

AN EMPIRICAL ANALYSIS OF THE MOTIVATION UNDERLYING TAKEOVERS IN AUSTRALIA

JOSHUA PORTER

HARMINDER SINGH*

ABSTRACT:

This paper empirically investigates the motives underlying takeovers in Australia, employing an event study methodology over multiple event windows. The study examines the relationships between the wealth changes associated to a takeover announcement to distinguish between the three major competing motives; synergy, hubris and agency. The empirical test indicated that the synergy motive is the predominate explanation for the majority of takeovers in Australia; however, the evidence is consistent with the simultaneous presence of hubris in value creating takeovers. The evidence also suggests agency, not hubris, is the primary motivation for takeover which results in value destruction.

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* Corresponding author. Tel: +61-3-9244 6233. Email: Singh@deakin.edu.au

I. Introduction

Mergers, acquisitions and takeovers have been a dynamic part of the corporate finance field for decades and playing an important role in reallocation of resources in an economy. Penrose (1959) described a firm is a collection of productive assets, whereby the long run profitability of the firm is associated with the growth in productive opportunity to use its assets more efficiently. The quest for productive opportunity leads the firm to search for new products and markets (via takeovers).

The past few years have witnessed a surge in takeover activities both globally and in Australia. The last wave of such concentrated takeover activity occurred in the mid 1980s which herald an inundation of research on merger and acquisitions activity in Australia. The three most seminal of the research was that of Walter (1984), McDougall and Round (1986) and Bishop, Dodd and Officer (1987) which examined the wealth outcomes of takeovers and the performance of the firms engaged in a takeover.

There are three widely accepted motives for takeovers which have been advanced in the literature; synergy, agency and hubris. The synergy motive proposes that acquisitions take place when the value of combined firm is greater than the sum of the values of the individual firms, Seth, Song and Pettit, (2000), p388. The agency motive suggests that acquiring managers embark on takeovers to pursue their own interest of maximising their own utility at the expense of the shareholders of their firm. The hubris motive implies overconfident acquiring firm managers unintentionally make mistakes in evaluating the potential of takeover target, therefore reducing the value of their shareholders wealth when undertaking the takeover.

The existing research has attempted to address these motivating factors, adopting various methodological approaches. The general conclusion reached was that the synergy motive explains the majority of takeovers; however, there was also conflicting evidence supporting agency and hubris motivated takeovers. The conflicting results yield the correct empirical approach to distinguish among the

different motives, as are highly contentious in this field of study, with authors arguing the existing empirical work on the motives of takeovers is inconclusive due to the simultaneous existence of all three motives in any sample Bradley, Desai and Kim, (1988) and Berkovitch and Narayanan (1993).

Australian empirical evidence has proven the value created for the target firm is substantially positive, consistent with the synergy hypothesis, but the value created for the bidding firm is quite mixed demonstrating that the other motives maybe at play. The existence of mixed empirical findings and the drawbacks of some of the methodological approaches attempted make it difficult to interpret previous evidence and to draw conclusions about the acquiring manager's takeover motivation from the perspective of Australian market.

The question remains unclear that what is/are the motives behind takeovers in Australia. The research designs adapted to date have made it difficult to distinguish if takeovers are symptomatic of hubris Da Silva Rosa and Walter (2004). This paper fills this gap by applying and extending on the empirical methodology used in the seminal study of Berkovitch & Narayanan (1993) examining the impact of the underlying motive on the wealth of the shareholders of the firms involved in the takeover by focusing on the daily share price movements surrounding the takeover announcement. This will enable the examination of the relationship between the takeover gains of each firm a partied to a takeover, to distinguish and determine the underlying motive for takeovers. The objective of this paper is to empirically investigate and clearly distinguish between the three underlying motives for managers pursuing takeovers in Australia. The findings of this paper will have a direct impact on market participants particularly acquiring firm shareholders as well as assessment of effective regulation. This paper uses an event study^a, which is arguably the most powerful analytical tool in the merger and acquisition field, over multiple (3, 11 and 21 day) event windows.

^a While there are alternatives to event study methodologies what most alternative methods lack is that the degree or size of the information impact can not be quantitatively measured relative to the pre-event condition. (See Pourian, Aby and Willis, 1989, for more detail).

The past research drew conclusions depending on average abnormal returns finding inconsistent and therefore inconclusive results, as it is difficult to establish motives for takeovers using this empirical approach, due to the concurrent existence of all three motives in any sample of takeovers. Berkovitch & Narayanan (1993) took a different approach, arguing that the correlations between the target and total gains and between the target and acquirer gains will distinguish among the three motives and determine the motivation underlying the takeover. Within this framework, the hypotheses outlined propose different correlations between the above pairings; the synergy motive assumes positive total gains as a synergy is created by the combining of the firms. Therefore a positive correlation exists between target and total gains, and a positive correlation between acquire and target gains. The market views agency motivated takeovers as unfavourable triggering a negative total gain outcome, which implies negative correlations between both the target and total gains and the target and the acquirer gains. When a takeover is motivated by hubris, the motive maintains that there is a zero total gains from the takeover hence there is no correlation between the gains of the target firm and the combined firm. There will be a negative correlation between the target firm and acquire because the targets gains are a mere transfer of wealth from the acquirer.

On these foundations, the paper can proceed and is organised as follows: Section 2 provides a literature review which includes; the theoretical background Section 3 describes the sample and methodological approach including hypotheses and empirical tests to determine and distinguish among the different motives. Section 4 reports the results of the empirical analysis including interpretations of motives underpinning takeovers. Finally, Section 5 provides the conclusions.

