



# **Corporate Governance, Manager Behavior, and Analyst Behavior as Determinants of Mergers and Acquisitions**

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# Corporate Governance, Manager Behavior, and Analyst Behavior as Determinants of Mergers and Acquisitions

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ABSTRACT: The literature on Mergers and Acquisitions activity has espoused various explanations for M&A activity. Some of this captures the nature of defence mechanisms against takeovers. In all the expositions the agency conflicts and degrees of collusion among the claimants to the firm's cash-flows, are apparent. In this paper we add to the literature by presenting an integrated framework that classifies manager behavior and corporate governance, and show how a manager can use M&A bids as a vehicle for maximising their own benefits, rather than shareholder value. The M&A bid targeted by the manager could simply be for diversionary reasons that seek to enable the manager to hold on to his employment and benefits, even though he may be a poor manager. We also consider M&A activity that benefits both managers and shareholders. In this analysis, M&A activity is driven by the manager's appetite for M&A activity, both beneficial and unbeneficial. The analysts, who are employed by investment banks, that advise on the M&A activity, collude with management. The analysts forecast inflated earnings for a company because the fees they earn as a portion of what the investment bank earns, are related to the size of the transaction which in turn is determined by the inflated future earnings. The agency conflicts between shareholders, investment banks and their analysts, and managers of the company, are central to our framework.

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## 1 Introduction

The advent of significant corporate collapses linked to mergers and acquisitions (M&A) and accounting scandals, in the last few years, has not only resulted in managers being prosecuted and companies being sued by investors, but has also led to investment banks being fined for their seemingly misleading earnings forecasts on these companies. Weak corporate governance and poor compliance procedures have been linked to the rise of many recent corporate scandals (Holmstrom and Kaplan, 2003). The Enron debacle, among others, has come to epitomise the nature of the phenomenon. Some M &A activities have not been beneficial to shareholders.<sup>1</sup> The wave of corporate scandals has culminated in increasing the effectiveness of reporting standards, general statutory compliance and the tightening of corporate governance rules via various means including the Sarbanes-Oxley Act of 2002.

The introduction of Sarbanes-Oxley rules have impacted firms' consideration of the costs of staying public (Engel et al., 2004) and altered their focus toward compliance rather than earnings managed growth (Li et al., 2004). Suppression of information in relation to agency costs is likely to remain an important issue as corporate governance strictures take effect (Arya et al., 1998; Bushman and Smith, 2001; Demski and Frimor, 1999; Indjejikian and Nanda, 1999). The introduction of the Sarbanes-Oxley Act is matched by a reduction in M&A activity as compliance has gained prominence over acquisitive growth in some sectors. For instance, in the first quarter of 2000 global M&A activity was valued at nearly US\$1.2 trillion. Over the next 24 months global M&A activity dropped to about US\$300 billion and remained flat up to the end of 2003. M&A activity subsequently began to rise reaching a level of about US\$500 billion in the fourth quarter of 2004.<sup>2</sup> During the

<sup>1</sup>An example, is the merger of Time Warner and American Online (AOL) in the year 2000, which seems not to have delivered benefits to shareholders but to have driven Time Warner to engage in aggressive accounting practices evidenced by AOL. On Wed, 15 December 2004, Time Warner announced that it had agreed to pay US\$510 million, as settlement for criminal and civil investigations associated with AOL. This settlement will allow the company to return to raising capital from debt and capital markets which it had difficulty accessing while the lawsuits remained with the spectre of being forced to restate its financial results. The company is expected to be able to now pursue potential acquisitions and focus on growth rather than compliance (see *Financial Times*, 12/7/2004, page 24).

<sup>2</sup>In December 2004 alone the M&A deals announced include, Johnson and Johnson in the healthcare sector having agreed to take over Guidant for US\$425 billion in cash

period from 2001 to 2003, companies were focusing on compliance as opposed to seeking growth opportunities - a trend that is now beginning to reverse.

The literature on Mergers and Acquisitions activity has espoused various explanations for M&A activity (see Bertrand and Mullainathan, 2003; Baghat, Shleifer and Vishny, 1990; Chang, 1990; Comment and Schwert, 1995; Gaughan, 2002; Grossman and Hart, 1980; Hellwig, 2000; Holmstrom and Kaplan, 2001; Pagano and Volpin, 2005). Some of this literature seeks to explain and capture the nature of *defence mechanisms* against takeovers. In these expositions, the agency conflicts and the strength of collusion among the claimants to the firm's cash flows, are apparent.

