

# **Determinants of Acquisition Premiums: Empirical Evidence from Mining Industry in Australia and Canada**

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## **ABSTRACT**

The objective of this study is to identify and analyse the determinants of the cross-sectional differences in mining industry takeover premiums. The study investigates how the method of payment, international corporate diversification, target takeover resistance, the distribution of target firm ownership and target firm performance affect the size of observed acquisition premiums offered to target mining firms. Using Australian and Canadian data spanning 1997-2007 the study answers five research questions constructed based on the above variables in attempting to fill the gaps left by previous merger and acquisition research. The results show that cash takeovers, hostile target management, the distribution of target ownership and poor target managerial performance prior to the takeover announcement all have statistically significant effects of acquisition premiums, where as the perceived international diversification benefits and the price-to-earnings ratio of the target firm fail to identify the hypothesised relationship. The results have beneficial implications for both individual investors and target firm management associated with an acquisition in the mining industry in regard to evaluating a takeover offer with the aim of maximising investment returns.

**Key Words:** Takeovers, Acquisition Premium, Australia, Canada, Mining Industry

**JEL Classification:** G34, L71, L72

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## **1. INTRODUCTION**

This is an empirical study examining the explanatory power of both firm specific and takeover specific variables in determining acquisition bid premiums, in the context of Australian and Canadian mining industries. While a considerable amount of research in Australia as well as the US has shown how takeovers can create value for both the bidding firm and target firm shareholders (see (Bishop, Dodd and Officer 1987; Jarrell, Brickley and Netter 1988) for summaries), surprisingly little have evidence attempting to explain the cross-sectional variation in the premiums paid to target firm shareholders (Bugeja and Walter 1995). Furthermore, mining firms have predominantly been excluded from previous merger and acquisition studies, arguing that they have systematically different financial, operating and risk characteristics to both financial industrial firms, making their exclusion from previous studies appropriate.

Past empirical research regarding mergers and acquisitions has focused primarily on the wealth effects of both successful and unsuccessful takeovers, analysing abnormal returns to both the bidding and target firm's shareholders on and around the offer date (Bugeja and Walter 1995; Bruner 2002).

This study investigates five main research questions centering around the determinants of acquisition bid premiums. The distribution of target firm ownership is argued to have great importance in the takeover process. One argument claims that increased ownership prior to the takeover announcement allows a bidding firm to acquire a target firm more cheaply. Contrasting this however is the argument that greater level of ownership in the target firm increases the likelihood of share price decline by the bidding firm when a takeover bid fails. Therefore, the first research question looks at how the distribution of target firm ownership effects the acquisition premiums offered to mining firm shareholders.

Many studies have examined the motives for corporate takeovers. It can be argued that they take place to remove inefficient target management identified as those with poor prior share price performance. Another argument is that takeovers are viewed as positive NPV investments where greater operating performance results in greater acquisition premiums for target shareholders. These conflicting motives and proposed relationships with acquisition

premiums result in the second hypothesis which deals how target firm performance prior to the takeover announcement affects the premium paid for a given mining firm.

The remaining aspects of this study deal with takeover specific variables and how they impact on the premium offered to target mining firm shareholders. First, the wealth distribution effects and the immediate capital gains tax liabilities associated lead to the third research question addressing how the method of payment in a takeover of a mining firm is associated with the premium paid to target shareholders.

The fourth research question addresses how perceived benefits of international corporate diversification effects premiums paid in mining firm takeovers. The fifth and final research question concerns itself with how target management use hostility in the takeover process, and in whose interests do they act in when resisting a bid.

The lack of Australian and Canadian research on acquisitions incorporating the mining industry is concerning given the weight of the industry in the respective economies. The mining industry is responsible for nearly 25% of all successful takeovers in both Australia and Canada from 1997-2007<sup>1</sup>. During the same period, the annual takeover market for mining firms in Australia increased from \$548m to \$37.1b<sup>2</sup>. Comparisons can be made to the growth in the Canadian takeover market for mining firms which, over the same time period, increased from \$483m in 1997 to \$18.97b in 2007<sup>3</sup>. These statistics demonstrate the dominance that resource firms have in both takeover markets.

Despite the decline in business sentiment in 2008, brought on partially by the current global “credit crunch”, the takeover market for mining firms appears buoyant. This is no more evident than the February 2008 announcement of BHP Billiton’s tender offer for Rio Tinto which, if successful, stands to be the largest acquisition ever world wide, valuing Rio Tinto at approximately AUD\$165,000,000,000<sup>4</sup>. If the rate and volume of mining takeovers continues at this unprecedented level, further analysis of the mining industry as well as increased understanding of acquisition premiums is essential if both firms and individual investors wish to efficiently and effectively evaluate a takeover offer, and hence, make optimal investment decisions.

<sup>1,2,3,4</sup> Source: Connect 4 Takeover Database and Zephyr International Database.

The Australian and Canadian economies are similar in composition, despite considerable size differences. Both countries have vast resource deposits and the economic growth in each country is greatly influenced by growth in the mining industry. For this reason a comparative analysis of takeover premium determinants between the two countries will greatly add to the robustness of any model constructed.

The originality of this study comes from the fact that it combines the examination of both firm specific and takeover specific variables in an economically significant industry such as mining, which has been unexamined by previous research. It aims to add to current literature concerning takeovers in both Australia and Canada which is limited to date.

An improved understanding of the determinants of takeover premiums in the mining industry benefits the corporate sector and individual investors alike. For the corporate sector, the results help to construct profitable takeover premiums which effectively value the potential gains of a takeover. Similarly for investors, the results can help value an offer for their stake in a mining firm and make timely decisions, maximising their portfolio returns.

The rest of this study is organised as follow. Section Two presents a detailed review of the existing literature on acquisition premiums and their determinants along with the objectives of this paper. A description of hypotheses, data and methodology used to achieve the research questions is given in Section Three. Empirical results are discussed in Section Four. Finally, conclusions and suggestions for future studies on acquisition premiums are outlined in section Five.

## **2. LITERATURE REVIEW**

This section reviews literature regarding the variables that may explain the cross sectional differences in acquisition premiums. An overview of international and Australian studies on acquisition premium determinants is also presented. We also develop our research questions in this section.

In determining an expected relationship between variables and acquisition premiums Varaiya (1987) and Crawford and Lechner (1996) note that the price offered by a bidding firm should be a function of both the underlying value of the target firm and all potential gains a bidder stands to make from the takeover. Therefore, any variable expected to increase these potential gains from a takeover should increase the observed premium offered to target firm shareholders.

## **2.2 BIDDER TOEHOLDS**

A number of recent studies look at the optimal toehold a bidder should acquire before announcing a takeover bid. However, the majority of these (see (Bulow, Huang and Klemperer 1999; Goldman and Qian 2005)) use an equilibrium model and provide little empirical evidence in whether acquiring firms obtain this optimal toehold before announcing a tender offer.

The most commonly accepted theory on the effect of bidder toeholds on acquisition premiums is that of an inverse relationship. So, the greater the proportion of the target company that is owned by the bidder, the fewer additional shares are required to establish the controlling majority (Casey and Eddey 1989; Stulz, Walkling and Song 1990; Bugeja and Walter 1995; Bulow et al. 1999; Goldman and Qian 2005), resulting in a smaller premium offered by the acquiring firm.

The limited empirical research in this field predominantly supports the general consensus of an inverse relationship between toeholds and premiums. In a regression analysis of 78 Australian takeovers between 1981 and 1989, Bugeja and Walter (1995) find a significant inverse relationship between the two variables. Despite the relatively small sample size of that paper the results support those of Stulz et al. (1990) who find a significant inverse relationship between toeholds and observed premiums in a study of 104 US takeover announcements between 1968 and 1986.

Goldman and Qian (2005) hypothesise that if large toeholds allow firms to be acquired cheaply then the bidder should acquire the maximum toehold allowable by regulation before announcement. However, their empirical evidence contradicts this belief. They find that the majority of firms do not obtain optimal toehold before bid announcement. This is attributed

to the likely trade-off between benefits of low bid premium and potential for a large decrease in firm value caused by a failed bid when toeholds are large.

Thus the first research question asks: **What effect does the distribution of target firm ownership have when determining acquisition bid premiums in the mining industry?**

### **2.3 TARGET FIRM PERFORMANCE**

Regression analysis on cross sectional differences in acquisition premiums invariably include a measure of target firm performance in the periods prior to the takeover bid. One principal argument is that takeovers take place to remove inefficient management (Bugeja and Walter 1995; Shleifer and Vishny 2003). If inefficient target management is reflected in the share price of the firm, then there is an expected negative relationship between the observed takeover premium and the target firm's prior performance (Servaes 1991). Cornett, McNutt and Tehranian (2006) who, in a study of 134 bank mergers between 1990-2000, find industry adjusted performance of acquired banks increase significantly after acquisition. The association between acquisition premiums and target management performance has been studied by Lang, Stulz and Walkling (1989) and Servaes (1991). Both studies use a modified Tobin's Q as a measure of past target share price performance and find support for the claim, concluding that a poor quality target firm achieves greater premium when purchased by a high quality acquirer.

