}\ N\_Deals + \alpha_{12}\ Relative\_Size + \alpha_{13}\ Toehold + \alpha_{14}\ Acq\_Leverage + \alpha_{15}\ Related + \alpha_{16}\ Hostile + \varepsilon$$

PANEL A: Regression results controlling for other factors affecting bidders' returns

Dependent variable: CAR	Model	
	Coefficient	***(p-value)***
Intercept	**-0.02506**	***(<0.001)*** [a]
Intangible assets' endowment		
Acq_HighPTTB	-0.00147	*(0.807)*
Tgt_HighPTTB	-0.00762	*(0.269)*
Value creation capability		
Acq_ValueBuilder	0.00797	*(0.129)*
Variables interaction		
Acq_HighPTTB * Tgt_HighPTTB	0.00560	*(0.531)*
Acq_HighPTTB * Acq_ValueBuilder	0.00050	*(0.951)*
Tgt_HighPTTB * Acq_ValueBuilder	0.00208	*(0.821)*
Acq_HighPTTB * Tgt_HighPTBB * Acq_ValueBuilder	-0.00039	*(0.974)*
Controls		
Cash	**0.01383**	***(<0.001)*** [a]
Tender	**0.00406**	***(0.031)*** [b]
Var_CRSP	**0.01394**	***(0.105)*** [c]
N_Deals	0.000002	*(0.826)*
Relative_Size	**0.00228**	***(0.015)*** [b]
Toehold	**0.00054**	***(0.027)*** [b]
Acq_Leverage	**0.01620**	***(0.043)*** [b]
Related	**0.00713**	***(0.019)*** [b]
Hostile	-0.00467	*(0.516)*
n		3,389
Adjusted R^2		0.16

Table 15

Determinants of Cumulative Abnormal Returns:

Sum of coefficients tests (robustness check section)

PANEL B: ***Test for HP 1a)*** $\alpha_3 > 0$

	Coefficient	*(p-value.)*
$\alpha_3 > 0$	0.00797	*(0.129)*

PANEL C: ***Test for HP 2a) CAR { Acq_HighPTTB = 1, Tgt_High PTTB = 1, Acq_ValueBuilder = 1 } > CAR { Acq_HighPTTB = 1, Tgt_High PTTB = 1, Acq_ValueBuilder = 0 }***

	Coefficient	*(p-value.)*
$\alpha_3 + \alpha_5 + \alpha_6 + \alpha_7 > 0$	**0.01016**	*(0.033)* [b]

PANEL D: ***Test for HP 3a) CAR { Acq_HighPTTB = 1, Tgt_High PTTB = 1, Acq_ValueBuilder = 1 } > CAR { Acq_HighPTTB = 1, Tgt_High PTTB = 0, Acq_ValueBuilder = 0 }***

	Coefficient	*(p-value.)*
$\alpha_2 + \alpha_3 + \alpha_4 + \alpha_5 + \alpha_6 + \alpha_7 > 0$	0.00813	*(0.143)*

Variables definition

Acq_HighPTTB = A dummy variable which equals 1 if acquirer *i* is in the High PTTB portfolio of acquirers, and 0 otherwise

Tgt_HighPTTB = A dummy variable which equals 1 if target *i* is in the High PTTB portfolio of targets, and 0 otherwise

Acq_ValueBuilder = A dummy variable which:

=1 if the percentage of the acquirer's intangibles explained by a ROE greater than the cost of equity is greater than the percentage of the target's intangibles explained by a ROE greater than the cost of equity, that is if:

$$\frac{\frac{Acq\_ROE}{Acq\_COE}}{Acq\_PTBV} > \frac{\frac{Tgt\_ROE}{Tgt\_COE}}{Tgt\_PTBV}$$

= 0 if the percentage of the acquirer's intangibles explained by a ROE greater than the cost of equity is lesser than the percentage of the target's intangibles explained by a ROE greater than the cost of equity, that is if:

$$\frac{\frac{Acq\_ROE}{Acq\_COE}}{Acq\_PTBV} < \frac{\frac{Tgt\_ROE}{Tgt\_COE}}{Tgt\_PTBV}$$

Notes:

I split the sample of acquirers (targets) into two sub-sample, High PTTB and Low PTTB, which group firms whose PTTB are above and below the median respectively.

The first row for each variable shows the coefficient, while the second row *(in italic)* show the p-value.

[a] Denotes significance at the 1% level, using a two-tail test.

[b] Denotes significance at the 5% level, using a two-tail test.

[c] Denotes significance at the 10% level, using a two-tail test.