In the literature, corporate governance and the behavior of the managers in the companies that engage in M&A activity and analysts who forecast earnings, have not received much attention as combined explanatory factors of the level of M&A activity. The analysts are employees of investment banks who also advise on M&A activity and strategies. This paper presents an integrated framework that characterises selfish manager behavior and poor corporate governance that result in managers seeking to use M&A activity as a vehicle for maximising their own benefits, rather than shareholder value. The M&A targeted by the manager may also have diversionary characteristics such as to enable the manager to hold on to his (his is used to refer to his or her in this paper) employment and benefits, even though poor performance is in evidence. We also consider M&A activity that benefits both the managers and shareholders. In our framework, the M&A activity is driven by the manager's appetite for M&A activity, both beneficial and unbeneficial. The analysts who are employed by investment banks that advise on the M&A activity, forecast inflated earnings for a company because the fees the investment banks earn, are related to the size of the transaction which in turn is determined by the inflated future earnings. The *agency conflicts* between shareholders, investment banks and their analysts, and the managers of the firms involved, are central to our framework.

The rest of the paper is organized as follows. Section II presents different characteristics of managers and develops a general equilibrium model for M&A activity under conditions of good corporate governance. Section III

and stock; Symantec took-over Veritas software for US\$13.5 billion in stock; Noble energy merged with Patina Oil and Gas in cash and stock deal worth US\$3.4 billion; United Technologies acquisition of Kidde of UK for US\$2.8 billion; Cedant's purchase of UK-based Gullivers Travel Associates and the online unit of Octopus travel group for US\$41.1 billion in cash (see *Financial Times*, 12/17/2004, page 1).

analyses the supply of M&A activity under conditions of good and bad corporate governance, while Section IV discusses the role of regulatory institutions. In Section V, we develop a model for analyst behavior and conditions for incentive compatibility. Section VI considers the analyst attitude to risk and their liability, while Section VII seeks to characterize the nature of potential shareholder-loss and analyst-liability when analysts overstate a company's earnings. Section VIII concludes.

## **2 General Equilibrium of M&A activity under Good Corporate Governance**

We assume there are a large number of companies each owned by identical types of individuals. We also assume that corporate leaders, whom we shall refer to as managers, are subjected to a two (2) term employment contract arrangement for the periods  $\{0, T\}$  and  $\{T+1, 2T\}$  which are equal in length. The ability to subject managers to a finite employment contract constitutes what we call "good corporate governance". If the shareholders or indeed its representative board are unable to terminate the manager's contract at the end of his first term or the manager is able to influence his own re-appointment process when deemed to have performed badly, then there is "poor corporate governance".

In this section we consider the company to be operating under conditions of good corporate governance. The manager possesses characteristics that determine the value of the company and subsequently, the welfare of the shareholders while they lead the company. The managers are drawn from the population and new candidates are appointed at the beginning of each contract period by a Board of Directors that represents the interests of shareholders. A poor manager is only punished at the end of the first period  $\{0, T\}$  when the incumbent's contract is not renewed, which constitutes good corporate governance practice.

We initiate the analysis of the problem by using a framework developed by Hess and Orphanides (2001). Let the consumption stream of shareholders,  $c_t$  be determined by earnings,  $dt$  minus the cost of an M&A process,  $kt$ . First, we will consider a situation where the M&A process does not yield any benefits to the shareholders, and indeed may only possess diversionary characteristics, and accentuate the manager's selfish behavior. In this case

the consumption of shareholders is given by:

$$c_t = d_t + s_t k_t \quad (1)$$

where  $s_t$  takes the value of one (1) if there is M&A activity and zero(0) if there is no M&A activity. Also assume that  $d_t$  and  $k_t$  are drawn from cumulative distributions  $H(d_t)$  and  $G(k_t)$ . We also assume that there is symmetric information between managers and shareholders, and each manager's abilities are only known when appointed to the position. The shareholders are risk-neutral and appoint, through their Board of Directors, a manager who maximizes expected welfare,  $W_t$ , given by:

$$W_t = E_t \sum \alpha^{s-t} c_s \quad (2)$$

where  $\alpha$  is a discount factor,  $0 < \alpha < 1$ . While in office, the manager derives rents (salaries and benefits)  $F$ . The manager is partially benevolent and maximizes a weighted average of their rents and shareholder's welfare. If  $\pi$  is the probability that a manager is re-appointed, then the manager's welfare function is:

$$V_t = (1 - \pi) W_t + \pi (F + \alpha F \Delta) \quad (3)$$

where  $\pi$  is a measure of the manager's selfishness, as  $\pi$  measures the weight he attaches to his own rents from being in office than to shareholder's welfare.