Previous research using accounting profitability ratios as a measure of past performance find results contradictory to those of Servaes (1991). The research suggests that the prior accounting performance of a target firm is positively associated with the size of the acquisition premium. This hypothesised relationship is supported by Rose (1991) and Shawky et al. (1996) who, in the study of bank merger premiums, find that target shareholders secure greater merger premiums if the target firm records higher rates of return on common equity and achieve greater operating efficiency than their acquirers in the pre-takeover announcement period. Rose (1991) notes this relationship could be a result of firms being valued using discount cash flow measures in which higher earnings results increase the premiums bidding firms are willing to pay for a given target. Henderson and Gart (1999), in a study of 228 US commercial bank takeovers between 1989 and 1998, also finds support for the proposed positive relationship between accounting profitability and takeover premiums.

They find that a target firm's return on assets is positive and statistically significant in determining book-value premiums.

This leads to the second research question: **How does target mining firm performance affect the premium offered in an acquisition?**

## **2.4 METHOD OF PAYMENT AND TAXATION**

In addition to synergistic benefits expected in a takeover, Wansley, Lane and Yang (1983) argue that the premium paid to an acquired firm is also dependent on the form of payment. Several hypotheses have been developed with regard to the relationship between payment method in an acquisition and premiums (see (Shawky et al. 1996)). First, the bidder overvaluation hypothesis suggests that if management of the acquiring firm have superior information that their own assets are overvalued, then they are more likely to undertake a stock-financed acquisition compared to a cash offer. However, the market will interpret this as a negative signal of the value of existing assets of the bidding firm (Myers and Majluf 1984). In addition to the bidder overvaluation hypothesis, the wealth redistribution hypothesis argued by Higgins and Schall (1975), and Galai and Masulis (1976) predicts that an unanticipated reduction in leverage ratio associated with a stock-financed acquisition makes outstanding debt less risky, transferring wealth from shareholders to debt holders. Both papers argue that unless restructuring occurs, debt holders will receive at least part of this benefit at shareholders' expense. An equity financed acquisition will result in both the potential gains of the takeover plus the wealth redistribution effects (Shawky et al. 1996). Accordingly, both hypotheses suggest equity financed takeovers involve greater premiums than cash takeovers. Shawky et al. (1996), in a study of US 320 bank mergers between 1982 and 1990, find support for these hypotheses with a positive and significant association between premiums and equity financed takeovers.

The association between shareholder taxation and the structure of corporate takeovers has received a great deal of attention in prior research (Bugeja and Da Silva Rosa 2008) and as a result, a contrasting hypothesis concerning the relationship between the method of payment and acquisition premiums is also frequently argued. Erickson (1998) and Dinnison (2000) note the immediate realisation of capital gains tax liabilities where cash is offered as the method of payment leads to the expectation that acquiring firms will be less likely to use cash

where target shareholders have a greater liability for capital gains tax (CGT). Tax liability forced upon target shareholders reduces propensity to accept a takeover offer thereby reducing the probability of a successful takeover offer. Wansley et al. (1983) and Brown and Ryngaert (1991) argue that this forces the acquiring firm to offer a greater acquisition premium under a cash offer scheme providing an incentive for target shareholders to accept the takeover offer. In support of this proposed relationship, Dhaliwal, Erickson and Heitzman (2004) in a study of acquisitions in the US healthcare sector find statistically significant evidence of a positive relationship between acquisition premiums and the capital gains tax rate.

An alternative hypothesis proposes a positive relationship between cash tenders and acquisition premiums; however, deals specifically with the convenience of a cash offer compared to the relative complexity of equity financed offers. Fishman (1989) argues that in equilibrium, both equity financed and cash financed takeovers should be observed, however notes bidding firm management often use cash offers as a method of making a pre-emptive takeover offer in the face of potential bidding competition. This is the reasoning offered by Mayer and Walker (1996) and Ayers, Lefanowicz and Robinson (2004) who find an increase in the popularity of cash takeovers spanning 1980 to 1990. Convenience of cash offers and the pre-emptive benefits it provides to the bidding firm should result in acquiring firm management willing to offer a greater bid premium for a given target.

These arguments lead us to the third research question, that is: **how does the method of payment in a takeover affect the acquisition bid premium offered to target mining firm shareholders?**

## **2.5 CROSS-BORDER ACQUISITIONS**

While shareholders benefit from international portfolio diversification (see Davis (1991) Solnik (1995)), there is less agreement on whether such benefits extend to corporate diversification (Danbolt 2004). Hisey and Caves (1985) and Markides and Ittner (1994) argue that, investors can benefit from international corporate diversification through cross-border acquisitions, beyond what they can achieve through individual portfolio adjustment. This is made possible through specific market inefficiencies including information asymmetry and high foreign exchange costs making it too costly for individuals to invest internationally.



Given the benefits of international diversification, management, a in the best interests of its shareholders, should seek international diversification through foreign takeovers (Cheng and Chan 1995). Crawford and Lechner (1996) argue that as the bidders' potential gains from takeovers increase with cross-border tenders, the acquirer should be willing to pay a larger premium than they would for an identical domestic target. Therefore, we would expect to observe higher premiums paid for international takeovers compared to domestic ones.

Results from this argument fail to provide conclusive evidence. Cakici, Hessel, and Tandon (1991), in a study of 245 foreign takeovers of US firms, find no significant difference in takeover premiums between domestic and international takeovers. Cheng and Chan (1995) find premiums for international takeovers to be nominally higher than domestic takeovers, however the difference proves statistically insignificant due to the limited sample size and the authors' inability to control influential variables such as method of payment.

Numerous studies in the US analysing differences in interstate vs. intrastate takeover premiums resulting from geographical deregulation of US bank merger laws (see (Adkisson and Fraser 1990; Brook, Hendershott and Lee 1998)). Brook et al. (1998) find the removal of takeover deregulation increases equity values of bidding firms subsequently increases the premiums they are willing to pay for interstate takeover targets. Stein (1988) however, shows how takeover deregulation makes firms who undertake long term investments more susceptible to takeover bids. This makes a manager's optimal investment strategy myopic, neglecting profitable long-term investments, and suggesting, in some cases, takeover deregulation erodes firm value.

Similar to Cheng and Chan's (1995) propositions about the benefits of international takeovers, another argument regarding interstate takeovers is that they provide the same benefits as international diversification in nations where corporate regulation differs between states (Levonian 1994; Shawky et al. 1996). If this argument holds true, we should observe a positive relationship between interstate takeovers and acquisition premiums, albeit a weaker one. Results are conflicting, Shawky et al (1996) finds interstate acquisitions involve significantly higher premiums than domestic takeovers, whereas Henderson and Gart (1999) find no significant difference between interstate and intrastate acquisitions. Again, these inconclusive results may be an outcome of failing to control for target size, method of

payment and other explanatory variables. Thus, this fourth research question asks: **How does international corporate diversification, specifically international takeovers, affect acquisition premiums paid to mining firms?**

## **2.6 TAKEOVER RESISTANCE AND AGENCY COSTS**

Early studies of the effect of takeover resistance and agency costs on acquisition premiums focus on the conflicting interests of shareholders and management. In defending against a tender offer, directors can act in the interest of existing shareholders, or with their own interest in mind (Casey and Eddey 1989). These are commonly referred to as the 'shareholder interest hypothesis' and the 'management entrenchment hypothesis'. Jensen and Meckling (1976) note that these interests rarely align due to the presence of both tangible and non-tangible managerial perquisites.

In nearly every contested takeover, target company directors state that the bidder's offer is inadequate in that it undervalues the target company. Defensive tactics, directors invariably argue, force the bidder to raise its bid premium (Schwert 2000). If the use of resistance as a bargaining tool to improve the terms of the tender argument holds true, we would expect to see a positive relationship between the level of bid resistance and the winning premium offered by the acquiring firm. This is supported by Hubbard (1987) and Bugeja and Walter (1995) who find that the winning tender premiums are significantly greater for firms which resist offers during the post takeover announcement period, compared to those accepting them. Findings in favour of the shareholder interest hypothesis are found by Casey and Eddey (1989) who conclude that initial bids rejected by management are significantly lower than those they accept suggesting in some cases management use resistance to ensure adequate returns for their shareholders.

In testing the managerial entrenchment hypothesis, Hartzell, Ofek and Yermack (2004) and Wulf (2004) provide marginally significant evidence that, in general, gains to target shareholders are reduced when the target CEO obtains additional benefits from the merger (beyond those specified in his pre-merger employment contract with the target). Wulf (2004) focuses on the issue of whether target CEOs accept a lower bid premium for target shareholders to obtain a position of power in the post-merger firm. Wulf (2004) finds on average, total gains measured by abnormal returns are insignificantly different between her samples; however, she finds target shareholders obtain a smaller proportion of these gains

when the target CEO obtains greater post-merger control rights. The smaller proportion of returns earned by target shareholders is attributed to the reduced acquisition bid premium offered to the target firm.

Many papers address the interrelation between target firm managerial ownership and the probability and implications of takeover resistance. Hartzell, Ofek and Yermack (2004) find evidence that target shareholders lose when the target CEO has below average ownership in the target suggesting the objectives of shareholders and manager are not aligned. This supports the claims of Jensen and Meckling (1976) who argue that agency costs are higher when there is low levels of managerial ownership. Furthermore, if takeovers are used to reduce agency costs, then the acquisition bid premium should be higher when managerial ownership is low (Bugeja and Walter 1995). This opinion is supported by Stulz's (1988) findings who concludes that an increased fraction of voting rights controlled by target management increases the premiums offered in a tender offer, suggesting managerial ownership in the target firm is successful in aligning interests of management and shareholders.