II. Literature Review and Theoretical background

A. The Synergy Motive

The theoretical explanation underlying the synergy motive for merges and takeovers was first described in the general explanation provided by Penrose (1959). The creation of synergies that results from takeover is one way a firm can achieve long run

profitability, as there are numerous sources^b of productive opportunities that extend from taking over another firm. Perhaps, the most widely cited source of productive opportunity in literature is the replacement of inefficient target firm management.^c The empirical evidence suggests takeover targets have usually performed poorly in periods leading up to a takeover announcement. In this circumstance both sets of shareholders gain from expertise of the acquiring firm's management taking over the underperforming firm and turning its performance around, Brown and Da Silva Rosa (1997) Seth (1990) and Bradley, Desai and Kim (1988) provide a comprehensive explanation of the synergy motive proposing that the managers of target firms and of acquirer firms act in the best interest of their respective shareholders, in essence, seeking to maximise their wealth via economic gains. The empirical evidence supporting the synergy motive is found in studies which have reported positive total gains (target plus acquirer), which include a sample of tender offers Bradley, Desai and Kim (1988), in combinations of cash strapped firms with cash rich firms Hubbard and Palia (1999). Noteworthy is the important research of Eddey (1993) and Hutson and Kearney (2001) contend that synergies are annulled because the takeover regulation in place to protect shareholders is 'one sided' on the target firm side.

B. The Hubris Motive

The hubris motive Roll (1986) postulates that the overconfidence of an acquiring firm's management induces them to make mistakes in evaluating the target firm, by either overvaluing the firm or overestimating the benefit derived from acquiring the firm. This leads to the acquiring firm to overpay for the target firm, which diminishes the synergistic gains from the takeover, if there was even any available in the first place. The overconfidence usually extends from the performance of their firm, as empirical evidence exhibits a takeover announcement proceeds a period of exceptionally good performance experienced by the acquiring firm Dodd (1976), Dodd and Officer (1987) and Simmonds (2004). Hubris can even be the consequence of an acquiring firm's manager's pride, in the sense of not wanting to lose, in situations when the takeover is hostile or when there are multiple bidders bidding up

^b Singh and Montgomery (1987) reported other sources include; increases in operational efficiency through revenue enhancements and cost reductions, increase in market power, or some other form of financial gain.

^c Known as the disciplinary assumption Da Silva Rosa and Walter (2004).

the price far beyond its intrinsic value, in an auction style.^d Firth (1980) and Roll (1986) provide the empirical evidence supporting the existence of the extreme version of the hubris motive.

In the extreme version of the hubris motive the overpayment is so severe that potential synergies are annulled. The end result is a gain to the target firm's shareholders which is simply a mere transfer of payment from the acquiring firm, resulting in a zero sum net total outcome. Assumptions of the hubris motive drawn from Seth, Song and Pettit (2000) are the irrationality of the acquirer's management and asymmetric information exists between the acquirer's and target's management about the wealth gains associated with the takeover. Anderson and Marshall (2006) advised that the moderate form of hubris was equally as dominate as the agency motive in their sample.

C. The Agency Motive

Morck, Shleifer and Vishny (1990) contend managers of acquiring firms engage in takeover activity with the intent of pursuing their own personal interests, rather than the interest of the shareholders, in stark contrast to the two other motives. The consequence of this activity could be detrimental to the shareholders, in that pursuing the takeover could result in negative wealth effects. This is known as the agency motive for takeovers^e and is possible due to the agency relationship which exists between managers and shareholders of a firm. A takeover is a viable way to inflate the assets under management's control Marris (1964). Furthermore, obtaining large amounts of assets also increases the acquiring firm's dependence on their management, Shleifer and Vishny (1989). The use of free cash flow to fund a takeover is underpinned by agency behaviour, as it promptly increases the size of the acquiring firm which may give the perception management is performing well, Jensen (1987). Ravenscraft and Scherer (1987) who found a decrease in operating profitability in the segments of the merged firms they identify as stemming from the acquired firms, suggesting the takeovers were motivated by agency motives.

D. Analysis of the Empirical Evidence

^d Often referred to as the winners curse Da Silva Rosa and Walter (2004).

^e The agency motive was originally described by Marris (1964) whom he called and is sometimes referred to as the 'managerialism' motive.

The evidence presented does however indicate that synergy, hubris and agency motives may all be relevant to any sample of takeovers. Nevertheless, the existing empirical evidence has not been able to clearly distinguish among different motives. This problem exists because authors drew conclusions based on average total gains Firth (1980), Malatesta (1983), Roll (1986) and Bradley, Desai and Kim (1988), therefore finding it difficult to establish the motive for takeovers, due to the simultaneous existence of all three. Morck, Shleifer and Vishny (1990) report that the results are mixed with some studies showing zero abnormal returns, while others showing only slightly positive or negative abnormal returns. Given the mixed and inconclusive evidence it is necessary to evaluate the underlying motive in a more comprehensive analysis.

The study of Berkovitch & Narayanan (1993) took a different approach to existing literature in distinguishing between the motives of takeover activity, by examining the correlation between the abnormal return of the target firm and the total abnormal return gained by both parties involved in a takeover, as well as, the correlation between the target and bidders abnormal returns. They found that 76% of takeovers were primarily motivated by synergy as the outcomes resulted in positive abnormal gains to both the acquirer and target shareholders. However, the evidence was also consistent with the simultaneous existence of the moderate form of hubris. Also observed was agency not hubris was the dominate motive explaining the negative total gain sub-sample. Gondhalekar and Bhagwat (2003) support this evidence when specifically examining the three competing motives using the correlations methodology, finding overall the synergy motive dominates takeover activity. Similar results were also found in Seth, Song and Pettit (2000) when analysing the motives for cross border acquisitions of US firms by foreign firms.

E. Australian Empirical Evidence.

Parallel to US studies, contradictions arise as to the motivating factors behind takeovers in Australian studies. Walter (1984) and Bugeja and Walter (1995) found announcement window abnormal returns consistent with the hubris motive, due to the '*winners curse*' in auction style contests. They also found it difficult to reconcile with the synergy motive. Conversely, McDougal and Round (1986 p.198) in a sample of

Australian takeovers taken from 1970 to 1981; concluded ‘... takeovers appear to have been caused by so-called managerial (agency) motives.’ Although an accounting methodology was applied to this paper, a striking feature was the consistency of the results with Avikiran (1999) and Sharma and Ho (2002) finding the acquiring firm performs worse in the post-takeover period when compared to both its pre-takeover period and with industry equivalents who did not engage in takeover activity, this evidence is consistent with the theory fundamental to agency motivated takeovers.

III. Data and Methodology

We examine the correlation between the abnormal returns of the target firm and the total abnormal returns gained by both parties (the combined firm) involved in a takeover, as well as, the correlation between the target and acquirers abnormal returns as per Berkovitch & Narayanan (1993). This relationship is summarised in *table 1* and discussed in subsections 3.1.1 to 3.1.3.