## 2.1 Manager-Type and Re-Appointment Dynamics

Now let us consider the dynamics of the re-appointment of the manager. We classify the managers into five (5) categories namely: *bad manager*; *satisfactory and selfish manager I*; *satisfactory and selfish manager II*; *good manager*; and *star-performing manager*. The shareholders consider the level of the earnings stream,  $d_t$ , as an important factor in choosing a manager. When the earning stream is high,  $d_{high}$  then any manager who produces  $d_t \geq d_{high}$  will be re-appointed, even if they engage in an unprofitable M&A process which results in no change in the earning, but incurs M&A cost of  $k_t$ . Let us also define the lowest earning stream so that any manager who pays out  $d_t < d_{low}$  would not have their contract renewed at time  $T + 1$ , even if they engaged in an M&A process. Therefore, the re-appointment of a manager depends on  $d_{low}$  and  $d_{high}$  relative to  $d_t$ . There is also a critical earning

stream  $d^{**}$  such that when  $d_t \geq d^{**}$  the manager would be re-appointed with no M&A process undertaken and the re-appointment only depends on  $d_t$ .

Next we define shareholder's welfare,  $W_1$ , which is associated with a new manager of unknown characteristics. When there are two or more candidates, the shareholders will only evaluate if their expected welfare associated with re-appointing the incumbent manager exceeds  $W_1$  on the basis of the information known about the incumbent. If so, then they would re-appoint the incumbent, otherwise not. Then, the re-appointment conditions for the incumbent, denoted by  $i$ , are:

$$d_i + \theta k_i \geq W_1 (1 - \alpha) \quad (4)$$

where  $\theta$  is the exogenous probability of being involved in M&A activity. For each company  $\theta$ , is exogenous but can be endogenized by aggregating across all companies. From (4) we notice that the incumbent will only be re-appointed if the consumption benefits exceed or are equal to those generated by an alternative candidate. Therefore, with the absence of M&A activity, re-appointment is guaranteed for any  $d \geq d^{**}$ , such that  $d^{**}$  is given by:

$$d^{**} = W_1 (1 - \alpha) - \theta k^* \quad (5)$$

where  $k^*$  is the expectation of  $k$  given by  $k$  given by  $k^* = -pK$ , where  $K$  is the cost of M&A activity and  $p$  is its probability of it being incurred. In other words, the cost of M&A activity characteristic  $k$ , is equal to  $-K$  with probability  $p$  and zero with probability  $1 - p$ . Therefore,  $K$  measures the *execution capacity* of M&A bids for the manager. From (5) we see that the critical earnings level  $d^{**}$  is one that is equal to the welfare associated with a new manager net of expected M&A costs.

Next, let us consider the expression for  $d_{high}$  which is that the manager is so good at his job as to produce a high earning such that the manager is re-appointed even though poor M&A execution skills are evident with costs  $k = -K$ . Then, if:

$$d_i - \theta K \geq W_1 (1 - \alpha) \quad (6)$$

then

$$d_{high} = \min \{1, W_1 (1 - \alpha) + \theta K\} \quad (7)$$

When  $\theta$  is high, then  $d_{high}$  is equal to one(1) or the earning yield is 100% of whatever is potentially possible. We can see that a manager with characteristics  $d \in \{d^{**}, d_{high}\}$  gets re-appointed regardless and are therefore least interested in M&A activity. This is a “good manager”.

A “bad manager” is one such that:

$$d_i < W_1 (1 - \alpha) \quad (8)$$

And indeed a “bad manager” is one with the characteristics  $d_{low}$  such that :

$$d_{low} = \max \{0, W_1 (1 - \alpha)\} \quad (9)$$

Note that “bad managers” are such that  $d \in \{0, d_{low}\}$  Bad managers avoid M&A activity as they do not enhance their re-appointment prospects.

We can see that the relevant region is  $d \in \{d_{low}, d^{**}\}$  where M&A activity may lead to re-appointment but his contract would not be renewed in the absence of M&A activity on their part. This is a “satisfactory (but selfish) manager”. What then determines the manager’s desire to pursue M&A activity is the difference between his welfare in the absence of M&A activity ( $V_0$ ) and welfare with M&A activity ( $V_{t0}$ ). Then,

$$V_0 = (1 - \pi) (d + \alpha W_1) + \pi F \quad (10)$$

and

$$V_{t0} = (1 - \pi) [d - pK + p\alpha W_1 + (1 - p) \alpha (d + \alpha W_1)] + \pi [F + (1 - p) \alpha F] \quad (11)$$

If  $V_0 - V_{t0} > 0, \forall d \in (d_{low}, d^*)$ , then the manager will initiate M&A activity for any  $d$  and will act in the interest of shareholders.