Strengthening the managerial entrenchment hypothesis, Walkling and Long (1984) and Cotter and Zenner (1994) find no significant difference between the bid premium offered to hostile and friendly takeover targets. Thus supporting claims that management addresses their own concerns before those of the shareholders and hence is the party benefiting from takeover resistance.

Despite perceived conflict between the shareholder interest hypothesis and managerial entrenchment hypothesis, Maheswaran and Pinder (2005) find support for both hypotheses. In a study of 133 Australian takeovers from 1992-2001 their findings show that resisted bids are associated with increases in shareholder wealth and increase the probability of upward bid revisions, supporting the shareholder interest hypothesis. Their findings are also consistent with the managerial entrenchment hypothesis, concluding that resistance is unrelated to the nominal value of the initial premium offered which questions the motive of initial resistance.

These arguments and findings lead to the fifth research question: **What effect does managerial resistance have on premiums paid in mining firm acquisitions?**

### **3. HYPOTHESES, DATA AND METHODOLOGY**

#### **3.1 HYPOTHESES DEVELOPMENT**

Based on the literature reviewed in the previous chapter, as well as the research questions proposed, the following hypotheses are generated for investigation.

Research question one asks: what effect does the distribution of target firm ownership have when determining acquisition bid premiums in the mining industry?, the related hypothesis is:

**H1: There is a negative linear relationship between a bidding firm's level of ownership in the target mining firm and the premium paid for that firm.**

In relation to research question two: how does target mining firm performance affect the premium offered in an acquisition?, two hypotheses have been identified:

**H2a: Acquisition premiums are positively related to the growth potential of the target firm.**

**H2b: There is a negative linear relationship between past share price performance and premiums measured using the market value premium approach.**

Relating to research question three: how does the method of payment in a takeover affect the acquisition bid premium offered to target mining firm shareholders?, hypothesis three states:

**H3: Acquisitions of mining firms financed by a cash payment involve greater acquisition bid premiums than those financed through equity.**

In the context of research question four: how does international corporate diversification affect acquisition premiums paid to mining firms?, the fourth hypothesis is:

**H4: Takeovers of mining firms in which the bidding firm is foreign to the target firm involve greater bid premiums compared to domestic takeovers.**

From research question five: what effect does managerial resistance have on premiums paid in mining firm acquisitions?, the fifth hypothesis proposes:

**H5: Takeovers of mining firms that have faced resistance from the target firm throughout the bidding process will involve greater acquisition premiums than those which face none.**

### **3.2 DATA DESCRIPTION**

The ideal sample size includes takeovers of publically listed mining/resource firms on the Australian Securities Exchange (ASX) and Toronto Stock Exchange (TSX). To be included in this study, target companies are required to have available accounting and share price data for at least the one year prior to the takeover announcement. Furthermore the target firm must be categorised as a metals/mining firm under the Global Industry Classification Standard (GICS). Finally, to be included in the sample, the takeover must have been announced within the period of January 1997 and December 2007.

### **3.3 DATA SOURCES**

The required data can be classified into groups concerning accounting data, share price data, ownership data, target management recommendation, and the names of acquiring and target firms involved in successful mining takeovers. As no database contains information on both Australian and Canadian takeover markets, the process of sourcing the data is different for the respective data sets. For the Australian sample, Connect 4 takeover database provides a list of all takeovers of publically listed companies in Australia from January 1997 and December 2007. Connect 4 also provides the deal value, the effective offer price, the acquiring firm's ownership stake in the target firm prior to the takeover announcement as well as the target management's recommendation concerning the offer. For the Canadian data set, Zephyr international acquisition database of Bureau Van Dijk provides the equivalent information.

Sourcing accounting information is again different for the Australian and Canadian data sets. For the Australian sample, the required accounting data needed to formulate the independent variables is sourced from FinAnalysis which subsequently also provides the share price information required to calculate the bid premiums. For the Canadian sample, Compustat North America is used to gather all relevant accounting information while Centre for Research in Security Prices (CRSP) provides necessary share price information.

### **3.4 SAMPLE SELECTION CRITERIA**

As this is a study of the determinants of acquisition premiums in the mining industry, one of the principle concerns in determining the selection criteria is how to identify mining/resource industry takeovers. On the 1<sup>st</sup> of July 2002, the Australian Securities Exchange (ASX) classification standard was dropped, replaced by the GICS. Therefore, for Australian takeovers included in the sample which precede this 2002 date, the target firm must be categorised as either one of the three broad ASX mining classifications.

In the Canadian sample, 107 of the takeovers listed in the database involved a target company which was only a selected division or subsidiary of the parent company. These were subsequently removed from the sample due to unavailability of market information. Furthermore, 26 takeover targets within the selected industries were identified as mining/resource trusts, income funds or other diversified vehicles. The unique characteristics of these observations, in particular their diversified nature, separates them from other firms included within the sample and so were removed. Thirdly, in attempting to remove the distortion of results caused by bankruptcy induced acquisitions, takeovers included in both the Australian and Canadian samples have been cleared from involving financially distressed firms.

Finally, to be included in this study, target companies are required to have available accounting and share price data for at least the one year prior to the takeover announcement. This is required to construct the necessary independent variables, as well as the calculation of takeover premiums. Table 1 outlines the sampling criteria and shows how the final sample of 92 Australian and 103 Canadian mining firm acquisitions between January 1, 1997 and December 31, 2007 is formed.

**Table 1: Sampling Procedure**

<i>Sampling Criteria</i>	<i>Number of Firms Remaining</i>	
	<b>Australia</b>	<b>Canada</b>
<b>Initial data set of takeovers of mining firms between January 1997 - December 2007</b>	160	1298
<b>After removing takeovers where:</b>		
The acquiring firm was not recorded	0	165
Target firm was a specialised mining/resource trust or income fund	0	26
Takeover was only for a selected division or subsidiary	0	107
Target firm was not a publically traded company	0	554
	<b>160</b>	<b>446</b>
<b>Data collected from Compustat and Datastream.</b>		
<b>After removing takeovers with insufficient:</b>		
Share price history	0	278
Past accounting records	0	65
	<b>160</b>	<b>103</b>
<b>Data collected from FinAnalysis.</b>		
<b>After removing firms with insufficient:</b>		
Accounting records	68	0
	<b>92</b>	<b>103</b>

**Note:** The number of takeovers that satisfy the sample selection criteria are detailed in this table. The final row shows the resulting sample size for analysis during the period of January 1997 to December 2007

**Source:** *Connect 4 Australian Takeover Database, Bureau Van Dijk's Zephyr International Database, Compustat and FinAnalysis*

### 3.5 METHODOLOGY

#### 3.5.1 DEPENDENT VARIABLE DEFINITIONS

Previous studies of acquisition bid premiums invariably select one of two commonly accepted methods of takeover premium measurement. These two measurements known as 'Book Value Premiums' and 'Market Value Premiums' commonly referred to as price premiums.

Book Value Premium (BVPREM):

$$BVPREM_i = \frac{P_i^*}{Net\ Assets_i / Total\ Shares\ Outstanding_i} - 1 \quad (1)$$

Where  $BVPREM_i$  is the book value acquisition premium offered to firm  $i$ , and is defined as the effective offer price,  $p_i^*$ , as a percentage premium over the target firm's book value of equity per share. This measure of acquisition premiums is consistent with that used by Shawky et al. (1996) and Henderson and Gart (1999).

Market Value Premium (MVPREM):

$$MVPREM_i = \frac{p_i^*}{p_i} - 1 \quad (2)$$

Where  $MVPREM_i$  is the market value acquisition premium offered to firm  $i$ , defined as the effective offer price,  $p_i^*$ , as a percentage premium over the target firm's market share price,  $p_i$ , two days prior to the takeover announcement. Following Cheng and Chan (1995), to calculate  $MVPREM_i$  the share price is taken two days prior to the takeover announcement to remove the effect of any rumours or information leaks in the market which may have adversely affected the target firm's share price. This is done to ensure the share price used in the calculation accurately measures the target firm's true market value prior to the takeover announcement.

### 3.5.2 INDEPENDENT VARIABLE DEFINITIONS

To date, no formal guidance in choosing an appropriate set of both test and control variables has been developed in regressing acquisition premiums. The test variables, listed in Table 2 are chosen based on their ability to provide insight into the characteristics of both the target firm involved in the takeover, and characteristics of the takeover itself. These variables, including their definition and calculation will be discussed further now.

**Table 2: Set of test variables included in this study**

- 
- (1) Bidding firm's toehold
  - (2) Target firm's price-to-earnings ratio
  - (3) Target firm's modified Tobin's Q
  - (4) Merger type (domestic or foreign)
  - (5) Method of payment (equity or cash)
  - (6) Target resistance (friendly or hostile)
-



Bidding Firm's Toehold (TOE):

$$TOE_i = \frac{\# \text{ of target shares outstanding held by the bidding firm}}{\text{Total shares outstanding}_i} \quad (3)$$

The bidding firm's toehold is defined as the percentage of the target mining firm owned by the acquiring firm prior to the takeover announcement, that is, the bidding firm's ownership stake in the target firm. This value is expressed as a percentage, where total shares outstanding is simply the number of ordinary shares that target firm  $i$  has on issue at the time of the takeover announcement.