Table 1

Summary of the Implications of Different Hypotheses Regarding the Relation between Target Gain and Total and Acquirer Gains

Motive	Correlation Between	
	Target Gain and Total Gain	Target Gain and Acquirer Gain
Synergy	Positive	Positive
Hubris	Zero	Negative
Agency	Negative	Negative

The above table shows the correlation between target and total gains and target and acquirer gains that would prevail depending on the motive behind a takeover.

Source: Berkovitch, E., Narayanan, M. P., 1993. ‘Motives for Takeovers: An Empirical Investigation’, *The Journal of Financial and Quantitative Analysis*, vol. 28, no. 3, p352.

A. Synergy Motive

The synergy motive predicts that the wealth of target firms’ shareholders increases at the acquisition announcement, and positive total gains are evidenced. This prediction holds as it can be assumed that the target firm is able to extract some of the total gains by virtue of its bargaining power or because of explicit or implicit competition in the market for corporate control. In this case, wealth gains to the target should be positively correlated with total gains. The wealth effects for the acquiring firm is also

assumed to be positive and positively correlated with target gains as the managers of the acquiring firm only engaged in takeover activity to maximise shareholder wealth.

B. Agency Motive

The assumption predicted by the agency motive is the wealth of shareholders of the acquiring firm declines as the target firm increases, hence a negative correlation between the two. Furthermore, value is destroyed upon acquisition (since there is a transfer of value from the combined firm to the acquiring firm's managers). This is to the extent of the target firm's bargaining power, as it will seek to extract some of the gains to the acquirer; which directly reduces the total gain, therefore an inverse relationship between target and total gains exists.

C. Hubris Motive

The hubris motive envisages that takeovers are a mere transfer of wealth from the acquirer to the target, thus the shareholders wealth of the acquiring firms deteriorates, equal to the increase in wealth of the target firm's shareholders, and zero total gains are realised. Consequently, there should be no correlation between total gains and target gains and a negative correlation between target and acquirer gains.

D. Empirical tests

The opposing predictions the different motives make about the correlations may cause the effects of each motive to cancel each other out or the dominate motive will rise to the forefront in the entire sample. Therefore, it is necessary to split the entire sample into two sub-samples; a sub-sample of takeovers which result in positive total gains and a sub-sample resulting in negative total gains, enabling the isolation certain motives. To understand this, assume that the correlations between target gains and total gains is positive for the sub-sample of takeovers that result in positive total gains (as would be expected in synergy – motivated takeovers) and this correlation is negative for the sub-sample of takeovers that result in negative total gains (as would be expected in agency – motivated takeovers). If so, the overall relationship between target gains and total gains may either turn out to be zero or it may exhibit the more dominating sign (i.e. positive or negative) in the entire sample. This may also be the case for the relationship between target gains and acquirer gains. Thus, one may reach an incorrect conclusion by analysing just the correlations for the entire sample of takeovers instead of splitting the sample into takeovers that create positive total gains and negative total gains. The three hypotheses play different roles within each of these

sub-samples, to allow for differentiating the following tests outlined in the following sections are employed.

E. Synergy Vs Agency

In the first test, the synergy motive is compared with the agency motive, without the confounding effects of hubris, by testing the sign of the correlation between target and total gains. Hubris is eliminated in this case since it implies the target and total gains are uncorrelated. The agency motive is more likely to be present in takeovers with negative total gains than in takeover with positive total gains. Thus the splitting of the full sample into the sub-samples based on total gains would imply the following hypotheses.

(H1): Takeovers are primarily motivated by synergy. Therefore, target and total gains will be positively correlated in takeovers with positive measured total gains as well as in takeovers with negative measured total gains.

(H2): Takeovers are primarily motivated by agency. Therefore, target and total gains will be negatively correlated in takeovers with positive measured total gains as well as in takeovers with negative measured total gains.

If the motives coexist in the entire sample then, the following hypothesis applies:

(H3): Takeovers with positive measured total gains are motivated by synergy and takeovers with negative measured total gains are motivated primarily by agency. Therefore, the target gains are positively correlated in takeovers with positive measured total gains and negatively correlated in takeovers with negative measured total gains.

F. Hubris Vs Synergy

In the sub-sample with positive total gains the hubris and synergy motives are isolated, as the agency hypothesis (which predicts negative total gains) is eliminated. The test to perform to distinguish between the two motives focuses on the correlations between acquirer and target gains, where the acquirer gains may be positive or negative. If the synergy hypothesis is the dominating motive for this sub-sample then there should be a statistically significant positive correlation between target and

acquirer gains, whereas the hubris hypothesis would indicate a negative correlation between the two.

(H4): In the absence of hubris, target and acquirer gains are positively correlated in the sub-sample of positive total gains.

G. Hubris Vs Agency

The negative total gains sub-sample allows for the assumption that the synergy hypothesis is eliminated and the investigation lies in determining whether the agency or hubris hypothesis represent the dominate explanation for this sub-sample. Both hypotheses predict a negative correlation between the target and acquirer gains, therefore to distinguish between the two, it is necessary to focus on the correlation between target gains and total gains. The agency hypothesis suggests that this relationship will be negative. Conversely, the hubris implies no such relationship.

(H5): In the absence of hubris, target and total gains are negative correlated and target and acquirer gains are negatively correlated in the sub-sample of negative total gains.

H. Hubris and the intercept term

To further investigate the presence of hubris Berkovitch and Narayanan (1993) propose examining the intercept (α) in the regressions of the target gains on total gains. This is important for judging overpayment in takeovers, and hence the presence of hubris. For example, in takeovers with $\alpha = 0$ implies the target gain would be zero if the total gains were zero, indicating there was no overpayment by the acquirer. On the other hand, in takeovers with a statistically significant α , would imply the target would gain even if total gains were zero, suggesting the presence of hubris as the acquirer overpaid for the target.

(H6): Takeovers are primarily motivated by synergy and with the absence of hubris, if the intercept between target and total gains and target and acquirer gains is equal to zero.

(H7): Takeovers are primarily motivated by agency and with the absence of hubris, if the intercept between target and total gains and target and acquirer gains is equal to zero.