See table 1 for definitions of variables

Table 16

Determinants of Buy-and-Hold Abnormal Returns:

Robustness check of multivariate tests

The table presents a *cross-sectional regression analysis of Buy-and-Hold Abnormal Returns.* Bold font indicates significance and superscripts indicate the level of significance. Significance at the 1%, 5% and 10% level is denoted with [a], [b], and [c]. P-values for two-tailed tests are reported below the coefficients and are in italics.

BHAR α_0 + α_1 Acq_HighPTTB + α_2 Tgt_HighPTTB + α_3 Acq_ValueBuilder + α_4 Acq_HighPTTB * Tgt_HighPTTB + α_5 Acq_HighPTTB * Acq_ValueBuilder + α_6 Tgt_HighPTTB * Acq_ValueBuilder + α_7 Acq_HighPTTB * Tgt_HighPTTB * Acq_ValueBuilder + α_8 Cash + α_9 Tender + α_{10} Var_CRSP + α_{11} N_Deals + α_{12} Relative_Size + α_{13} Toehold + α_{14} Acq_Leverage + α_{15} Related + α_{16} Hostile + ε

PANEL A: Regression results controlling for other factors affecting bidders' returns

Dependent variable: BHAR

	Model	
	Coefficient	*(p-value)*
Intercept	0.04433	(0.362)
Intangible assets' endowment		
Acq_HighPTTB	**-0.18556**	***(0.032)*** [b]
Tgt_HighPTTB	-0.09088	(0.100)
Value creation capability		
Acq_ValueBuilder	0.00060	*(0.406)*
Variables interaction		
Acq_HighPTTB * Tgt_HighPTTB	0.07337	(0.306)
Acq_HighPTTB * Acq_ValueBuilder	-0.01414	(0.829)
Tgt_HighPTTB * Acq_ValueBuilder	0.02575	(0.728)
Acq_HighPTTB * Tgt_HighPTBB * Acq_ValueBuilder	**0.08076**	***(0.040)*** [b]
Controls		
Cash	**0.02179**	***(0.049)*** [b]
Tender	**0.07313**	***(0.023)*** [b]
Var_CRSP	- 0.04324	(0.542)
N_Deals	- 0.00010	(0.273)
Relative_Size	0.00209	(0.781)
Toehold	0.00137	(0.489)
Acq_Leverage	0.01088	(0.865)
Related	**0.01179**	***(0.062)*** [c]
Hostile	-0.02110	(0.714)
n		3,389
Adjusted R^2		0.08

Table 17

Determinants of Buy-and-Hold Abnormal Returns:

Sum of coefficients tests (robustness check section)

PANEL B: ***Test for HP 1b)*** $\alpha_3 > 0$

	Coefficient	*(p-value.)*
$\alpha_3 > 0$	0.00060	*(0.406)*

PANEL C: ***Test for HP 2b) BHAR { Acq_HighPTTB = 1, Tgt_High PTTB = 1, Acq_ValueBuilder = 1 } > BHAR { Acq_HighPTTB = 1, Tgt_High PTTB = 1, Acq_ValueBuilder = 0 }***

	Coefficient	*(p-value.)*
$\alpha_3 + \alpha_5 + \alpha_6 + \alpha_7 > 0$	**0.09296**	*(0.015)* [b]

PANEL D: ***Test for HP 3b) BHAR { Acq_HighPTTB = 1, Tgt_High PTTB = 1, Acq_ValueBuilder = 1 } > BHAR { Acq_HighPTTB = 1, Tgt_High PTTB = 0, Acq_ValueBuilder = 0 }***

	Coefficient	*(p-value.)*
$\alpha_2 + \alpha_3 + \alpha_4 + \alpha_5 + \alpha_6 + \alpha_7 > 0$	**0.07546**	*(0.090)* [c]

Variables definition

Acq_HighPTTB = A dummy variable which equals 1 if acquirer *i* is in the High PTTB portfolio of acquirers, and 0 otherwise

Tgt_HighPTTB = A dummy variable which equals 1 if target *i* is in the High PTTB portfolio of targets, and 0 otherwise

Acq_ValueBuilder = A dummy variable which:

=1 if the percentage of the acquirer's intangibles explained by a ROE greater than the cost of equity is greater than the percentage of the target's intangibles explained by a ROE greater than the cost of equity, that is if:

$$\frac{\frac{Acq\_ROE}{Acq\_COE}}{Acq\_PTBV} > \frac{\frac{Tgt\_ROE}{Tgt\_COE}}{Tgt\_PTBV}$$

= 0 if the percentage of the acquirer's intangibles explained by a ROE greater than the cost of equity is lesser than the percentage of the target's intangibles explained by a ROE greater than the cost of equity, that is if:

$$\frac{\frac{Acq\_ROE}{Acq\_COE}}{Acq\_PTBV} < \frac{\frac{Tgt\_ROE}{Tgt\_COE}}{Tgt\_PTBV}$$

Notes:

I split the sample of acquirers (targets) into two sub-sample, High PTTB and Low PTTB, which group firms whose PTTB are above and below the median respectively.