If  $V_0 - V_{t0} < 0, \forall d \in (d_{low}, d^*)$ , the manager will initiate M&A activity whenever he can raise his chances of re-appointment. This is the case of a ‘selfish manager’. Solving  $V_0 - V_{t0} = 0$  for  $d$  yields.

$$d_0 = (1 - \alpha) W_1 + pK / (1 - p) \alpha - \pi F / (1 - \pi) \quad (12)$$



Then, we can define  $d^*$  such that the manager will only engage in M & A activity if  $d \in \{d^*, d^{**}\}$ . Then  $d^*$  is given by

$$d^* = \min \{ \max (d_{low}, d_0), d^{**} \} \quad (13)$$

We can see from expressions from  $d_0$  and  $d^*$  that the decision to embark on M&A activity depends on the manager's degree of selfishness  $\pi$ . Then, the minimum  $\pi$ , namely  $\pi^*$ , such that the manager behaves selfishly is one such that  $d_{low} = d_0$ , and is given by:

$$\pi^* = pK / [pK + \alpha F (1 - p)] \quad (14)$$

If  $\pi > \pi^*$ , then the manager will initiate M&A activity whenever  $d_{low} \leq d \leq d^{**}$  this indistinguishable from the case of a manager who is totally selfish with  $\pi = 1$ , such that  $d^* = d_{low}$ .

The unconditional probability of the manager being re-appointed,  $J(\theta)$ , is determined by the type of manager as defined by five possible regions of  $d$  namely

- Region 1: *Bad manager* with characteristics  $d \in \{0, d_{low}\}$  has a zero probability of re-appointment;
- Region 2: *Satisfactory and selfish manager I* with characteristics  $d \in \{d_{low}, d^*\}$  has re-appointment probability  $\theta(1 - p)$ ;
- Region 3: *Satisfactory and selfish manager II* with characteristics  $d \in \{d^*, d^{**}\}$  has re-appointment probability  $(1 - p)$ ;
- Region 4: *Good manager* with characteristics  $d \in \{d^{**}, d_{high}\}$  has re-appointment probability  $(1 - \theta) + \theta(1 - p)$ ; and
- Region 5: *Star-performing manager* with characteristics  $d \in \{d_{high}, 1\}$  has a re-appointment probability of one(1).

Then the unconditional probability of a manager's re-appointment is given by:

$$J(\theta) = (d^* - d_{low}) \theta (1 - p) + (d^{**} - d^*) (1 - p) + (d_{high} - d^{**}) (1 - \theta p) + (1 - d_{high}) \quad (15)$$

## 2.2 The Quantity of Global M&A Activity

The probability that a new manager will initiate M&A activity is

$$B(\theta) = H(d^{**}) - H(d^*) = d^{**} - d^* \quad (16)$$

and the probability of re-appointment is defined in expression (15) above. We now wish to determine the expected frequency with which a company will have a manager facing the temptation of engaging in M&A activity. These would be managers in their first term contract and having poor management skills and without any proven record of efficiently handling M&A activity. Let this fraction of companies be  $f(\theta)$ . Let us first determine the frequency that a company has a manager serving the first term of his contract in period  $j$ . Let the  $M_j$  denote that the manager is in his first term in period  $j$ , and  $1 - M_j$  denote that the manager is in his second term of the contract. Now consider a Markov process for whether a company has a manager who is in his first term of the contract of employment. If the manager is serving his first term, the probability with which a manager will be serving his first term in the subsequent period is  $1 - J(\theta) = Pr(M_{t+1}|M_t)$ . If the current manager is not serving his first term, since managers may serve only up to two terms, this manager may not be re-appointed. Then the probability with which a manager is serving his first term in the subsequent period is one (1), that is,

$$Pr(M_{t+1} | 1 \sim M_t) = 1 \quad (17)$$

Then, a transition probability matrix can be constructed, indicating the term served by a company's manager.

From the transition probability matrix we can show that the unconditional frequency or stationary probability with which a manager will be serving his first term is,

$$\phi(\theta) = 1/[1 + J(\theta)] \quad (18)$$

Since we assume that only managers serving their first term engage in M&A activity and they face this possibility with probability  $B$ , then the frequency with which a company's manager will contribute to the quantity of M&A activity is:

$$f(\theta) = B(\theta)\phi(\theta) \quad (19)$$

From (19) it follows that the global quantity of M&A activity is given by <sup>3</sup>

$$Q(\theta) = \sum_i^n B(\theta_i) \phi(\theta_i) \quad (20)$$

the sum of the frequencies for  $n$  companies.