Data

A preliminary sample is obtained consisting of takeover announcements relating to Australian firms occurring during the sample period commencing 13 March 2000 and concluding 31 December 2006. This six-year period was chosen as it coincides with a surge in takeover activity witnessed in Australia, as well as corresponding to the establishment of the Takeovers Panel^f, which may have a significant impact on the motive underlying takeovers in the Australian market. This is because the Panel has the power to make orders to protect the rights of persons (especially target company shareholders) during a takeover bid. Takeover^g announcements are sourced from two prominent research databases; Bloomberg Mergers and Acquisitions and AspectHuntley Dat Analysis.^h The preliminary search captured 386 observations. A screening process was then applied to remove observations that were not suitable for this study.

In order to examine the motive behind a takeover announcement, it is imperative that the announcement is an isolated event. This is necessary to control as share price movements could be a response to other information entering the market. If this contaminationⁱ occurred to one or both of the firms involved in a takeover, then that takeover must be excluded from the sample as any observed abnormal return may be attributed to the concurrent event, which distorts the findings in regards to takeover announcements.

I. Sample Data

In this study, all the daily share price data of the target and acquirer firm is required for 130 days before the takeover announcement until 10 days after the announcement. All daily closing share price data for each firm in the final sample is obtained from primarily *Bloomberg ASX Market database*. The data was adjusted for any changes which may artificially distort the share price, such as bonus issues, stock splits, dividends, etc.

^f The Takeovers Panel is the primary forum for resolving disputes about a takeover bid, which commenced on March 13 2000. The Panel was established under section 171 of the ASIC Act and Part 6.10 of the Corporations Act, Takeovers Panel (2004).

^g For the aim of this study, defined as an unconditional commitment, by way of either an on or off market bid, by the acquiring firm to takeover the target firm, with the announcement date being the day on which the acquiring firm lodges their intentions with ASIC and the ASX.

^h <http://www.aspectfinancial.com.au.ezproxy.lib.deakin.edu.au/af/dathome?xtm-licensee=dat>

ⁱ In order to check for contaminating news, a search of the ASX site was conducted for price sensitive information relating to the sample firms over the period 10 days before & after the announcement date.

Applying the filter criterion to the preliminary sample of announcements derived a final sample containing 76 matched acquirer and target firms involved in a takeover announcement. The elimination process is detailed in *table 2*

TABLE 2

Sample selection screening process for Acquirer and target firms

Selection Criterion	Exclusions	Residual Total
Preliminary Sample		386
i. Acquirer and Target identified and listed on the ASX	120	266
ii. Classified as takeover, merger or acquisition	88	178
iii. Complete and successful single bid takeover	32	146
iv. No other price sensitive announcements	14	132
v. All available daily share price data	56	76
Final Sample		76

J. Event Study

We have used event study methodology; it comprises an estimation window and event window. The intention of an estimation window is to allow the parameters of the model to be estimated away from the period surrounding the announcement, in order to avoid bias in the estimation of the parameters due to the event itself. The estimation window will cover the period from 130 trading days prior to the announcement to 30 days before the announcement date, thus giving a total of 100 observations for estimation event window. The size of this estimation window is similar to those utilised in other studies in the Mergers and Acquisitions (see Peterson, 1989). The three event windows chosen for this paper are 3, 11 and 21 day. Overwhelming evidence from numerous event studies indicate that information is anticipated in the lead up before that actual announcement day and is absorbed by the market within 2 days of the event. A larger 21 [-10, +10] day window is examined to allow any additional information concerning the announcement to be fully absorbed by the market, for example clear indication that there is no interest from any other potential acquirers. In event time, Day 0 is the day of the takeover announcement, as

announced on the Australian Stock Exchange (ASX). Days preceding the announcement are events days -1, -2... until day -130. Days subsequent to the announcement are event day +1, +2 and so on until -10.

K. Market Model

A market model requires the estimation of 'normal' stock returns for a period that does not include the event itself. Brown and Warner (1985) simulate an event study using daily data, concluding that the use of the market model when testing for abnormal returns is robust.^j The market model estimates normal returns through an Ordinary Least Squares (OLS) regression over the estimation period, which is based on the relationship between a firm's share price return and the returns of a market index. The Standard & Poor's (S&P) ASX 200^k Accumulation Index is the market index chosen to measure the market returns.

L. Estimating market model parameters

The continuous daily share price return of each firm in the sample (R_{it}) and market index return (R_{mt}) are calculated for the estimation window [-130, -30], this was also calculated over all the event windows:

$$R_{it} = Ln(P_{it} / P_{it-1}) \quad (1)$$

$$R_{mt} = Ln(P_{mt} / P_{mt-1}) \quad (2)$$

Where:

R_{it} = The continuous daily return of the share price of firm i on day t.

R_{mt} = The return of the market index, S&P ASX 200 Accumulation Index

Ln = The natural log.

P_{it} = The closing share price of firm i on day t.

P_{mt} = The closing price of the market index on day t.

For the estimation period the market model states a linear relationship between the returns from a given stock and the market index. This is determined by an OLS (Ordinary Least Square) regression in the form:

^j Although, Coutts, Mills and Roberts (1995) acknowledge that misspecification of the market model can lead to incorrect findings of abnormal returns. While, Cable and Holland (1999) and Brown and Warner (1985) argue that the market model is a robust and accurate method to test is the market model eliminates any systematic effects that may impact on a firm's abnormal stock returns.

^k This Index was chosen because it comprises of the top 200 firms shares weighted according to each firms market capitalisation, accounting for approximately 90% of total equity capitalisation.

$$\hat{R}_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad (3)$$

When estimating the return of the share price it is necessary for the effects of non-synchronous¹ data to be taken into consideration. The Scholes and Williams (1977) adjusted beta (β_{iSW}) reinforces the market model to account for this non-synchronous bias:

$$\beta_{iSW} = \frac{\beta_i^+ + \beta_i + \beta_i^-}{(1 + 2\rho)} \quad (4)$$

Where:

- β_{iSW} = The estimated Scholes-Williams adjusted beta for firm i.
- $\beta_i^+, \beta_i, \beta_i^-$ = represents the beta estimates from the market model regression using a lead, standard and lag beta.
- ρ = The slope of the coefficient of an OLS regression of the market return on a single observation lagged value.^m

The corresponding Scholes and Williams (1977) adjusted alpha (α_{iSW}) is in conjunction with the adjusted β_{iSW} and was calculated as follows:

$$\alpha_{iSW} = \left(\frac{1}{T-2} \right) \left[\sum_{t=2}^{T-1} R_{it} - \left(\beta_{iSW} \sum_{t=2}^{T-1} R_{mt} \right) \right] \quad (5)$$

Where:

- α_{iSW} = The estimated Scholes-Williams adjusted alpha for firm i.
- T = Represents the number of observations in the estimation window.