The first row for each variable shows the coefficient, while the second row *(in italic)* show the p-value.

[a] Denotes significance at the 1% level, using a two-tail test.

[b] Denotes significance at the 5% level, using a two-tail test.

[c] Denotes significance at the 10% level, using a two-tail test.

See table 1 for definition of variables

Appendix

Table A1

The data for the estimate of the equity risk premium: Raw data for S&P 500 and T. Bond rate

Year	S&P 500	Dividends	Dividend Yield	T.Bond rate
1927	17.66	0.62	3.50%	3.17%
1928	24.35	1.05	4.30%	3.45%
1929	21.45	0.88	4.10%	3.36%
1930	15.34	0.72	4.70%	3.22%
1931	8.12	0.50	6.10%	3.93%
1932	6.92	0.50	7.20%	3.35%
1933	9.97	0.41	4.10%	3.53%
1934	9.5	0.35	3.70%	3.01%
1935	13.43	0.51	3.80%	2.84%
1936	17.18	0.54	3.14%	2.59%
1937	10.55	0.56	5.30%	2.73%
1938	13.14	0.50	3.80%	2.56%
1939	12.46	0.54	4.30%	2.35%
1940	10.58	0.55	5.20%	2.01%
1941	8.69	0.54	6.20%	2.47%
1942	9.77	0.59	6.00%	2.49%
1943	11.67	0.55	4.70%	2.49%
1944	13.28	0.61	4.60%	2.48%
1945	17.36	0.68	3.90%	2.33%
1946	15.3	0.60	3.90%	2.24%
1947	15.3	0.80	5.20%	2.39%
1948	15.2	0.97	6.40%	2.44%
1949	16.79	1.19	7.10%	2.19%
1950	20.43	1.53	7.50%	2.39%
1951	23.77	1.50	6.30%	2.70%
1952	26.57	1.51	5.70%	2.75%
1953	24.81	1.44	5.80%	2.59%
1954	35.98	1.87	5.20%	2.51%
1955	45.48	2.23	4.90%	2.96%
1956	46.67	2.19	4.70%	3.59%
1957	39.99	1.80	4.50%	3.21%
1958	55.21	2.26	4.10%	3.86%
1959	59.89	1.98	3.30%	4.69%
1960	58.11	1.98	3.41%	3.84%
1961	71.55	2.04	2.85%	4.06%
1962	63.1	2.15	3.40%	3.86%
1963	75.02	2.35	3.13%	4.13%
1964	84.75	2.58	3.05%	4.18%
1965	92.43	2.83	3.06%	4.62%
1966	80.33	2.88	3.59%	4.84%
1967	96.47	2.98	3.09%	5.70%
1968	103.86	3.04	2.93%	6.03%
1969	92.06	3.24	3.52%	7.65%
1970	92.15	3.19	3.46%	6.39%
1971	102.09	3.16	3.10%	5.93%
1972	118.05	3.19	2.70%	6.36%
1973	97.55	3.61	3.70%	6.74%
1974	68.56	3.72	5.43%	7.43%
1975	90.19	3.73	4.14%	8.00%
1976	107.46	4.22	3.93%	6.87%
1977	95.1	4.86	5.11%	7.69%
1978	96.11	5.18	5.39%	9.01%
1979	107.94	5.97	5.53%	10.39%
1980	135.76	6.44	4.74%	12.84%
1981	122.55	6.83	5.57%	13.72%
1982	140.64	6.93	4.93%	10.54%
1983	164.93	7.12	4.32%	11.83%
1984	167.24	7.83	4.68%	11.50%
1985	211.28	8.20	3.88%	9.26%
1986	242.17	8.19	3.38%	7.11%
1987	247.08	9.17	3.71%	8.99%
1988	277.72	10.22	3.68%	9.11%
1989	353.4	11.73	3.32%	7.84%
1990	330.22	12.35	3.74%	8.08%
1991	417.09	12.97	3.11%	7.09%
1992	435.71	12.64	2.90%	6.77%
1993	466.45	12.69	2.72%	5.77%
1994	459.27	13.36	2.91%	7.81%
1995	615.93	14.17	2.30%	5.71%
1996	747.74	14.89	1.99%	6.30%
1997	970.43	15.52	1.60%	5.81%
1998	1229.23	16.20	1.32%	4.65%
1999	1469.25	16.71	1.14%	6.44%
2000	1320.28	16.27	1.23%	5.11%