Price-to-Earnings Ratio (PE):

$$PE_i = \frac{p_i}{\text{Net profit after tax}_i / \text{total shares outstanding}_i} \quad (4)$$

The price-to-earnings ratio is the independent variable used to proxy for the future growth potential of the target mining firm; where net profit after tax is the target mining firm's most recently reported profit prior to the takeover announcement. This follows Warren (1974) and Balke and Woha (2001) who identify price-to-earnings ratio as a proxy for the market's perceptions of a firm's growth potential. Balke and Woha (2001) note that firms with high share prices relative to their operating income (that is, high price-to-earnings ratios) are expected to achieve high future income growth to compensate shareholders for buying the stock at seemingly inflated current prices. Importantly, the use of the price-to-earnings ratio on a single company provides little interpretive ability, however when used as a relative value within specific industries or groups, as used in this study, the price-to-earnings ratio can provide insight into the perceived growth potential of a specific stock (Jones 2008).

Modified Tobin's Q (MTQ):

$$MTQ_i = \frac{\text{Market capitalisation}_i}{\text{Total assets}_i} \quad (5)$$

Following the methodology of Lang, Stulz and Walkling (1989) and Servaes (1991), a Modified Tobin's Q variable will proxy for past share price performance of the target mining

firm, and as such represents past target managerial performance; where total assets is the most recently reported value for the target firm's total assets. Servaes (1991) argues that high quality target management are those who have been able to achieve a superior market capitalisation based on a given level of assets. Alternatively, this can be viewed as achieving a high share price for a given level of assets per share. For the purpose of this study, high quality target firm management is identified by 'good' past share price performance (relative to other firms in the sample), hence a relatively higher Modified Tobin's Q value.

### Test Dummy Variables

The testing of hypotheses 3, 4 and 5 involve usage of dummy variables in the multivariate regressions. In the analysis of the effect that the method of payment has on acquisition bid premiums, the dummy variable is given the value of 1 when the takeover is financed with cash and 0 otherwise. In analysing foreign takeovers, the dummy variable will be given the value of 1 if the bidding firm is foreign to the target mining firm and 0 if the bidding firm is domestic. Finally, in the analysis of target firm hostility, the dummy variable will be given the value of 1 if the target mining firm management recommends that target shareholders reject the takeover offer, and the value of 0 if target management recommends target shareholder accept the offer.

While testing the above variables, this study will also control for the variables listed in Table 3 below. Unlike the test variables above, the control variables are chosen to allow for comparison with previous studies.

**Table 3: Set of Control Variables Included in This Study**

- 
- (1) Target firm's leverage
  - (2) Target firm's book-to-market ratio
  - (3) Total deal value
  - (4) Daily bond spread
- 

Target firm's leverage is calculated as the target firm's total liabilities divided by its total assets. Book-to-market ratio is defined as the target firm's book value of equity divided by its market capitalisation. Total deal value is calculated as effective offer price multiplied by the number of target firm shares outstanding. Finally, the daily bond spread is calculated as the

annualised yield on the ten year government bond minus the annualised yield on the ninety day treasury note.

### 3.5.3 CROSS-SECTIONAL REGRESSIONS

Regression analysis has been widely used in analysing acquisition premiums in the banking industry (Knutson 2002), and the methodology used in this study is similar to that of Henderson and Gart (1999); Brewer, Jackson, Jagtiani and Nguyen (2000); Cornett, Hovakimian, Palia and Tehranian (2003); and Maheswaran and Pinder (2005) to name but a few. The explanatory power of the independent variables is measured using a multiple linear regression model with the premium as the dependent variable. The model is given by:

$$PREM_i = \alpha + \beta_1 TOE_i + B_2 PE_i + B_3 LEV_i + B_4 BM_i + B_5 DV_i + B_6 SPREAD_t + B_7 DCASH + B_8 DFOR + B_9 DRES + \varepsilon_i \quad (6)$$

Where:

- $PREM_i$  = The acquisition bid premium paid for target  $i$ . Calculated as either book value or market value premiums as in equations (3.1) and (3.2).
- $TOE_i$  = The bidding firms ownership stake in the target firm, defined in equation (3.3)
- $PE_i$  = The price-to-earnings ratio for the target firm. Given by equation (3.4)
- $LEV_i$  = The level of target firm leverage. Defined as the target firm's total liabilities divided by its total book value
- $BM_i$  = The book to market ratio of the target firm.
- $DV_i$  = The total value of the acquisition.
- $SPREAD_t$  = The spread between the daily 10 year government bond annualised yield and the daily 90 day treasury note annualised yield.
- $DCASH$  = The dummy variable for the method of payment.  
 $DCASH = 0$  When the offer is financed with equity  
 $DCASH = 1$  When the offer is a cash offer
- $DFOR$  = The dummy variable for foreign takeovers.  
 $DFOR = 0$  When the bid is domestic  
 $DFOR = 1$  When the bid is foreign
- $DRES$  = The dummy variable for a hostile takeover.  
 $DRES = 0$  When directors recommend shareholders accept the bid.  
 $DRES = 1$  When directors recommend shareholders reject the bid.

## 4. EMPIRICAL RESULTS AND DISCUSSION

Before commencing any regression analysis it is important to examine the statistical characteristics of all variables used in the analysis. Tables 4, 5 and 6 contain the descriptive statistics for both the dependent and independent variables for Australia and Canada respectively. Most variables in both tables have a mean and median that differ substantially.

This observation is enforced by the ranging values of the skewness coefficients for many of the variables. A positive skewness indicates the mean is an underestimated measurement of the centre of the data while the opposite is true for a negative skewness coefficient. Despite this however, what is most noticeable in the tables is the high Jarque-Bera statistics. This measure of the normality of a variable's distribution (Gel and Gastwirth 2008) and Tables 4 and 5 both show that the only variables seen as "normal" are the variables of leverage and the bond spread in Table 4.

**Table 4 Descriptive Statistics for Australian Continuous Variables  
January 1997 – December 2007**

	Mean	Standard Deviation	Median	Minimum	Maximum	Skewness	Kurtosis	Jarque-Bera
<b>Book value premiums (%)</b>	459.596	11.431	128.437	-78.800	8430.127	4.902	30.471	3261.243
<b>Market value premiums (%)</b>	71.802	4.938	12.561	-83.870	4733.333	9.296	88.202	29152.340
<b>Toehold</b>	17.935	22.520	14.636	0.000	87.710	1.579	4.742	49.848
<b>PE</b>	-13.230	66.830	-1.720	-250.460	242.400	-0.560	8.750	131.700
<b>Tobin's Q</b>	3.292	9.203	1.237	0.127	79.635	6.832	54.232	10777.060
<b>Leverage</b>	0.340	0.240	0.330	0.009	0.890	0.319	2.015	2.580
<b>BM</b>	0.689	0.766	0.495	0.012	4.754	3.252	16.072	817.261
<b>Deal value (\$000 AUD)</b>	\$495,389.80	\$1,235,553.08	\$109,165.86	\$2,993.46	\$9,201,344.78	4.917	30.941	3363.450
<b>Bond yield spread</b>	0.002	0.007	-0.001	-0.0130	0.020	0.496	2.349	5.403
<b>n</b>	92							

**Note:** Book value premiums = acquisition premiums calculated using equation 3.1 in chapter 3; Market value premiums = acquisition premiums calculated using equation 3.2 in chapter 3; Toehold = the bidding firms ownership stake in the target mining firm, prior to the takeover announcement; PE = the target firm's price-to-earnings ratio; Leverage = the target firm's gearing ratio; BM = the target firm's book-to-market ratio; Deal value = the total value of the acquisition; Bond yield spread = daily spread between 10 year government bond and 90 day treasury note yield.

**Table 5 Descriptive Statistics for Canadian Continuous Variables**  
**January 1997 – December 2007**

	<b>Mean</b>	<b>Standard Deviation</b>	<b>Median</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Skewness</b>	<b>Kurtosis</b>	<b>Jarque-Bera</b>
<b>Book value premiums (%)</b>	272.947	346.288	176.170	-86.386	1788.221	2.425	9.516	283.220
<b>Market value premiums (%)</b>	54.254	203.023	34.037	-96.593	2030.913	9.076	88.977	33138.040
<b>Toehold (%)</b>	1.570	9.840	0.000	0.000	78.000	6.917	50.227	10393.631
<b>PE</b>	-10.958	250.563	5.345	-1435.787	1669.676	0.893	31.522	3504.963
<b>Tobin's Q</b>	2.746	6.310	1.201	0.018	56.030	6.627	52.930	11453.010
<b>Leverage</b>	0.363	0.190	0.420	0.011	0.683	-0.375	1.927	7.360
<b>BM</b>	0.874	0.493	31.733	0.015	3.094	9.772	97.975	40351.268
<b>Deal value (\$000 CAD)</b>	\$635,024.65	\$165,000.00	\$9,800,000.00	\$11,625.00	\$1,559,466.06	4.416839	23.284898	2100.817855
<b>Bond yield spread</b>	0.012700	0.010379	0.010900	-0.002800	0.035000	0.358565	1.872372	7.515330
<b>n</b>	103							

**Note:** Book value premiums = acquisition premiums calculated using equation 3.1 in chapter 3; Market value premiums = acquisition premiums calculated using equation 3.2 in chapter 3; Toehold = the bidding firms ownership stake in the target mining firm, prior to the takeover announcement; PE = the target firm's price-to-earnings ratio; Leverage = the target firm's gearing ratio; BM = the target firm's book-to-market ratio; Deal value = the total value of the acquisition; Bond yield spread = daily spread between 10 year government bond and 90 day treasury note yield.