The Scholes and Williams (1977) adjusted alpha and beta market model was utilised to determine the predicted returns of each observation for both the acquirer and target pertained to a takeover announcement over the estimation and even window.

¹ Non-synchronicity is when the data does not reflect the actual price of a given share, thereby potentially providing a misrepresentation of the actual price, If left unaccounted for, the non-synchronicity of the data will directly introduce bias into estimates

^m $\rho = \frac{Cov(R_{mt}, R_{mt-1})}{\sqrt{Var(R_{mt})}\sqrt{Var(R_{mt-1})}}$

M. Share market movements:

The abnormal return for each observation on each event day was calculated as the divergence between the actual return and the expected 'normal' return based on the estimated market model parameters. Hence, the abnormal return (AR_{it}) for each day in the event window is calculated as:

$$AR_{it} = R_{it} - (\alpha_{iSW} + \beta_{iSW} \times R_{mt}) \quad (6)$$

The cumulative abnormal return CAR_{it} is the summation of the firm's AR_{it} over the respective event window used in this study. Average abnormal return (AAR_t) is calculated as:

$$AAR_t = \sum \frac{AR_{it}}{N} \quad (7)$$

In addition to the AAR_t 's calculated individually for each event day, the Cumulative Average Abnormal Returns ($CAAR_n$'s) are also calculated for the acquirer, target and combined firms. $CAAR_n$'s are the summation of AAR_t 's over the given event window, defined as:

$$CAAR_n = \sum_{t=t_1}^{t=t_2} AAR_t \quad (8)$$

The acquirer, target and total $CAAR_n$ is used in the analysis to determine the motive for a takeover, as explained in the next section. Firstly, significance of AAR_t or $CAAR_n$ is calculated by estimating the standard deviation for the event window's AAR was calculated as per MacKinlay (1997):

$$S_{AAR} = \sqrt{\left(\frac{1}{75}\right) \sum_{t=1}^{76} (AAR_t - AAR^*)^2} \quad (9)$$

After using the above estimate of standard deviation a two-tailed test to determine if the results calculated for the AAR_t 's and $CAAR_n$'s were significant was conducted. The standardised cross-sectional t-test was employed to test the null hypothesis. This was dependent upon the level of the t-statistic calculated as follows:

$$t = \frac{AAR_t}{S_{AAR}} \quad \text{Or} \quad t = \frac{CAAR_n}{\sqrt{NS_{AAR}}}$$

N. Correlation analysis

To empirically test the hypotheses developed in Section 3, Ordinary least squares (OLS) regression model is employed. The model is described below

$$Y = \alpha + \beta(X) + \varepsilon \quad (10)$$

Where:

Y = Dependent variable

X = Independent variable

α = Intercept term, β = the slope term and ε = error variable

In all the regressions over the different samples and sub-samples, the dependent variable is the average abnormal return of the target firms (denoted target gain). In determining the relationship between target and total gains the independent variable is the $CAAR_n$ of the combined firm (denoted total gain). Conversely when measuring the relationship between target and acquirer gains, the independent variable is the $CAAR_n$ of the acquirer firms (denoted acquirer gain).

$$\text{Target Gain} = \alpha + \beta (\text{Total Gain}) + \varepsilon \quad (11)$$

And

$$\text{Target Gain} = \alpha + \beta (\text{Acquirer Gain}) + \varepsilon \quad (12)$$

The parameters of interest in the above equations are the α and β . The α is intercept term and β would indicate a positive/ negative relationship respectively between the target gain and total gain and target gain and acquirer gain.

IV. Results

A. Share price movements

Table 3 shows the average abnormal return and cumulative average abnormal return for all observations in the sample selection, from days -10 to + 10 relative to the announcement day.

TABLE 3

Daily market-adjusted abnormal returns for aggregated acquirers and targets engage in takeover activity

Firm:	Acquirers	Targets	Total
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Panel A: Average Abnormal Returns

Event Day	AAR %	t-statistic	AAR %	t-statistic	AAR %	t-statistic
-10	0.19	0.86	-0.02	-0.09	0.16	0.76
-9	-0.16	-0.75	0.14	0.52	-0.03	-0.24
-8	-0.07	-0.39	0.07	0.25	-0.01	-0.13
-7	-0.06	-0.29	0.05	0.18	-0.02	-0.11
-6	0.31	1.34	0.47	1.72	0.77	3.07
-5	0.51	1.45	0.27	0.63	0.77	2.08
-4	-0.18	-0.62	0.05	0.10	-0.13	-0.51
-3	0.11	0.46	2.39	0.88	2.49	1.34
-2	0.16	0.58	4.94**	3.74	5.10*	4.32
-1	0.31	1.37	5.48**	6.54	5.78**	7.91
0	-0.29	-1.58	6.43**	7.56	6.14**	5.98
1	0.34	1.11	1.81**	2.82	2.14	3.93
2	0.28	1.49	1.71*	2.56	1.99	4.05
3	-0.05	-0.17	0.79*	2.14	0.73	1.96
4	-0.10	-0.39	-0.03	-0.11	-0.13	-0.49
5	0.16	0.77	0.15	0.50	0.31	1.27
6	-0.28	-1.58	0.49	1.01	0.21	-0.57
7	0.06	0.28	-0.02	-0.07	0.03	0.21
8	0.34	1.10	0.25	1.40	0.58	2.50
9	-0.05	-0.23	0.09	0.30	0.04	0.07
10	0.06	0.42	0.14	0.48	0.20	0.90

Panel B: Cumulative Average Abnormal Returns

Event Window	CAAR %	t-statistic	CAAR %	t-statistic	CAAR %	t-statistic
[- 1 , + 1]	0.37	1.03	13.71**	2.95	14.06**	3.34
[- 5 , + 5]	1.26	0.94	23.98*	2.07	25.19*	1.96
[- 10 , + 10]	1.61	0.59	25.63*	1.96	27.13*	1.94

Note: * Statistically significant at the 5% level

** Statistically significant at the 1% level

The above table provides details of the aggregated daily market-adjusted share price effect surrounding the takeover announcement date (event day 0) over the sample period 13th March 2000 to 31st December

2006. In Panel A, AAR represents the average abnormal return for the acquirer, target & combined firms over the event window. Panel B shows the cumulative average abnormal return (CAAR) to all sets of firms. T-stats represent statistical significance analysis performed using two tailed t-test on the AARs & CAARs.