### 2.3 M&A Equilibrium

We consider the notion of equilibrium when there is a large number of companies. Here one company's avoidable M&A bid could be another company's unavoidable M&A bid. We need to determine the probability with which a firm not seeking an M&A bid is forced into an M&A bid if a fraction,  $f$ , of companies seek M&A bid. We shall refer to the companies seeking M&A bids as "hawks",  $f$ , and those seeking to avoid M&A bids as "doves",  $1-f$ . Then  $\theta$  is the probability that a dove is involved in an M&A bid with a hawk. Let each hawk be matched with a dove with probability  $\omega$ . Then the probability of unavoidable M&A bids is:

$$\theta = \omega f / (1 - f) = (\text{fraction of doves matched with hawks}) \quad (21)$$

If  $f = 0$ , then doves are never attacked and  $\theta = 0$ . If a hawk is always matched with a dove then  $\omega = 1$ , and the equilibrium condition is:

$$\theta = f / (1 - f) \quad (22)$$

However, in equilibrium

$$\omega = 1 - f \quad (23)$$

and

$$\theta = f \quad (24)$$

This means that in equilibrium, the probability of being drawn into an M&A bid is equal to the proportion of "hawks" in the population of companies. Then an M&A activity equilibrium is characterised by the pair  $\{\theta, f\}$  which satisfies the contribution to M&A activity in (19) and the equilibrium condition (24).

<sup>3</sup>The number M&A deals globally during 2004 was 28 664 compared to 28642 in 2003 (see Business Day, 1/3/2005)

### 3 Beneficial M&A Activity

In the analysis above we have considered a scenario where the M&A activity is not beneficial to shareholders and is therefore diversionary on the part of the manager. In this section we now consider a scenario where there is poor corporate governance, and the Manager cannot be dislodged from his position, even when he is a bad manager. But also there are scenarios where there is good corporate governance and the right level of shareholder activism, and M&A activities could produce positive benefits.

#### 3.1 Good Corporate Governance and Beneficial M&A Activity

We consider a situation where a company is presented with an opportunity to initiate an M&A bid. The manager realises such an opportunity with probability,  $\varphi$ . These M&A bids result in benefits,  $d_2$ , in the form of additional earning flows to shareholders. In this case the consumption stream for each shareholder is now,

$$c_t = d + k_t + d_2 \quad (25)$$

The decision to engage in M&A activity now depends on the size of  $d_2$ . There are two (2) possible scenarios. The first one is where a manager engages in M&A activity, extracting benefits even if the manager is a poor executioner of M&A bids. In this case there will always be M&A activity. The second case is where benefits are extracted and the manager is well supported by shareholders and he has proven skills in executing M&A activity. If the manager has excellent execution capabilities, then  $k = 0$ , and the manager will engage in M&A activity after they have proved their execution abilities.

The overall frequency with which a company with good corporate governance will contribute to M&A activity is then:

$$f^G(\theta) = B(\theta)\phi(\theta) + \varphi z(\theta) \quad (26)$$

where  $z(\theta) \geq 0$  is the frequency of managers who are currently serving their second terms in their contract of employment and have acquired good M&A experience from the first term of their contracts. The first term in (26) captures the pointless M&A motive (diversionary motive) as in expression (19).

The second term in (26) captures the additional beneficial M&A activity component. In (26) if  $\theta = 0$ , then the quantity of M&A activity is also zero (0),  $z(0) = 0$ . However, if a manager engages in M&A bids he may not know how good he is and does not get experience. In other words the manager has to be engaged in non-beneficial M&A bids in his first term in order to have experience to pursue another M&A bid with success in their second term. If  $\theta > 0$ , then the engagement in M&A bids by companies with good corporate governance is positive. The supply of appropriate M&A activity is always less than  $\varphi$  regardless of  $\theta$ .