**Table 6: Descriptive Statistics for Dummy Variables  
January 1997 – December 2007**

<b>Country:</b>	<b>Australia</b>		<b>Canada</b>	
<b>Panel A: Method of payment</b>	Observations	Proportion	Observations	Proportion
Equity financed	49	53.30%	46	44.66%
Cash financed	43	46.70%	57	55.34%
<b>Panel B: Merger type</b>				
Domestic	43	46.70%	88	85.44%
Foreign	49	53.30%	15	14.56%
<b>Panel C: Target management reaction</b>				
Friendly	72	78.30%	75	72.82%
Hostile	20	21.70%	28	27.18%

#### **4.1 TARGET FIRM AND ACQUISITION CHARACTERISTICS**

The previous section examined the statistical characteristics of both the firm specific variables and takeover specific variables that may explain cross-sectional variability in acquisition premiums. In the following sections we test the hypotheses and examine the explanatory power of each of the independent variable in determining both book value and market value premiums in the context of Australian and Canadian mining acquisitions.

**Table 7: Cross-sectional Regression of Selected Variables on Book Value Acquisition****Premiums**

$$PREM = \alpha_i + \beta_1 TOE_i + \beta_2 PE_i + \beta_3 LEV_i + \beta_4 BM_i + \beta_5 DV_i + \beta_6 SPREAD_i + \beta_7 DCASH_i + \beta_8 DFOR_i + \beta_9 DRES_i + \varepsilon_i$$

Independent Variable	Premiums (PREM)	
	Australia	Canada
	Coefficient	Coefficient
Intercept	5.8421** (0.032)	4.9789*** (0.001)
Toehold	-5.7751* (0.088)	-7.2271* (0.0776)
Price-to-earnings ratio	-0.0521*** (0.003)	-0.0007 (0.304)
Leverage	-0.8662 (0.431)	-6.2710*** (0.001)
Book-to-market ratio	-1.7706 (0.142)	-0.1420* (0.083)
Deal value	0.0001 (0.275)	0.0001* (0.085)
Spread	7.9243 (0.118)	6.2940** (0.034)
DCASH	2.1444* (0.096)	1.2377** (0.031)
DFOR	1.6251 (0.257)	-0.9156 (0.174)
DRES	4.0067* (0.085)	1.1480* (0.059)
<b>n</b>	92	103
<b>R<sup>2</sup></b>	0.1887	0.2622
<b>F Stat</b>	2.1197	3.5933

- **P-values in parentheses.**
- **\*\*\*, \*\*, \* denote significant at the 1%, 5% and 10% significance level respectively.**
- **All regressions are White-Heteroskedasticity Consistent.**

**Note:** PREM = Book value premiums as calculated in equation 3.1; Toehold = the bidding firms ownership stake in the target mining firm, prior to the takeover announcement; PE = the target firm's price-to-earnings ratio; Leverage = the target firm's gearing ratio; BM = the target firm's book-to-market ratio; Deal value = the total value of the acquisition; Bond yield spread = daily spread between 10 year government bond and 90 day treasury note yield; DCASH = Dummy variable for payment method (0 = equity financed, 1 = cash financed); DFOR = Dummy variable for merger type (0 = domestic takeover, 1 = foreign takeover); DRES = Dummy variable for target firm resistance (0 = target firm recommends takeover, 1 = target firm advises against the takeover).



**Table 8: Cross-sectional Regression of Selected Variables on Market Value Acquisition**

<b>Premiums</b>		
$PREM = \alpha_i + \beta_1 TOE_i + \beta_2 PE_i + \beta_3 LEV_i + \beta_4 BM_i + \beta_5 DV_i + \beta_6 SPREAD_i + \beta_7 DCASH_i + \beta_8 DFOR_i + \beta_9 DRES_i + \varepsilon_i$		
<b>Independent Variable</b>	<b>Premiums (PREM)</b>	
	<b>Australia</b>	<b>Canada</b>
	<b>Coefficient</b>	<b>Coefficient</b>
Intercept	-0.7154 (0.310)	-0.2010** (0.014)
Toehold	-2.0279* (0.083)	-1.5550*** (0.006)
Price-to-earnings ratio	-0.0034** (0.046)	-0.0001* (0.095)
Leverage	3.2973* (0.077)	0.0061 (0.489)
Book-to-market ratio	0.8514 (0.1321)	0.6409*** (0.001)
Deal value	0.0001 (0.272)	0.0001*** (0.007)
Bond spread	-5.7420 (0.249)	-7.9108** (0.027)
DCASH	1.3253* (0.066)	0.1881*** (0.009)
DFOR	1.2197 (0.145)	0.0691 (0.275)
DRES	0.1081* (0.068)	0.5553*** (0.001)
<b>n</b>	92	103
<b>R<sup>2</sup></b>	0.0748	0.9698
<b>F Stat</b>	0.7368	325.1636

- **P-values in parentheses.**
- **\*\*\*, \*\*, \* denote significant at the 1%, 5% and 10% significance level respectively.**
- **All regressions are White-Heteroskedasticity Consistent.**

**Note:** PREM = Book value premiums as calculated in equation 3.1; Toehold = the bidding firms ownership stake in the target mining firm, prior to the takeover announcement; PE = the target firm's price-to-earnings ratio; Leverage = the target firm's gearing ratio; BM = the target firm's book-to-market ratio; Deal value = the total value of the acquisition; Bond yield spread = daily spread between 10 year government bond and 90 day treasury note yield; DCASH = Dummy variable for payment method (0 = equity financed, 1 = cash financed); DFOR = Dummy variable for merger type (0 = domestic takeover, 1 = foreign takeover); DRES = Dummy variable for target firm resistance (0 = target firm recommends takeover, 1 = target firm advises against the takeover).

## 4.2 HYPOTHESIS ONE

Hypothesis one proposes that there is a negative linear relationship between the level of bidding firm ownership in the target mining firm and the premium paid for that firm. To test hypothesis four the analysis relies on results of the multiple regression, specifically the regression coefficient for 'toehold'.

The coefficients for the toehold variables appear consistently statistically significant across both measures of premiums as well as across both Australian and Canadian data sets. In the analysis of book value premiums, Table 7 shows that the Australian regression coefficient for the toehold variable is -5.7751, indicating that for every one percent increase in the bidder's level of ownership in the target company prior to announcing a takeover reduces the winning book value premium by 5.7751% on average. This relationship is statistically significant at the 10% level. Before drawing any conclusive statements about the affects of toeholds in the Canadian takeover market for mining firms, it is important to note that only 10 out of the 103 takeovers included in the Canadian sample recorded any level of bidding firm ownership prior to announcement. This very small proportion of firms may influence the validity of any inference that may be drawn from the results. The Canadian coefficient of 1.1480 shows the same relationship to that which was found in the Australian regression, albeit a weaker one. The coefficient indicates a one percent increase in the bidder's toehold reduces the winning book value premium by 1.1480% on average and again this is statistically significant at the 10% level.

Analysis of bidder toeholds on market value premiums in Australian and Canadian mining industries provides supporting evidence consistent with those of the regressions of book value premiums however the magnitude of the relationship is somewhat diminished. The Australian coefficient of -2.0279, statistically significant at the 10% level indicates that a one percent increase in the bidding firm's ownership in the target mining firm decreases of the market value premium offered by 2.0279% on average. As with the book value regressions, the Canadian coefficient for the toehold variable closely resembles the Australian regression. The statistically significant coefficient of -1.5550 demonstrates that a one percent increase in the toehold held by a Canadian mining firm decreases the winning market value premium by 1.555% on average. However, as noted previously, the limited sample size of Canadian takeovers that reported any bidder toehold may affect the validity of these results.

The results of the regressions provide evidence supportive of those in the previous literature. Stulz et al. (1990) and Bugeja and Walter (1995) note acquisition premiums depend upon the distribution of target firm ownership, with a constant negative linear relationship between bidding firm ownership in the target company and the acquisition premiums offered to target shareholders. The results also support the mathematical models formulated by Stulz (1988), Bulow et al. (1999) and Goldman and Qian (2005) which propose a negative linear relationship between bidding firm ownership and premiums.

The regression results shown in Table 7 and 8 overwhelmingly support hypothesis one indicating a significant negative linear relationship between toeholds and acquisition premiums consistently across both measures of premiums and across both data sets. It is clear that by accumulating significant ownership in a target mining firm before announcing a takeover bid, acquiring firms can, on average, successfully complete takeover at substantially cheaper, supporting hypothesis one.

### **4.3 HYPOTHESIS TWO**

In the context of research question two, it is necessary to determine how target firm performance affects the acquisition premium paid to target shareholders. In the previous chapter hypothesis two was divided into two sub-hypotheses, this is adhered to in this section

#### **4.3.1 HYPOTHESIS TWO A**

The first sub-hypothesis regarding target firm performance variables is that acquisition premiums are positively related to the growth potential of the target mining firm. To test this hypothesis, the regression coefficient for price-to-earnings ratio will be used. This follows Warren (1974) and Balke and Woha (2001) who identify price-to-earnings ratio as a proxy for the market's perceptions of a firm's growth potential.

As shown by regression coefficients in tables 7 and 8 the results conflict with hypothesis 5a. All four regression coefficients show a negative linear relationship between a target firm's price-to-earnings ratio and the bid premium offered to that firm, with three of these coefficients being statistically significant. In the Australian sample, the negative coefficient of -0.0521 under the book value approach indicates that an increase in the target firm's price-to-earnings ratio by one unit reduces the premium offered by 5.21%, statistically significant

at the 1% level. Australian results under the market value premium approach prove consistent. The coefficient for price-to-earnings ratio of -0.0034 again indicates that a one unit increase in the target firm's price-to-earnings ratio reduces the market value premium offered by 0.34%, statistically significant at the 5% level.