Analysis of the *table 3* reveals the AAR of the acquiring firms on the announcement day was -0.29%. Further, there were no significant AAR's and CAAR's to the acquiring firm. This result is consistent with Bishop, Dodd and Officer (1987), their study showing zero to slightly positive or negative gains, over similar event windows. The AAR of the target firms provides more compelling evidence with a significant announcement day return of 6.43%. The evidence of Australian market points to the target firms gaining substantially in the month of the announcement of a takeover bid, Dodd (1976), Walter (1984) and Anderson, Heynes and Heaney (1994). The existing empirical evidence is not accurate in determining motives because the methodology does not clearly distinguish among the motives. Hence the more in-depth analysis proposed by Berkovitch and Narayanan's (1993) of the relationships between abnormal returns is required, which we have undertaken.

Table 4 provides the regression results of the [-5, +5] event window, for the entire sample as well as for sub-samples. *Panel A* provides the results of the regression; target gain = $\alpha + \beta$ (total gain), while *Panel B* illustrates the results of the regression between target and acquirer, target gain = $\alpha + \beta$ (acquirer gain).

TABLE 4
Relationship between target gains and total gains and between target gains and acquirer gains over a 11 day [-5, +5] event window

Panel A: Target Gain = $\alpha + \beta$ (Total Gain)

Sample	N	α	β	R ²
All	76	71.45** (4.56)	0.34* (1.86)	0.25
Positive Total Gains	52	23.73 (1.41)	0.58** (3.44)	0.38
Negative Total Gains	24	9.66 (0.75)	-0.26** (-5.47)	0.57

Panel B: Target Gain = α + β (Acquirer Gain)

Sample	N	α	β	R ²
All	76	67.11** (4.56)	-0.62 (-0.85)	0.05
Positive Total Gains	52	63.78* (1.91)	-0.38 (-0.44)	0.14
Negative Total Gains	24	23.49 (1.10)	-0.22* (-2.84)	0.27

Note: * Statistically significant at the 10% level

** Statistically significant at the 1% level

In each of the panels of table-4 coefficients are estimates for the entire sample and the sub-samples of positive total gains and negative total gains with n denoting the size of these samples. The intercept is denoted by α , the correlation between the two variables is represented by β and R² represents the goodness of fit of the regression. The numbers in parentheses are White's (1980) heteroskedasticity consistent t-statistics.

Examining *Panel A*, the regression results for the entire sample shows the estimate of β is 0.34, indicating the correlation between target and total gains is positive and significant. This outcome is inline with the synergy hypothesis as the primary motivation for the entire sample. However, in the sample of positive total gains, the estimate of β is 0.58 indicating a positive correlation, while a negative correlation is found in the negative total gains sub-sample, with a β estimate of -0.26. The findings from *Panel A* support the *H3* hypothesis that synergy is the primary motive for takeovers in the positive total gain sub-sample, while agency is the primary motive in the negative total gain sub-sample. Specifically, the significance of the β estimate for both the sample of positive total gains and negative total gains sub-samples is inconsistent with the hubris hypothesis, which proposes there is no correlation between target and total gains.

The regression results found in *Panel B* indicate a negative correlation between target and acquirer gains with the estimate of β is -0.62 for the entire sample, although not significant. Positive total gains has a β estimate of -0.38 while the sample of negative gains has a significant β , i.e., 0.22. This demonstrates that the entire sample appears to support the hubris hypothesis, however, the clear differences in the correlation between target and acquirer gains across the sub-samples of positive and negative

total gains, indicates other motives are in existence. This does not support the *H4* hypothesis as the correlation between target and acquirer gains is opposite to that predicted by the synergy hypothesis, even though the estimate is not significant. This result leads to the deduction that hubris might be present in many of the takeovers in the sample. Since both agency and hubris result in negative correlation between target and acquirer gains, it cannot be concluded whether only hubris is present or not by looking at this result. Therefore it is necessary to revisit *Panel A*, where the significant negative correlation between target and total gains in the negative total gain sub-sample implies the *H5* hypothesis cannot be rejected. The conclusion drawn from this is agency, not hubris, accounts for the negative total gain outcome.

Exploring the intercept (α) observations sheds further light on the motives underlying a takeover bid, as it determines if overpayment occurred in the takeovers and hence the presence of Hubris. When the target gain is regressed against total gain in *Panel A* of *Table 4* the intercept for the entire sample is 71.45, the significance of this parameter indicates hubris may be present in the sample. However, on further investigation it can be seen that intercept (α) is not significantly different from zero for both sub-samples. This finding so far is consistent with the *H6* and *H7* hypothesis because under the synergy hypothesis, in the absence of hubris, the target gain should be zero when the total gain is zero as no synergy is created. Similarly, under the agency hypothesis, when the total gain is zero, there is little to no agency problem and, hence, the target gain must be close to zero. On the other hand, the hubris hypothesis would postulate the target gain to be positive even if the total gain is zero.

Further examination of the intercept (α) in *Panel B* leads to the rejection of the *H6* hypothesis and acceptance of the *H7* hypothesis. This is because the intercept is significantly positive in the sub-sample of positive gains, but not significantly different from zero in the sub-sample of negative gains. This result is consistent with the examination of the β coefficients as there is evidence of the existence of hubris in the positive gain sub-sample and the absence of hubris in the negative gain sub-sample. Intuitively the conjecture drawn from the intercept analysis confirms the presence of the moderate form of hubris when synergy is the primary motive, whilst also supporting the view that the negative gains experienced by acquirer's are primarily due to agency and not due to hubris.