### 3.2 M& A activity under Poor Corporate Governance

Here we consider a situation where there is poor corporate governance and the manager has a constant probability of remaining employed for an additional term independent of his performance abilities and capabilities in handling M&A bids. We refer to these managers as *dictatorial managers*. At the risk of oversimplification, dictatorial managers could include managers who are also founders of the company that they manage but have since been joined by other shareholders in the ownership of the company. Such managers create the scenario where they are so closely identified with the company that their personalities reflect the characteristics of the company. In this case it means dictatorial managers need not engage in diversionary M&A activity and indeed have no incentive to engage in such activity. This means if managers were dictatorial they are not likely to contribute to diversionary and wasteful M&A bids because they do not need to. The interesting result is that poor corporate governance which supports dictatorial managers gives the managers an incentive to engage in beneficial M&A activity! This perverse result seems to suggest that improving the corporate governance requirements, as the Sarbanes-Oxley Act does, is more likely to result in pointless M&A activity with strong diversionary characteristics. However, by being dictatorial, the manager will expropriate the benefits of M&A bids,  $d_2$ , and not pay that out as dividends to shareholders but pay that as a bonus to themselves, and the shareholders bare the costs  $k$ . Then the dictatorial manager will initiate an M&A bid only if it is beneficial, and the benefits flow to themselves and not the shareholders.

The supply of M&A activity under poor corporate governance is  $f^B = \varphi$ . In this case if all companies had poor corporate governance then the equilibrium frequency of M&A activity would be  $\varphi$ . Notice that the equilibrium

supply of M&A activity under poor corporate governance is higher than under good corporate governance, that is  $\varphi > f^G(\theta)$ . This ties in with the empirical evidence we presented above where before the introduction of the Sarbanes-Oxley act M&A activity was high and dropped substantially after its introduction in year 2001.

### 3.3 M&A Activity Under both Good and Poor Corporate Governance

In the real world we have the co-existence of companies operating under both good and bad governance conditions. Under these conditions, would the frequency of M&A activity be lower than that under good governance conditions? Let the fraction of companies with good governance be  $\eta$  and those with bad governance be  $1 - \eta$ . In this case the global supply of M&A activity would be the weighted average

$$f^T(\theta) = \eta f^G(\theta) + (1 - \eta) f^B(\theta) \quad (27)$$

where  $f^G(\theta)$  is defined in equation (26) and  $f^B(\theta) = \varphi$ . Let us consider the case where the manager is selfish, that is  $\pi > \pi^*$ . If all companies practice good governance, then  $\eta = 1$ , and the supply of M&A activity is  $f^G(\theta)$  and frequency of M&A activity is  $f^G(\theta)$ . If all the global companies are practicing poor corporate governance then the global supply of M&A activity is  $f^B(\theta) = \varphi$ . In reality the global supply of M&A activity is a weighted average of the two extreme scenarios, and as to whether the supply of M&A activity increases or falls depends on whether  $f^G(\theta)$  is greater or smaller than  $\varphi$ , the availability of M&A opportunities. In other words, the supply of M&A activity could increase or indeed fall, compared to the case of universal good corporate governance.

## 4 Role of Regulatory Institutions in M&A Activity

Above we have established that selfishness on the part of managers will inevitably cause some M&A activity. The role of regulatory bodies such as Takeover Panels, Competition Commissions, Securities and Exchange Commissions, Financial Accounting Standards Board and their equivalent in other countries, is to ensure that the process of Mergers and Acquisitions is reasonably fair to all stakeholders involved with the companies. These institutions

can also be utilized by firms that are considered as *doves* to ward off attack from firms that are *hawks*. Indeed, the presence of these regulatory bodies can serve to reduce unbeneficial M&A activity, which may prove difficult to get approval for from regulatory bodies.

## 5 The Behavior of Investment Banking Analysts

### 5.1 Incentive Compatibility

In this section we consider the role of investment banks and the Analysts they employ who forecast earnings of companies some of whom the investment banks are advising on M&A activities. While the advisory department in the banks is meant to be separate from the securities departments that forecast company earnings, there may be some collusion. The so-called “Chinese Wall” between the advisory divisions and securities division may be adhered to. The collusion is driven by the fact that the Advisory division of the Bank has an M&A advisory mandate whose fees depend on the size of the M&A deal, in other words, the size of the company in value terms.

To maximize their payment, the analysts, some of whom participate in these advisory mandates, become incentivized to present the company as being well-managed and indeed the managers of the company are presented as good managers even though they may be “bad” managers. The payment structure for the analyst and indeed the advisory department of the investment bank is a percentage of the value of the M&A transaction. Then there is an incentive for the analyst to inflate the true value of the firms projected earnings in order to increase fees. In our analysis we shall focus on just the analyst since we have established that his behavior is similar to that of his employers, the bank. In the analysis above there are five possible earning streams namely  $d_{low}$ ,  $d^*$ ,  $d^{**}$ ,  $d_{high}$ , and 1. For simplicity we consider two earning scenarios, namely  $d_{low}$ , for poor performance of the firm, and  $d_{high}$  for good performance of the firm in the eyes of shareholders. Also, let  $b$  be the probability that the expected firm performance is bad and  $b_p$  that the analyst finds out that the expected performance is bad, and  $b_p < b$ .