In context of Canadian regressions, a similar conclusion is drawn from the regression results. Both price-to-earnings ratio coefficients indicate a negative relationship however, in the Canadian sample only one coefficient proves statistically significant. The regression coefficient of -0.0001 under the market value approach to measuring premiums indicates that a one unit increase in a targets firm's price-to-earnings ratio reduces the market value premium received by target shareholders by 0.01% significant at the 10% level.

Despite the coefficient's conflicting direction with previous literature, these minor yet significant coefficients are similar in magnitude to those of Knutson (2002) who notes a price-to-earnings coefficient of 0.00763 in his analysis of book value premiums.

McGirt (2004) notes when using price-to-earnings ratio as a measure of growth potential, it is largely influenced by price bubbles or excessive investor optimism that may be present in the market at any given time. This is particularly important in the context of mining firms, many experiencing rapid share price growth from 2005 to 2007, outperforming the rest of the market.

The presence of a bubble in global mining markets may help to explain the negative coefficients calculated in the regressions. If significant price growth experienced by the mining industry throughout the sample period is seen as unwarranted price growth based on the earnings potential of the firm, then this may negatively influence the explanatory power of the price-to-earnings ratio acting as a proxy for expected growth. It can be argued that the significant negative coefficient for price to earnings ratio indicates on average that bidding firms are unwilling to pay the inflated price for a target mining firm and so adjust their bid premium accordingly. Further compounding this logic is that for many smaller mining firms, value is often based not on their assets in place but in potential future growth. If this future growth is seen to be over estimated by an optimistic market in times of a bubble then you would expect to see bidding firms offer a discounted bid premium, suggesting the presence of a negative relationship between the price-to-earnings ratio and observed bid premiums.

#### **4.3.2 HYPOTHESIS TWO B**

The second aspect of hypothesis two concerns the effect of past share price performance on acquisition premiums. Specifically, hypothesis 2b states there is a negative linear relationship between past share price performance and premiums measured using the price premium approach. As described in the previous chapter, the Modified Tobin's Q variable will proxy for past share price performance following methodology adopted by Lang, Stulz and Walkling (1989) and Servaes (1991).

Table 9 shows the regression output for testing the explanatory power of Modified Tobin's Q on market value premiums. The regression results show a consistent negative relationship between the two variables across both the Australian and Canadian sample data. The negative coefficient in the Australian regression of  $-0.0115$  indicates acquisition premiums measured using the market value approach decrease on average by 1.15% for every one unit increase in a target firm's Modified Tobin's Q. Similar results are found in the Canadian regression. The

coefficient of  $-0.0380$  indicates that an increase in Tobin's Q decreases observed market value premium by 3.8% on average. The Australian and Canadian coefficients are statistically significant at the 5% and 10% level respectively.

**Table 9: Cross-sectional Regression of Tobin's Q on Market Value Premiums**

Independent Variable	Market Value Premiums	
	Australia	Canada
	Coefficient	Coefficient
Intercept	-0.2207 (0.414)	0.3771 (0.226)
Modified Tobin's Q	-0.0115** (0.024)	-0.0380* (0.086)
Leverage	2.9755* (0.098)	0.2981 (0.408)
Deal value	0.0001 (0.367)	-0.0001 (0.495)
Risk-free rate	9.4070 (0.216)	14.1994 (0.262)
<b>R<sup>2</sup></b>	0.0299	0.0245
<b>F Stat</b>	0.6722	0.602

- **P-values in parentheses.**
- **\*\*\*, \*\*, \* denote significant at the 1%, 5% and 10% significance level respectively.**
- **All regressions are White-Heteroskedasticity Consistent.**

The test results for hypothesis 2b contribute to those of Lang et al. (1989) and Servaes (1991) who find a significant negative relationship between prior target managerial performance, measured by past share price performance, and market value premiums. This supports the proposition that acquiring firms will be more willing to pay higher premiums for a given target if their management is seen to have performed poorly prior to the takeover announcement. The introduction of new and more efficient management increases the probability of future favourable share price movements as the assets of the target mining firm become more efficient (Lang et al. 1989; Shleifer and Vishny 2003). There is sufficient evidence to support hypothesis 2b in claiming that market value premiums are negatively related to past share price performance of the target mining firm.

#### 4.4 HYPOTHESIS THREE

This section analyses the explanatory power of the cash takeover dummy variable, ‘DCASH’, in the regression of acquisition premiums. In analysing cash takeovers, premiums calculated using the book value approach will be addressed before those calculated under the market value premium approach, this will be repeated in all following hypotheses tests.

**Table 10: Mann-Whitney Test Results**

Country:	Australia			Canada		
	Mann-Whitney U Statistic	Z statistic	p-value	Mann-Whitney U Statistic	Z statistic	p-value
<b>Panel A: Book value premiums</b>						
DCASH	1160	-1.650	0.090*	1528	-1.645	0.100*
DFOR	1119	0.510	0.922	662	-0.020	0.985
DRES	804.5	-1.647	0.099*	933	-1.820	0.071*
<b>Panel B: Market value premiums</b>						
DCASH	1444	-3.060	0.002***	1659	-2.310	0.021**
DFOR	1041	0.100	0.960	664	-0.040	0.970
DRES	893.5	-1.645	0.100*	1976	-6.860	0.001***

- \*\*\*, \*\*, \* denote significant at the 1%, 5% and 10% significance level respectively.

**Note:** This table displays the non-parametric Mann-Whitney results testing the difference in mean acquisition premiums between i) cash and equity financed takeovers; ii) foreign and domestic takeovers; and iii) hostile and friendly takeovers; where: DCASH = Dummy variable for payment method (0 = equity financed, 1 = cash financed); DFOR = Dummy variable for merger type (0 = domestic takeover, 1 = foreign takeover); DRES = Dummy variable for target firm resistance (0 = target firm recommends takeover, 1 = target firm advises against the takeover)

Table 10 shows the output for the Mann-Whitney test analysing the difference in book value premiums between cash and equity financed takeovers, for both Australian and Canadian mining firms. The table shows consistent results between both the Australian and Canadian data set. For the Australian sample, the z statistic of  $-1.65$  demonstrates a significant difference in book value premiums between cash and equity takeovers in Australia. Similarly with the Canadian sample, with a z statistic of  $-1.645$  shows a statistically significant difference in book value premiums, statistically significant at the 10% level.

The results of the multiple regressions shown in tables 7 for the Australian and Canadian samples are largely consistent with those of the Mann-Whitney test results. Both coefficients are positive and statistically significant indicating that on average cash financed takeovers

result in higher premiums than equity financed takeovers. The Australian coefficient of 2.1444 indicates that cash takeovers yield book value premiums 214.44% greater than equity financed takeovers, statistically significant at the 10% level. Likewise, the Canadian coefficient of 1.2377 indicates that on average, cash financed takeovers yield book value premiums 123.77% greater than equity financed takeovers in the Canadian mining industry, statistically significant at the 5% level.

Table 10 also shows the results of the nonparametric Mann-Whitney tests conducted using the market value approach to measuring acquisition premiums. The results for the Australian and Canadian data show substantial consistency with the book value approach. The z statistics of  $-3.06$  and  $-2.31$  for the Australian and Canadian samples respectively show differences in market value premiums achieved by target shareholders under cash and equity financed takeovers. Both p-values show these results are statistically significant at the 5% level. Again, the results of the multiple regressions in Tables 4.7 support those of the Mann-Whitney tests. A positive and statistically significant coefficient in the Australian regression of 1.3253 indicates on average cash takeovers involve a market value premium 132.53% above that offered in equity financed takeovers. The Canadian regression results suggest the same directional relationship however the magnitude is somewhat diminished. The Canadian coefficient of 0.1881, statistically significant at the 1% level, indicates that in the takeover of Canadian mining firms, cash financed acquisitions yield market value premiums 18.81% higher than those offered under equity financed takeovers.

These findings support those of Wansley et al. (1983), Bugeja and Walter (1995) and Maheswaran and Pinder (2005), who find that cash takeovers involve premiums that are 90% larger than equity financed takeovers on average. The results provide evidence to the proposition made by Brown and Ryngaert (1991) who argue that forced realisation of capital gains tax liabilities by target shareholders under cash financed takeovers requires bidding firms to offer greater acquisition premiums to encourage the acceptance of the takeover bid. The results of both the regressions and Mann-Whitney tests provide evidence in favour of hypothesis three, that mining firm acquisitions financed through cash provide greater acquisition premiums, significant both economically and statistically, compared to the acquisition of mining firms financed through equity.



#### 4.5 HYPOTHESES FOUR

In the context of research question five, the second hypothesis proposes that takeovers in which the bidding firm is foreign to the target mining firm involve greater bid premiums compared to those considered domestic takeovers. This section analyses the explanatory power of the foreign dummy variable, 'DFOR', in the regression of acquisition premiums.

Table 10 displays the results for the Mann-Whitney test analysing the difference in book value premiums between foreign and domestic takeovers for both Australian and Canadian mining firms. For Australian target mining firms, the z statistic of 0.51 demonstrates a statistically insignificant difference in the mean book value premium between foreign and domestic takeovers. The Canadian Mann-Whitney test supports this finding with a z statistic of -0.02 showing no significant difference in book value premiums for Canadian acquisition when the bidder is either domestic or foreign.