The supposition drawn from the [-5, +5] event window infers that the takeovers that resulted in negative total gains were motivated by agency, indicating that the acquiring firms management were acting in their own best interests. The consequence was the announcement of the takeover bid resulted in a more substantial loss to the acquirer than gain to the target, as the market looked unfavourably on the move, netting a negative total gain outcome. Conversely, takeover announcements that resulted in positive total gains were primarily motivated by synergy, even though; there is evidence of the simultaneous existence of the moderate form of hubris. This suggests that some of the possible synergistic gains from a takeover available to the acquiring firms were transferred to the target firms due to the acquiring firms' managers' overconfidence (hubris) in the estimation of the potential synergy and thus offered to high of a consideration for the target firm.

B. Three Day Event Window

The results of the [-5, +5] event windows are similar to those found in Berkovitch and Narayanan (1993). To establish if the same results hold over dissimilar windows, the investigation is extended to investigate a shorter and a longer event window. First, the results of shorter 3 day [-1, +1] event window are presented in *table 5*.

TABLE 5

Relationship between target gains and total gains and between target gains and acquirer gains over a 3 day [-1, +1] event window

Panel A: Target Gain = $\alpha + \beta$ (Total Gain)

Sample	N	A	B	R²
All	76	122.92 (1.18)	0.57** (3.41)	0.51
Positive Total Gains	60	109.38 (0.58)	0.72** (3.71)	0.63
Negative Total Gains	16	23.97 (0.75)	0.29* (2.61)	0.40

Panel B: Target Gain = $\alpha + \beta$ (Acquirer Gain)

Sample	N	A	B	R ²
All	76	89.34 (0.73)	-0.42** (-10.25)	0.68
Positive Total Gains	60	87.58 (0.65)	0.43** (-6.94)	0.52
Negative Total Gains	16	33.60* (3.88)	-0.08 (-0.69)	0.07

Note: * Statistically significant at the 5% level
 ** Statistically significant at the 1% level

In the above table, in each of the panels coefficients are estimates for the entire sample and the sub-samples of positive total gains and negative total gains with n denoting the size of these samples. The intercept is denoted by α , the correlation between the two variables is represented by β and R² (coefficient of determination) represents the goodness of fit of the regression. The numbers in parentheses are White's (1980) heteroskedasticity consistent t-statistics.

Immediately upon examination of *table 5* the sample has different dynamics to the larger 11 day event window. The 3 day event window incorporates the large positive share price movement to the target firm occurring in days -1 to +1, but doesn't include the subsequent revaluation that accompanies a takeover announcement. The results found in panel A indicates that for the entire sample the β is 0.57 symbolising the relationship between target and total gain is positive and significant. However, unlike the [-5, +5] event window this significantly positive relationship holds across both the positive and negative gain sub-samples, with $\beta = 0.72$ and $\beta = 0.29$ for the respective sub-samples. These findings support the *H1* hypothesis that synergy is the primary motivation in takeover announcements which realise positive measured total gains as well as in takeovers with negative total gains. There is no evidence in support of the *H2* and *H3* hypotheses. Analogous to the [-5, +5] event window the significant β values reported in this event window is inconsistent with the hubris hypothesis which predicts the β 's values would not be significantly different from zero.

Panel B shows that the entire sample has a negative ($\beta = -0.42$) and significant correlation. There is a positive and statistically significant relationship between target and acquire gains for the positive total gain sub-sample $\beta = 0.43$ consistent with the synergy hypothesis (*H4*). This outcome signals hubris is not present in the positive gain sub-sample. In contrast, the results are not in support of the *H5* hypothesis, although β is negative (-0.08), it is not significantly different from zero. Assimilated from this is the probable presence of hubris in the negative gain sub-sample, this can

be interpreted that in some instances the managers of the acquiring firms make mistakes in the estimation of the synergistic gains available in the proposed takeover. The results point out that the over estimation (and hence consideration offered) is so great that the acquirers share price is devalued so severely by the market that their loss is far greater than the targets gain, signifying a negative total gain.

In Panel A the intercept is not significant in both sub-samples of positive and negative total gains. This is consistent with the synergy and agency hypotheses, as target gain should be zero when there is no total gain. As shown in *Panel B*, the insignificant intercept $\alpha = 87.58$ in the positive gain sub-samples eliminates any support for the presence of hubris when synergy is the underlying motive. In the negative total gains sub-sample the presence of hubris is confirmed with the intercept being significantly different from zero, i.e., $\alpha = 33.60$. In all the evidence supports the *H6* hypothesis and leads to the rejection of the *H7* hypothesis. These outcomes are consistent with the results of the correlation (β) analysis, but is opposite to the findings of the [-5, +5] window, which found presence of hubris in takeovers primarily motivated by synergy.

C. Twenty one Day Event Window

TABLE 6

Relationship between target gains and total gains and between target gains and acquirer gains over a 21 day [-10, +10] event window

Panel A: Target Gain = $\alpha + \beta$ (Total Gain)

Sample	N	α	β	R ²
All	76	65.61 (0.44)	0.27** (2.22)	0.37
Positive Total Gains	48	21.91 (1.13)	0.38** (3.86)	0.43
Negative Total Gains	28	5.80 (0.05)	0.16* (-1.96)	0.12

Panel B: Target Gain = α + β (Acquirer Gain)

Sample	N	α	β	R ²
All	76	122.23 (0.84)	-0.34 (-0.51)	0.10
Positive Total Gains	48	148.65 (1.06)	-0.21 (-0.48)	0.03
Negative Total Gains	28	16.03 (1.19)	-0.53* (-2.04)	0.61

Note: * Statistically significant at the 10% level
 ** Statistically significant at the 1% level

In each of the panels coefficients are estimates for the entire sample and the sub-samples of positive total gains and negative total gains with n denoting the size of these samples. The intercept is denoted by α , the correlation between the two variables is represented by β and R² (coefficient of determination) represents the goodness of fit of the regression. The numbers in parentheses are White's (1980) heteroskedasticity consistent t-statistics.