Table A2

The data for the estimate of the equity risk premium: Annual returns on stock and T. Bonds from 1928

Years	Annual returns on stocks	Annual returns on T. Bonds	Years	Annual returns on stocks	Annual returns on T. Bonds
1928	43.81%	0.84%	*1965*	12.40%	0.72%
1929	-8.30%	4.20%	*1966*	-9.97%	2.91%
1930	-25.12%	4.54%	*1967*	23.80%	-1.58%
1931	-43.84%	-2.56%	*1968*	10.81%	3.27%
1932	-8.64%	8.79%	*1969*	-8.24%	-5.01%
1933	49.98%	1.86%	*1970*	3.56%	16.75%
1934	-1.19%	7.96%	*1971*	14.22%	9.79%
1935	46.74%	4.47%	*1972*	18.76%	2.82%
1936	31.94%	5.02%	*1973*	-14.31%	3.66%
1937	-35.34%	1.38%	*1974*	-25.90%	1.99%
1938	29.28%	4.21%	*1975*	37.00%	3.61%
1939	-1.10%	4.41%	*1976*	23.83%	15.98%
1940	-10.67%	5.40%	*1977*	-6.98%	1.29%
1941	-12.77%	-2.02%	*1978*	6.51%	-0.78%
1942	19.17%	2.29%	*1979*	18.52%	0.67%
1943	25.06%	2.49%	*1980*	31.74%	-2.99%
1944	19.03%	2.58%	*1981*	-4.70%	8.20%
1945	35.82%	3.80%	*1982*	20.42%	32.81%
1946	-8.43%	3.13%	*1983*	22.34%	3.20%
1947	5.20%	0.92%	*1984*	6.15%	13.73%
1948	5.70%	1.95%	*1985*	31.24%	25.71%
1949	18.30%	4.66%	*1986*	18.49%	24.28%
1950	30.81%	0.43%	*1987*	5.81%	-4.96%
1951	23.68%	-0.30%	*1988*	16.54%	8.22%
1952	18.15%	2.27%	*1989*	31.48%	17.69%
1953	-1.21%	4.14%	*1990*	-3.06%	6.24%
1954	52.56%	3.29%	*1991*	30.23%	15.00%
1955	32.60%	-1.34%	*1992*	7.49%	9.36%
1956	7.44%	-2.26%	*1993*	9.97%	14.21%
1957	-10.46%	6.80%	*1994*	1.33%	-8.04%
1958	43.72%	-2.10%	*1995*	37.20%	23.48%
1959	12.06%	-2.65%	*1996*	23.82%	1.43%
1960	0.34%	11.64%	*1997*	31.86%	9.94%
1961	26.64%	2.06%	*1998*	28.34%	14.92%
1962	-8.81%	5.69%	*1999*	20.89%	-8.25%
1963	22.61%	1.68%	*2000*	-9.03%	16.66%
1964	16.42%	3.73%			

Table A3

The data for the estimate of the equity risk premium: The geometric average of the annual returns on stocks and T. Bonds and the equity risk premium

Period	Geometric average of annual returns on stocks (a)	Geometric Average of annual returns on T. Bonds (b)	Risk premium (a-b)
1928-1980	8.60%	2.87%	5.73%
1928-1981	8.34%	2.97%	5.37%
1928-1982	8.55%	3.44%	5.10%
1928-1983	8.78%	3.44%	5.34%
1928-1984	8.73%	3.61%	5.12%
1928-1985	9.09%	3.96%	5.13%
1928-1986	9.24%	4.27%	4.97%
1928-1987	9.18%	4.11%	5.07%
1928-1988	9.30%	4.18%	5.12%
1928-1989	9.62%	4.38%	5.24%
1928-1990	9.41%	4.41%	5.00%
1928-1991	9.71%	4.57%	5.14%
1928-1992	9.67%	4.64%	5.03%
1928-1993	9.68%	4.78%	4.90%
1928-1994	9.55%	4.58%	4.97%
1928-1995	9.91%	4.83%	5.08%
1928-1996	10.10%	4.78%	5.32%
1928-1997	10.39%	4.86%	5.53%
1928-1998	10.62%	4.99%	5.63%
1928-1999	10.76%	4.79%	5.96%
1928-2000	10.46%	4.95%	5.51%

A formal derivation of the CAR and the tests for stastistical significance

To obtain the *abnormal return* (or *prediction error*) for the common stock of the j^{th} firm on day t, I use the standard event study methodology of Brown and Warner (1985) with the market model:

$$A_{jt} = R_{jt} - (\hat{\alpha}_j + \hat{\beta}_j R_{mt})$$

where the coefficients $\hat{\alpha}_j$ and $\hat{\beta}_j$ are ordinary least squares estimates of α_j and β_j (market model parameter estimates).