Let us consider the preferences of the analyst, who is employed by the investment bank that has an advisory contract with the company, during period interval  $\{0, T\}$ . the bank has to be involved in a competitive bidding process for the renewal of the advisory mandate beyond this period. Let  $I$

$> 0$ , be the income earned by the analyst, during period  $(0, T]$ . Let  $X$  be future income of the analyst from having the contract of the investment bank renewed beyond period  $T$ , that period  $\{T+1, T+N\}$ . Let  $\varepsilon$  be the effort that the analyst applies in the performance of his duties of forecasting earnings, and  $D(\varepsilon)$  be the disutility of the degree of effort. We also assume that the analyst's preferences  $U(\cdot)$  are separable in money  $m$  and effort  $e$ , giving utility  $U(m)$ , so that  $U(m, \varepsilon) = U(m) - D(\varepsilon)$ . Seeing that the analyst is selfish will report  $d_{high}$ , seeing that the investment bank will lose its advisory mandate in the next period, or trigger a review of the contract, if they forecast  $d_{low}$ . The analyst will then forecast  $d_{high}$  when they know that  $d_{low}$ , is the truthful situation.

Let  $d^0$  be the performance at time  $t = 0$ , that the analyst observes ( $O$ ) where  $O \in \{g, b\}$ ; and  $d^{\mathfrak{R}}$  be the performance at time  $t = 0$  that the analyst reports ( $R$ ) where  $\mathfrak{R} \in \{g, b\}$ . Let  $\Phi(\cdot | \cdot)$  be the analyst's expected utility when the manager of the company reports  $d^{\mathfrak{R}}$  having observed  $d^0$ . Therefore,

$$\Phi(d_{high} | d_{high}) = U(I + X) - D(\varepsilon) > 0 \quad (28)$$

where the analyst reports good performance when the underlying state of the company is good, receives his current income  $I$ , future income  $X$  after applying effort,  $\varepsilon$ , to perform his duties, experiencing disutility  $D(\varepsilon)$  from effort level,  $\varepsilon$ . For the bad state we have

$$\Phi(d_{low} | d_{low}) = U(x) - D(\varepsilon) \quad (29)$$

and the analyst forecasts bad performance when the underlying performance is bad, and they risk the investment bank losing its advisory contract. But by being truthful the analyst creates a good chance of having the Bank's contract renewed and he earns future income,  $X$ , as (29) shows. Also

$$\Phi(d_{high} | d_{low}) = (1 - \chi) U(1 + X) - \chi U(X - \kappa) - D(\varepsilon) \quad (30)$$

where  $\chi$  is the probability of the investment bank losing the contract, and this is also the probability of being found out to have been *untruthful* about the real state of affairs. Basically, (30) says that, if the analyst reports good earnings when the underlying state of affairs is bad, then the bank could survive dismissal and continue receiving current fees ( $I$ ) and future income ( $X$ ) from re-appointed, with probability  $(1 - \chi)$ , with the company recovering quickly. Expression (30) also recognizes the possibility of the bank losing the



contract with probability  $\chi$  and the analysts only receiving future income,  $X$ , if the Bank is re-appointed in future.

The term  $\kappa$  in (30) is the legal liability of the investment bank and the analyst, from being found not to have been truthful about the true state of affairs in the company. In (30), if we set  $\kappa$  sufficiently high then the analyst will not be tempted to report good when the underlying state of affairs is bad since they do not wish to risk a high liability. How high should be? For incentive compatibility we require that

$$\Phi(d_{high} | d_{low}) \leq \Phi(d_{low} | d_{low}) \quad (31)$$

In other words, the analyst will experience a lower expected utility from reporting a good state of affairs when the real situation is bad, than from reporting the true bad state of affairs. Being truthful is more rewarding than being untruthful. Expression (31) is the condition that ensures the existence of a “Chinese Wall” between the advisory and securities divisions of an investment bank.

## 6 Liability of Analysts and Attitude to Risk

The probability of the investment bank losing the contract  $\kappa$ , can be set to be exogenous in the sense that we can impose it, and besides it may depend on the strategy of the investment bank. However, we can also set  $\kappa$  to be endogenous in cases where the Investment bank’s actions result in the collapse of the company. In this case the loss to shareholders can be quantified exactly. The regulators and legal institutions would be concerned with identifying the minimum level of liability  $\kappa_1$  which ensures that (31) always holds. Then  $\kappa_1$ , is the minimum liability that would ensure incentive compatible behavior from the investment bank, and hence reduce the possibility of untruthful and perhaps corrupt behavior.