In *panel A*, the findings are similar to those in the [-5, +5] event window, with the β having the same signs and significance across the entire sample and the positive and negative gain sub-samples signifying that the *H3* hypothesis cannot be rejected. In *panel B*, results are parallel to the [-5, +5] event window with correlation (β) being negative and not significant for the entire sample, symptomatic of hubris being present in the sample. Further examination into the sub-samples, confirms the presence of hubris in the positive gain sub-sample as the relationship between target and total gains is not significant, hence the *H4* hypothesis can be rejected. Conversely, the relationship in the negative total gain sub-sample is significant, allowing support for the *H5* hypothesis and demonstrating takeovers that resulted in negative total gains transpired because the acquiring firms were motivated by agency.

The inferences that can be drawn from the (α) is not as definitive as the [-5, +5] event window as α is not significant in the entire sample as well as in the sub-samples in both the regressions between target and total gain and target and acquirer gain. This insinuates that there is no evidence of hubris in both the positive and negative total gain sub-samples, leading to the acceptance of the *H6* and *H7* hypotheses.

V. Conclusions

This paper empirically examined the motivation underlying takeovers in Australia. An event study methodology was employed to a sample of 76 takeover announcements of ASX listed firms from March 13, 2000 to December 31, 2006. While in previous literature, authors have used average total gains to distinguish and determine between the three major motives proposed in literature; synergy, agency and hubris, finding it difficult to establish the motivation due to the simultaneous existence of all three in any sample. This paper applied the empirical test developed by Berkovitch and Narayanan (1993) which is based on the correlations between target and total gains and target and acquirer gains which is shown to be more comprehensive and robust when examining the motivation driving takeovers.

The findings from the 11 day event window indicated that on average takeovers yield positive total gains. The total Cumulative Average Abnormal Return was 25.19%, with the majority of this gain realised by the target firm, while the acquiring firms appeared to only have negligible gains. This is consistent with previous Australian research, and the inference which can be derived from this is that the introduction of the Takeovers Panel has not disparaged the synergistic gains available to the acquiring firm. This contradicts the research of Eddey (1993) and Hutson and Kearney (2001) who contend synergies are annulled because the takeover regulation in place to protect shareholders imposes inordinately high costs on the acquiring firm, diminishing any economic gain available to them when pursuing a takeover.

The correlation analysis indicated that the synergy motive explains the majority of takeovers which resulted in positive total gains; however, there is evidence to suggest the simultaneous presence of the moderate form of hubris. Value destroying takeovers that result in negative total gains were found to be the consequence of the takeovers being motivated by agency alone, and not hubris, indicating that the acquiring firms management were focused on pursuing the takeover acting in their own best interests, rather than their shareholders. The consequence of this meant upon announcement of the takeover the market's response was unfavourable on the move resulting in a more substantial loss to the acquirer than gain to the target, netting a negative total gain outcome.

The empirical test over the shorter 3 day event window still found the synergy was the dominate motive in explaining the majority of takeovers in the entire sample. However, the results indicate that synergy was the lone motive driving the value creating takeover. Contradictory to the 11 day event window was the agency and hubris motives were both found to be the rationale for the value reducing takeovers. However, the results are problematic as this event window incorporates the large positive share price movement to the target firm occurring on the announcement day, but do not incorporate the observed subsequent revaluation that accompanies the takeover announcements in the sample; this is only captured by the longer event windows. The results of the 11 day event window relatively hold over the longer 21 day event window. However, the findings are not as strong because the evidence is inconclusive as to the parallel existence of hubris with synergy motive in value creating takeovers. The inferences made from extending analysis over the multiple event windows is that the longer event windows are more conclusive in distinguishing the takeover motives.

On average managers seek to create economic value and appear to have the ability to do so when pursuing takeovers, however, in some circumstances they don't have the motive and/or cognitive capability to create economic value for their firms. This is supported by the empirical analysis that showed takeover announcement resulting in negative total gains are circumvent of acquiring managers pursuing the takeover acting on their own interest rather than the best interests of their shareholders (agency motivated). Also, the moderate form of hubris was found to coexist with synergy in takeover announcement resulting in positive total gains, this suggest that acquiring managers may not have the cognitive ability to correctly value the target firm, resulting in paying an excessive premium which diminishes value to the acquiring firm's shareholders.

The breakdown of the assumption that acquiring managers have the motive and cognitive capability to pursue takeovers to create economic value for their shareholders has implications for market participants, particularly shareholders of acquiring firms. This may lead to the existence of managerial performance packages that are in place to align the interest of the acquiring firm's managers and shareholders. Akhigbe, Madura and Tucker (1996) propose the pegging the strike

price of executive share options and/or the assets under control to a market benchmark instead of the firm's share price and/or assets, as this provides more incentive to align the interest of shareholders and managers, thus providing protection to shareholders. This paper supports the following of strategies and paying control premiums to prevent hubris induced takeovers as a way of hedging against unnecessary losses, which are a result of the cognitive capability of the acquiring management. Varaiya and Ferris (1987) and Kohers and Ang (2000) found firms implementing such hedging policies earned better returns than firms who did not.

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Appendix

Descriptive Statistics

In *table 7*, the descriptive statistics for the entire sample used in this analysis for the event window [-10, +10] are shown.

TABLE 7

Descriptive Statistics for Observations in the Sample

Sample (n = 76)	Mean	Medium	Minimum	Maximum	Range
Total Combined: Gains (\$m)	190.80	49.84	-233.22	3,967.23	4,200.45
Acquirer: Gains (\$m)	44.56	6.32	-649.63	2,245.64	4,616.86
Target: Gains (\$m)	146.24	39.12	-62.42	3,004.82	4,029.65

The above table provides the descriptive statistics of the entire sample of takeover announcement taken during March 13, 2000 to December 31, 2006. The gains are measured in US dollars over a 21 day [-10, +10] event window. Target and acquirer gains are computed by multiplying the firms CAR by the market value of the firms equity as of the end of the thirtieth [-30] trading day prior to the announcement. Target gain is adjusted by reducing the value of target shares held by the acquirer. The combined firm total gain is the sum of the target and acquirer gains.

Although these figures in *table 2* do not necessarily have a direct impact on the findings of this analysis, they do demonstrate the wide array of dollar gains experienced by the firms involved in a takeover announcement. To conserve the space the descriptive statistics of other windows are not shown.