The *Average Abnormal Return* (or *average prediction error*) AAR_t is the sample mean:

$$AAR_t = \frac{\sum_{j=1}^{N} A_{jt}}{N}$$

where t is defined in trading days relative to the event date (e.g. t= −10 means 10 trading days before the event), N is the number of securities whose abnormal return (A) is available at date t.

I then compute the average standardized abnormal returns (SAR_t) and the t-statistic to test whether the average standardized abnormal returns equal to zero.

Specifically, statistical test of significance of abnormal return (significantly different from zero) for time t (for each day within the event window) are carried out with *a t-Statistic* (a parametric test) and the *Wilcoxon test* (a non-parametric test).

Under the null hypothesis, each A_{jt} has mean zero and variance σ^2_{Ajt}. Under the assumption that the measures of A_{jt} are independent, identically distributed (IID) and normal, the test statistic is distributed Student-t under the null hypothesis that the mean day zero abnormal return is not different from zero. If the event has a significant impact on the returns of the sample firms I expect the null to be rejected.

The *Cumulative Abnormal Return (CAR)* for each j^{th} firm is formed by summing individual abnormal returns over time:

$$CAR_{T_1T_2} = \sum_{j=1}^{N} \sum_{t=T1}^{T_2} A_{jt}$$

Over an interval of two or more trading days beginning with day T_1, and ending with T_2, the *Cumulative Average Abnormal Return* is:

$$CAAR_{T_1T_2} = \frac{1}{N} \sum_{j=1}^{N} \sum_{t=T1}^{T_2} A_{jt}$$

Although it is possible that infrequent trading could produce some bias in measured parameters [Dimson (1979,1985) and Dimson and Marsch (1983)], Brown and Warner (1980) show with their simulation studies that the impact on the results is small.

The Fama-French three-factor model

The application of the Fama-French three-factor model that I consider, which is analogous to a traditional market model approach, is to estimate three coefficients on the market risk premium, size factor, and book-to-market factor using a pre-event window. Expected returns can be calculated using the estimated coefficients, the risk-free rate, and the realized market, size, and book-to-market risk premiums. Post-event abnormal returns can be calculated using a sample firm's realized returns less an expected return.

The Fama-French three-factor model is:

$$R_{jt} = \alpha + \beta_j R_{pt} + s_j SMB_t + h_j HML_t + \varepsilon_{jt}$$

where R_{jt} is the rate of return of the common stock of the j^{th} firm on day t; R_{pt} is the rate of return of the size decile to which the sample firm belongs on day t; SMB_t is the average return on small market capitalization portfolios minus the average return on three large market capitalization portfolios; HML_t is the average return on two high book-to-market equity portfolios minus the average return on two low book-to-market equity portfolios; ε_t is a random variable that, by construction, must have an expected value of zero, and it is assumed to be uncorrelated with R_{mt}, uncorrelated with R_{kt} for $k \neq j$, not autocorrelate and homoscedastic[63]. B_{jt} is a parameter that measures the sensitivity of R_{jt} to the excess return on the market index; s_j measures the sensitivity of R_{jt} to the difference between small and large capitalization stock returns; and h_j measures the sensitivity of R_{jt} to the difference between value and growth stock returns.

The regression yields parameter estimates of α_j, β_j, s_j, h_j.

Define the *abnormal return* (or *prediction error*) for the common stock of the j^{th} firm on day t as:

$$A_{jt} = R_{jt} - (\hat{\alpha}_j + \hat{\beta}_j R_{mt} + \hat{s}_j SMB_t + \hat{h}_j HML_t)$$

where the coefficients $\hat{\alpha}_j, \hat{\beta}_j, \hat{s}_j, \hat{h}_j$ are ordinary least squares estimates of α_j, β_j, s_j, h_j.

Over an interval of two or more trading days beginning with day T_1 and ending with T_2, the Buy-and-Hold Abnormal Return is:

$$BHAR_{j,T_1,T_2} = \left[\prod_{t=T_1}^{T_2}(1+R_{jt})-1\right] - \left[(1+\hat{\alpha}_j)^{(T_2-T_1+1)}-1\right] - \hat{\beta}_j\left[\prod_{t=T_1}^{T_2}(1+R_{mt})-1\right]$$

[63] See Fama and French (1993) for a detailed description of SMB_t and HML_t.

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