What factors determine the liability of untruthful behavior on the part of the analyst? We can show that this liability depends on attitude towards risk, potential future income, and the probability of being found out to have inflated the true performance of the company. The probability of being caught lying is also the same as that of losing the contract. To show this we consider the level  $\kappa$  that makes the incentive compatible equation hold with equality and then substitute equations (29) and (30) in (31). We then

consider a Taylor series expansion about  $X$  of  $U(I + X)$  and  $U(X - \kappa)$ , and obtain

$$U(I + X) = U(X) + IU'(X) + 0.5I^2U''(X^*), X^* \in (X, X + I) \quad (32)$$

and

$$U(X - \kappa) = U(X) - \kappa U'(X) + 0.5\kappa^2 U''(X^{**}), X^{**} \in (X - \kappa, X) \quad (33)$$

We can show that  $\kappa$  satisfies the quadratic equation where

$$0.5U''(X^{**})\kappa^2 - U'(X)\kappa + A = 0 \quad (34)$$

$$A = \chi^{-1}(1 - \chi) \{IU'(X) + 0.5I^2U''(X^*)\} > 0 \quad (35)$$

and again  $\chi$  is the probability of being found to have been untruthful and the investment bank losing the advisory contract.

If we exclude negative roots in (34) we can show that

$$\kappa = \left( U'(X) / U''(X^{**}) \right) \left\{ 1 - U''(X^{**}) A / U'(X)^2 \right\}^{0.5} > 0 \quad (36)$$

Noting that the Arrow-Pratt measure of Absolute Risk Aversion,  $\lambda$ , and noting that,

$$U'(X) / U''(X^{**}) \geq U'(X) / U''(X) \quad (37)$$

we obtain

$$\kappa \geq - (1/\lambda) \left( 1 - \left\{ 1 + (2\lambda A / U'(X)) \right\}^{0.5} \right) \quad (38)$$

Since

$$U''(X^*) / U'(X) \geq U''(X) / U'(X) \quad (39)$$

and substituting for  $A$ , we obtain

$$\kappa \geq - (1/\lambda) \left( 1 - \left\{ 1 + 2\lambda\chi^{-1}(1 - \chi) (I - 0.5I^2\lambda) \right\}^{0.5} \right) \quad (40)$$

Then  $\kappa$  depends on the probability of being found to have been untruthful and losing the contract,  $\chi$ , the income,  $I$ , and attitude to risk,  $\lambda$ . By inspection of (40) we see that when the probability of the analyst being untruthful being established is high, one expects the value of  $\kappa$  to increase. When the appetite for risk increases, the liability  $\kappa$ , also increases.

## 7 Loss to Shareholders and Liability of the Analyst

This section seeks to link to loss to shareholders and the legal liability of an analyst who inflates the true performance of a company. How large should the fine to analysts and the bank be? To answer this question we should measure the loss to shareholders due to the actions of the analyst. We will just focus on reporting earnings  $d_{low}$  and  $d_{high}$ .

The value of the company under poor performance conditions  $d_{low}$ , using a dividend discount model, is

$$S_0 = (1 - b) d_{low} / (r - bROE) \quad (41)$$

where  $r$  is the discount rate,  $b$  is the retention ratio and ROE is the return on equity. When the company is a star-performer, then its value is

$$S_t = (1 - b) d_{high} / (r - bROE) \quad (42)$$

If the analyst reports  $d_{high}$  when in fact  $d_{low}$  is the truth and is later realised, then the loss to the shareholders is

$$L = (1 - b) (d_{high} - d_{low}) / (r - bROE) \quad (43)$$

Then, the liability of the analyst should be set to equal the expected loss of the shareholders as in expression (43).

## 8 Conclusion

In this paper we have presented an integrated framework that classifies manager behavior and corporate governance, and show how a manager can use M&A bids as a vehicle for maximising his own benefits, rather than shareholder value. The M&A bid so targeted by the manager could simple be for diversionary reasons, that seek to enable the manager to hold on to his employment and benefits, even though he is not a good manager. We also consider M&A activity that benefits both the managers and shareholders. In this analysis, M&A activity is driven by the manager's appetite for M&A activity, both beneficial and unbeneficial. The analysts, who are employed by investment banks, that advise on the M&A activity, collude with management. The analysts forecast inflated earnings for a company because the fees they earn as a portion of what the investment bank earns, are related to

the size of the transaction which in turn is determined by the inflated future earnings. The agency conflicts between shareholders, investment banks and their analysts, and managers of the company, are central to our framework.

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