The multiple regressions performed on book value premiums further confirm the results provided above. Both Australian and Canadian regressions in Table 7 show a statistically insignificant coefficient for the foreign acquirer dummy variable (DFOR). Again, this indicates that there is no statistically significant difference in the book value premiums offered to target firm shareholders between domestic and foreign takeovers in either Australian or Canadian mining industries.

Using the market value approach to measuring premiums, results consistent with those above are found. Both Mann-Whitney test results in Table 10 identify no statistically significant difference in mean market value premiums between foreign and domestic takeovers for either Australian or Canadian mining firms with z statistics of 0.1 and -0.04 respectively. These claims are supported by the results of the multiple regressions in which both Australian and Canadian regressions of market value premiums show a statistically insignificant relationship between the foreign dummy variable and the market value premium.

These results, suggesting that expected acquisition premiums offered in a foreign takeover are no different to those expected in a domestic takeover, refute the findings of Cheng and Chan (1995) and Danbolt (2004) who find that international diversification increases the potential gains of takeover, leading to bidding firms paying larger acquisition premiums. One

plausible explanation of these findings is described by Cakici et al. (1991) and Brook, Hendershott and Lee (1998) who researching the effects of the deregulation of banking takeover legislation in the US. Cakici et al. (1991) find interstate acquisition premiums are only significantly higher than intrastate takeovers in the two years immediately following the deregulation. Brook et al. (1998) argue this is due to the “myopia” effect present in acquiring firm management, which seek to take action in response to the newly deregulated banking industry even in the absence of any positive NPV gains. If the arguments of Brook et al. (1998) hold true across industries and can be expanded internationally, then this could explain the test results for hypothesis two. The resource industries in both Australia and Canada have long been open to international market forces and ownership rights and a period of deregulation of takeover legislation cannot be identified in the sample period used in this study.

Another reason for the discrepancy between the results achieved in this study and those of previous research on other industries again links to the global nature of the resource industry. Danbolt (2004) argues that international takeovers allow bidding firms to diversify themselves across markets and economic cycles. However, in a global industry like the mining industry, these diversification benefits may be less attainable as resource prices are mostly derived on an international platform driven by global demand. This results in limited diversification benefits that can be achieved through the acquisition of foreign mining firms and may explain the statistically insignificant difference between domestic and foreign acquisition premiums. There is no evident relationship between foreign takeovers and acquisition bid premiums resulting in a rejection of hypothesis four.

#### **4.6 HYPOTHESIS FIVE**

In relation to research question five, hypothesis five states that takeovers of mining firms that have faced resistance from target firm management throughout the bidding process will involve greater acquisition premiums than those which have faced none. This section analyses the explanatory power of the resistance dummy variable (DRES), in the regression of acquisition premiums.

The results of the Mann-Whitney test shown in Table 10 are consistent across both Australian and Canadian book value premiums. They demonstrate a statistically significant difference in mean book value premiums earned by target resource firms which resist the takeover offer

compared to those which do not. The results of the Mann-Whitney test are supported by those of the multiple regressions. The coefficients for the target resistance dummy variable in Table 4.6 are both positive and statistically significant at the 10% level. The Australian coefficient of 4.0067 suggests that on average resisted takeovers of mining firms will yield book value premiums 400.67% larger than the equivalent book value premium for a non-resisted takeover. Similarly, the Canadian coefficient of 1.1480 indicates book value premiums in resisted Canadian takeovers will be on average 114.80% greater than the equivalent non-resisted acquisition premium.

The Mann-Whitney test in Table 10 using the market value method of measuring acquisition premiums, yields results consistent with those found while using the book value approach. The results demonstrate that both Australian and Canadian samples display significant differences in mean market value premiums between hostile and friendly target firms. For Australia, the z statistic of -1.645 indicates that the difference is significant at the ten percent level while the Canadian sample z statistic of -6.86 indicates significance at the one percent level.

The results of the multiple regressions in tables 8 support the findings of the Mann-Whitney tests however the magnitude of the coefficients is somewhat smaller than under the market value approach. The Australian coefficient for the resistance dummy variable of 0.1081 indicates that the presence of target managerial increases the winning market value premium by 10.81% on average; statistically significant at the 10% level. Similarly, the Canadian regression coefficient of 0.5553, statistically significant at the 1% level indicates that hostile takeovers of Canadian mining firms yield market value premiums 55.53% greater than friendly takeovers.

The results relating to hypothesis three overwhelmingly support the 'shareholder wealth hypothesis' proposed by Casey and Eddey (1989) and Schwert (2000) who suggest that takeover resistance is a tool used by target firm management to maximise shareholder wealth as part of the "strategic bargaining process". The larger acquisition premiums found across both measures of premiums (when the target firm management resists a takeover bid) indicates that on average resistance is successful in increasing the gains to target shareholders. Interestingly, the magnitude of the coefficients proves much greater than in previous studies. Maheswaran and Pinder (2005) in a cross-industry study of Australian

takeovers excluding the resource industry, find that maintained defiance of a takeover bid in the post announcement period increases the acquisition premium by only 10% on average. Comparing their results with the range of 10.81% to 400.67% found in this study, it is clear that the difference in premiums is quite substantial.

The evidence put forward in this study conflicts with the ‘managerial entrenchment hypothesis’. Argued by Walkling and Long (1984) and Bugeja and Walter (1995), it proposes that target management resist a takeover to ensure their long term position within the firm. The evidence for hypothesis five does not indicate target management *always* put shareholder interest before their own, but on average over the entire data set there is sufficient evidence to support the view that resistance is most often used to extract a larger bid premium from the acquiring firm.

## **5. CONCLUSION**

While the extensive corporate finance literature in both Australia as well as the US has shown that takeovers can create value for both the bidding firm and target firm shareholders, very few papers attempt to explain the cross-sectional variation in the premiums paid to target firm shareholders. Furthermore, mining firms have been predominantly excluded from previous merger and acquisition studies, arguing that they have systematically different financial, operating and risk characteristics. This research paper attempts to fill these gaps left by previous studies by examining the extent to which specific firm specific takeover specific variables affect the size of the premium offered to target firm shareholders. Finally, this study incorporates data from both Australia and Canada in a cross-country examination of acquisition premiums between two resource reliant economies. This is done to increase the robustness and validity of the results presented in this research paper.

The first hypothesis of this study was to examine how a bidding firm can purchase a toehold in the target company prior to the takeover announcement, to lower the bid premium necessary, and achieve a successful takeover. The test results from Tables 4.6 and 4.7 support hypothesis one by indicating a negative and significant coefficient for all toehold variables suggesting that in both Australia and Canada obtaining a level of ownership in the target

company prior to the takeover announcement allows the bidding firm to acquire the target mining firm at a cheaper price.

The results from the second hypothesis were mixed. Hypothesis two was split into two sub-hypotheses, both relating to the performance of the target mining firm. Hypothesis 2a found negative and statistically significant relationship between the perceived growth potential of a target mining firm, when using its price-to-earnings as a proxy, and three out of the four measures. This result with previous literature and the existence of a ‘bubble’ in the mining industry may also explain some of the divergence from previous research. We can conclude that the price-to-earnings ratio is too simple a measure to capture the future growth potential of mining firms where much of the value is intangible, and a more detailed and accurate measure should be found.

Hypothesis 2b found results more consistent with previous literature. The negative and statistically significant relationship found for the modified Tobin’s Q variable when regressing against market-value premiums suggests an acquiring firm will pay more for a mining firm that is seen to have had poor managerial performance prior to the takeover announcement. This is because implementation of new and more efficient management increases the probability of favourable share price movements, increasing potential takeover profits.

Hypothesis three aims to determine if payment method in a mining firm takeover has any affect on the cross-sectional variability in premiums paid to target shareholders. All four regression coefficients show a positive and statistically significant association between cash payments and acquisition premiums, supporting the proposition that the immediate realisation of capital gains tax liabilities by target shareholders forces the acquiring firm to offer a greater premium in order to induce the acceptance of the takeover offer.

Hypothesis four was concerned with finding an association between international takeovers and the subsequent diversification benefits and acquisition premiums. The results are largely inconclusive suggesting that, even if acquiring firms do receive diversification benefits through international takeovers, they do not factor these benefits into the premium they offer target mining firm shareholders.

The fifth and final hypothesis aims to test in whose interests mining firm management act when resisting a takeover offer. The results show a consistently positive and statistically significant coefficient for the target resistance coefficient suggesting that target hostility is in fact successful in increasing the premiums paid to target shareholders and is used as part of a strategic bargaining tool by target management to maximise target shareholder gains.

The most obvious extension to this study is to expand the sample size. This can be done in two ways. First, incorporating more countries into the investigation with a similar economic construct to Australia and Canada will increase the number of observations used in the statistical tests. Alternatively extending the sample period and/or using a more extensive database may also have the same impact on sample size.

In addition, this paper does not account for the possibility of a multiple bidder takeover contest. Two main areas of research relating to this limitation could possibly be further explored. First, following Bulow et al. (1999) a multiple bidder framework could be implemented to determine how toeholds affect the bidding strategies of acquiring firms seeking to acquire a mining firm. This could incorporate a study to see if a stake in the target company gives the owner an advantage in the bidding process. Secondly, target managerial resistance could be studied in the context of a multiple bidder takeover to gain insight into how target management can signal the relative value of a takeover offer to target shareholders. Alternatively, if it hypothesised that target management act in their own self interest when rejecting a takeover bid, a study attempts to associate management recommendations and post-acquisition perquisites could prove beneficial to the study of takeover resistance.

**REFERENCES**

- Ayers, B. C., Lefanowicz, C. E., and Robinson, J. R. (2004). The effect of shareholder-level capital gains taxes on acquisition structure. *Accounting Review*, 79(4), 859-887.
- Balke, N. S., and Wohar, M. E. (2001). Explaining stock price movements: Is there a case for fundamentals? *Economic & Financial Review*, 1-22.
- Bishop, S., Dodd, P., and Officer, R. (1987). Australian takeovers: The evidence 1972-1985. *The Centre for Independent Studies*.
- Brewer, E., Jackson, W., Jagtiani, J., and Nguyen, T. (2000). The price of bank mergers in the 1990s. *Economic Perspectives*, 24(1), 2.
- Brook, Y., Hendershott, R., and Lee, D. (1998). The gains from takeover deregulation: Evidence from the end of interstate banking restrictions. *Journal of Finance*, 53(6), 2185-2204.
- Brown, D. T., and Ryngaert, M. D. (1991). The mode of acquisition in takeovers: taxes and asymmetric information. *Journal of Finance*, 46(2), 653-669.
- Bruner, R. F. (2002). Does M&A pay? A survey of evidence for the decision-maker. *Journal of Applied Finance*, 12(1), 48.
- Bugeja, M., and Da Silva Rosa, R. (2008). Taxation of shareholder capital gains and the choice of payment method in takeovers. *Accounting & Business Research*, 38(4), 331-350.
- Bugeja, M., and Walter, T. (1995). An empirical analysis of some determinants of the target shareholder premium in takeovers. *Accounting & Finance*, 35(2), 33-60.
- Bulow, J., Huang, M., and Klemperer, P. (1999). Toeholds and takeovers. *Journal of Political Economy*, 107(3), 427-454.

- Cakici, N., Hessel, C., and Tandon, K. (1991). Foreign acquisitions in the United States and the effect on shareholder wealth. *Journal of International Financial Management & Accounting*, 3(1), 39-60.
- Casey, R. S., and Eddey, P. H. (1989). Directors' recommendations in response to takeover bids: Do they act in their own interests? *Australian Journal of Management*, 14(1).
- Cheng, D. C., Gup, B. E., and Wall, L. D. (1989). Financial determinants of bank takeovers. *Journal of Money, Credit & Banking*, 21(4), 524-536.
- Cheng, L., and Chan, K. (1995). A comparative analysis of the characteristics of international takeovers. *Journal of Business Finance & Accounting*, 22(5).
- Cornett, M. M., Hovakimian, G., Palia, D., and Tehranian, H. (2003). The impact of the manager-shareholder conflict on acquiring bank returns. *Journal of Banking & Finance*, 27(1), 103-131.
- Cornett, M. M., McNutt, J. J., and Tehranian, H. (2006). Performance changes around bank mergers: Revenue enhancements versus cost reductions. *Journal of Money, Credit & Banking*, 38(4), 1013-1050.
- Cotter, J. F., and Zenner, M. (1994). How managerial wealth affects the tender offer process. *Journal of Financial Economics*, 35(1), 63-97.
- Crawford, D., and Lechner, T. (1996). Takeover premiums and anticipated merger gains in the US market for corporate control. *Journal of Business Finance & Accounting*, 23(5/6), 807-829.
- Danbolt, J. (2004). Target company cross-border effects in acquisitions into the UK. *European Financial Management*, 10(1), 83-108.
- Davis, E. P. (1991). International diversification of institutional investors. *Bank of England Discussion Papers*, 44, 10-16.



- Dhaliwal, D. S., Erickson, M. M., and Heitzman, S. (2004). The effect of seller income taxes on acquisition price: Evidence from purchases of taxable and tax-exempt hospitals. *Journal of the American Taxation Association*, 26(2), 1-21.
- Dinnison, I. (2000). Australia opts for rollover relief. *International Tax Review*, 11(7), 49.
- Erickson, M. (1998). The effect of taxes on the structure of corporate acquisitions. *Journal of Accounting Research*, 36(2), 279-298.
- Fishman, M. J. (1989). Pre-emptive bidding and the role of the medium of exchange in acquisitions. *Journal of Finance*, 44(1), 41-57.
- Galai, D., and Masulis, R. W. (1976). The option pricing model and the risk factor of stock. *Journal of Financial Economics*, 3(1/2), 53-81.
- Gel, Y. R., and Gastwirth, J. L. (2008). A robust modification of the Jarque-Bera test of normality. *Economics Letters*, 99(1), 30-32.
- Goldman, E., and Qian, J. (2005). Optimal toeholds in takeover contests. *Journal of Financial Economics*, 77(2), 321-346.
- Hartzell, J. C., Ofek, E., and Yermack, D. (2004). What's in it for me? CEOs whose firms are acquired. *Review of Financial Studies*, 17(1), 37-61.
- Henderson, H., and Gart, A. (1999). Key variables explaining acquisition premiums for large commercial banks. *Bank Accounting & Finance*, 12(4).
- Higgins, R. C., and Schall, L. D. (1975). Corporate bankruptcy and conglomerate merger. *Journal of Finance*, 30(1), 93-113.
- Hisey, K. B., and Caves, R. E. (1985). Diversification strategy and choice of country: Diversifying acquisitions abroad by U.S. multinationals, 1978-1980. *Journal of International Business Studies*, 16(2), 51-64.
- Hubbard, G. L. (1987). Targeting the takeover. *Professional Administrator*, 13-18.

- Jarrell, G., Brickley, J., and Netter, J. (1988). The market for corporate control: The empirical evidence since 1980. *Journal of Economic Perspectives*, 2, 49-68.
- Jensen, M. C., and Meckling, W. H. (1976). Theory of the firm: Managerial behaviour, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305-360.
- Jones, C. P. (2008). How important is the P/E ratio in determining market returns? *Journal of Investing*, 17(2), 7-14.
- Knutson, J. (2002). *Financial determinants of merger premiums*. Nova Southeastern University.
- Lang, L. H. P., Stulz, R. M., and Walkling, R. A. (1989). Managerial performance, Tobin's q, and the gains from successful tender offers. *Journal of Financial Economics*, 24(1), 137-154.
- Levonian, M. (1994). Interstate banking and risk. *Federal Reserve Bank of San Francisco Economic Letter*, 94(26).
- Maheswaran, K., and Pinder, S. (2005). Australian evidence on the determinants and impact of takeover resistance. *Accounting & Finance*, 45, 613-633.
- Markides, C. C., and Ittner, C. D. (1994). Shareholder benefits from corporate international diversification: Evidence from U.S. international acquisitions. *Journal of International Business Studies*, 25(2), 343-366.
- Mayer, W. J., and Walker, M. M. (1996). An empirical analysis of the choice of payment method in corporate acquisitions during 1980 to 1990. *Quarterly Journal of Business & Economics*, 35(3), 48.
- McGirt, E. (2004). The truth about P/E. *Money*, 33, 73-73.
- Myers, S. C., and Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, 13(2), 187-221.

- Rose, P. S. (1991). Bidding theory and bank merger premiums: The impact of structural and regulatory factors. *Review of Business & Economic Research*, 26(2), 22-40.
- Schwert, G. W. (2000). Hostility in takeovers: In the eyes of the beholder? *Journal of Finance*, 55(6).
- Servaes, H. (1991). Tobin's Q and gains from takeovers. *Journal of Finance*, 46(1), 409-419.
- Shawky, H., Kilb, T., and Staas, C. (1996). Determinants of bank merger premiums. *Journal of Economics and Finance*, 20(1), 117-131.
- Shleifer, A., and Vishny, R. W. (2003). Stock market driven acquisitions. *Journal of Financial Economics*, 70(3), 295.
- Solnik, B. H. (1995). Why not diversify internationally rather than domestically? *Financial Analysts Journal*, 51(1).
- Sprent, P., and Smeeton, N. C. (2003). *Applied Nonparametric Statistical Methods* (Vol. 45): American Statistical Association.
- Stein, J. C. (1988). Takeover threats and managerial myopia. *Journal of Political Economy*, 96(1), 61.
- Stulz, R. M. (1988). Managerial control of voting rights: Financing policies and the market for corporate control. *Journal of Financial Economics*, 20(1), 25-54.
- Stulz, R. M., Walkling, R. A., and Song, M. H. (1990). The distribution of target ownership and the division of gains in successful takeovers. *Journal of Finance*, 45(3), 817-833.
- Varaiya, N. P. (1987). Determinants of premiums in acquisition transactions. *Managerial and Decision Economics*, 8, 175-184.
- Walkling, R. A., and Long, M. S. (1984). Agency theory, managerial welfare, and takeover bid rescue. *RAND Journal of Economics*, 15(1), 54-68.
- Wansley, J. W., Lane, W. R., and Yang, H. C. (1983). Abnormal returns to acquired firms by type of acquisition and method of payment. *Financial Management*, 12(3), 16-22.

Warren, J. M. (1974). An operational model for security analysis and valuation. *Journal of Financial & Quantitative Analysis*, 9(3), 395-422.

White, H. (1980). A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. *Econometrica*, 48(4), 817-838.

Wulf, J. (2004). Do CEOs in mergers trade power for premium? Evidence from "mergers of equals". *Journal of Law, Economics & Organization*, 20(1), 60-101.